

NC COASTAL RESOURCES COMMISSION

April 26-27, 2017

Dare County Government Complex

Manteo, NC

The State Government Ethics Act mandates that at the beginning of any meeting the Chair remind all the members of their duty to avoid conflicts of interest and inquire as to whether any member knows of any conflict of interest or potential conflict with respect to matters to come before the Commission. If any member knows of a conflict of interest or potential conflict, please state so at this time.

Wednesday, April 26th

- 10:00 COASTAL RESOURCES ADVISORY COUNCIL MEETING (Rm. 168)** Greg “rudi” Rudolph, Chair
- 1:00 COMMISSION CALL TO ORDER* (Commission Meeting Room)** Renee Cahoon, Chair
- Roll Call
 - Chair’s Comments
- 1:15 VARIANCES**
- Sanitary Restaurant - (*CRC-VR-17-02*), Morehead City, Urban Waterfront Roy Brownlow
Christine Goebel, Esq.
Meredith Jo Alcocke, Esq
- 2:15 COASTAL RESERVES**
- NC National Estuarine Research Reserve Management Plan (*CRC-17-08*) Rebecca Ellin
- 3:00 ACTION ITEMS**
- Perquimans County LUP Amendment (*CRC-17-10*) Charlan Owens
 - Adoption of 15A NCAC 7L Planning & Management Grants Rachel Love-Adrick
- 3:15 ESTUARINE SHORELINE MANAGEMENT**
- Living Shoreline (Marsh Sill) General Permit Update (*CRC-17-11*) Daniel Govoni
- 3:45 Closed Session**
- Nies v. Emerald Isle - (409PA15) Update Mary Lucasse
- 4:15 RECESS**

Thursday, April 27th

- 9:00 COMMISSION CALL TO ORDER* (Commission Meeting Room)** Renee Cahoon, Chair
- Roll Call
 - Chair’s Comments
 - Approval of February 7-8, 2017 Meeting Minutes Renee Cahoon, Chair
 - Executive Secretary’s Report Braxton Davis
 - CRAC Report Greg “rudi” Rudolph, Chair
- 10:00 BEACH AND INLET MANAGEMENT**
- Sediment Criteria – Sampling Methodology (*CRC-16-44*) Ken Richardson
 - Figure Eight Island Development Line Approval (*CRC-17-13*) David Kellam or Bill Raney
- 11:00 OCEAN SHORELINE MANAGEMENT**
- CRC Dune Protection, Restoration & Repair (*CRC-17-14*) Frank Jennings
 - CRC Discussion
- 11:45 OLD/NEW BUSINESS** Renee Cahoon, Chair

- Town of Topsail Beach Letter to CRC

12:00 PUBLIC INPUT AND COMMENT

Renee Cahoon, Chair

12:15 LUNCH

1:30 PUBLIC HEARING

- 15A NCAC 7H .0306; 7J .1301 Development Line Procedures Amendments

Renee Cahoon, Chair

Ken Richardson

1:45 ADJOURN

Executive Order 34 mandates that in transacting Commission business, each person appointed by the governor shall act always in the best interest of the public without regard for his or her financial interests. To this end, each appointee must recuse himself or herself from voting on any matter on which the appointee has a financial interest. Commissioners having a question about a conflict of interest or potential conflict should consult with the Chairman or legal counsel.

** Times indicated are only for guidance and will change. The Commission will proceed through the agenda until completed.*



N.C. Division of Coastal Management

www.nccoastalmanagement.net

Next Meeting: July 11-12, 2017; Greenville



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

WILLIAM F. LANE
General Counsel

TO: The Coastal Resources Commission

FROM: Christine A. Goebel, DEQ Assistant General Counsel *CA*

DATE: April 12, 2017 (for the April 26-27, 2017 CRC Meeting)

RE: **Variance Request by The Sanitary Fish Market & Restaurant, Inc.
(CRC-VR-17-02)**

Petitioner is The Sanitary Fish Market & Restaurant, Inc. (the "Sanitary"), (through Jeff Garner, Secretary and Registered Agent) which leases a portion of a lot owned by the Vernon Jackson Garner Jr. Trust located at 501 East Evans Street in Morehead City, Carteret County. Most of the site is located over the navigable waters of Harbor Channel, part of Bogue Sound in the urban waterfront area of Morehead City. The Sanitary takes up approximately half of the lot, and includes the large building which houses the restaurant and the deli, dock platforms around the building which provide outdoor seating, an electrical vault, a new roof over part of the outdoor dock platform area, and boat docks. Through a January 2017 CAMA Minor Permit application, Petitioner sought authorization to build a new set of stairs to connect the roof-covered dock area to the top of the roof to provide more seating for deli customers on the top of the new roof. On February 13, 2017, the Morehead City LPO denied Petitioner's CAMA Minor Permit application as the proposed development does not comply with 15A NCAC 7H .0209(g)(4)(B)(iii) which limits new structures built for non-water dependent purposes to single-story, unenclosed decks and boardwalks. Petitioner now seeks a variance in order to develop the access stairs and to convert the roof into a second-story use.

The following additional information is attached to this memorandum:

Attachment A: Relevant Rules
 Attachment B: Stipulated Facts
 Attachment C: Petitioner's Positions and Staff's Responses to Variance Criteria
 Attachment D: Petitioner's Variance Request Materials
 Attachment E: Stipulated Exhibits including powerpoint

cc(w/enc.): Merrie Jo Alcoke, Petitioner's Counsel, electronically
 Mary Lucasse, Special Deputy AG and CRC Counsel, electronically
 Jeannie Drake, Morehead City CAMA LPO, electronically



RELEVANT STATUTES OR RULES**APPENDIX A****SECTION .0200 – THE ESTUARINE AND OCEAN SYSTEMS****15A NCAC 07H .0201 ESTUARINE AND OCEAN SYSTEM CATEGORIES**

Included within the estuarine and ocean system are the following AEC categories: estuarine waters, coastal wetlands, public trust areas, and estuarine and public trust shorelines. Each of the AECs is either geographically within the estuary or, because of its location and nature, may significantly affect the estuarine and ocean system.

15A NCAC 07H .0202 SIGNIFICANCE OF THE SYSTEMS APPROACH IN ESTUARIES

The management program must embrace all characteristics, processes, and features of the whole system and not characterize individually any one component of an estuary. The AECs are interdependent and ultimately require management as a unit. Any alteration, however slight, in a given component of the estuarine and ocean system may result in unforeseen consequences in what may appear as totally unrelated areas of the estuary. For example, destruction of wetlands may have harmful effects on estuarine waters which are also areas within the public trust. As a unified system, changes in one AEC category may affect the function and use within another category.

15A NCAC 07H .0203 MANAGEMENT OBJECTIVE OF THE ESTUARINE AND OCEAN SYSTEM

It is the objective of the Coastal Resources Commission to conserve and manage estuarine waters, coastal wetlands, public trust areas, and estuarine and public trust shorelines, as an interrelated group of AECs, so as to safeguard and perpetuate their biological, social, economic, and aesthetic values and to ensure that development occurring within these AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources. Furthermore, it is the objective of the Coastal Resources Commission to protect present common law and statutory public rights of access to the lands and waters of the coastal area.

15A NCAC 07H .0204 AECS WITHIN THE ESTUARINE AND OCEAN SYSTEM

The following regulations in this Section define each AEC within the estuarine and ocean system, describe its significance, articulate the policies regarding development, and state the standards for development within each AEC.

15A NCAC 07H .0206 ESTUARINE WATERS

(a) Description. Estuarine waters are defined in G.S. 113A-113(b)(2) to include all the waters of the Atlantic Ocean within the boundary of North Carolina and all the waters of the bays, sounds, rivers and tributaries thereto seaward of the dividing line between coastal fishing waters and inland fishing waters. The boundaries between inland and coastal fishing waters are set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Environment and Natural Resources and in the most current revision of the North Carolina Marine Fisheries Regulations for Coastal Waters, codified at 15A NCAC 3Q .0200.

(b) Significance. Estuarine waters are the dominant component and bonding element of the entire estuarine and ocean system, integrating aquatic influences from both the land and the sea. Estuaries are among the most productive natural environments of North Carolina. They support the valuable commercial and sports fisheries of the coastal area which are comprised of estuarine dependent

species such as menhaden, flounder, shrimp, crabs, and oysters. These species must spend all or some part of their life cycle within the estuarine waters to mature and reproduce. Of the 10 leading species in the commercial catch, all but one are dependent on the estuary.

This high productivity associated with the estuary results from its unique circulation patterns caused by tidal energy, fresh water flow, and shallow depth; nutrient trapping mechanisms; and protection to the many organisms. The circulation of estuarine waters transports nutrients, propels plankton, spreads seed stages of fish and shellfish, flushes wastes from animal and plant life, cleanses the system of pollutants, controls salinity, shifts sediments, and mixes the water to create a multitude of habitats. Some important features of the estuary include mud and sand flats, eel grass beds, salt marshes, submerged vegetation flats, clam and oyster beds, and important nursery areas.

Secondary benefits include the stimulation of the coastal economy from the spin off operations required to service commercial and sports fisheries, waterfowl hunting, marinas, boatyards, repairs and supplies, processing operations, and tourist related industries. In addition, there is considerable nonmonetary value associated with aesthetics, recreation, and education.

(c) Management Objective. To conserve and manage the important features of estuarine waters so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing estuarine waters so as to maximize their benefits to man and the estuarine and ocean system.

(d) Use Standards. Suitable land/water uses shall be those consistent with the management objectives in this Rule. Highest priority of use shall be allocated to the conservation of estuarine waters and their vital components. Second priority of estuarine waters use shall be given to those types of development activities that require water access and use which cannot function elsewhere such as simple access channels; structures to prevent erosion; navigation channels; boat docks, marinas, piers, wharfs, and mooring pilings.

In every instance, the particular location, use, and design characteristics shall be in accord with the general use standards for coastal wetlands, estuarine waters, and public trust areas described in Rule .0208 of this Section.

15A NCAC 07H .0207 PUBLIC TRUST AREAS

(a) Description. Public trust areas are all waters of the Atlantic Ocean and the lands thereunder from the mean high water mark to the seaward limit of state jurisdiction; all natural bodies of water subject to measurable lunar tides and lands thereunder to the normal high water or normal water level; all navigable natural bodies of water and lands thereunder to the normal high water or normal water level as the case may be, except privately-owned lakes to which the public has no right of access; all water in artificially created bodies of water containing public fishing resources or other public resources which are accessible to the public by navigation from bodies of water in which the public has rights of navigation; and all waters in artificially created bodies of water in which the public has acquired rights by prescription, custom, usage, dedication, or any other means. In determining whether the public has acquired rights in artificially created bodies of water, the following factors shall be considered:

- (1) the use of the body of water by the public;
- (2) the length of time the public has used the area;
- (3) the value of public resources in the body of water;
- (4) whether the public resources in the body of water are mobile to the extent that they can move into

natural bodies of water;

- (5) whether the creation of the artificial body of water required permission from the state; and
- (6) the value of the body of water to the public for navigation from one public area to another public area.

(b) Significance. The public has rights in these areas, including navigation and recreation. In addition, these areas support commercial and sports fisheries, have aesthetic value, and are important resources for economic development.

(c) Management Objective. To protect public rights for navigation and recreation and to conserve and manage the public trust areas so as to safeguard and perpetuate their biological, economic and aesthetic value.

(d) Use Standards. Acceptable uses shall be those consistent with the management objectives in Paragraph (c) of this Rule. In the absence of overriding public benefit, any use which jeopardizes the capability of the waters to be used by the public for navigation or other public trust rights which the public may be found to have in these areas shall not be allowed. The development of navigational channels or drainage ditches, the use of bulkheads to prevent erosion, and the building of piers, wharfs, or marinas are examples of uses that may be acceptable within public trust areas, provided that such uses shall not be detrimental to the public trust rights and the biological and physical functions of the estuary. Projects which would directly or indirectly block or impair existing navigation channels, increase shoreline erosion, deposit spoils below normal high water, cause adverse water circulation patterns, violate water quality standards, or cause degradation of shellfish waters are considered incompatible with the management policies of public trust areas. In every instance, the particular location, use, and design characteristics shall be in accord with the general use standards for coastal wetlands, estuarine waters, and public trust areas.

15A NCAC 07H .0208 USE STANDARDS

(a) General Use Standards

(1) Uses which are not water dependent shall not be permitted in coastal wetlands, estuarine waters, and public trust areas. Restaurants, residences, apartments, motels, hotels, trailer parks, private roads, factories, and parking lots are examples of uses that are not water dependent. Uses that are water dependent include: utility crossings, wind energy facilities, docks, wharves, boat ramps, dredging, bridges and bridge approaches, revetments, bulkheads, culverts, groins, navigational aids, mooring pilings, navigational channels, access channels and drainage ditches;

(2) Before being granted a permit, the CRC or local permitting authority shall find that the applicant has complied with the following standards:

(A) The location, design, and need for development, as well as the construction activities involved shall be consistent with the management objective of the Estuarine and Ocean System AEC (Rule .0203 of this subchapter) and shall be sited and designed to avoid significant adverse impacts upon the productivity and biologic integrity of coastal wetlands, shellfish beds, submerged aquatic vegetation as defined by the Marine Fisheries Commission, and spawning and nursery areas;

(B) Development shall comply with state and federal water and air quality

(C) Development shall not cause irreversible damage to documented archaeological or historic resources as identified by the N.C. Department of Cultural resources;

(D) Development shall not increase siltation;

(E) Development shall not create stagnant water bodies;

(F) Development shall be timed to avoid significant adverse impacts on life cycles of estuarine and ocean resources; and

(G) Development shall not jeopardize the use of the waters for navigation or for other public trust rights in public trust areas including estuarine waters.

(3) When the proposed development is in conflict with the general or specific use standards set forth in this Rule, the CRC may approve the development if the applicant can demonstrate that the activity associated with the proposed project will have public benefits as identified in the findings and goals of the Coastal Area Management Act, that the public benefits outweigh the long range adverse effects of the project, that there is no reasonable alternate site available for the project, and that all reasonable means and measures to mitigate adverse impacts of the project have been incorporated into the project design and shall be implemented at the applicant's expense. Measures taken to mitigate or minimize adverse impacts shall include actions that:

(A) minimize or avoid adverse impacts by limiting the magnitude or degree of the action;

(B) restore the affected environment; or

(C) compensate for the adverse impacts by replacing or providing substitute resources.

(4) Primary nursery areas are those areas in the estuarine and ocean system where initial post larval development of finfish and crustaceans takes place. They are usually located in the uppermost sections of a system where populations are uniformly early juvenile stages. They are designated and described by the N.C. Marine Fisheries Commission (MFC) and by the N.C. Wildlife Resources Commission (WRC);

(5) Outstanding Resource Waters are those estuarine waters and public trust areas classified by the N.C. Environmental Management Commission (EMC). In those estuarine waters and public trust areas classified as ORW by the EMC no permit required by the Coastal Area Management Act shall be approved for any project which would be inconsistent with applicable use standards adopted by the CRC, EMC, or MFC for estuarine waters, public trust areas, or coastal wetlands. For development activities not covered by specific use standards, no permit shall be issued if the activity would, based on site specific information, degrade the water quality or outstanding resource values; and

(6) Beds of submerged aquatic vegetation (SAV) are those habitats in public trust and estuarine waters vegetated with one or more species of submergent vegetation. These vegetation beds occur in both subtidal and intertidal zones and may occur in isolated patches or cover extensive areas. In either case, the bed is defined by the Marine Fisheries Commission. Any rules relating to SAVs shall not apply to non-development control activities authorized by the Aquatic Weed Control Act of 1991 (G.S. 113A-220 et seq.).

15A NCAC 07H .0209 COASTAL SHORELINES

(a) Description. The Coastal Shorelines category includes estuarine shorelines and public trust shorelines. Estuarine shorelines AEC are those non ocean shorelines extending from the normal high water level or normal water level along the estuarine waters, estuaries, sounds, bays, fresh and brackish waters, and public trust areas as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Environment and Natural Resources [described in Rule .0206(a) of this Section] for a distance of 75 feet landward. For those estuarine shorelines

immediately contiguous to waters classified as Outstanding Resource Waters by the Environmental Management Commission, the estuarine shoreline AEC shall extend to 575 feet landward from the normal high water level or normal water level, unless the Coastal Resources Commission establishes the boundary at a greater or lesser extent following required public hearing(s) within the affected county or counties. Public trust shorelines AEC are those non-ocean shorelines immediately contiguous to public trust areas, as defined in Rule 07H .0207(a) of this Section, located inland of the dividing line between coastal fishing waters and inland fishing waters as set forth in that agreement and extending 30 feet landward of the normal high water level or normal water level.

(b) Significance. Development within coastal shorelines influences the quality of estuarine and ocean life and is subject to the damaging processes of shore front erosion and flooding. The coastal shorelines and wetlands contained within them serve as barriers against flood damage and control erosion between the estuary and the uplands. Coastal shorelines are the intersection of the upland and aquatic elements of the estuarine and ocean system, often integrating influences from both the land and the sea in wetland areas. Some of these wetlands are among the most productive natural environments of North Carolina and they support the functions of and habitat for many valuable commercial and sport fisheries of the coastal area. Many land-based activities influence the quality and productivity of estuarine waters. Some important features of the coastal shoreline include wetlands, flood plains, bluff shorelines, mud and sand flats, forested shorelines and other important habitat areas for fish and wildlife.

(c) Management Objective. The management objective is to ensure that shoreline development is compatible with the dynamic nature of coastal shorelines as well as the values and the management objectives of the estuarine and ocean system. Other objectives are to conserve and manage the important natural features of the estuarine and ocean system so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing these shorelines so as to maximize their benefits to the estuarine and ocean system and the people of North Carolina.

(d) Use Standards. Acceptable uses shall be those consistent with the management objectives in Paragraph (c) of this Rule. These uses shall be limited to those types of development activities that will not be detrimental to the public trust rights and the biological and physical functions of the estuarine and ocean system. Every effort shall be made by the permit applicant to avoid, mitigate or reduce adverse impacts of development to estuarine and coastal systems through the planning and design of the development project. In every instance, the particular location, use, and design characteristics shall comply with the general use and specific use standards for coastal shorelines, and where applicable, the general use and specific use standards for coastal wetlands, estuarine waters, and public trust areas described in Rule .0208 of this Section. Development shall be compatible with the following standards:

(1) All development projects, proposals, and designs shall preserve and not weaken or eliminate natural barriers to erosion including peat marshland, resistant clay shorelines, and cypress gum protective fringe areas adjacent to vulnerable shorelines.

(2) All development projects, proposals, and designs shall limit the construction of impervious surfaces and areas not allowing natural drainage to only so much as is necessary to adequately service the major purpose or use for which the lot is to be developed. Impervious surfaces shall not exceed 30 percent of the AEC area of the lot, unless the applicant can effectively demonstrate, through innovative design, that the protection provided by the design would be equal to or exceed the protection by the 30 percent limitation. Redevelopment of areas exceeding the 30 percent

impervious surface limitation may be permitted if impervious areas are not increased and the applicant designs the project to comply with the intent of the rule to the maximum extent feasible.

(3) All development projects, proposals, and designs shall comply with the following mandatory standards of the North Carolina Sedimentation Pollution Control Act of 1973:

(A) All development projects, proposals, and designs shall provide for a buffer zone along the margin of the estuarine water which is sufficient to confine visible siltation within 25 percent of the buffer zone nearest the land disturbing development.

(B) No development project proposal or design shall permit an angle for graded slopes or fill which is greater than an angle which can be retained by vegetative cover or other erosion control devices or structures.

(C) All development projects, proposals, and designs which involve uncovering more than one acre of land shall plant a ground cover sufficient to restrain erosion within 30 working days of completion of the grading; provided that this shall not apply to clearing land for the purpose of forming a reservoir later to be inundated.

(4) Development shall not have a significant adverse impact on estuarine and ocean resources. Significant adverse impacts include development that would directly or indirectly impair water quality standards, increase shoreline erosion, alter coastal wetlands or Submerged Aquatic Vegetation (SAV), deposit spoils waterward of normal water level or normal high water, or cause degradation of shellfish beds.

(5) Development shall not interfere with existing public rights of access to, or use of, navigable waters or public resources.

(6) No public facility shall be permitted if such a facility is likely to require public expenditures for maintenance and continued use, unless it can be shown that the public purpose served by the facility outweighs the required public expenditures for construction, maintenance, and continued use. For the purpose of this standard, "public facility" means a project that is paid for in any part by public funds.

(7) Development shall not cause irreversible damage to valuable, historic architectural or archaeological resources as documented by the local historic commission or the North Carolina Department of Cultural Resources.

(8) Established common law and statutory public rights of access to the public trust lands and waters in estuarine areas shall not be eliminated or restricted. Development shall not encroach upon public accessways nor shall it limit the intended use of the accessways.

(9) Within the AECs for shorelines contiguous to waters classified as Outstanding Resource Waters by the EMC, no CAMA permit shall be approved for any project which would be inconsistent with applicable use standards adopted by the CRC, EMC or MFC for estuarine waters, public trust areas, or coastal wetlands. For development activities not covered by specific use standards, no permit shall be issued if the activity would, based on site-specific information, degrade the water quality or outstanding resource values.

(10) Within the Coastal Shorelines category (estuarine and public trust shoreline AECs), new development shall be located a distance of 30 feet landward of the normal water level or normal high water level, with the exception of the following: **(omitted as not applicable to this Urban Waterfront)**

(g) Urban Waterfronts.

(1) Description. Urban Waterfronts are waterfront areas, not adjacent to Outstanding Resource Waters, in the Coastal Shorelines category that lie within the corporate limits of any municipality duly chartered within the 20 coastal counties of the state. In determining whether an area is an urban waterfront, the following criteria shall be met as of the effective date of this Rule:

(A) The area lies wholly within the corporate limits of a municipality; and

(B) the area has a central business district or similar commercial zoning classification where there is minimal undeveloped land, mixed land uses, and urban level services such as water, sewer, streets, solid waste management, roads, police and fire protection, or in an area with an industrial or similar zoning classification adjacent to a central business district.

(2) Significance. Urban waterfronts are recognized as having cultural, historical and economic significance for many coastal municipalities. Maritime traditions and longstanding development patterns make these areas suitable for maintaining or promoting dense development along the shore. With proper planning and stormwater management, these areas may continue to preserve local historical and aesthetic values while enhancing the economy.

(3) Management Objectives. To provide for the continued cultural, historical, aesthetic and economic benefits of urban waterfronts. Activities such as in-fill development, reuse and redevelopment facilitate efficient use of already urbanized areas and reduce development pressure on surrounding areas, in an effort to minimize the adverse cumulative environmental effects on estuarine and ocean systems. While recognizing that opportunities to preserve buffers are limited in highly developed urban areas, they are encouraged where practical.

(4) Use Standards:

(A) The buffer requirement pursuant to Subparagraph (d)(10) of this Rule is not required for development within Urban Waterfronts that meets the following standards:

(i) The development must be consistent with the locally adopted land use plan;

(ii) Impervious surfaces shall not exceed 30 percent of the AEC area of the lot. Impervious surfaces may exceed 30 percent if the applicant can effectively demonstrate, through a stormwater management system design, that the protection provided by the design would be equal to or exceed the protection by the 30 percent limitation. The stormwater management system shall be designed by an individual who meets any North Carolina occupational licensing requirements for the type of system proposed and approved during the permit application process. Redevelopment of areas exceeding the 30 percent impervious surface limitation may be permitted if impervious areas are not increased and the applicant designs the project to comply with the intent of the rule to the maximum extent feasible; and

(iii) The development shall meet all state stormwater management requirements as required by the NC Environmental Management Commission;

(B) Non-water dependent uses over estuarine waters, public trust waters and coastal wetlands may be allowed only within Urban Waterfronts as set out below.

(i) Existing structures over coastal wetlands, estuarine waters or public trust areas may be used for commercial non-water dependent purposes provided that the structure promotes, fosters, enhances or accommodates public benefit. Commercial, non-water dependent uses shall be limited to restaurants and retail services. Residential uses, lodging and new parking areas shall be prohibited.

(ii) For the purposes of this Rule, existing enclosed structures may be replaced and or expanded vertically provided that vertical expansion does not exceed the original footprint of the structure,

is limited to one additional story over the life of the structure and is consistent with local requirements or limitations.

(iii) New structures built for non-water dependent purposes are limited to pile-supported, single-story, unenclosed decks and boardwalks, and shall meet the following criteria:

- (I) The proposed development shall provide for enhanced public access to the shoreline;
- (II) Structures may be roofed but shall not be enclosed by partitions, plastic sheeting, screening, netting, lattice or solid walls of any kind and shall be limited to a single story;
- (III) Structures shall be pile supported and require no filling of coastal wetlands, estuarine waters or public trust areas;
- (IV) Structures shall not extend more than 20 feet waterward of the normal high water level or normal water level;
- (V) Structures shall be elevated at least three feet over the wetland substrate as measured from the bottom of the decking;
- (VI) Structures shall have no more than six feet of any dimension extending over coastal wetlands;
- (VII) Structures shall not interfere with access to any riparian property and shall have a minimum setback of 15 feet between any part of the structure and the adjacent property owners' areas of riparian access. The line of division of areas of riparian access shall be established by drawing a line along the channel or deep water in front of the properties, then drawing a line perpendicular to the line of the channel so that it intersects with the shore at the point the upland property line meets the water's edge. The minimum setback provided in the rule may be waived by the written agreement of the adjacent riparian owner(s) or when two adjoining riparian owners are co applicants. Should the adjacent property be sold before construction of the structure commences, the applicant shall obtain a written agreement with the new owner waiving the minimum setback and submit it to the permitting agency prior to initiating any development;
- (VIII) Structures shall be consistent with the US Army Corps of Engineers setbacks along federally authorized waterways;
- (IX) Structures shall have no significant adverse impacts on fishery resources, water quality or adjacent wetlands and there must be no reasonable alternative that would avoid wetlands. Significant adverse impacts include the development that would directly or indirectly impair water quality standards, increase shoreline erosion, alter coastal wetlands or Submerged Aquatic Vegetation (SAV), deposit spoils waterward of normal water level or normal high water level, or cause degradation of shellfish beds;
- (X) Structures shall not degrade waters classified as SA or High Quality Waters or Outstanding Resource Waters as defined by the NC Environmental Management Commission;
- (XI) Structures shall not degrade Critical Habitat Areas or Primary Nursery Areas as defined by the NC Marine Fisheries Commission; and
- (XII) Structures shall not pose a threat to navigation.

STIPULATED FACTS**ATTACHMENT B****General**

1. Petitioner is Jeff Garner, owner of The Sanitary Fish Market and Restaurant, Inc. ("the Sanitary Restaurant" or "the restaurant") located at 501 Evans Street (the "Site") in Carteret County, North Carolina. Jeff Garner is the Secretary and Registered Agent of the Sanitary Restaurant, and his father Vernon Garner Jr. is the President, according to corporate records filed with the NC Secretary of State's Office, a copy of which is attached. Also attached is an agent authorization form from Vernon Garner Jr. of the Vernon Jackson Garner Jr. Trust to Jeff Garner.
2. The Sanitary is a family owned restaurant and local landmark on the Morehead City waterfront. First built in 1938, the restaurant has been operated continuously since that time by the Garner family.
3. The 1.2-acre parcel upon which the Sanitary and other structures are located has been owned by the Vernon Jackson Garner Jr. Trust since 2005 as evidenced by a deed recorded at Book 1144, Page 238 of the Carteret County Registry, a copy of which is provided. As shown on the Carteret County GIS parcel map, the parcel has approximately 491 linear feet of shoreline. The parcel measures between 103 and 108 feet in depth.
4. The Sanitary Restaurant and its associated docks and platforms are located over the public trust waters of Harbor Channel off Bogue Sound. A small island called Sugarloaf Island is located directly across from the restaurant and separates Harbor Channel from the Atlantic Intracoastal Waterway ("AIWW").
5. A seawall runs parallel to the Evans Street sidewalk and is the location of mean high water at this Site.
6. The waters of Harbor Channel and Bogue Sound are classified as SC Waters by the North Carolina Environmental Management Commission ("EMC") and are closed to the harvest of shellfish.
7. The Sanitary is located over the Public Trust and Estuarine Waters Areas of Environmental Concern ("AECs"), and the area of the Site landward of mean high water is within the Coastal Shorelines AEC.
8. Six additions to the building were completed between 1950 and 1968. By 1971, additional expansions increased seating to 650, about 100 seats more than the current configuration.
9. In December 1999, the Sanitary Restaurant replaced worn air compressors which were located on the roof with units that sit on a specialized rack on the roof, and then built a 24' by 24' enclosure around the new units on the roof which is anchored to load-bearing walls underneath. The enclosure had ten windows and a door but is not climate-controlled. On January 21, 2000, DCM issued a Notice of Violation to the Sanitary Restaurant for the development of the enclosure.

10. At the March 24, 2000 meeting of the Commission, it heard a declaratory ruling filed by the Sanitary Restaurant deciding whether the enclosure around the air compressors on the roof was “development” or not within the meaning of the Coastal Area Management Act (“CAMA”) definition found at N.C.G.S. 113A-103(5)a. In a written order attached, the Commission held that “as this enclosure is solely used for the purpose of sheltering air compressors and is not climate controlled . . . the Commission hereby determines that the enclosure is an accessory building, pursuant to N.C. Gen. Stat. 113A-105(5)(b)6.”

11. In 2016, Petitioner converted the fish market portion of the business to a deli called Sugarloaf Island Deli. The deli is accessed by a separate entrance from the Restaurant and is located in the north-east corner of the building.

12. The existing enclosed single-story restaurant and deli building measures approximately 14,688 square feet. The restaurant has a seating capacity of approximately 550, including inside seating and outside seating on the existing wrap-around dock platform. The deli has an outdoor seating capacity of approximately 48 and indoor seating for approximately 10 people, with a maximum occupancy outside set by the fire department of 81.

13. On April 7, 2016, the Town of Morehead City issued Petitioner Building Permit number 2016-0113 authorizing the development of a roof over an existing fixed dock platform, along with dock repairs. This roofed dock platform is located just east of the building near the deli and by the brick-enclosed electrical vault. A copy of the building permit is provided. The dock platform area under the new roof is used as an outdoor bar, as can be seen in the attached site photos.

14. The roof of the restaurant is not readily accessible, and is accessed through an interior storage room and up a set of stairs. The new roof is only accessible from the restaurant’s roof and they are separated by a wooden handrail approximately 42” in height. The wooden handrail was constructed by the fall of 2016.

15. The 2016 work included replacement of 25-foot and 30-foot support pilings and replacement of existing deck boards. An architectural parapet roof with a knee-wall was added to the façade on the main restaurant, as was a tiki-bar thatched roofed counter. The area of the covered deck is 20' by 50.' This work can be seen in the attached photos. The Town of Morehead City Building Inspector and LPO requested DCM Staff visit the site and determine if the work done in 2016 was consistent with the CAMA and the Commission’s rules. A site visit was conducted by DCM Staff and the Morehead City Building Inspector on June 6, 2016.

16. A CAMA permit was not required for improvements to the existing dock platform because the cost of the work was less than fifty percent of the value of the structure. DCM Staff determined that the new roof work was not “development” as long as a second-story use was not allowed and the new roof did not expand beyond the footprint of the existing dock platform. DCM Staff required Petitioner to restrict access from the existing roof to the new roof over the dock platform to prevent it from becoming a second-story use.

CAMA Minor Permit Application

17. On January 1, 2017, Petitioner applied to the Town of Morehead City's Local Permit Officer ("LPO") for a CAMA minor permit to construct slatted wooden stairs from the existing dock platform beside the deli to access the new roof. A copy of the CAMA minor permit application is provided.

18. The U.S. Army Corps of Engineers' representative indicated to DCM Staff that they did not require a Section 10 (of the Rivers and Harbors Act) Review for the proposed development even though the proposed development was over estuarine and public trust waters, as it was water already covered by existing development.

19. As required, Petitioner sent notice of the application to the two adjacent riparian property owners and to the public through onsite posting. Neither of the adjacent owners objected to the project. No public comments were received. One of the adjacent riparian property owners submitted a second form clarifying that he had no objection to the project. Copies of the adjacent riparian notices are provided.

20. The proposed stairs would measure 20' by 14', for a total area of 280 square feet. These stairs would be located over the existing uncovered dock platform which is over public trust and estuarine waters.

21. Petitioner proposes to connect the existing dock platform (part of which is open and part of which is covered) to the new roof so the new roof deck may be used by deli customers. The area of the new roof deck is 1,000 square feet.

22. On February 13, 2017, the Town's LPO denied Petitioner's application because the proposed development does not comply with 15A NCAC 7H .0209(g)(4)(B)(iii) which limits new structures built for non-water dependent purposes to pile-supported, single-story, unenclosed decks and boardwalks. A copy of the denial letter is provided.

23. The LPO's letter also cautioned Petitioner that the new structure is adjacent to an electrical vault, which is located next to the new roof-covered dock area, and which may restrict the use and occupancy of the second story deck or may require specific building requirements.

24. The electrical vault mentioned in the letter has been present since the early 1980's and is located on the same parcel as the Sanitary Restaurant. Petitioner addressed similar proximity concerns raised in 2016 related to the electrical vault when he made the deli repairs and improvements. If granted this variance, Petitioner must comply with the Town of Morehead City's requirements, all State building and fire codes, and Duke Energy's requirements.

Urban Waterfront Rules

25. The CRC adopted urban waterfront rules in 2001. The rules describe urban waterfronts as "waterfront areas, not adjacent to Outstanding Resource Waters, in the Coastal Shorelines category that lie within the corporate limits of any municipality duly chartered within the 20 coastal counties of the state." 15A NCAC 7H .0209(g)(1).
26. The Sanitary Restaurant is within the Town of Morehead City's designated Urban Waterfront as that term is defined in 15A NCAC 7H .0209(g)(1).
27. The management objectives for urban waterfronts recognize that "activities such as in-fill development, reuse and redevelopment facilitate efficient use of already urbanized areas and reduce development pressure on surrounding areas." 15A NCAC 7H.0209(g)(3). The urban waterfront rules expressly allow "non-water dependent uses over estuarine waters, public trust waters, and coastal wetlands" as long as such uses occur within designated "Urban Waterfront" areas and comply with the specific urban waterfront use standards in 15A NCAC 7H.0209(g)(4)(B).
28. The urban waterfront use standards in 15A NCAC 7H .0209(g)(4)(B) specifically provide that:
- (B) Non-water dependent uses over estuarine waters, public trust waters and coastal wetlands may be allowed only within designated Urban Waterfronts as set out below:
 - (i) Existing structures over coastal wetlands, estuarine waters or public trust areas may be used for non-water dependent purposes.
 - (ii) Existing enclosed structures may be expanded vertically provided that vertical expansion does not exceed the original footprint of the structure.
 - (iii) New structures built for non-water dependent purposes are limited to pile-supported, **single-story**, unenclosed decks and boardwalks"
29. The above-cited use standards distinguish between "existing structures" and "new structures" and apply different standards to each.
30. Petitioner's proposed development falls under the use standards for "new structures."
31. The use standards for new structures within urban waterfronts provide:
- (iii) New structures built for non-water dependent purposes are limited to pile-supported, **single-story**, unenclosed decks and boardwalks, and shall meet the following criteria:

- (I) The proposed development shall provide for enhanced public access to the shoreline;
- (II) Structures may be roofed but shall not be enclosed by partitions, plastic sheeting, screening, netting, lattice or solid walls of any kind and shall be limited to a single story;
- (III) Structures shall be pile supported and require no filling of coastal wetlands, estuarine waters or public trust areas;
- (IV) Structures shall not extend more than 20 feet water ward of the normal high water level or normal water level;
- (V) Structures shall be elevated at least three feet over the wetland substrate as measured from the bottom of the decking;
- (VI) Structures shall have no more than six feet of any dimension extending over coastal wetlands;
- (VII) Structures shall not interfere with access to any riparian property and shall have a minimum setback of 15 feet between any part of the structure and the adjacent property owners' areas of riparian access. The line of division of areas of riparian access shall be established by drawing a line along the channel or deep water in front of the properties, then drawing a line perpendicular to the line of the channel so that it intersects with the shore at the point the upland property line meets the water's edge. The minimum setback provided in the rule may be waived by the written agreement of the adjacent riparian owner(s) or when two adjoining riparian owners are co-applicants. Should the adjacent property be sold before construction of the structure commences, the applicant shall obtain a written agreement with the new owner waiving the minimum setback and submit it to the permitting agency prior to initiating any development;
- (VIII) Structures shall be consistent with the US Army Corps of Engineers setbacks along federally authorized waterways;
- (IX) Structures shall have no significant adverse impacts on fishery resources, water quality or adjacent wetlands and there must be no reasonable alternative that would avoid wetlands. Significant adverse impacts include the development that would directly or indirectly impair water quality standards, increase shoreline erosion, alter coastal wetlands or Submerged Aquatic Vegetation (SAV), deposit spoils water ward of normal water level or normal high water level, or cause degradation of shellfish beds;
- (X) Structures shall not degrade waters classified as SA or High Quality Waters or Outstanding Resource Waters as defined by the NC Environmental Management Commission;
- (XI) Structures shall not degrade Critical Habitat Areas or Primary Nursery Areas as defined by the NC Marine Fisheries Commission; and,

(XII) Structures shall not pose a threat to navigation.

32. Petitioner stipulates that the proposed development is inconsistent with 15A NCAC 07H .0209(g)(4)(B)(iii) which limits new structures to pile-supported, single-story, unenclosed decks and boardwalks.

33. Except for the second-story proposed use, Petitioner's project is otherwise consistent with the relevant use standards outlined in criteria (I) and (III) through (XII) above.

34. Petitioner sent notice of the variance to the adjacent property owners as required by 15A NCAC 7J .0701(c)(7). Copies of these letters are provided.

35. Petitioner seeks a variance from the Commission of 15A NCAC 7H .0209(g)(4)(B)(iii) in order to construct the stairs and to use the new roof as a second-story use.

STIPULATED EXHIBITS

1. The Sanitary Fish Market and Restaurant, Inc. Secretary of State records
2. Agent authorization form from Vernon Jackson Garner, Jr. Trust to Jeff Garner
3. Petitioner's General Warranty Deed 1144/238
4. Carteret County Parcel overlain on GIS map
5. Commission's 2000 Final Agency Decision in declaratory ruling
6. Local Building Permit No. 2016-0113
7. CAMA Minor Permit Application with site plan drawings
8. Adjacent Riparian Notice and responses/clarification of no objection
9. February 13, 2017 Denial Letter
10. Proof of Notice of the Variance Request to Adjacent Owners
11. Photographs/Powerpoint

PETITIONER'S and STAFF'S POSITIONS**ATTACHMENT C**

I. Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? If so, the petitioner must identify the hardships.

Petitioner's Position: Yes.

Strict application of the relevant urban waterfront rule causes Petitioner an unnecessary hardship. Petitioner is a local business owner trying to remain relevant and profitable in the competitive and constantly changing restaurant business. There are unique challenges to running a restaurant over 75 years old. Tastes change, and while other restaurants come and go, Petitioner must keep up with the competition while preserving the historic aspects of the restaurant that define it. The Sanitary is an important part of the Morehead City community and a tourist attraction for the East Coast.

Petitioner responded to market demands by converting the historic fish market to a deli, which has proven very popular. The hardship Petitioner faces is that the deli has space for only two tables. Petitioner needs additional space for his deli customers and therefore requests permission to add stairs and use the existing rooftop deck beside the deli. It causes Petitioner unnecessary hardship not to use this space because Petitioner has few options to expand capacity, as further addressed in the next factor below. Here, the stairs and the use of the existing roof deck will not add any new impervious surface or otherwise adversely affect the adjacent waters. Because the purpose of the rule will still be met, Petitioner's hardship is unnecessary.

Staff's Position: No.

Strict application of the Urban Waterfront rules does not cause Petitioner an unnecessary hardship. The Urban Waterfront rules recognize that in the central business districts of waterfront municipalities, there is often existing development which is of cultural, historical and economic importance, and that these areas are suitable for maintaining or promoting dense development along the shore. (See 15A NCAC 7H .0209(g)(2)). For these reasons, the Urban Waterfront rules provide exceptions to both the Commission's 30' Buffer Rule and the limitations on non-water dependent uses over Public Trust Waters.

The Commission's Urban Waterfront rules allow certain existing structures associated with restaurants and retail services to be replaced within the original footprint and expanded up to one-story within that footprint, as long as there is a "public benefit." (See 15A NCAC 7H .0209(g)(4)(B)(i)) After the rule was adopted in 1999, any new non-water-dependent structures were limited to "pile-supported, single-story, unenclosed decks and boardwalks" and had to meet 12 specific requirements in the rules. (See 15A NCAC 7H .0209(g)(4)(B)(iii)(I-XII)).

Petitioner focuses on the fact that the Sanitary is an important part of the Morehead City waterfront, notes that it has had to respond to the changing industry and uses in the Morehead City waterfront, and asks for a second-story use on top of the existing roof deck, which was constructed in 2016. As noted in the stipulated facts, this Site was used historically as a fish market and restaurant, but Petitioner recently chose to convert the fish market use into a deli. Petitioner also

converted the outside dock area adjacent to the deli to customer seating and an outdoor bar, covered by the recently constructed roof. This single-story use (under the new roof) already provides an additional area for deli customers and bar patrons to sit in the shade and enjoy a view of the water while eating at the Petitioner's restaurant, bar, or deli.

While the Commission's Urban Waterfront rules acknowledge the need for in-fill development, reuse and redevelopment in urban areas, in this case, Petitioner has already availed himself of that ability in converting the fish house to a deli and to developing the outdoor area adjacent to the fish house into additional covered seating. Petitioner's alleged hardship is a result of seating allocation decisions within the available space on the Site. If Petitioner has maxed out seating space for the deli, customers can utilize the existing first-story seating on the Site. Additionally, Petitioner could take advantage of the Commission's Urban Waterfront rules to provide additional seating above the building that houses the restaurant and deli, and which already is accessible via an existing set of stairs, but has chosen not to utilize that portion of the existing property. Therefore, any hardship to Petitioner is not unnecessary, as the Commission's Urban Waterfront rules establish a reasonable limitation on commercial uses over navigable public trust waters. Requesting a new second-story use, in addition to the redevelopment and reconfiguration already undertaken by Petitioner, is beyond the expanded uses afforded by the Commission.

II. Do such hardships result from conditions peculiar to the petitioner's property, such as location, size, or topography of the property? Explain.

Petitioner's Position: Yes.

The hardships result from conditions peculiar to Petitioners' property. First, the property's size is peculiar. The parcel measures 491 feet along the water, 103 feet deep on the east side, and 108 feet deep on the west side. Shaped like a rectangle, the property is almost five times as long as it is wide. Second, the property's location within the waters of Harbor Channel is also peculiar. The property extends on the landward side to the sidewalk with no setbacks. Petitioner cannot expand landward due to the sidewalk, nor can Petitioner expand waterward due to CRC rules. His only option for meeting the demands of the growing deli business is to expand vertically. The hardship of not being able to accommodate more customers results from the long and very narrow shape of the property and the location of the property between the water and the sidewalk, unique conditions that pre-date CAMA.

Staff's Position: No.

Staff contends that any hardships which may exist do not result from conditions peculiar to Petitioner's property. The physical limitations of this parcel have existed for a long time, and after maximizing the use of most areas allowed to be developed under various land use regulations, Petitioner now wants to add additional seating area to the site through this variance request for a new second-story use. The cause of any hardships is Petitioner's desired use of the property, and not based on peculiarities of the size, topography or location of the property. Further, Staff disagrees with Petitioner's assertion that the long but narrow parcel causes Petitioner's hardship, where the parcel houses not only Petitioner's restaurant and deli, but the Ruddy Duck restaurant and the Beaufort Olive Oil Co. The Sanitary takes up over half of the area of the entire parcel

described and provides seating for over 600 guests, not counting additional seating that could be added by adding a second-story use to the restaurant/deli building, which would be allowed under the Commission's Urban Waterfront rules.

III. Do the hardships result from the actions taken by the Petitioner? Explain.

Petitioner's Position: No.

Petitioner has taken no actions that cause the hardships. Although Petitioner has applied for a project that conflicts with the rule, Petitioner has applied for development that promotes in-fill and minimizes impacts to the adjacent resource.

Staff's Position: Yes.

Petitioner's own actions have created any hardship alleged by Petitioner. Petitioner appears to allege that the hardship is that his deli customers do not have seating other than the ten seats currently available inside the deli portion of the building. However, this argument seems to ignore the indoor and outdoor seating for over 600 guests located in and around the Sanitary, including the new outdoor area east of the building was also recently improved from its past fish house use and is now an outdoor seating area with a bar, much of it roof-covered. Additionally, Petitioner could take advantage of the Commission's Urban Waterfront rule to provide additional seating above the Sanitary Restaurant by adding an additional story, but has chosen not to utilize that portion of the existing property. Petitioner has squeezed seating into all available first floor areas on the site (for the restaurant, the deli and the bar), and is causing any hardship by choosing to seek this variance from the Commission's long-standing one-story use restriction on the existing dock over navigable water instead of accommodating the need for additional seating above the adjacent Sanitary Restaurant building to better accommodate deli customers or by reallocating the existing seating on the Site.

V. Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Petitioner's Position: Yes.

The variance will be consistent with the **spirit, purpose and intent** of the Commission's rules. The Sanitary Restaurant is located in the heart of Morehead City's urban waterfront and has "cultural, historical, and economic significance" as contemplated by the CRC's rules. 15A NCAC 7H .0208(g)(2). The rules provide that "[m]aritime traditions and longstanding development patterns make these areas suitable for maintaining or promoting dense development along the shore." Petitioner's proposed development is consistent with this rule because it promotes density within an existing commercial use and will preserve local historical and aesthetic values while enhancing the economy.

The management objectives for urban waterfronts favor "in-fill development, reuse, and redevelopment" as proposed by Petitioner, as such activities "reduce development pressure on surrounding areas" thus minimizing "adverse cumulative environmental effects on estuarine and

ocean systems." 15A NCAC 7H .0208(g)(3). The variance will be consistent with the spirit, purpose, and intent of the urban waterfront rules because Petitioner's project involves in-fill and does not increase cumulative adverse effects on the environment.

The variance will also be consistent with the spirit, purpose and intent of the Commission's rules applicable to public trust and estuarine waters, the primary AEC's affected by the proposed development. The management objective for the estuarine and ocean system provides: "It is the objective of the Coastal Resources Commission to conserve and manage estuarine waters, coastal wetlands, public trust areas, and estuarine and public trust shorelines, as an interrelated group of AECs, so as to safeguard and perpetrate their biological, social, economic, and aesthetic values and to ensure that development occurring within these AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources. Furthermore, it is the objective of the Coastal Resources Commission to protect present common law and statutory public rights of access to the lands and waters of the coastal area." 15A NCAC 7H .0203.

The proposed variance meets these management objectives because aside from the second story issue, the project meets all other relevant use standards designed to protect the resource. Specifically, as required by 15A NCAC 7H .0208(g)(4)(B)(iii), the project will provide enhanced public access to the shoreline (I); requires no filling of wetlands or waters (III); will not extend more than 20 feet waterward of normal high water (IV); will not impact coastal wetlands (V-VI); will not interfere with access to any riparian property (VII); will not impact Army Corps of Engineers setbacks along federally authorized waterways (VIII); will have no significant adverse impact on fishery resources, water quality, or wetlands (IX); will not degrade water quality (X); will not degrade Critical Habitat Areas or Primary Nursery Areas (XI); and will pose no threat to navigation (XII).

Allowing Petitioner to build stairs and use the rooftop deck promotes in-fill while not causing additional impacts to the adjacent (SC) waters. It meets the spirit, purpose and intent of both the urban waterfront rules and the management objectives for public trust and estuarine waters.

Public safety and welfare will be secured by this variance because Petitioner's project will allow more people to access the shoreline, one goal of the urban waterfront rules. Safety will be secured by compliance with all local building and fire codes.

Substantial justice will be preserved by this variance because Petitioner may use an area of the property already "developed," promoting density in an urbanized area while avoiding increased adverse impacts to the adjacent waters. The CRC's rules are not a one-size-fits-all solution to managing coastal resources. In cases like this, justice requires that an exception be made where strict application of the rules causes an unnecessary hardship and the Commission can be satisfied that the overall purposes of the rules will still be achieved.

For the reasons stated above, granting Petitioner the requested variance will be consistent with all four (4) of the criteria stated in N.C. Gen Stat. § 113A-120.1 and in NCAC 7J .0700. Petitioner respectfully requests that the Commission issue a variance in accordance the permit application.

Staff's Position: No.

Staff contends that the requested variance to build the stairs and allow a second-story use on the 2016 roof located on the existing dock over navigable, public trust waters would not be within the spirit, purpose and intent of the Commission's limitations on non-water dependent uses, and the Commission's existing exceptions found in the Urban Waterfront rules. The Commission's rules generally limiting non-water dependent uses over public trust waters, but allow exceptions to this limitation through the Urban Waterfront rules. These rules recognize urban waterfront areas as having "cultural, historical, and economic significance" and are "suitable for maintaining and promoting dense development." 15A NCAC 0209(g)(2).

In this case, Petitioner has already availed itself of the Urban Waterfront rules in order to redevelop the Site and construct a new roof over the existing dock platform area and convert its use from a fish house to a deli and restaurant/bar/deli customer covered seating. The Urban Waterfront rules limit new uses to single-story unenclosed decks and boardwalks. Uses existing at the time the Urban Waterfront rules were enacted could be vertically expanded by one more story. See 15A NCAC 7H .0209(g)(4)(B)(ii) and (g)(4)(B)(iii). The rules further prohibit the enclosure of new deck structures by partitions, plastic sheeting, screening, netting, lattice or solid walls of any kind, presumably to prevent the blocking of the view of the water by the public on land. See 15A NCAC 7H .0209(g)(4)(B)(iii)(II). Staff believes that a second-story use on a newly constructed roof exceeds the reasonable limitations found in the Commission's Urban Waterfront rules (already an exception to the Commission's limitations on non-water dependent uses over Public Trust Waters) [15A NCAC 7H .0208(a)(1)]. Therefore, a variance would not be within the spirit, purpose and intent of the Urban Waterfront's reasonable limitations on adding additional use.

Staff agrees that local and State building codes and Duke Energy rules will help ensure that public safety and welfare will be secured if this variance were granted.

Substantial justice will not be preserved by granting this variance where Petitioner has already redeveloped the commercial uses and added additional seating under the existing regulations which limit use of docks over public trust waters within an Urban Waterfront to single-story use. Petitioner now wishes to increase customer seating space by adding a second-story use to a new structure over Public Trust Waters, instead of adding a second-story use to the restaurant/deli building which is allowed by rule and without a variance. Additionally, such a variance would not preserve substantial justice as it would be unfair to all other businesses in Urban Waterfront areas who develop a new use and limit their use to single-story use per the regulations. Staff have significant concerns about other businesses seeking variances for new second-story uses (or more) in the Morehead City Urban Waterfront district in order to compete with Petitioner's increased use, as well as requests from businesses in other Urban Waterfront districts along the coast. Of particular concern to Staff is the cumulative impacts new second-story uses in Urban Waterfront along the coast might have. While the Commission's Urban Waterfront exception recognizes the need for in-fill development, reuse and redevelopment, it limits this use to single-story use (or one additional story for existing enclosed structures) so as to limit new structures over Public Trust Waters.

**ATTACHMENT D:
PETITIONER'S VARIANCE REQUEST MATERIALS**



MEREDITH JO ALCOKE, Attorney at Law

1001 College Court (28562)
Post Office Box 867
New Bern, NC 28563-0867

P: 252.672.5507
P: 252.572.5477
MJAalcoke@wardandsmith.com

March 15, 2017

VIA EMAIL
ORIGINAL VIA U.S. MAIL

Mr. Braxton Davis
Director, Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

RE: Petitioner Sanitary Fishmarket and Restaurant
CAMA Variance Request Form
Our File 700648-00007

Dear Mr. Davis:

We represent Petitioner Sanitary Fishmarket and Restaurant (the "Sanitary") in its endeavor to obtain a variance to undertake the construction of a set of outdoor stairs on its property located at 501 Evans Street, Morehead City, North Carolina. The Sanitary intends to build stairs to lead to an existing second story deck. In this regard and on the Sanitary's behalf, we are submitting the enclosed original Variance Petition together with supporting documents. We respectfully request that this variance request be scheduled for the April meeting of the Coastal Resources Commission in Manteo, North Carolina. Please let us know if there is anything else you need from us to ensure this matter will be heard as requested.

Thank you for your consideration of this matter.

Yours truly,

A handwritten signature in black ink that reads 'Meredith Jo Alcock'. The signature is fluid and cursive, with the first name 'Meredith' being the most prominent part.

Meredith Jo Alcock

ND: 4816-8952-7876, v. 1

Enclosures

cc: Sanitary Fishmarket and Restaurant (w/encs.)
Attorney General's Office (w/encs.)

ASHEVILLE

GREENVILLE

NEW BERN

RALEIGH

WILMINGTON

www.wardandsmith.com

CAMA VARIANCE REQUEST FORM

DCM FORM 11

DCM FILE No.:

17-02

PETITIONER'S NAME Jeff GarnerCOUNTY WHERE THE DEVELOPMENT IS PROPOSED Carteret

Pursuant to N.C.G.S. § 113A-120.1 and 15A N.C.A.C. 07J .0700 *et seq.*, the above named Petitioner hereby applies to the Coastal Resources Commission (CRC) for a variance.

VARIANCE HEARING PROCEDURES

A variance petition will be considered by the CRC at a regularly scheduled meeting, heard in chronological order based upon the date of receipt of a complete petition. 15A N.C.A.C. 07J .0701(e). A complete variance petition, as described below, must be *received* by the Division of Coastal Management (DCM) a minimum of six (6) weeks in advance of the first day of a regularly scheduled CRC meeting to be eligible for consideration by the CRC at that meeting. 15A N.C.A.C. 07J .0701(e). The final set of stipulated facts must be agreed to at least four (4) weeks prior to the first day of a regularly scheduled meeting. 15A N.C.A.C. 07J .0701(e). The dates of CRC meetings can be found at DCM's website: www.nccoastalmanagement.net

If there are controverted facts that are significant in determining the propriety of a variance, or if the Commission determines that more facts are necessary, the facts will be determined in an administrative hearing. 15A N.C.A.C. 07J .0701(b).

VARIANCE CRITERIA

The petitioner has the burden of convincing the CRC that it meets the following criteria:

- (a) Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? Explain the hardships.
- (b) Do such hardships result from conditions peculiar to the petitioner's property such as the location, size, or topography of the property? Explain.
- (c) Do the hardships result from actions taken by the petitioner? Explain.
- (d) Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Please make your written arguments that Petitioner meets these criteria on a separate piece of paper. The Commission notes that there are some opinions of the State Bar which indicate that non-attorneys may not represent others at quasi-judicial proceedings such as a variance hearing before the Commission. These opinions note that the practice of professionals, such as engineers, surveyors or contractors, representing others in quasi-judicial proceedings through written or oral argument, may be considered the practice of law. Before you proceed with this variance request, you may wish to seek the advice of counsel before having a non-lawyer represent your interests through preparation of this Petition.

For this variance request to be complete, the petitioner must provide the information listed below. The undersigned petitioner verifies that this variance request is complete and includes:

- The name and location of the development as identified on the permit application;
- A copy of the permit decision for the development in question;
- A copy of the deed to the property on which the proposed development would be located;
- A complete description of the proposed development including a site plan;
- A stipulation that the proposed development is inconsistent with the rule at issue;
- Proof that notice was sent to adjacent owners and objectors*, as required by 15A N.C.A.C. 07J .0701(c)(7);
- Proof that a variance was sought from the local government per 15A N.C.A.C. 07J .0701(a), if applicable;
- Petitioner's written reasons and arguments about why the Petitioner meets the four variance criteria, listed above;
- A draft set of proposed stipulated facts and stipulated exhibits. Please make these verifiable facts free from argument. Arguments or characterizations about the facts should be included in the written responses to the four variance criteria instead of being included in the facts.
- This form completed, dated, and signed by the Petitioner or Petitioner's Attorney.

**Please contact DCM or the local permit officer for a full list of comments received on your permit application. Please note, for CAMA Major Permits, the complete permit file is kept in the DCM Morehead City Office.*

Due to the above information and pursuant to statute, the undersigned hereby requests a variance.


Signature of Petitioner or Attorney

March 15, 2017
Date

Meredith Jo Alcock
Printed Name of Petitioner or Attorney

mialcock@wardandsmith.com
Email address of Petitioner or Attorney

Post Office Box 867
Mailing Address

252.672.5400
Telephone Number of Petitioner or Attorney

New Bern, NC 28563-0867
City State Zip

252.672.5477
Fax Number of Petitioner or Attorney

DELIVERY OF THIS HEARING REQUEST

This variance petition must be received by the Division of Coastal Management at least six (6) weeks before the first day of the regularly scheduled Commission meeting at which it is heard. A copy of this request must also be sent to the Attorney General's Office, Environmental Division. 15A N.C.A.C. 07J .0701(e).

Contact Information for DCM:

Contact Information for Attorney General's Office:

By mail, express mail or hand delivery:
Director
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

By mail:
Environmental Division
9001 Mail Service Center
Raleigh, NC 27699-9001

By Fax:
(252) 247-3330

By express mail:
Environmental Division
114 W. Edenton Street
Raleigh, NC 27603

By Email:
Check DCM website for the email address of the current DCM Director
www.nccoastalmanagement.net

By Fax:
(919) 716-6767

PETITIONER MEETS THE FOUR VARIANCE CRITERIA

I. Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? If so, the petitioner must identify the hardships.

Petitioner's Position: Yes.

Strict application of the relevant urban waterfront rule causes Petitioner an unnecessary hardship. Petitioner is a local business owner trying to remain relevant and profitable in the competitive and constantly changing restaurant business. There are unique challenges to running a restaurant over 75 years old. Tastes change, and while other restaurants come and go, Petitioner must keep up with the competition while preserving the historic aspects of the restaurant that define it. The Sanitary is an important part of the Morehead City community and a tourist attraction for the East Coast.

Petitioner responded to market demands by converting the historic fish market to a deli, which has proven very popular. The hardship Petitioner faces is that the deli has space for only two tables. Petitioner needs additional space for his deli customers and therefore requests permission to add stairs and use the existing rooftop deck beside the deli. It causes Petitioner unnecessary hardship not to use this space because Petitioner has few options to expand capacity, as further addressed in the next factor below. Here, the stairs and the use of the existing roof deck will not add any new impervious surface or otherwise adversely affect the adjacent waters. Because the purpose of the rule will still be met, Petitioner's hardship is unnecessary.

II. Do such hardships result from conditions peculiar to the petitioner's property, such as location, size, or topography of the property? Explain.

Petitioner's Position: Yes.

The hardships result from conditions peculiar to Petitioners' property. First, the property's size is peculiar. The parcel measures 491 feet along the water, 103 feet deep on the east side, and 108 feet deep on the west side. Shaped like a rectangle, the property is almost five times as long as it is wide. Second, the property's location within the waters of Harbor Channel is also peculiar. The property extends on the landward side to the sidewalk with no setbacks.

Petitioner cannot expand landward due to the sidewalk, nor can Petitioner expand waterward due to CRC rules. His only option for meeting the demands of the growing deli business is to expand vertically. The hardship of not being able to accommodate more customers results from the long and very narrow shape of the property and the location of the property between the water and the sidewalk, unique conditions that pre-date CAMA.

III. Do the hardships result from the actions taken by the Petitioner?

Explain.

Petitioner's Position: No.

Petitioner has taken no actions that cause the hardships. Although Petitioner has applied for a project that conflicts with the rule, Petitioner has applied for development that promotes in-fill and minimizes impacts to the adjacent resource.

V. Will the variance requested by the petitioner

(1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Petitioner's Position: Yes.

The variance will be consistent with the spirit, purpose and intent of the Commission's rules. The Sanitary Restaurant is located in the heart of Morehead City's urban waterfront and has "cultural, historical, and economic significance" as contemplated by the CRC's rules. 15A NCAC 7H .0208(g)(2). The rules provide that "[in]aritime traditions and longstanding development patterns make these areas suitable for maintaining or promoting dense development along the shore." Petitioner's proposed development is consistent with this rule because it promotes density within an existing commercial use and will preserve local historical and aesthetic values while enhancing the economy.

The management objectives for urban waterfronts favor "in-fill development, reuse, and redevelopment" as proposed by Petitioner, as such activities "reduce development pressure on surrounding areas" thus minimizing "adverse cumulative environmental effects on

estuarine and ocean systems." 15A NCAC 7H .0208(g)(3). The variance will be consistent with the spirit, purpose, and intent of the urban waterfront rules because Petitioner's project involves in-fill and does not increase cumulative adverse effects on the environment.

The variance will also be consistent with the spirit, purpose and intent of the Commission's rules applicable to public trust and estuarine waters, the primary AEC's affected by the proposed development. The management objective for the estuarine and ocean system provides: "It is the objective of the Coastal Resources Commission to conserve and manage estuarine waters, coastal wetlands, public trust areas, and estuarine and public trust shorelines, as an interrelated group of AECs, so as to safeguard and perpetrate their biological, social, economic, and aesthetic values and to ensure that development occurring within these AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources. Furthermore, it is the objective of the Coastal Resources Commission to protect present common law and statutory public rights of access to the lands and waters of the coastal area." 15A NCAC 7H .0203.

The proposed variance meets these management objectives because aside from the second story issue, the project meets all other relevant use standards designed to protect the resource. Specifically, as required by 15A NCAC 7H .0208(g)(4)(B)(iii), the project will provide enhanced public access to the shoreline (I); requires no filling of wetlands or waters (III); will not extend more than 20 feet waterward of normal high water (IV); will not impact coastal wetlands (V-VI); will not interfere with access to any riparian property (VII); will not impact Army Corps of Engineers setbacks along federally authorized waterways (VIII); will have no significant adverse impact on fishery resources, water quality, or wetlands (IX); will not degrade water quality (X); will not degrade Critical Habitat Areas or Primary Nursery Areas (XI); and will pose no threat to navigation (XII).

Allowing Petitioner to build stairs and use the rooftop deck promotes in-fill while not causing additional impacts to the adjacent (SC) waters. It meets the spirit, purpose and intent of both the urban waterfront rules and the management objectives for public trust and estuarine waters.

Public safety and welfare will be secured by this variance because Petitioner's project will allow more people to access the shoreline, one goal of the urban waterfront rules. Safety will be secured by compliance with all local building and fire codes.

Substantial justice will be preserved by this variance because Petitioner may use an area of the property already "developed," promoting density in an urbanized area while avoiding increased adverse impacts to the adjacent waters. The CRC's rules are not a one-size-fits-all solution to managing coastal resources. In cases like this, justice requires that an exception be made where strict application of the rules causes an unnecessary hardship and the Commission can be satisfied that the overall purposes of the rules will still be achieved.

For the reasons stated above, granting Petitioner the requested variance will be consistent with all four (4) of the criteria stated in N.C. Gen Stat. § 113A-120.1 and in NCAC 7J .0700. Petitioner respectfully requests that the Commission issue a variance in accordance the permit application.

700648-00007

ND: 4829-6486-7653, v. 2

**ATTACHMENT E:
STIPULATED EXHIBITS INCLUDING POWERPOINT**



Elaine F. Marshall
Secretary

North Carolina

DEPARTMENT OF THE
SECRETARY OF STATE

PO Box 29622 Raleigh, NC 27626-0622 (919)807-2000

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Placing and Viewing Orders
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How to Start a Business
Business Link North Carolina
Business Schemes
IRS Information
Entities at Risk of Losing
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Corporate Names

Legal: Sanitary Fish Market & Restaurant,
Inc.

Business Corporation Information

SosId: 0129241
Status: Current-Active
Annual Report Status: Current
Citizenship: Domestic
Date Formed: 12/20/1979
Fiscal Month: December
Registered Agent: [Garner, Jeffrey G](#)

Corporate Addresses

Mailing: 501 Evans St PO Box 38
Morehead City, NC 28557-
0000
Principal Office: 501 Evans St PO Box 38
Morehead City, NC 28557-
0000
Reg Office: 501 Evans St PO Box 38
Morehead City, NC 28557-
0000
Reg Mailing: PO Box 38
28557, NC 28557

Officers

Secretary: Jeffrey G Garner
PO Box 38
Morehead City NC 28557-
0000
Treasurer: Lisa L. Garner
501 Evans St., P.O. Box 38
Morehead City NC 28557
President: Vernon Garner
501 Evans St PO Box 38
Morehead City NC 28557-
0000

Stock

Class: Common Class A Voting
Shares: 100000
Par Value: 1
Class: Common Class B Non
Voting
Shares: 10000000

AGENT AUTHORIZATION FOR CAMA PERMIT APPLICATION

Name of Property Owner Requesting Permit: Vernon J. Garner Jr

Mailing Address: 219 Deep Bay Dr
Newport, NC 28570

Phone Number: 252 723 7923

Email Address: tedgarner74@gmail.com

I certify that I have authorized Jeff Garner
Agent / Contractor

to act on my behalf, for the purpose of applying for and obtaining all CAMA permits
necessary for the following proposed development: Sugarloaf Island
Deli

at my property located at _____,
in Carteret County.

*I furthermore certify that I am authorized to grant, and do in fact grant permission to
Division of Coastal Management staff, the Local Permit Officer and their agents to enter
on the aforementioned lands in connection with evaluating information related to this
permit application.*

Property Owner Information:
[Signature]
Signature

Vernon J. Garner Jr
Print or Type Name

Resident
Title

3/31/17
Date

This certification is valid through ____/____/____

NORTH CAROLINA, CARTERET COUNTY
This instrument and this certificate are duly filed at
the date and time and in the Book and Page shown
on the first page hereof.

Melanie Arthur
CARTERET COUNTY 8R
NA Date 11/21/2005 Time 13:44:00
BR 1144238 Page 1 of 8

Melanie Arthur, Register of Deeds
[Signature]
Assistant Register of Deeds

Prepared by L. Patton Mason, Attorney, Morehead City, NC

NORTH CAROLINA
CARTERET COUNTY

- Parcel No. 6336.03.43.7367000
- Parcel No. 6386.10.37.1027000
- Parcel No. 6336.03.42.7303000
- Parcel No. 6386.20.80.5623000
- Parcel No. 6386.20.81.3018000
- Parcel No. 6386.20.81.5047000
- Parcel No. 6386.20.80.2884000

THIS DEED, Made this 21st day of November, 2005, by Vernon J. Garner, Jr. of Carteret County, and State of North Carolina, party of the first part, to the Vernon Jackson Garner, Jr. Living Trust, of 501 Evans Street, Morehead City, Carteret County and State of North Carolina 28557, party of the second part;

W I T N E S S E T H

That the party of the first part in consideration of the sum of Ten (\$10.00) Dollars and other good and valuable considerations to him paid by the party of the second part, has bargained and sold, and by these presents does grant, bargain, sell and convey to said party of the second part, its successors and assigns, certain tracts or parcels of land in Carteret County, State of North Carolina and being more particularly described as follows:

BOOK 1144 PAGE 238

Ⓢ

Tract 1

Being all of Lots Number 4 and 14 as shown on a map entitled "Map of Deep Bay" made by Sam J. Morris, Jr., Consulting Engineer, dated May 2, 1974, recorded in Map Book 13, Page 9, Carteret County Registry.

Tract 2

Being all of Lot 3, Wayne See Subdivision Section III, of record in Map Book 26, at Page 659, Carteret County Registry.

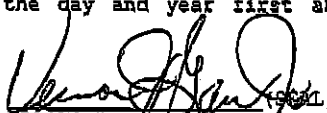
Tract 3

All those certain tracts or parcels of land located in the Town of Morehead City and more particularly described on "Exhibit A" attached hereto and made a part hereof.

To it, the party of the second part, its successors and assigns in fee simple forever.

And the said party of the first part for himself and his heirs, executors and administrators, covenants with said party of the second part, its heirs and assigns, that he is seized of said premises in fee and has the right to convey the same in fee simple; that the same are free and clear from all encumbrances and that he does hereby forever warrant and will forever defend the said title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the said party of the first part has hereunto set his hand and seal, the day and year first above written.


VERNON J. CARVER, JR. (SEAL)

BOOK 1144 PAGE 238

NORTH CAROLINA
CARTERET COUNTY

I, Iva A. Spell, Notary Public, do hereby certify that
Vernon J. Garner, Jr. personally appeared before me this day
and acknowledged the due execution of the foregoing Deed.

Witness my hand and notarial seal, this 21st day of
November, 2005.

Iva A. Spell
Notary Public

My Commission Expires: July 27, 2007



BOOK 1146 PAGE 238

EXHIBIT "A"

Lying and being in the Town of Morehead City, Carteret County, North Carolina, and being:

1. Being all of Lot No. 2, in Square or Block No. 5, said lot fronting 50 feet on Evans Street and running back between parallel side lines 100 feet, including in this conveyance all riparian rights attached to said lot, and all improvements thereon situated, particularly including the "T. Duffy Wade Fish House" located on said lot, and also that certain cafe immediately in front of said Lot No. 2, Square No. 5, on the South side of Evans Street, South of the seawall, and extending to the waters of Bogue Sound or Morehead Harbor and particularly including in this conveyance all articles of fixtures, furniture and equipment now located within or on said cafe building, and including the building itself.

This being the same land conveyed to J. L. Seamon and Vernon Jackson Garner by deed from W. P. Freeman and wife, Vallie H. Freeman, dated 28 May 1942, of record in Book 98, page 372, Carteret County Registry; and deed dated November 12, 1943, of record in Book 102, page 134.

2. Lot No. 1, in Square or Block No. 5, and also lot on south side of seawall, immediately opposite Lot 1, Square 5, each lot fronting 50 feet on Evans Street, north and south sides, with all improvements and structures thereon, and all riparian and littoral rights incident thereto, in accordance with official map of said town as registered in Carteret County Registry.

This being the same land conveyed to J. L. Seamon and V. J. (Ted) Garner by deed from

BOOK 1144 PAGE 238

Willie P. Peace et al, dated 1 March 1944, of record in Book 103, page 276, Carteret County Registry.

3. Being known and designated as all of Lots 3 and 13, in Square or Block 5, according to the official map and plan of said Town as recorded in Map Book 1, page 139, Carteret County Registry, together with the block walls situate on the North, East and South sides, together with all riparian and littoral rights incident to Lot 3, Block 5, and particularly all land, water, docks, riparian and littoral rights south of Evans Street, and particularly as defined in the agreement with the Town of Morehead City as recorded in Book 18, at page 118, Carteret County Registry.

This being the same land conveyed to J. L. Seamon, Sr., et ux, et al, from L. D. Gore et ux, dated 27 March 1962, of record in Book 227, page 605, Carteret County Registry.

4. In the Town of Morehead City and being Lot 12, Block 5, of the Town of Morehead City, according to the official plan thereof recorded in Map Book 1, page 139, Office of the Register of Deeds of Carteret County, North Carolina.

This being the same land conveyed to J. L. Seamon, Sr., et al, by deed from Alvin E. Wade et ux, dated 29 March 1963, of record in Book 238, page 115, Carteret County Registry.

5. All and singular that certain lot or parcel of land situate in the city of Morehead City, adjoining the lot of S. A. Chalk (formerly of James B. Blades) or the alleyway separating said lot from said lot of S. A. Chalk, and being part of Lot #10, Square 3, as laid out on the plan of the town site of the Shepard Point Land Company for the Town of Morehead City, to which plan reference is made, and as laid out on said plan beginning on the south side of the street running along the line of the Atlantic and North Carolina Railroad, at a point which is 50 feet east of what is known on said plan as Fifth Street and being the northeast corner of the lot laid down on said plan as Lot #9; and running thence eastwardly along with and parallel with said street and said railroad 50 feet; thence southwardly parallel with the said street called "Fifth Street" one half the distance to the street called Evans Street (being the street running along the waterfront); thence northwardly (westwardly) parallel with said Evans Street 50 feet; thence a direct line to the beginning, it being a part of the lot of land conveyed to Owen H. Guin and wife, Pattie R. Guin by William B. Blades and wife by deed dated 2 July 1911 and recorded in the office of the Register of Deeds of Carteret County in Book 13, page 170, and being the same property as shown in that deed of Mrs. Pattie R. Guin, widow of Owen H. Guin, to Mrs. Lena Meredith (now Mrs. Lena M. Jarvis) under deed of October 22, 1930, and recorded in Book 69, page 138, Carteret County Registry and being the same property conveyed to Lillian English Robinson by deed from Lena M. Jarvis

BOOK 1144 PAGE 238

dated October 24, 1944, of record in Book 103, page 549, Carteret County Registry.

This being the same lands conveyed to J. L. Seamon, Sr. et al by deed from Lillian English Robinson and husband, Justin Robinson, dated 15 March 1966, of record in Book 273, page 252, Carteret County Registry.

6. Beginning at the southeast corner of the intersection of 5th and Arendell Streets, the northwest corner of Lot #9, in Square #3; thence southwardly with the east line of 5th Street to the waters of Bogue Sound, Harbor line; thence straight line with the waters of the Sound, or harbor line, 50 feet; thence northwardly and parallel 5th Street to the north side of Evans Street, the southeast corner of Lot #7 and the southwest corner of Lot #6, Square #3; thence eastwardly with north side of Evans Street 4 1/2 feet; thence northwardly and parallel 5th Street 125 feet, an iron stake; thence westwardly and parallel Evans Street 4 1/2 feet to an iron stake; thence northwardly and parallel 5th Street 125 feet to south side of Arendell Street; then with south side of Arendell Street 50 feet to the beginning; Excepting that portion of Evans Street across said premises; being all of Lot 9, western part of Lot 8, all of Lot 7, and western 4 1/2 feet of lot 6, Square 3, and the area south of the seawall immediately opposite Lot 7, Square 3; acquired by Ivey Blades Robinson by descent from her father, Wm. B. Blades, and devise from her mother, Amanda C. Blades, and from Sheriff of Carteret County, as appears of record in Book 81, page 335, and from J. F. Lyon et ux as appears recorded in Book 108, page 119, and deed from R. E. Whitehurst, Commissioner, filed for registration July 22, 1946, all Carteret County Registry, and being the same property conveyed to Clyde A. Douglass and wife, Mary A. Douglass, by Ivy Blades Robinson and husband, C. O. Robinson, as appears in Book 109 of Deeds, on page 514, in the Registry of Carteret County, which said deed is dated the 24th day of July 1946.

This being the same lands conveyed to J. L. Seamon, Sr. et al, by deed from Clyde A. Douglass et ux, dated April, 1966, of record in Book 275, page 132, Carteret County Registry.

7. Part of Lots 6 and 8, in Square 3, and property opposite thereto south of breakwater or seawall on Evans Street: Beginning at a point in the east line of Lot 8, Square 3, which is 125 feet southwardly from the northeast corner of Lot 10, Square 3, the southeast corner of lot sold by Guion to Meredith (Oct. 22, 1930, Book 69, page 138); thence westwardly and parallel Evans Street 4 1/2 feet to the northeast corner of tract conveyed by Lyon et ux to Ivey Blades Robinson (Book 108, page 119); thence southwardly and parallel 5th Street to the north line of Evans Street; thence westwardly with the north side of Evans Street 4 1/2 feet to the southwest corner of Lot 6 and southeast corner of Lot 7, Square 3; thence southwardly and parallel 5th Street to the waters of Bogue Sound (bulkhead or seawall); thence eastwardly with the waters of

BOOK 1111 Page 238

Bogue Sound (bulkhead or seawall) 50 feet; thence northwardly and parallel 5th Street (extended) to the beginning, excluding Evans Street (cf. Book 103, page 142 and Book 108, page 119), Carteret County Registry; with all improvements thereon and all riparian and littoral rights appurtenant or incident, being the same property conveyed to Clyde A. Douglass and wife, Mary A. Douglass, by J. F. Lyon and wife, Sara F. Lyon, by deed recorded in Book 125 of Deeds, page 419, in the Registry of Carteret County, which said deed bears date of December 17, 1949.

This being the same lands conveyed to J. L. Seamon, Sr. et al by deed from Clyde A. Douglass and wife, Mary A. Douglass, dated April 1966, of record in Book 275, page 135, Carteret County Registry.

8. Being all of Lots 14, 15 and 16, Square 5, in accordance with the official plan or map of said Town as same is of record in Carteret County Registry.

This being the same land conveyed to J. L. Seamon, Sr. et al by deed from Robert A. Alston et al, Trustees, dated 19 December 1966, of record in Book 283, page 489, Carteret County Registry.

9. Parts of Lots 4, 5 and 6, Block 5, of the Town of Morehead City according to the official plan thereof recorded in Map Book 1, page 139, Office of the Register of Deeds of Carteret County, and the area between said lots and the navigable waters of Bogue Sound, described by metes and bounds as follows:

Beginning at a point in the dividing line between Lots 3 and 4, Block 5, of the map aforesaid, said point being N 5-45 E 1 foot along the dividing line between Lots 3 and 4, Block 5, from the north line of Evans Street; runs thence N 84-15 W in a line parallel with and 1 foot north of the north line of Evans Street 145 feet to a point; thence S 5-45 W, crossing Evans Street, to the navigable waters of Bogue Sound; thence in an eastwardly direction along the navigable waters of Bogue Sound to the point where the southwardly extension of the dividing line between Lots 3 and 4, Block 5, as aforesaid, intersects the navigable waters of Bogue Sound; and thence N 5-45 E, crossing Evans Street, to and along the dividing line between Lots 3 and 4, Block 5, as aforesaid, to the point of beginning; together with all riparian and littoral rights and easement, appurtenant thereto as contemplated by the instrument recorded the 20th day of July, 1914, in Book 18, page 118, office of the Register of Deeds of Carteret County and otherwise.

This conveyance is subject to reservations as set forth in deed to J. L. Seamon, Sr. et al from Thomas D. Eure et ux, dated 27 July 1962, of record in Book 231, page 339, Carteret County Registry.

BOOK 1144

PAGE 23

5

10. Lying and being in the Town of Morehead City, Carteret County, North Carolina, and being a tract of land consisting of Lots 4, 5, part of Lot 6, part of Lot 7, and certain adjacent areas in Block 5 according to the official map or plan of the Town of Morehead City, and being further described as follows, to wit:

Beginning at a point in Lot 7, Block 5, Morehead City, which point of beginning is located S 84-15 E 28.80 feet and then N 04-45 E 1.0 feet from the northeast corner of Evans Street and South Sixth Street; runs thence from said point of beginning N 04-45 E 36.0 feet; thence N 64-15 E 4.67 feet; thence N 05-45 E 6.09 feet; thence S 84-15 E 38.94 feet; thence N 05-45 E 54.49 feet to the north line of Lot No. 6; thence S 84-15 E 31.87 feet; thence N 05-45 E 32.60 feet; thence S 84-15 E 55.0 feet; thence N 05-45 E 9.80 feet; thence S 84-15 E 50 feet; thence S 05-45 W 142.4 feet to the north line of Evans Street; thence with said street line N 84-15 W 145.0 feet, thence N 05-45 E 1.0 feet, thence N 84-15 W 36.20 feet to the point of beginning.

Together with and including all improvements and fixtures located upon the above described premises.

11. Beginning at a point in the south right of way line of Evans Street which point is located S 84-15 E 65.0 feet from the intersection of the south right of way line of Evans Street and a southwardly extension of the east line of Sixth Street and running thence S 5-45 W to the highwater mark of Bogue Sound, running thence a generally eastwardly direction along the highwater mark of Bogue Sound to a point formed by the intersection of the highwater mark of Bogue Sound and a S 5-45 W extension of the east line of Lot 6, Block 3, running thence N 5-45 E to the south right of way line of Evans Street and running thence along the south right of way line of Evans Street N 84-15 W to the point of beginning. Together with and including all riparian and littoral rights and all improvements located thereon or extending therefrom, including but not limited to all docks, bulkheads, wharves, piers, pilings and buildings.

12. There is also conveyed all right, title and interest held by the parties of the first part herein in that tract of land described as follows: Beginning at the southeast corner of Lot 13, Block 5; running thence S 5-45 W to the northeast corner of Lot 3, Block 5; running thence westwardly along the north line of Lot 3, to the northwest corner of said Lot 3; running thence N 5-45 E to the southwest corner of Lot 13, Block 5, and running thence along the south line of said Lot 13 a generally eastwardly direction to the point of beginning.

BOOK 11064 PAGE 38



- Address Points ●
- Parcels - Updated 03-15-2017
- Centerlines
- NC Railroad Right of Way
- County Boundary
- Other County <all other values>
- Cart ●
- PIN ●
- Acreage ●
- Parcel Dimensions ●
- Lot Number ●

| | | |
|----------------------------------|--|--|
| <u>TOWNSHIP</u> 1351 | <u>FIRE DISTRICT</u> 1351 | <u>OBJECTID</u> 56907 |
| <u>PDOT</u> 3845 | <u>CONDO NUMBER</u> 3845 | <u>MOTHER</u> 0 |
| <u>PRID</u> 13013C0406 | <u>PIN15</u> 638620803845000 | <u>OWNER</u> GARNER, VERNON JACKSON JR TRUST |
| <u>DEED BOOK</u> 1144 | <u>DEED PAGE</u> 238 | <u>CURRENT DEED DATE</u> 0 |

| | | |
|---|--|---|
| <u>TOWNSHIP</u> 1351 | <u>FIRE DISTRICT</u> | <u>OBJECTID</u> 56907 |
| <u>PDOT</u> 3845 | <u>CONDO NUMBER</u> | <u>MOTHER</u> 0 |
| <u>PRID</u> 13013C0406 | <u>PIN15</u> 638620803845000 | <u>OWNER</u> GARNER,VERNON JACKSON JR TRUST |
| <u>DEED BOOK</u> 1144 | <u>DEED PAGE</u> 238 | <u>CURRENT DEED DATE</u> 0 |
| <u>SALE PRICE</u> 0 | <u>LAND VALUE</u> 945997 | <u>STRUCTURE VALUE</u> 955492 |
| <u>OTHER VALUE</u> 118103 | <u>YEAR CONDO BUILT</u> 0 | <u>MAILING ADDRESS HOUSE NUMBER</u> |
| <u>MAILING ADDRESS DIRECTION</u> | <u>MAILING ADDRESS STREET</u> | <u>MAILING ADDRESS CITY</u> MOREHEAD CITY |
| <u>MAILING ADDRESS STATE</u> NC | <u>MAILING ADDRESS ZIP</u> 28557 | <u>MAILING ADDRESS PO BOX</u> PO BOX 38 |
| <u>CITY LIMIT</u> MOREHEAD CITY | <u>NEIGHBORHOOD CODE</u> 510001 | <u>RESCUE DISTRICT</u> |
| <u>LEGAL DESCRIPTION</u> WATERFRONT EVANS ST - MOREHEAD | <u>TOTAL ACRES</u> 1.189 | <u>YEAR BUILT</u> 1945 |
| <u>TOTAL SQUARE FEET</u> 1444 | <u>ROLL TYPE</u> R | <u>BATHROOMS</u> 1 |
| <u>BEDROOMS</u> 0 | <u>HOUSE NUMBER (7 Digits)</u> 0000000 | <u>STREET NAME</u> |
| <u>STREET TYPE</u> | <u>APT #</u> | <u>CITY</u> |
| <u>TOTAL VALUE</u> 2019592 | <u>PLAT BOOK</u> 0 | <u>PLAT PAGE</u> 0 |
| <u>District</u> 1351 | <u>aicuz</u> | <u>RISK LEVEL</u> |
| <u>NOISE LEVEL</u> | | |

The information displayed by this website is prepared for the inventory of real property found within this jurisdiction and is compiled from recorded deeds, plats, and other public records and data. Users of this information are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this site. Carteret County assumes no legal responsibility for the information contained on this site. Carteret County does not guarantee that the data and map services will be available to users without interruption or error. Furthermore, Carteret County may modify or remove map services and access methods at will.

STATE OF NORTH CAROLINA
 COUNTY OF CARTERET

BEFORE THE NORTH CAROLINA
 COASTAL RESOURCES COMMISSION

IN THE MATTER OF:)
 PETITION FOR DECLARATORY)
 RULING BY SANITARY FISH)
 MARKET AND RESTAURANT, INC.)

DECLARATORY RULING

Pursuant to Gen. Stat. § 150B-4 and 15A NCAC 7J .0603, the Chairman of the Coastal Resources Commission determined to allow the Petitioner's request for a declaratory ruling before the Coastal Resources Commission in the above-captioned matter. The subject of the request was to determine whether a 576 square foot structure built on the roof of the Sanitary Fish Market and Restaurant, Inc. on the Morehead City waterfront is an "accessory building" such that it is excluded from the definition of "development" pursuant to N.C. Gen. Stat. § 113A-103(5)(b)6., or whether that the structure does not otherwise constitute "development" within the meaning of N.C. Gen. Stat. § 113A-103(5)a.

This matter was heard on oral arguments and stipulated facts at the regularly scheduled meeting of the North Carolina Coastal Resources Commission (hereinafter CRC) on March 24, 2000, in Atlantic Beach, North Carolina pursuant to N.C. Gen. Stat. § 113A-120.1 and 15A NCAC 7J.0700, et seq. Assistant Attorney General Meredith Jo Alcoke appeared for the Department of Environment and Natural Resources, Division of Coastal Management; Petitioner was represented by Frank H. Sheffield, Jr., Ward and Smith, P.A..

Upon consideration of the stipulated facts, the record documents and the arguments of the parties, the CRC adopts the following:

STIPULATED FINDINGS OF FACT

1. Petitioner, The Sanitary Fish Market and Restaurant, Inc. (hereinafter referred to as "the Sanitary" or "the restaurant"), is a well-established Morehead City waterfront restaurant located at 501 Evans Street, Morehead City, Carteret County, North Carolina 28577.
2. The Sanitary is located over the Public Trust Areas and Estuarine Waters of Harbor Channel off Bogue Sound, which are designated Areas of Environmental Concern (AECs).
3. The Sanitary is considered a non-conforming structure which is inconsistent with current Coastal Resources Commission Rules.
4. Air compressors which support the restaurant's air conditioning and refrigeration system are located at the rear of the building on the roof.
5. In December, 1999, the Sanitary removed five worn air compressors and replaced them with three new units by mounting them on a specialized compressor rack.
6. The Sanitary built an enclosure around the equipment which is 24' x 24' (or 576 square feet).
 - a. The second story room is anchored to load bearing walls underneath it, securely affixing the structure to the restaurant building.
 - b. The room has ten windows and a door but is not climate-controlled.
 - c. Currently, no adverse environmental impacts are associated with the presence of the equipment room.
7. On January 21, 2000, Ms. T. Barrett, Field Representative for the North Carolina Department of Environment and Natural Resources, Division of Coastal Management, issued a Notice of Violation to the Sanitary's owner for construction of the 576 square foot structure

described in Paragraph 6.

8. The Notice of Violation alleges that the Sanitary undertook Major Development in violation of the Coastal Area Management Act (CAMA). According to N.C. Gen. Stat. § 113A-118, no person may undertake Major Development in a designated AEC without first obtaining a permit from the Coastal Resources Commission.

9. The Notice of Violation ordered removal of the structure in accordance with a Restoration Plan and Agreement, but also provided that the Division of Coastal Management "would not object to a box-type cover or similar enclosure to protect the recently installed equipment on the roof of the restaurant."

10. The Notice of Violation informed the Sanitary's owner that failure to remove the structure could result in a penalty of \$2,500.00 per day.

11. The Division alleges that the structure constitutes "development" within the meaning of N.C. Gen. Stat. § 113A-103(5)a. requiring a CAMA major development permit.

12. The Sanitary alleges the structure constitutes an "accessory building" pursuant to N.C. Gen. Stat. § 113A-105(5)(b)6., and is consequently exempt from CAMA permitting requirements.

13. In the alternative, the Sanitary alleges that the structure does not constitute "development" within the meaning of N.C. Gen. Stat. § 113A-103(5)a. and is consequently exempt from CAMA permitting requirements.

CONCLUSIONS OF LAW

1. The CRC has jurisdiction over the parties and the subject matter.
2. The parties have been correctly designated and there is no question of misjoinder

or nonjoinder of parties.

3. All notices for the proceeding were adequate and proper.

4. As this enclosure is solely used for the purpose of sheltering air compressors and is not climate controlled, as stated in Stipulated Findings of Fact numbers 5 and 6, the Commission hereby determines that the enclosure is an accessory building, pursuant to N.C. Gen. Stat. § 113A-105(5)(b)6.

5. This ruling is based on the stipulated facts presented to the Commission and is hereby issued expressly upon condition that the enclosure's uses or dimensions are not expanded beyond those represented to the Commission in the stipulated facts above.

ORDER

THEREFORE, the petition for declaratory ruling that the 576 square foot structure built on the roof of the Sanitary Fish Market and Restaurant, Inc. on the Morehead City waterfront is GRANTED and the Commission determines that the enclosure is an "accessory building" such that it is excluded from the definition of "development" pursuant to N.C. Gen. Stat. § 113A-103(5)(b)6.

This the 11th day of May, 2000.

Eugene B. Tomlinson Jr.

Eugene B. Tomlinson, Jr., Chairman
Coastal Resources Commission

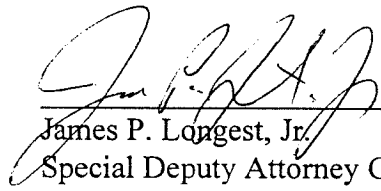
ep-39812

CERTIFICATE OF SERVICE

This is to certify that I have caused the foregoing Declaratory Ruling to be served upon the Petitioner by depositing a copy thereof in the U.S. Postal Service with sufficient postage for delivery by first class mail and addressed to:

Frank H. Sheffield, Jr.
Ward & Smith, P.A.
1001 College Court
Post Office Box 867
New Bern, NC 28563

This the 11th day of May, 2000.



James P. Longest, Jr.
Special Deputy Attorney General
N.C. Department of Justice
P.O. Box 629
Raleigh, NC 27602-0629
(919) 716-6954

ep/39667

Building Permit

TOWN OF MOREHEAD CITY

Carteret, North Carolina

Inspections & Planning Department

706 Arendell Street, Morehead City, North Carolina 28557

(252)726-6848



Building Permit Number: 2016-0113

ADDRESS: **501 EVANS STREET**

PARCEL NO.: **638620802884000**

ZONING: **DB**

OWNER/OCC: **VERNON JACKSON GARNER JR. TRUST**

PO BOX 38

MOREHEAD CITY NC 28557

PERMIT DATE: **04/07/2016**

PERMIT TYPE: **COMM.ALTERATION**

FEE: **\$115.00**

PROJECT: **DOCK & ROOF REPAIRS**

EST. COST: **\$15,000**

STRUCTURE: **COMMERCIAL**

FLOOD PLAIN: **YES**

CONTRACTOR: **BOGUE BANKS MARINE CONST.: DEREK S SMITH: 65969**

Condensor units are considered an accessory use and must be a minimum of five (5) feet from the side or rear property line in accordance with Article 14-3.1 of the Unified Development Ordinance.

Eaves shall be allowed to project into a minimum required yard no more than twenty-four (24) inches.

Please call 726-6848 ext. 125 to schedule inspections. A one day notice is required.

Notify this office of any changes to the contractor or sub-contractors being used.

FILE COPY

OWNER/AGENT SIGNATURE: _____

APPROVED BY: _____

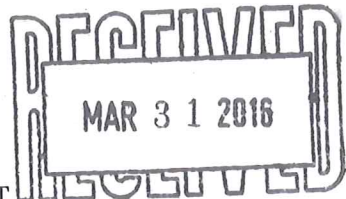
Building Inspector

DATE: **04/07/2016**

2016-0113



2016
line 4036



150 049

TOWN OF MOREHEAD CITY
COMMERCIAL APPLICATION FOR BUILDING PERMIT

Date: 3/30/16
Owner: Jeff Garner
(Name)
(Mailing Address, City, State, Zip) PO Box 38 Morehead City NC 28557
E-mail Address:
(Work Phone) 241-2185
(Home Phone)

Construction Site Address: 501 Evans St.

General: Bogue Banks Marine Const. (252) 725-0985
(Contractor Name) (Phone)
Morehead 28557 111 O Turner's Dairy Rd (License # or N/A)
(Mailing Address, City, State, Zip) (252) 469
E-mail Address: bbmc71@hotmail.com

Electrical: N/A
(Contractor Name) (Phone)
(Mailing Address, City, State, Zip) (License # or N/A)
E-mail Address:

Plumbing: N/A
(Contractor Name) (Phone)
(Mailing Address, City, State, Zip) (License # or N/A)
E-mail Address:

Water Treatment: N/A
(Softener) (Contractor Name) (Phone)
(Mailing Address, City, State, Zip) (License # or N/A)
E-mail Address:

Mechanical: N/A
(Contractor Name) (Phone)
(Mailing Address, City, State, Zip) (License # or N/A)
E-mail Address:

Fuel Piping: N/A
(Natural Gas) (Contractor Name) (Phone)
(Mailing Address, City, State, Zip) (License # or N/A)
E-mail Address:

Insulation: N/A
(Contractor Name) (Phone)
(Mailing Address, City, State, Zip)
E-mail Address:



TOWN OF MOREHEAD CITY
COMMERCIAL APPLICATION FOR BUILDING PERMIT

Refrigeration Piping _____
(Contractor Name) N/A (Phone) _____

(Mailing Address, City, State, Zip) _____ (License # or N/A) _____
E-mail Address: _____

Fire Sprinkler: _____
(Contractor Name) N/A (Phone) _____

(Mailing Address, City, State, Zip) _____ (License # or N/A) _____
E-mail Address: _____

1) Explanation of Construction:
Rebuild of Deck & Cover proposed
rebuild Repairing Deck + Adding Roof

2) SM Initial here if the proposed improvements requested within this application are within the existing footprint of that which currently exists (e.g. no roofline extension, no structural addition, etc.).

3) If Construction is: Renovation: Repair: _____ Total \$ Value of Construction: 15,000.00
Work will include: Building: _____ Electrical: _____ Plumbing: _____ Mechanical: _____

4) If Construction is: Addition: _____ New Construction: _____ Total \$ Value of Construction: _____
Number of Stories: _____ Height (from average grade): _____
Overall Dimensions of Construction Area: _____
Square Footage Information (of area to be built):

1st floor 1000 square feet

2nd floor _____ square feet

Other N/A square feet

Total heated area to be added: 0 square feet

Accessory Areas: Garage _____ square feet

Porch _____ square feet

Porch _____ square feet

Deck 1000 square feet Repairs

Other _____ square feet

Total accessory area to be added: _____ square feet



TOWN OF MOREHEAD CITY
COMMERCIAL APPLICATION FOR BUILDING PERMIT

- 5) Total footprint area covered by roof (including new and existing) 1000 sf
- 6) Property is located in flood zone: _____
(Flood elevation certificate is due 21 days from time first floor elevation is established: ___ Yes ___ No)
- 7) Copy of septic tank permit is _____ attached; or septic tank permit _____ not applicable.
- 8) Water line size from meter: _____ Sewer line size: _____
- 9) Height of building (from average grade to highest point of structure): _____
- 10) Any additional information included with application: _____

I hereby certify that all information in this application is correct and all work will comply with the State Building Code and all other applicable State and local laws and ordinances and regulations. The Inspection Department will be notified of any changes in the approved plans and specifications for the project permitted herein.

Date 3/30/16

[Signature]
(Owner/Agent Signature)

Jeff Garner
(Printed Name)

Below to be completed by Staff:

Property Information: (to be completed by staff) Data Entry By: Jeanie Date: 3/31/16
 Tax Parcel # 6386 2080 2884 Zoning District DB City limits: Inside X Outside _____
 Flood Zone: AE8(9) Structure Value: \$ 882,002
 CAMA required (yes/no) (no) If yes, CAMA permit #: see attached email from Heather Styron

Zoning Review:

Setbacks: front 0 side 0 rear 0 corner lot (yes/no) (no) Any encroachments in setback no
 Lot size: N/A Maximum lot coverage allowed N/A Lot coverage after permit issued N/A
 DMCRA (yes/no) (no) Zoning Official Signature: Jeanie Drake Date: 3/31/16



TOWN OF MOREHEAD CITY
COMMERCIAL APPLICATION FOR BUILDING PERMIT

AFFIDAVIT OF WORKERS' COMPENSATION COVERAGE
N.C.G.S. 87-14

The undersigned applicant for a Building Permit, being the
Bogue Banks Marine Construction → Sanitary Fish
Contractor (PRINTED NAME) Market & Rest.
Devt Smith → Jeff Garner
Owner (PRINTED NAME)
Kim Smith / Jeff Garner → Jeff Garner
Officer/Agent of the Contractor or Owner (PRINTED NAME)

do hereby aver under penalties of perjury that the person(s), firm(s), or corporation(s) performing the work set forth in the permit:

- has / have three (3) or more employees and have obtained workers' compensation insurance to cover them,
- has / have one or more subcontractor(s) and have obtained workers' compensation insurance covering them,
- has / have one or more subcontractor(s) who has / have their own policy of workers' compensation covering themselves,
- has / have not more than two (2) employees and no subcontractors,

while working on this project for which this permit is sought. It is understood that the Inspection Department issuing the permit may require certificates of coverage of workers' compensation insurance prior to issuance of the permit and at any time during the permitted work from any person, firm, or corporation carrying out the work.

Firm Name: Bogue Banks Marine Construction
By: Jeff Garner
Title: VP
Date: 3/30/16

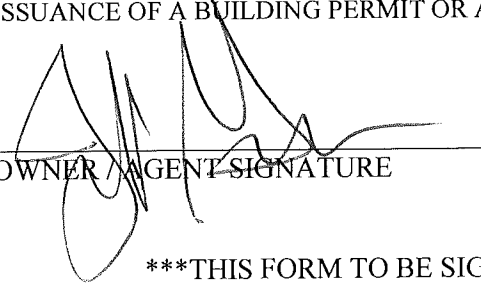



**TOWN OF MOREHEAD CITY
COMMERCIAL APPLICATION FOR BUILDING PERMIT**

CHECKLIST FOR NEW COMMERCIAL PROJECTS

- 1 - DISCUSS PROPOSAL WITH THE **PLANNING AND INSPECTIONS DEPARTMENT (P&I)**
726-6848 EXTENSION 121, 119, or 140
- 2 - FOR "FOOD SERVICE" ESTABLISHMENTS - SUBMIT PLANS, DRAWINGS, SPECIFICATIONS TO
CARTERET COUNTY HEALTH DEPARTMENT FOR APPROVAL IN WRITING
728-8499
- 3 - IN AREAS WITHOUT CITY WATER OR WITHOUT CITY SEWER, CONTACT THE **CARTERET COUNTY
HEALTH DEPARTMENT** FOR APPROVAL IN WRITING
728-8499
- 4 - SUBMIT COMPLETED APPLICATION, PLANS, DRAWINGS, AND SPECIFICATIONS TO **P&I**
726-6848 EXTENSION 125
- 5 - OBTAIN INFORMATION WITH REGARDS TO TAP & IMPACT FEES FROM **PUBLIC UTILITIES**
726-6848 EXTENSION 122 OR 132
- 6 - OBTAIN INFORMATION ABOUT SIDEWALKS & DRIVEWAY PERMITS FROM **PUBLIC WORKS**
726-6848 EXTENSION 122 OR 132

THIS IS TO CERTIFY THAT I HAVE READ AND UNDERSTAND THESE REQUIREMENTS AND FULLY UNDERSTAND ALL REQUIREMENTS GIVEN TO ME BY THE APPROPRIATE DEPARTMENTS. I FURTHER UNDERSTAND THAT FAILURE TO COMPLY WITH THESE REQUIREMENTS MAY CAUSE A DELAY IN THE ISSUANCE OF A BUILDING PERMIT OR A DELAY IN THE OPENING OF MY ESTABLISHMENT.


OWNER / AGENT SIGNATURE


PRINTED NAME

THIS FORM TO BE SIGNED AND RETURNED TO THE INSPECTION DEPARTMENT WITH COMPLETED CONSTRUCTION PACKET



MOREHEAD CITY
PLANNING & INSPECTIONS DEPARTMENT
706 ARENDELL STREET
MOREHEAD CITY, NC 28557
TEL (252)726-6848 ext 125
FAX (252) 726-2267

COMMERCIAL APPLICATION FOR BUILDING PERMIT
MEMORANDUM

TO: Applicants

SUBJECT: Application Procedures

You will need to submit a completed and signed application form along with the following information:

1. Two (2) sets of building plans (sealed by an engineer, if required by Building Code);
2. Completed Appendix B for new projects, not renovations.
3. (a) A site plan or survey (**drawn to scale**), indicating placement of proposed new construction and all other existing structures located on the lot (to include, but not limited to, fireplaces, steps, condensing units, etc.) must be attached and include the following:

| | |
|--|---|
| _____ show all property lines with dimensions | _____ show proposed structure with dimensions |
| _____ label distance to all property lines from existing and proposed structures | _____ label road front, rear, and sides |
| _____ show easements, if applicable | _____ location of driveway/access |
| _____ flood zone must be labeled on site plan | _____ septic tank/drain lines, if applicable |
| | _____ square footage of lot must be shown (not acreage) |

The site has to be checked for zoning (setbacks and maximum lot coverage).
- (b) Indicate the current location of electric meter and any overhead electric lines;
- (c) An interior floor plan if any walls are being relocated or added. All rooms must be labeled.
4. A copy of well permit and septic tank permit or a Development Application, if applicable.
5. CAMA permit, if applicable.
6. Check Lien Agent Requirements and attach two copies, if required.
7. Downtown Morehead City Revitalization Association review, if located East of 14th Street
They can be contacted at 808-0440, 1001 Arendell Street.

Dmccra
WJA
WJA

Failure to provide ALL of the above-required information will result in the return of the application.

The application must be left with the secretary and will be reviewed by Staff. Results of the plan review will be forwarded to the designer of record for revisions or clarifications. Once received, a follow-up review is conducted and, if approved, the permit will be issued. The total turnaround time varies, but generally takes two to four weeks.

You will be contacted when the permit is ready for pick-up; no money is accepted until permit is issued.

Substantial Improvement Worksheet for Floodplain Construction

(for reconstruction, rehabilitation, addition, or other improvements, and repair of damage from any cause)

Property Owner: Vernon Jackson Garner Jr. Trust
 Address: PO Box 38, Morehead City, NC 28557
 Permit No.: _____
 Location: 501 Evans St., M.C. (Sanitary Restaurant)
 Description of Improvements: Dock Repairs and Roof Addition over existing dock

Present Market Value of structure ONLY (market appraisal or adjusted assessed value, BEFORE Improvement, or if damaged, before the damage occurred), not including land value:

\$ 882,000

Cost of Improvement -

Actual cost of the construction** (see items to include/exclude)

\$ 15,000

Include volunteer labor and donated supplies.

Ratio = $\frac{\text{Cost of Improvement (or Cost to Repair)}}{\text{Market Value}} \times 100$

1.7 %

+25,000
+ 5,800
5.19%

If ratio is 50 percent or greater (Substantial Improvement), entire structure including the existing building must be elevated to the base flood elevation (BFE) and all other aspects brought into compliance.

Important Notes:

1. Review cost estimates to ensure that all appropriate costs are included or excluded.
2. If a residential pre-FIRM building is determined to be substantially improved, it must be elevated to or above the BFE. If a non-residential pre-FIRM building is substantially improved, it must be elevated or dry floodproofed to the BFE.
3. Proposals to repair damage from any cause must be analyzed using the formula shown above.
4. Any proposed improvements or repairs to a post-FIRM building must be evaluated to ensure that the improvements or repairs comply with floodplain management regulations and to ensure that the improvements or repairs do not alter any aspect of the building that would make it non-compliant.
5. Alterations to and repairs of designated historic structures may be granted a variance or be exempt under the substantial improvement definition) provided the work will not preclude continued designation as a "historic structure."
6. Any costs associated with directly correcting health, sanitary, and safety code violations may be excluded from the cost of improvement. The violation must have been officially cited prior to submission of the permit application.

Determination completed by: Jarvis Drake
 Date: 3/31/16

2016-0009 Interior Reno. Issued: 1/12/16 Final Open \$ 25,000-
 SP16-0049 Adding Sprinkler Heads Issued: 4/14/16 Open \$ 5,800-



407

Jeannie Drake

From: Styron, Heather M. <heather.m.styron@ncdenr.gov>
Sent: Thursday, March 31, 2016 11:21 AM
To: Jeannie Drake
Subject: RE: 501 Evans Street - Sanitary Restaurant

Hey Jeannie,

As long as the dock repair is less than 50 percent of the total structural framing members (stringers, girders, pilings and joists) and the roof area is over the existing platform etc. and does not allow for second story use, then a CAMA permit would not be required. Please let me know if you need anything else ☺

Heather

From: Jeannie Drake [mailto:Jeannie.Drake@moreheadcitync.org]
Sent: Thursday, March 31, 2016 10:02 AM
To: Styron, Heather M. <heather.m.styron@ncdenr.gov>
Subject: 501 Evans Street - Sanitary Restaurant

Good morning, Heather –

Jeff Garner dropped off an application for dock repairs and a roof addition over the existing dock at 501 Evans Street, Morehead City (The Sanitary Restaurant). I just need confirmation from you that a CAMA permit is not required.

Thank you - Jeannie

*Jeannie Drake
Code Enforcement Officer
706 Arendell Street
Morehead City, NC 28557
252-726-6848 x138
Jeannie.drake@moreheadcitync.org*

Line # 4036
"2016"



FEE SHEET

Town of Morehead City
706 Arendell St.
Morehead City, NC 28557

Tel: (252) 726-6848 ext. 132
Fax: (252) 726-2267

DATE: April 7, 2016

SITE ADDRESS: 501 Evans Street (Dook & Roof Repairs)

NAME: Jeff Garner

PUBLIC UTILITIES DEPARTMENT

IMPACT FEES: WATER (code 341)
\$ 0

SEWER (code 340)
\$ 0

WATER TAP: \$ 0
(code 1100)

SEWER TAP: \$ 0
(code 870)

DEPOSIT: \$ 0
(code 440 override to 61-2500-000)

SERVICE FEE: \$ 0

THE FEES SHOWN ARE BASED ON THE INFORMATION GIVEN TO THE TOWN OF MOREHEAD CITY AT THE TIME THE BUILDING PERMIT WAS APPLIED FOR. IN THE EVENT THERE ARE ANY CHANGES IN SIZE OR FUNCTION OF THE BUILDING OR THE CONNECTIONS TO THE TOWN'S SYSTEM, THERE MAY BE CHANGES TO THE FEES REQUIRED, EITHER UP OR DOWN.

EXTENSION FEES:
(code 158)

WATER : \$ 0

SEWER: \$ 0

PUBLIC WORKS DEPARTMENT

SIDEWALK FEE: \$ 0
(code 420 override to 10-3451-840)

TOTAL FEES: \$ 0

| WATER LINE SIZE | IN-TOWN TAP FEES | UTILITY DEPOSIT FEE |
|---|------------------|---------------------|
| 3/4 inch | \$ 700.00 | \$ 100.00 |
| 1 inch | \$ 900.00 | \$ 140.00 |
| Greater than 1 inch will be done at actual cost plus 15%. See Public Utilities Director | | |

Sam Collins Duriddy
Public Utilities/Public Works Department

[Signature]
Contractor/Owner/Agent

Memorandum

To: Dykeman Baily, Fire Marshal
Robert Davis, Chief Building Inspector
Bernette Morris, Police Chief
Graham Strother, Assistant Public Services

From: Ethan Brogden, Code Enforcement Officer

Date: March 31, 2016

Re: 501 Evans Street / Repairing Dock & Adding Roof

Please review the revised plans located on the plan review table in the Inspectors office and **Email your comments back to me by 04/07/2016**. Thank you.

If you have any questions, please let me know. Thank you.

cc: Linda Staab, Planning Director
Sandi Watkins, Planner
Jeannie Drake, Code Enforcement Officer
John Varner, Building Inspector
Meredith Dillon, Planning/Inspections Assistant
Jamie Fulk, Fire Chief
Bobby Stephens, Assistant Fire Marshal
Daniel Williams, Public Services Director
Derek Williams, Water & Sewer Supervisor

MOREHEAD CITY
NORTH CAROLINA

COUNCIL
Harvey N. Walker, Jr., Mayor Pro Tem
George W. Ballou
Demus L. Thompson
William F. Taylor
Diane C. Warrender

706 Arendell Street
Morehead City, North Carolina 28557-4234
TEL (252) 726-6848
FAX (252) 726-2267
www.moreheadcity.nc.gov



David S. Whitlow
City Manager

DATE: 04/07/2016
TO: Jeff Garner
PO Box 38
Morehead City, NC 28557
yellowfin57@gmail.com
FROM: Ethan Brogden, Code Enforcement Officer
RE: 501 Evans Street (Sanitary) / Dock Repairs & Roof

A PLAN REVIEW HAS BEEN CONDUCTED FOR THE ABOVE PROJECT AND THE FOLLOWING INFORMATION IS REQUESTED:

Zoning (Plan reviewed by Ethan Brogden, Zoning Enforcement 726-6848, ext. 119 ethan.brogden@moreheadcitync.org):

- 1. No comment at this time.

Fire Department (Plan reviewed by, Dykeman Baily, Fire Marshal, 726-5040 ext. 3 dykeman.bailey@moreheadcitync.org):

- 1. Ensure a fire extinguisher with a minimum rating of 3A-40BC is located within 75-foot travel distance of the repaired docks.

Plan review fees: \$25.00 Account # 28-3434-410 Central Collection Code 240

Public Services (Plan reviewed by Graham Strother, Assistant Public Services Director, 726-6848, ext. 120 graham.strother@moreheadcitync.org):

- 1. No comment at this time.

Inspections (Plan reviewed by Robert Davis, Chief Building Inspector, 726-6848, ext. 143 robert.davis@moreheadcitync.org):

- 1. No comment at this time.

Police Department (Plan reviewed by Bernette Morris, Chief MHCPD, 726-3131, bernette.morris@moreheadcitync.org):

- 1. No comment at this time.

UPON RECEIPT OF THE REQUESTED INFORMATION, A FOLLOW-UP PLAN REVIEW WILL BE CONDUCTED.

Inspection Detail List

ID# PR108870\BD007525 **Location** 501 EVANS STREET
Permit # 2016-0113 **Entered** 04/07/2016 **Permit Date** 04/07/2016
Owner/Occ. Owner **Name** VERNON JACKSON GARNER JR. TRUST **Phone** 252-241-2185
Contractor BOGUE BANKS MARINE CONST.: DEREK S SMITH: 65969 **Structure** COMMERCIAL
Electrician
Plumber
Mechanical
Other **Fee Paid** 04/11/2016

Permit Type COMM.ALTERATION **Project** DOCK & ROOF REPAIRS **Est. Cost** \$15,000
Setbacks: **Lot#/Subd.** **Stories** 1
Front N/A **Rear** N/A **Dimensions** **Flood Zone** AE8(9)
Right N/A **Left** N/A **District** DB **Heated S.F.** 14688 **Unheated S.F.** 3049 **Crawl Space S.F.**

| Detail | Scheduled Insp. Time | Inspected | Time | Result | Who |
|------------|----------------------|------------|------|--------|-----|
| FRAMING | 08/25/2016 | 08/25/2016 | | PASSED | RD |
| FINAL | 11/09/2016 | 11/09/2017 | | FAILED | RD |
| FINAL | 02/16/2017 PM | 02/16/2017 | | PASSED | RD |
| FINAL FIRE | 02/16/2017 | 02/16/2017 | | PASSED | DB |

Inspection Count 4

Past Notes

Notes EB FOR RD

SEE EMAIL FROM HEATHER STYRON INDICATING THAT A CAMA PERMIT WOULD NOT BE REQUIRED BECAUSE THE ROOF AREA IS OVER AN EXISTING PLATFORM. JD

11/9/16: open j box covers on south deck.
 need to add exit on east side of bar.
 add exit sign east side of bar.

Sanitary Restaurant / Sugarleaf Island Deli

3/1/16

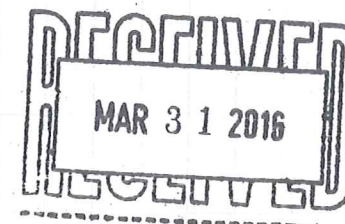
Dock/Deck Proposal

cross section

"REVIEWED FOR CODE COMPLIANCE"

TOWN OF MOREHEAD CITY

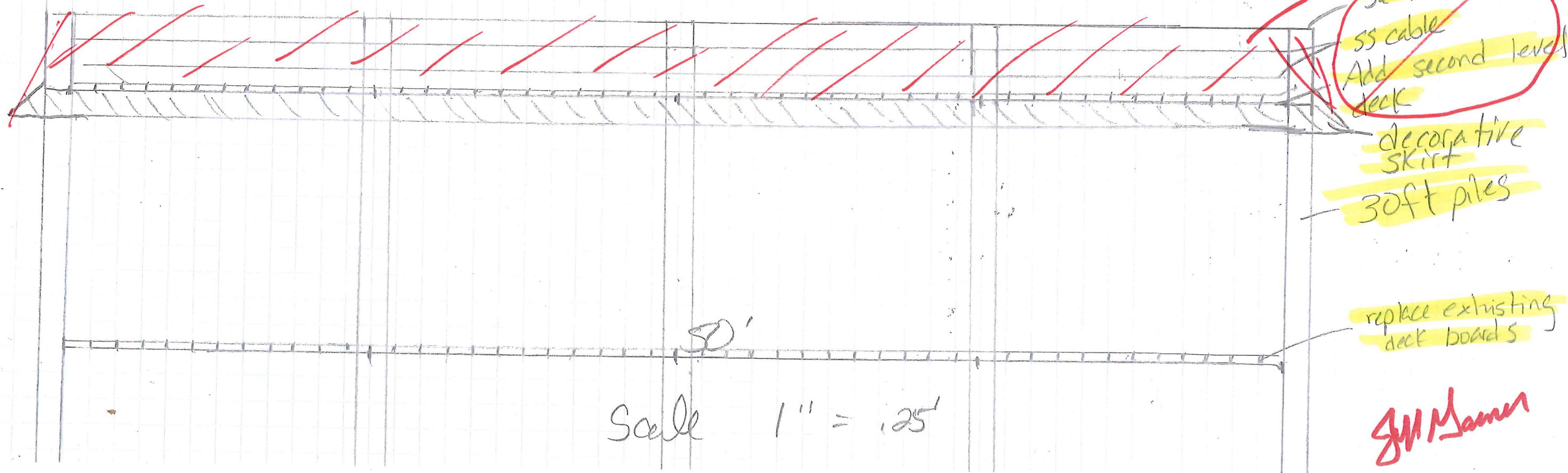
FILE COPY



Proposed rubber roofing

JJ.

omit second level deck



3/4" hand rail
 SS cable
 Add second level deck

decorative skirt
 30ft piles

replace existing deck boards

50'

Scale 1" = .25"

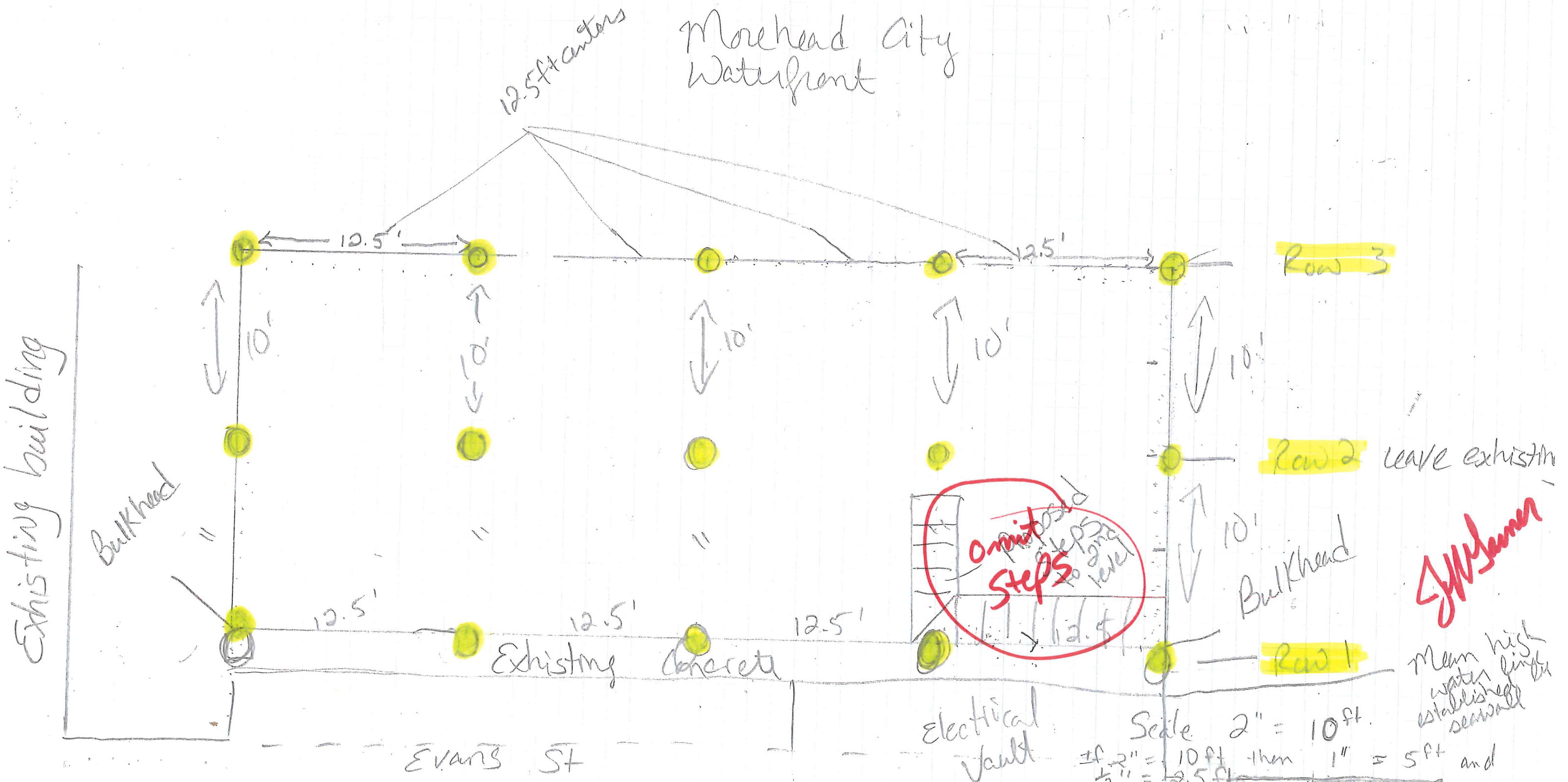
JJ. Mamer

Sugarloaf Island Deli/Sanitary 3/1/16 Pier/Dock Proposal

We propose 25' piles for row 1 and 30' piles for rows 2 & 3.

- Row 1 25' piles
- Row 2 leave existing
- Row 3 30' piles

● = Proposed New Piling

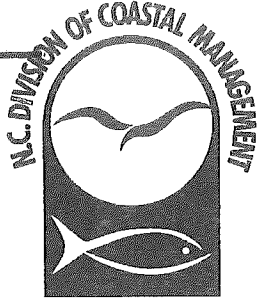


RECEIVED
FEB 08 2017

065

17-06

APPLICATION FOR
CAMA MINOR
DEVELOPMENT
PERMIT



In 1974, the North Carolina General Assembly passed the Coastal Area Management Act (CAMA) and set the stage for guiding development in fragile and productive areas that border the state's sounds and oceanfront. Along with requiring special care by those who build and develop, the General Assembly directed the Coastal Resources Commission (CRC) to implement clear regulations that minimize the burden on the applicant.

This application for a minor development permit under CAMA is part of the Commission's effort to meet the spirit and intent of the General Assembly. It has been designed to be straightforward and require no more time or effort than necessary from the applicant. Please go over this folder with the Local Permit Officer (LPO) for the locality in which you plan to build to be certain that you understand what information he or she needs before you apply.

Under CAMA regulations, the minor permit is to be issued within 25 days once a complete application is in hand. Often less time is needed if the project is simple. The process generally takes about 18 days. You can speed the approval process by making certain that your application is complete and signed, that your drawing meets the specifications given inside and that your application fee is attached.

Other permits are sometimes required for development in the coastal area. While these are not CAMA-related, we urge you to check with the Local Permit Officer to determine which of these you may need. A list is included on page two of this folder.

We appreciate your cooperation with the North Carolina Coastal Management Program and your willingness to build in a way that protects the resources of our beautiful and productive coast.

Coastal Resources Commission
Division of Coastal Management

APPLICATION: *Sanitary - Shell Shaver*

LOCALITY: *Beaufort & Beaufort City*

PERMIT ISSUED USING
STATIC LINE EXCEPTION?
YES NO

Locality Town of Morehead City Permit Number 17-06

Ocean Hazard _____ Estuarine Shoreline X ORW Shoreline _____ Public Trust Shoreline _____ Other _____

(For official use only)

GENERAL INFORMATION

LAND OWNER

Name Vernon Jackson Garner Jr. & Sanitary Fish Market & Restaurant
Address 501 Evans St.
City Morehead State NC Zip 28557 Phone (252) 247-3111
Email yellowfin57@gmail.com

AUTHORIZED AGENT

Name Jeff Garner
Address PO Box 38
City Morehead State NC Zip 28557 Phone (252) 241-2185
Email yellowfin57@gmail.com

LOCATION OF PROJECT: (Address, street name and/or directions to site. If not oceanfront, what is the name of the adjacent waterbody.) 501 Evans St. (Sanitary Restaurant)

DESCRIPTION OF PROJECT: (List all proposed construction and land disturbance.) Build steps over existing deck for upstairs/2nd str

SIZE OF LOT/PARCEL: 20 x 14' square feet N/A acres

PROPOSED USE: Residential (Single-family Multi-family) Commercial/Industrial Other

COMPLETE EITHER (1) OR (2) BELOW (Contact your Local Permit Officer if you are not sure which AEC applies to your property):

(1) OCEAN HAZARD AECs: TOTAL FLOOR AREA OF PROPOSED STRUCTURE: 280 square feet (includes air conditioned living space, parking elevated above ground level, non-conditioned space elevated above ground level but excluding non-load-bearing attic space)

(2) COASTAL SHORELINE AECs: SIZE OF BUILDING FOOTPRINT AND OTHER IMPERVIOUS OR BUILT UPON SURFACES: 20 x 30' square feet (includes the area of the roof/drip line of all buildings, driveways, covered decks, concrete or masonry patios, etc. that are within the applicable AEC. Attach your calculations with the project drawing.)

STATE STORMWATER MANAGEMENT PERMIT: Is the project located in an area subject to a State Stormwater Management Permit issued by the NC Division of Water Quality?
YES _____ NO ✓

If yes, list the total built upon area/impervious surface allowed for your lot or parcel: N/A square feet.

OTHER PERMITS MAY BE REQUIRED: The activity you are planning may require permits other than the CAMA minor development permit, including, but not limited to: Drinking Water Well, Septic Tank (or other sanitary waste treatment system), Building, Electrical, Plumbing, Heating and Air Conditioning, Insulation and Energy Conservation, FIA Certification, Sand Dune, Sediment Control, Subdivision Approval, Mobile Home Park Approval, Highway Connection, and others. Check with your Local Permit Officer for more information.

STATEMENT OF OWNERSHIP:

I, the undersigned, an applicant for a CAMA minor development permit, being either the owner of property in an AEC or a person authorized to act as an agent for purposes of applying for a CAMA minor development permit, certify that the person listed as landowner on this application has a significant interest in the real property described therein. This interest can be described as: (check one)

an owner or record title, Title is vested in _____, see Deed Book _____ page _____ in the _____ County Registry of Deeds.

an owner by virtue of inheritance. Applicant is an heir to the estate of _____; probate was in _____ County.

if other interest, such as written contract or lease, explain below or use a separate sheet & attach to this application.

I Jeff Garner own Sanitary Fish Market & Restaurant and lease from
NOTIFICATION OF ADJACENT PROPERTY OWNERS: *vernon Jackson Garner Jr, my dad*
I furthermore certify that the following persons are owners of properties adjoining this property. I affirm that I have given *JS*
ACTUAL NOTICE to each of them concerning my intent to develop this property and to apply for a CAMA permit.

- | (Name) | (Address) |
|------------------------------------|---|
| (1) <i>Camp Seagull / Seafarer</i> | <i>(Boys & Girls Club) Gary Brown</i> |
| (2) <i>Jack Waterfront BAR</i> | <i>Jeff McCann</i> |
| (3) _____ | _____ |
| (4) _____ | _____ |

ACKNOWLEDGEMENTS:

I, the undersigned, acknowledge that the land owner is aware that the proposed development is planned for an area which may be susceptible to erosion and/or flooding. I acknowledge that the Local Permit Officer has explained to me the particular hazard problems associated with this lot. This explanation was accompanied by recommendations concerning stabilization and floodproofing techniques.

I furthermore certify that I am authorized to grant, and do in fact grant, permission to Division of Coastal Management staff, the Local Permit Officer and their agents to enter on the aforementioned lands in connection with evaluating information related to this permit application.

Jeff Garner

This the 1st day of Jan, 2017

Landowner or person authorized to act as his/her agent for purpose of filing a CAMA permit application

This application includes: general information (this form), a site drawing as described on the back of this application, the ownership statement, the Ocean Hazard AEC Notice where necessary, a check for \$100.00 made payable to the locality, and any information as may be provided orally by the applicant. The details of the application as described by these sources are incorporated without reference in any permit which may be issued. Deviation from these details will constitute a violation of any permit. Any person developing in an AEC without permit is subject to civil, criminal and administrative action.

068
SITE DRAWING/APPLICATION CHECKLIST

Please make sure your site drawing includes the following information required for a CAMA minor development permit. The Local Permit Officer will help you, if requested.

PHYSICAL DIMENSIONS

- _____ Label roads
- _____ Label highways right-of-ways
- _____ Label local setback lines
- _____ Label any and all structures and driveways currently existing on property
- _____ Label adjacent waterbody

PHYSICAL CHARACTERISTICS

- _____ Draw and label normal high water line (contact LPO for assistance)
- _____ Draw location of on-site wastewater system

If you will be working in the ocean hazard area:

- _____ Draw and label dune ridges (include spot elevations)
- _____ Draw and label toe of dunes
- _____ Identify and locate first line of stable vegetation (contact LPO for assistance)
- _____ Draw and label erosion setback line (contact LPO for assistance)
- _____ Draw and label topographical features (optional)

If you will be working in a coastal shoreline area:

- _____ Show the roof overhang as a dotted line around the structure
- _____ Draw and label landward limit of AEC
- _____ Draw and label all wetland lines (contact LPO for assistance)
- _____ Draw and label the 30-foot buffer line

DEVELOPMENT PLANS

- _____ Draw and label all proposed structures
- _____ Draw and label areas that will be disturbed and/or landscaped
- _____ Note size of piling and depth to be placed in ground
- _____ Draw and label all areas to be paved or graveled
- _____ Show all areas to be disturbed
- _____ Show landscaping

NOTE TO APPLICANT

Have you:

- completed all blanks and/or indicated if not applicable?
- notified and listed adjacent property owners?
- included your site drawing?
- signed and dated the application?
- enclosed the \$100.00 fee?
- completed an AEC Hazard Notice, if necessary? (Must be signed by the property owner)

FOR STAFF USE

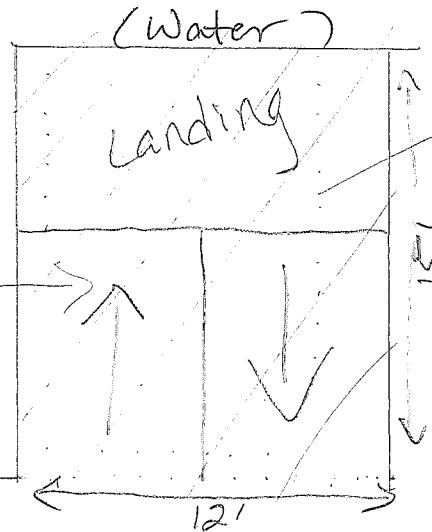
Site Notice Posted _____ Final Inspection _____ Fee Received \$100.00 ck #38100

Site Inspections

Date of Action: Issued _____ Exempted _____ Denied _____ Appeal Deadline (20 days from permit action) _____

Boat (water) Slips

proposed steps to access ~~at~~ existing roof



existing

Breezeway to floating dock

Existing non water dependant deck w/ roof

sidewalk

Evans Street ↓

electrical vault

501 Evans St. Sanitary Restaurant Deck

CERTIFIED MAIL, RETURN RECEIPT REQUESTED or HAND DELIVERED

Jan 1, 2017
Date

Jeff McCann (Jack's)
Name of Adjacent Riparian Property Owner

501 Evans St.
Address
Marched City NC 28557
City, State Zip

To Whom It May Concern:

This correspondence is to notify you as a riparian property owner that I am applying for a CAMA Minor permit to
Build steps over existing deck on 2nd story deck
on my property at 501 Evans St. for use for deli.
in Carteret County, which is adjacent to your property. A copy of the application and project
drawing is attached/enclosed for your review.

If you have no objections to the proposed activity, please mark the appropriate statement below and return to me as soon as possible. If no comments are received within 10 days of receipt of this notice, it will be considered that you have no comments or objections regarding this project.

If you have objections or comments, please mark the appropriate statement below and send your correspondence to:
(LOCAL PERMIT OFFICER, NAME OF LOCAL GOVERNMENT, MAILING ADDRESS CITY, STATE, ZIP CODE)

If you have any questions about the project, please do not hesitate to contact me at my address/number listed below, or contact (LOCAL PERMIT OFFICER) at (PHONE NUMBER), or by email at: (LPO EMAIL).

Sincerely,

Jeff Garner
Property Owner's Name

(252) 241-2185
Telephone Number

Address City State Zip

I have no objection to the project described in this correspondence.
 I have objection(s) to the project described in this correspondence.

Kurt C
Adjacent Riparian Signature

2-8-17
Date

Keri McCann
Print or Type Name

252-422-8853
Telephone Number

Address City State Zip

CERTIFIED MAIL, RETURN RECEIPT REQUESTED or HAND DELIVERED

Gary Brown (Camp Seafull)
Name of Adjacent Riparian Property Owner

Jan 1, 2017
Date

Moahad City NC 28557
Address
City, State Zip

To Whom It May Concern:

This correspondence is to notify you as a riparian property owner that I am applying for a CAMA Minor permit to Build steps over existing deck on my property at 501 Evans St. in Carteret County, which is adjacent to your property. A copy of the application and 2nd story deck use for deli project drawing is attached/enclosed for your review.

If you have no objections to the proposed activity, please mark the appropriate statement below and return to me as soon as possible. If no comments are received within 10 days of receipt of this notice, it will be considered that you have no comments or objections regarding this project.

If you have objections or comments, please mark the appropriate statement below and send your correspondence to: (LOCAL PERMIT OFFICER, NAME OF LOCAL GOVERNMENT, MAILING ADDRESS CITY, STATE, ZIP CODE)

If you have any questions about the project, please do not hesitate to contact me at my address/number listed below, or contact (LOCAL PERMIT OFFICER) at (PHONE NUMBER), or by email at: (LPO EMAIL).

Sincerely,

Jeff Garner
Property Owner's Name

(252) 241-2185
Telephone Number

Address City State Zip

- I have no objection to the project described in this correspondence.
- I have objection(s) to the project described in this correspondence.

Gary Brown YMCA
Adjacent Riparian Signature

Feb 8, 2017
Date

Gary D. Brown
Print or Type Name

252-671-6113
Telephone Number

Address City State Zip

CERTIFIED MAIL, RETURN RECEIPT REQUESTED or HAND DELIVERED

Camp Seagull/ Seafarer (YMCA) 2/24/17
 Name of Adjacent Riparian Property Owner Date
571 Evans St Agent Gary Brown
 Address
Macon City NC 28557
 City, State Zip

To Whom It May Concern:

This correspondence is to notify you as a riparian property owner that I am applying for a CAMA Minor permit to
Utilize second story of existing Seagull Island
 on my property at 571 Evans St Delco and incorporate
 in Carteret County, which is adjacent to your property. A copy of the application and project steps for
 drawing is attached/enclosed for your review. access

If you have no objections to the proposed activity, please mark the appropriate statement below and return to me as soon as possible. If no comments are received within 10 days of receipt of this notice, it will be considered that you have no comments or objections regarding this project.

If you have objections or comments, please mark the appropriate statement below and send your correspondence to: (LOCAL PERMIT OFFICER, NAME OF LOCAL GOVERNMENT, MAILING ADDRESS CITY, STATE, ZIP CODE)

If you have any questions about the project, please do not hesitate to contact me at my address/number listed below, or contact (LOCAL PERMIT OFFICER) at (PHONE NUMBER), or by email at: (LPO EMAIL).

Sincerely,

Jeff Garner (agent) (252) 241-2185
 Property Owner's Name Telephone Number

Address City State Zip

I have no objection to the project described in this correspondence.
 I have objection(s) to the project described in this correspondence.

Gary D. Brown YMCA 2/25/17
 Adjacent Riparian Signature Date
GARY D. BROWN YMCA (252) 671-6113
 Print or Type Name Telephone Number

Address City State Zip

MOREHEAD CITY

NORTH CAROLINA

Gerald A. Jones, Jr., Mayor

David S. Whitlow
City Manager**COUNCIL**

William F. Taylor, Mayor Pro Tem
George W. Ballou
Demus L. Thompson
Harvey N. Walker, Jr.
Diane C. Weirander

706 Arendell Street
Morehead City, North Carolina 28557-4234
TEL (252) 726-6848
FAX (252) 726-2267
www.moreheadcitync.org

February 13, 2017

CERTIFIED MAIL - 7016 1370 0002 3221 9099**RETURN RECEIPT REQUESTED**

Vernon Jackson Garner Jr. Trust
c/o Jeff Garner
P.O. Box 38
Morehead City, NC 28557

RE: DENIAL OF CAMA MINOR DEVELOPMENT PERMIT
APPLICATION NUMBER- 17-06
PROJECT ADDRESS- 501 Evans Street, Morehead City, NC 28557

Dear Mr. Garner:

After reviewing your application in conjunction with the development standards required by the Coastal Area Management Act (CAMA) and our locally adopted Land Use Plan and Ordinances, it is my determination that no permit may be granted for the project which you have proposed.

This decision is based on my findings that your request violates NCGS 113A-120(a)(8) which requires that all applications be denied which are inconsistent with CAMA guidelines. You have applied to convert the existing parapet roof over an existing wooden platform into a second-story non-water dependent deck and to add steps to access the second-story deck over estuarine waters within an Urban Waterfront which is inconsistent with NCAC 15A 07H.209(g)(B)(iii), which limits new structures built for non-water dependent purposes to be limited to pile supported, single-story, unenclosed decks and boardwalks.

Also, keep in mind that this structure is immediately adjacent to an electrical vault. This may restrict the use and occupancy of the 2nd story deck and/or you may be required to meet specific building requirements.

Should you wish to appeal my decision to the Coastal Resources Commission or request a variance from that group, please contact me so I can provide you with the proper forms and any other information you may require. The Division of Coastal Management Morehead City Headquarters Office must receive appeal notices within twenty (20) days of the date of this letter in order to be considered.

Respectfully yours,

Jeannie Drake, LPO
Town of Morehead City
706 Arendell Street
Morehead City, NC 28557

cc: Roy Brownlow, District Manager & Compliance Coordinator, DCM
Heather Styron, Field Representative, DCM

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Jeffrey McCann
 Sacks Waterfront Bar
 513 Evans Street
 Morehead City, NC
 28557



9590 9402 2090 6132 2159 28

7015 1520 0001 2899 0952

700648-7 KSR / SUB

PS Form 3811, July 2015 PSN 7530-02-000-9053

WT 135

COMPLETE THIS SECTION ON DELIVERY

A. Signature Agent
 Addressee

B. Received by (Printed Name) Jeffrey McCann
 C. Date of Delivery 3/11/17

D. Is delivery address different from item 1? Yes
 If YES, enter delivery address below: No

3. Service Type
- Adult Signature
 - Adult Signature Restricted Delivery
 - Certified Mail®
 - Certified Mail Restricted Delivery
 - Collect on Delivery
 - Collect on Delivery Restricted Delivery Mail
 - Insured Mail Restricted Delivery (over \$500)
 - Priority Mail Express®
 - Registered Mail™
 - Registered Mail Restricted Delivery
 - Return Receipt for Merchandise
 - Signature Confirmation™
 - Signature Confirmation Restricted Delivery

Domestic Return Receipt

USPS TRACKING #



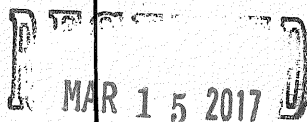
9590 9402 2090 6132 2159 28



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

United States
Postal Service

• Sender: Please print your name, address, and ZIP+4® in this box•



WARD & SMITH, P.A.
1001 COLLEGE COURT (29562)
P.O. BOX 887
NEW BERN, NC 28563-0887

BY:

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Garry D. Brown
 Agent for YMCA/Camp Seagull
 Seafarer
 1925 Craig St
 Raleigh, NC 27608



9590 9402 2090 6132 2159 11

7015 1520 0001 2899 0945

700648-7 KSRJLB

PS Form 3811, July 2015 PSN 7530-02-000-9053

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X *Garry D. Brown*

Agent

Addressee

B. Received by (Printed Name)

Garry D. Brown

C. Date of Delivery

D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No

3. Service Type

Adult Signature

Adult Signature Restricted Delivery

Certified Mail®

Certified Mail Restricted Delivery

Collect on Delivery

Priority Mail Express®

Registered Mail™

Registered Mail Restricted Delivery

Return Receipt for Merchandise

Signature Confirmation™

Signature Confirmation Restricted Delivery

Delivery Restricted Delivery

Insured Mail Restricted Delivery (over \$500)

WT 136

Domestic Return Receipt

USPS TRACKING#



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

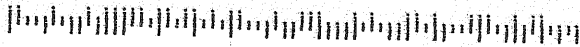
9590 9402 2090 6132 2159 11

United States
Postal Service

MA 16 2017

• Sender: Please print your name, address, and ZIP+4® in this box•

WARD & SMITH, P.A.
1001 COLLEGE COURT (28562)
P.O. BOX 867
NEW BERN, NC 28563-0867





The Sanitary Fish Market & Restaurant
(CRC-VR-17-02) Variance Request

April 26, 2017

Department of Environmental Quality



The Sanitary Restaurant Variance Request

501 Evans Street, Morehead City, Carteret County



Legend

- DC Feature 1
- Island
- Morehead City
- ↓ The Sanitary Restaurant

Vicinity Map

Sanitary Restaurant
501 Evans St
Morehead City
Carteret County



The Sanitary Restaurant

Yacht Basin

Sugarloaf Island

The Sanitary Restaurant Variance Request

Carteret County GIS Parcel Map



Sanitary Restaurant

Sugar Loaf Island Harbor Shops

Subject area prior to new roof over existing platform

Ruddy Duck Restaurant

Beaufort Olive Oil Co.

Atlantic Bay Mortgage

Sanitary Restaurant Variance Request

2017 aerial



Sanitary Restaurant Variance Request

June 2016, Looking East



Support Poles for vault wall (not constructed in this photo)

Electrical vault below

New Roof Area over Existing Dock Platform Below

Sanitary Restaurant Variance Request ⁰⁸³

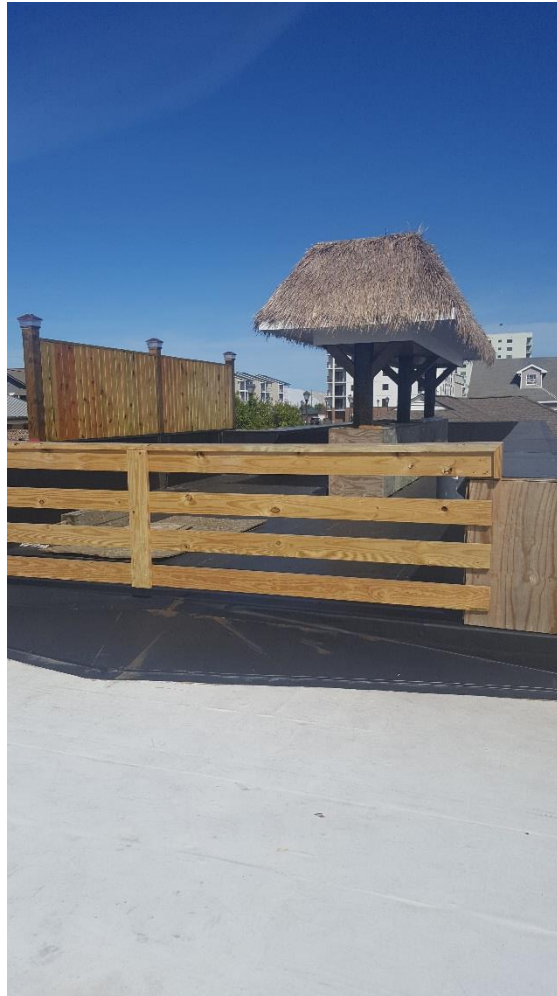
June 2016

Looking North



Sanitary Restaurant Variance Request

Wooden handrail separating the old roof and the new roof,
Taken April 10, 2017 by DCM Staff



085

Sanitary Restaurant Variance Request

Street View Looking South

03/31/2017

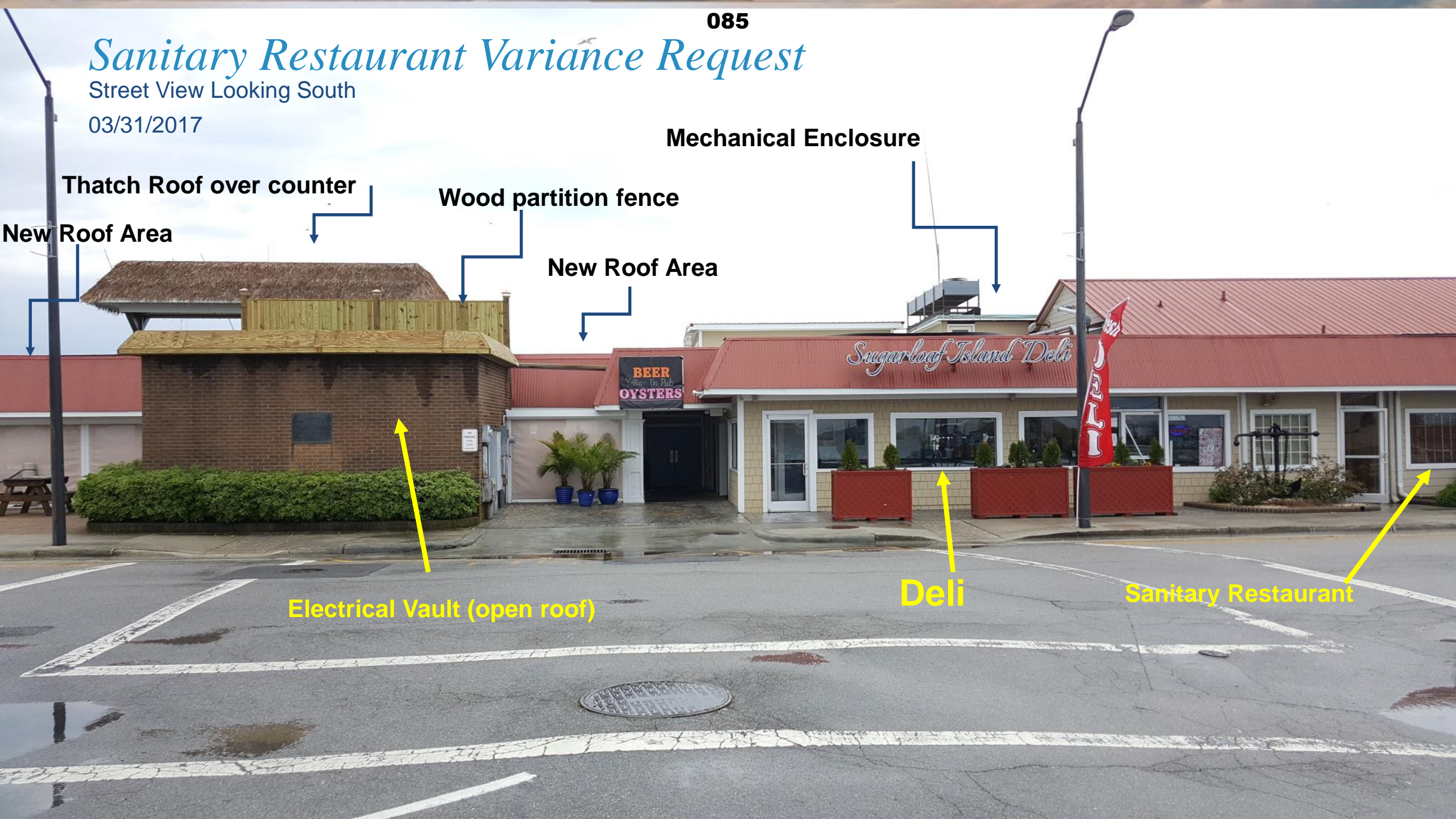
Mechanical Enclosure

Thatch Roof over counter

Wood partition fence

New Roof Area

New Roof Area



Electrical Vault (open roof)

Deli

Sanitary Restaurant

View from Evans St.
looking Southeast

03/31/2017

086

New Roof Area

Thatch Roof over Counter

New Wood Partition Fence/Wall

Beaufort Olive Oil Co.

Electrical Vault (open roof)

Deli

Sugarloaf Island



087

New Roof

Wood partition fence/wall

Electrical Vault

Photo Taken 03/31/2017



088

New Roof

Existing Dock Platform

Photo Taken 03/31/2017



089

New Roof

Thatched "Tiki" Roof over counter



Existing Dock Platform

Photo Taken 03/31/2017

**Existing Dock Platform
Looking North
Photo Taken 03/31/2017**





Existing Dock Platform

Looking East

Photo taken 03/31/2017

The Sanitary Restaurant Variance Request



Inside the Deli Looking West
Photo taken 03/31/2017



Sanitary Restaurant Variance Request

Petitioner's Photos (Aerial Looking West)

Photo taken 2010



North 



Sanitary Restaurant Variance Request

Petitioner's Photos



North side of Sanitary
Restaurant looking East
2015 Photo



Sanitary Restaurant Variance Request

Petitioner's Photos



View of attached Deli on East side of the Sanitary Restaurant. View is from Evans St. looking South.



Sanitary Restaurant Variance Request

Petitioner's Photos



View of existing dock platform area on south side of the Sanitary Restaurant
2015 Photo

Sanitary Restaurant Variance Request

Petitioner's Photos



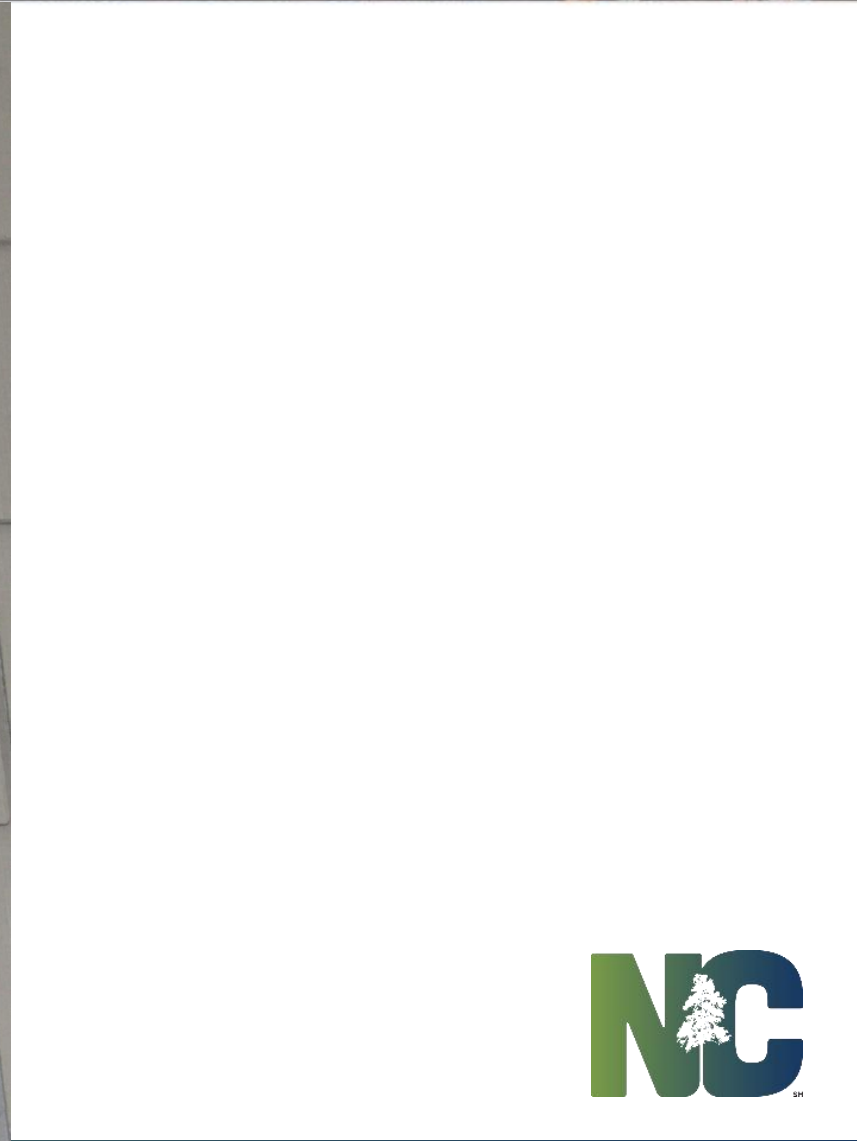
View of the inside seating area
of the Sanitary Restaurant
2015 Photo



Sanitary Restaurant Variance Request

Petitioner's Photos

2017 Photo



Sanitary Restaurant Variance Request

Petitioner's Photos

2015 Photo



Sanitary Restaurant Variance Request

Petitioner's Photos

1950 Photo



Sanitary Restaurant Variance Request

VARIANCE CRITERIA 15A NCAC 07J.0703 (f)

-to grant a variance, the Commission must affirmatively find each of the following factors listed in G.S. 113A-120.1(a).

- (A) that unnecessary hardships would result from strict application of the development rules, standards, or orders issued by the Commission;
- (B) that such hardships result from conditions peculiar to the petitioner's property such as the location, size, or topography of the property;
- (C) that such hardships did not result from actions taken by the petitioner; and
- (D) that the requested variance is consistent with the spirit, purpose and intent of the Commission's rules, standards or orders; will secure the public safety and welfare; and will preserve substantial justice.



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON C. DAVIS
Director

MEMORANDUM

CRC-17-08

TO: N.C. Coastal Resources Commission

FROM: Rebecca Ellin, Coastal Reserve Program Manager

DATE: April 12, 2017

SUBJECT: N.C. National Estuarine Research Reserve Management Plan

The N.C. Coastal Reserve and National Estuarine Research Reserve is updating its management plan for the N.C. National Estuarine Research Reserve (NCNERR). The plan covers 2017-2022 and provides a framework for the Reserve to continue, enhance, and expand its programs and operations to support its sites (Currituck Banks, Rachel Carson, Masonboro Island, and Zeke's Island), better serve NCNERR target audiences and address high priority coastal management issues. The National Oceanic and Atmospheric Administration (NOAA), the Reserve's federal partner in the implementation of the NCNERR, requires each Reserve within the National Estuarine Research Reserve System to prepare a management plan that describes the Reserve's goals, objectives and actions for its education, training, research and stewardship programs; management issues; and plans for public access and visitor use, land acquisition and facilities. The management plan must be approved by NOAA. The initial NCNERR management plan was approved in 1983 with revisions occurring in 1990, 1998, and 2009. The management plan's executive summary provides an overview of the program and the plan's contents and begins on page 2 of the attached draft management plan.

A robust public input process was utilized by the Reserve to inform the management plan update including the following mechanisms: public meetings, local advisory committee focus groups, an online partner survey, and needs assessments for the training and education programs. The local advisory committees for each NCNERR site provided input on the draft strategic plan section and the full draft management plan. The Reserve's education advisory committee and other partners also had the opportunity to provide input on the draft management plan. Feedback on the draft plan has been very positive with no major concerns identified. Minor changes have been

incorporated based on input received from the local advisory committees and partners. More detail on the public input process is provided in Appendix T in the management plan.

As the Coastal Area Management Act states that the Department will consult with and seek advice of the Coastal Resources Commission in its administration of the Coastal Reserve, **the Division is requesting the Commission's support of the draft NCNERR management plan to inform its recommendation to the Department.**

After review by the Department, NOAA will conduct a technical and content review of the plan. A NOAA-required 30-day public comment period will be held on the draft management plan following NOAA's review and prior to its finalization. The comment period will be announced in the Federal Register. Staff will host public meetings during the public comment period in the northern, central and southern regions of the coast to brief stakeholders on the draft management plan. Interested parties will be encouraged to submit comments electronically or at the public meetings held during the comment period.

North Carolina National Estuarine Research Reserve

DRAFT Management Plan 2017 – 2022



This management plan was developed in accordance with NOAA regulations, including all provisions for public involvement. It is consistent with the congressional intent of Section 315 of the Coastal Zone Management Act of 1972, as amended, and the provisions of the North Carolina Coastal Management Program.

Executive Summary

The North Carolina National Estuarine Research Reserve (NCNERR) protects approximately 10,500 acres of estuarine habitats in coastal North Carolina for the purposes of research and education. The NCNERR is part of the National Estuarine Research Reserve System (NERRS), a network of protected areas established to promote informed management of the Nation's estuaries and coastal habitats. The NERRS addresses nationally significant and locally relevant issues through national and local research, education, and stewardship programs. The NERRS currently consists of 29 Reserves in 24 states and territories, protecting over one million acres of estuarine land and water.

The NCNERR is managed as a federal-state partnership between the National Oceanic Atmospheric Administration's (NOAA) Office for Coastal Management (OCM) and the North Carolina Department of Environmental Quality's (DEQ) Division of Coastal Management (DCM). OCM implements the National Coastal Zone Management Program and the NERRS with authorization from the Coastal Zone Management Act of 1972 (CZMA). OCM provides funding, technical assistance, and national coordination and oversight to Reserves within the NERRS. The DCM carries out the state's Coastal Area Management Act, the Dredge and Fill Law and the federal CZMA in the 20 coastal North Carolina counties, using rules and policies of the N.C. Coastal Resources Commission. As the state partner, the DCM has delegated authority from the state of North Carolina to manage the NCNERR sites and provides staff, programming, and matching funds for implementation of the NCNERR. The DCM is well suited as NCNERR's state partner as both organizations have similar missions of protecting coastal resources and are able to take advantage of respective programmatic expertise in planning, permitting, scientific research, educational translation, and coastal land management to form a complementary and comprehensive coastal management program as originally envisioned by the CZMA.

Coastal North Carolina is unique in that it includes both the Virginian and Carolinian biogeographic regions. The NCNERR was established as a multi-site Reserve to take advantage of this unique biogeography and is comprised of four geographically disparate sites representing diverse estuarine habitats:

1. The 965-acre Currituck Banks Reserve located in Currituck County, just north of the village of Corolla at the end of North Carolina (N.C.) 12;
2. The 2,315-acre Rachel Carson Reserve located in Carteret County between the town of Beaufort, Harkers Island and Cape Lookout National Seashore;
3. The 5,653-acre Masonboro Island Reserve, an undeveloped barrier island, situated in New Hanover County between the towns of Wrightsville Beach and Carolina Beach; and
4. The 1,635-acre Zeke's Island Reserve, encompassing tracts in both New Hanover and Brunswick counties, reached via United States (U.S.) 421 south of Kure Beach.

The Currituck Banks, Rachel Carson, and Zeke's Island Reserves were designated in 1985 and the Masonboro Island Reserve was designated in 1991.

The NCNERR mission is *to practice and promote informed management and appreciation of North Carolina's coastal and estuarine ecosystems and provide protected sites for research, education, and stewardship*. The NCNERR accomplishes this mission and its purposes identified in the N.C. Administrative Code (15A 070) through its education, research, training and stewardship programs, each of which is devoted to fostering that aspect of the program, under the guidance of the Reserve Program Manager and according to this management plan.

- The education program increases awareness of the importance of coastal and estuarine ecosystems and inspires protection of these ecosystems for K-12 students and teachers, educators and the general public through its programs and materials.
- The Coastal Training Program promotes informed decisions regarding coastal resources by providing target audiences, such as local officials, realtors, state agency staff, resources managers, non-profit organizations and others, with science-based training opportunities on a variety of coastal topics.
- The research and monitoring program conducts, promotes and facilitates research at Reserve sites focused on ecosystem dynamics, coastal hazards resilience and human influences on estuarine systems and also provides long-term data on water quality, weather, biological communities, habitat and land-use and land-cover characteristics through its System-Wide Monitoring Program (SWMP).
- The stewardship program maintains and protects the natural integrity of Reserve sites by integrating science, community input and volunteer monitoring efforts to ensure suitable environments for research and education and to protect and restore coastal and estuarine species and habitats of environmental, economic and traditional use value to North Carolina.

Each program utilizes the four sites of the NCNERR to implement its respective activities, promoting site-based management and program implementation of the Reserve.

The OCM requires each Reserve within the NERRS to prepare a written management plan that describes the Reserve's goals, objectives and management issues, and identifies the Reserve's intended actions for its education, training, research, and stewardship programs as well as for public access and visitor use, land acquisition, and facilities. The plan must be approved by OCM and periodically updated. The initial NCNERR management plan was approved in 1983 with revisions in 1990, 1998, and 2009. This document is the fourth revision of that plan.

The 2017-2022 NCNERR management plan provides a framework for the Reserve to continue, enhance, and expand its programs and operations to better serve NCNERR target audiences and address high priority coastal management issues to promote healthy estuaries and coastal watersheds. The management plan addresses themes identified during the public input process (Appendix T) including program visibility, visitor use, research awareness, and partnerships. The plan also addresses threats and stressors of concern to the NCNERR sites: overarching threats and stressors include invasive species, water quality, visitor use and sea level rise and storms, and site-specific challenges include feral species, marine debris, and shoreline change and sedimentation.

The following four goals and resultant objectives and actions will guide Reserve implementation during 2017-2022:

1. Education and training inspire target audiences to protect coastal and estuarine ecosystems.
2. Research and monitoring advance understanding of coastal and estuarine ecosystems and inform coastal management.
3. Stewardship of protected sites contributes to the study and appreciation of coastal and estuarine ecosystems.
4. The NCNERR is recognized as a leader in coastal and estuarine ecosystem research, training, education and stewardship through effective administration and communication strategies.

To strengthen alignment of NCNERR programs and efforts with NERRS Strategic Goals and address public input, the NCNERR selected three topical areas of national, regional, state, and local importance: water quality, coastal and estuarine protection, and coastal hazards resilience. These priority coastal management issues were identified and informed by current work and input from Reserve staff, public and local advisory committee meetings, partner surveys, and education and training needs assessments. The topical areas will serve as additional focus and investment for the NCNERR management plan and will be addressed through a strategic and integrated process utilizing the capacity of the NCNERR programs and leveraging its partnerships.

The management plan details how each program will address the relevant goals and topical areas. The plan also identifies the types of projects the NCNERR will undertake in an effort to address the threats, stressors and coastal management issues facing its sites and N.C. coastal communities. The successful implementation of this management plan will rely on a coordinated approach involving OCM and DCM, the Reserve's diverse network of partners, local advisory committees and volunteers.

Table of Contents

Contents

| | |
|---|----|
| Executive Summary | 2 |
| Table of Contents | 5 |
| List of Figures..... | 7 |
| List of Tables..... | 8 |
| List of Appendices..... | 9 |
| Acronyms and Abbreviations | 10 |
| Acknowledgements | 12 |
| I. Introduction..... | 13 |
| INTRODUCTION TO THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM | 13 |
| <i>National Estuarine Research Reserve System Strategic Goals</i> | 14 |
| <i>Biogeographic Regions and Boundaries of the National Estuarine Research Reserve System</i> | 15 |
| <i>National Estuarine Research Reserve Administrative Framework</i> | 15 |
| INTRODUCTION TO THE NORTH CAROLINA NATIONAL ESTUARINE RESEARCH RESERVE | 16 |
| <i>Establishment of the Reserve and State Management Framework</i> | 16 |
| NORTH CAROLINA NATIONAL ESTUARINE RESEARCH RESERVE STRATEGIC PLAN | 19 |
| <i>Reserve Vision</i> | 19 |
| <i>Reserve Mission</i> | 19 |
| <i>NCNERR Programs</i> | 19 |
| <i>Goals, Objectives and Actions</i> | 20 |
| ENVIRONMENTAL SETTING | 30 |
| RESERVE SITE DESCRIPTIONS | 31 |
| <i>Currituck Banks Reserve</i> | 32 |
| <i>Rachel Carson Reserve</i> | 42 |
| <i>Masonboro Island Reserve</i> | 52 |
| <i>Zeke’s Island Reserve</i> | 63 |
| II. Education Program Plan | 74 |
| EDUCATION PROGRAM OVERVIEW | 74 |
| NORTH CAROLINA NERR EDUCATION PROGRAM | 75 |
| <i>Education Program Context</i> | 75 |
| <i>Education Program Capacity</i> | 75 |
| <i>Education Program Delivery</i> | 76 |
| <i>Education Program Needs and Opportunities</i> | 78 |
| <i>Education Program Objectives and Actions</i> | 79 |
| III. Coastal Training Program Plan | 86 |
| COASTAL TRAINING PROGRAM OVERVIEW | 86 |
| NORTH CAROLINA NERR COASTAL TRAINING PROGRAM | 87 |
| <i>Coastal Training Program Context</i> | 87 |
| <i>Coastal Training Program Capacity</i> | 87 |
| <i>Coastal Training Program Delivery</i> | 88 |
| <i>Coastal Training Program Needs and Opportunities</i> | 89 |
| <i>Coastal Training Program Objectives and Actions</i> | 90 |
| IV. Research and Monitoring Program Plan | 93 |

| | |
|---|-----|
| RESEARCH AND MONITORING PROGRAM OVERVIEW..... | 93 |
| NORTH CAROLINA NERR RESEARCH AND MONITORING PROGRAM | 95 |
| <i>Research and Monitoring Program Context</i> | 95 |
| <i>Research and Monitoring Program Capacity</i> | 95 |
| <i>Research and Monitoring Program Delivery</i> | 96 |
| <i>Research and Monitoring Needs and Opportunities</i> | 101 |
| <i>Research and Monitoring Objectives and Actions</i> | 102 |
| V. Stewardship Program Plan | 108 |
| STEWARDSHIP PROGRAM OVERVIEW | 108 |
| <i>Program Context</i> | 108 |
| <i>Program Capacity</i> | 109 |
| <i>Needs and Opportunities</i> | 110 |
| RESOURCE PROTECTION PLAN | 111 |
| PUBLIC ACCESS AND VISITOR USE PLAN | 118 |
| LAND ACQUISITION PLAN | 120 |
| STEWARDSHIP POLICIES | 120 |
| STEWARDSHIP PROGRAM OBJECTIVES AND ACTIONS | 129 |
| VI. Administration Plan | 142 |
| ADMINISTRATIVE PLAN OVERVIEW | 142 |
| <i>Organizational Framework</i> | 142 |
| <i>Strategic Partnerships</i> | 144 |
| <i>Current Staff and Needs</i> | 147 |
| ADMINISTRATIVE OBJECTIVES AND ACTIONS | 155 |
| VII. NCNERR Strategic Plan Topical Areas | 167 |
| WATER QUALITY | 167 |
| COASTAL AND ESTUARINE ECOSYSTEM PROTECTION..... | 172 |
| COASTAL HAZARDS RESILIENCE | 176 |
| VIII. Facility Development and Improvement Plan | 181 |
| FACILITY, EQUIPMENT, ON-SITE INFRASTRUCTURE, AND EXHIBIT DESCRIPTIONS AND NEEDS | 183 |
| <i>Currituck Banks Reserve</i> | 183 |
| <i>Rachel Carson Reserve</i> | 185 |
| <i>Masonboro Island Reserve</i> | 188 |
| <i>Zeke's Island Reserve</i> | 191 |
| References | 193 |

List of Figures

Figure 1: National Estuarine Research Reserve System Sites Map

Figure 2: North Carolina National Estuarine Research Reserve Sites Map

Figure 3: Currituck Banks Reserve Boundary Map

Figure 4: Currituck Banks Reserve Core and Buffer Map

Figure 5: Currituck Banks Reserve Watershed Map

Figure 6: Currituck Banks Reserve Habitat Map

Figure 7: Rachel Carson Reserve Boundary Map

Figure 8: Rachel Carson Reserve Core and Buffer Map

Figure 9: Rachel Carson Reserve Watershed Map

Figure 10: Rachel Carson Reserve Habitat Map

Figure 11: Masonboro Island Reserve Boundary Map

Figure 12: Masonboro Island Reserve Core and Buffer Map

Figure 13: Masonboro Island Reserve Watershed Map

Figure 14: Masonboro Island Reserve Habitat Map

Figure 15: Zeke's Island Reserve Boundary Map

Figure 16: Zeke's Island Reserve Core and Buffer Map

Figure 17: Zeke's Island Reserve Watershed Map

Figure 18: Zeke's Island Reserve Habitat Map

Figure 19: NCNERR Organizational Framework Chart

Figure 20: NCNERR Organizational Chart with Full-time Employees and Location

Figure 21: North Carolina National Estuarine Research Reserve Sites and Offices Map

Figure 22: Reserve Northern Office

Figure 23: Reserve Central Office

Figure 24: Reserve Southern Office

List of Tables

Table 1: Currituck Banks Reserve Habitat Map Legend

Table 2: Rachel Carson Reserve Habitat Map Legend

Table 3: Masonboro Island Reserve Habitat Map Legend

Table 4: Zeke's Island Reserve Habitat Map Legend

Table 5: Allowable and prohibited uses at the four NCNERR sites

List of Appendices

**Only Appendix T is included in this version of the management plan to keep the size of the document as manageable as possible. Please contact the Reserve Program Manager if you are interested in seeing an appendix that is not included.*

Appendix A: Federal Regulations 15 C.F.R Part 921

Appendix B: Coastal Zone Management Act

Appendix C: State Assignment of Management Responsibilities

Appendix D: National Oceanic and Atmospheric Administration and Division of Coastal Management MOU

Appendix E: Coastal Area Management Act

Appendix F: 15A N.C. Administrative Code 070

Appendix G: State Nature Preserve Designation

Appendix H: County and Municipal Zoning Regulations

Appendix I: Dominion Power MOU

Appendix J: University of North Carolina at Wilmington and the Division of Coastal Management MOU

Appendix K: National Park Service MOU

Appendix L: Research Permit and Conditions

Appendix M: 15A N.C. Administrative Code 12H

Appendix N: Division of Parks and Recreation and Division of Coastal Management MOU

Appendix O: Wildlife Resources Commission and Division of Coastal Management MOU

Appendix P: Division of Marine Fisheries and Division of Coastal Management MOU

Appendix Q: Friends of the Reserve and Division of Coastal Management MOU

Appendix R: Reserve Safety Plan

Appendix S: Lease from Town of Kitty Hawk for Northern Office

Appendix T: Public Input Process for NCNERR Management Plan 2017 - 2022

Acronyms and Abbreviations

AOWG: American Oystercatcher Working Group
APNEP: Albemarle-Pamlico National Estuary Partnership
BMP: Best Management Practice
CAMA: Coastal Area Management Act
C-CAP: NOAA's Coastal Change Analysis Program
CCFHR: NOAA's Center for Coastal Fisheries and Habitat Research
CCVATCH: Climate Change Vulnerability Assessment Tool for Coastal Habitats
CDMO: Centralized Data Management Office
CMS: University of North Carolina Wilmington's Center for Marine Science
CMST: North Carolina State University's Center for Marine Sciences and Technology
COE: U.S. Army Corps of Engineers
CTP: Coastal Training Program
CZMA: Coastal Zone Management Act
DCM: North Carolina Division of Coastal Management
DEQ: North Carolina Department of Environmental Quality
DMF: North Carolina Division of Marine Fisheries
DPR: North Carolina Division of Parks and Recreation
DUML: Duke University Marine Laboratory
FOR: Friends of the Reserve
GIS: Geographic Information System
HUC: Hydrologic Unit Code
ICW: Atlantic Intracoastal Waterway
IMS: University of North Carolina's Institute of Marine Sciences
ISS: International Shorebird Survey
KEEP: K-12 Estuarine Education Program
LAC: Local Advisory Committee
LID: Low Impact Development
MOU: Memorandum of Understanding
N.C.: North Carolina
NCCOS: NOAA's National Centers for Coastal Ocean Science
NCCR: North Carolina Coastal Reserve
NCNERR: North Carolina National Estuarine Research Reserve
NCSSC: North Carolina Sentinel Sites Cooperative
NERRS: National Estuarine Research Reserve System
NPS: National Park Service

NOAA: National Ocean and Atmospheric Administration
OCM: NOAA's Office for Coastal Management
ORV: Off-road vehicle
PAR: Photosynthetically active radiation
RTK: Real-time kinematic
SEANET: Seabird Ecological Assessment Network
SET: Surface elevation table
SLR: Sea level rise
SSAM 1: Sentinel Site Application Module 1
SWMP: System-Wide Monitoring Program
TOTE: Teachers on the Estuary
UAS: unmanned aerial system
UNCW: University of North Carolina Wilmington
U.S.: United States
USDA-WS: U.S. Department of Agriculture Wildlife Services program
WRC: N.C. Wildlife Resources Commission

Acknowledgements

This management plan was produced by the North Carolina National Estuarine Research Reserve staff including:

- Lori Davis, Education Coordinator
- Rebecca Ellin, Reserve Program Manager
- Elise Gilchrist, Communications Specialist
- Paula Gillikin, Central Sites Manager
- Rodney Guajardo, GIS Specialist
- Whitney Jenkins, Coastal Training Program Coordinator
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- Hope Sutton, Stewardship Coordinator and Southern Sites Manager
- Byron Toothman, Research Specialist
- Woody Webster, Buckridge Site Manager
- Heather Wells, Research Specialist

The following former staff members also contributed to the management plan: Kate Brogan, Scott Crocker, Marie Davis, and Emily Woodward. The public input process was developed and implemented with the assistance of Ann Weaver and Chris Ellis of NOAA's Office for Coastal Management. Development of the strategic plan was facilitated by Ann Weaver during a strategic planning workshop. Comments on the draft management plan were provided by N.C. Division of Coastal Management staff and by Stephanie Robinson, NOAA's Office for Coastal Management. The local advisory committees for the North Carolina National Estuarine Research Reserve provided input throughout the update process and their time and thoughtful comments are sincerely appreciated. This plan was prepared utilizing NOAA's *Reserve System Management Plan Guidelines and Resources* (2013).

I. Introduction

Introduction to the National Estuarine Research Reserve System

The National Estuarine Research Reserve System (NERRS) was created by the Coastal Zone Management Act (CZMA) of 1972, as amended, to augment the National Coastal Zone Management Program which is dedicated to comprehensive, sustainable management of the nation's coasts.

The Reserve System is a network of protected areas representative of the various biogeographic regions and estuarine types in the United States. Reserves are established for long-term research, education and interpretation to promote informed management of the Nation's estuaries and coastal habitats. (15 C.F.R Part 921.1(a)) The Reserve System currently consists of 29 reserves in 24 states and territories, protecting over one million acres of estuarine lands and waters (Figure 1).

The Reserve System is a partnership program between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. NOAA provides funding, national guidance and technical assistance. The state partner manages reserve resources on a daily basis working collaboratively with local and regional partners.



Figure 1. National Estuarine Research Reserve System Sites Map

National Estuarine Research Reserve System Strategic Goals

Estuaries are biologically rich, economically valuable, and highly vulnerable ecosystems. The vision and mission of the Reserve System reflect the importance of these systems within our communities.

Vision: Resilient estuaries and coastal watersheds where human and natural communities thrive.

Mission: To practice and promote stewardship of coasts and estuaries through innovative research, education, and training using a place-based system of protected areas.

The program goals, per Federal regulations 15 C.F.R. Part 921.1(b), outline five specific goals for the Reserve System:

1. Ensure a stable environment for research through long-term protection of National Estuarine Research Reserve resources;
2. Address coastal management issues identified as significant through coordinated estuarine research within the system;
3. Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;
4. Promote Federal, state, public and private use of one or more Reserves within the System when such entities conduct estuarine research; and
5. Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

These foundational goals are complemented by those that are systematically set by the program every five years. Strategic planning has been an integral part of the National Estuarine Research Reserve System for nearly twenty years. The planning process is designed to bridge national program direction with local coastal management needs through a representative and participatory process that supports NOAA's mission of science, service, and stewardship. The 2011-2016 Reserve System Strategic Plan focuses reserve core strengths of research, education, and training on three core issues: climate change, habitat protection, and water quality.

The Reserve System Strategic Plan Goals are:

1. **Protected Places:** Estuaries and coastal watersheds are better protected and managed by implementing place-based approaches at reserves.
2. **Science:** National Estuarine Research Reserve System scientific investigations improve understanding and inform decisions affecting estuaries and coastal watersheds.
3. **People:** National Estuarine Research Reserve System education and training increases participants' environmental literacy and ability to make science-based decisions related to estuaries and coastal watersheds.

Biogeographic Regions and Boundaries of the National Estuarine Research Reserve System

NOAA has identified eleven distinct biogeographic regions and 29 subregions in the United States, each of which contains several types of estuarine ecosystems (Appendix A). When complete, the Reserve System will contain examples of estuarine hydrologic and biological types characteristic of each biogeographic region. As of 2017, the Reserve System includes 29 reserves and one state in the process of designating a reserve.

Reserve boundary size will vary greatly depending on the nature of the ecosystem. Boundaries must include an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Reserve boundaries encompass areas for which adequate state control has or will be established by the managing entity over human activities occurring within the reserve. Reserve boundaries include a “core” area which is comprised of key land and water encompassing natural resources representative of the total ecosystem, which if compromised could endanger the research objectives of the reserve, as well as a “buffer” area designed to protect the core area and provide additional protection for estuarine-dependent species, including those that are rare or endangered. Buffer areas may also include areas necessary for facilities required for research and interpretation. Additionally, buffer areas are identified to accommodate a shift of the core area as a result of biological, ecological or geo-morphological change which reasonably could be expected to occur. (15 C.F.R. Part 921.11 (c)(3))

National Estuarine Research Reserve Administrative Framework

The process for federal designation of a National Estuarine Research Reserve has many steps and involves many individuals and organizations. While each reserve is a partnership program between NOAA and a coastal state, there are many entities that collaborate to support designation of a reserve. Other partners include federal and state agencies, non-profit groups, universities and members of the local community. For more information on the designation process see nerrs.noaa.gov/about/designation-process.

Upon designation, the reserve implements the approved management plan and is eligible for NOAA financial assistance on a cost-share basis with the state. A reserve may apply to NOAA for funds to help support implementation of the management plan largely funding operations, research, monitoring, education/interpretation, training, stewardship, development projects, facility construction, and land acquisition. Management plans provide a vision and framework to guide reserve activities during a five-year period and enable the reserves and NOAA to track progress and realize opportunities for growth. Each management plan contains the reserve goals, objectives, and strategies supported by programs focused on research and monitoring, education and outreach, training, and stewardship. They also outline administration, public access, land acquisition and facility plans and needs, as well as restoration and resource manipulation plans, if applicable. Reserves are increasingly confronted with complex questions regarding new uses in or near reserves that may or may not be compatible with the Reserve System’s mission. A thoughtful and

comprehensive management plan provides a foundation for addressing these challenges to protect and manage reserve resources wisely and ensure the public and coastal decision makers value and protect coastal resources.

NOAA administers the Reserve System and establishes standards for designating and operating reserves, provides support for reserve operations and system-wide programming, undertakes projects that benefit the Reserve System, and integrates information from individual reserves and programs to support decision-making at the national level. Additionally, NOAA periodically evaluates reserves for compliance with federal requirements and with the individual reserve's federally approved management plan, as mandated under Section 312 of the Coastal Zone Management Act (15 C.F.R. Part 921.40, Appendix B).

NOAA currently provides leadership and support for three system-wide programs including the System-Wide Monitoring Program, the K-12 Estuarine Education Program (KEEP), and the Coastal Training Program (CTP), as well as the NERRS Science Collaborative. They also provide support for initiatives focused on the Reserve System's priorities: climate change, water quality and habitat protection.

Introduction to the North Carolina National Estuarine Research Reserve

Establishment of the Reserve and State Management Framework

The North Carolina General Assembly passed the Coastal Area Management Act (CAMA) in 1974 in response to the Federal CZMA. As the regulatory and planning programs of CAMA were implemented by the now-North Carolina Department of Environmental Quality's (DEQ) Division of Coastal Management (DCM) in the late 1970s, it became apparent that an effective, comprehensive coastal management program must include a land acquisition program. CAMA was amended to include the beach access program in 1981. In 1982 North Carolina received its first federal award to establish a multi-site National Estuarine Research Reserve in the state. Four properties were selected to become sites within the North Carolina National Estuarine Research Reserve (NCNERR) and together, they protect approximately 10,500 acres of coastal and estuarine habitat from the northern, central, and southern regions of coastal North Carolina, covering two biogeographic regions:

1. The 965-acre Currituck Banks Reserve located in Currituck County just north of the village of Corolla at the end of N.C. 12;
2. The 2,315-acre Rachel Carson Reserve located in Carteret County between Beaufort, Harkers Island, and the Cape Lookout National Seashore;
3. The 5,653-acre Masonboro Island Reserve, an undeveloped barrier island, situated in New Hanover County between the towns of Wrightsville Beach and Carolina Beach; and

4. The 1,635-acre Zeke's Island Reserve, encompassing tracts in both New Hanover and Brunswick counties, near Fort Fisher and south of Kure Beach.

The NCNERR is a federal-state partnership between NOAA and DCM (Appendix D). Three of the sites were designated in 1985 (Currituck Banks, Rachel Carson, and Zeke's Island Reserves) and Masonboro Island Reserve was designated in 1991. The four Reserve sites are owned in fee simple by the State of North Carolina. Management of the sites is delegated by the N.C. Department of Administration to DCM.

The NCNERR's success in protecting coastal and estuarine habitats for research and education inspired the State to protect additional coastal and estuarine habitats thereby creating the North Carolina Coastal Reserve (NCCR), which was incorporated into CAMA by amendment in 1989 (G.S. 113A-129.1-.3; Article 7). The CAMA amendment complements and reinforces the Federal NERRS regulations by declaring that management of the NCNERR, as part of the Coastal Reserve, is state policy (Appendix E). The 1989 statute establishes the basic Coastal Reserve purpose:

Important public purposes will be served by the preservation of certain areas in an undeveloped state. Such areas would thereafter be available for research, education, and other consistent public uses. These areas would also continue to contribute perpetually to the natural productivity and biological, economic, and aesthetic values of North Carolina's coastal area [G.S. 113A-129.1(b)].

This purpose is further articulated in G.S. 113A-129.2-.3, providing additional detail regarding the mechanics of the Coastal Reserve and its coordination with the NERRS and State Nature Preserve program.

The DEQ promulgated rules in 1986 for Coastal Reserve sites within the North Carolina Administrative Code (T15: 70). These rules were established to further define the purpose, responsibilities, functions, components, and use requirements for the Reserves (Appendix F).

The Coastal Reserve includes the four NCNERR sites (Currituck Banks, Rachel Carson, Masonboro Island, and Zeke's Island) and six state sites: Kitty Hawk Woods (Dare County), Buxton Woods (Dare County), Buckridge (Tyrrell and Hyde Counties), Permuda Island (Onslow County), Bald Head Woods (Brunswick County), and Bird Island (Brunswick County) (Figure 2).

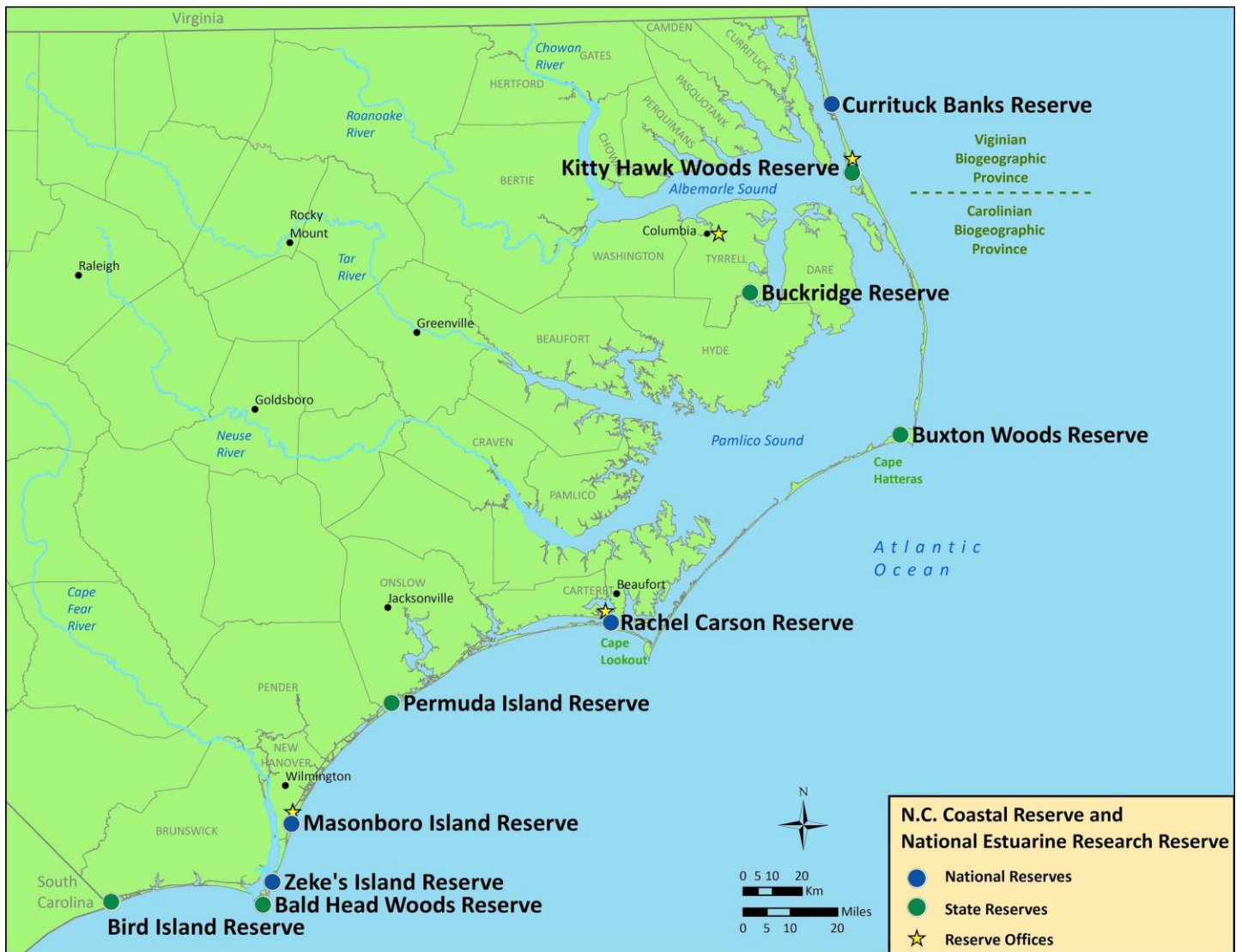


Figure 2. North Carolina National Estuarine Research Reserve Sites Map

The NCNERR sites are also designated as State Nature Preserves, which are limited use areas that serve to preserve and portray the natural features unique to the region (Appendix G). Some NCNERR sites are also subject to county and municipal zoning designations and ordinances (Appendix H).

Refer to the Administration Plan for more information about the administrative framework of the Reserve. Additional information about Reserve management authority and stewardship policies is located in the Stewardship Program chapter. More detailed descriptions of the sites are provided in the Site Descriptions at the end of this chapter.

North Carolina National Estuarine Research Reserve Strategic Plan

Reserve Vision

Healthy coastal watersheds and estuaries support thriving ecosystems and human communities

Reserve Mission

To practice and promote informed management and appreciation of North Carolina's coastal and estuarine ecosystems and provide protected sites for research, education, and stewardship

NCNERR Programs

The NCNERR is a network of protected coastal sites established for long-term research, education and stewardship. The sites provide essential habitat for wildlife; offer educational opportunities for students, teachers and the public; serve as living laboratories for scientists; and provide public enjoyment. The NCNERR accomplishes the Reserve Vision and Mission through the integrated work of its four programs.

Education Program

The education program offers activities for K-12 students, teachers and the general public. Programs include public and school field trips, summer camps, professional training opportunities for teachers, and outreach events. These activities are designed to enhance public awareness of the importance of coastal and estuarine ecosystems and inspire protection of these ecosystems through hands-on, interactive experiences.

Coastal Training Program

The Coastal Training Program promotes informed decisions regarding coastal resources by providing professionals with science-based training opportunities. Local officials, realtors, state agency staff, resource managers, non-profit organizations and others benefit from access to new scientific research and training on a variety of coastal topics presented by local experts.

Research and Monitoring Program

The research program conducts, promotes and facilitates research and monitoring at Reserve sites. Reserve research is focused on ecosystem dynamics, coastal hazards resilience and human influences on estuarine systems. The System-Wide Monitoring Program (SWMP) provides long-term data on water quality, weather, biological communities, habitat and land-use and land-cover characteristics of coastal and estuarine ecosystems for the purpose of informing coastal management.

Stewardship Program

The stewardship program is dedicated to protecting and restoring the natural integrity of Reserve sites to ensure suitable environments for research and education. Stewardship programs integrate science, community input and volunteer monitoring efforts to protect and restore coastal and estuarine species and habitats of environmental, economic and recreational value to North Carolina.

Goals, Objectives and Actions

Goal 1: Education and training inspire target audiences to protect coastal and estuarine ecosystems

Objectives:

1.1 Two hundred fifty educators receive information on North Carolina's coastal and estuarine ecosystems and are able to apply curricula within their instruction.

Action 1: Conduct hands-on and field-based educator workshops, including Coastal Explorations and Teachers on the Estuary (TOTE).

Action 2: Update workshops and curricula based on current techniques and topics identified through the 2014 needs assessment as well as future surveys.

Action 3: Incorporate Reserve research and stewardship activities and monitoring data into workshops and curricula.

Action 4: Engage educators through partner-hosted education programs and events.

Action 5: Maintain and enhance partnerships for program implementation and seek input from the NCNERR education advisory committee.

1.2 Five thousand students receive information on North Carolina's coastal and estuarine ecosystems and are able to describe an estuary and its benefits.

Action 1: Conduct educational field trips for K-College students, focusing each field trip on the grade's standards.

Action 2: Work with partners to offer the Masonboro Island Explorer Program.

Action 3: Present coastal and estuarine concepts and curricular activities to students through classroom visits.

Action 4: Conduct summer programs for students and incorporate new curricular activities.

1.3 N.C. citizens and visitors understand the value of coastal and estuarine ecosystems and how the NCNERR protects these resources.

Action 1: Conduct public outreach programs at Reserve sites.

Action 2: Enhance partnerships with government agencies delivering public programming at Reserve sites.

Action 3: Participate in community events such as Earth Day festivals and National Estuaries Day.

Action 4: Encourage program participants to make a commitment to protect estuaries.

Action 5: Recruit and train volunteers to support education activities.

1.4 Annually, 90% of participants state that they intend to apply the science-based knowledge and skills relevant to coastal management gained through CTP activities.

Action 1: Coordinate core trainings for decision-makers in collaboration with program partners.

Action 2: Coordinate new training events in response to the 2014 needs assessment and emerging policy issues in collaboration with program partners.

Action 3: Incorporate coastal and estuarine science into trainings.

1.5 Annually, at least two partners will receive technical assistance from the CTP to address mutual priorities relative to NCNERR topical areas.

Action 1: Establish collaborative relationships with local communities within Reserve watersheds and determine communities' technical assistance needs.

Action 2: Connect with existing or new partners to address mutual priorities relative to NCNERR topical areas.

Action 3: Provide technical assistance to local communities and partners to address needs relative to NCNERR priorities, applying for external funding as need and available.

Goal 2: Research and monitoring advance understanding of coastal and estuarine ecosystems and inform coastal management.

Objectives:

2.1 Research and monitoring is conducted within Reserve sites and associated watersheds.

Action 1: Prioritize research on coastal management topics annually through interactions with researchers, coastal decision-makers, and Reserve staff.

Action 2: Conduct research that addresses research priorities and NCNERR Strategic Plan Topical Areas.

Action 3: Continue implementation of the NERRS SWMP to assess change in abiotic and biotic indicators and habitat distribution.

Action 4: Explore opportunities to expand abiotic and biotic components of SWMP monitoring to additional Reserve sites.

Action 5: Continue implementing the Sentinel Site Application Modules as resources are available to detect and understand the effects of sea level change on estuaries.

Action 6: Analyze and synthesize Reserve research and monitoring data to evaluate trends and patterns of local, regional, and national significance.

2.2 Research and monitoring datasets, results, and products are communicated to target audiences (e.g., coastal decision-makers, research community, Reserve program participants) to address relevant coastal and estuarine topics.

Action 1: Describe the Reserve's research and monitoring datasets, results and products to coastal decision-makers and other end users through 10 or more forums annually.

Action 2: Provide high-quality data that is accessible by all interested parties through the NERRS' Centralized Data Management Office's website.

Action 3: Highlight research and monitoring projects on the Reserve's website.

Action 4: Collaborate with education and training staff to package and integrate research and monitoring data into education and training programs.

2.3 Reserve sites are promoted as place-based research platforms and Reserve's long-term datasets are promoted as a research tool.

Action 1: Facilitate, promote, and participate in research conducted at Reserve sites, particularly research that supports the Reserve's mission and informs coastal management.

Action 2: Review 12 or more research permit applications from external researchers annually, evaluate the percentage of applicants using the Reserve's long-term datasets for research, and maintain the NCNERR portion of the NERRS' research database.

Action 3: Support and promote the Coastal Research Fellowship in collaboration with N.C. Sea Grant to provide opportunities for graduate students to conduct research within Reserve boundaries.

2.4 Research partnerships are enhanced through collaboration with the Reserve research program.

Action 1: Provide advisory services to research community by serving on at least one graduate student committee and at least two science committees annually.

Action 2: Develop at least 2 collaborative research proposals annually seeking external funds to support Reserve research priorities.

Goal 3: Stewardship of protected sites contributes to the study and appreciation of coastal and estuarine ecosystems.

Objectives:

3.1 Coastal and estuarine ecosystems are managed and protected.

Action 1: Monitor general site condition at least monthly.

Action 2: Respond to issues on sites, coordinating with law enforcement, state and federal agencies, and partner organizations.

Action 3: Manage species of interest by conducting survey and monitoring activities, protecting critical habitat areas and implementing management actions to address concerns and support state, federal and regional recommendations or initiatives.

Action 4: Manage, enhance and restore habitats by implementing activities to support the natural integrity of sites, working with partners and contributing to state and regional initiatives.

Action 5: Manage invasive, non-native and feral species by conducting survey, monitoring and treatment activities on sites and in coordination with partners as appropriate.

Action 6: Support efforts to assess and update rules and policies to respond to site conditions and ensure the Reserve's mission is fulfilled and local, state and federal laws are upheld.

Action 7: Document and maintain natural history records by developing a centralized online database, populating it with existing geographic and photographic species records, and continuing to document observances on sites.

Action 8: Enhance partnerships with natural resource management agencies and organizations by providing advisory services and developing collaborative projects that support protection of ecosystems.

3.2 Access is accommodated for site uses that maintain protection of natural resources and are compatible with research and education activities.

Action 1: Provide for public access to sites by installing and maintaining structures, signage, and trails to guide and inform visitors.

Action 2: Work with local partner agencies and governments to support efforts to provide access facilities for local communities to engage in nature-based recreational use of the sites.

Action 3: Provide information to specific user groups to promote safe and appropriate use of the sites while preserving natural integrity and minimizing impacts by providing information about site resources and guidance for minimizing impacts during use of sites.

Action 4: Inspire current and potential site users to appreciate and engage in the stewardship of estuarine and coastal ecosystems by providing opportunities for active participation in Reserve activities on the sites.

Action 5: Engage researchers, educators, and commercial operators as active participants in stewardship of the sites by encouraging them to provide information about site observances and their use of the sites.

Action 6: Assess and characterize use of the sites to inform balanced management between access and resource protection and to reduce potential conflicts between user groups by monitoring uses, engaging user groups, and implementing management actions.

3.3 Trained volunteers contribute to and benefit from supporting stewardship activities.

Action 1: Recruit volunteers to support stewardship activities by engaging students, community members, and civic groups and utilize volunteers to accomplish and enhance stewardship activities.

Action 2: Advance volunteers' skills and knowledge of stewardship of coastal and estuarine natural resources by providing mentoring, training, and hands-on field experiences.

Action 3: Provide a safety briefing at each volunteer training or activity.

Action 4: Facilitate management of volunteers to support Reserve programs by maintaining effective tracking and communication tools and providing current volunteer resources and materials.

3.4 Boundary expansion and acquisition opportunities are explored to protect Reserve resources.

Action 1: Evaluate acquisition of inholding and adjacent properties from willing sellers to expand boundaries to parcels that meet NERRS definitions for core and buffer areas as appropriate.

Action 2: Maintain and enhance relationships with adjacent and inholding property owners.

Action 3: Explore opportunities for assessing future acquisitions based on prioritization of habitat protection and ecosystem resilience needs.

Goal 4: The NCNERR is recognized as a leader in coastal and estuarine ecosystem research, training, education, and stewardship through effective administration and communication strategies.

Objectives:

4.1 Rules and policies assist in fulfilling the Reserve’s mission and local, state, and federal laws.

Action 1: Evaluate and update rules through the Rules Review Process.

Action 2: Update policies as needed based on program and site conditions.

Action 3: Inform rule and policy updates with program and site assessment information.

4.2 Reserve core partnerships are enhanced.

Action 1: Strengthen relationship with OCM through annual cooperative agreements and performance reports, and by addressing federal evaluation recommendations, participating in national meetings and contributing to system-wide initiatives.

Action 2: Strengthen relationship with DCM by providing technical expertise on education, training, research, and stewardship, and collaborating on mutually beneficial activities and topics.

Action 3: Strengthen relationship with UNCW and CCFHR through regular communication with partner administrations, finalization and implementation of memoranda of understanding, participation in facility committees, and collaboration on mutually beneficial activities.

Action 4: Maintain and strengthen education, training, research, and stewardship activities through formal and informal partnerships.

4.3 Reserve operations support the implementation of the mission.

Action 1: Utilize a collaborative decision-making process and effective internal communication mechanisms to provide direction for the Reserve, foster understanding regarding decision-making and ensure that programs are appropriately supported.

Action 2: Ensure the Reserve’s organizational structure supports staff and programs, including addressing staffing needs as resources are available.

Action 3: Utilize appropriate databases and performance measures to track and evaluate program achievement, natural resources and site use.

Action 4: Maintain and enhance file and data storage and sharing methods and infrastructure to meet current and future needs.

Action 5: Practice excellent workplace safety for staff, volunteers and visitors through effective procedures and appropriate equipment, supplies, and signage.

Action 6: Demonstrate sustainable and best management practices through use of appropriate supplies, materials and methods.

Action 7: Strengthen community and partner involvement in Reserve programs through local advisory committees (LAC).

Action 8: Leverage state and federal investments in the Reserve through internal and external funding opportunities to address needs and advance Reserve initiatives.

4.4 Staff are recognized as valued experts in their fields.

Action 1: Provide professional development opportunities annually to enhance and expand staff skills through appropriate means such as trainings and attendance at professional meetings.

Action 2: Encourage staff participation in local, state, regional and national committees and workgroups.

Action 3: Encourage staff to provide technical assistance to target audiences.

Action 4: Continue to promote Reserve programs through presenting at conferences, conducting public field trips, participating in partner events, and hosting volunteer activities.

Action 5: Organize and host a symposium to deliver NCNERR program highlights to a variety of target audiences.

Action 6: Provide students with skills to advance NCNERR programs and to inspire stewardship of coastal and estuarine ecosystems through a structured mentoring program.

4.5 Reserve communications are enhanced to increase audience engagement and program visibility and share important information.

Action 1: Brand the Reserve through consistent messaging and product format.

Action 2: Develop messages and products that highlight site research and relevant coastal and estuarine topics.

Action 3: Share Reserve accomplishments, upcoming activities, publications, data and resources on relevant coastal and estuarine topics to target audiences through the Reserve newsletter, website and social media.

Action 4: Share rules and policies that encourage safety and promote responsible use of sites by visitors.

Action 5: Increase Reserve presence in local media by connecting with reporters to share Reserve accomplishments, program information and opportunities.

Action 6: Enhance engagement and improve Reserve online communication by incorporating more visuals, creating infographics and exploring additional digital media.

Action 7: Use online tools to evaluate audience engagement.

NCNERR Topical Areas

To strengthen alignment of NCNERR programs and efforts with NERRS Strategic Goals and address stakeholder input, the NCNERR selected three topical areas of national, regional, state, and local importance: water quality, coastal and estuarine protection, and coastal hazards resilience. These areas were informed by current work and input from Reserve staff, public and local advisory committee meetings, partner surveys, and education and training needs assessments. There are a number of overarching threats and stressors that impact all sites of NCNERR such as invasive species, water quality issues, increased visitor use and sea level rise and storms. In addition to these overarching issues, individual Reserve sites face specific local challenges, including feral species, marine debris and shoreline change and sedimentation. By focusing on the three topical areas, many of these threats and stressors will be addressed and mitigated through the work of NCNERR programs. The topical areas will serve as focus and investment for the NCNERR Strategic Plan and will be addressed through a strategic and coordinated process. The NCNERR is uniquely positioned to address these topical areas using an integrated approach via its education, training, research, and stewardship programs and network of protected sites. Objectives and actions are outlined for each topical area to build on the current strengths of the NCNERR, address NCNERR needs, and advance work in the topical areas across geographic scales.

Water Quality

Maintaining and improving water quality at the NCNERR sites begins with understanding the present condition of our waters. The Reserve is uniquely positioned to access and translate the best available data on the condition of water quality by following NERRS SWMP protocols and using the network of water quality monitoring stations at Reserve sites. These monitoring data can be used by scientists, educators, managers, and commercial and recreational users for a variety of purposes. Additionally, the Reserve's ability to couple long-term monitoring data with management practices on Reserve sites and in adjacent coastal watersheds provides an opportunity to study the effectiveness of different management practices. The Reserve will integrate relevant research into education and training efforts targeted to a wide range of audiences including the general public, students, and key decision-makers and will explore opportunities for mutually beneficial partnerships with entities that most directly influence water quality.

Objectives:

T1.1 Increase knowledge of short and long-term water quality trends using data collected through SWMP and other water quality monitoring methods.

Action 1: Research staff continues SWMP monitoring and explores opportunities to expand SWMP monitoring.

Action 2: Research staff helps to advance Reserve staff understanding of water quality concepts and the utility of SWMP and water quality data through professional sharing opportunities.

Action 3: Research staff and partners analyze and synthesize SWMP data to identify locally, regionally, and nationally significant trends and patterns.

Action 4: Research staff networks with existing partners and forge new partnerships to integrate SWMP data into local and state-wide water quality monitoring programs.

T1.2 Integrate water quality concepts and Reserve water quality research into Reserve programs and products to improve understanding and awareness.

Action 1: Education and training staff works with research staff to incorporate water quality concepts and SWMP and water quality data into curricular activities, workshops for professionals, and other education programs.

Action 2: Research staff collaborates with other Reserve staff to develop communications products designed to increase awareness of water quality concepts, the Reserve's role in monitoring water quality and available data.

Action 3: Reserve staff engages participants in field-based stewardship activities that promote the importance of water quality and its protection.

T1.3 Improve water quality in Reserve site watersheds.

Action 1: Reserve staff collaborate with partners on projects that promote stormwater management, habitat restoration, living shorelines and low impact development.

Action 2: CTP staff delivers trainings and technical assistance on water quality best management practices.

Action 3: Reserve staff incorporate watershed concepts and impacts of human choices into program activities.

Coastal and Estuarine Ecosystem Protection

North Carolina has 2.2 million acres of biologically rich coastal and estuarine ecosystems that function as nurseries for commercially important fish and shellfish and offer protection for human communities from stormwater runoff, storm surge, and flooding by buffering wave energy and filtering pollutants. Because North Carolina's shallow sounds, rivers and creeks comprise one of the largest estuarine systems in the United States, it's important to monitor stressors affecting the health of these systems. Sea level rise (SLR), invasive species, and coastal development are just a few of the threats that can result in loss and alterations to habitat

and ecosystem function. The NCNERR is well suited to address these stressors through mapping and monitoring habitat change and developing, testing, and implementing methods for coastal and estuarine ecosystem protection. Reserve research and monitoring methods, along with best management practices that focus on protecting these ecosystems, can be shared through the Reserve's coastal training and community education programs and volunteer opportunities.

Objectives:

T2.1 Improve understanding of Reserve ecosystems, including the ecosystem services they provide, the threats they face, and how to best protect them.

Action 1: Research and stewardship staff generate baseline data on Reserve ecosystems and potential stressors and document change through habitat mapping, monitoring programs, and natural history records.

Action 2: Research staff communicates Reserve research needs relevant to quantifying estuarine ecosystem services to partners and research community and works with them to quantify estuarine ecosystem services and how services are impacted by stressors.

Action 3: Research and stewardship staff collaborate to design studies that address ecosystem protection and inform restoration and management projects.

Action 4: Reserve staff work with organizations involved in landscape-scale initiatives to further the protection and understanding of coastal and estuarine ecosystems.

T2.2 Inform target audiences about the importance of protecting coastal and estuarine ecosystems to inspire protection.

Action 1: Education staff collaborates with research and stewardship staff to inspire K-College audiences to appreciate and protect coastal and estuarine ecosystems through program offerings such as field trips, classroom visits and educational programs and materials.

Action 2: Reserve staff participates in efforts to educate the general public and site users by providing educational materials through the Reserve website, public presentations and events and interpretive signage.

Action 3: Stewardship staff engages community volunteers in species monitoring, research and protection projects, such as marine debris removal, habitat mapping, marsh grass planting and other activities.

Action 4: Training and education staff provide teachers and professionals with training on issues relevant to ecosystem protection such as low impact development, living shorelines, and coastal wetlands.

Action 5: Training and stewardship staff collaborate on training opportunities for the natural resource community to share information and tools to improve management of coastal and estuarine ecosystems.

Coastal Hazards Resilience

The natural geography and topography of North Carolina's coastline make it vulnerable to coastal hazards, such as flooding, coastal storms, shoreline erosion, and SLR. Assessing the vulnerability of coastal and

estuarine ecosystems at Reserve sites is accomplished through existing monitoring programs like SWMP, natural species surveys, habitat mapping, and elevation data. The NCNERR's ability to monitor and characterize these processes and changes is increasingly important when it comes to understanding and planning for coastal hazards to our ecosystems and coastal communities. The Reserve is equipped to improve the knowledge of coastal communities about the necessity of establishing long-term resilience through education, training, research, and stewardship activities that promote monitoring programs and the importance of natural infrastructure for coastal resilience.

Objectives:

T3.1 Assess vulnerability of Reserve natural resources to coastal hazards and use results to inform management decisions.

Action 1: Research and stewardship staff continue to implement SWMP, sentinel site and natural resource monitoring to understand vulnerability of species, habitats and/or geographic areas.

Action 2: Reserve staff and a collaborative team of land managers, researchers, and other relevant stakeholders identify and prioritize Reserve natural resources for vulnerability assessments.

Action 3: Reserve staff plans and implements strategies to improve resilience based on vulnerability assessments as resources are available.

T3.2 Increase understanding and communicate knowledge of the importance of natural infrastructure (e.g., oyster reefs, marsh, living shorelines) to coastal resilience.

Action 1: Research staff continues to conduct and explore opportunities to expand the Sentinel Sites for Sea Level Rise and Inundation application module of SWMP to assess the resilience of marshes to SLR.

Action 2: Research staff continues working with partners to evaluate the performance of living shorelines over time and during storms, and assess the impact of shoreline hardening on marshes.

Action 3: Reserve staff uses vulnerability assessments and resilience strategies to educate communities and coastal decision-makers on what coastal hazards are and the importance of natural infrastructure for coastal resilience through educational materials, research presentations, training events and hands-on stewardship activities.

Action 4: Training staff delivers training on natural infrastructure including living shorelines and coastal wetlands.

Action 5: Training staff assists coastal communities to implement actions that increase their resilience to coastal hazards through technical assistance.

T3.3 Increase understanding of sea level rise implications for Reserve sites and coastal and estuarine ecosystems by participating in local, regional, and state initiatives.

Action 1: Reserve staff advance the work of the NCSSC through participation in its Core Management Team and research and training activities.

Action 2: Reserve staff support DCM initiatives to address sea level monitoring and resilience planning.

Environmental Setting

North Carolina lies midway along the United States (U.S.) eastern seaboard. The total area of the State is 52,669 square miles, of which 48,843 square miles are land and 3,826 square miles are water (State Library of North Carolina 2008). The state is divided into three distinct geographic regions (the Coastal Plain, the Piedmont, and the Mountains) and two unique biogeographical provinces (the Virginian and Carolinian).

North Carolina's coastal plain extends out from the east coast of the United States into the Atlantic Ocean and the Gulf Stream. The land and water areas of the coastal plain comprise nearly half the area of the State. The coastline is further subdivided into three distinct regions (Northern, Central and Southern) based on geomorphological and ecological features. Each region has a unique geologic framework that results in distinctive types of barrier islands, inlets, and estuaries influenced by different wave and tidal processes (Pilkey et al. 1998). The underlying geology leads to distinguishing coastal habitat types with different biological and anthropogenic influences. The NCNERR was established as a multi-site Reserve to include sites in both the Virginian and Carolinian biogeographic region as well as the three regions of the coastal plain. As a consequence, the Reserve is made up of four geographically disparate sites consisting of unique representative coastal and estuarine ecosystems.

North Carolina's 2.2 million acres of estuarine waters make it one of the largest estuarine systems in the United States. The North Carolina coast includes over 10,500 miles of estuarine shoreline, with a wide range of habitats. Estuaries and the lands surrounding them are places of transition from land to sea, and from fresh to saltwater. Estuarine environments are influenced by the tides yet are protected from the full force of ocean waves by barrier islands, reefs, or sand formations on the seaward boundary. Estuaries are among the most productive environments on earth and contain many different habitat types.

Coastal and estuarine ecosystems are subject to hazards that are unique to their position in the landscape. North Carolina's geography makes it prone to strikes by tropical and coastal storm systems. Coastal storms bring tremendous amounts of wind and rain to the coastal region and are capable of causing significant shoreline erosion and flooding. From 1851 to 2014, North Carolina had more direct hurricane landfalls (48 hurricanes) than any other state on the east coast, except for Florida (141 hurricanes) (N.C. Climate Office). These impacts are of consequence coast-wide as well as for the four NCNERR sites which are coastal barriers or estuarine islands located at the interface between the ocean and land. Increasing storm intensity and frequency will cause degradation of water quality and coastal and estuarine ecosystems caused by flooding, erosion, and runoff (Global Climate Change Impacts in the United States 2009). Sea level rise is also occurring along the coast. According to the N.C. Sea Level Rise Assessment Report, if existing trends continue for the next 30 years, sea level will be expected to rise between approximately 2 and 6 inches across the North Carolina coast, with the highest sea levels expected in Dare County in the northeast and the lowest along New Hanover and Brunswick counties to the south (2015 N.C. Sea Level Rise Assessment Report). Higher sea levels may lead to loss of marsh and other estuarine habitats and enhance shoreline erosion at Reserve sites.

In addition to having impacts on coastal and estuarine ecosystems, more frequent and severe flooding, storm events, and rising water levels can also affect North Carolina's coastal economy in several ways. Tourism and real estate are at risk to flooding and storms (N.C. Coastal Habitat Protection Plan 2015). Tourism and recreation are two industries that fuel the economy in North Carolina. In 2012 the GDP for tourism and recreation industries was over 1 billion dollars, over half of the total GDP for all ocean industries in North Carolina ([NOAA Digital Coast 2012](#)). Many residents along the coast live in homes located within the FEMA floodplain and are at risk of flooding. Within the four counties in which Reserve sites are located, the percentage of the total population living in a floodplain are as follows: 52% in Currituck County, 33% in Carteret County, 18% in New Hanover County, and 25% in Brunswick County ([NOAA Digital Coast 2012](#)). Because of the risks associated with coastal hazards, educating local communities about coastal resilience and resilient infrastructure is increasingly important.

Reserve Site Descriptions

The diverse range of habitats in North Carolina noted above make it an ideal location for a National Estuarine Research Reserve. The multi-site NCNERR, through its Currituck Banks, Rachel Carson, Masonboro Island and Zeke's Island Reserves, represents and protects a broad range of coastal and estuarine ecosystem diversity present in the State.

There are a variety of unique characteristics that are taken into account in the management of and implementation of programs at the four NCNERR sites. The following site descriptions explain the history, local management, location, and social attributes that are unique to each of the four NCNERR sites. The physical and environmental characteristics specific to each Reserve site, including geography, geology, hydrology, biological resources, climate, weather, and key habitat and species, are also defined to convey both the similarities and differences between the four sites. Understanding the existing site conditions and anthropogenic and environmental stressors is imperative to the management and support of each site's natural resources in adapting to changing conditions. Site-specific threats and stressors are addressed in each site description, along with a brief statement explaining how these threats impact the site. Threats and stressors that are common to all sites include water quality, sea level rise and storms, invasive species, and visitor use.

Reserve boundaries encompass two areas, core and buffer, which are also described and depicted for each site in the descriptions below. Core and buffer areas are established to ensure adequate control by the managing entities over human activities occurring within all areas of the Reserve boundary; definitions for core and buffer areas are provided in the NERRS regulations and are discussed previously in the National Estuarine Research Reserve Administrative Framework section. Core areas within the Reserve boundaries are comprised of estuarine habitats. Buffer areas are comprised of ocean beach, palustrine, and upland habitats. Core and buffer areas were updated based on the most recent habitat mapping assessment using 2010

imagery. As a result, the core and buffer area boundaries and acreages have shifted slightly over time due to refinements in mapping technologies and changes in habitat distribution. Habitat maps for each site depict intertidal and supratidal habitat; subtidal habitats have not been mapped. More information about habitat mapping protocols can be found in the Research Program Chapter in the Management Plan.

Currituck Banks Reserve

Site Description and Location

The Currituck Banks Reserve, designated in 1985, is the northernmost site within the NCNERR and the only site located in the Virginian biogeographic province (Figure 2). Currituck Banks Reserve is included in the NCNERR because it serves as an excellent example of an undisturbed cross-section of a barrier island in a low-salinity estuarine system.

Currituck Banks Reserve encompasses 965 acres in the northeastern corner of North Carolina in Currituck County on the Outer Banks. The site is ten miles south of the Virginia border and a mile north of the unincorporated village of Corolla. The Nature Conservancy and U.S. Fish and Wildlife Service properties bound Currituck Banks to the north, the Atlantic Ocean to the east, the Currituck Sound to the west, and private subdivisions of Corolla to the south (Figure 3).

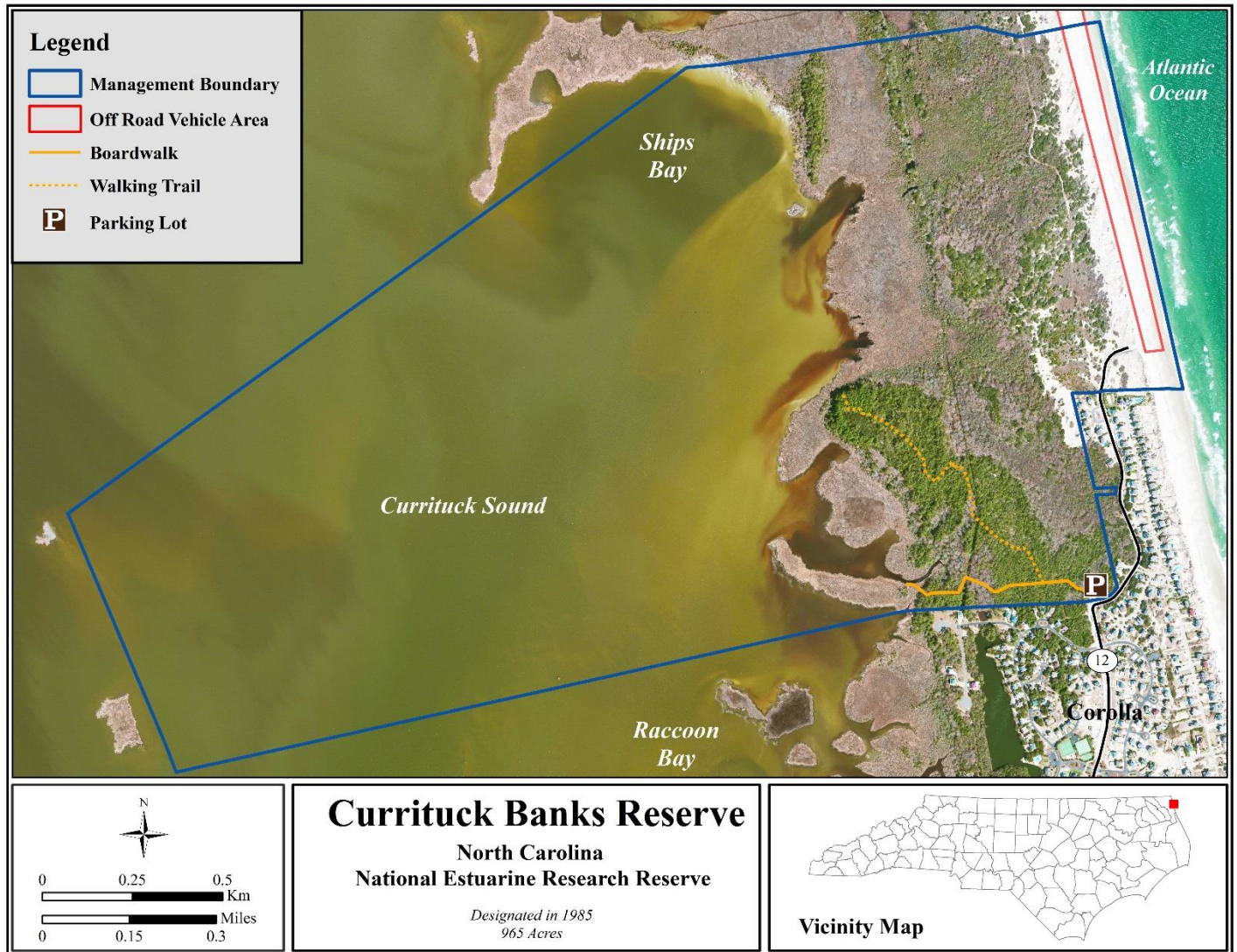


Figure 3. Currituck Banks Reserve Boundary Map

The delimited portion of Currituck Sound and the associated marshes constitute the 713 acres of estuarine habitats in the Currituck Banks Reserve core area. The sound waters contain extensive mud and sand flats covered in some areas by submerged aquatic vegetation. Ocean (18 acres), palustrine (89 acres), and upland habitats (145 acres) comprise the 252 acres of buffer area including ocean beaches, dunes, shrub thickets, maritime forests, and interdune ponds. The 1/3-mile boardwalk, 3/4 mile walking trail and parking lot are located in the buffer area of Currituck Banks Reserve (Figure 4).

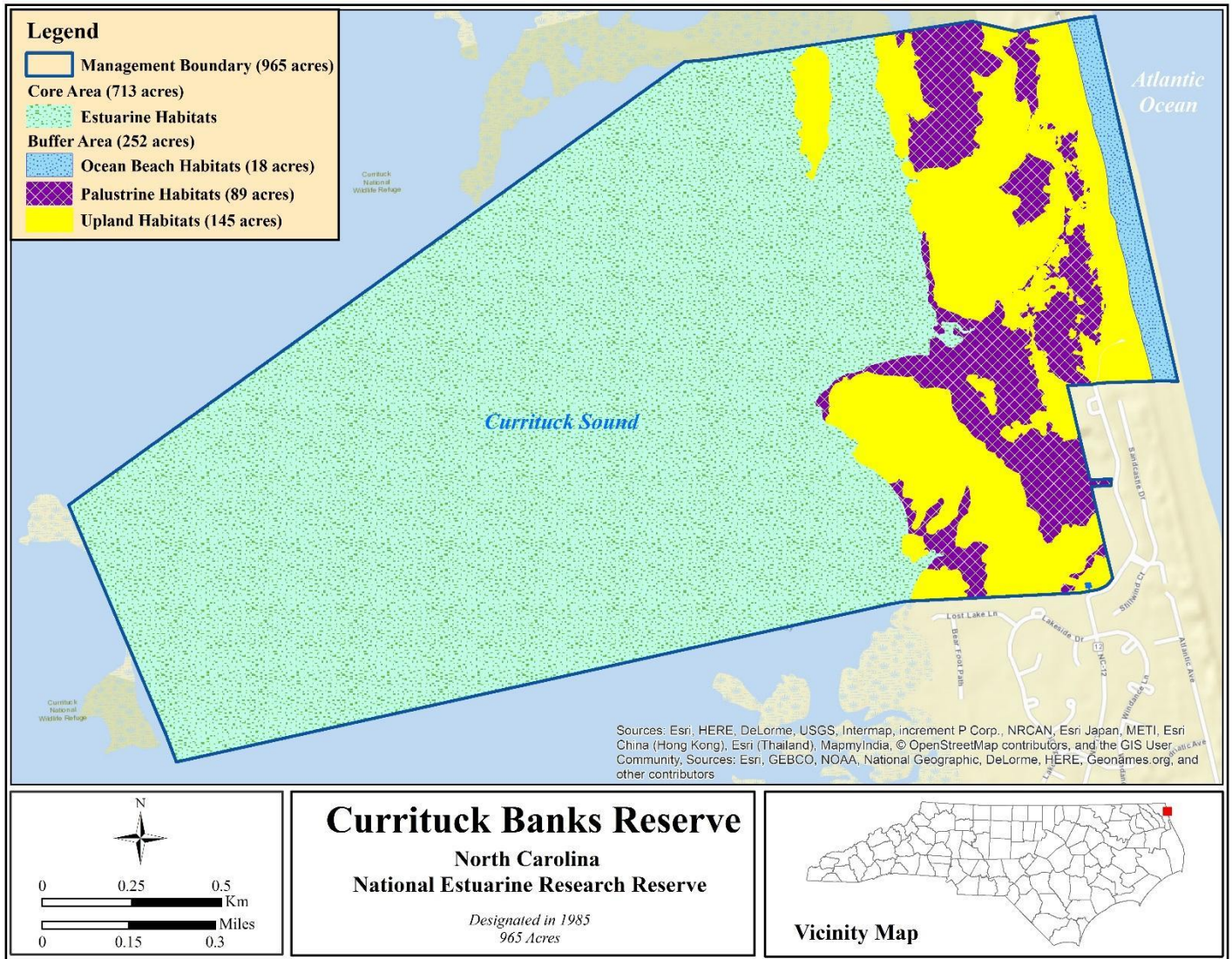


Figure 4. Currituck Banks Reserve Core and Buffer Map

The Currituck Banks Reserve is owned by the State of North Carolina and management of the site is delegated by the State to DCM. Several access easements are held on the Currituck Banks Reserve including two by Currituck County along the southeast boundary of the site for pedestrian access and one by Dominion Power for underground power lines that run parallel to the beach just behind the main dune line (Appendix I). The Nature Conservancy placed a conservation easement on one of the two tracts purchased that comprise the Currituck Banks Reserve prior to the State of North Carolina taking ownership of the Reserve. The conservation easement has since been transferred to the U.S. Fish and Wildlife Service.

The Currituck Banks Reserve is managed by the Northern Sites Manager based out of the Northern Sites Reserve office, located 20 miles south of the site in Kitty Hawk, N.C. The Northern Sites Manager conducts regular site maintenance and other management activities with assistance from seasonal interns, university

volunteers, and local community volunteers. Land management and species monitoring activities are conducted in cooperation with various state and federal agencies and local partner organizations, including The Nature Conservancy, N.C. Wildlife Resources Commission (WRC), and U.S. Fish and Wildlife Service. Enforcement activities are conducted by the Currituck County Sheriff's Office and State law enforcement agencies on behalf of and in coordination with the NCNERR.

Currituck Banks Reserve is used as a resource for educational and research activities led by Reserve staff and partners. Reserve staff and the WRC provide environmental education programs for the general public on the interpretive boardwalk and visitor trail. Long-term research and monitoring by Reserve staff at Currituck Banks Reserve includes the habitat mapping component of the System-wide Monitoring Program (SWMP) and monitoring long-term changes in marsh surface elevation. Scientists and students from academic and research institutions, resource management agencies, and environmental and conservation organizations investigate a wide array of coastal topics at the site.

Currituck County is located in the Pasquotank River Basin and has approximately 813 miles of estuarine shoreline (Figure 5, part of Albemarle Hydrologic Unit Code: 03010205) (Estuarine Shoreline Mapping Analysis Report 2012). Land uses vary between the mainland and barrier island regions of Currituck County. The northeastern portion of the county on the barrier island where Currituck Banks Reserve is located is dominated by vast expanses of wetlands on the sound side of the barrier island and also contains the villages of Corolla and Carova, both of which are experiencing development. These communities bracket the Currituck Banks Reserve and The Nature Conservancy and U.S. Fish and Wildlife Service properties to the north of the Reserve. The mainland portion of the county, which is farthest from the Reserve, is used agriculturally. In addition to continued residential development, construction of vacation rental homes is steadily increasing in the county (Census.gov 2014).

Currituck Banks Reserve: Pasquotank River Basin, 2010 Land Cover Data from NOAA CCAP

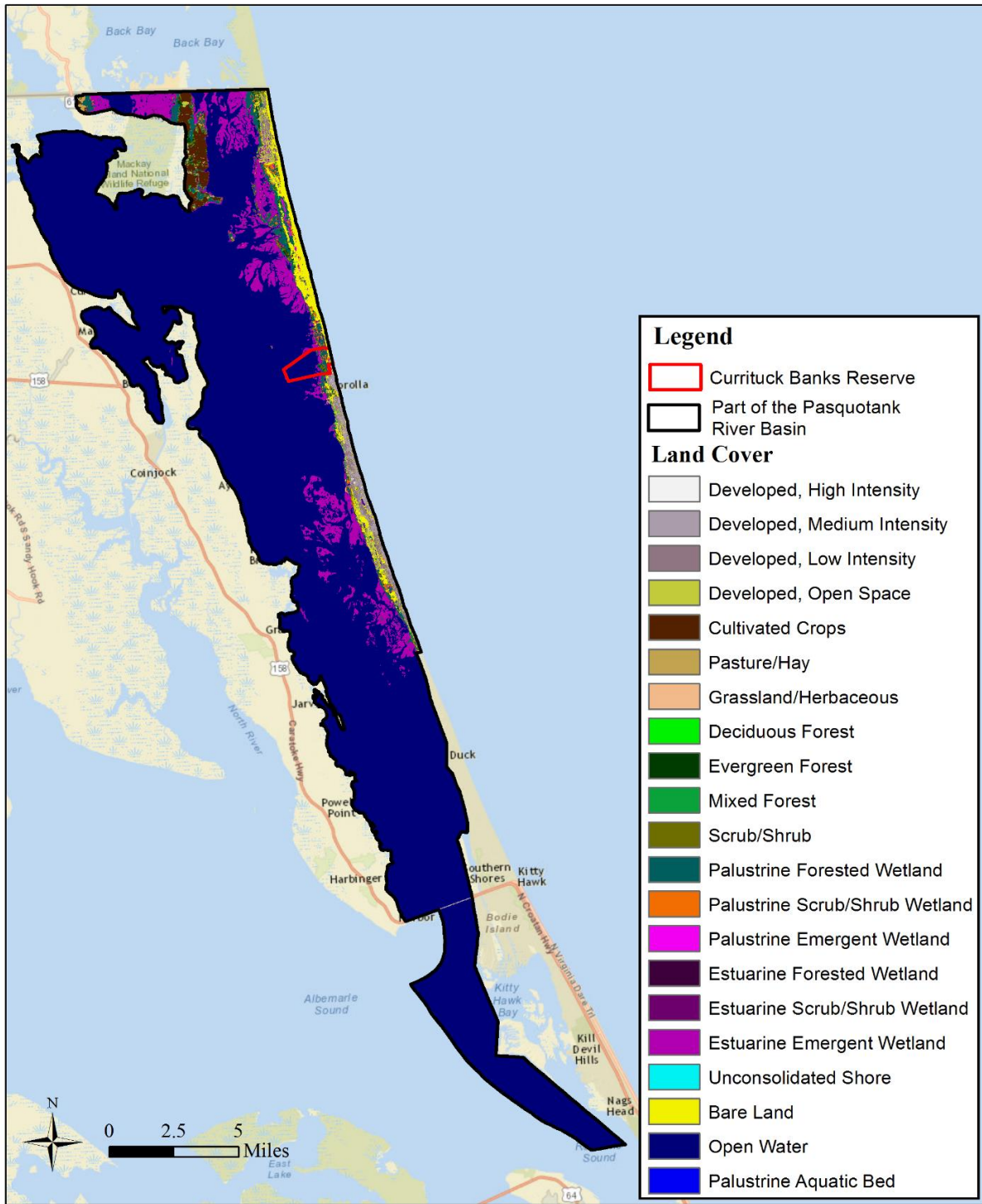


Figure 5. Currituck Banks Reserve Watershed Map

In 2014, the population of Currituck County was nearly 24,980. Of the total population, 50.3% were females and 49.7% were males (Census.gov 2014). The county population is made up of: 90.4% White, 6.1% Black, 3.7% Hispanic or Latino (Census.gov 2014). Census data from 2013 shows the average household income within the county was just under \$67,600, and an estimated 6.4% of the population was living below the poverty line (Census.gov 2013). Industries that boast the most employment in Currituck County include trade, transportation, educational services, manufacturing, retail trade, and financial activities (Census.gov 2013).

The Currituck Banks Reserve is accessible by foot traffic and boat. The nearest public boat ramp is located next to the Currituck Lighthouse in Corolla and is managed by Currituck County. Use of the ramp is limited to smaller vessels and kayaks due to extremely shallow waters at the ramp. Two walking trails exist at the southern portion of the site just off N.C. 12 where public parking and handicap access is available. The ocean beach portion of the Reserve is accessible by four-wheel drive along the beach corridor after N.C. 12 terminates at the beach access ramp. This area of the Reserve is heavily used by the public to access the beaches north of the Reserve and the village of Carova.

The Currituck Banks Reserve is used regularly by the public for traditional activities such as nature-based recreation, hunting, and fishing. Popular recreational activities at the site include hiking and wildlife observation which are largely restricted to the ocean beach area and walking trails because of the mosaic of dense or seasonally wet habitats at the site. Other recreational activities include fishing, crabbing, birdwatching, and kayaking. Hunting is permitted during the fall and winter months.

Geomorphology, Hydrology, Climate, and Weather

Throughout recent geologic time, the barrier landform that includes Currituck Banks has been very dynamic. It has migrated inland in response to sea level changes, and several inlets have opened and closed. Currently, the landform consists of a solid barrier spit that extends about 70 miles from Virginia Beach, V.A., to Oregon Inlet, N.C. This limits sound to ocean exchange and because of the distance to the Oregon Inlet, Currituck Sound is a predominately oligohaline body of water with wind driven tides. The sediments that comprise the barrier spit are very similar to those that make up the rest of the Outer Banks. They consist of both Recent (less than ~11,550 years old) and Pleistocene (~1.8 million to ~11,550 years before present) sediments. The Pleistocene sediments represent ancient sand shoals that have been pushed landward by oceanic processes (Atkinson et al 1998).

Currituck Sound is approximately 35 miles long, varies from 4 to 15 miles wide, and is extremely shallow, averaging 5 feet. Water movement in Currituck Sound is driven primarily by wind. This means that the water levels in Currituck Sound can change dramatically and rapidly in response to changes in the wind pattern. North winds tend to blow water out of the sound and southerly winds tend to force water into the sound. Because of this relationship between wind direction and water level, water levels tend to be highest in summer when winds blow mostly from the south-southwest, and tend to be lowest in the winter when winds predominately blow from the north-northeast (Caldwell 2001).

The shallower regions of Currituck Sound contain vast meadows of submerged aquatic vegetation. Marshes border the sound. Habitats found within the core area are influenced by brackish sound waters with seasonal ranges in salinity from 0 - 5 ppt, with occasional spikes in salinity that rarely exceed 10 ppt. Lunar tides determine the water level on the ocean beach. The waters of Currituck Sound are designated as "SC" by the N.C. Division of Water Resources, which means they are protected for secondary recreation such as fishing, boating, and other activities involving minimal skin contact; fish and noncommercial shellfish consumption; aquatic life propagation and survival; and wildlife.

The weather of Currituck Banks is typical of a maritime climate on the Outer Banks with the ocean having a strong moderating effect on air temperature compared to the mainland areas. Climatologically, Currituck Banks is classified as subtropical with humid, warm summers and mild winters. The mixing of the warm Gulf Stream and the cool Labrador Current off Currituck Banks creates a climate where northern species reach the southern limit of their ranges and southern species reach the northern limit of their ranges. As a result, a diversity of species from both regions is found within the site's boundary.

Key Habitats and Species

Habitats in the core area include subtidal soft bottoms and tidal flats with submerged aquatic vegetation, emergent marsh and scrub-shrub wetlands (Figure 6). The marsh is primarily composed of giant cordgrass (*Spartina cynosuroides*), black needlerush (*Juncus roemerianus*), and cattails (*Typha spp.*). Habitats found within the buffer area of Currituck Banks Reserve consists ocean beach, sand dunes, grasslands, shrub thickets, and mature deciduous and evergreen maritime forests that are primarily composed of live oak (*Quercus virginiana*), loblolly pine (*Pinus taeda*), longleaf pine (*Pinus palustris*), red maple (*Acer rubrum*) and common persimmon (*Diospyros virginiana*). The mature maritime deciduous forest within the site's boundaries is one of the rarest habitat types on the U.S. east coast (Schafale & Weakley 1990). The interior uplands of Currituck Banks are characterized by dense woody vegetation intermingled with numerous seasonal wetlands.

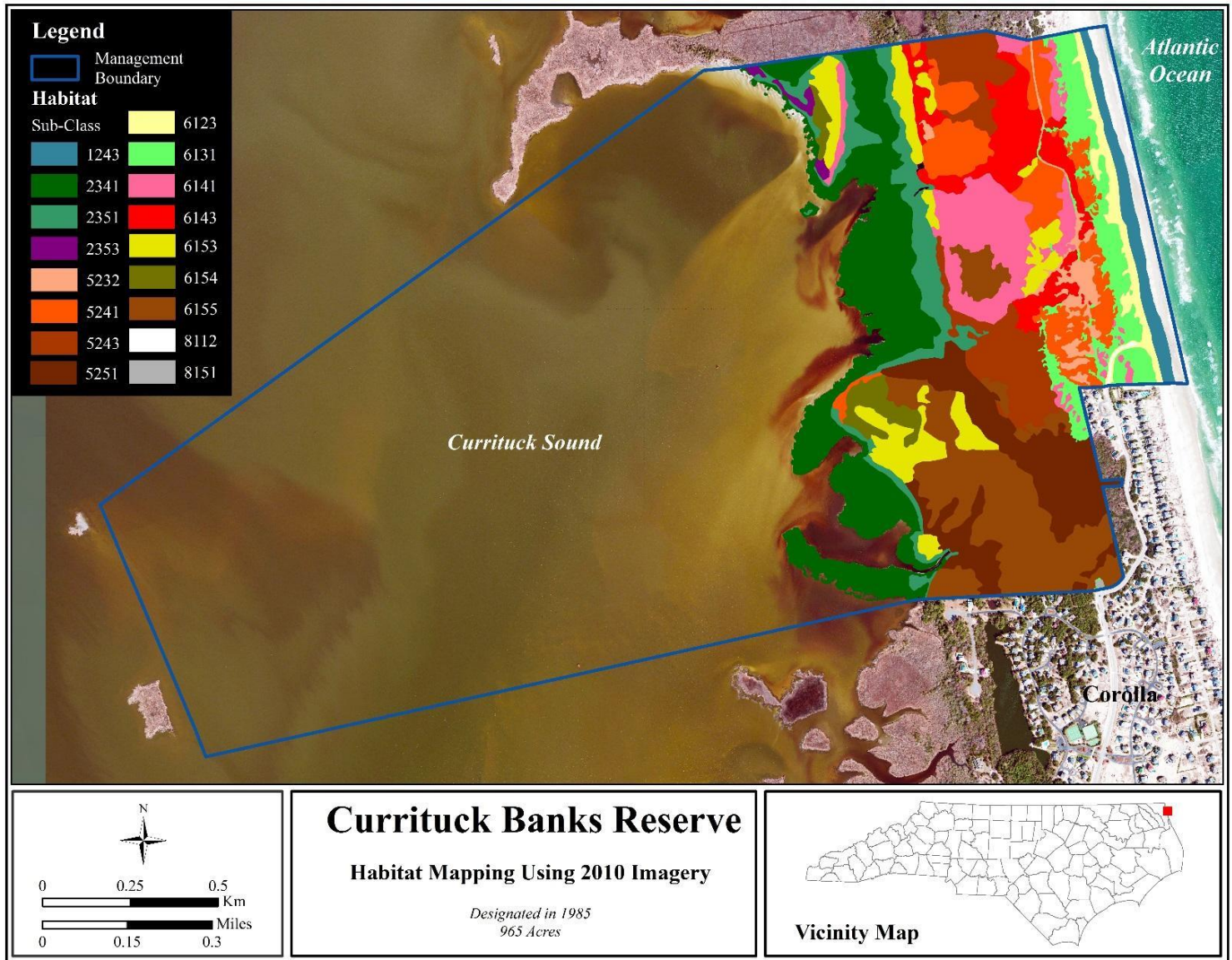


Figure 6. Currituck Banks Reserve Habitat Map

| Habitat | Subsystem | Class | Sub-Class | COLOR | | | |
|---------------------|-----------|---------------------------|-----------|-----------------------|------|-----------------------|--|
| Marine | 1200 | Intertidal | 1240 | Unconsolidated Shore | 1243 | Sand | |
| Estuarine | 2300 | Supratidal Haline | 2340 | Emergent Wetland | 2341 | Persistent | |
| | | | 2350 | Scrub Shrub Wetland | 2351 | Broad Leaf Deciduous | |
| | | | | | 2353 | Broad Leaf Evergreen | |
| Palustrine | 5200 | Intermittent or Saturated | 5230 | Emergent Wetland | 5232 | Persistent | |
| | | | 5240 | Scrub Shrub Wetland | 5241 | Broad Leaf Deciduous | |
| | | | | | 5243 | Broad Leaf Evergreen | |
| | | | 5250 | Forested Wetland | 5251 | Broad Leaf Deciduous | |
| Upland | 6100 | Supratidal Upland | 6120 | Unconsolidated Upland | 6123 | Sand | |
| | | | 6130 | Herbaceous Upland | 6131 | Grassland | |
| | | | 6140 | Scrub Shrub Upland | 6141 | Broad Leaf Deciduous | |
| | | | | | 6143 | Broad Leaf Evergreen | |
| | | | 6150 | Forested Upland | 6153 | Broad Leaf Evergreen | |
| | | | | | 6154 | Needle Leaf Evergreen | |
| | | | | | 6155 | Mixed | |
| Cultural Land Cover | 8100 | Developed Upland | 8110 | Impervious Cover | 8112 | Paved Roadway | |
| | | | 8150 | Unconsolidated Cover | 8151 | Dirt/Gravel Lot | |

Table 1. Currituck Banks Reserve Habitat Map Legend

There is a rich community of both commercial and game fish species in the sound, such as largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), pumpkinseed (*Lepomis gibbosus*), blue-spotted sunfish (*Enneacanthus gloriosus*), bluegill (*Lepomis macrochirus*), black crappie (*Pomoxis nigromaculatus*), American eel (*Anguilla rostrata*), and channel catfish (*Ictalurus punctatus*). Other fish include tidewater silverside (*Menidia peninsulae*), white perch (*Morone americana*), common carp (*Cyprinus carpio*), hickory shad (*Alosa mediocris*), and herring (*Alosa aestivalis*).

The dense forest canopy, shrub thickets, and marsh provide useful habitat for a variety of birds that include raptors, songbirds, wading birds, and shorebirds that utilize the Reserve throughout the year. Birds found in the area that are of special concern include the bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), black skimmer (*Rynchops niger*), least tern (*Sterna antillarum*), common tern (*Sterna hirundo*), and tri-colored heron (*Egretta tricolor*). Piping plover (*Charadrius melodus*), a federally protected threatened species, and Wilson’s plover (*Charadrius wilsonia*), a state species of special concern, exist at the Currituck Banks Reserve (NC Natural Heritage Program 2016). Currituck Sound is located within the Atlantic Flyway and the Reserve site is especially important for migrating waterfowl.

Feral horses (*Equus caballus*), feral pigs (*Sus scrofa*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canus latrans*), gray fox (*Urocyon cinereoargenteus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and marsh rabbit (*Sylvilagus palustris*) are common mammals found at the Reserve. Red fox (*Vulpes vulpes*) have recently been observed within site boundary as well.

Threats and Stressors

Feral Species

The presence of feral pig and horse populations impact estuarine productivity and alter natural ecosystem processes at the site through foraging and rooting, trampling of vegetation, and excretion of waste. Control efforts for feral pigs are underway through a trapping program in partnership with The Nature Conservancy and U.S. Department of Agriculture and pigs are also hunted by permit at the site. Currituck Banks Reserve is within the Currituck County-designated Wild Horse Management Area for the Currituck County feral horses. The horses roam the area and are not owned or managed by the State, but have been granted special status by the State due to their cultural significance even though they are considered an introduced species. The Northern Sites Manager serves on the Currituck County Wild Horse Advisory Board, which meets quarterly with partners to implement the 2014 Wild Horse Management Agreement.

Invasive Species

Invasive plant species can alter habitats by outcompeting native vegetation. Several invasive species are currently a threat to the Currituck Banks Reserve. Various olive species (*Elaeagnus sp.*) are continuously introduced to the Reserve due to landscaping on surrounding properties that serve as seed sources. Alligator weed (*Alternanthera philoxeroides*) has been observed, but the extent of its presence is unknown at this time. Eurasian water milfoil (*Myriophyllum spicatum*) is present at the site and throughout Currituck Sound. Common reed (*Phragmites australis*) is also present and poses a risk to native marsh plant communities. Over time, invasion by additional species, such as hydrilla (*Hydrilla verticillate*) or pampas grass (*Cortaderia selloana*), may take place as range expansion occurs or new species are introduced to the region.

Visitor Use

Currituck Banks Reserve's location near the terminus of N.C. 12 and access point to the northern Currituck County beaches has resulted in increased public use in recent years. The small parking lot at the Reserve is the northernmost parking lot on N.C. 12 and thus, this area experiences an exceptional amount of traffic in the summer months. The parking lot is sufficient for boardwalk and hiking trail users but is often beyond capacity due to inappropriate use by commercial entities and public individuals who use it to access areas north of the Reserve, which is accessible only by four-wheel drive vehicles. This impacts the ability of visitors, researchers, and Reserve staff to access the site by means of the boardwalk or hiking trail. The proposed construction of the Mid-Currituck Bridge connecting mainland Currituck County to the Currituck Outer Banks south of the Reserve will provide easier access to the area and likely increase use at the site. The Reserve regularly promotes responsible visitor use of the site through signage, various communication initiatives, and social media to help maintain a balance between resource protection and public enjoyment and safety. Enforcement of Reserve rules and policies as well as State and local laws is provided by partner agencies which often have limited time and resources to devote to this effort.

Water Quality

Historically, Currituck Sound has fluctuated between a saline and a freshwater environment, depending on the presence of an inlet opening in the barrier island. The last inlet closed in 1828. Since then, the system had been predominantly fresh water, but human-induced landscape alterations such as the Albemarle and Chesapeake Canal connecting the Chesapeake Bay to Currituck Sound may be a source of salinity entering Currituck Sound (Caldwell, 2001). Ecological conditions in and around Currituck Sound in northeastern North Carolina and southeastern Virginia have changed noticeably since at least the 1980s. Fish population surveys have indicated a decrease in freshwater species and an increase in estuarine species. These changes are attributed to an increase in salinity in the sound (Southwick and Norman, 1991). A decline in submerged aquatic vegetation beds has been attributed to a decline in water quality due to a decrease in submerged aquatic vegetation root systems and underwater biomass resulting in increased resuspension of fine sediments and associated nutrients during wind events (U.S. Army Corps of Engineers, 2001). Anthropogenic and natural causes may have led to a general reduction in water quality that is causing impacts on species diversity and community composition (USGS, 2016).

Sea Level Rise and Storms

Barrier islands ecosystems are subject to forces such as sea level rise and storms that move sediment, cause changes in topography and geomorphology, and require constant adaptation by vegetation communities. As sea level rises, barrier islands retreat landward. Large storms such as nor'easters and hurricanes redistribute sediment across the barrier beach, and sediment from the water column is deposited on the surface of the marsh, though accretion rates in the marsh are not well understood. The 2015 N.C. Sea Level Rise Report Update shows the highest amount of sea level rise occurring in the northern regions of the coast. Over the next 30 years, a mean increase of 5.4 inches in sea level rise is predicted in Duck, N.C., which is roughly 15 miles south of Currituck Banks Reserve. Sea level rise and storms have the potential to result in significant change to the site's natural resources, particularly if water levels change at a greater rate than accretion is occurring.

Rachel Carson Reserve

Site Description and Location

The Rachel Carson Reserve, designated in 1985, is named for Rachel Louise Carson (1907-1964), a federal scientist and naturalist, who conducted research at the site in the 1940s. The Rachel Carson Reserve is part of the NCNERR because of its extensive pristine salt marshes and intertidal and subtidal flats. The site also represents a typical Mid-Atlantic coast intertidal estuarine-marsh system that is strongly influenced by both river and inlet dynamics. The site is located within the Carolinian biogeographic province (Figure 2).

The site is located between the mouths of the Newport and North Rivers in southern Carteret County, directly across Taylor's Creek from Beaufort, N.C. The 2,315-acre site consists of a complex of several small islands: Carrot Island, Town Marsh, Bird Shoal, Horse Island, and Middle Marshes, which is located across North River

Channel from the other four islands. The Morehead City State Port is located 2.75 miles to the west-northwest. The site is bounded to the north by Taylor’s Creek and Beaufort, to the east by Back Sound, to the south by Shackleford Banks (Cape Lookout National Seashore) and Beaufort Inlet, and to the west by Pivers and Radio Islands (Figure7).

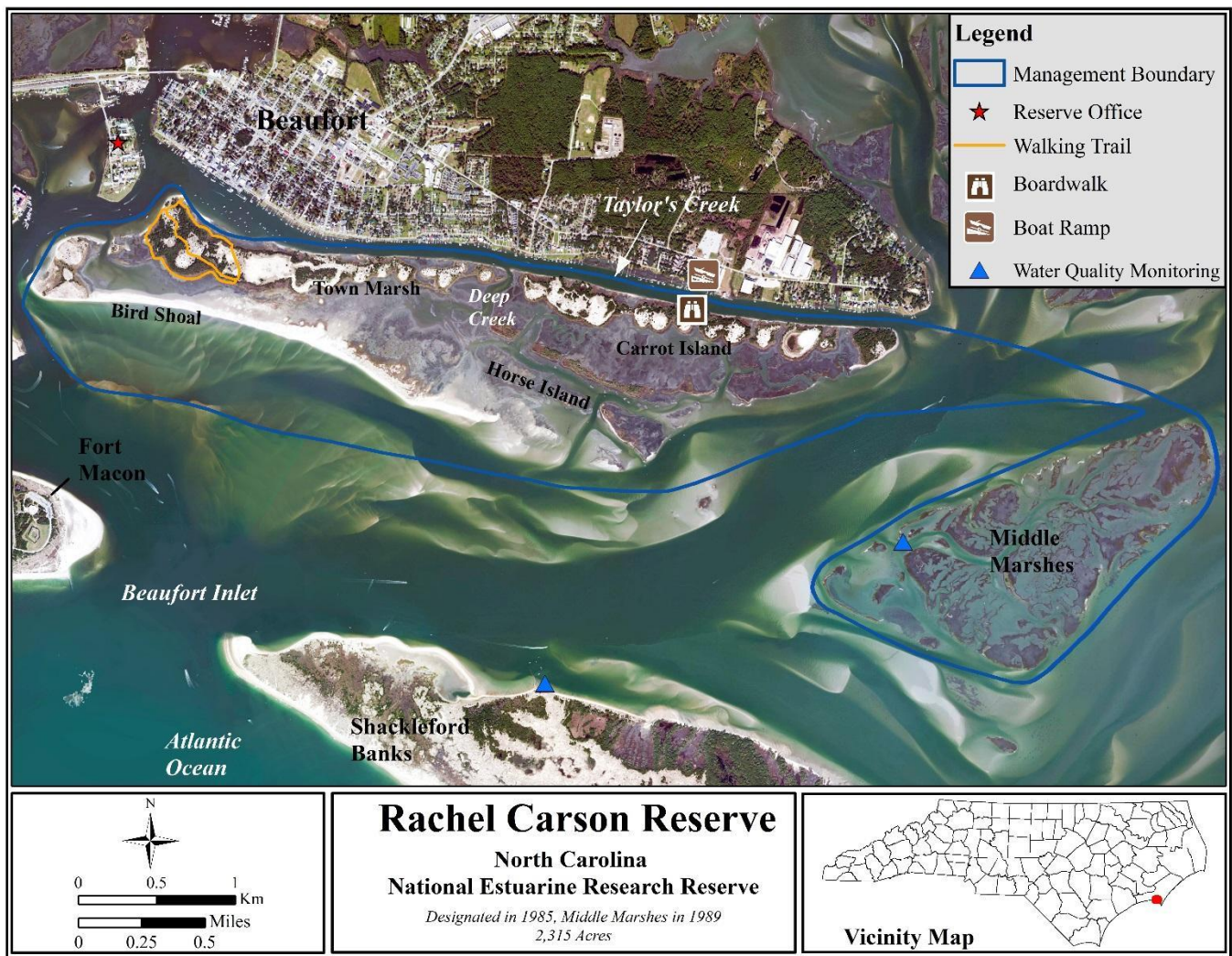


Figure 7. Rachel Carson Reserve Boundary Map

The Rachel Carson Reserve core area includes 2,134 acres and consists of sound waters, tidal flats, creeks, and marshes that occur within the five islands that comprise the site. The buffer area totals 181 acres and includes dredge material deposits, beaches, dunes, shrub thickets, and a remnant of maritime forest (Figure 8).

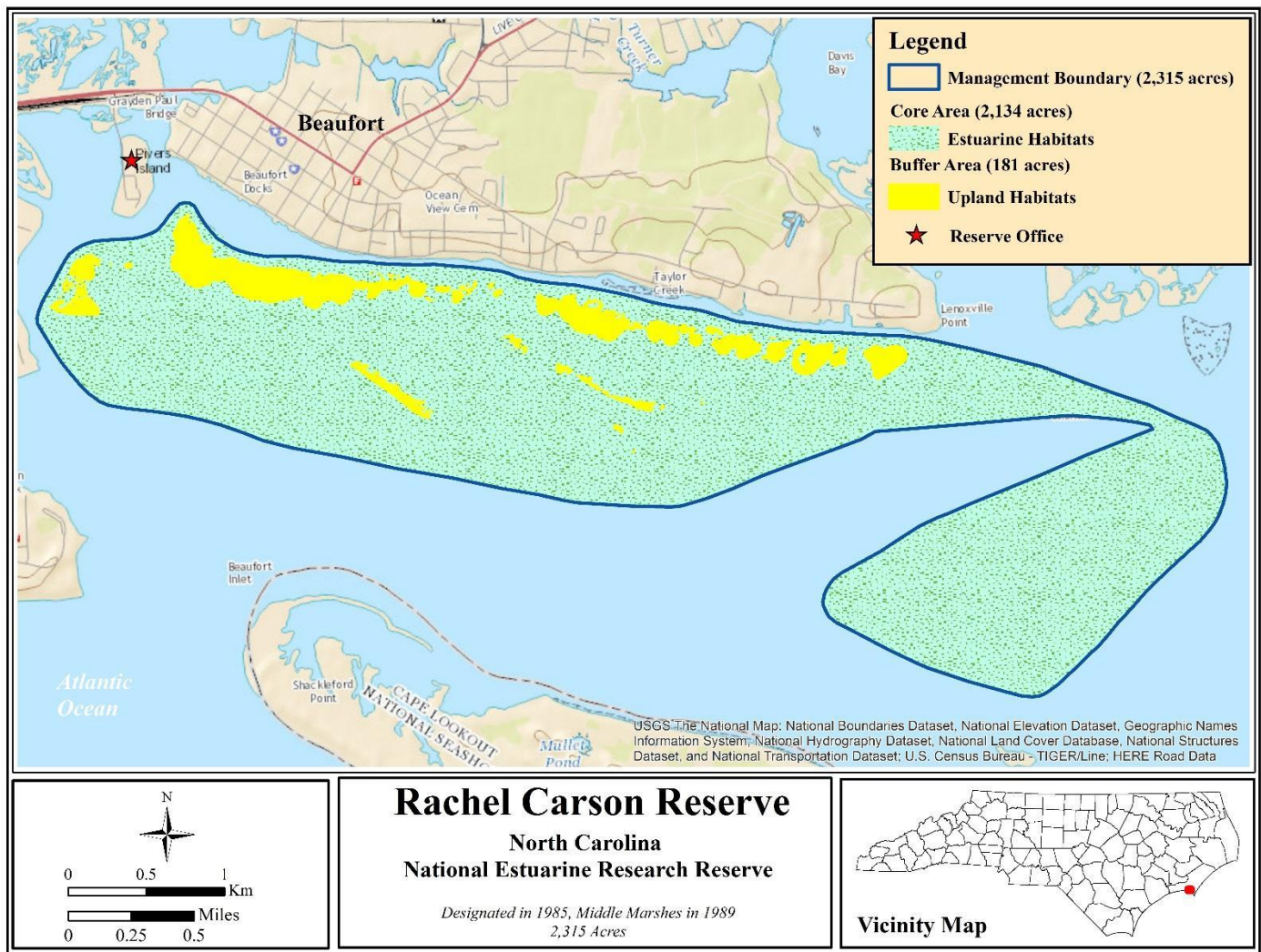


Figure 8. Rachel Carson Reserve Core and Buffer Map

The Rachel Carson Reserve is owned by the State of North Carolina and management of the site is delegated by the State to DCM. The site was added to the NCNERR following the efforts of the local community to prevent residential development on Carrot Island. The State acquired Town Marsh, Carrot Island, Horse Island, and Bird Shoal in 1985, with the addition of Middle Marshes in 1989. The western portion of the Reserve is within Beaufort’s city limits. Parts of Town Marsh and Bird Shoal are designated as part of the Beaufort Historic District that is part of the National Register of Historic Places. This designation was formalized in 1974, in part, to protect Beaufort’s waterfront viewscape and the potential for the islands to yield archaeological resources. The U.S. Army Corps of Engineers holds an easement along the north side of Town Marsh and Carrot Island for dredge material deposition within designated cells. The site is managed by Reserve staff at the Beaufort office located at the NOAA Beaufort Lab. Seasonal staff and volunteers conduct and support

management activities. Land management and species monitoring activities are conducted in cooperation with various State and Federal agencies, as well as local partner organizations. Enforcement activities are conducted by local and State law enforcement agencies on behalf of and in coordination with the Reserve.

The site is located in the White Oak River Basin (Figure 9, part of Bogue-Core Sound Hydrologic Unit Code: 03020106). In Carteret County, there are over 1,530 miles of estuarine shoreline and land use varies by region: east, central, and west (Estuarine Shoreline Mapping Analysis Report 2012). The eastern part of the county is dominated by vast expanses of wetlands and agriculture interspersed with several small communities. The central area (including the Rachel Carson Reserve) comprises the population centers of Beaufort, Morehead, and Newport, all of which are experiencing population growth and development. The western portion of the county contains the largest population base and is experiencing the most development. In addition to residential development, scattered commercial and industrial development continues to occur throughout the county (Carteret County 2005 Land Use Plan). The main industries in the area include management, business, science, arts, sales, and office occupations (Census.gov 2013). The 2014 population estimate in Carteret County is just over 68,800 (Census.gov 2014). Of that 68,000, 49.3% were male and 50.7% were female. (Census.gov 2014). The county population is comprised of: 89.7% White, 6.2% Black, 4.3% Hispanic or Latino (Census.gov 2014). In 2013, the average household income was \$61,663 and the percentage of the population living below the poverty line was 14.4% (Census.gov 2013).

Rachel Carson Reserve: White Oak River Basin, 2010 Land Cover
Data from NOAA CCAP

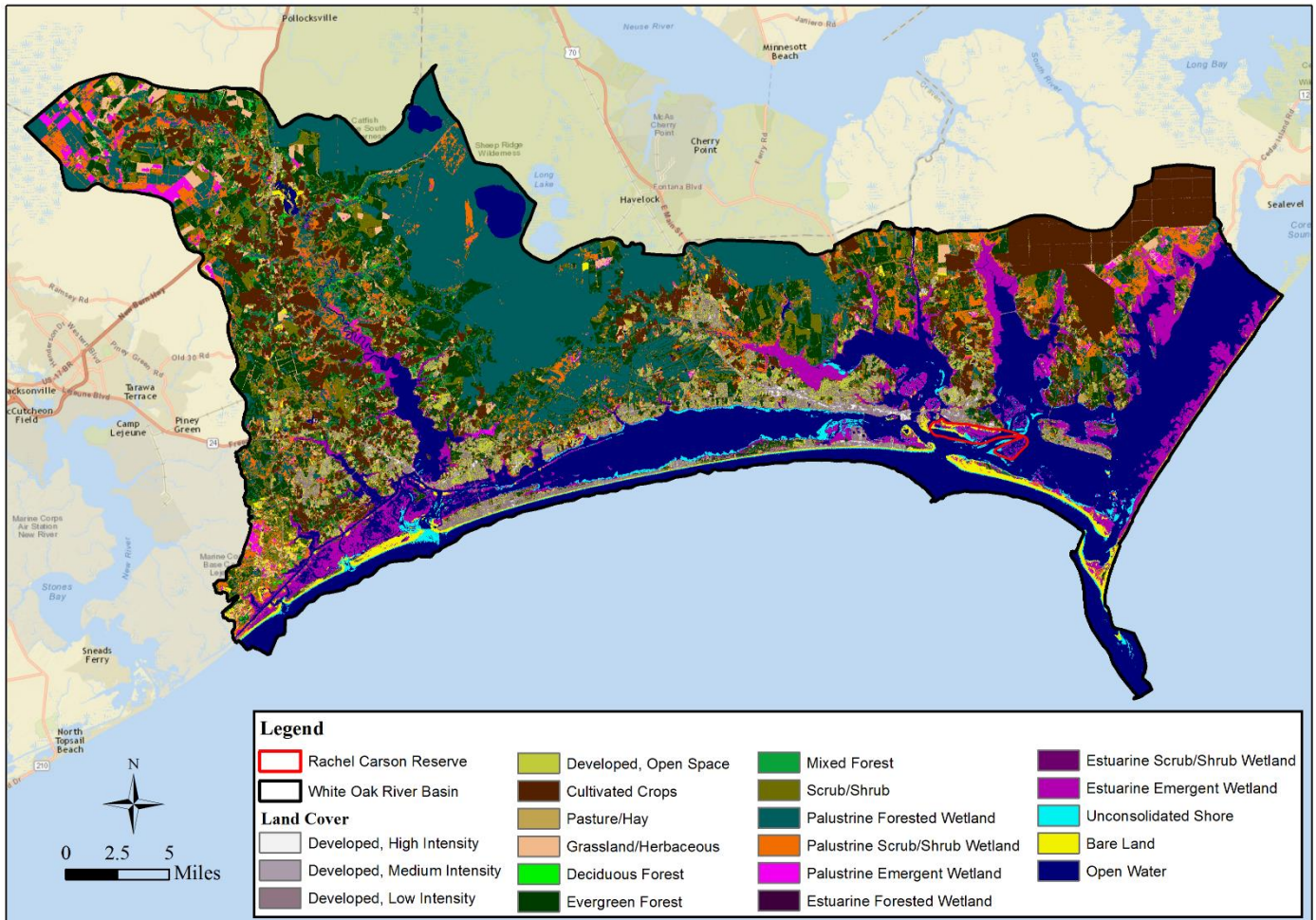


Figure 9. Rachel Carson Reserve Watershed Map

The site is located in a nationally and internationally recognized marine science and education community that has been in existence for over one hundred years. Duke University Marine Laboratory (DUML), the University of North Carolina’s Institute of Marine Sciences (IMS), and North Carolina State University’s Center for Marine Sciences and Technology (CMST) are located in the area, as is NOAA’s Center for Coastal Fisheries and Habitat Research (CCFHR), the N.C. Division of Marine Fisheries (DMF), and DCM.

The Rachel Carson Reserve serves as an outdoor classroom for teachers, students, and the general public. The site also serves as a living laboratory for coastal research. Reserve staff offer educational programs at the site that focus on exploring local habitats and understanding the importance of estuaries spring through fall. Additionally, partner organizations occasionally offer similar field trips to the Reserve. Long-term research and monitoring is conducted by Reserve staff at the site and includes SWMP-like water quality monitoring,

biological monitoring of emergent marsh vegetation, habitat mapping, and monitoring long-term changes in marsh surface elevation. Partner organizations and university students and researchers investigate a wide array of coastal topics at the site.

The site is accessed by a variety of user groups including scientists, students, recreational users, and commercial businesses (ferries and tour groups). The site can only be reached by boat. The WRC operates a public boat ramp and parking lot along Taylor's Creek at the intersection of Front Street and Lennoxville Roads. Several private ferry and tour companies offer access to the Reserve from Beaufort. Interpretive walking trails, approximately one mile each, are available on the west end of Town Marsh, and a boardwalk with interpretive signs is located on the east end of Carrot Island across from the boat ramp.

The Rachel Carson site is used regularly by the public for traditional activities such as nature-based recreation, commercial and recreational fishing and hunting. The creeks, marshes, and waters within the site's boundary are used extensively by motorized and non-motorized vessels for boating, tours, and fishing. Sunbathing, swimming, and general beach-going along the shoreline are common activities. Hunting occurs in the marshes and dredge material deposition occurs in areas outside of Beaufort's city limits.

Geomorphology, Hydrology, Climate, and Weather

Carteret County is located in the south-central part of the North Carolina coastal plain. In general, the county's land surface is a plain representing a former sea floor that has been elevated above sea level in the relatively recent geologic past. Unlike the other sites that make up the NCNERR, Rachel Carson is not a true barrier island. The underlying sediments are a relict flood tide delta from a now closed inlet. These sediments raised the estuarine bottom enough to produce several shoals and small islands. The islands and tidal flats comprising Rachel Carson consist of Recent (less than ~11,550 years old) and Pleistocene (1.8 million to ~11,550 years ago) sediments (Atkinson et al. 1998). Over time this area was colonized by marsh plants which stabilized the sediments. During the early 1900s the U.S. Army Corps of Engineers placed material from the dredging of Taylor's Creek on areas of these low lying marshes and shoals. These dredge material deposition areas now make up the upland portions of the Reserve, which provide habitat for many upland plant and animal species.

The waters around Rachel Carson are generally less than 6 feet in depth except for a few deep sloughs and Taylor's Creek that is periodically dredged by the U.S. Army Corps of Engineers. Tides in the Rachel Carson area average about 3 feet and are semidiurnal in nature and average salinity of the surrounding waters is around 30 ppt. The Reserve is located in the convergence zone of several bodies of water: the Newport River, North River, Back Sound, and Bogue Sound. Currents in the region are highly influenced by the adjacent Beaufort Inlet. Waters in different areas of the site are assigned specific surface water designations by the N.C. Division of Water Resources. The waters of Taylor's Creek are designated as "SC" which means they are protected for secondary recreation such as fishing, boating, and other activities involving minimal skin contact; fish and noncommercial shellfish consumption; aquatic life propagation and survival; and wildlife. Waters south of

Taylor's Creek that are included in north Back Sound are designated as High Quality Waters and waters that are located along the southern shore of the site through Middle Marshes are designated as Outstanding Resource Waters.

The weather of the Rachel Carson Reserve is typical of a southeastern coastal climate where the ocean has a strong moderating effect on air temperature, thus resulting in subtropical conditions. The site is especially susceptible to tropical storm and hurricane impacts because of the geography of the region. This part of the coast extends out into the Atlantic Ocean in an east-west orientation. Thus, the area is prone to impact by northward moving storms. Tropical cyclones regularly impact the site through storm surges and freshwater introductions. During winter, nor'easters periodically move through the area, often causing shoreline erosion in some areas and accretion in others.

Key Habitats and Species

Primary habitat types found at the Rachel Carson Reserve are subtidal flats, tidal creeks, submerged aquatic vegetation, salt marshes, oyster reefs, dredge material deposition areas, and maritime shrub. There are also areas of beaches, dunes and a few small stands of maritime forest on Carrot Island (Figure 10).

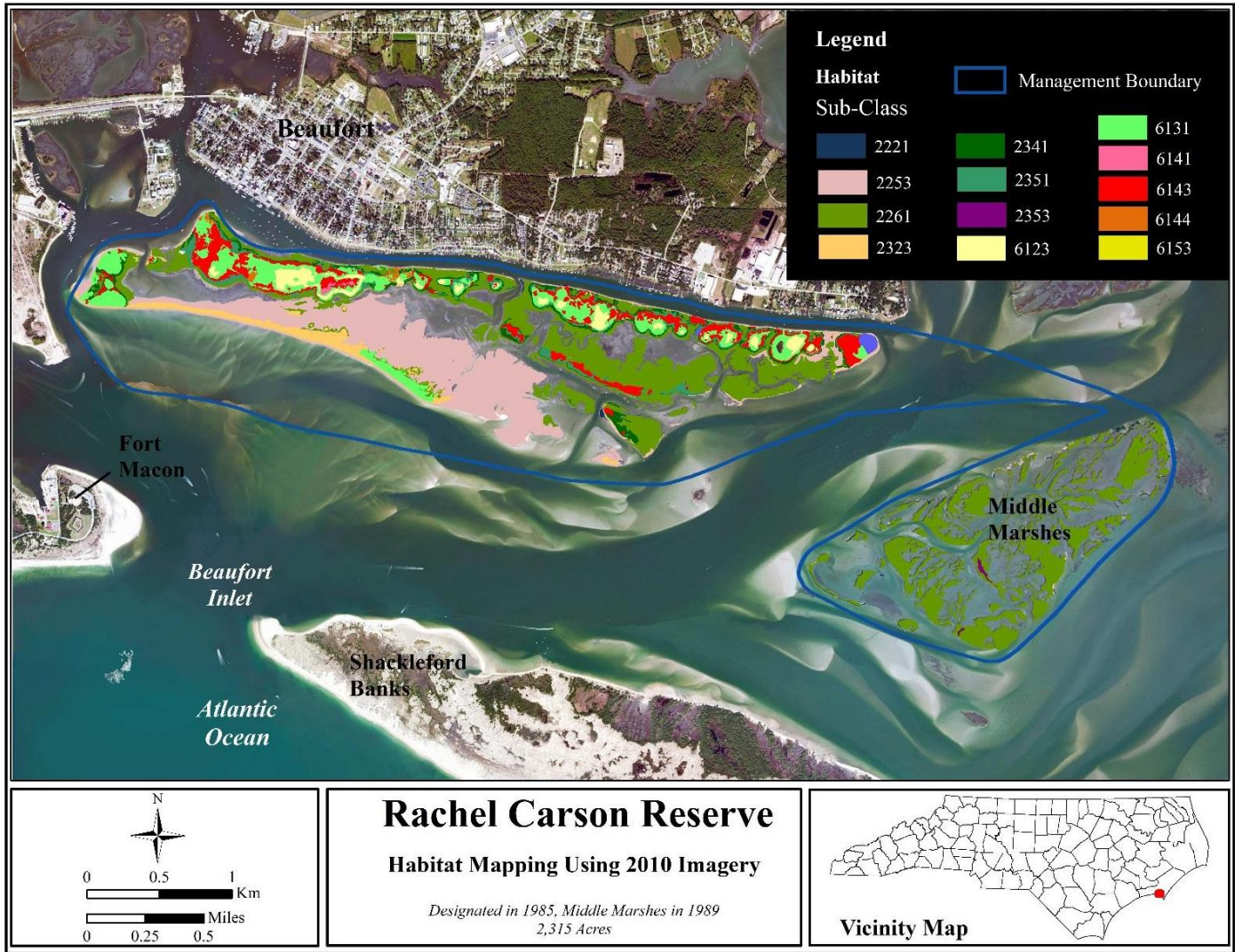


Figure 10. Rachel Carson Reserve Habitat Map

| Habitat | Subsystem | Class | Sub-Class | COLOR | |
|-----------|-----------|-------------------|-----------------------|---------------------------|---------------------------|
| Estuarine | 2200 | 2220 | Reef | 2221 Mollusk | |
| | | 2250 | Unconsolidated Shore | 2253 Sand | |
| | | 2260 | Emergent Wetland | 2261 Persistent | |
| | 2300 | Supratidal Haline | 2320 | Unconsolidated Bottom | 2323 Sand |
| | | | 2340 | Emergent Wetland | 2341 Persistent |
| | | Supratidal Upland | 2350 | Scrub Shrub Wetland | 2351 Broad Leaf Deciduous |
| | | | | | 2353 Broad Leaf Evergreen |
| Upland | 6100 | 6120 | Unconsolidated Upland | 6123 Sand | |
| | | 6130 | Herbaceous Upland | 6131 Grassland | |
| | | 6140 | Scrub Shrub Upland | 6141 | Broad Leaf Deciduous |
| | | | | 6143 | Broad Leaf Evergreen |
| | | | | 6144 | Needle Leaf Evergreen |
| | | 6150 | Forested Upland | 6153 Broad Leaf Evergreen | |

Table 2. Rachel Carson Reserve Habitat Map Legend

The Rachel Carson Reserve provides a diverse array of habitats that are home to various estuarine species, many of which are protected. The site is located within the Atlantic Flyway and is an important feeding area for Wilson's plover (*Charadrius wilsonia*) in the summer and red knot (*Calidris canutus*) and piping plover (*Charadrius melodus*) in the winter. Middle Marshes provides nesting habitat for American oystercatcher (*Haematopus palliatus*), Forster's tern (*Sterna forsteri*), and various species of egret and heron. Bird Shoal provides sandy habitat for seabeach knotweed (*Polygonum glaucum*), beach morning-glory (*Ipomoea imperati*) and small patches of seabeach amaranth (*Amaranthus pumilus*). The marshes and creeks of the site are home to the estuarine dependent diamondback terrapin (*Malaclemys terrapin*), which is a state species of special concern. Dredge material deposition areas on the west end of the site are home to the significantly rare crystal skipper butterfly (*Atrytonopsis quinteri*).

Commonly found mammals include feral horses (*Equus caballus*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), and marsh rabbit (*Sylvilagus palustris*). The Atlantic bottlenose dolphin (*Tursiops truncatus*), green sea turtle (*Chelonia mydas*) and loggerhead sea turtle (*Caretta caretta*) utilize the waters around the island. Common fish species found at the site include southern flounder (*Paralichthys lethostigma*), red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), weakfish (*Cynoscion regalis*), kingfish (*Menticirrhus* spp.), striped mullet (*Mugil cephalus*), pinfish (*Lagodon rhomboides*), pigfish (*Orthopristis chrysotera*) and many more.

Threats and Stressors

Shoreline Change

Shoreline change is occurring in several locations throughout the Rachel Carson Reserve due to its location in the vicinity of the dynamic Beaufort Inlet system and the complex interaction of natural and anthropogenic influences in the area. A living shoreline was installed at the southeast shoreline of Carrot Island in 2012 as part of a collaborative estuarine shoreline stabilization project to test the efficacy of this type of structure in a highly erosive environment (shoreline is eroding at a rate of 3 feet per year). Shoreline and elevation change along Bird Shoal and the western portion of the Reserve is of concern as these sandy inlet-facing areas provide habitat for protected species, protect against storm surge, and are used for recreational purposes. Due to the low elevation of Bird Shoal, overwash events are not uncommon and most often occur during higher than average high tides and storm events. Erosion is also a concern on the edges of the marsh complex at Middle Marshes. Reserve staff are currently undertaking efforts to understand shoreline change across the Reserve and specific to Bird Shoal. These efforts include analyzing erosion and accretion in this area using historical and current imagery, and conducting shoreline elevation studies to better understand short- and long-term shoreline change.

Water Quality

The largest point source discharge impact to the Rachel Carson Reserve is the Beaufort Wastewater Treatment Plant. The outfall pipe discharges into Taylor's Creek directly across from Deep Creek. Because of the potential

for a wastewater spill from this outfall and stormwater runoff and boat head discharge concerns, the waters of Taylor's Creek and four of the site's islands (Town Marsh, Carrot Island, Bird Shoal, and Horse Island) are permanently closed to shellfishing.

Invasive Species

Invasive plant and animal species found on the islands of the Rachel Carson site include tamarisk tree (or salt cedar, *Tamarix* sp.), Japanese honeysuckle (*Lonicera japonica*), red algae (*Gracilaria vermiculophylla*), Asian shore crab (*Hemigrapsus sanguineus*), feral horse (*Equus caballus*), and others. The tamarisk tree is monitored through long-term mapping efforts. Over time, invasion by additional species such as lionfish (*Pterois*) or organisms introduced via ballast water may take place as range expansion occurs or new species are introduced to the region.

Feral Horses

The Rachel Carson Reserve is home to a resident population of feral horses, which are considered to be an introduced species, but are allowed to roam the islands due to their cultural significance. These horses descend from a population placed on the islands in the late 1940s and are managed by Reserve staff through a humane birth control and monitoring program. The herd is maintained at approximately 30 individuals and due to their isolation on the islands, provide an opportunity to study their impact on a coastal island ecosystem.

Visitor Use

In recent years, use of the Rachel Carson Reserve by visitors and commercial enterprises (i.e., ferries and tour groups) has increased due to growth in tourism and the local coastal population. Although most visitors leave little to no trace of their presence, inappropriate activities and excessive or irresponsible visitor use can result in damage to habitats and disturbance of wildlife as well as reduce the overall visitor experience. The most common visitor related challenges are dogs off leash; approaching and/or harassing wild horses; leaving trash and/or personal property behind; vandalism of Reserve property; and camping. The Reserve regularly promotes responsible visitor use of the site through signage, various communication initiatives, and social media to help maintain a balance between resource protection and public enjoyment and safety. Enforcement of Reserve rules and policies as well as State and local laws is provided by partner agencies which often have limited time and resources to devote to this effort. Enforcement of visitor use issues is further complicated because the site can only be reached by boat.

Vessel Groundings

Throughout the year and particularly during storm events, improperly secured vessels that are anchored or moored in Taylor's Creek wash ashore on the site. The vessels primarily ground in wetland habitats such as marsh and oyster reef. Removal operations often noticeably disturb these sensitive habitats, sometimes with large portions of sediment and marsh grass being sloughed from the shoreline.

Marine Debris

Marine debris is a continuous problem at the site, more so than user-generated debris. Since 2007, staff and volunteers have removed over 15,000 pounds of debris, which is primarily comprised of plastic and wood from docks, boats, and construction. Marine debris can release toxins, cover and damage habitats, and harm wildlife through entanglement or ingestion. Additionally, debris is unsightly and can pose safety hazards to visitors. Efforts are ongoing to understand the composition of debris, its effects on habitats, and accumulation rates.

Sea Level Rise and Storms

Barrier island and estuarine island ecosystems are subject to forces, such as sea level rise and storms, which move sediment, cause changes in topography and geomorphology, and require constant adaptation by vegetation communities. The Rachel Carson Reserve has characteristics of both estuarine island and barrier island ecosystems given the site's close proximity to Beaufort Inlet and direct contact with the Atlantic Ocean. Generally, as sea level rises, barrier islands and some estuarine islands retreat landward and/or have the potential to become submerged. Large storms such as nor'easters and hurricanes redistribute sediment, resulting in erosion and accretion in different areas. At the Rachel Carson Reserve, erosion and accretion, particularly along the southern edge of the site, are obvious after these large storm events. The 2015 N.C. Sea Level Rise Report Update shows that the sea level in Beaufort, N.C., will increase an average of 3.2 inches in the next 30 years. Sea level rise and storms have the potential to result in significant change to the site's natural resources, particularly if water levels change at a greater rate than accretion is occurring.

Masonboro Island Reserve

Site Description and Location

The Masonboro Island Reserve was designated as the fourth site of the NCNERR in 1991 and is the largest of the four NCNERR sites. The site is located within the Carolinian biogeographic province. It is included in the NCNERR because it is the largest undisturbed barrier island along the southern coast of North Carolina, providing an excellent location for the study of natural barrier island systems, including sediment movement and its effect on biological communities (Figure 2).

The site is located in New Hanover County between the barrier island towns of Wrightsville Beach and Carolina Beach. Comprised of the barrier island known as Masonboro Island, as well as the associated dredge material islands and surrounding salt marsh and tidal creek system, the Masonboro Island Reserve is bounded by Masonboro Inlet to the north, the Atlantic Ocean to the east, Carolina Beach Inlet to the south, and the Atlantic Intracoastal Waterway (ICW) to the west. The city of Wilmington lies approximately five miles to the northwest (Figure 11).



Figure 11. Masonboro Island Reserve Boundary Map

The island is approximately 8.4 miles long and the management boundary encompasses 5,653 acres. The back-island sounds plus associated tidal creeks and salt marshes are included in the core area, totaling 4,163 acres. Masonboro Island proper and dredge material islands along the ICW constitute the buffer area, totaling 1,490 acres consisting of ocean beach (868 acres) and upland (622 acres) habitat. The buffer area also includes 50 acres owned by the University of North Carolina Wilmington (UNCW) located across the ICW from the island. Part of the Campus for Research, Entrepreneurship, Service and Teaching, the UNCW Center for Marine Science (CMS) houses the Reserve office for the Masonboro Island and Zeke's Island Reserves (Figure 12).

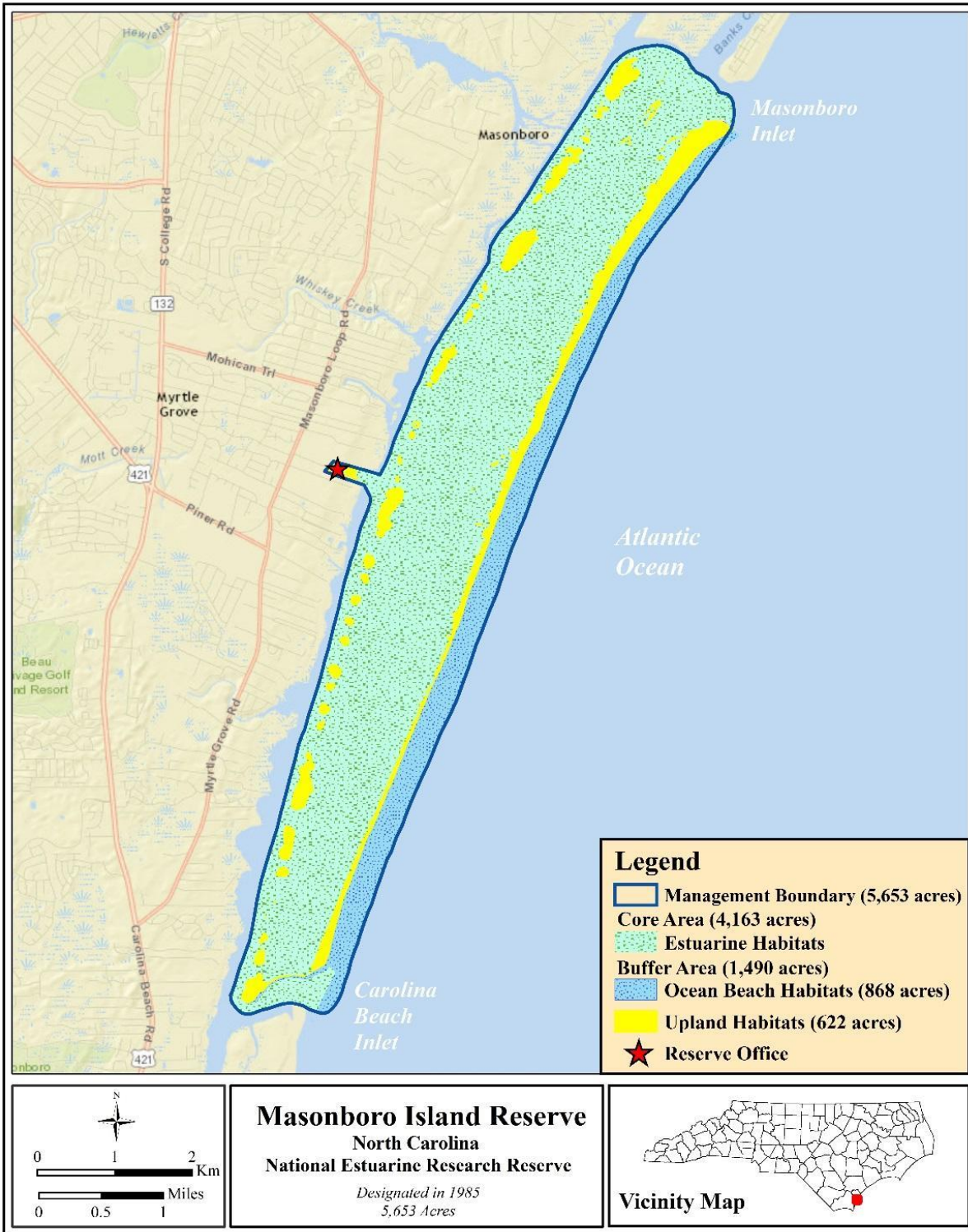


Figure 12. Masonboro Island Reserve Core and Buffer Map

The site was added to the NCNERR following the efforts of the local community to prevent commercial and recreational development on Masonboro Island Reserve. The site is owned by the State of North Carolina, except for a small number of remaining privately owned inholdings, and management of the site is delegated by the State to DCM. The Division of Parks and Recreation retains authority over the 150-acre Masonboro Island State Natural Area located within the management boundary. The U.S. Army Corps of Engineers holds a linear easement near the western boundary that includes areas of historic, current, and potential future dredge material disposal cells. The Masonboro Island Reserve is the only NCNERR site that has privately-owned parcels within the management boundary. There are 12 remaining privately owned properties totaling approximately 17 acres of Masonboro Island proper, as well as two sections of dredge material deposition islands that are privately held. The site is managed by staff located at the CMS. Seasonal staff and university interns are utilized to support management activities. Land management and species monitoring activities are conducted in cooperation with various State and Federal agencies, as well as local partner organizations. Enforcement activities are conducted by local and State law enforcement agencies on behalf of and in coordination with the Reserve.

The Masonboro Island Reserve serves as an outdoor classroom for teachers, students, and the general public. Reserve staff occasionally offer programs at the site that focus on coastal and estuarine ecosystems. A self-guided nature trail provides the public with the opportunity to learn about site features and coastal ecology.

Long-term research and monitoring is conducted at Masonboro Island Reserve by staff and includes SWMP water quality and meteorological monitoring, biological monitoring of emergent marsh vegetation, and habitat mapping. NCNERR research staff are also monitoring long-term changes in marsh surface elevation. Partner organizations and university students and researchers regularly use the site for research projects addressing a wide array of coastal topics.

Land cover in both New Hanover County and the City of Wilmington is primarily developed for residential and commercial uses, with pockets of open space scattered throughout. Agriculture and industrial uses are very minor land cover types. The site is located in the Cape Fear River Basin (Figure 13, part of New Hydrologic Unit Code: 03030001). The total population estimate of New Hanover County in 2014 was 216,298; 48% male, 52% female (Census.gov 2014). The population is comprised of 81.3% White, 14.6% Black, 5.4% Hispanic or Latino (Census.gov 2014). 16.5% of the population was living below the poverty level and the average household income was \$69,443 (Census.gov 2013). The main occupations in 2013 were management, business, science, arts, and sales (Census.gov 2013). The top industries were educational services, health care and social assistance, arts, entertainment, recreation, accommodation, and food services (Census.gov 2013).

Masonboro Island Reserve: Cape Fear River Basin, 2010 Land Cover Data from NOAA CCAP

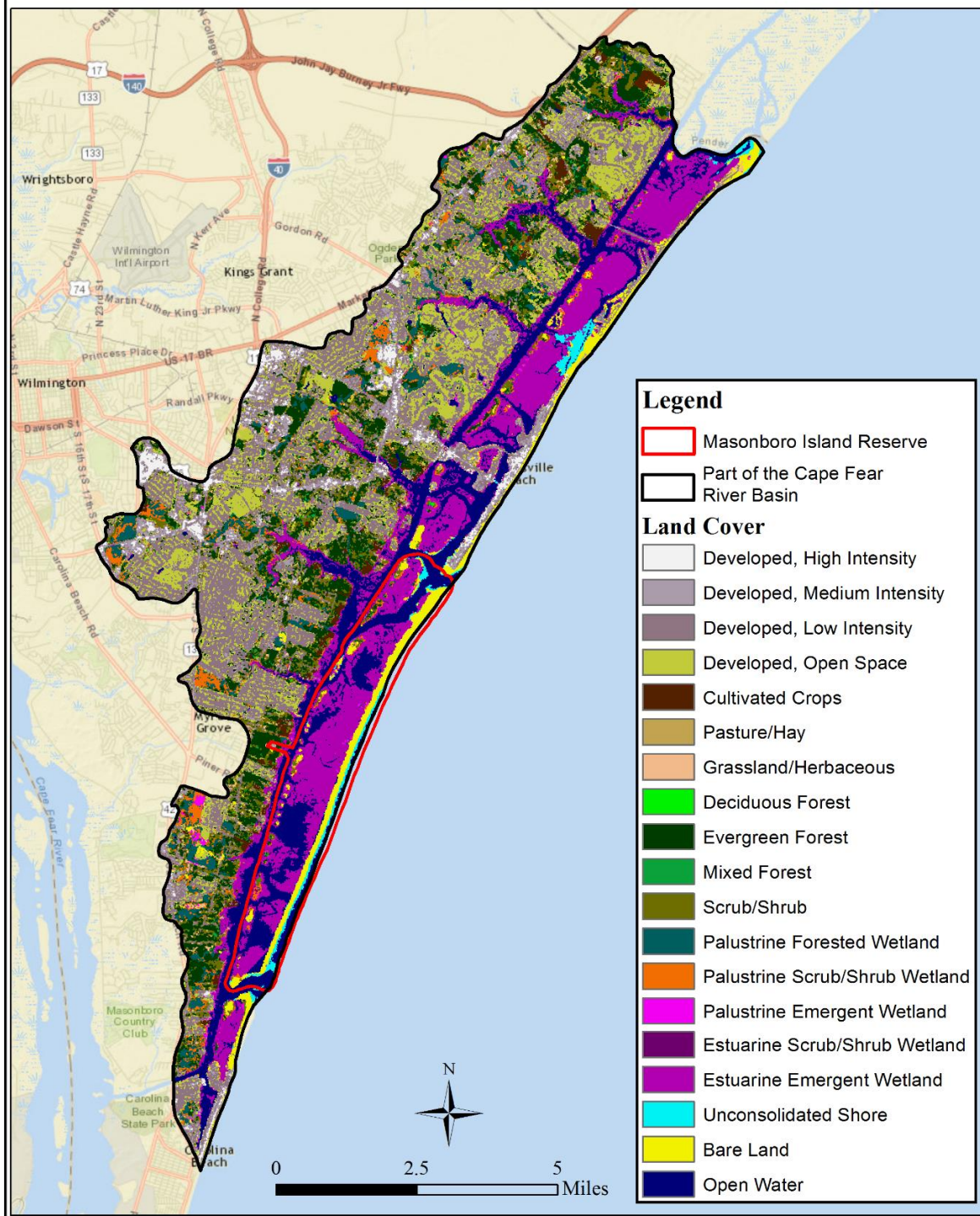


Figure 13. Masonboro Island Reserve Watershed Map

Masonboro Island Reserve is only accessible by boat. Public boat ramps owned by the WRC are located at Wrightsville Beach and Carolina Beach and are approximately 3 miles and 1.5 miles from the site. The Trails End Park, a New Hanover County park, is located just across the ICW from the site. Although the majority of visitors travel to the island via private motorized and non-motorized boats, private commercial operators also provide fee-based ferry service to the site. Most visitors land on the sound side of the northern and southern ends of the island where there are large sandy beaches. Other natural landing areas on the sound side of the Reserve are accessible only during the higher portion of the tidal cycle. No boat landing or anchoring infrastructure exists on the site.

Masonboro Island Reserve is used extensively by the public for traditional activities such as nature-based recreation, hunting, and fishing. Visitors enjoy access to both the ocean and sound beaches, utilizing a number of primitive trails to cross from the sound side landing areas to the ocean beach. Recreational activities at the site that are primarily associated with Masonboro Island proper, include beach walking, sunbathing, motorized and non-motorized boating, surfing, paddle boarding, birdwatching, and surf fishing. Hunting and fishing, both recreational and commercial, occur throughout the marshes and waters within the boundary, as well as on the dredge material islands. This site is the only site within the NCNERR where primitive camping is permitted.

Geomorphology, Hydrology, Climate, and Weather

Masonboro Island Reserve consists of Recent (less than ~11,550 years old) and Pleistocene (~1.8 million to ~11,550 years before present) sediments (Atkinson et al. 1998, Moorefield 1978). The upland areas include natural and dredge material built areas. These are mostly found on the back side of the island and along the western boundary adjacent to the ICW. Masonboro Inlet is stabilized by jetties on the southern end of Wrightsville Beach and the northern end of Masonboro Island Reserve. Portions of Masonboro Island proper's ocean beach periodically receive sand deposits during inlet maintenance activities conducted by the U.S. Army Corps of Engineers due to a study that indicated a sand deficit associated with the jetty structure's disruption of natural sediment flows. Carolina Beach Inlet, at the southern end, is an artificial waterway created to enhance boater access to the Atlantic Ocean. Sand from maintenance of this inlet has not been placed on Masonboro Island Reserve. Material is occasionally placed on select dredge material islands as a result of maintenance of the ICW or nearby private marinas and waterways. Due to the low elevation of the Reserve, particularly along its southern half, overwash of the beach is common during spring tides and storms.

As a result of the direct connection to the ocean at both inlets, the salinity of the waters within the site's boundary is consistent with ocean water and semidiurnal lunar tides influence the site, averaging 3.8 feet. Freshwater influx, with associated sediment and nutrient transport, comes from several small tidal creeks on the mainland across the ICW and from the Cape Fear River through Snow's Cut. Salinity ranges between 20-35 ppt. Waters at the site are designated as Outstanding Resource Waters by the N.C. Division of Water Resources and Primary Nursery Areas by the DMF.

The weather at the Masonboro Island Reserve is typical of a maritime climate, with the ocean having a strong moderating effect on air temperature compared to nearby mainland areas. Climatologically, the area is classified as subtropical with humid, warm summers and mild winters. Tropical cyclones, ranging from tropical depressions to large hurricanes, are a regular weather impact at the site, introducing freshwater into the estuarine system and sometimes causing storm surges that can lead to significant shoreline change. During winter, nor'easters periodically move through the areas, leading to erosion and sediment redistribution.

Key Habitats and Species

Habitats found within the core area consist of sound waters, intertidal and subtidal soft bottom mud and sand flats, oyster reefs, and intertidal and supratidal salt marshes. Within the buffer area, habitats include shrub thicket, maritime forest, dredge material areas, grasslands, sand dunes and the ocean beach (Figure 14).

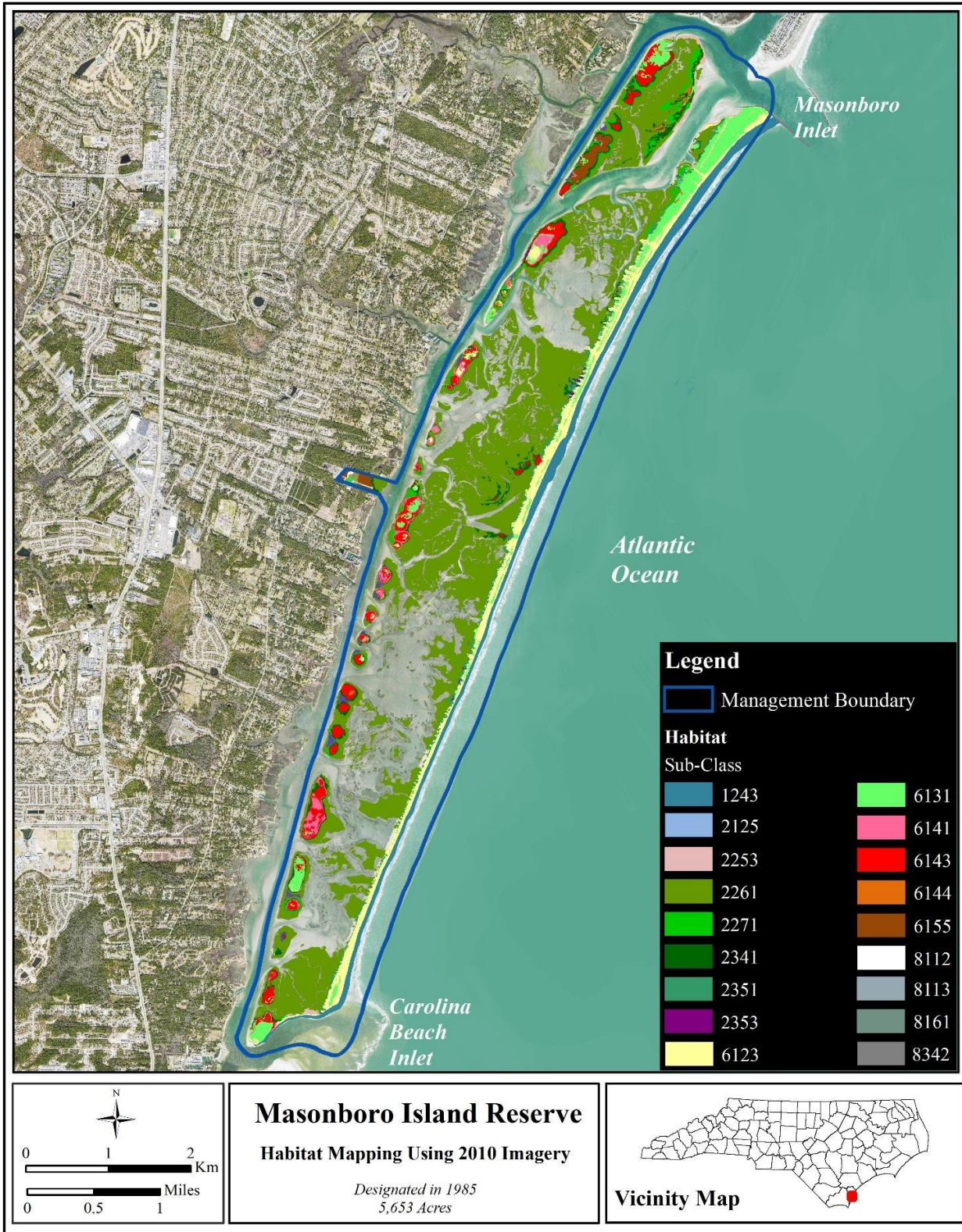


Figure 14. Masonboro Island Reserve Habitat Map

| Habitat | Subsystem | | Class | Sub-Class | | COLOR | |
|---------------------|-----------|---------------------------------|-------|-----------------------|------|--------------------------|--|
| Marine | 1200 | Intertidal | 1240 | Unconsolidated Shore | 1243 | Sand | |
| Estuarine | 2100 | Subtidal Haline | 2120 | Unconsolidated Bottom | 2125 | Organic | |
| | | | 2250 | Unconsolidated Shore | 2253 | Sand | |
| | 2200 | Intertidal Haline | 2260 | Emergent Wetland | 2261 | Persistent | |
| | | | 2270 | Scrub Shrub Wetland | 2271 | Broad Leaf Deciduous | |
| | | | 2340 | Emergent Wetland | 2341 | Persistent | |
| | 2300 | Supratidal Haline | 2350 | Scrub Shrub Wetland | 2351 | Broad Leaf Deciduous | |
| | | | | | 2353 | Broad Leaf Evergreen | |
| Upland | 6100 | Supratidal Upland | 6120 | Unconsolidated Upland | 6123 | Sand | |
| | | | 6130 | Herbaceous Upland | 6131 | Grassland | |
| | | | 6140 | Scrub Shrub Upland | 6141 | Broad Leaf Deciduous | |
| | | | | | 6143 | Broad Leaf Evergreen | |
| | | | | | 6144 | Needle Leaf Evergreen | |
| | | | 6150 | Forested Upland | 6155 | Mixed | |
| Cultural Land Cover | 8100 | Developed Upland | 8110 | Impervious Cover | 8112 | Paved Roadway | |
| | | | | | 8113 | Large Building | |
| | 8300 | Dev. & Managed Wetlands & Water | 8340 | Rocky Cover | 8160 | Herbaceous Cover | |
| | | | | | 8342 | Rocky In-Water Structure | |

Table 3. Masonboro Island Reserve Habitat Map Legend

Masonboro Island Reserve supports a myriad of coastal and estuarine species. Loggerhead (*Caretta caretta*) and green sea turtles (*Chelonia mydas*), both federally protected threatened species, nest on the ocean beach. Seabeach amaranth (*Amaranthus pumilus*), a federally listed threatened species, has historically been documented growing on the foredunes. Tough bumelia (*Sideroxylon tenax*), a federal species of concern, is found scattered throughout shrub thicket areas. Dune bluecurls (*Trichostema sp.*), a federally listed significantly rare plant, is found on dredge material islands within the boundary.

Other species of concern found at the site are the American oystercatcher (*Haematopus palliatus*), Wilson’s plover (*Charadrius wilsonia*), and least tern (*Sterna antillarum*), all of which routinely utilize Masonboro Island Reserve for nesting. The piping plover (*Charadrius melodus*), brown pelican (*Pelecanus occidentalis*), and black skimmer (*Rynchops niger*) use the site for foraging or during migration. Black skimmers historically nested on the island but have not been documented in recent years. The site is located within the Atlantic Flyway. In total, the site has been documented to provide habitat to over 250 species of birds and over 150 species of fish. Its waters and marshes provide important nursery area for numerous commercially important finfishes. The marshes and creeks of the site are home to the estuarine dependent diamondback terrapin (*Malaclemys terrapin*), which is a state species of special concern. The Atlantic bottlenose dolphin (*Tursiops truncatus*) regularly utilizes the waters around the island. The waters and submerged areas of Masonboro Sound are an important source of oysters, clams, and blue crabs for local recreational and commercial fishermen.

Threats and Stressors

Property Ownership

The Masonboro Island Reserve is the only site within the NCNERR that includes privately owned inholdings.

Although these areas constitute a small total area within the management boundary, ownership of parcels by private individuals will eliminate the possibility of development on the island thereby keeping the ecosystem intact for Reserve purposes.

Visitor Use

Due to its proximity to the large, growing population center of Wilmington and the ease of access afforded by the ICW, portions of the Masonboro Island Reserve receive significant visitor use. Although most visitors leave little to no trace of their presence, inappropriate activities and excessive or irresponsible visitor use can result in damage to habitats and disturbance of wildlife as well as reduce the overall visitor experience. Sound side beaches along the northern stretches of the island are particularly heavily used during summer holidays, with visitor activity sometimes including very large gatherings, excessive alcohol use, and significant quantities of trash. The Reserve regularly promotes responsible visitor use of the site through signage, various communication initiatives, and social media to help maintain a balance between resource protection and public enjoyment and safety. Enforcement of Reserve rules and policies at the site, as well as State and local laws, is provided by partner agencies which often have limited time and resources to devote to this effort. The size of summer holiday gatherings has required the NCNERR to dedicate a portion of its funding to contract supplemental local law enforcement to maintain public safety. Enforcement of visitor use issues at the site is further complicated because the site is only accessible by boat.

Water Quality

The water quality in and around the Masonboro Island Reserve has been impacted periodically by sewage contamination associated with failures in or disturbances to the City of Wilmington wastewater treatment system and by non-point source pollution contained in stormwater runoff associated with land development and land cover change in the surrounding watershed (NCNERR, 2008). Wastewater contamination can result in shellfish bed closures and swimming advisories. Population growth projections, development and land cover change are likely to continue to affect water quality in the watershed in coming decades.

Sea Level Rise and Storms

Barrier islands ecosystems are subject to forces such as sea level rise and storms that move sediment, cause changes in topography and geomorphology, and require constant adaptation by vegetation communities. As sea level rises, barrier islands such as Masonboro Island Reserve retreat landward. Large storms such as nor'easters and hurricanes redistribute sediment across the barrier beach and sediment from the water column is deposited on the surface of the marsh, although accretion rates in the marsh are not well understood. The 2015 NC Sea Level Rise Report Update shows that the sea level in Wilmington, N.C., will increase an average of 2.4 inches in the next 30 years. Sea level rise and storms have the potential to result in significant change to the site's natural resources, particularly if water levels change at a greater rate than accretion is occurring.

Sediment Movement Disruption

At the Masonboro Island Reserve, a sand deficit resulting from the disruption of longshore sediment flow caused by the Masonboro Inlet jetties has been documented. To mitigate the deficit, sand has periodically been placed along the ocean beach as part of maintenance of Masonboro Inlet. However, the quantity of sand placed has not matched the projected deficit and the southern portions of the island are sand deprived (U.S. Army Engineer District, 2000). Changing conditions related to sand redistribution priorities and funding associated with these projects may decrease the likelihood of regular sand placement on Masonboro Island Reserve, presenting challenges to maintaining ocean beach habitat.

Invasive Species

Invasive plant species can alter habitats by outcompeting native vegetation. Species known to occur at the Masonboro Island site include the common reed (*Phragmites australis*), beach vitex (*Vitex rotundifolia*), and red algae (*Gracilaria vermiculophylla*). Over time, invasion by additional species may take place as range expansion occurs or new species are introduced to the region.

Predators

Masonboro Island Reserve represents some of the highest quality habitat available in southeastern North Carolina for nesting sea turtles and nesting, foraging, and roosting waterbirds, including several species listed as species of special concern in North Carolina. Reserve staff began monitoring sea turtle and shorebird nests in 2006 and these efforts show that predation has been a threat to sea turtle and shorebird nests. Predation has lowered reproductive success or resulted in complete nest failure. Red fox (*Vulpes vulpes*) are known to inhabit the island and were a major source of sea turtle nest predation between 2006 and 2013 (NCNERR, unpublished data). Red fox are sometimes considered subsidized predators due to their tendency to live near and benefit from association with humans; the red fox population has been managed to reduce the predation impact on sea turtle nesting. Raccoon are known to be present, gray fox are believed to be present, and coyote have been documented in the past.

Zeke's Island Reserve

Site Description and Location

The 1,635-acre Zeke's Island Reserve was designated in 1985 and is located in the Carolinian biogeographic province (Figure 2). The lagoon-like character of the northern open water portion of the site, known locally as "the basin," represents a unique estuary type with distinct water chemistry and water quality characteristics for the NCNERR. The site's location adjacent to the Cape Fear River makes it an excellent reference for river ecosystems and its position between additional undeveloped islands and marshes provides additional protection for its ecosystems.

The site is located in both Brunswick and New Hanover counties in southeastern North Carolina, just south of Kure Beach (Figure 15). The nearest population center is Wilmington, N.C., located 22 miles to the north.

Southport, N.C., is located across the Cape Fear River 10 miles to the south-southwest. The Zeke's Island site is bounded to the north by Federal Point (which includes Fort Fisher State Recreation Area and the North Carolina Aquarium at Fort Fisher), to the east by the Atlantic Ocean, the Cape Fear River to the west, and the Bald Head Island State Natural Area and greater Smith Island complex to the south.



Figure 15. Zeke's Island Reserve Boundary Map

The western boundary for the Zeke's Island Reserve is a late 19th century rock jetty commonly called 'the rocks' which is comprised of the New Inlet Dam and Swash Defense Dam. The jetty was installed by the U.S. Army Corps of Engineers as a sediment control structure to minimize shoaling of the shipping channel in the Cape Fear River. The area to the east of the jetty has become lagoonal in nature (Figure16). The core area of the Zeke's Island Reserve includes 1,418 acres of estuarine habitats with tidally influenced basin waters, creeks, and intertidal and supratidal marsh communities. The buffer area for Zeke's Island Reserve comprises 217 acres: 177 acres of upland habitats distributed between Zeke's Island, North Island, and the barrier spit along the Atlantic Ocean, and 40 acres of intertidal ocean beach habitat along the Atlantic Ocean shoreline. Zeke's Island has elevations of only several feet. North Island has several scattered dune systems, some of which reach up to twenty feet above sea level.

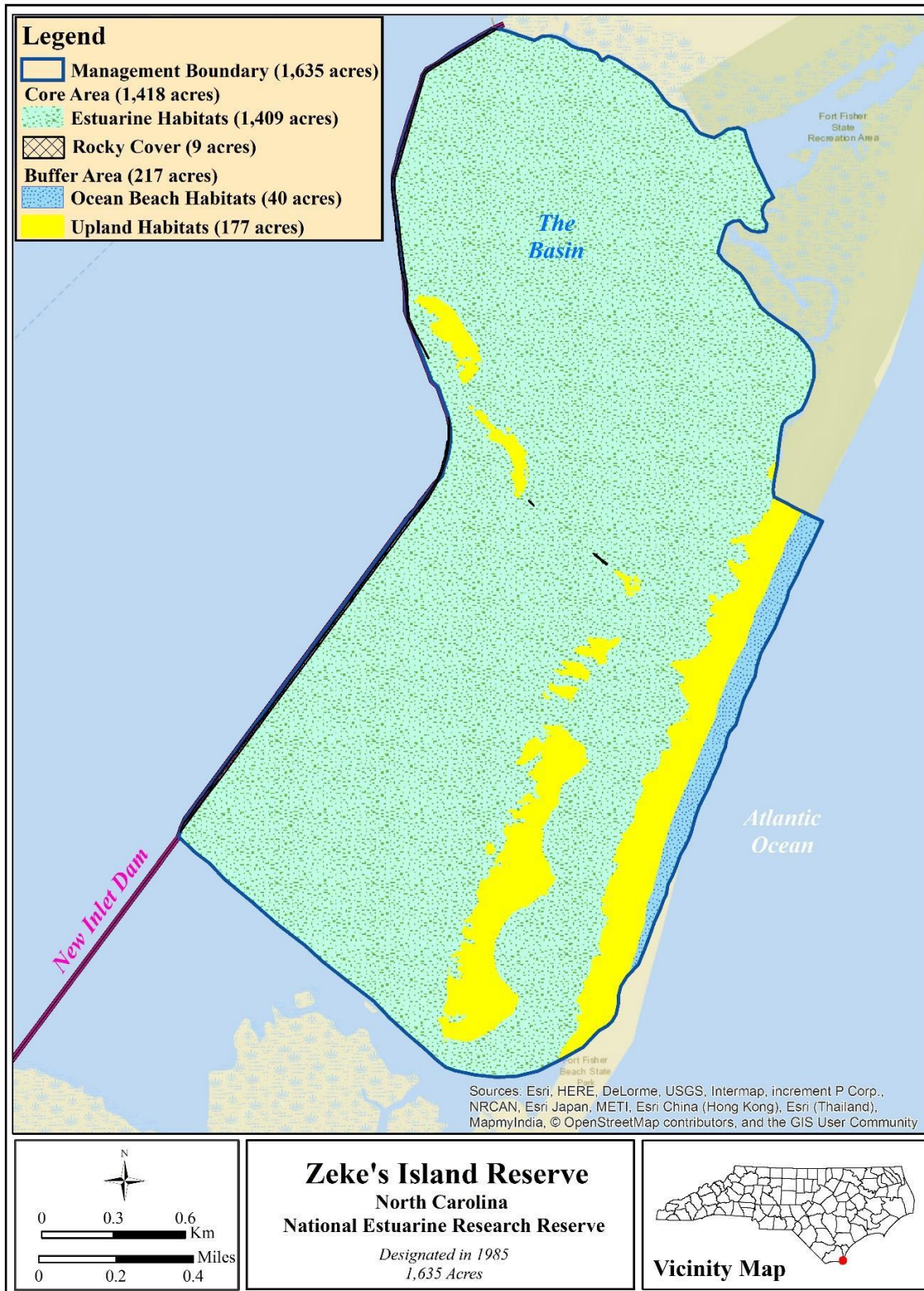


Figure 16. Zeke's Island Reserve Core and Buffer Map

Zeke's Island Reserve is owned by the State of North Carolina and management of the site is delegated by the State to DCM. The site is managed by staff located at the CMS and supported by the N.C. Division of Parks and Recreation, through its Fort Fisher State Recreation Area staff. Land management activities are conducted in cooperation with various State and Federal agencies, as well as local partner organizations. Enforcement activities are conducted by local and State law enforcement agencies on behalf of and in coordination with the Reserve. The Fort Fisher State Recreation Area staff provides the majority of the on-site management for daily operations along the beach strand and driving beach, as well as providing species of interest monitoring and protection.

The Zeke's Island Reserve serves as an outdoor classroom for teachers, students, and the general public. Fort Fisher State Recreation Area and N.C. Aquarium at Fort Fisher staff occasionally offer educational programs at the site. Long-term research and monitoring is conducted by Reserve staff at the site including SWMP water quality monitoring, biological monitoring of emergent marsh vegetation, habitat mapping, and monitoring long-term changes in marsh surface elevation. Partner organizations, university students and researchers investigate a wide array of coastal topics at the site.

The Zeke's Island Reserve is located in the Cape Fear River watershed and straddles the boundary between Brunswick County (to the south) and New Hanover County (to the east) (Figure 17, part of Lower Cape Fear Hydrologic Unit Code: 03030005). Land use in the Cape Fear River basin ranges from highly developed residential areas to agricultural uses to industrial development. These two counties boast the largest populations of the counties in which NCNERR sites are located. Both counties are rapidly developing with increasing populations and commercial development. The total population estimate of New Hanover County in 2014 was 216,298; 48% male, 52% female (Census.gov 2014). The population is comprised of 81.3% White, 14.6% Black, 5.4% Hispanic or Latino (Census.gov 2014). 16.5% of the population was living below the poverty level and the average household income was \$69,443 (Census.gov 2013). The main occupations in 2013 were management, business, science, arts, and sales (Census.gov 2013). The top industries were educational services, health care and social assistance, arts, entertainment, recreation, accommodation, and food services (Census.gov 2013).

Zeke's Island Reserve: Lower Cape Fear River Basin, 2010 Land Cover Data from NOAA CCAP

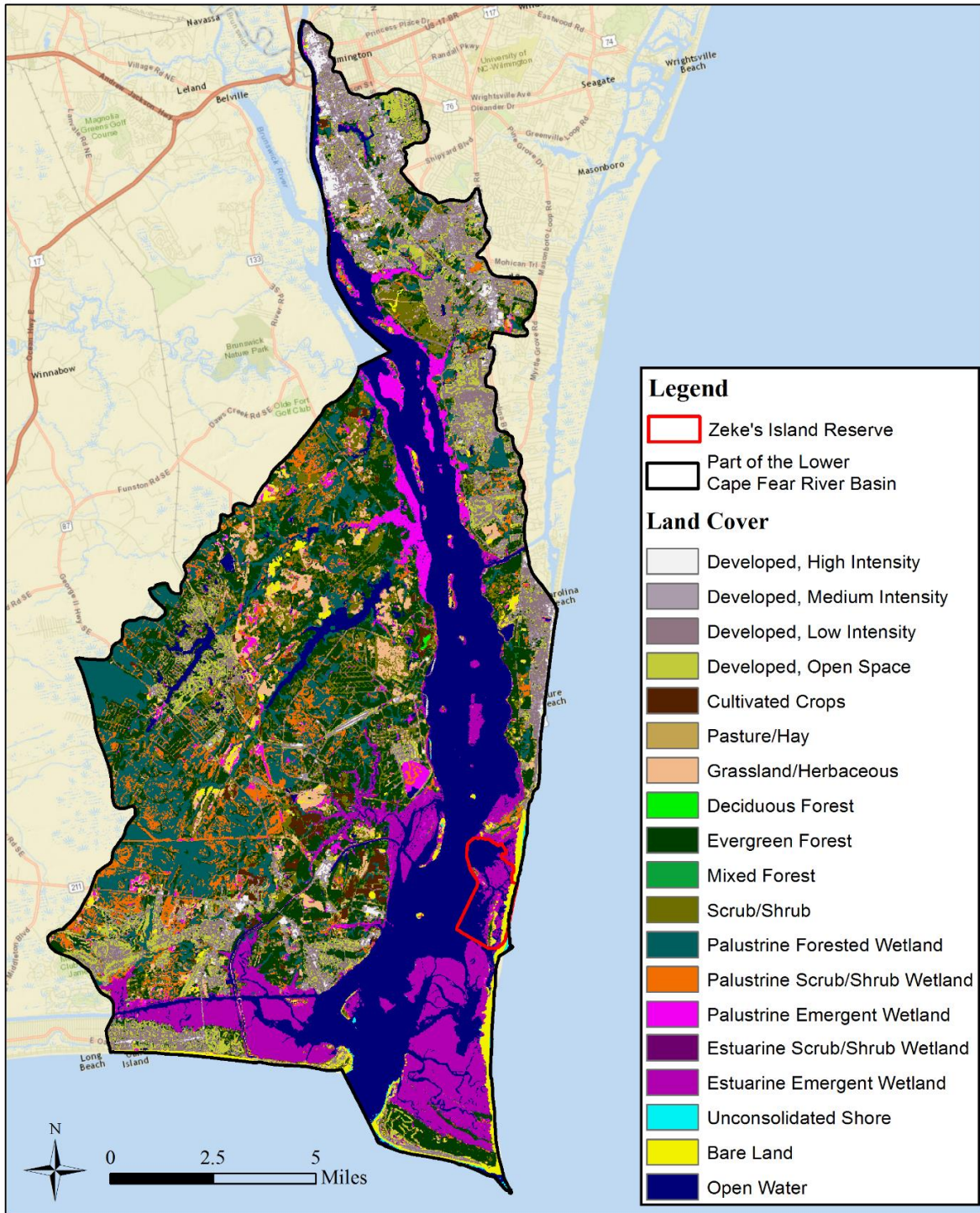


Figure 17. Zeke's Island Reserve Watershed Map

In 2014, the population estimate of Brunswick County was 118,836; 48.6% male and 51.4% female (Census.gov 2014). In 2014, the population was 85.4% White, 11.2% Black, 4.8% Hispanic or Latino (Census.gov 2014). 16.6% of people lived below the poverty level and \$61,517 was the mean household income ([Census.gov 2013](#)). The main occupations in 2013 were business, science, arts, sales, and office. The top industries were educational services, health care and social assistance, manufacturing, retail trade, and real estate. (Census.gov 2013).

The waters of the Zeke's Island Reserve, as well as Zeke's Island and North Island proper, are accessible by boat. A boat ramp owned by the WRC is located at the northern end of the Reserve, providing motorized and non-motorized boat access to the Reserve. It is possible to access Zeke's Island by walking along the rock jetty, but this access method is not recommended because it is not safe and has resulted in injuries and emergency rescue of visitors. A walking trail at the Fort Fisher State Recreation Area overlooks the Reserve's marshes and waters.

Zeke's Island Reserve is used extensively by the public for traditional activities such as nature-based recreation, hunting and fishing. Visitors accessing the ocean beach via pedestrian trails or by the North Carolina Division of Parks and Recreation permitted 4 wheel drive off-road vehicle access engage in beach walking, sunbathing, surfing, birdwatching, and surf fishing. Visitors accessing the waters of the site via the public boat ramp are primarily using the site for motorized and non-motorized boating, hunting, and fishing, both recreational and commercial.

Geomorphology, Hydrology, Climate, and Weather

The Zeke's Island Reserve contains surface sediments representative of the coastal plain. These sediments are varying combinations of sand, silt, and clay, from terrestrial and marine sources. Some of these deposits are considered Recent (less than ~11,550 years old) and some are of Pleistocene (~1.8 million to ~11,550 years before present) origin (Atkinson et al. 1998, Moorefield 1978). The Pleistocene deposits are thin blankets of marine and estuarine sands and clays occurring in a series of terraces and scarps related to previous shoreline locations. These deposits overlay layers of Cretaceous (~140 to ~70 million years before present) and Tertiary (~70 to ~1.8 million years before present) terrigenous and carbonate deposits (Atkinson et al. 1998, Moorefield 1978).

The Cape Fear region is representative of coastal cape formations along North and South Carolina. Shoals often extend seaward from these cape areas. Frying Pan Shoals extends seaward from the Cape Fear estuary area outward to approximately 31 miles. Barrier island formations generally extend north and southwest off these cape regions. The accepted theory is that the capes have maintained their basic positions and morphologies throughout the Pleistocene and Holocene (~11,550 years ago to present) by migrating landward or seaward in response to sea level changes (Moorefield 1978).

Ocean inlets have historically formed, migrated, and closed within the barrier-spit area of the Zeke's Island Reserve. The last oceanic inlet in this area, New Inlet, closed in March 1999 (Cleary & Marden 2001), connecting Pleasure Island with Bald Head Island. Water exchange at the site is currently dependent on the adjacent Cape Fear River. Coastal processes continue to change and rework the beach environments that produce the site's barrier island and estuarine features.

Due to the tidal nature of the river in the area of the Reserve site, both upstream and downstream influences occur. Although the rock jetty reduces the rate and volume of water exchange with the river, it is porous and regularly overtopped during times of higher tides or higher river water levels, so the quality and characteristics of the river water directly influence the waters within the Reserve. The salinity range is typically 12-30 ppt, but can drop below 10 ppt during periods of heavy rain when significant input of freshwater from upstream can occur, carrying with it sediments and pollutants from across the Cape Fear River Basin, the largest in the state. Due to the site's proximity to the river mouth and the historical deepening of the river's shipping channel, high tides and tropical storm events can introduce large pulses of high salinity water into the area. Tidal range in Zeke's Basin averages 4 feet. Waters at the site are designated as High Quality Waters by the N.C. Division of Water Resources and a portion of the site is considered Primary Nursery Area by the DMF.

The weather at the Zeke's Island Reserve is typical of a maritime subtropical climate, with humid, warm summers and mild winters and with temperatures moderated by proximity to the ocean and river waters. Tropical cyclones, ranging from tropical depressions to large hurricanes, are a regular weather impact at the site. These storms can introduce freshwater into the estuary system and can cause storm surges that lead to significant shoreline change. Storms can also push ocean water up into the river system, exposing ecosystems to higher salinity waters. During winter, nor'easters periodically move through the areas, leading to erosion and sediment redistribution.

Key Habitats and Species

The unusual characteristics of the site have created a variety of habitats, including tidal flats, salt marshes, shrub thicket, maritime forest, sand dunes, ocean beach, and the hard surface of the rock jetty. Extensive salt marshes, open water, and submerged habitats dominate the site. High marsh habitats fringe the upland areas, particularly on Zeke's and North Islands. Small areas of maritime forest are found on both islands in the central portions with the greatest elevation (Figure 18). Habitats in these areas support a variety of faunal species, including white-tailed deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), marsh rabbits (*Sylvilagus palustris*), gray fox (*Urocyon cinereoargenteus*), and red fox (*Vulpes vulpes*).

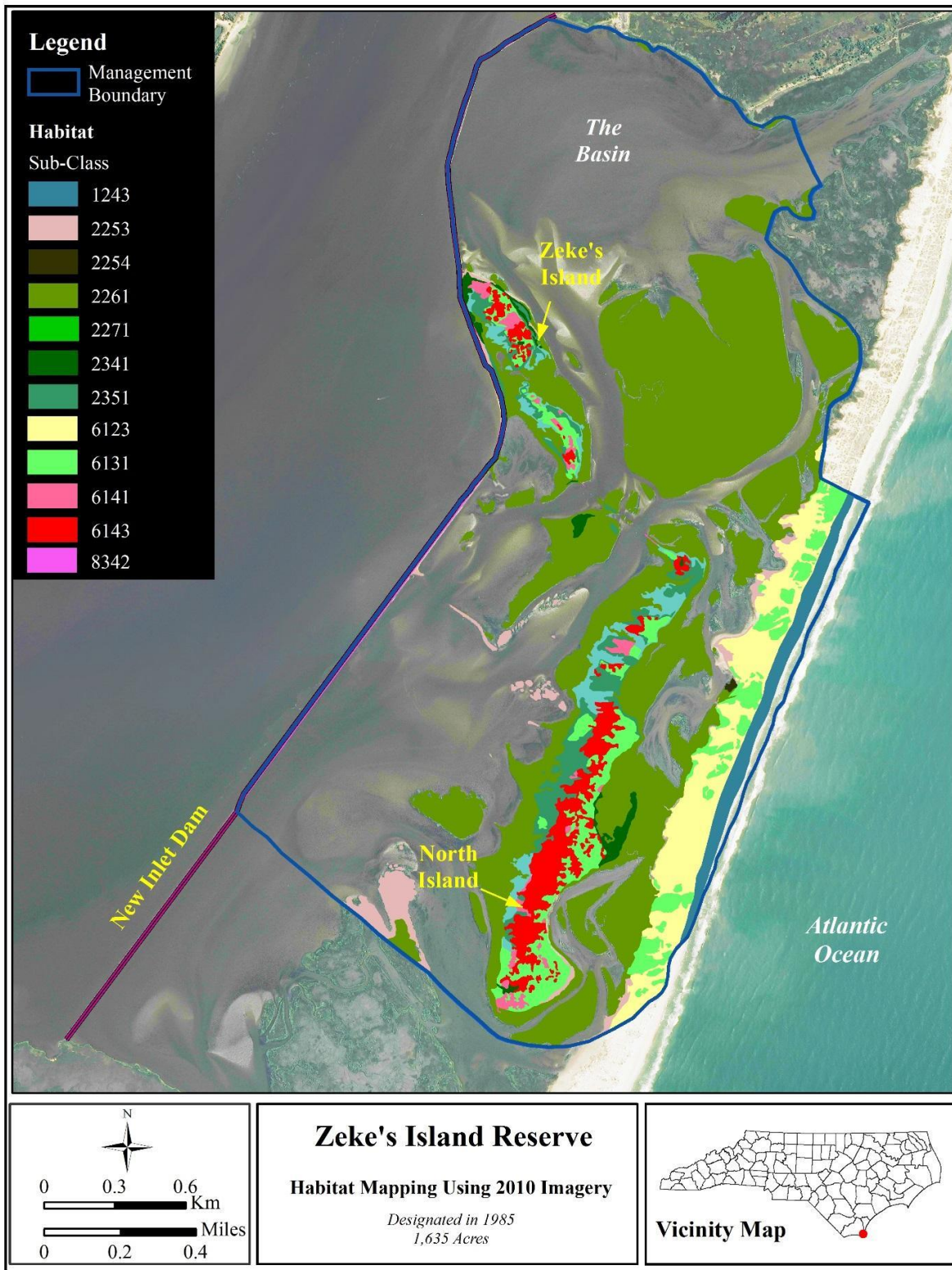


Figure 18. Zeke's Island Reserve Habitat Map

| Habitat | Subsystem | | Class | | Sub-Class | | COLOR |
|---------------------|-----------|---------------------------------|-------|-----------------------|-----------|--------------------------|-------|
| Marine | 1200 | Intertidal | 1240 | Unconsolidated Shore | 1243 | Sand | |
| Estuarine | 2200 | Intertidal Haline | 2250 | Unconsolidated Shore | 2253 | Sand | |
| | | | | | 2254 | Mud | |
| | | | 2260 | Emergent Wetland | 2261 | Persistent | |
| | 2300 | Supratidal Haline | 2270 | Scrub Shrub Wetland | 2271 | Broad Leaf Deciduous | |
| | | | 2340 | Emergent Wetland | 2341 | Persistent | |
| | | | 2350 | Scrub Shrub Wetland | 2351 | Broad Leaf Deciduous | |
| Upland | 6100 | Supratidal Upland | 6120 | Unconsolidated Upland | 6123 | Sand | |
| | | | 6130 | Herbaceous Upland | 6131 | Grassland | |
| | | | 6140 | Scrub Shrub Upland | 6141 | Broad Leaf Deciduous | |
| | | | | | 6143 | Broad Leaf Evergreen | |
| Cultural Land Cover | 8300 | Dev. & Managed Wetlands & Water | 8340 | Rocky Cover | 8342 | Rocky In-Water Structure | |

Table 4. Zeke’s Island Reserve Habitat Map Legend

The surrounding estuarine waters are highly productive and used regularly for recreational and commercial fishing purposes. Fish, shrimp, crabs, clams, and oysters also use the estuary as a nursery ground. Over 100 species of fish have been documented to utilize the site. The extensive mud flats support a vast array of invertebrate species that serve as food items for many species of fish.

Loggerhead (*Caretta caretta*) and green sea turtles (*Chelonia mydas*), both federally protected threatened species, occasionally nest on the site’s open beaches. The marshes and creeks of the site are home to the estuarine dependent diamondback terrapin (*Malaclemys terrapin*), a state species of special concern. Seabeach amaranth (*Amaranthus pumilus*), a federally threatened plant species, has also been found on the site’s foredune areas. Dune bluecurls (*Trichostema sp.*), a federal listed significantly rare plant, is also found within the boundary.

The site is located within the Atlantic Flyway and shorebirds of interest nesting on the barrier island portion of the site include the American oystercatcher (*Haematopus palliatus*) and Wilson’s plover (*Charadrius wilsonia*). Various other birds utilize the site for foraging and resting during migration, including the black skimmer (*Rynchops niger*), dunlin (*Calidris alpina*), and red knot (*Calidris canutus*). Bird utilization surveys of site habitats have documented over 260 species.

Threats and Stressors

Sedimentation

Water depths in the basin area of the site are known to have decreased markedly in recent decades. Local fishermen report that many portions of the basin were up to 20 feet deep, as recently as the 1970s. Following closure of New Inlet, sedimentation has increased rapidly, resulting in shallow water depths throughout the basin area. Shallower water may contribute to the development of extensive algal mats and/or water quality changes, including episodes of hypoxia and occasionally unusual pH patterns.

Visitor Use

The ease of access afforded by the Fort Fisher State Recreation Area beach driving road and the WRC boat ramp expose portions of the site to significant visitor use. Although most visitors leave little to no trace of their presence, inappropriate activities and excessive or irresponsible visitor use can result in damage to habitats and disturbance of wildlife as well as reduce the overall visitor experience. Camping is not permitted at this site yet, illegal camping and campfires occur regularly. Driving on the barrier beach portion of the site is managed by marked corridors; however, occasional instances of driving in wet or vegetated areas occur. The rock jetty constitutes a safety hazard for visitors at the site; despite warning signage, many visitors attempt to utilize the dam to access Zeke's Island or for fishing. The Reserve regularly promotes responsible visitor use of the site through signage, various communication initiatives, and social media to help maintain a balance between resource protection and public enjoyment and safety. Enforcement of Reserve rules and policies at the site, as well as State and local laws, is provided by partner agencies which often have limited time and resources to devote to this effort. Enforcement of visitor use issues on Zeke's and North Islands is further complicated because these portions of the site are only accessible by boat.

Water Quality

The water quality in and around the Zeke's Island site has been impacted periodically by inputs from upstream activities such as non-point source pollution associated with land development and land cover change. Due to population growth projections, development and land cover change are likely to continue to affect water quality in the watershed in coming decades. Water quality can also be influenced by the Cape Fear River shipping channel which has introduced salt water further up into the river as it has been deepened to accommodate larger container ships. As previously stated, some hypoxia and unusual pH events have been documented, although the causes are not well understood at this time.

Sea Level Rise and Storms

Barrier island ecosystems are subject to forces such as sea level rise and storms that move sediment, cause changes in topography and geomorphology, and require constant adaptation by vegetation communities. As sea level rises, barrier islands tend to retreat landward which can be expected of the barrier beach at Zeke's Island Reserve. The 2015 NC Sea Level Rise Report Update shows that the sea level in Wilmington, N.C., will increase an average of 2.4 inches in the next 30 years. Sea level rise and storms have the potential to result in significant change to the site's natural resources, particularly if water levels change at a greater rate than accretion is occurring.

Invasive Species

Invasive plant species can alter habitats by outcompeting native vegetation. Species known to occur at the Zeke's Island site include the common reed (*Phragmites australis*), beach vitex (*Vitex rotundifolia*), red algae (*Gracilaria vermiculophylla*), and white poplar (*Populus alba*). Over time, invasion by additional species may take place as range expansion occurs or new species are introduced to the region.

II. Education Program Plan

Education Program Overview

The National Estuarine Research Reserve System's mission includes an emphasis on education, interpretation, and outreach. Education at each reserve is designed to fulfill the Reserve System goals as defined in the regulations (15 C.F.R Part 921(b)):

- Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;
- Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

To sustain these system goals, the 2011-2016 Reserve System Strategic Plan outlines education objectives that support the focus areas of climate change, habitat protection and water quality:

- Enhance the capacity and skills of teachers and students to understand and use Reserve System data and information for inquiry-based learning; and
- Increase estuary literacy and promote active stewardship among public audiences through the development and delivery of tools and programs addressing climate change, habitat protection, and water quality.

The Reserve System provides a vehicle to increase understanding and awareness of estuarine systems and improve decision-making among key audiences to promote stewardship of the nation's coastal resources. Education and interpretation incorporate science-based content into a range of programs and methodologies that are systematically tailored to key audiences around priority coastal resource issues.

Reserves conduct formal and informal education activities, as well as outreach activities that target culturally diverse audiences of educators and students, environmental professionals, resource users and the general public. Education and public programs, interpretive exhibits and community outreach programs integrate elements of Reserve System science, research and monitoring activities and ensure a systematic, multi-faceted, and locally focused approach to fostering stewardship.

The Reserve System is committed to preparing tomorrow's future leaders with the knowledge and understanding of our nation's oceans and coasts to be responsible stewards. To fulfill this commitment, the Reserve System has created the K-12 Estuarine Education Program (KEEP) to increase the estuary literacy of students, teachers and the general public. The KEEP Program helps students and teachers learn about essential coastal and estuarine concepts, develop data literacy skills and strengthen their critical thinking, team building, and problem-solving skills. K-12 and professional development programs for teachers include the use of established coastal and estuarine science curricula aligned with state and national science education standards and frequently involves both on-site and in-school follow-up activities.

Community education is another priority for the Reserve System. Community education programs foster behavioral change to promote resource conservation. These programs work with audiences whose choices directly impact the integrity of our estuaries and their associated watersheds.

North Carolina NERR Education Program

Education Program Context

The NCNERR education program builds on the NERRS System goals and Strategic Plan, delivering information to target audiences on N.C. coastal resources to foster environmental stewardship and informed decision-making. Reserve education programs are offered for a variety of audiences including K-12 and college students, formal and non-formal educators, and the general public. Field trips, activity books, and summer camps are offered to North Carolina's K-12 and college students to enhance lessons learned in the classroom. To serve formal and non-formal educators, professional development workshops are offered and classroom activities/curricula are developed and available for educator use. Information about the Reserve and North Carolina's estuaries is shared with the general public during summer field trips to Reserve sites and at fairs and festivals. All education programs are open to the citizens and visitors of North Carolina but are most heavily advertised in North Carolina's 20 coastal counties including those that include Reserve sites. The Reserve's research and stewardship initiatives are incorporated into educational activities and scientific information is translated into language that can be understood and applied by target audiences. Where appropriate, education and training staff work to share relevant complementary messages to their intended groups. Efforts will be made to incorporate themes and projects that address the three NCNERR topical areas, as addressed in the Topical Areas Chapter.

Formal needs assessments are conducted every five years with the most recent one completed in 2014. From this evaluation, education staff gained information pertaining to what Reserve education offerings educators use, what topics they would like more information on, and the format they prefer for programs and curricular activities. Topics identified include changing coastal conditions, human impact on the environment, and how estuaries serve as nurseries for marine life. Education programs are also assessed through formal evaluations at the end of most offerings and conversations with program participants; this information is used to refine offerings and topics presented.

Education Program Capacity

Education programs are developed and administered by the education staff. Currently, the education staff includes the Education Coordinator located in the central office and a temporary Stewardship and Education Specialist located in the southern office. Summer education programs and activities are accomplished with the help of interns, part-time temporary assistance, and volunteers. Education programs are conducted in concert with Reserve training, research and stewardship staff who deliver program content and assist with logistics, including the Reserve Manager, CTP Coordinator, Research Coordinator, research staff in Wilmington, and stewardship staff in the northern, central, and southern offices. A teaching classroom for classes, camps, and workshops is located in the central office and a 27 ft. passenger boat is used to transport field trip participants to the Rachel Carson Reserve. For education programs in the southern region, staff use

meeting and classroom space at the CMS facility. Partner facilities are utilized in the northern and southern regions when other space is more conducive to programming or where Reserve facilities don't exist. Examples include the WRC Outer Banks Education Center and N.C. State Parks facilities.

Partnerships with other organizations are an integral part of the Reserve's ability to educate a broader population along the 300 miles of North Carolina's coast. Partners include N.C. Sea Grant, Albemarle-Pamlico National Estuary Partnership, the WRC, the N.C. Office of Environmental Education, the N.C. Maritime Museum and various divisions within the N.C. Department of Environmental Quality. These partners serve in a variety of roles such as co-hosting educator workshops, reviewing curricular activities, and leading student programs.

The education annual budget allows for purchasing of necessary supplies and materials to deliver programs. External funding opportunities are sought and funds are leveraged from partners to implement new programs and initiatives. All programs, except the summer camps, are delivered free of charge and in free partner facilities to maximize program funds.

Education Program Delivery

Education goals and target audiences are engaged through three programs: K-12 and College Student Education Program, Educator Professional Development Program, and Community Education and Outreach Program.

K-12 and College Student Education Program

The K-12 and college student program provides students with hands-on, inquiry-based learning opportunities with content that focuses on North Carolina's coastal and estuarine ecosystems. All K-12 programs are aligned to the North Carolina Standard Course of Study and National Science Standards. National Ocean Literacy Essential Principles and Estuarine Principles and Concepts are also incorporated into K-12 and college student programs. K-12 field trips, classroom visits and summer camps are part of NERRS KEEP.

Field trips are held primarily at the Rachel Carson Reserve each spring and fall and include a two-hour interpretive nature hike that highlights estuaries, and habitats and organisms found at the Reserve. Field studies are also available at the Rachel Carson Reserve for classes that are interested in exploring a topic more in-depth, such as vegetation monitoring, population studies, and water quality testing. Content is tailored to the appropriate grade level and standards. In partnership with Masonboro.org and Carolina Ocean Studies, the Masonboro Island Explorer Program allows New Hanover County fifth grade students the chance to visit the Masonboro Island Reserve. During these field trips, students visit different stations on the island and participate in activities that highlight salt marsh ecology, tidal creeks, and barrier islands. All three activities enforce the grade's curriculum standards. Field trips and studies are evaluated by the students, teachers, and chaperones to determine information learned, program effectiveness, and overall enjoyment. Programs are held at other NCNERR sites as staff and resources are available.

For classes that cannot travel to the Reserve, the education staff offers a variety of classroom-based programs on estuarine-related topics that can be led by teachers. Reserve education staff are available for classroom visits by request.

Through a partnership with the N.C. Maritime Museum, the Reserve offers four summer camp programs for children: Preschool Storytime and Crafts (ages 3-5), Seashore Life 1 (grades 1-2), Seashore Life 2 (grades 3-5), and Coastal Conservation Stewards (grades 6-10). NCNERR education staff schedule, design, and deliver these programs while the N.C. Maritime Museum advertises the camps and registers participants.

The K-12 and college student education program is supported by other Reserve staff members. Training and stewardship staff assist with program delivery and transportation for field trips and studies. Stewardship and research staff offer suggestions on how recent and relevant projects can be incorporated into K-12 and college educational opportunities and assist with translation.

Educator Professional Development Program

The purpose of the educator professional development program is to educate several different audiences-- formal and non-formal educators and pre-service teachers. Formal educators are classroom teachers and non-formal educators are individuals who teach a specific subject, usually in the field. Pre-service teachers are individuals enrolled in college-level education courses. These programs inform educators about coastal and estuarine ecosystems to improve estuarine literacy in both educators and students. The Reserve accomplishes this through workshops and by providing supplementary curricular materials.

Education staff offer two different professional development programs; Coastal Explorations and Teachers on the Estuary (TOTE). The Reserve's Coastal Explorations Workshop is offered to all educators (formal, non-formal and pre-service) in North Carolina who would like to learn more about the Reserve program, estuaries and their importance. This 6-hour workshop highlights the Reserve's curriculum and includes a trip to a Reserve site. The workshop is offered twice a year, once in Beaufort and another rotating between the northern and southern regions. This workshop is currently approved to offer North Carolina teacher certification renewal credits and is an approved course for the North Carolina's Environmental Educators certification program. TOTE is a more in-depth workshop and is part of the NERRS KEEP Program. This program offers hands-on, field-based, professional teacher development opportunities by NERRS sites across the nation. The program goals are for teachers and students to increase their knowledge and appreciation of estuarine environments, as well as, acquire the necessary skills to act as stewards of estuarine resources. This 2-day (15 contact hours) workshop for formal educators highlights national curriculum, NCNERR curriculum, and includes a field trip to a Reserve site. TOTE differs from Coastal Explorations by incorporating research and stewardship staff-led presentations and hands-on activities showcasing current projects, and highlights NERRS Estuaries 101 Curriculum, which is not presented during Coastal Explorations Workshops.

Post-workshop evaluations are conducted for every workshop to ensure that content and delivery meet participant needs. Many educator professional development workshops are conducted in partnership with other organizations, such as offering meeting space and assisting with workshop content. For example, N.C. Sea Grant's educator has shared organization activities that relate to estuaries with NCNERR workshop participants.

The Reserve also provides K-12 educators with written, estuarine-based, curricular material for both classroom and field-based activities. In addition to the curricula, the Reserve produces educational posters, activity books, coloring books, and a variety of informational brochures to use in classrooms. Web resources are also available for teachers/educators to download and use, including basic estuarine information, videos,

and field guides. These resources are promoted during educator professional development programs and at relevant conferences.

Community Education and Outreach Program

The community education and outreach program strives to increase public awareness of the mission and goals of the NCNERR, enhance understanding of estuarine systems and processes by increasing estuarine literacy, and foster environmental stewardship in citizens of all ages. Target audiences are the general public including local citizens of and visitors to coastal North Carolina. Outreach activities include: public field trips; participation in environmental festivals and fairs; public presentations; and production of educational materials.

Every summer the Reserve offers naturalist-led public field trips twice a week to the Rachel Carson Reserve led by trained volunteers and/or Reserve staff. Public nature hikes and paddle trips have also been offered at the Currituck Banks and Masonboro Island Reserves as staff and resources allow.

Public presentations on the Reserve's programs and coastal and estuarine-related topics are delivered year-round by a variety of Reserve staff by request to organizations, including Boys and Girls Clubs, Boy Scout Troops, church groups, garden clubs, science clubs, preschools, colleges and universities, and other interested parties. Stewardship and research staff have held several seminar series in Wilmington on estuarine faunal species, their habitats, and related science and monitoring efforts.

Informational brochures, posters, interpretive signs, and display boards are used to inform local citizens and visitors about the Reserve and estuarine habitats. Web resources such as basic estuarine information and field guides are available for the public and are promoted through the Reserve's social media pages.

Delivery of community education and outreach programs involves the entire Reserve staff given the size of the Reserve staff and the location of expertise across the Reserve offices. Education staff develop educational materials, incorporating input from relevant staff as appropriate, and provide input and assistance to Reserve staff on appropriate content and materials when planning for presentations and outreach events. Stewardship staff deliver and/or play critical roles in site-based outreach programs. All staff deliver presentations to organizations.

Education Program Needs and Opportunities

The following needs, opportunities and partnerships will improve and expand upon current programming to meet the objectives and actions identified in this plan.

As part of the most recent education needs assessment, survey respondents identified that educator workshops are the most useful out of all of NCNERR's education programs. To expand TOTE and have the ability to attract more educators, more funding is needed for this program in order to staff additional workshops and purchase supplies and materials. Water quality demonstration equipment including ten water testing kits and a hand-held YSI are needed to supplement field activities and TOTE workshops that feature water quality testing as part of the Estuaries 101 curriculum. Tablets are also needed for workshop participants to interact with mobile applications such as the NOAA marine debris tracker application and access GIS data while in the field. To enhance classroom activities that include lessons about plant and animal

identification, a hand-held microscope and a projection microscope is needed. To support K-12, public education, and training programs conducted in the Beaufort office, an outdoor classroom is needed. More detail regarding outdoor classroom can be found in the administration plan.

Program offerings in the northern and southern regions are limited due to current staffing levels. Education staff fully rely on stewardship staff in the northern region to conduct programs independently or partner with local agencies and organizations. A full-time or temporary staff person is needed to expand education programs in this region. To fulfill education tasks in the southern region, it is critical to maintain the ability to fund staff at least partially dedicated to education programming. See the staffing plan for additional detail on staffing needs.

Seeds to Shoreline is a program where students and teachers grow *Spartina alterniflora* plants in their classrooms from seeds to plants and then plant the marsh grass at Reserve sites and other appropriate locations. This program represents an opportunity in which staff will continue to partner with the southeast NERRs and N.C. Sea Grant and seek additional funding and support for this program to incorporate additional schools into the program.

Videos are an effective and engaging method for sharing information with program participants and are an opportunity to connect with participants in a different way to complement more traditional methods. Education staff and interns and the Communications Specialist will produce videos to support education programs using existing field cameras.

Education Program Objectives and Actions

Education objectives are presented in bold text following Goal 1 below. Actions are listed under each objective, along with supporting text used to describe the implementation of each action.

Goal 1: Education and training inspire target audiences to protect coastal and estuarine ecosystems.

Objective 1.1 Two hundred fifty educators receive information on North Carolina's coastal and estuarine ecosystems and are able to apply curricula within their instruction.

Action 1: Conduct hands-on and field-based educator workshops, including Coastal Explorations and Teachers on the Estuary.

The Reserve's educator professional development program will seek to increase both the number of workshops offered and participants in Reserve workshops. As more educators become estuarine literate they can impart their knowledge to their students and thus increase estuarine literacy in North Carolina. Through partnerships with WRC, University of North Carolina Wilmington (UNCW), and North Carolina State Parks, the Reserve will conduct professional development educator workshops in northern and southern regions on the coast, increasing the Reserve's programmatic impact. These partners provide meeting space for the workshops in these areas. Education staff will develop workshop content, deliver programming, and increase

educational resources such as needed equipment and printed material through grant writing or partnership opportunities.

Coastal Explorations will be offered twice a year with one being conducted in the central region and the other one rotating between the northern and southern region and is open to all educators in the 20 coastal counties. This workshop serves as an overview of the Reserve program and North Carolina estuaries and highlights NCNERR curricula. Coastal Explorations workshops held in the southern region will target New Hanover County teachers to complement the Masonboro Island Explorers Program.

TOTE will be offered once a year and is open to all formal educators in North Carolina with educators working in the 20 coastal counties receiving first priority to attend. Each workshop will highlight both the national curriculum (Estuaries 101) and NCNERR curricula and will focus more in-depth on the current research being conducted at the sites and current stewardship projects.

All workshops will continue to be evaluated for their effectiveness and updated based on feedback. Evaluations are given at the end of each workshop. Participants are given the opportunity to comment on what they liked best about the workshop and changes that need to be made.

The number of educators reached (by grade level) and contact hours spent with staff through the educator professional development program are recorded as NERRS performance measures; data from action 1.1.4 is also incorporated into this measure.

Action 2: Update workshops and curricula based on current techniques and topics identified through the 2014 needs assessment as well as future surveys.

Curricular activities, originally developed in the early 1990s, are updated by education staff on a regular basis. The activities reflect up-to-date educational methods and information that better address different learning styles, such as inquiry-based activities.

The 2014 needs assessment indicated that educators would like to receive more information regarding changing coastal conditions, human impact on the environment, and how estuaries serve as nurseries for marine life. Educators also requested this information be delivered through hands-on activities, demonstrations, and field studies during 1 – 3 day workshops. This requested information will be incorporated into trainings by having a guest speaker and/or by adding a field study. Curricular activities will also be developed by education staff regarding these topics.

In response to a recent TOTE evaluation comment, a matrix outlining NCNERR curricula and how they correlate with North Carolina standards will be developed by education staff to provide an easy way for educators to explore the curriculum.

Action 3: Incorporate Reserve research and stewardship activities and monitoring data into workshops and curricula.

As more accessible online water quality SWMP data is developed and tablets are available for field programs, education staff will work with research staff to incorporate the mobile, user-friendly data interfaces into student and teacher activities. In addition to SWMP data, tablets will be used for presenting relevant GIS maps and data to program participants.

As research results become available, the education staff will work to translate, distill, and incorporate new information about estuaries and watersheds into educational curricula and products. The education staff will also work with stewardship staff to incorporate site-specific information into programming and encourage educators to participate in new and ongoing stewardship projects. For example, the 2015 TOTE workshop included a section on marine debris, an ongoing stewardship issue at local, state, and national levels, and participants met with stewardship staff to learn about marine debris, how to use NOAA's Marine Debris Tracker application, and ways to present the application to their students.

Action 4: Engage educators through partner-hosted education programs and events.

Often education staff are invited to present Reserve information and curricula as part of educator trainings being offered near a Reserve office by other agencies and organizations. These opportunities are a good way to work with the hosting organization to present about the education program. For example, education staff are invited to participate in the University of North Carolina's Scientific Research and Education Network (SciREN) event. This networking event brings researchers and teachers together for face-to-face interactions and to exchange ideas and materials relating to local/current research.

The Education Coordinator attends the North Carolina Science Teachers Convention every year and hosts an informational booth. Every other year (pending approval) a presentation is made at the convention informing participants about the Reserve's education program and offerings.

The number of educators reached (by grade level) and contact hours spent with staff through the educator professional development program are recorded as NERRS performance measures; data from action 1.1.1 is also incorporated into this measure.

Action 5: Maintain and enhance partnerships for program implementation and seek input from the NCNERR education advisory committee.

The audience, topical, and geographic diversity of the Reserve's education programs offers many opportunities for partnerships throughout coastal North Carolina. Many of the Reserve's partners help facilitate education programs such as partnering with North Carolina Sea Grant on TOTE workshops and the Seeds to Shoreline program. Seeds to Shoreline is a program where students and teachers grow *Spartina alterniflora* plants in their classrooms from seeds to plants and then plant the marsh grass at Reserve sites and other appropriate locations. Students also learn about the importance of this plant species to North Carolina estuaries.

The Education Coordinator seeks input from the NCNERR Education Advisory Committee on an annual basis regarding professional development and education programs. Staff will seek committee input on priorities for curricular development described in Action 2 of this objective as well as priorities and methods for incorporating new content into workshops. The NCNERR Education Advisory Committee is comprised of other educators employed by state agencies, formal educators, Reserve volunteers, and the Reserve Research Coordinator.

Objective 1.2 Five thousand students receive information on North Carolina’s coastal and estuarine ecosystems and are able to describe an estuary and its benefits.

Action 1: Conduct educational field trips for K-college students, focusing each field trip on the grade’s standards.

The Reserve will continue to provide field trip and/or field study experiences such as population studies and water quality monitoring for K-12 and college students. Field trips are ecology-based nature hikes that present basic estuarine information and are tailored to meet North Carolina’s Standard Course of Study for the appropriate grade level. For example, during a field trip for third graders, education staff focus on plants and how they survive in an estuary and when leading a high school aged group, staff highlight water quality in North Carolina’s tidal environments. Most field trips are conducted on the Rachel Carson Reserve as a result of staffing proximity and appropriate facilities. These field trips are evaluated by the students, teachers, and chaperones to determine information learned, program effectiveness, and overall enjoyment. As staff and resources allow, the education program will work to increase field trip opportunities for student groups at the Currituck Banks, Masonboro Island, and Zeke’s Island Reserves.

The number of K-12 and college students reached through this program and the contact hours spent with the students per year are recorded as NERRS performance measures. The number of contact hours spent with students per year is recorded as a NCNERR 312 performance measure, with a target of 1080 student contact hours per year; data from actions 1.2.2, 1.2.3, and 1.2.4 are also incorporated into this measure. This target was established in 2012 and does not reflect planned growth during the scope of this management plan for this objective.

Action 2: Work with partners to offer the Masonboro Island Explorer Program.

Education staff will work with Masonboro.org, Carolina Ocean Studies, and the New Hanover County School System to offer this program for fifth grade students of New Hanover County. Reserve staff will continue to work with Carolina Ocean Studies to provide up-to-date activities for students based on fifth grade standards, and make changes to the activities based on staff observations and teacher comments as needed. Education staff will ensure that Carolina Ocean Studies instructors are current on the curriculum through a once a year training and will attend at least one trip per field trip season. Staff will participate in annual planning and debriefing meetings as appropriate.

The number of K-12 and college students reached through this program and the contact hours spent with the students per year are recorded as NERRS performance measures. The number of contact hours spent with

students per year is recorded as a NCNERR 312 performance measure, with a target of 1080 student contact hours per year; data from actions 1.2.1, 1.2.3, and 1.2.4 are also incorporated into this measure. This target was established in 2012 and does not reflect planned growth during the scope of this management plan for this objective.

Action 3: Present coastal and estuarine concepts and curricular activities to students through classroom visits.

The K-12 student education program will provide local outreach in schools in the vicinity of the Rachel Carson Reserve by request and staff availability. Classroom visits include conducting hands-on, inquiry-based activities, and providing information about the Reserve and its habitats. Information about classroom visits will be shared with educators through workshops, seminars, personal communications, and the web.

The number of K-12 and college students reached through this program and the contact hours spent with the students per year are recorded as NERRS performance measures. The number of contact hours spent with students per year is recorded as a NCNERR 312 performance measure, with a target of 1080 student contact hours per year; data from actions 1.2.1, 1.2.2, and 1.2.4 are also incorporated into this measure. This target was established in 2012 and does not reflect planned growth during the scope of this management plan for this objective.

Action 4: Conduct summer programs for students and incorporate new curricular activities.

The Reserve partners with the N.C. Maritime Museum to offer four summer programs for children: Preschool Storytime and Crafts (ages 3-5), Seashore Life 1 (grades 1-2), Seashore Life 2 (grades 3-5), and Coastal Conservation Stewards (grades 6-10). These programs are held in the Reserve's facility in Beaufort with daily field trips to the Rachel Carson Reserve where the students conduct field investigations and learn through hands-on activities. Core estuarine concepts and new and updated curricular content and activities developed by education staff are presented to summer program participants each year. For example, each summer camp conducted in the field starts off with a scavenger hunt using the NCNERR curricular activity titled "Exploring an Estuary" which introduces estuarine habitat, flora and fauna to participants. Education staff will also highlight new content developed under Objective 1.1 during summer programs. The N.C. Maritime Museum assists with advertising and registration.

The number of K-12 and college students reached through this program and the contact hours spent with the students per year are recorded as NERRS performance measures. The number of contact hours spent with students per year is recorded as a NCNERR 312 performance measure, with a target of 1080 student contact hours per year; data from actions 1.2.1, 1.2.2, and 1.2.3 are also incorporated into this measure. This target was established in 2012 and does not reflect planned growth during the scope of this management plan for this objective.

Objective 1.3: N.C. citizens and visitors understand the value of coastal and estuarine ecosystems and how the NCNERR protects these resources.

Action 1: Conduct public outreach programs at Reserve sites.

Summer public field trips are a core component of community education and outreach programs. These field trips are currently conducted bi-weekly on the Rachel Carson Reserve during the summer months. Three types of field trips are offered, depending on the tide: 1) 2-hour nature hike across the western part of the Rachel Carson Reserve, 2) a 2-hour boat trip to the Rachel Carson boardwalk at the eastern end of the Reserve and 3) a circumnavigation cruise around Rachel Carson Reserve including a visit to Middle Marsh. Kayak trips around Masonboro Island are led in the spring and fall by staff.

The number of public program participants is recorded as a NERRS performance measure; data from action 1.3.3 is also incorporated into this measure.

Action 2: Enhance partnerships with government agencies delivering public programming at Reserve sites.

Partner agencies such as the WRC, N.C. Maritime Museum, and N.C. Aquariums conduct general public education programs on Reserve sites. Education staff will work with these agencies to better understand how they use the sites and develop a mechanism for collecting data from partners on the number of participants and programs delivered on an annual basis. Education staff will collect and summarize these data annually and provide relevant site and program updates to partners.

Action 3: Participate in community events such as Earth Day festivals and National Estuaries Day.

Education staff reach the general public through outreach programs that involve display booths and activities during celebrations like Earth Day or National Estuaries Day. At these events, staff bring educational activities that focus on the importance of estuaries, current research being conducted on the sites and ways that the public can protect estuaries. Display boards were recently updated for these kinds of events, along with hands-on activities, such as a habitat matching game and touch tables, to inspire audiences to protect coastal and estuarine ecosystems. The target number for festivals and outreach events is 2 per region per year.

The number of public program participants is recorded as a NERRS performance measure; data from action 1.3.3 is also incorporated into this measure.

Action 4: Encourage program participants to make a commitment to protect estuaries.

Education program participants may choose to make an estuary pledge to protect coastal and estuarine ecosystems. The estuary pledge is an interface for engagement at public events and is used to accompany K-college educational activities on Reserve sites. Participants record a self-selected commitment that will aid in the protection of estuaries on an estuary pledge magnet or card that they take with them to remember their

commitment. Reserve staff offers guidance when necessary to aid in the selection and understanding of beneficial personal actions.

By engaging pledge signees to directly identify personal action(s) that can be taken at home or in the community that will positively impact the health, protection, or preservation of estuaries, NCNERR is able to promote understanding, stewardship and appreciation of coastal and estuarine resources. This activity also allows the opportunity to educate participants on how the selected action(s) helps to protect and preserve estuaries. As a result of making a personal decision to support estuarine protection, participants are more likely to have a place-based connection and greater appreciation for local estuaries.

Action 5: Recruit and train volunteers to support education activities.

Volunteers lead summer field trips to the Rachel Carson Reserve. Volunteers are recruited through public field trips, and through the Reserve website and social media outlets. Information about the Rachel Carson Reserve, NCNERR programs including current research and stewardship projects, and safety information is reviewed with volunteers during a pre-field trip season training led by education and stewardship staff.

The number of volunteers that support education activities and hours contributed are recorded as NERRS performance measures.

III. Coastal Training Program Plan

Coastal Training Program Overview

The National Estuarine Research Reserve System's mission includes an emphasis on education and interpretation. The Reserve System recognizes it has a responsibility to educate coastal decision makers and supports the Reserve System goals, as defined in the regulations (15 C.F.R Part 921(b)), through the Coastal Training Program:

- Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;
- Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

To sustain these system goals, the 2011-2016 Reserve System Strategic Plan outlines coastal training objectives that support the focus areas of climate change, habitat protection and water quality:

- Increase estuary literacy and promote active stewardship among public audiences through the development and delivery of tools and programs addressing climate change, habitat protection, and water quality.
- Improve the capacity and skills of coastal decision makers to use and apply science- based information in decisions that affect estuaries and coastal watersheds.

The CTP provides up-to-date scientific information and skill-building opportunities to coastal decision makers responsible for making decisions affecting coastal resources. Through this program, reserves ensure that coastal decision makers have the knowledge and tools they need to address local critical resource management issues.

Coastal decision makers are defined as individuals whose duties include making decisions that affect the coast and its resources. The target decision-maker groups vary according to reserve priorities, but generally include groups such as local elected or appointed officials, managers of both public and private lands, natural resource managers, coastal and community planners, and coastal business owners and operators. They may also include groups such as farmers, watershed councils, professional associations, recreation enthusiasts, researchers, and more.

Reserves are uniquely positioned to deliver pertinent information to local and regional decision makers given their place-based nature. CTP coordinators know the local people, places, and science and are able to skillfully convene training participants and experts to address coastal management issues. Training programs are built upon solid and strategic program documents, including an analysis of the training market and assessment of audience needs. Coordinators then work with the results to identify how their program can best address local and Reserve System priority issues.

Partnerships are integral to the success of the program. Reserves work closely with several other NOAA programs, as well as a host of local partners in determining key coastal resource issues, target audiences, and expertise to deliver relevant and accessible programs.

North Carolina NERR Coastal Training Program

Coastal Training Program Context

The North Carolina Coastal Training Program (CTP) focuses efforts within North Carolina's 20 coastal counties. Programs are generally in-person workshops conducted regionally, in the northern, central, and southern coasts, which align regionally with NCNERR sites. Within this geographical scope, the CTP target audiences include local elected and appointed officials, local government staff, state agency staff, land use planners, engineers, marine contractors, consultants, landscape architects, and real estate agents. Specific target audiences vary by program. For example, real estate agents are targeted for programs related to living shorelines, barrier island development, and low impact development. The goal is to increase real estate agents' knowledge, make them more informed professionals, and encourage them to share information with their clients.

Assessments of audience needs, which are formally conducted approximately every five years, are critical for the success of the CTP. Informal needs assessments – through post-workshop evaluations, communication with training attendees, and training partner requests – also assist the CTP in determining program focus. The most recent needs assessment of past workshop attendees and partners was conducted in 2014. This online survey revealed the need for information on the following topics: stormwater management, coastal wetlands, shoreline development rules, living shoreline implementation, community resilience/preparedness, sea level rise adaptation, and sustainable growth/development. These needs align with the NCNERR Strategic Plan Topical Areas – water quality, coastal and estuarine ecosystem protection, and coastal hazards; and with the NERRS Strategic Plan priorities – climate change, habitat protection, and water quality.

Coastal Training Program Capacity

Implementation of the CTP is conducted by a full-time staff person located at the Reserve office in Beaufort, N.C. in the central coastal region. This location allows for easy travel to the southern and northern coastal regions. The CTP Coordinator routinely seeks assistance from other staff to help with program logistics. The CTP annual budget allows for purchasing of necessary supplies and materials to deliver programs. Funds are also leveraged from partners to implement trainings on mutual program priorities. Almost all programs are delivered in partner facilities, most of which are free, to maximize program funds. For example, the New Hanover County Center (part of the N.C. Cooperative Extension) is used for programs held in Wilmington (southern region) and Jennette's Pier (part of the N.C. Aquarium) is used for programs held in the Nags Head area (northern region).

Every program delivered by the CTP is done so in coordination with partners. Partners vary by program type and include the DEQ, the DCM, N.C. Sea Grant, Albemarle-Pamlico National Estuary Partnership (APNEP), N.C.

Coastal Federation, OCM, and CCFHR. Routinely, academics and other professionals from local institutions help deliver programs based upon their area of expertise. Example institutions include N.C. Aquariums, UNCW, IMS, and N.C. Division of Energy, Mineral, and Land Resources' Stormwater Permitting Program. As programs continue to develop, new partnerships will be fostered to deliver the best available information to target audiences, meet mutual education goals, and increase program efficiencies.

Coastal Training Program Delivery

The CTP routinely coordinates with the research, education, and stewardship programs of the Reserve. This is done through program development that highlights the other sectors' work, sharing curricula foci, or developing trainings that fulfill a sector's information needs. Where appropriate, the CTP will incorporate data into trainings from NERRS system-wide programs such as the SWMP and Sentinel Site Application Module 1. The CTP Coordinator participates in NERRS workgroups to help with national initiatives. The CTP Coordinator also seeks external funding for projects relevant to priority areas and has been the Collaborative Lead on several NERRS Science Collaborative proposals, two of which were funded.

The CTP usually delivers training via in-person events and posts workshop materials online, such as workshop agendas, presentations, resources, and video recordings. The CTP strives to incorporate adult learning styles in all programming. This includes diversifying information delivery methods (i.e. presentations mixed with discussion, group problem solving, site visits, or other learning activities) as well as allowing participants to share their knowledge and experience. For example, workshops on living shorelines incorporate field visits to existing living shorelines (including those located on Pivers Island, where the NCNERR Beaufort office is located) with the opportunity for participants to plant marsh plants. Workshops on Low Impact Development (LID) incorporate key pad polling in presentations and participants play a large board game with the goal of reducing pollution entering a fictional watershed using LID techniques.

Training events give participants the opportunity to network with others who are dealing with the same issues. These opportunities may yield new partnerships to solve coastal problems and identify and address barriers to implementing effective coastal management techniques and policies.

In addition to offering training events, the CTP also provides technical assistance to partners and target audience members. Past technical assistance has included review of needs assessment surveys and planning and facilitating stakeholder engagement meetings. For example, the CTP partnered with N.C. Sea Grant to plan and facilitate a stakeholder meeting to help define responsibilities for removal of abandoned and derelict vessels among government agencies.

The CTP evaluates all events with post-workshop evaluations. The data collected helps to fine-tune future training events. Anecdotal data at training events (i.e. engagement of participants, questions asked, comments made to presenters or the CTP Coordinator) are also used to help evaluate workshop effectiveness and fine-tune training events. Data collected with the post-workshop evaluations are aligned with the NERRS reporting requirements to ensure consistency with other NERRS CTPs and ensure that NERRS performance measures are met. NERRS CTP performance measures include: maintain capacity to deliver at least five coastal decision-maker training events annually and 90% of the coastal decision-makers participating in CTP training

or services report they plan to apply what they learned in their work or decisions. Historically, the CTP has offered an average of ten training events annually and normally met the 90% of participants reporting an intent to apply information gained at CTP events in their work. The CTP also submits an annual success story that highlights training outcomes, synergies, or collaborations that result from CTP training and technical assistance activities.

Coastal Training Program Needs and Opportunities

Many of the information needs identified in the 2014 needs assessment have been long-term priorities addressed by CTP that will continue to be addressed. These remain priorities due to the enduring nature of these topics – they are challenges not solved in a few years and are influenced by increasing demand for resources, population growth, changes in regulations and policies, and new information. As new research or problem-solving approaches become available, the CTP incorporates these data, tools, and resources into programming to keep target audiences informed.

Community resilience/preparedness and sea level rise adaptation are newly identified needs. The CTP has the capacity, with the assistance of partners, to address these topics in the next five years. Additionally, the CTP seeks to establish collaborations with local communities and relevant partners to increase the impact of the CTP and the Reserve within its watersheds. Through stakeholder engagement processes, the CTP is poised to provide technical assistance on coastal hazard vulnerability, resilience, and adaptation. In some cases, external funding may be applied to accomplish tasks associated with these collaborations.

The main limitation of the training program is the ability to reach the entire N.C. coast with only one staff member located in the central coastal region. Thus, decisions are made on a case by case basis on where a workshop will be conducted and if the workshop will be replicated in the other coastal regions. This decision is usually determined by the topic being addressed, outside support provided by partners, and time constraints of the CTP Coordinator and of partners. Trainings based on high priority coastal management topics, determined by needs assessments and emerging coastal policy, are routinely offered in the three coastal regions. Training that meets Reserve staff needs or are a regular offering of the CTP are usually only conducted in one or two of the coastal regions, with the latter rotating regions as appropriate over time.

An opportunity for the CTP is to expand the strong network of partners that has been cultivated over the years to address newly identified audience needs. Partners serve as expert speakers, provide funding, provide meeting spaces, assist in marketing programs to target audiences, and serve as advisors to training content. Another opportunity of the CTP is increasing NCNERR and DCM staff involvement to address program needs. This can include the development and delivery of CTP activities. Lastly, the CTP is able to be nimble in its approach to training delivery. Emerging topics, audience needs, and audience and partner requests can easily be accommodated due to the flexibility of the CTP and the support received from NCNERR staff and partners.

Coastal Training Program Objectives and Actions

Goal 1: Education and training inspire target audiences to protect coastal and estuarine ecosystems.

Objective 1.4: Annually, 90% of participants state that they intend to apply the science-based knowledge and skills relevant to coastal management gained through CTP activities.

Action 1: Coordinate core trainings for decision-makers in collaboration with program partners.

Core trainings include getting to know wetlands, barrier island development, LID basics for water quality protection, stormwater management, and living shorelines for estuarine shoreline stabilization. Additionally, training on stewardship related issues, such as citizen science and volunteer management, is an annual offering to support the stewardship program. Annual trainings targeting DCM staff are also coordinated based on the needs of the division that year.

The need for these core trainings was reaffirmed in the 2014 audience needs assessment. Core trainings are offered every one to two years and are often offered in response to a partner request. For example, the CTP has developed partnerships with county Associations of Realtors and real estate offices located throughout the N.C. coast. Historically, these partners request multiple trainings per year. Since these core trainings are routinely offered, accommodating these requests is a strength of the CTP.

Action 2: Coordinate new training events in response to the 2014 needs assessment and emerging policy issues in collaboration with program partners.

From this needs assessment, the biggest training need revolves around community resilience/preparedness to coastal hazards, which includes sea level rise adaptation and beach and estuarine erosion. Additionally, development and growth issues, such as balancing economic growth and development with resource protection, was a major theme that arose from the needs assessment. While the CTP has historically provided training on sustainable development, these needs present an opportunity to expand on this focus area.

To keep the CTP relevant between audience needs assessments, training programs are refined through post-workshop evaluations and training topics are oftentimes a result of emerging coastal policy. Assessment of emerging policy issues is accomplished through networking with partners, including the reserve's management partner, the DCM. For example, the division is working to promote living shorelines as an estuarine shoreline stabilization option where site conditions are appropriate. It became apparent that there was a lack of property owner and marine contractor knowledge on the effectiveness of living shorelines for erosion control. Thus, the CTP has worked collaboratively with permitting, policy, and research staff and other partners, such as the N.C. Coastal Federation, to craft trainings and outreach products to help promote the use of these more natural erosion control measures along the N.C. coast.

Action 3: Incorporate coastal and estuarine science into trainings.

A strength of the CTP is the incorporation of reserve and partner research results into programs. Every training begins with the scientific reasons why a resource is protected, including the ecosystem services it provides. This important context helps participants understand why environmental regulations exist as well as provides reasons to care about the resource.

The CTP is beginning to be viewed as a resource to local researchers who commonly have to incorporate outreach efforts into grant proposals. Through these partnerships, the CTP is able to increase its reach, incorporate the latest scientific findings in programs, and tap into external funding to support efforts. This also helps the CTP develop its yearly training schedule, as trainings are commonly scheduled as research project results are finalized.

Objective 1.5: Annually, at least two partners will receive technical assistance from the CTP to address mutual priorities relative to NCNERR topical areas.

Action 1: Establish collaborative relationships with local communities within Reserve watersheds and determine communities' technical assistance needs.

There are numerous ways in which these relationships could be established including connections made at reserve site LAC meetings, referrals from existing partners, funding proposals that include other reserve programs, and networking at CTP events.

Action 2: Connect with existing or new partners to address mutual priorities relative to NCNERR topical areas.

The CTP routinely assists partners such as the N.C. Sentinel Site Cooperative with training or meeting delivery. The CTP Coordinator also serves as a collaboration expert for researchers needing to engage stakeholders in research projects.

Action 3: Provide technical assistance to local communities and partners to address needs relative to NCNERR priorities, applying for external funding as needed and available.

Examples of technical assistance available to local communities and partners includes meeting planning and facilitation to engage stakeholders, needs assessments, and outreach. As technical assistance is provided, it may become clear that external funding is needed to make significant progress on the issue. Local improvements related to water quality, ecosystem protection, and coastal hazard resilience tend to be large scale endeavors not funded by a municipality's or partner's budget.

One source of funding is the NERRS Science Collaborative. The CTP Coordinator has served as the Collaborative Lead on proposals related to water quality improvements in the Towns of Wrightsville Beach and Beaufort. The role of the Collaborative Lead is to engage stakeholders in generation of the science to ensure that the science is meeting stakeholder needs and is applied by project end users.

Serving as Collaborative Lead can be a time consuming process. As an additional form of technical assistance, the CTP Coordinator could serve an advisor to a local professional working as a Collaborative Lead. This would increase the reach of the CTP while not overwhelming the CTP Coordinator as lead on multiple proposals during a funding cycle.

IV. Research and Monitoring Program Plan

Research and Monitoring Program Overview

The National Estuarine Research Reserve System's mission provides that reserves are protected and managed to afford opportunities for long-term research. Research at each reserve is designed to fulfill the Reserve System goals as defined in the regulations (15 C.F.R Part 921(b)):

- Address coastal management issues identified as significant through coordinated estuarine research within the system;
- Promote Federal, state, public and private use of one or more reserves within the system when such entities conduct estuarine research;
- Conduct and coordinate estuarine research within the system, gather and make available information necessary for improved understanding and management of estuarine areas.

To sustain these system goals, the 2011-2016 Reserve System Strategic Plan outlines research objectives that support the focus areas of climate change, habitat protection, and water quality:

- Expand capacity to monitor changes in water quality and quantity, habitat, and biological indicators in response to land use and climate change drivers.
- Improve understanding of the effects of climate change and coastal pollution on estuarine and coastal ecology, ecosystem processes, and habitat function.
- Characterize coastal watersheds and estuary ecosystems and quantify ecosystem services to support ecosystem-based management of natural and built communities.
- Increase social science research and use of social information to foster coastal stewards that value and protect estuaries.

The Reserve System's research and monitoring program provides the scientific basis for addressing coastal management challenges. Reserve research and monitoring activities provide valuable information about estuarine resources to increase understanding and awareness of their importance to a variety of audiences including scientists, resource managers, educators, and the general public.

Reserve System Research Program

Currently, there is one focused effort to fund estuarine research within the Reserve System.

The National Estuarine Research Reserve System Science Collaborative is a program that focuses on integrating science into the management of coastal natural resources. Currently administered through the University of Michigan, the program supports the co-development and application of relevant and usable knowledge and assessment information to address critical coastal management issues identified by the NERRS to improve the long-term stewardship of the nation's estuaries. The program is designed to enhance the Reserve System's ability to support decisions related to coastal resources through collaborative approaches

that engages the people who produce science and technology with those who need it. In so doing, the Science Collaborative seeks to make the process of linking science to coastal management decisions, practices, and policies more efficient, timely, and effective and share best practices and examples for how this can be done.

Reserve System Monitoring Program

The System-Wide Monitoring Program (SWMP) provides standardized data on national estuarine environmental trends while allowing the flexibility to assess coastal management issues of regional or local concern and is guided by the Reserve System-Wide Monitoring Program Plan. The principal mission of the monitoring program is to develop quantitative measurements of short-term variability and long-term changes in water quality, biological systems, and land use/ land cover characteristics of estuaries and estuarine ecosystems for the purposes of informing effective coastal zone management. The program is designed to enhance the value and vision of the reserves as a system of national reference sites and focuses on three ecosystem characteristics:

1. **Abiotic Characteristics:** Abiotic measurements are supported by standard protocols, parameters, and approaches that describe the physical environment including weather, water quality, hydrological, and sediment related parameters. The monitoring program currently provides data on water temperature, specific conductivity, percent saturation of dissolved oxygen, pressure, pH, turbidity, salinity, concentration of dissolved oxygen, and pressure corrected water depth. Meteorological data include air temperature, relative humidity, barometric pressure, wind speed, wind direction, rainfall, and photosynthetically active radiation (PAR). In addition, the program collects monthly nutrient and chlorophyll a samples and monthly diel samples at one SWMP data logger station. Data is Federal Geographical Data Committee compliant and available via the *Reserve System Centralized Data Management Office* (<http://cdmo.baruch.sc.edu/>).
2. **Biotic Characteristics:** As resources are available, reserves are focusing on monitoring habitats and biodiversity.
3. **Watershed and Land Use Classifications:** The Reserve System is examining the link between watershed land use and coastal habitat quality by tracking and evaluating changes in coastal habitats and watershed land use/cover. This element is guided by the Reserve System Habitat Mapping and Change Plan.

Building on these foundational elements, the Reserve System is developing a network of sentinel sites and the capacity to assess the impact of sea level/lake level changes and inundation on the diverse set of coastal vegetative habitats represented in the system. Reserves are implementing a suite of activities, as described in the 2012 Reserve System Sentinel Site Guidance Document, to assess the relationship between vegetative communities (marsh, mangrove and submerged aquatic vegetation) and sea level. Reserves are adding surface elevation tables and monitoring pore water chemistry along vegetation monitoring transects and linking their SWMP to a network of specialized spatial infrastructure to allow precise measurement of local sea level and lake level changes and subsequent impacts to key habitats. The Reserve System is working in partnership with NOAA's National Geodetic Survey and the Center for Operational Oceanographic Products and Services to support the development of sentinel sites.

North Carolina NERR Research and Monitoring Program

Research and Monitoring Program Context

The NCNERR research and monitoring program strives to address scientific and technical aspects of coastal management through a comprehensive, interdisciplinary, and coordinated approach. In this pursuit, the program implements NERRS' research priorities, as well as state-level and Reserve priorities to foster a program that conducts both nationally significant and locally relevant research and monitoring. National guidance for the program is provided by the NERRS Strategic Plan which identifies the NERRS' areas of focus and investment, as well as science-based goals and objectives. State-level program guidance is provided by a number of sources including our state partner, the DCM, and the North Carolina Coastal Habitat Protection Plan (<http://portal.ncdenr.org/web/mf/habitat/CHPP>). These sources identified a number of research priorities (e.g., estuarine erosion and shoreline stabilization, habitat status and trends, comprehensive water quality monitoring) that are well-aligned with national priorities.

Priority research and monitoring topics are addressed within the NCNERR sites and in adjacent sounds and coastal watersheds located throughout North Carolina's coast. Within its boundaries, the NCNERR provides a network of diverse habitat types, watershed characteristics, and biogeographic settings needed to address complex coastal management issues. Research conducted within Reserve sites by research staff is highly focused on the research needs of NCNERR. Scientists unaffiliated with NCNERR also use the Reserves as living laboratories to address research topics that may be less focused on NCNERR priorities, but still germane to the understanding of coastal and estuarine ecosystems. Research conducted at Reserve sites requires a research permit (in addition to other necessary state and federal permits). The purposes of the research permit are to: 1) improve research coordination by reducing interference among research projects, 2) ensure research projects are compatible with other Reserve uses and do not compromise sensitive areas within Reserve sites, 3) provide an opportunity for research staff to interact with researchers to initiate new partnerships and advertise research program capabilities and available data, and 4) serve as a record for reporting on NCNERR's 312 research program performance measure—number of permits issued annually. Reserve research staff also use information collected during the permitting process to populate a research geodatabase and reference library for internal uses.

Research and Monitoring Program Capacity

The research program staff includes the Research Coordinator and two Research Specialists. The Research Coordinator is located at the NOAA Beaufort Laboratory. This location provides research staff with access to neighboring scientists and partners at marine laboratories affiliated with NOAA, Duke University, N.C. State University, University of North Carolina at Chapel Hill, as well as state agencies such as the DMF. The RC coordinates research and monitoring across the Reserve network; serves mentoring and supervisory roles for Research Specialists, temporary staff, and graduate students; and conducts collaborative and independent research to address NCNERR Strategic Plan Topical Areas, site-based needs, and coastal management needs. The Research Specialists are located in the Wilmington office at CMS, which provides research staff with access to research support and administrative services. The Research Specialists implement, operate, and maintain the Reserve's SWMP at Masonboro Island and Zeke's Island Reserves, assist with monitoring

activities at Currituck Banks and Rachel Carson as needed, conduct and assist with collaborative and independent research, and serve supervisory roles for volunteers and students at UNCW enrolled in independent study courses. The research program's activities are augmented by the work of temporary staff, interns, and volunteers.

Research and Monitoring Program Delivery

System-Wide Monitoring Program

The NCNERR implements each component of SWMP as identified previously in this chapter.

Abiotic indicators of water quality and weather

Research staff implement SWMP water quality, Chlorophyll α , and nutrient monitoring at four stations located at the Masonboro Island and Zeke's Island Reserves. Meteorological monitoring is conducted at Masonboro Island Reserve. Water quality monitoring began at two of the stations in 1994, providing one of the best long-term estuarine monitoring datasets in North Carolina for detecting trends and variation in water quality across broad spatial and temporal scales. Maintenance of the stations is a high priority to ensure high quality data continues to be collected and added to this valuable dataset. Station details (from north to south) are provided below.

1) Loosin Creek, Masonboro Island

In 2002, the Loosin Creek water quality station was established at 34° 10'20.0" latitude and 77° 49'58.1" longitude. The salinity range is typically 22-35, but can drop to 15 during periods of heavy rain. Tidal range averages 1.2 m. The creek substrate is characterized by sand and detritus based sediment with areas of soft mud. Depth ranges from 0.1 to 2.5 m. *Spartina alterniflora* dominated salt marsh and tidal creeks that are frequently used for commercial fishing and recreational activities surround the station.

2) Research Creek, Masonboro Island

In 1994, the Research Creek water quality station was established at 34° 09'21.7" latitude and 77° 50'59.9" longitude. The salinity range is typically 20-35, but can drop to 10 during periods of heavy rain. Tidal range averages 1.2 m. The creek substrate is characterized by sand and detritus based sediment with areas of soft mud. Depth ranges from 0.2 to 2.6 m. *Spartina alterniflora* dominated salt marsh and tidal creeks that are frequently used for commercial fishing and recreational activities surround the station. In 2001, the meteorological station was established at Research Creek at a distance of 76 m from the water quality station. The meteorological station sits at an elevation of approximately 4.88 m above sea level.

3) Zeke's Basin, Zeke's Island

In 1994, the Zeke's Basin water quality station was established at 33° 57'17.0" latitude and 77° 56'6.0" longitude. The salinity range is typically 12-30, but can drop below 10 during periods of heavy rain and subsequent freshwater input from the Cape Fear River. Tidal range averages 1.2 m. The basin substrate is characterized by large rocks (the cribbings) with sand and detritus based sediment and a layer of soft

organic sediments. Depth ranges from 0.1 to 1.8 m. *Spartina alterniflora* dominated salt marsh and tidal creeks that are frequently used for commercial fishing and recreational activities surround the station.

4) East Cribbings, Zeke's Island

In 2002, the East Cribbings water quality station was established at 33° 56'23.5" latitude and 77° 56'28.1" longitude. The salinity range is typically 15-33, but can drop to 10 during periods of heavy rain and subsequent freshwater input from the Cape Fear River. Tidal range averages 1.2 m. The basin substrate is characterized by large rocks (the cribbings) with sand and organic sediment. Depth ranges from 0.5 to 2.7 m. *Spartina alterniflora* dominated salt marsh surrounds the station.

To better monitor the varied estuarine abiotic indicators of water quality within North Carolina, NCNERR has established additional partnerships to expand 'SWMP-like' monitoring of water quality. Through a partnership with CMS, a SWMP-like station was established at the CMS research pier within the Masonboro Island Reserve (data are available at <http://loggernet.cms.uncw.edu:5600/OysterHatchery/index.html>). SWMP-like stations were established at the Shackleford Banks portion of the Cape Lookout National Seashore and the Middle Marshes portion of the Rachel Carson Reserve through a partnership with the National Park Service's (NPS) Inventory and Monitoring Program (data are available as part of the Southeast Coast Network at <https://irma.nps.gov/aqwebportal/https://irma.nps.gov/aqwebportal/>). These water quality monitoring stations are implemented according to protocols established by the NERRS, but are not considered official SWMP stations. Through these partnerships, codified with Memoranda of Understanding (Appendix flag K and L), Reserve partners provide equipment and necessary consumables, and the Reserve provides staff to maintain the water quality monitoring stations. The abiotic component of SWMP was temporarily supported at the Currituck Banks Reserve from 2006-2007 through a partnership with Elizabeth City State University and the U.S. Geological Survey (data available at <http://waterdata.usgs.gov/nc/nwis>).

Biological monitoring

The biological monitoring component of SWMP addresses several biological systems including submerged aquatic vegetation and emergent marsh vegetation, nekton, phytoplankton, and benthic infauna. The NCNERR research program does not have the capacity to undertake all aspects of the biological monitoring component of SWMP. To date, the research program has focused efforts on monitoring emergent marsh vegetation at the Rachel Carson, Masonboro Island, and Zeke's Island Reserves. Monitoring of emergent vegetation is conducted proximal to water quality monitoring stations to better couple the water quality and biological monitoring components of SWMP.

A standardized monitoring approach following the protocols outlined in Moore et al. (2009) is applied to assess changes in the spatial and temporal distribution of emergent vegetation within the Reserves. Within each Reserve, seven fixed transects were located perpendicular to the vegetation line. Along each transect, quadrats (1 m²) are used to sample emergent vegetation from the marsh-water interface to the marsh-upland transition. Emergent marsh vegetation has been monitored since 2008 and will continue to be monitored annually during peak biomass in N.C. (i.e., July-September).

In addition to the SWMP emergent vegetation monitoring described above, the scope of the emergent vegetation monitoring extends beyond Reserve boundaries. For example, the research program collaborates with scientists from the NOAA Beaufort Laboratory to examine how closely restored marshes mimic the function of natural marshes and how shoreline stabilization structures influence marsh vegetation. The marshes within the Reserve sites serve as 'reference' natural fringing marshes.

Monitoring of additional biological systems will be implemented based on priorities and as funding, staff resources, and partnerships allow. For instance, during the summer of 2015, the research program partnered with researchers from N.C. State University to conduct a pilot program to monitor plankton abundance and community composition at all four Reserve sites. In 2016, the research program partnered with researchers from IMS to monitor submerged aquatic vegetation abundance and community composition at the Rachel Carson Reserve.

Watershed, land use, and habitat mapping

The NERRS Habitat Mapping and Change component of SWMP focuses on tracking and evaluating changes in coastal and estuarine habitats over space and time. The goal is to understand the relationships between watersheds, land use, and habitat changes. In 2013, the research and stewardship programs conducted a joint effort with the Geographic Information System (GIS) Specialist to update habitat maps for each of the four Reserve sites. Habitat maps at each site were created using heads-up digitizing methods with *ArcGIS* and 2010 Statewide Orthophotography. Habitat classifications were based on the NERRS habitat classification scheme, which consists of four hierarchical levels and a set of non-hierarchical categories. The hierarchical levels are: system, subsystem, class, and subclass; with each level representing a significant break in land cover ranging from primary source of water (system) to leaf type, grain size, or cultural use (subclass). Following the creation of maps, Reserve staff conducted an accuracy assessment to determine habitat classification success of habitat maps. Reserve habitat maps are scheduled to be updated on a ten-year cycle, dependent on availability of appropriate aerial imagery and staff priorities. The updates will be used to evaluate changes in habitat distribution and condition for the Reserve sites.

Reserve watersheds were mapped at the estuarine basin scale and a smaller scale referred to as the targeted watershed boundary. The appropriate estuarine basin for each site was determined based on a flow analysis that most closely corresponds to a USGS 8-digit Hydrologic Unit Code (HUCs). Targeted watersheds represent those watersheds that directly flow into and potentially impact the habitats within the four Reserve sites (Figures 5, 9, 13, and 17). Targeted watersheds for the N.C. Reserves represent the USGS 14 digit HUCs encompassing the river systems directly flowing into the sites. NOAA's Coastal Change Analysis Program (C-CAP) provides online access to coastal land cover and land cover change information. The C-CAP data is available at 30-meter resolution for 1996, 2001, 2006, and 2010 (same year as imagery used for Reserve site habitat maps) and is appropriate for use at the watershed level. The C-CAP land cover data can be clipped to each Reserve's watershed and targeted watershed boundary to assess changes in land cover over time and potentially link changes in land cover to changes in Reserve habitats. Research staff will continue to assist the GIS Specialist with habitat mapping and C-CAP land cover analysis as new imagery becomes available. Opportunities also exist to include land cover information in education products and CTP workshops through topics such as low impact development, population change, and stormwater management.

NERRS Sentinel Site Program

The NERRS are ideally suited to assess the impacts of changing climate conditions on coastal areas across a diverse suite of ecosystem variables (e.g., changes in air, water, and soil temperatures; changes in sea level and vegetation). A number of responses relevant to climate forcing are already measured within elements of SWMP, such as marsh loss and changes in primary productivity. More importantly, Reserve sites have the operational capacity for intensive study and sustained observations to detect and understand changes in the ecosystems they represent, thereby serving as ‘sentinel sites’. Recognizing this unique opportunity, the NERRS Sentinel Sites Program was initiated to understand climate change impacts on coastal ecosystems. As an active participant in the NERRS Sentinel Site Program, NCNERR is striving to establish sentinel sites for the initial purpose of understanding the impacts of sea level change and inundation on coastal habitats. Referred to as Sentinel Site Application Module 1 (SSAM 1): “Sentinel Site for Sea Level Rise and Inundation”, NCNERR is measuring and comparing the responses of vegetative communities to changes in water levels and patterns of inundation at the Masonboro Island Reserve. The three other NCNERR sites are missing one or more required infrastructure components (e.g., a meteorological station) to become SSAM 1 compliant. The research program will explore expanding NCNERR sentinel site status to additional Reserve sites as resources and priorities align. Furthermore, the research program anticipates future Sentinel Site Application Modules where sentinel sites are established to address the effects of other climate-related stressors, such as ocean acidification, on coastal ecosystems. Each new Sentinel Site Application Module may require additional funding and infrastructure within Reserves.

Research

The Reserve conducts, promotes, and coordinates research at all sites. The sites provide undeveloped properties where natural processes occur with minimal anthropogenic impacts. Accordingly, the Reserves function as ideal sites for conducting coastal and estuarine research. In addition to serving as ideal sites for research, the Reserves provide ideal locations for demonstration projects. The public access to Reserve sites and public engagement through the education, training, and stewardship programs provide an excellent platform for demonstrating coastal management practices.

Nearly all research within Reserves is focused on understanding coastal processes with the goal of improved management of coastal resources locally, regionally, and nationally. In a typical year, the research program leads or collaborates on several projects within the Reserve sites and facilitates a dozen more by scientists from academic and research institutions, resource management agencies, and environmental and conservation groups. Research led by research staff addresses priority research needs identified by Reserve staff. External funding and partnership opportunities are often required to enhance the research program’s ability to address priority research needs.

The Reserve facilitates research at NCNERR sites through a number of avenues. Research staff maintain an internal research permit database to minimize interference among projects and other site uses. Research and stewardship staff also provide assistance with field sampling, expertise in guiding site selection and project design, access to Reserve sites using Reserve vehicles and vessels, and provision of data (e.g., SWMP) relevant to particular projects. The Reserve’s education, stewardship and coastal training programs also help facilitate

research by providing an extremely valuable outreach component that many external researchers and institutions do not possess.

The research program engages students in research within Reserve sites through the Coastal Research Fellowship. Funded through a partnership with N.C. Sea Grant, the fellowship provides 1-2 North Carolina-based graduate students with a one-year award of up to \$10,000 to conduct research within the Reserve sites. Fellows must conduct research that addresses priority coastal management issues. The fellowship's research focus areas shift from year to year, but are generally aligned with the NCNERR Strategic Plan Topical Areas. The Reserve promotes and fosters this fellowship program through four main processes: providing funds in support of the fellowship through DCM, advertising the funding opportunity, conducting the application review process, and by assisting graduate students with any and all aspects of their fellowship project including site selection, field work, and manuscript preparation.

Partners

Partnerships and collaboration are paramount to the success of the research program. Research partnerships enhance the topical coverage of the research program, as well as promote the Reserve sites as a research platform to the broader scientific community. The topical and geographic diversity of the research program offers opportunities for new partnerships and expansion of existing partnerships.

Research Facilities

The facilities of the research program are largely met through existing infrastructure at the Reserve's offices and through informal partnerships with laboratories at nearby academic institutions that provide lab space and access to analytical equipment.

System-Wide Monitoring Program

Efforts to expand abiotic monitoring beyond current capacity requires partnerships, funding, and additional Reserve staff. The Reserve partners with the NPS and CMS to monitor water quality at the Rachel Carson Reserve and an additional station with Masonboro Island following SWMP abiotic monitoring protocols. Biological monitoring of emergent marsh vegetation at the Rachel Carson Reserve (and marshes in the surrounding county) is conducted through a partnership with scientists at the NOAA Beaufort Laboratory. In the past, water quality and emergent vegetation monitoring at the Currituck Banks component was accomplished through a partnership with researchers at Elizabeth City State University. The research program continues to explore partnerships with Audubon North Carolina, academics at Chowan University, and organizations involved in the Alliance for Currituck Sound for opportunities to resume water quality and emergent vegetation monitoring at Currituck Banks Reserve.

Research

The research program collaborates with a number of academic, state, federal, and non-governmental organizations to conduct research within the Reserves, their associated watersheds, and coastal counties. Examples of existing partnerships include those with (1) IMS and UNCW to assess the resiliency of living shorelines to large storm events, (2) NCCOS to assess the impact of shoreline stabilization on marsh vegetation, (3) CMST, the North Carolina Coastal Federation, and DMF to provide science-based strategies for

oyster restoration, (4) DUMML to monitor the recovery of coastal habitats following removal of marine debris, and (5) UNCW to quantify the benefits and impacts of oyster aquaculture on estuarine ecosystems. The research program also looks to expand partnerships to broaden both the breadth and geographic coverage of its research. For instance, the research program is interested in expanding research related to living shorelines to Currituck Sound, which is a traditionally understudied region of the state. In concert with the education, stewardship and training programs, staff are exploring partnerships with U.S. Fish and Wildlife Service, Audubon North Carolina, marine contractors, and private citizens to accomplish this work. Lastly, the Reserve partners with N.C. Sea Grant to support the Coastal Research Fellowship discussed previously.

Research and Monitoring Needs and Opportunities

The research program has identified equipment-related needs that would improve and expand upon current research and monitoring efforts. Research staffing needs are discussed in detail in the Administration Plan. Program needs include the following:

- 1) To expand SWMP and Sentinel Site Application Module 1 to additional Reserve sites, the research program needs:
 - a. Meteorological stations at the Currituck Banks, Rachel Carson, and Zeke's Island Reserves.
 - b. Abiotic water quality monitoring at Currituck Banks Reserve.
 - c. Platform upgrades for vertical control of deployed equipment to measure water level at Currituck Banks and Zeke's Island.
 - d. Two additional surface elevation tables (SETs) each at Currituck Banks and Zeke's Island.
 - e. A Real-time kinematic (RTK) rover unit for occupying vertical control network at sentinel sites. The rover unit would also be used for research projects related to quantifying shoreline change. The research program is exploring opportunities to partner with DCM to purchase a rover unit that could be jointly used by the research program and DCM regulatory program.
- 2) To improve efficiency in data entry associated with abiotic and biotic SWMP monitoring, the research program needs waterproof tablets with Wi-Fi for field applications.
- 3) To monitor shoreline change and coastal erosion (both horizontal and vertical) in response to major events (e.g., hurricanes) and over large spatial extents, map Reserve habitat, and survey flora and fauna (including invasive species), the research program needs a fixed-wing unmanned aerial system (UAS) with RTK capabilities. The research program is exploring opportunities to partner with DCM to purchase an UAS that could be jointly used by the research program and DCM regulatory program.
- 4) To obtain more accurate measurements of water level to evaluate storm surge and nuisance flooding, the research program needs more stable platforms for the continuous water quality monitoring stations. Current single piling platforms are not sufficiently stable to provide necessary accuracy for water level measurements.
- 5) To prevent possible damage to marshes at Currituck Banks, Rachel Carson, Masonboro Island, and Zeke's Island during monitoring of emergent vegetation and SETs, the research program needs boardwalks installed along vegetation transects and around SETs.

Research needs and priorities identified by partners, researchers, coastal managers and decision-makers are addressed below in the Research and Monitoring Objectives and Actions section.

Research and Monitoring Objectives and Actions

Research objectives are presented in bold text following Goal 2 below. Actions are listed underneath each objective, along with supporting text used to describe the implementation of each action.

Goal 2: Research and monitoring advance understanding of coastal and estuarine ecosystems and inform coastal management.

Objective 2.1: Research and monitoring is conducted within Reserve sites and associated watersheds.

Action 1: Prioritize research on coastal management topics annually through interactions with researchers, coastal decision-makers, and Reserve staff.

Research staff will identify high priority coastal management science needs by referring to several guiding documents including the NERRS Strategic Plan and the North Carolina Coastal Habitat Protection Plan. Additional guidance will be sought from DCM staff and academic scientists. Research staff will also work with stewardship and education staff to identify high priority Reserve site research needs. The research priorities will be circulated among the scientific and coastal management communities through informal communication in workgroup settings, the Reserve website, seminars, and NERRS Science Collaborative and Coastal Research Fellowship RFPs. The list of prioritized research topics will be revisited annually so that as the coastal management needs change, the focus of NCNERR's research efforts may follow. Research staff will generate the list during fall/early winter of each calendar year.

Action 2: Conduct research that addresses research priorities and NCNERR Strategic Plan Topical Areas.

The research program strives to conduct original, high-quality scientific research within Reserve sites and associated watersheds. Research staff will serve as PI or Co-PI on two or more proposals seeking external funding to support research on priorities identified in Action 1, as well as those relevant to addressing the NCNERR Strategic Plan Topical Areas.

Action 3: Continue implementation of the NERRS SWMP to assess change in abiotic and biotic indicators and habitat distribution.

The NERRS system-wide investment to purchase two YSI EXO sondes for each Reserve enabled the research program to fully transition to EXOs at all four abiotic SWMP stations at Masonboro Island and Zeke's Island abiotic SWMP as of fall 2016. The research program will continue partnering with CMS and the NPS to maintain SWMP-like monitoring at additional stations in Masonboro Island and Rachel Carson, respectively (see Partners section above). Biological monitoring of emergent marsh vegetation will continue at Rachel Carson, Masonboro Island, and Zeke's Island Reserves. Habitat mapping of Reserve sites was completed in 2013 as described above (see Watershed, land use, and habitat section

above) and will be revisited to assess habitat change over a 10-year period around 2020 as new imagery becomes available and Reserve resources allow.

Action 4: Explore opportunities to expand abiotic and biotic components of SWMP monitoring to additional Reserve sites.

Given the geographical, biophysical, and land-use differences associated with each Reserve site, it would be ideal to conduct SWMP-like monitoring at each site to draw conclusions relevant to each as it pertains to changes in water quality and emergent marsh vegetation associated with anthropogenic (e.g., increase in coastal populations) and environmental (e.g., sea level rise) drivers. Expanding abiotic and biotic monitoring to all four Reserves would also expand NCNERR's partnership base. To explore the potential for abiotic and biotic monitoring in Currituck Banks, research and stewardship staff engage with partners (see Partners section above). Funding for monitoring equipment and personnel required for routine, long-term monitoring would need to be established (see Research and Monitoring Needs and Opportunities section above).

Action 5: Continue implementing the Sentinel Site Application Modules as resources are available to detect and understand the effects of sea level change on estuaries.

Three of the four Reserve sites require additional infrastructure to address the effects of sea level change on emergent vegetation as part of Sentinel Sites Application Module 1. Masonboro Island is completely Sentinel Site compliant following installation of two SETs in fall 2015. Due to the nature of SETs, settlement of substrate, and desired precision in measurements, the new SETs at Masonboro will be of limited use for a few years. The remaining Reserve sites need one or more pieces of infrastructure before becoming fully compliant sentinel sites (see Program Needs section above). Research staff will explore funding opportunities and partnerships to continue the Sentinel Site build-out at Zeke's Island, Rachel Carson, and Currituck Banks Reserves.

Action 6: Analyze and synthesize Reserve research and monitoring data to evaluate trends and patterns of local, regional, and national significance.

The research program has generated an enormous amount of research and monitoring data. Abiotic SWMP data are analyzed yearly as part of the required NERRS QA/QC process, but the true value of this comprehensive data set will be better realized as more in-depth analyses and syntheses are conducted. Analyses and syntheses will be conducted with input from Reserve staff to create products that benefit all NCNERR programs, as well as the scientific and management communities. For instance, SWMP abiotic monitoring data can be synthesized to develop curricula for K-12 education programs and inform the scientific community of local, regional, and national trends. Analysis of long-term SWMP biological monitoring and monitoring of shoreline stabilization structures can provide the CTP with training material for workshops on living shorelines and green infrastructure. The research program is partnering with scientists at UNCW and colleagues within NERRS to acquire funding for analysis and synthesis of abiotic monitoring data. Additionally, research staff continues to partner with scientists from NCCOS to analyze long-term marsh monitoring and shoreline stabilization data for

publication in a peer-reviewed journal. Throughout the analysis, synthesis, and product development process, research staff will collaborate with Reserve staff and partners to identify how these products can best meet Reserve program needs while also addressing coastal management needs.

Objective 2.2: Research and monitoring datasets, results, and products are communicated to target audiences (e.g., coastal decision-makers, research community, Reserve program participants) to address relevant coastal and estuarine topics.

Action 1: Describe the Reserve’s research and monitoring datasets, results, and products to coastal decision-makers and other end users through 10 or more forums annually.

Building on objective 2.1 and the associated actions, research staff will actively communicate available datasets, program capabilities, and products to relevant end users such as coastal-decision makers, coastal scientists, and educators. Dissemination of this information by research staff will occur through 10 or more forums annually (e.g., conferences, workgroups, proposals, publications). For example, research staff will deliver research- and monitoring-based presentations at university seminar series, serve on workgroups where staff expertise and program data can improve management of coastal resources, and provide a program overview and available data in support of education program objectives (e.g., TOTE; Objective 1.1, Action 1). Research staff will keep track of progress towards this goal with a spreadsheet that tracks relevant information such as the type of forum and information conveyed about the research program during the forum.

Action 2: Provide high-quality data that is accessible by all interested parties through the NERRS’ Centralized Data Management Office’s (CDMO) website.

The research program recognizes that quality data is paramount to good science. In each SWMP component NCNERR conducts—abiotic, biological, and habitat mapping—staff strive to collect robust, high-quality data. All data are QA/QC’d following NERRS protocols to ensure high-quality data. The research program also recognizes the importance of making SWMP data accessible to outside entities to maximize the benefit of these data for coastal management. Research staff will strive to submit SWMP data in a timely fashion to meet the CDMO submission deadlines for raw, quarterly, and annual data that can be easily accessed by outside entities. For instance, submission of raw abiotic monitoring data is due within two weeks of data collection. Staff will aim to submit all data to CDMO prior to submission deadlines. NCNERR is also currently submitting biological monitoring data to CDMO and will continue to do so. The research staff and GIS Specialist submitted habitat maps of the four NCNERR sites and required documents during 2016.

Action 3: Highlight research and monitoring projects on the Reserve’s website.

Research staff will work with the Communications Specialist to ensure that NCNERR’s website, and specifically the Research and Monitoring Projects webpage, contain projects relevant to coastal management priority issues. The webpage currently contains information on research projects relevant

to estuarine shoreline stabilization, SWMP, and oyster reef restoration. Webpage updates may include projects that expand on these topics or address new coastal management issues.

Action 4: Collaborate with education and training staff to package and integrate research and monitoring data into education and training programs.

The research program will work to ensure accurate and timely transfer of research results to the education and training programs. Research staff will continue to work with education and training staff to incorporate data, tools, techniques, and research results into education materials and programs. Opportunities for distribution of research through the education program include incorporation of products into K-12 curricula, community outreach display boards, newsletters, and presentations at education workshops such as TOTE.

Objective 2.3: Reserve sites are promoted as place-based research platforms and Reserve’s long-term datasets are promoted as a research tool.

Action 1: Facilitate, promote, and participate in research conducted at Reserve sites, particularly research that supports the Reserve’s mission and informs coastal management.

Research is critical to understanding and managing estuarine and coastal ecosystems at Reserve sites and surrounding watersheds. While the research conducted within Reserve sites is locally relevant, much of this work is also regionally and nationally significant. Understanding the importance of research within the Reserve sites to accomplishing NCNERR’s mission, the research program is committed to ensuring Reserves serve as a research platform. Research staff will facilitate and participate in research on Reserve sites in a number of ways including project development, assisting researchers with site selection within Reserves, and providing supporting data, staff, transportation, and gear to researchers as available. The promotion of site-based research will occur in collaboration with Reserve staff through various forums including the Reserve website, social media, and Reserve newsletter.

Action 2: Review 12 or more research permit applications from external researchers annually, evaluate the percentage of applicants using the Reserve’s long-term datasets for research, and maintain the NCNERR portion of the NERRS’ research database.

The NCNERR requires all researchers that plan to conduct research in Reserve sites to submit a research permit application (Appendix L). The purpose of the research permit is to ensure research projects are compatible with other Reserve uses, do not interfere with other research projects, incorporate available data when applicable, and are catalogued for reporting on NCNERR’s 312 research program performance measure. The target for the research program’s 312 performance measure is 12 research permits issued annually. Over the past 5 years, the research program has issued an average of 11 research permits per year. The preceding actions should help to improve the visibility of the research program and increase the number of research permit applications that are submitted and reviewed each year. The research staff recently added an additional component to the research

permit application inquiring as to whether applicants are familiar with the Reserve's long-term monitoring datasets, if they plan to use any of the data in their respective research, and if they know how to access the data. Staff will evaluate trends in the percentage of applicants that plan to use these datasets to see if usage increases over time.

Permitted research is required to follow a set of conditions (Appendix L). One of the permit conditions requires that final reports and manuscripts that result from research conducted on the Reserve be submitted to the research program. Research staff use information on the permit application such as principal investigator(s), affiliation(s), project title, as well as reports and manuscripts to update the NCNERR portion of the NERRS' research database, which is the research program's NERRS performance measure. The NERRS' research database is updated annually during late fall/early winter.

Action 3: Support and promote the Coastal Research Fellowship in collaboration with N.C. Sea Grant to provide opportunities for graduate students to conduct research within Reserve boundaries.

The NCNERR supports and promotes the Coastal Research Fellowship program through four main avenues: providing funds in support of the fellowship, advertising the funding opportunity, conducting the application review process, and by facilitating the fellow's research during the fellowship year. Advertising the funding opportunity is done by the Reserve through email postings to student listserves, directed phone calls to Principal Investigators, and advertisement at regional scientific conferences. Advertising to a broad audience should increase the number of applicants, level of competition and, ultimately the quality of the research. As part of the review process, the research program forms review panels, secures and compiles all reviews, and ranks candidates in collaboration with N.C. Sea Grant. Research and stewardship staff provide varying levels of support to facilitate the fellows' research. For instance, research and stewardship staff involvement has ranged from help with site selection to assisting with all aspects of the research including experimental design, field work, and data analysis. The research program will continue supporting and promoting the Coastal Research Fellowship.

Objective 2.4: Research partnerships are enhanced through collaboration with the Reserve Research Program.

Action 1: Provide advisory services to research community by serving on at least one graduate student committee and at least two science committees annually.

The research program is committed to serving the research community in several ways including serving on committees and workgroups. Research staff currently serve on graduate student committees, a number of local, regional, and national workgroups, including the NERRS bivalve workgroup, as well as advisory committees. Participation in these activities allows Reserve staff to provide subject matter expertise, thereby benefiting local, regional, and national coastal science and management. Additionally, these partnerships provide additional exposure to the NCNERR and its research priorities and capabilities among various groups, ultimately enhancing NCNERR partnerships and collaboration.

Action 2: Develop at least 2 collaborative research proposals annually seeking external funds to support Reserve research priorities.

Acquiring external funding through submission of proposals is often required to conduct research that addresses Reserve research priorities. Many of the Reserve research priorities are multi-disciplinary in nature and require development of collaborative research proposals to complement research staff expertise. During the collaborative process of proposal development, Reserve partnerships are strengthened and the research program's datasets and capabilities are shared among the scientific community.

V. Stewardship Program Plan

Stewardship Program Overview

Program Context

The Reserves within the NERRS, per its authorizing legislation the CZMA and Federal regulations (15 C.F.R. Part 921.1), are to be managed to ensure that Reserve ecosystems continue to be available for long-term estuarine research, education, and interpretation, while also enhancing public awareness and understanding of estuarine areas and accommodating compatible public use. The NCNERR is also directed by the CAMA to maintain, protect, and preserve its designated sites for NERRS purposes, utilizing the sites primarily for research and education, while providing public access and allowing compatible traditional uses such as hunting, fishing, navigation, and recreation that are consistent with the primary Reserve purposes.

The NCNERR stewardship program protects the natural integrity of each site for these purposes through its implementation of the stewardship plan. The stewardship plan provides a framework to address Reserve management responsibilities, activities, and strategies designed to balance protection and management of natural resources with access to and use of the sites by the public, to meet federal and state obligations associated with the sites, and to maintain the sites as a platform and information base for scientific and educational activities designed to foster more informed management of estuaries. The NCNERR stewardship approach uses the best available science to maintain and restore healthy, productive and resilient ecosystems and to share resource management information with local, regional, and national stakeholders. Stewardship strategies assess and respond to threats and concerns arising from coastal development, human use of the sites, environmental changes, and feral and invasive species.

Stewardship efforts can primarily be characterized into two broad categories: resource management and visitor access and use; therefore, the stewardship plan includes both the resource protection and public access and visitor use plans. Because stewardship staff are directly involved with NCNERR acquisition activities, this chapter also contains the land acquisition plan. NCNERR Strategic Plan objectives and actions related to each of these topics are discussed. Additionally, stewardship policies specific to recreation, off-road vehicle access, fishing and hunting, disposal of dredge material, habitat restoration, feral horses, and surveillance, enforcement and maintenance are located at the end of this chapter.

The stewardship program conducts activities at each of the sites and connects with the local communities surrounding each site through partnerships and community engagement. NCNERR stewardship staff interacts directly with local government officials, visitors to the sites, the general public, and specific user groups such as researchers, educators, non-governmental organizations and commercial operators. The stewardship staff also works to coordinate with partner organizations and agencies and/or with law enforcement agencies to address concerns at the sites. Across the sites of the NCNERR, stewardship efforts are aligned with the NERRS national strategic goals and strategies related to protection and management of coastal and estuarine ecosystems and watersheds.

Stewardship activities and strategies are implemented proactively using an adaptive management approach whenever possible. Management decision-making is conducted as a flexible, iterative process in which outcomes of management actions are used to inform future actions. When management challenges or concerns arise at the sites, site managers gather information for a baseline understanding of the situation. Subsequently, a range of management actions is considered, based on the best available science found in current literature. Because expertise or experience of partner agencies and organizations can contribute to improved understanding of a management concern, partners are also frequently consulted as part of the decision-making process. Following implementation of the chosen strategy, response is monitored and assessed. Results and new knowledge are applied as future efforts are planned and implemented. Throughout the adaptive management process, site managers share information and collaborate in choosing management actions.

Program Capacity

The stewardship program is primarily conducted by the Site Managers located in the northern, central, and southern regions of coastal North Carolina. The Northern Sites Manager, located in Kitty Hawk, is responsible for the Currituck Banks Reserve. The Central Sites Manager, located at the Reserve headquarters office in Beaufort, is responsible for the Rachel Carson Reserve. The Stewardship Coordinator & Southern Sites Manager, located in Wilmington, is responsible for the Masonboro Island Reserve and the Zeke's Island Reserve. Facilities, equipment, and infrastructure are shared among NCNERR staff, with stewardship staff coordinating with research, education, and administrative staff when stewardship activities will make use of shared resources. The capacity of the stewardship staff to engage in specific types of programs at each site varies and is based on the management needs at each site, as well as the total suite of activities within each site manager's responsibilities.

Partnerships

The NCNERR maintains ongoing partnerships with numerous local, state, and federal agencies, as well as a variety of private non-profit organizations. The work of some partners contributes to the accomplishment of Reserve goals, such as commercial operators who provide educational activities on the sites and deliver messages related to the Reserve mission. Other partnerships allow the Reserve to support local and regional efforts that are aligned with the Reserve mission, such as broader scale water quality restoration or invasive species management projects. The NCNERR stewardship staff works with partners on specific site-based projects, such as marine debris clean-ups, and with local communities to address issues of concern such as access to nature-based recreation like that which occurs at the sites. Site managers work to strengthen existing partnerships and seek out new partnerships on an ongoing basis in order to address topics of mutual interest.

Each Reserve site is managed in coordination with local agencies and organizations, based on local needs and site conditions. Primary partners for the Currituck Banks Reserve include the U.S. Fish and Wildlife Service Currituck National Wildlife Refuge, The Nature Conservancy, the WRC, and Currituck County. Primary partners for the Rachel Carson Reserve include the Town of Beaufort, the Maritime Museum, and the NPS Cape Lookout National Seashore. Primary partners for the Masonboro Island Reserve include New Hanover County, the N.C. Coastal Land Trust, the Town of Wrightsville Beach, and the N.C. Division of Parks and Recreation. Primary partners for the Zeke's Island Reserve include the N.C. Division of Parks and Recreation and the N.C.

Aquarium. Additional partners associated with each site support or provide guidance related to specific, discrete management activities. These partners, in addition to community members and other partners, serve on the NCNERR's LACs.

Volunteers

Volunteers play a critical role in the accomplishment of stewardship and resource management goals. Recruiting, training, and effectively utilizing volunteers from the local community serves the dual purpose of maximizing the effectiveness of stewardship staff efforts and instilling a stewardship ethic in individuals from the communities adjacent to the Reserve sites. Many of the Reserve volunteers are traditional users of the sites who visit and utilize the sites regularly; volunteering provides them with an opportunity to deepen their level of understanding and appreciation of the sites' natural resources. Community volunteers are directly engaged in a variety of stewardship activities at each site based on the resource management priorities per site, including marine debris removal, species of interest monitoring and protection, basic site monitoring and maintenance, and ecosystem restoration or enhancement projects.

Needs and Opportunities

The stewardship program seeks to utilize available human and material resources efficiently and effectively to implement the stewardship goals, objectives, and actions. The primary limitation to full implementation of the stewardship program across all sites is staff time. At the 2014 stakeholder meetings, local partners and site users recognized important stewardship activities that would benefit from additional stewardship staff resources, including species of interest surveys, marine debris removal, and community engagement programs. To address these limitations in the absence of additional stewardship staff, site managers utilize interns and volunteers to assist with implementation of stewardship activities that are appropriate for non-professional support. Stewardship staffing needs are discussed in detail in the Administration Plan. Supply and equipment needs are ongoing, as many stewardship tasks require specialized equipment and tools or utilize supplies that are consumed in the course of use. Larger needs, such as site infrastructure and interpretive signage, are discussed in the Administration Plan. Additionally, as new technologies related to resource management are developed, replacement of outdated equipment to increase efficiency is a priority. Examples of stewardship program needs range from basic field supplies such as field notebooks, binoculars, and appropriate personal protective equipment to specialized equipment such as GPS enabled cameras, ATVs, landscaping equipment, wildlife cameras, and boats. Operational funds and reprogrammed funds are regularly used to address these needs. When appropriate, stewardship staff pursue outside funding, independently or in collaboration with partners, to supplement these funds or to support specific project needs. Building partnerships with organizations and agencies with similar priorities increases the Reserve's opportunity to accomplish stewardship goals. Aside from these material needs, the key challenge to implementation of the stewardship program is a limited ability to respond to site use issues using existing Reserve rules in the N.C. Administrative Code, which are largely unchanged since their adoption in 1986. Reserve rules will be going through the State's mandated Periodic Rules Review Process beginning in 2017 (see Administration Plan Goal 4.1.1). Management of the Reserve sites would benefit from clear rules that address current issues and uses, support public safety, strengthen resource protection, and assist law enforcement partners in responding to site concerns.

Resource Protection Plan

The Resource Protection Plan is a required element of a NERRS management plan, per the Federal Code of Regulations, 15 CFR 921.13. The NCNERR management and statutory authorities are derived from federal and state sources including the CZMA Section 315, Federal Code of Regulations 15 CFR 921, CAMA, and N.C. Administrative Code 15A NCAC 070. (See Appendix A, B, E & F) Each of these authorities mandates that the coastal and estuarine resources at the Reserve sites be protected and maintained in order to ensure a suitable and stable natural environment for long-term research and educational activities. This is the primary purpose of the resource protection function of the stewardship program. Each of these authorities also accommodates public access and use of the sites for activities that are consistent and compatible with resource protection, research, and education activities. Access and uses at each Reserve site vary depending on site conditions and are discussed in the public access section below.

Protecting the natural resources of the Reserve, including the key representative coastal habitats that led to designation of these sites as components of the NCNERR, and maintaining and enhancing these resources in the face of natural and human stressors, serves as the foundation for all stewardship activities and is central to the success of the Reserve and all of its programs. Use of the sites includes research, educational activities, and traditional activities such as hunting, fishing, navigation, and recreation. In order to protect natural resources and maintain ecosystem integrity at Reserve sites to ensure these primary uses continue, uses that may be detrimental or damaging to natural resources are managed or disallowed.

Table 5 summarizes allowable and prohibited uses per site and provides the sources for each. The sources are described in more detail below.

Table 5. Allowable and prohibited public uses at the four NCNERR sites. This list was compiled based on NCNERR policies, which are described later in the public access and visitor use plan, the North Carolina Coastal Area Management Act, 15A NCAC 070 (Appendix F), North Carolina General Statutes, county and town ordinances, and the State Nature Preserves Dedication letters (Appendix G).

| Allowable and prohibited public uses at NCNERR sites | | | | |
|--|---|---|---|--|
| Use | Currituck Banks Reserve | Rachel Carson Reserve | Masonboro Island Reserve | Zeke's Island Reserve |
| Pets | Allowed if pets are under control and as required by local ordinances ^{2,3,4} | Allowed if pets are under control and as required by local ordinances ^{2,3,4,5} | Allowed if pets are under control and as required by local ordinances ^{2,3,4} | Allowed if pets are under control and as required by local ordinances ^{2,3,4} |
| Off-road vehicles (other than boats, emergency vehicles, enforcement vehicles) | Allowed as defined by local ordinances; driving on dunes/vegetation is not allowed ^{1,2,3,4} | Prohibited ^{2,3,5} | Prohibited ^{2,3,4} | Allowed only in designated areas and with the required permit; driving on dunes/vegetation is not allowed ^{1,2,3} |
| Disturbing or removing live animals or vegetation; collection (sampling) of natural materials | Prohibited unless necessary permits or approval from management agency has been obtained ^{1,2,3} | Prohibited unless necessary permits or approval from management agency has been obtained ^{1,2,3} | Prohibited unless necessary permits or approval from management agency has been obtained ^{1,2,3} | Prohibited unless necessary permits or approval from management agency has been obtained ^{1,2,3} |
| Introducing exotic flora and fauna | Prohibited ^{1,2} | Prohibited ^{1,2} | Prohibited ^{1,2} | Prohibited ^{1,2} |
| Camping | Allowed only for research with written permission from DCM ^{1,2,3,4} | Allowed only for research with written permission from DCM ^{1,2,3} | Allowed with posted permission from DCM ^{1,2,3,7} | Allowed only for research with written permission from DCM ^{1,2,3} |
| Fires | Prohibited ^{2,3,4} | Prohibited ^{2,3,4,5} | Allowed only in areas designated by DCM ^{2,3,7} | Prohibited ^{2,3} |
| Recreation | Allowed as long as natural integrity and research and education activities | Allowed as long as natural integrity and research and education activities | Allowed as long as natural integrity and research and education activities | Allowed as long as natural integrity and research and education activities |

| | | | | |
|--|---|--|--|--|
| | are not disrupted ^{1,2,3,6} | are not disrupted ^{1,2,3,6} | are not disrupted ^{1,2,3,6} | are not disrupted ^{1,2,3,6} |
| Use | Currituck Banks Reserve | Rachel Carson Reserve | Masonboro Island Reserve | Zeke's Island Reserve |
| Fishing and Hunting | Allowed within the limits of federal, state, and local laws ^{1,2,3,6} ; hunting also requires written permission from DCM ⁶ | Allowed within the limits of federal, state, and local laws ^{1,2,3,6} | Allowed within the limits of federal, state, and local laws ^{1,2,3,6} | Allowed within the limits of federal, state, and local laws ^{1,2,3,6} |
| Target shooting | Prohibited ^{1,3} | Prohibited ^{1,3,5} | Prohibited ^{1,3} | Prohibited ^{1,3} |
| Nudity | Prohibited ⁶ | Prohibited ^{5,6} | Prohibited ⁶ | Prohibited ⁶ |
| Pollution; deposition of solids or discharge of liquids | Prohibited ^{1,2} | Prohibited ^{1,2} | Prohibited ^{1,2} | Prohibited ^{1,2} |
| Disturbing research | Prohibited ¹ | Prohibited ¹ | Prohibited ¹ | Prohibited ¹ |
| Storage of personal property | Prohibited ^{1,4} | Prohibited ¹ | Prohibited ¹ | Prohibited ¹ |
| Disposal of dredge material | Prohibited ^{2,3} | Allowed for U.S. Army Corps of Engineer projects and permitted and approved navigation projects within designated areas ^{2,3} | Allowed for U.S. Army Corps of Engineer projects and permitted and approved navigation and private projects within designated areas ^{2,3} | Prohibited ^{2,3} |
| Groundwater removal | Prohibited ^{1,2} | Prohibited ^{1,2} | Prohibited ¹ | Prohibited ^{1,2,4} |

| Noise production | Prohibited if disruptive to local wildlife and the aesthetic enjoyment of the Reserve as a natural area ¹ ; Prohibited if disturbs other persons ⁴ | Prohibited if disruptive to local wildlife and the aesthetic enjoyment of the Reserve as a natural area ¹ ; Prohibited if causes public nuisance ^{4, 5} | Prohibited if disruptive to local wildlife and the aesthetic enjoyment of the Reserve as a natural area ¹ ; Prohibited if causes public nuisance ⁴ | Prohibited if disruptive to local wildlife and the aesthetic enjoyment of the Reserve as a natural area ¹ ; Prohibited if causes public nuisance ⁴ |
|---|--|---|--|--|
| Use | Currituck Banks Reserve | Rachel Carson Reserve | Masonboro Island Reserve | Zeke's Island Reserve |
| Disturbances of soil, excavation, mining, commercial or industrial uses, timber harvesting, ditching and draining, deposition of waste materials | Prohibited ^{1,2} | Prohibited ^{1,2} | Prohibited ^{1,2} | Prohibited ^{1,2} |
| Fireworks | Prohibited ^{1,6} | Prohibited ^{1,5,6} | Prohibited ^{1,4,6} | Prohibited ^{1,4,6} |
| Dumping and littering | Prohibited ^{1,2,3,4,6} | Prohibited ^{1,2,3,4,5,6} | Prohibited ^{1,2,3,4,6} | Prohibited ^{1,2,3,4,6} |
| Removal of artifacts | Prohibited ^{2,6} | Prohibited ^{2,6} | Prohibited ^{2,6} | Prohibited ^{2,6} |
| Disturbing feral horses | Prohibited including harming, approaching within 50 feet, feeding, petting, possessing, or riding feral horses ⁴ | Prohibited including harming, approaching within 50 feet, feeding, petting, possessing, or riding feral horses ⁵ | Not applicable | Not applicable |

¹ 15A NCAC 070 – N.C. Administrative Code for N.C. Coastal Reserve

² State Nature Preserves Dedication letter

³ NCNERR Stewardship Policy

⁴ County Ordinance (Currituck County, Carteret County, New Hanover County, Brunswick County)

⁵ Town Ordinance (Town of Beaufort)

⁶ N.C. General Statutes, including Coastal Area Management Act

⁷ Guidance for camping and campfires can be found on the Reserve's website, www.nccoastalreserve.net

In addition to the resource protection guidance found in the aforementioned authorities, the sites of the NCNERR are designated as State Nature Preserves by the State and, as such, are subject to management guidance and principles administered by the N.C. Natural Heritage Program found in the N.C. Administrative Code (15A 12H) (Appendix M) that require each site's natural resources be protected and maintained in as nearly a natural condition as possible as public trust resources. The following management principles are applied for all dedicated preserves, unless exceptions are expressly provided in the dedication letters. The site-specific management principles identified in the site dedication letters provide guidance regarding potentially disruptive activities that are not allowed. The principles also include requirements for the NCNERR, as the managing agency, to implement management actions that protect natural resources from stressors. Topics discussed include controlling invasive species, managing visitor activity to prevent degradation, and installing the minimum amount of access and guidance structures to provide for safe and informed access. To ensure the NCNERR adheres to the requirements for State Nature Preserves, the stewardship staff coordinates with Natural Heritage Program staff when developing management approaches.

The Reserve is also subject to State laws and local ordinances that affect uses at the sites. These are primarily related to visitor activities and will be discussed in the public access section below. Finally, policies that further explain the stewardship program's approach to specific resource protection activities such as management of feral horses, dredge material placement, off-road vehicles, and traditional uses can be found at the end of the stewardship chapter.

Site managers monitor site conditions regularly and respond to resource protection issues by contacting the appropriate agencies and organizations for support or enforcement action. Enforcement of the rules that relate to protection of the sites is accomplished through regular communication and coordination with local, state, and federal law enforcement agencies, when law enforcement action is required. Memoranda of Understanding (MOUs) or similar agreements with enforcement agencies that support effective enforcement and resource protection can be found in Appendices O, P and Q. Coordination with local partner agencies and organizations is utilized to address resource protection concerns for which law enforcement response is not needed.

Resource protection can be complex due to the variety of stressors affecting each Reserve site. Challenges to the maintenance of sites in a natural condition can come from natural sources, uses of the sites, or anthropogenic activities in the watershed. Site managers operate at multiple scales to proactively address stressors that could compromise site integrity. Examples of activities that may be undertaken to protect natural resources from stressors include: installation of visitor guidance structures to protect sensitive habitats, collaboration with local communities and non-governmental organizations on regional conservation or restoration efforts, and engagement with the research staff and community to promote research to better understand impacts of stressors.

Species of interest management

Plant and animal species naturally occurring at the sites of the NCNERR vary from common and representative to rare and listed as threatened, endangered, or special concern. Some species are well

documented and considered to have stable populations; others are known to be at risk or have not been well studied. Some species are of particular interest to the research community or to a wider community of resource managers; others, including charismatic megafauna, can serve as “ambassadors” to the public, providing opportunities for volunteer participation and public engagement. Although basic inventory and monitoring activities would be beneficial at all NCNERR sites, at each site some species of special interest occur for which specific management actions are undertaken. Details regarding the current species of interest per site are included in the site descriptions.

Management activities related to species of interest, including protection and monitoring, are guided by the Reserve’s foundational documents, including the Nature Preserve dedications and N.C. Administrative Code that mandate that the essential natural character of the sites be maintained.

A species may be of interest for a variety of reasons, including its conservation status and federal or state listing, its uniqueness or rarity, its ecological niche, its role as a representative species (umbrella, keystone, or indicator species), or due to a current known threat impacting the species. Site managers implement management actions related to species of interest to ensure that critical habitat is available and protected, contribute to broader species management initiatives at the state or federal levels, respond to site-specific threats, or as part of local or regional research efforts. In some cases, single-species management actions are designed; however, management actions that benefit multiple species are implemented when feasible.

Management activities related to species of interest, including survey and inventory efforts, short or long-term monitoring, and actions taken to protect habitat, are often resource intensive in terms of labor and supplies. Survey and inventory work to develop species lists or establish baselines can benefit from greater numbers of participants while monitoring activities often require labor to be expended over extended periods in order to accumulate data to support answering research questions, understand trends, or assess the results of previous management actions.

Given the number of species of interest associated with each site, these activities must be prioritized. Efforts are made to collaborate with partners to maximize efficiency or to utilize volunteers where these approaches can be employed effectively. Outside funding is pursued to support species management activities where appropriate. Projects in which the Reserve can contribute to an existing, broader effort are pursued when possible. Examples of species of interest activities that would ideally be possible include conducting intensive monitoring of multiple species of nesting shorebirds in order to contribute more fully to regional efforts, developing and engaging in ongoing mark-recapture work to support a stronger understanding of diamondback terrapin populations and management approaches, and establishing a shellfish monitoring program to track changes in native populations over time given the multiple pressures of extraction and environmental change affecting these organisms. More intensive efforts such as these are often delayed until the appropriate financial resources become available.

To prioritize management activities for species of interest, the following questions are considered:

- What species are rare, endemic, or of special legal status (endangered, threatened, special concern)?

- What species are the foci of larger monitoring or research efforts conducted by partners at the local, regional, or national level?
- What species can be monitored utilizing existing protocols tested and implemented by other NERRS or partners?
- For what species can the NCNERR support development of survey and monitoring protocols?
- What species are of importance to the public or can serve as ambassadors to link to the NCNERR mission and purposes?
- What species are being exposed to specific pressures or management challenges?
- What species are most sensitive to threats and stressors?
- What species play a crucial role in ecosystem function?
- What species can be monitored at reasonable cost and with low impact?
- What gaps in knowledge can be filled by survey and inventory efforts or what research questions can be answered through monitoring efforts?

Site managers make decisions regarding which species management activities to undertake based on consideration of the above. Also considered is the availability of funding to support activities; species management activities may occasionally be undertaken opportunistically if a funding source or funded partnership collaboration presents itself. Generally, prioritization of species management activities can be described as follows:

- High priority: species listed as threatened or endangered at state and/or federal levels; species under imminent threat; species that are the subject of a regional or national research project or initiative of limited duration
- Medium priority: species for which existing monitoring programs can be easily implemented; rare or endemic species; species for which a funded opportunity exists; species for which the NCNERR can support development of methodologies and protocols; species for which trained volunteers can be utilized effectively, and
- Low priority: species with no state or federal status; species with populations known to be stable; species for which no existing protocols are available; species for which no larger collaboration exists; species for which monitoring efforts would be costly and/or labor intensive.

Habitat management

Functional, intact habitats provide services to the natural and human communities in and around the Reserve sites. To protect and support the integrity of important habitats, site managers undertake management activities to document and understand habitat condition and to ensure that habitat integrity is not compromised. Management activities to understand conditions may include periodic monitoring of specific habitats and areas or application of remote sensing methods to analyze historic conditions. When conditions are determined to be suboptimal or opportunities exist to increase the quality of habitat, restoration or enhancement actions may be undertaken. Examples include: enhancing specific vegetation communities through selective plantings; altering geologic or hydrologic conditions to restore functions or mitigate for known impacts; and supplementing existing habitat through Reserve initiated or partner led restoration projects. Enhancement and restoration activities will be based the best available science,

planned in consultation with appropriate experts and partner organizations, and adhere to the Habitat Restoration policy included in the Reserve's stewardship policies.

Invasive, non-native, and feral species management

A variety of plant and animal species that are non-native to North Carolina's coastal ecosystems are found on NCNERR sites. Domesticated animal species that have become wild and are considered feral are found on Reserve sites. Non-native plants and animals can become invasive or act as nuisance species when they are able to out-compete native species, have no natural predators or population controls, or are promoted by human activity. These species have the potential to disturb and damage naturally occurring species, harm existing natural communities and disrupt ecological functions in the Reserve. Invasive plants currently occur at each NCNERR site and are discussed per site in the site descriptions. To address these possible changes and protect the sites' natural resources, invasive plant management strategies, including monitoring and treatment, are continuous. Site managers stay abreast of potential new threats, maintain partner relationships to support invasive and non-native management, and implement management activities using an adaptive management framework. Problems with non-native and feral animals vary per site and by scale. Accordingly, non-native and feral animals must be managed at the appropriate statewide, regional, or local level through coordinated, collaborative efforts. Actions at the site level, such as managing feral horses, focus on minimizing impacts to the sites by these animals.

Site managers prioritize invasive, non-native, and feral species to manage based on: the availability of staffing and funds; the likelihood that an organism will cause damage to a site's natural resources; and the potential for a removal effort to result in eradication or the likelihood of re-invasion by the organism. Management approaches are then developed and implemented that are species and site specific.

Specific objectives and actions related to resource protection are discussed below as part of Objective 3.1.

Public Access and Visitor Use Plan

The Public Access Plan is a required element of a NERRS management plan, per the Federal Code of Regulations 15 CFR 921.13. Public access to the NCNERR sites is defined as the ability of the public to pass physically and visually to, from, and along the ocean shore, other waterfronts, and over public lands. The ability to enjoy the oceans, bays and rivers is directly related to the ability to reach them. In providing for public access, the NCNERR must balance allowing for long-term public use and enjoyment of the sites while minimizing damage to and protecting the integrity of the sites' natural resources. A site-specific approach is used to provide public access due to the unique set of conditions and uses at each site. Support and management of public access may include structures that guide and facilitate access and signage to provide site and access information, support a positive visitor experience, and encourage visitors to follow rules for responsible use of the sites' natural resources.

The NCNERR sites are open access with no hours of operation or access fees. Details regarding modes of access to each site are included in the site descriptions in the Introduction chapter as well as visible on the boundary maps (Figures 3, 7, 11, and 15). Site managers work with the surrounding local communities to

improve access and address access-related concerns on an ongoing basis. Access to specific areas of sites may be restricted for limited periods of time to meet management goals or maintain public safety. Examples of these limited access restrictions include posting of bird nesting enclosures for species of interest and closure of specific areas for short durations following storms during which hazardous debris may have been deposited on site.

Access to the sites supports use of the sites' natural resources by visitors, researchers, and educators for a variety of purposes. The majority of visitors engage in activities that can be characterized as traditional uses, including hunting, fishing, navigation, and recreation for which direct involvement with natural elements of the environment is required. Access to near-pristine sites provides visitors with an opportunity for genuine interaction with the natural world. Visitor activities vary based on the natural resource characteristics of each site as discussed in the site descriptions. Examples of nature-based activities that occur at one or more sites include bird watching, beach walking or hiking, motorized and non-motorized boating, and other water-based recreational activities. Given the increasing human development in the coastal area of North Carolina, the NCNERR sites offer an opportunity for visitors to experience natural, undeveloped coastal and estuarine ecosystems in ways that can only be found in limited areas along the coast.

Researchers access the sites to utilize these outdoor laboratories and functional ecosystems available for research and monitoring, and as control sites. Educators access the sites to utilize these outdoor classrooms to educate people of all ages, encourage appreciation of the beauty and uniqueness of these sites, and foster a stewardship ethic in the citizens of and visitors to North Carolina. Other individuals accessing the sites include commercial operators providing transportation to the sites or programming at the sites, such as ecotours.

Although the stewardship staff are most closely engaged in managing public access and visitor use, other Reserve staff contribute to management of public access and visitor use. Research staff communicate with the research community about ways to minimize the impact research activities may have on natural resources and support research that helps site managers understand the impacts of visitor use. Education staff lead programs at the sites and develop programs and materials to encourage visitors to use the sites responsibly and develop the public's understanding and appreciation of coastal and estuarine ecosystems. Research and education staff also document and report any site concerns to the appropriate stewardship staff.

Challenges related to public access and visitor use are varied. Specific threats and stressors at each site are discussed in the site descriptions. In general, the primary public access concern for the NCNERR is the rapidly increasing coastal population in North Carolina, the associated increasing demand for natural and recreational areas and the potential increase in use impact pressure at the sites. Managing public access in the face of an increasing human population will require careful monitoring of impacts, development and testing of strategies to direct use to less sensitive resources, and an adaptive management approach that allows for flexibility and adaptation to respond to changing conditions in order to maintain the NCNERR sites in as near-pristine conditions as possible.

Due to the multi-component nature of the NCNERR and the isolation of the sites from Reserve offices, the majority of the visitors to the sites may never interact with a member of the Reserve staff. To communicate with visitors about the purpose of the sites and encourage responsible visitor behavior while supporting a positive visitor experience, signage at each site provides basic information to promote understanding of the

importance of the site and guide visitors in minimizing impacts. The NCNERR maintains minimal infrastructure on the sites to ensure that the near-pristine character of the sites is preserved. Trails, boardwalks, and overlooks exist at some sites, where installation of these structures is most supportive of both visitor access and resource protection. Development of site infrastructure is based on needs and opportunities as they arise. Information about existing on-site infrastructure at each Reserve site and needs is available in the facilities section of the Administration Plan.

Specific objectives and actions related to public access are discussed below as part of Objective 3.2.

Land Acquisition Plan

The Land Acquisition Plan is a required element of a NERRS management plan, per the Federal Code of regulations, 15 CFR 921.13. Because estuaries offer numerous and diverse benefits to society and natural systems, the U.S. Commission on Ocean Policy (2004) recommended that priority coastal habitats be identified and conserved. The NCNERR Land Acquisition Plan describes the values underlying acquisition activities and the processes used to evaluate and prioritize acquisitions.

An ongoing focus of the NCNERR Land Acquisition Plan is to complete acquisition of the remaining inholdings within the Masonboro Island Reserve boundary as owners express interest in selling. Acquisition of new lands outside of the site management boundaries has not been a priority for the NCNERR; however, in the future, selective acquisition and boundary expansion may be useful to enhance the program mission, further research, education, and stewardship goals, or address environmental change and allow for migration and connectivity of important habitats. New lands and waters may be parcels adjacent to current holdings or may comprise non-contiguous parcels within current site watersheds.

Priority habitats the NCNERR will consider for acquisition include areas that would add to the core of the sites, including sound waters, mud and sand flats, and intertidal and supratidal salt marshes. These areas are vital to the functioning of the estuarine system. Buffer habitats, areas adjacent to or surrounding the core habitats, that provide protection for core habitats and estuarine dependent species or that provide for habitat migration or support ecosystem resiliency will also be considered for acquisition.

Criteria that will be considered by the Reserve when determining whether to pursue acquisition include: the location of the parcel, the level of site management the parcel will require, the Reserve purposes served by the acquisition, and the community's support of the acquisition.

Specific objectives and actions related to public access are discussed below as part of Objective 3.4.

Stewardship Policies

In addition to the variety of authorities and management documents that guide stewardship of the sites, a number of site-specific policies are needed to address the diversity of site conditions and local uses. Stewardship policies were originally developed with input from OCM. Policies are reviewed periodically and updated by site managers in conjunction with the Reserve Manager, with input from LACs as appropriate, to respond to changing conditions at the sites.

Recreation

Recreation policies are intended to allow for rights of access for compatible and consistent uses of the sites while ensuring that Reserve natural resources are protected. Responsible use of the Reserve by traditional users and recreational visitors protects the Reserve ecosystems and enhances the user experience for subsequent visitors.

Policy 1: Traditional recreational uses of each site shall be allowed to continue as long as they do not disrupt the natural integrity of the site or any research or educational activities.

The four sites have long been used by area residents and visitors for swimming, fishing, hunting, nature study, hiking, and other nature-dependent recreational activities. These traditional uses have created a strong local pride in and attachment to the natural and aesthetic values of each site. Recreation can be compatible with research and education when visitors are informed and take steps to minimize the impact of their activities. Site managers implement actions such as signage guidance structures to guide visitors away from sensitive resources and to provide information to support responsible use. Where sensitive resources may be directly impacted by visitors or visitor safety may be compromised by site conditions, time-limited areas of restricted access may be implemented (i.e. posted shorebird nesting enclosure areas). Providing for public access and traditional and recreational use of the sites promotes appreciation of the Reserve's natural resources and meets the state and federal legislative requirements for the program. Protection of the sites and research and education programs take priority over recreational activities as per the Reserve program's legislative guidance; management actions will be implemented to minimize the impact of recreational activity on the natural integrity of the Reserve or if conflicts arise between these uses. Installation of interpretive trails and signage will be compatible with this policy with respect to protecting the natural integrity of the sites.

Policy 2: Users of the Reserve shall not disturb or remove any live animals (except for fish, shellfish, game animals, furbearers, or waterfowl per fishing and hunting policies) or vegetation at any site unless it is part of an approved research or educational project and all necessary permits have been obtained.

Removal and destruction of vegetation can lead to serious long-term damage to the ecosystems found in the Reserve by causing erosion or sedimentation, decreasing species richness, damaging habitat important to species of interest, or negatively impacting ecosystem function. Disturbing nesting birds and other animals can interfere with their natural habits, potentially causing nesting failure or departure of the animals from the Reserve. Visitors to Reserve sites are encouraged to observe live animals inhabiting or utilizing the Reserve and minimize the impact of their activities on the native wildlife.

Policy 3: Pets must be under control at all times.

Pets on Reserve sites can damage and destroy habitat or disturb wildlife if not properly controlled. Uncontrolled pets can also negatively affect other visitors' experience at the sites. In addition, pet wastes can carry potentially damaging bacteria or become a nuisance for visitors. Pet owners who choose to recreate on the sites of the NCNERR must keep their animals under control at all times and

collect and properly dispose of pet wastes. Owners and their pets are subject to the relevant county and municipal rules regarding leashing and appropriate disposal of wastes.

Policy 4: Camping or fires in designated areas are only allowed by written or posted permission from DCM.

Restriction of camping and fires protects the Reserve's habitats from disturbance and destruction. Camping at the Zeke's Island, Rachel Carson and Currituck Banks Reserves will be permitted only for research that requires overnight stays for observations or data gathering; written permission must be obtained from the Reserve. Primitive camping and campfires on Masonboro Island will be allowed in accordance to guidance posted on-site and via the Reserve's website which includes information on appropriate areas.

Policy 5: All visitors must pack out their own trash.

Debris and litter left behind by visitors can negatively impact the NCNERR habitats and organisms or can enter the ocean system and contribute to marine debris concerns at the global level; it can also negatively impact the experience of other visitors. Because the primary purposes of the Reserve are research and education, recreational facilities such as trashcans and restrooms are not available at the sites. Thus, it is the responsibility of visitors to plan to pack out all trash and refuse generated as a result of their visit. Many visitors demonstrate a stewardship ethic by also collecting and removing trash left behind by other visitors or true marine debris carried to the Reserve by weather, winds, and tides.

Off-Road Vehicles and ORV Access

Off-Road Vehicle and ORV Access policies provide guidance for the use of ORVs at sites where these vehicles are permitted while ensuring that Reserve natural resources remain protected. Responsible use of ORVs at NCNERR sites protects the Reserve ecosystems, supports visitor safety, and enhances the user experience for subsequent visitors.

Policy 1: No power-driven vehicles shall be used on the uplands and marsh sediments within the Rachel Carson or Masonboro Island sites except during emergency, enforcement, management, research, or dredging operations. Motorized boat use within these sites, consistent with WRC regulations, is not affected by this policy.

Unauthorized power vehicles (*e.g.*, motorcycles and ORVs) have created problems on the sites by damaging dunes and vegetation or by disturbing wildlife and visitors. The Town of Beaufort has an ordinance that prohibits motor vehicles on the Rachel Carson islands. New Hanover County has an ordinance that prohibits use of motor vehicles on Masonboro Island except for specific emergency and management purposes. ORVs permitted for emergency, enforcement, management, research, and dredging activities shall take actions to minimize impacts to the sites and avoid sensitive habitat areas. ORVs permitted on Masonboro Island will travel only in the intertidal beach zone during the shorebird and sea turtle nesting seasons (April-September).

Policy 2: Reserve operation at the Currituck Banks site shall not reduce current levels and rights of public access to properties located between the site and the Virginia line.

Currently, paved road access north of Corolla terminates at an ocean beach access ramp located within the Reserve site. Landowners, local residents and visitors depend upon this ramp to route them to the beach for access to lands located between the Reserve and the state line. Currituck County ORV regulations limit this access to the ocean beach seaward of the foredunes. Federal regulations restrict access through the Back Bay National Wildlife Refuge (VA) to certain permanent residents of Currituck Banks. Thus, the ramp and beach within the Reserve property are vital for public access to the northern banks.

When the beach is impassible due to high water levels, access across the site for property owners to the north will be extended to include back dune areas. The road in the adjacent Ocean Hills development to the south will also be part of this "high water" route. Dominion Power maintains a MOU with DCM for cooperative maintenance of a permanent easement granted to Dominion Power for an electric distribution right-of-way to service the northern banks (Appendix I). The easement is located in the back dune areas of the Currituck Banks site and its location must be considered when delineating "the high water" route.

If, at some point in the future, driving along the ocean beach conflicts with Reserve goals and objectives (*e.g.*, environmental issues, recreational beach uses, or research/education uses), it will be the responsibility of the state to make available replacement upland access and to do so prior to any restriction of current beach driving. Any such action will be taken only after full consultation and coordination with the LAC, Currituck County, NOAA, adjacent landowners, and current landowners between the site and the state line.

Access across the site shall be for the purpose of providing a vehicular route to and from properties located between Corolla and the Virginia state line. At no time shall the site be used to provide through access to Virginia (except for enforcement, emergencies, and the currently permitted beach driving access to the north allowed to permanent residents). Should improved access to properties located between the Reserve site and Virginia ever be provided from the north, access across the site may be terminated. Improvement of internal access within those subdivisions north of the site shall not alter provision of access across the Reserve site.

Policy 3: Off-road-vehicles at the Zeke's Island and Currituck Banks shall normally operate only on the flat, sandy beach area: driving over dunes and disturbing vegetation is prohibited. Vehicles using the Currituck Banks during flooded beach conditions shall follow interdune flats and avoid vegetated areas. Drivers shall avoid posted areas of nesting birds and turtles and shall observe the State or County mandated speed limit.

The destruction of plants and sand dunes accelerates erosion of barrier beaches and diminishes the Reserve's natural productivity and habitat diversity. The beach and dune areas are important nesting areas for various bird and turtle species that cannot find these natural habitats elsewhere along the rapidly developing coast. The Reserve staff will coordinate with the Fort Fisher Recreation Area superintendent in the delimitation of waterbird feeding and nesting sites within the Zeke's Island site.

Policy 4: At the Zeke's Island site, power-driven, off-road vehicles (other than boats, emergency vehicles, law enforcement vehicles, and vehicles permitted to engage in research and management activities) are only allowed in designated areas on the barrier spit. ORV use at the Zeke's Island site is managed by the N.C. Division of Parks and Recreation (DPR). A permit must be obtained and the required fee paid to the DPR prior to using ORVs at the site. Dates and hours of accessibility are determined by the DPR and vary seasonally.

The barrier spit is the only portion of the Zeke's Island site that is easily accessible to users of off-road vehicles (ORVs). This portion of the site overlaps with DPR's Fort Fisher State Recreation Area and DPR manages the ORV use per a long-standing MOU with DCM (Appendix N). Confining ORVs to this area does not diminish other uses within the site. The islands and marshes remain protected, while traditional users, such as fishermen, retain access to the inlet and sound waters. Special areas for bird nesting and wintering are posted to minimize impacts from vehicles and foot traffic. Sea turtle nests and hatchlings are marked and protected by DPR staff. Because the ocean beach of the Zeke's Island site serves as nesting area for sea turtles that come ashore to lay eggs during nesting season, ORV use during nesting season may be limited to daylight hours. Lights from vehicles can keep the turtles from coming ashore and nesting or interfere with turtle hatchlings' journey to the ocean. Tire tracks on the beach can also impede or misdirect the hatchlings.

Fishing and Hunting

Fishing and hunting policies clarify the traditional hunting and fishing activities supported by the Reserve while ensuring that Reserve natural resources remain protected and available for research and education activities. Hunting policies provide for public safety and resource protection while supporting this traditional use.

Policy 1: Fishing, shellfishing, and hunting may occur on the Reserve within the limits of federal, state, and local laws. Hydraulic dredging or "clam kicking" is prohibited within the Reserve.

Commercial fishing and recreational fishing and hunting will be allowed subject to existing county, WRC, and DMF regulations including but not limited to bag limits, seasons and gear. Collection of all migratory birds requires a U.S. Fish and Wildlife permit and a WRC license. In order to maintain ecosystem diversity and protect the natural integrity of the sites, hunting and trapping of certain species on upland portions of a given site may be necessary. If these rights do not exist currently, they may be extended on a case-by-case basis after consultation with Reserve staff and the WRC. Hydraulic dredging to harvest shellfish destroys underwater habitats by the severe disturbance of estuarine bottoms and vegetation and by extensive sedimentation of the water column. Such activity is expressly prohibited in the Reserve according to North Carolina Administrative Code Reserve Use Requirements.

Policy 2: Certain areas of the Reserve may be closed to commercial and recreational fishing and shellfishing to provide undisturbed sites for research and fisheries reproduction.

Portions of the sites may be closed to fishing and shellfishing based on research to better document the condition of the Reserve's submerged habitats and species that they support. Such closings would benefit commercial fishing by protecting nursery and spawning areas. Similarly, areas may be closed

for research projects if undisturbed waters and habitat areas are required. Authority to close certain areas of the Reserve rests with DMF. Reserve staff will seek input from LACs as appropriate to inform decision making on closures. When Reserve staff find that such a closing is warranted, the DCM will petition the DMF for such action in accordance with the existing regulations. Also, primary nursery areas within the Rachel Carson, Masonboro Island, and Zeke's Island site are protected from bottom-disturbing fishing gear by DMF regulations.

Policy 3: Hunting is permitted in the Reserve according to local, state or federal wildlife regulations. More stringent rules may be pursued if hunting conflicts with research and education uses or threatens the Reserve's wildlife populations. Target shooting is not allowed.

Existing WRC and U.S. Fish and Wildlife Service regulations set season, bag limits, and limits on methods of taking for game species found at Reserve sites (*e.g.*, migratory waterfowl, marsh hens, doves, deer, and other game). At this time, these regulations, when properly enforced, are adequate to maintain wildlife populations in the Reserve. Reserve staff will seek input from LACs as appropriate to inform decision making related to hunting rules. If the Reserve staff deem more stringent regulations to be necessary, the DCM will petition the WRC and the Secretary of DEQ to adopt appropriate restrictions in accordance with departmental procedures. The Currituck Banks site, and other sites if deemed appropriate, is registered with the State's Registered Lands program through the WRC to allow more effective enforcement of hunting regulations and protection of the Reserve.

Target shooting is prohibited within the Reserve sites because it is not formally regulated. Bullets may carry for great distances and cause severe injury or death, posing a hazard to staff and research, educational, and recreational users as well as creating a liability hazard for the state. Past problems with target shooting at the sites have resulted in damage to vegetation and signs and improper disposal of target materials. In addition, target shooting can present potential user conflicts and disturbance to adjacent property owners.

Dredge Material Placement

The Dredge Material Placement policies provide conditions and guidance to ensure that activities that alter site conditions are completed in ways that minimize damage to Reserve natural resources and encourage beneficial uses of dredging material.

Policy 1: Dredge material placement as part of U.S. Army Corps of Engineers projects shall be allowed to continue at the Rachel Carson and Masonboro Island sites, but only within existing disposal areas of designated easements. All operations must comply with the North Carolina Coastal Area Management Act (G.S. 113A-100 et seq.), Dredge and Fill Act (G.S. 113-229), Section 404 of the Federal Water Pollution Control Act (33 USC 1251 et seq.), and the Use Requirements of the N.C. Coastal Reserve (NCAC T15A: 070). Deposition of dredge material within the Corps easement by private contractors will be allowed only if approved by the Corps, the DCM, and the State Property Office and the contractors have received appropriate permits from the DCM. Disposal sites must be located, designated, and managed to prevent sedimentation of marshes, intertidal flats and submerged lands, and to minimize impacts to ground nesting birds and sea turtle nesting areas. All dredge material shall be placed in a manner consistent with the best

technology available for prevention of mosquito and other disease vector breeding. Dredging projects that include a research component and/or produce an ecosystem enhancement benefit are preferred and will be given additional consideration. All dredging proposals shall be reviewed by the Reserve staff through the land owner permission portion of permit review process.

The U.S. Army Corps of Engineers (COE) retains perpetual easements along Taylor's Creek at the Rachel Carson site and along the ICW at the Masonboro Island site. Dredge material deposition at Rachel Carson site and along the waterway portion of the Masonboro Island site shall be in diked areas within the existing easements.

In areas that have received periodic deposition of dredge material, early stages of plant succession have been maintained, providing appropriate habitat for some species of birds. Ecosystem enhancement projects can be used to intentionally create benefits of this type. Research projects can be designed to help better understand the best methods and approaches for using dredge material beneficially.

Policy 2: Dredge material deposition on the ocean beach at the Masonboro Island site shall not occur during the critical nesting times of sea turtle and ground-nesting shorebirds (April - November). Populations of seabeach amaranth shall also be protected from direct deposition and from vehicular impacts of disposal operations. If dredging is unavoidable during that time period, it shall be contingent upon prior and concurrent monitoring for nesting activity and presence of seabeach amaranth.

Dredge material deposition occurs periodically on the ocean beach at the Masonboro Island site, typically in association with maintenance dredging of Masonboro Inlet. This deposition activity serves to partially mitigate the erosion and sediment loss caused by the jetty on the north end of the island. This deposition does not directly affect the estuary area within the Reserve as the dredge material will be washed back into the natural longshore transport of sediments. Impacts to surf zone fauna may occur, although these have not been extensively studied at Masonboro Island.

The courting and nesting of shorebirds at the Masonboro Island site extends from April through September. This roughly coincides with the sea turtle nesting season, which extends from May 1 - November 15. Thus, deposition of dredge material during these months plus the associated activities of bulldozers and other vehicles on the beaches can negatively impact these species. Seabeach amaranth, a federal and state threatened species, historically occurred on the upper beaches and foredunes of Masonboro Island and deposition of material and associated vehicular activity may disrupt species presence and habitat. Conducting seasonal monitoring of sea turtles and seabeach amaranth shall be a priority for the Reserve; if dredging and deposition activities occur outside the suggested timeframe, monitoring will be of increased importance in order to ensure that protected listed species are not affected.

Habitat Restoration

The Habitat Restoration policy is intended to ensure that any restoration or remediation project undertaken at a NCNERR site will provide benefit to the Reserve's natural resources and that restoration science will be furthered when research can be incorporated into a restoration project.

Policy 1: Projects to restore estuarine and upland habitats within the Reserve will be reviewed by state and federal Reserve staff. Input from other governmental agencies, LACs, and other interested parties will be sought as needed. Priority shall be given to areas impacted by visitor use, dredge material deposition, and invasive species. Restoration activities will be undertaken using the best available science. Whenever possible, restoration projects will include internal or independent research that advances restoration science and understanding of Reserve ecosystems and their function and response.

Given the diversity of habitats and uses within the various sites, occasional restoration projects may be beneficial or necessary. For example, some dredge material islands along the waterway side of Masonboro Island include former salt marshes that have been filled. Portions of these islands located outside of the Corps easement could be considered for mitigation projects where marsh could be restored and, thus, increase the Reserve estuarine area. Likewise, areas within sites that have experienced damage from visitor use or that have been altered by the presence of invasive or feral species may require remedial action. At both the Currituck Banks and Rachel Carson sites, damage to vegetation by feral hogs or horses, may be mitigated through restoration of groundcover species. Restoration projects present opportunities for long-term monitoring of structure and function within the restored habitat.

Feral Horses

The feral horse policies describe the ownership and management of horses that occur at the Currituck Banks and Rachel Carson sites. Effective management of feral horses reduces habitat impacts and protects horse health from the detriments of overpopulation.

Policy 1: The state of North Carolina is the lawful owner of the feral horses on the Rachel Carson site. However, the state does not own the horses that roam the Currituck Banks site.

The state Attorney General's Office has determined that the horses found on the islands composing the Rachel Carson site are owned solely by the state. The horses on Currituck Banks roam many properties and, thus, are not claimed by the state.

Policy 2: Scientific studies of population structure, feeding habits, and impacts on Reserve habitats plus information from analogous management programs of feral horses shall be used to manage the horses at the Rachel Carson site. Such information will also be used to consult with key parties concerning feral horse management on the Currituck Banks.

Information gathered from studies of feral horses on the sites plus additional data from other populations (*e.g.*, at Cape Lookout National Seashore and Assateague National Seashore) will be used to determine proper management of the horse herds. The primary goal of the NCNERR is to manage the sites for research and education. Though the horses are very popular with local residents, the animals represent a management conflict because they are an introduced species that consumes and tramples marsh vegetation vital to estuarine productivity, and their presence, activities, and wastes alter other natural processes. Decisions regarding horse management will be made in accordance with the Rachel Carson feral horse management plan with input from DEQ, OCM, and the LAC as appropriate. Decisions regarding horse management at

Currituck Banks will be developed in collaboration with the Currituck Outer Banks Wild Horse Advisory Board, which includes the Corolla Wild Horse Fund, Currituck County, representatives from each of the protected lands utilized by the herd (Reserve and U.S. Fish and Wildlife Service), and community members.

Surveillance, Enforcement and Maintenance

Surveillance, enforcement and maintenance policies explain how the Reserve accomplishes these activities at the NCNERR sites. Appropriate surveillance and enforcement ensures that Reserve resources are protected and that traditional and recreational users can safely visit and utilize the sites.

Policy 1: The Reserve staff and enforcement personnel from other federal, state and local agencies shall periodically visit each site to identify and investigate possible violations of Reserve regulations. The Reserve also relies on researchers, educators, members of the LACs, and other users of the sites to report any problems.

Time and budget limitations keep Reserve and DCM staff from maintaining a continuous presence at each site in the Reserve. Enforcement agencies are able to visit the sites only periodically or in response to reports of possible rule violations or public safety concerns. Therefore, all users of the Reserve must exercise responsibility for obeying the management policies and rules of use stated in this plan, for reporting possible violations of the rules and policies, and for cooperating with Reserve staff and pertinent enforcement agencies.

Policy 2: The DCM, DMF, DPR, WRC, and local law enforcement agencies shall cooperate in the enforcement of Reserve use standards listed in the North Carolina Administrative Code (see Appendix M) as well as applicable state and local laws and ordinances.

Each site in the NCNERR falls into a number of different, sometimes overlapping jurisdictions involving state and local law enforcement agencies. Strong lines of communication and a strong sense of cooperation among the Reserve and the enforcement agencies ensures that rules and ordinances are effectively enforced. Site managers maintain regular communication with each of these groups to proactively address site concerns that may compromise public safety, to investigate any rule violations through the appropriate channels, and to take management action when necessary.

At Zeke's Island, the DEQ has assigned management responsibility for patrol and enforcement of the barrier spit to the DPR (Appendix N). In addition, the New Hanover County Sheriff has jurisdiction throughout the Zeke's Island and Masonboro Island sites. The Town of Beaufort Police and Carteret County Sheriff respond to law enforcement concerns at the Rachel Carson site. The Currituck Banks site is within the jurisdiction of the Currituck County Sheriff; response is coordinated with the deputy stationed in Corolla. Rangers of the Currituck and Mackay Island National Wildlife Refuge also patrol this site. The WRC has authority to patrol the lands and waters of the entire Reserve for enforcement of their regulations (i.e., hunting and boating) (Appendix O). Likewise, the DMF patrols the sites to enforce marine fisheries regulations (Appendix P).

Policy 3: When deemed necessary, the DCM shall enter into cooperative agreements with pertinent law enforcement agencies to clarify enforcement jurisdictions and responsibilities.

In the past, a lack of understanding on the part of the enforcement authorities regarding which agency should respond to a given problem has at times led to difficulty with response to law enforcement calls. The site managers work to improve effectiveness of law enforcement response by communicating regularly with law enforcement agencies and providing information regarding the Reserve, its sites, and its regulations to authorities. In addition, cooperative agreements that help to clarify each agency's role relative to Reserve management are used to support coordinated and effective enforcement of Reserve use standards.

Stewardship Program Objectives and Actions

Goal 3: Stewardship of protected sites contributes to the study and appreciation of coastal and estuarine ecosystems.

Objective 3.1 Coastal and estuarine ecosystems are managed and protected.

Actions that will be undertaken under Objective 3.1 support the resource protection plan and include activities that are specific to management, enhancement, and restoration of protected resources, including habitats and species of interest. Invasive, non-native and feral species are managed to support protection and restoration of protected resources. Actions related to development and enforcement of policies and rules to support site management are also discussed. Additional information regarding recreation and hunting and fishing can be found in the Stewardship Policies at the end of this chapter.

Action 1: Monitor general site condition at least monthly.

To adequately address protection of the NCNERR sites, the site managers will monitor each site on a regular basis as deemed appropriate based on season and use. Each site has a characteristic suite of communities and species, as well as a unique list of traditional uses and local threats and stressors associated with it, requiring that the monitoring schedule and protocols be site-specific. Monitoring may include assessment of any or all of the following: invasive and feral species presence and condition; threatened, endangered, and species of interest presence and condition; visitor use patterns or impacts; habitat change as a result of natural or anthropogenic influences; and condition of Reserve-owned equipment and structures. Monitoring activities will assist in maintaining the Reserves for use by researchers, educators, and the public. Monitoring also aids in designing management strategies to address stressors. The Reserve's surveillance and enforcement approach is described in the Stewardship Policies at the end of the chapter.

Action 2: Respond to issues on sites, coordinating with law enforcement, state and federal agencies, and partner organizations.

Enforcement of rules is conducted through partnerships with local, state, and federal enforcement agencies. Regular communication and coordination with these agencies will ensure that enforcement

response is effective and that enforcement gaps are identified and addressed. Responding to issues on the sites does not always require law enforcement action; where appropriate and based on site needs and conditions, strategies will be implemented to address potential disturbance or damage to site resources through cooperation with local communities using the lowest level of enforcement possible to get the desired compliance result. This can be accomplished through coordinated media campaigns or through outreach programs: a public relations campaign collaboratively implemented by the Reserve, New Hanover County Sheriff's Office, and the Town of Wrightsville Beach has been used to help address the impacts of large gatherings of visitors at the Masonboro Island Reserve, encourage responsible visitor behavior, and reduce the incidence of illegal activity; and a coordinated approach between the Reserve and the NPS has been used at the Rachel Carson Reserve to develop and deliver educational messages to reduce illegal and unsafe visitor interactions with feral horses. Through these partnerships and similar coordinated efforts, the NCNERR will effectively manage the Reserves against the effects of overuse or misuse associated with increased coastal population. Additional explanation of the Reserve's surveillance and enforcement approach is described in the Stewardship Policies at the end of the chapter.

Action 3: Manage species of interest by conducting survey and monitoring activities, protecting critical habitat areas, and implementing management actions to address concerns and support state, federal, and regional recommendations or initiatives.

Species of interest and associated management activities the Reserve will conduct under this management plan include:

- Regional and national monitoring efforts exist for the piping plover, listed as a federally endangered shorebird under the Endangered Species Act. The NCNERR supports efforts to survey for and document this species by participating in partner agency organized breeding and wintering surveys.
- The International Shorebird Survey (ISS) is a monitoring network with a focus on gathering data about shorebirds and the habitats they depend on. The surveys are conducted for all shorebirds, but with a focus on vulnerable species such as the threatened red knot. This data is used to set regional and national shorebird conservation priorities. At the Rachel Carson site, ISS surveys are conducted several times throughout the year by volunteers with staff support. Surveys at other sites are supported by staff as resources allow.
- Loggerhead and green sea turtles are listed as threatened under the Endangered Species Act. Nesting activity is managed either by partner agencies (DPR at the Zeke's Island site), partner organizations (Network for Endangered Sea Turtles at the Currituck Banks site) or by seasonal staff, interns, and community volunteers (at the Masonboro Island site) working to identify, protect, monitor, and excavate nests following hatching. Since 2010, the Reserve has also supported a regional loggerhead genetic fingerprinting project by providing egg samples from nests on Reserve sites.
- The diamondback terrapin is listed as a species of special concern in North Carolina and is identified as a priority species in the State Wildlife Action Plan. Management activities implemented by the NCNERR support priority activities suggested at the state level, including surveying of habitats for presence of terrapins and development of survey and

monitoring methods. At the Masonboro Island site, a pilot effort to create a citizen science based survey program was developed in collaboration with the N.C. WRC. This effort will be expanded to other Reserve sites or to other portions of the State's estuaries, as financial resources allow.

- The American oystercatcher is considered an umbrella species; management actions implemented to protect this species tend to indirectly protect other species utilizing the same habitat. In areas where nesting is determined to occur, posts and signs are used to demarcate nesting habitat and protect it from disturbance from visitor activity. At the Masonboro Island, Reserve staff and volunteers post nesting areas each season based on conditions and habitat utilization. At the Masonboro Island site, monitoring of nesting success has also been undertaken as funds allow and in collaboration with Audubon NC in order to support the broader range-wide effort of the American Oystercatcher Working Group (AOWG) to collect data to inform management of this species. The Reserve also supports banding of adults and chicks of this species at the Masonboro Island site, in coordination with Audubon. At the Zeke's Island site, the DPR monitors and protects nesting American oystercatchers. At the Rachel Carson site, staff and volunteers conduct occasional breeding surveys in cooperation with N.C. WRC. Sightings of banded oystercatchers at all sites are reported through the AOWG online database.
- Seabeach knotweed is a state endangered plant that grows in highly dynamic ocean and sound beach habitats. It can be used as an indicator species to assess the quality of these habitats, which are critical for listed nesting and foraging shorebird species including the piping plover and red knot. At the Rachel Carson site, volunteers conduct periodic surveys to document the presence and extent of this species.
- Remains of seabirds are regularly found along the shores of the Reserve sites. The Seabird Ecological Assessment Network (SEANET) program is an existing survey and research program coordinated through Tufts University. At the Rachel Carson site, staff provide transport and support for trained volunteers who conduct periodic surveys utilizing these existing protocols and contribute data to the existing database. This program will be expanded to include other Reserve sites, as financial resources allow.

Action 4: Manage, enhance, and restore habitats by implementing activities to support the natural integrity of sites, working with partners and contributing to state and regional initiatives.

Habitat management activities are undertaken based on specific site needs and are designed to utilize the best available science. Action may be taken to reduce or eliminate the impacts of a threat or stressor or promote resilience. Alternately, a project may be implemented to address an identified need for restoration or to strengthen or augment an existing habitat. Management actions may require characterization of conditions based on field data collection and supported through mapping and monitoring efforts. Methods and timing of habitat management actions are dependent on available staff and financial resources. Reserve staff work to connect with and build on state or regional initiatives in planning and implementing habitat management actions on the sites. An adaptive management framework in which monitoring, evaluation, and adaptation of strategies is used iteratively to adjust management when appropriate.

Habitat management activities the Reserve will conduct under this management plan include:

- Stewardship staff participate in regional efforts to address habitat protection at landscape scales. Staff will continue to participate in the Currituck Alliance for the Sounds, an initiative to study and advance resilience in and around the freshwater sounds, and the Onslow Bight Forum and Cape Fear Arch Conservation Collaborative, regional efforts to implement community conservation plans and promote stewardship of natural resources.
- Stewardship staff work to support Reserve habitat mapping efforts, but may also take on mapping of specific areas or habitats to understand and prepare for implementation of a management strategy. Efforts to collect accurate benthic habitat data at the Masonboro Island site began due to a need to develop a policy to manage shellfish aquaculture leases. This mapping effort was coordinated with the state's benthic habitat survey program through the DMF and collaborators at UNCW. The Reserve will continue to support ongoing efforts to improve benthic habitat maps to support a variety of purposes.
- Building off current research done by wetland scientists, vegetation monitoring and mapping will continue in the marshes at the Currituck Banks site. Mapping will provide information about vulnerability to erosion and inform decisions about potential shoreline stabilization projects. Vegetation monitoring will help prioritize sites for marsh restoration and aid in developing metrics to measure restoration success.
- Habitat enhancement and restoration at the Currituck Banks site will be undertaken through the construction of a wooden raised platform at the terminus of the primitive trail. The platform will prevent further erosion of the shoreline and damage to the existing marsh habitat by trampling. It will also enhance the visitor experience through an improved view of the Currituck Sound and a more stable walking surface. Interpretive signage will be included in the project, depending on funding.
- Grassland enhancement projects involve protecting early successional upland plant species from the damaging effects of invasive species and/or undertaking planting projects to support habitat function. A previous grassland enhancement project at the Rachel Carson site will be monitored and opportunities may be pursued to implement similar projects at this and other sites.
- Large pieces of marine debris can disturb and cause damage to habitats by smothering vegetation, excluding plants and animals from utilizing habitats and opening areas to colonization by invasive species. At the Rachel Carson Site, debris research and removal efforts, coupled with data collection, will continue to be undertaken by staff and volunteers to protect and restore habitats.
- A documented sediment deficit exists at the Masonboro Island site resulting from the influence of the jetty stabilizing Masonboro Inlet. Sand is placed on the ocean beach during periodic maintenance events. The Reserve will continue to coordinate these efforts with the Army Corps of Engineers and local government partners in order to protect existing habitat and restore ocean beach habitat.
- The NCNERR is working with the North Inlet-Winyah Bay National Estuarine Research Reserve, SC on a recently awarded NERRS Science Collaborative grant to use the Climate Change Vulnerability Assessment Tool for Coastal Habitats (CCVATCH), a habitat vulnerability assessment tool that will help the Reserves better understand coastal habitat vulnerability to changing climate conditions. The assessment will be applied to marshes at all four sites of the

NCNERR. Stewardship and training staff will prepare for and implement the community engagement and expert elicitation aspects of the CCVATCH.

Action 5: Manage invasive, non-native and feral species by conducting survey, monitoring and treatment activities on sites and in coordination with partners as appropriate.

Management activities undertaken under this action are based on specific site needs and are designed utilizing the best available science. Activities may require characterization of conditions based on field data collection and supported through mapping and monitoring efforts. Management strategies may include eradication, treatment to prevent the spread of an existing invasion or maintain populations at a defined level, or monitoring to determine trends prior to further action. Methods and timing of invasive, non-native and feral species management actions are dependent on available staff and financial resources. Reserve staff work to connect with and build on state or regional initiatives in planning and implementing management actions on the sites. An adaptive management framework in which monitoring, evaluation, and adaption of strategies is used iteratively to adjust management when appropriate.

Invasive, non-native and feral species management activities the Reserve will conduct under this Management Plan include:

- Alligatorweed (*Alternanthera philoxeroides*), an invasive exotic aquatic plant, is currently found in pockets along the sound shorelines and creeks at the Currituck Banks site. Alligatorweed forms dense mats that crowd out native species and impede recreational activities such as boating, swimming, and fishing. Reserve staff will work with the USDA and other partners in the region to identify areas of concern at the site and potential treatment options for eradication.
- Feral hogs are an actively managed invasive species at the Currituck Banks site. Staff will continue to work with the U.S. Department of Agriculture Wildlife Services program (USDA-WS) to eradicate hogs from the site. Feral hogs are managed through trapping, exclusion from specific areas of habitat, and monitoring with trail cameras. Depending on funding availability, additional management may be undertaken utilizing radio telemetry and GPS collars to study movement patterns and habitat use and to support aerial-based removal.
- Feral horses are actively managed as non-native species at both the Rachel Carson and Currituck Banks sites. The State owns and manages the Rachel Carson horses, but does not own or manage the Currituck Banks herd. At the time the Rachel Carson site was designated as part of the NCNERR, the state-owned feral horse population was experiencing a population explosion that led to significant impacts on marsh habitat and horse welfare. To avoid repeating this situation, best protect site habitats, and meet its obligation as the state's management agency, the Reserve established a population management target of 30 animals. Current management includes use of a remote dart delivery system to administer an immunocontraception vaccine (birth control) to select mares annually. Forage availability, which is linked to vegetation health, is monitored through body condition and activity budget studies of the horses. Feral horses utilize the Currituck Banks site as a small portion of their total available habitat; these horses are not owned by the State and are monitored by partner

organizations under a multi-agency approved management plan on which the Reserve is a signatory.

- Salt cedar (*Tamarix*) is an invasive plant found at the Rachel Carson site. Initial treatment efforts attempted in 1999 were not cost and time effective. Since 2001, management efforts have been focused on monitoring the spread and die-off of individual *Tamarix* plants.
- Beach vitex (*Vitex rotundifolia*) is under treatment at the Masonboro Island site. Working with the Beach Vitex Task Force, a regional management group, Reserve staff survey and treat occurrences with herbicides annually. Although early management recommendations suggested that the plants would not be capable of producing viable seeds outside their native habitats, plants at the Masonboro Island site have successfully seeded, requiring ongoing maintenance management effort.
- The presence of non-native red foxes at the Masonboro Island site has resulted in damage to sea turtle and shorebird nests. Management of this species has been undertaken as funding allows to achieve predation rates at or below those recommended in sea turtle recovery plans, shorebird management plans, and best practices documents.
- Gracilaria (*Gracilaria vermiculophylla*) is a non-native red algae that has invaded the waters of the Zeke's Island and Masonboro Island sites, creating erosion of marsh edges and potentially causing changes to water biochemistry in discrete areas. Management of this species includes working with researchers to determine and characterize the invasion and exploring possible treatment methods.
- White poplar (*Populus alba*) occurs on the upland extent of Zeke's Island, within the Zeke's Island site. Eradication of this woody invasive capable of outcompeting native maritime forest species will be accomplished through periodic herbicide treatment.

Action 6: Support efforts to assess and update rules and policies to respond to site conditions and ensure the Reserve's mission is fulfilled and local, state and federal laws are upheld.

By rule, the sites in the NCNERR are protected primarily for research and education; traditional uses that are compatible and consistent with these priorities are allowed. Occasionally, conditions or uses are determined to be incompatible or inconsistent but current policies, rules or enforcement do not provide clear direction for addressing these situations. Site managers review applicable state rules and county and local ordinances to identify opportunities to better support site protection and enforcement. To address identified rule and policy gaps, clear policies or rule update recommendations are developed based on site manager, program, and Division experience. Stewardship policies are reviewed and updated by site managers, the Reserve Manager and LACs, as needed. New or updated rules are developed and recommended by site managers and the Reserve Manager and adopted based on departmental authority and approval. If deemed necessary for protection of NCNERR resources and to ensure safe public use of the sites, changes or additions to existing policies and rules will be pursued.

Action 7: Document and maintain natural history records by developing a centralized online database, populating it with existing geographic and photographic species records, and continuing to document observances on sites.

Maintaining past and current natural heritage records is essential for understanding the ecological significance and condition of NCNERR sites. Natural heritage records are useful for understanding how ecosystems and habitats may be changing over time and evaluating the potential environmental impacts of proposed research and stewardship projects and development projects on adjacent lands. Additionally, a natural resource database to house natural history records and photographs is critical to the preservation of stewardship staff knowledge, documentation of site occurrences, and as a resource for current and future research and education efforts. Site managers will collect records, including geospatial data and images, as available, and maintain records in a standardized format. Depending on availability of funding, a database designer will be contracted to develop an internet-accessible database to house the records.

Action 8: Enhance partnerships with natural resource management agencies and organizations by providing advisory services and developing collaborative projects that support protection of ecosystems.

Stewardship staff coordinate and collaborate with a wide variety of partner agencies and organizations. Site managers provide information and advice as requested to share their individual areas of expertise and strengthen these partnerships. Site managers also work collaboratively with partners to design, seek funding for, implement, and review ecosystem protection, management, enhancement, and restoration activities undertaken at site, local, and regional scales.

Objective 3.2 Access is accommodated for site uses that maintain protection of natural resources and are compatible with research and education activities.

Actions that will be undertaken under Objective 3.2 support the public access and visitor use plan and include activities that are specific to public access, encourage users of the sites to be responsible stewards, and ensure a positive experience for all user groups. Additional information regarding recreation and hunting and fishing can be found in the Stewardship Policies at the end of this chapter.

Action 1: Provide for public access to sites by installing and maintaining structures, signage, and trails to guide and inform visitors.

In order to provide a positive visitor experience, encourage responsible use, and instill an environmental ethic in visitors to the NCNERR sites, the stewardship staff plan for, install, and maintain minimal infrastructure on the sites. Site managers maintain and replace identification and rules signs on an ongoing basis. Structures and trails are developed based on site needs and funding opportunities. Informational signs containing site descriptions, program information, and visitor use guidance are installed at regularly used access points. Additional interpretive signs, frequently highlighting specific site use topics or more detailed descriptions of site features, are designed and installed when conditions suggest that this will be an effective means of communicating with visitors. Site managers coordinate with other Reserve staff and partners to seek funding for and to develop access and guidance infrastructure. Existing on-site facilities and needs are detailed in the Facilities Plan.

Action 2: Work with local partner agencies and governments to support efforts to provide access facilities for local communities to engage in nature-based recreational use of the sites.

As near-pristine natural areas, the sites of the NCNERR are important to members of the surrounding communities interested in recreational activities that are dependent on access to nature. Members of local communities visit the sites of the NCNERR to engage in activities such as bird watching, hiking, beach combing, boating, surfing, and paddling. The stewardship staff support these uses of the sites by communicating with local partners about the ways in which the sites are accessed by the community, including boat ramps, ORV accesses, and parking areas to facilitate continued access. In cooperation with local partners, site managers may pursue opportunities to provide additional access points or to make improvements to existing access facilities consistent with the Reserve purposes.

Action 3: Provide information to specific user groups to promote safe and appropriate use of the sites while preserving natural integrity and minimizing impacts by providing information about site resources and guidance for minimizing impacts during use of sites.

Stewardship staff directly engage several specific user groups: educators, researchers, and commercial operators. Educators and researchers are provided with information and guidance tailored to their needs and based on the character, location, frequency, and duration of their activities on a site. Site managers may recommend adjustments to a planned research or education activity in order to reduce its impacts on sensitive resources or minimize potential conflicts with other uses and/or users. Commercial operators, businesses that utilize the sites as part of their ongoing operations or business activities, are engaged by stewardship staff on an ongoing basis. Because preservation of the natural integrity of the sites is in the best interest of the commercial operators and because commercial operators interact directly with significant numbers of site visitors, the site managers engage the commercial operators as partners in stewardship of the sites. Site managers provide information to commercial operators about the sites' resources, NCNERR program activities, and responsible use of the sites. To directly and indirectly reach recreational users of the sites, stewardship staff provide information to the general public via the website, social media, on-site signage, scheduled outreach programs, and personal communications. Recreation policies 1-5 address management of recreational activities and provide greater detail regarding responsible use of the sites.

Action 4: Inspire current and potential site users to appreciate and engage in the stewardship of estuarine and coastal ecosystems by providing opportunities for active participation in Reserve activities on the sites.

Site users who are directly engaged in hands-on activities can experience learning that leads to a feeling of attachment and appreciation of the sites. To encourage visitors to develop a stewardship ethic, the site managers provide opportunities for community members to participate in a variety of stewardship activities. These activities are typically coordinated by site managers and may include site cleanup and maintenance, monitoring and protection of species of interest, invasive species management, and biological surveys. Opportunities to engage in hands-on stewardship activities are

promoted through a number of media outlets and locations to reach out to both current visitors and potential future visitors to the sites.

Action 5: Engage researchers, educators, and commercial operators as active participants in stewardship of the sites by encouraging them to provide information about site observances and their use of the sites.

In order to better understand the interests and potential impacts of these specific user groups, it is important for site managers to have information about these users' activities, including the location, frequency, duration, and character of use. Researchers and educators are engaged on an ongoing basis, depending on the details of their activities; these users are also engaged by the Reserve's research and education staff as detailed in the research and education plans. Site managers reach out to commercial users on an annual basis to encourage submission of information about their activities on the sites. Because they are physically present on the sites in the course of their activities, these user groups are recognized as potential partners in observing and reporting site management concerns. To best utilize this opportunity, commercial operators, educators, and researchers are encouraged to communicate with site managers about conditions on the sites and observances of an interesting or concerning nature.

Action 6: Assess and characterize use of the sites to inform balanced management between access and resource protection and to reduce potential conflicts between user groups by monitoring uses, engaging user groups, and implementing management actions.

Each site has a unique set of uses and user groups and may include recreational use, commercial use, research and education use, and other traditional uses such as hunting, fishing and navigation. To increase understanding of use trends per site, stewardship staff may conduct studies on specific or general use patterns and impacts of uses. As coastal populations continue to increase, the likelihood of conflict between uses and the potential for damage to protected resources also increases. Where a use may be conflicting with other uses or resulting in damage to protected resources, management strategies may be implemented using an adaptive management framework. Approaches site managers utilize to understand and address management concerns related to site uses may include: periodic monitoring and data collection; surveys of site visitors or specific user groups; and meetings and input from user groups. Site managers also seek advice from partners and consult scientific literature to inform decision making related to management of site uses.

Management activities the Reserve will conduct to better understand and balance uses at Reserve sites under this Management Plan include:

- Hunting is recognized and protected as a traditional use at Reserve sites. Increased residential development adjacent to the sites has resulted in an increase in the number of concerns expressed by community members regarding the relationship between safe recreational use and hunting. The Reserve will explore options to balance these uses and promote safe use of the sites for all users; management actions may include implementing policy or outreach strategies and working with partner agencies to develop more effective tracking and management of hunting activity.

- Community engagement and development of management strategies in conjunction with local governments can be used to resolve use conflicts. At the Currituck Banks site, the Reserve will work to consider options to ensure proper use of the parking lot for access to the boardwalk and trails.
- Understanding visitor use patterns supports management decision making. Protocols to develop annual visitation numbers were developed and implemented for the Masonboro Island and Rachel Carson sites. Stewardship staff will evaluate these efforts, determine appropriate next steps, and continue to use similar approaches to collect data that will support effective management actions when addressing site concerns.
- Previous research conducted at Reserve sites indicated that many visitors were unaware of the purpose and management framework under which the Reserve sites are managed. Outreach and community engagement strategies were implemented to address these findings. Similar efforts will continue to build on these strategies and the Reserve will consider conducting follow-up research to assess the effectiveness of these efforts.
- With increasing coastal populations, Reserve staff have noted an increase in the levels of commercial and recreational fishing at some Reserve sites. Opportunities will be pursued to increase interaction with the DMF, collaborate on fisheries related research and management projects, and consider interactions between fisheries activities, natural resource protection, and recreational use of the sites.

Objective 3.3 Trained volunteers contribute to and benefit from supporting stewardship activities.

Action 1: Recruit volunteers to support stewardship activities by engaging students, community members, and civic groups and utilize volunteers to accomplish and enhance stewardship activities.

Site managers recruit volunteers from local communities and educational institutions to assist with site management activities. Due to the resource limitations at the Reserve, volunteer participation plays an important role in accomplishing the goals of the stewardship program. Engaging members of the public directly in active participation in stewardship activities encourages the development of a stewardship ethic and understanding of the importance of coastal and estuarine resources. The NCNERR 312 performance measure for the stewardship program sets a target of 1350 hours of volunteer effort to be contributed toward completion of stewardship program goals and under the direction of stewardship staff.

Action 2: Advance volunteers' skills and knowledge of stewardship of coastal and estuarine natural resources by providing mentoring, training, and hands-on field experiences.

Site managers seek to offer volunteers the opportunity to grow in skills and knowledge. Volunteers receive training and information to enrich their experience and volunteer activities are designed to be meaningful and to contribute significantly to site management and resource protection. Handbooks and training sessions are used to promote learning. Some volunteer opportunities include longer term activities in which volunteers can develop skills such as species identification or use of natural resource management equipment and practices. Volunteers have been trained to support activities such as shorebird surveys, sea turtle nest monitoring, and monitoring of vegetation change.

Action 3: Provide a safety briefing at each field-based volunteer training or activity.

Safety is critically important for activities conducted in an outdoor setting or on and around water. To support a safe volunteer working environment, a safety briefing is conducted at the start of each field-based volunteer activity. Volunteers receive information about the possible hazards and risks associated with the activity, the location of safety supplies, and the safety and communication systems in place, such as a weather lookout or on-shore contact.

Action 4: Facilitate management of volunteers to support Reserve programs by maintaining effective tracking and communication tools and providing current volunteer resources and materials.

Stewardship staff maintain spreadsheets that are used to track volunteer contributions to the Reserve and report on volunteer performance measures biannually. Stewardship staff also communicate regularly with volunteers to promote recruitment and maintain relationships in order to build a core of regular volunteers. Stewardship staff coordinate the periodic update of volunteer materials, including web-based information and print materials. In order to ensure that volunteers can participate in all appropriate aspects of Reserve operations, stewardship staff coordinate with other sector staff in these efforts.

Objective 3.4 Boundary expansion and acquisition opportunities are explored to protect Reserve sites.

Actions that will be undertaken under Objective 3.4 support the land acquisition plan and include activities that are specific to acquisition efforts and expansion of the Reserve boundaries and its holdings.

Action 1: Evaluate acquisition of inholding and adjacent properties from willing sellers to expand boundaries to parcels that meet NERRS definitions for core and buffer areas as appropriate.

The four sites comprising the NCNERR represent the most tangible and enduring aspects of the program. Permanently preserved, undisturbed examples of various estuarine types are fundamental to the underlying concept of NERRS. Thoughtful acquisition and boundary expansion planning is essential to ensure proper environmental protection and to anticipate user demands and potential impacts from activities in the surrounding communities and watersheds. Opportunities to expand current site boundaries to incorporate additional acreage and important representative natural resources may occur and will be pursued as possible.

The Masonboro Island Reserve is the only NCNERR site that has privately held inholdings within its management boundary. Twelve properties totaling approximately 17 acres on Masonboro Island proper plus some areas of the adjacent spoil areas remain in private ownership. Acquisition of these parcels by the State for inclusion in the NCNERR will eliminate the possibility of development on the island, thereby keeping the ecosystem intact for Reserve purposes. The North Carolina Coastal Land Trust, which absorbed the former Society for Masonboro Island and worked to protect Masonboro Island, continues to assist in acquisition efforts through annual landowner contacts to pursue potential donation or sale of property or property rights to the State of North Carolina for inclusion in the NCNERR.

Action 2: Maintain and enhance relationships with adjacent and inholding property owners.

The NCNERR works to maintain positive relationships with adjacent property owners, recognizing that this group has a unique opportunity to observe activities and disturbance on the sites and that this group may be most directly affected by activities on the sites. Open communication with these neighbors can benefit both the Reserve and the adjacent owners, as information is shared and site concerns are addressed. Cultivating informed neighbors, valuing their input, and responding efficiently strengthens the community of support around the Reserve sites.

Adjacent property owners include private individuals and public partners. Private landowners on adjacent properties have been invited to participate in Reserve-led field activities such as diamondback terrapin surveys. They have also been recruited to serve on the sites' LACs. As many adjacent property owners also frequently visit the sites, opportunities arise to directly engage them by offering them information and encouraging them to contact staff with concerns. Engaged neighbors have reported illegal activity such as target shooting, allowing staff to take action to resolve the issue quickly. Reserve staff will continue to encourage adjacent property owners to be engaged in management of the sites and will explore additional opportunities to reach out to this group.

Reserve staff will also continue to maintain regular communications and strong relationships with partner agencies and organizations with adjacent holdings. Good communication facilitates implementation of management actions such as treatment of invasive species, monitoring of species of concern, and response to law enforcement or safety concerns.

At the Masonboro Island Reserve, many of the remaining inholding property owners visit the site less frequently than the Reserve staff. Because of this, it is likely that Reserve staff will be aware of potential harmful impacts, such as wildfire, vandalism or invasive species presence, prior to the inholding owners. Serving as a resource for these owners, maintaining open communication, and continuing to be respectful neighbors facilitates productive relationships and increased understanding of the Reserve and its purposes.

Action 3: Explore opportunities for assessing future acquisitions based on prioritization of habitat protection and ecosystem resilience needs.

Existing Reserve sites were chosen in part because of the representational value their natural communities possess. Moving forward, additional acquisition to support ecosystem resilience will need to be considered. Sea level rise, land subsidence, and changes to climate systems may affect Reserve sites, though to varying degrees. Effects may include loss of habitat, conversion of areas from one habitat type to another, introduction of non-native species, and changes in patterns of wildlife utilization. As the effects on representative natural community types become more fully understood, non-contiguous acquisitions may be needed to ensure that representative habitats continue to be protected and ecosystems continue to function. For example, the Currituck Banks Reserve will likely experience sea level rise impacts prior to other NCNERR sites (NC Sea Level Rise Report Update 2015). If

it becomes apparent that sea level rise will impact the natural communities at this site to the point they are no longer representative, sites containing examples of ecologically intact communities may be considered for acquisition or boundary expansion to ensure that the site continues to include core and buffer areas representing the habitats and ecosystem.

Ecological value will be the primary criteria for all future acquisitions. Parcels will be analyzed based on characteristics such as types of habitat available, quality of habitats, presence of priority species, connectivity with other protected areas, and potential for habitat migration. Additional criteria that will be considered in evaluating any potential acquisition or boundary expansion include: the location of the property and ease of access for management; how the property will help to fulfill Reserve purposes; the level of effort and resources required for management of the property; and the level of community support for acquisition of the property. Reserve stewardship and administrative staff will evaluate each potential acquisition and boundary expansion to ensure that the acquisition will result in a net gain for the Reserve. Results of planned and future vulnerability assessments will be incorporated as appropriate into acquisition planning and prioritization.

Existing tools developed by the State and conservation partners may be used to assess and prioritize properties under consideration for acquisition. For example, the N.C. Conservation Planning Tool scores parcels in a variety of categories, four of which are applicable to the NCNERR mission: Biodiversity and Wildlife Habitat, Open Space and Conservation Lands, Water Services, and Marine and Estuarine Resources. This and similar tools will be incorporated where effective to provide an objective measure of the conservation value of potential acquisitions and inform acquisition decision making.

VI. Administration Plan

Administrative Plan Overview

Administration of the NCNERR advances the operations, infrastructure, and stature of the NCNERR to support and enable the implementation of the education, training, research, and stewardship programs to fulfill its mission. The administration team includes the Reserve Manager, and the Education, Training, Research, and Stewardship Coordinators. Administration encompasses a wide range of activities including providing long-term direction and vision for the program; working with NOAA, DCM, and strategic partners to fulfill program requirements and address needs; ensuring that rules and policies result in program compliance with authorities and relevant laws; overseeing day-to-day operations; assessing and addressing infrastructure needs; appropriately staffing the Reserve, and providing staff with the skills and resources necessary to perform their jobs and do it safely; and communicating the work and value of the NCNERR and relevant coastal and estuarine ecosystem and management information to target audiences. This work is described herein as the administration plan, and includes the staffing plan.

Organizational Framework

NERRS operates as a federal-state partnership. OCM provides direction, funding, and review for the System and individual Reserves and state partners manage the individual Reserves.

Office for Coastal Management (OCM)

Direction is provided by the OCM through the NERRS Strategic Plan and regular interaction with Reserve managers and sector coordinators. Coordination between the federal and state partners is provided by OCM program specialists. The program specialist communicates directly and regularly with Reserve staff, building a level of trust between the partners and familiarizing the federal and state personnel with NERRS and Reserve management procedures and policies.

Section 315 of the CZMA provides non-competitive operations funding and competitive construction and acquisition funding for the System. The OCM administers these funding programs and program specialists review operations work plans through annual cooperative agreements and performance reports to ensure compliance with program policies and special award conditions. The OCM provides technical assistance and oversight of system-wide programs such as the SWMP, CTP, and the KEEP.

The OCM also conducts performance evaluations on the operation and management of individual Reserves pursuant to sections 312 and 315 of the CZMA. The purpose of NOAA review is to ensure that a state partner is complying with NERRS goals, approved funding agreements and work plans, and Reserve management plans. Deficiency findings must be addressed in operation awards and management plan updates in an appropriate and timely manner to avoid withdrawal of National Estuarine Research Reserve designation.

North Carolina Division of Coastal Management (DCM)

The state partner in the NCNERR federal-state partnership is the North Carolina Department of Environmental Quality's (formerly the Department of Environment and Natural Resources) Division of Coastal Management (DCM) (Figure 19). The DCM carries out the state's CAMA, the Dredge and Fill Law and the federal CZMA of 1972 in the 20 coastal North Carolina counties, using the rules and policies of the N.C. Coastal Resources Commission. Per CAMA, the NCNERR is administered by DEQ. CAMA also states that DEQ "shall consult with and seek the ongoing advice of the Coastal Resources Commission" (G.S 113A-129.2 (b)).

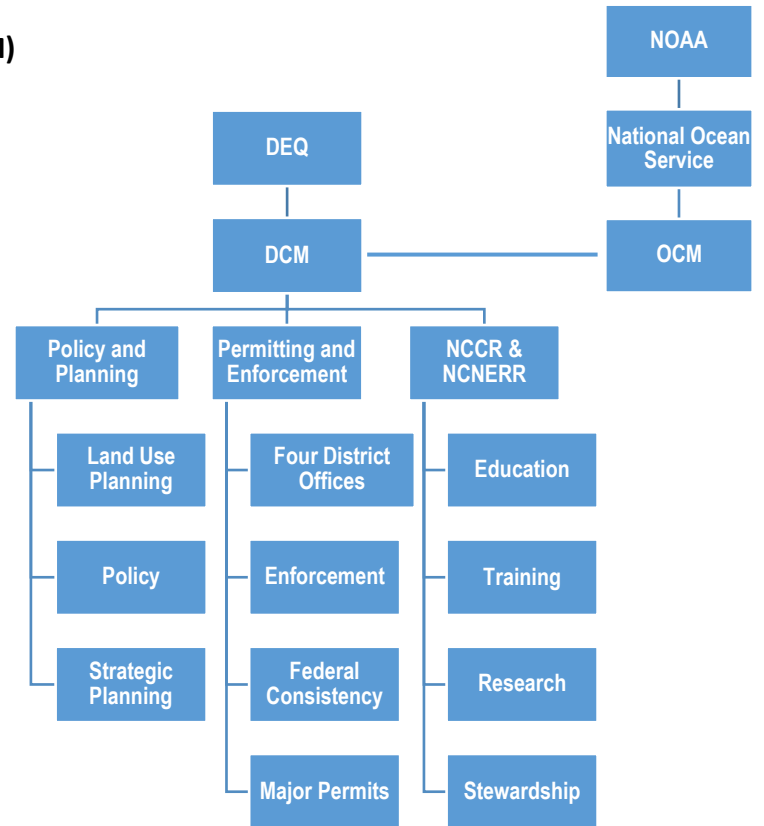


Figure 19. NCNERR Organizational Framework Chart

The organizational chart for DCM is presented in Figure 19. The Division is organized into three sections: Policy and Planning, Permitting and Enforcement, and the North Carolina Coastal Reserve (NCCR), which includes the NCNERR.

The DCM is an appropriate state partner for the NCNERR because:

- The organizations have complementary missions as both are authorized by the CZMA to protect coastal resources. This partnership embodies the original vision of the CZMA for holistic and more effective coastal management;
- Both organizations address relevant coastal management issues, and a broad range of expertise, programming, and results is available to inform section-specific issues and broader coastal management topics and initiatives where collaboration is appropriate; and
- There is a cost-savings to both programs as 315, 306, 306A, and 309 funds are managed by one agency and are leveraged to achieve collective efforts.

The Reserve Manager participates in DCM Director-led bi-weekly section coordination meetings that bring together Reserve, Planning and Policy, Regulatory and budget staff. Monthly DCM budget meetings are also

held. Examples of collaboration include: development and review of policy and rules; discussion and alignment of program planning documents such as the NCNERR management plan and DCM's 309 Program Enhancement Strategy; cross-section workgroup on living shorelines to collaboratively promote this technology where appropriate through policy, permitting, research, training, and outreach; and delivery of external and internal trainings through the CTP that address barrier island, wetlands, and estuarine shoreline regulations that the Division implements.

Strategic Partnerships

The administration of the NCNERR is achieved through a collaborative process involving the following strategic partners. These partners perform core functions of the NCNERR such as providing facilities and staff, collaborating on and implementing programs, and enforcing relevant rules and laws.

Center for Coastal Fisheries and Habitat Research (CCFHR)

The CCFHR, part of NOAA's National Ocean Service's National Centers for Coastal Ocean Science (NCCOS), manages the NOAA Beaufort Laboratory on Pivers Island where the NCNERR's central office is located. Location of this NCNERR office at CCFHR provides quick access to the Rachel Carson Reserve which is across the waterway from Pivers Island and a variety of opportunities for collaboration. CCFHR and NCNERR share the administration building which was constructed in 2007 and provides office space for Reserve staff, a teaching classroom, and an auditorium. Outside facilities support field operations and programming. The NCNERR and CCFHR are currently developing an agreement and it will be made available when complete.

Co-locating the Reserve with CCFHR provides mutual benefit to the parties in fulfilling NOAA's Next Generation Strategic Plan objectives of *improved understanding of ecosystems to inform resource management decisions*, and *healthy habitats that sustain resilient and thriving marine resources and communities*, and addressing NCCOS's science priorities: environmental stressors, resilience and coastal climate vulnerability, coastal and marine ecology, monitoring and detecting change, and social science. This partnership also supports the DCM's mission to *protect, conserve, and manage North Carolina's coastal resources through an integrated program of planning, permitting, education, and research* and the Reserve's mission to *practice and promote informed management and appreciation of North Carolina's coastal and estuarine ecosystems and provide protected sites for research, education, and stewardship*.

The NCNERR provides a science to management relationship between CCFHR and the coastal decision-maker community and a science to education connection between CCFHR and K-12 and community audiences. The Reserve and CCFHR enhance their respective research capabilities through collaborative partnerships addressing relevant coastal habitat and management-related questions consistent with their respective planning documents. Examples of collaborative work include ongoing research and monitoring on a range of estuarine shoreline stabilization techniques including comparisons to natural reference marshes; connecting CCFHR scientists to professional audiences at CTP workshops and K-12 student and teacher programs through

presentations on coastal and estuarine ecology and research; joint participation in the NCSSC, a collaborative effort to address sea level rise impacts by leveraging NOAA trust resources, ecosystem monitoring tools, and expertise; and living shoreline and stormwater best management practices demonstration and monitoring.

University of North Carolina Wilmington (UNCW)

The NCNERR has a long-standing relationship with the UNCW, which has provided office space and staffing support for the NCNERR since 1989. A significant percentage of the NCNERR's annual cooperative agreement is contracted to UNCW to fund three full-time contract positions and house the Reserve's southern office at the CMS where the contract employees and several temporary positions and seasonal interns are located. Waived indirect from this contract is used to meet the cooperative agreement's match requirement. This partnership allowed the NCNERR to expand its staff when the state was not able to create more staff positions and it provides a staff presence near and quick access to the Masonboro Island and Zeke's Island Reserves. A MOU between NCNERR and UNCW is available in Appendix J.

Co-locating the Reserve's southern office with CMS provides mutual benefit to the parties by supporting the mission of the University and CMS to *promote basic and applied research*. This partnership also supports the Reserve's mission to *practice and promote informed management and appreciation of North Carolina's coastal and estuarine ecosystems and provide protected sites for research, education, and stewardship*.

The Reserve provides a science to management relationship between the University and the coastal decision-maker community and a science to education connection between the University and K-12 and community audiences. The Reserve and the University enhance their respective research capabilities through collaborative partnerships addressing relevant coastal habitat and management related questions consistent with their respective missions.

This partnership with UNCW also allows for collaboration with UNCW's Biology and Marine Biology department, Environmental Studies department and the Shellfish Research Hatchery. Faculty and graduate and undergraduate students conduct research, education, and stewardship projects at the southern sites and NCNERR staff consult with faculty on site management and coastal resource issues. Examples of collaborative projects include water quality monitoring of CMS' seawater system intake using NERRS System-wide Monitoring Program protocols; general public programming on oysters and the Shellfish Research Hatchery; research and monitoring of diamondback terrapins at the Masonboro Island Reserve; and a 2016 NERRS Science Collaborative project in which UNCW faculty are examining the ecosystem services of shellfish aquaculture at the Masonboro Island Reserve and other similar sites.

Local Advisory Committees

The N.C. Administrative Code (15A NCAC 07O.0104) directs DCM to establish a LAC for each Reserve site. These committees serve as advisory groups, whereby members work with NCNERR staff to provide input and recommendations on stewardship, research and education activities at the sites, and review policies and implementation strategies for staff consideration. The committees operate per the Local Advisory Committee Operating Procedures document, updated October 2013. Available on the Reserve's website (www.nccoastalreserve.net), the Operating Procedures provide an overview of the NCNERR; outline the purpose and roles of the committees; describe membership including member selection, member responsibilities, and terms of service; and define committee meeting operation and administration.

LAC membership is comprised of community members and organizations, and relevant governmental agencies and non-governmental partner organizations that represent the NCNERR program areas, partners and user groups to provide diverse perspectives on management and program implementation at the NCNERR sites. Representation from these groups varies by committee based on the characteristics and needs of each Reserve site. Members are appointed by the Secretary of DEQ.

The committees are chaired and managed by NCNERR staff and meet at least annually. The meetings follow a standard agenda that includes Reserve-wide and site-specific updates, a member roundtable, and public input period.

Friends of the Reserve

Friends of the Reserve (FOR) is a non-profit 501(c)(3) organization that works exclusively to support the preservation, development and cooperation of the North Carolina Coastal Reserve and NCNERR for charitable, educational, and scientific purposes. FOR is a voice to speak on behalf of the Reserve and works to sustain and increase funding for the Reserve programs.

The FOR board of directors is comprised of representatives from across the coastal region to reflect the distribution of Reserve sites. The Reserve Manager serves on the board in an ex-officio capacity, ensuring that FOR is aware of and addressing NCNERR needs, and coordinating with existing NCNERR programs. A MOU between NCNERR and FOR is located in Appendix Q.

Additional Partners

The NCNERR also partners with a wide variety of agencies and organizations at various levels of engagement. A memorandum of understanding (MOU) between the NCNERR and a strategic partner is developed and periodically updated to set forth mutual expectations regarding partner roles that support operation of the Reserve. All MOUs are included in the Appendices of the management plan and are referenced throughout the plan as the partnerships are addressed.

Current Staff and Needs

An adequate staff is necessary to implement the management plan and to achieve the NCNERR's education, training, research, and stewardship goals and objectives. The NCNERR is currently staffed by nine full-time permanent positions employed by the DCM or UNCW, three long-term temporary staff, and a variety of seasonal interns and staff. Figure 20, the NCNERR organizational chart, indicates the employer and location of each full-time permanent position. Current staff responsibilities and duties are outlined below as is the list of future staffing needs and the rationale for each.

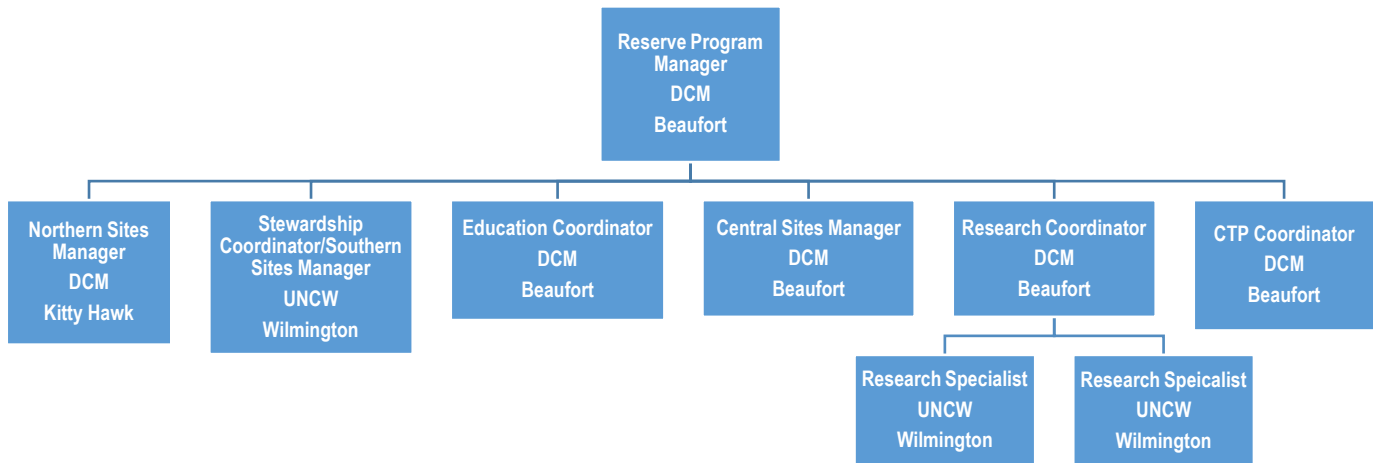


Figure 20. NCNERR Organizational Chart with Full-time Employees and Location

Full-time Staff Responsibilities and Duties

1. Reserve Program Manager:

- Fulfill Reserve mission, goals, and objectives
- Ensure the NCNERR's rules and policies are current and met, and that Reserve programs successfully meet the mandates of the NERRS and the DCM
- Seek and administer federal and other grants, contracts, and state budget appropriations
- Provide oversight and coordination of education, training, research and monitoring, and stewardship programs
- Supervise the following positions: Education Coordinator, CTP Coordinator, Research Coordinator, Stewardship Coordinator, Central Sites Manager, and Northern Sites Manager
- Develop and maintain partnerships with local, state, and federal agencies, groups and individuals to enhance NCNERR exposure and capacity at the local, state, regional, and national levels
- Maintain responsibility for all activities, lands, and facilities within the Reserve site boundaries and for office and laboratory facilities leased from partners
- Receive and evaluate input from LACs in coordination with stewardship staff

2. Education Coordinator:

- Manage and deliver the K-12 and college student education program, educator professional development program, and community education and outreach program in accordance with the NCNERR management plan and NERRS and DCM mandates
- Supervise temporary staff and summer interns
- Provide regular guidance and direction to the temporary Stewardship and Education Specialist in Wilmington on education activities
- Produce educational materials including curricula to meet educator needs
- Develop and maintain partnerships to enhance education programs
- Administer education grants and budgets
- Work with the CTP to ensure complementary and consistent education and training programs where appropriate and assist with CTP workshop logistics
- Coordinate with research staff on current research developments at the local and national level for translation into education activities
- Meet with K-12 education advisory committee annually to discuss current educational programming and seek input on programs
- Represent the NCNERR at local, state, and national levels by serving on boards, committees, and workgroups
- Represent NCNERR at festivals and meetings and develop content for such events for NCNERR staff
- Assist with Rachel Carson Reserve site management and research and stewardship programs as needed

3. Coastal Training Program Coordinator:

- Deliver workshops for coastal decision-makers based on formal and informal needs assessments in accordance with the North Carolina CTP Strategy document on key coastal issues, the NCNERR management plan, and NERRS and DCM mandates
- Provide technical assistance to partners and customers including meeting design and facilitation
- Meet minimum CTP performance requirements and submit appropriate reporting
- Develop and maintain partnerships to enhance the CTP
- Administer CTP grants and budget
- Produce materials to support workshop issue areas
- Represent the NCNERR at local, state, and national levels by serving on boards, committees, and workgroups
- Supervise temporary Communication Specialist
- Coordinate with research staff on current research developments at the local and national level for translation into training activities
- Work in close collaboration with the education program to ensure complementary and consistent education and training programs where appropriate and assist with education program field trips
- Assist with Rachel Carson Reserve site management and research and stewardship programs as needed

4. Research Coordinator:

- Coordinate all research and monitoring activities performed within the NCNERR in accordance with the NCNERR management plan and NERRS and DCM mandates
- Administer the Reserve research permits, which are utilized as a 312 performance measure, and maintain the NCNERR portion of the NERRS research database
- Foster partnerships to link the Reserve research and monitoring program to other relevant state, federal and university activities in the state and region to enhance program implementation
- Conduct research and long-term monitoring projects on the NCNERR sites that address Reserve topical areas and site-based research needs as well as local, state, and national coastal management needs
- Administer research and monitoring grants and budgets
- Supervise Research and GIS Specialists and summer interns, including providing guidance to graduate research fellows
- Translate research and monitoring results for incorporation into various formats to reach target audiences, including scientific and management communities
- Represent the NCNERR at local, state, and national levels by serving on national, state, and local boards, committees, and workgroups
- Coordinate with education and training staff on research developments at the local and national level for potential incorporation into education and training activities
- Work with stewardship staff to prioritize research projects to address site management needs and identify potential funding opportunities relevant to priority research projects
- Assist with Rachel Carson Reserve site management and education, training, and stewardship programs as needed

5. Research Specialists (2):

- Implement the System-wide Monitoring Program in accordance with NERRS and the CDMO requirements
- Procure and maintain SWMP equipment and supplies
- Deploy equipment as scheduled
- Conduct Quality Assurance /Quality Control procedures on data and prepare annual reports for submittal to CDMO
- Conduct Reserve research projects and perform data analyses in collaboration with the Research Coordinator
- Represent the NCNERR by serving on boards, committees, and workgroups
- Assist the Research Coordinator with grant proposals, preparation of manuscripts for publication, presentations and other outreach activities
- Assist the Research Coordinator with developing and maintaining partnerships to further research programs
- Assist the Research Coordinator with managing the research budget
- Assist with Masonboro Island and Zeke's Island Reserves site management and stewardship, education and training programs as needed

6. Stewardship Coordinator and Southern Sites Manager:

- Manage the stewardship program in accordance with the NCNERR management plan and NERRS and DCM mandates, coordinating with the Reserve Program Manager, Northern Sites Manager, and Central Sites Manager on activities performed at and across the sites and site management policies and issues
- Develop and implement stewardship policies and rules in coordination with Reserve Program Manager
- Manage the Masonboro Island and Zeke's Island Reserves
- Conduct Masonboro Island and Zeke's Island LAC meetings
- Supervise the temporary Stewardship and Education Specialist, seasonal staff, and interns*
- Administer stewardship grants and budgets
- Develop and maintain partnerships to enhance stewardship programs
- Represent the NCNERR at local, state, and national levels by serving on boards, committees, and workgroups
- Link the Reserve stewardship program to other relevant state, federal, and university activities in the state and region
- Manage a volunteer force to support site activities
- Deliver community outreach and education programs as requested and resources allow
- Facilitate and assist with research at the sites in conjunction with research staff as needed

*Stewardship is accomplished in conjunction with the Reserve Program Manager as the Stewardship Coordinator does not supervise the site managers.

7. Central Sites Manager:

- Manage the Rachel Carson Reserve
- Coordinate with the Stewardship Coordinator and Northern Sites Manager on site activities, policies, and issues
- Conduct Rachel Carson Reserve LAC meetings
- Develop and maintain partnerships to enhance stewardship programs
- Supervise seasonal staff and interns
- Assist the Stewardship Coordinator in administering stewardship grants and budgets
- Captain Reserve vessels to deliver education programming
- Manage a volunteer force to support site activities
- Represent the NCNERR by serving on boards, committees, and workgroups
- Deliver community outreach and education programs as requested and resources allow
- Facilitate and assist with research at the Rachel Carson Reserve in conjunction with research staff as needed

8. Northern Sites Manager:

- Manage the Currituck Banks Reserve
- Coordinate with the Stewardship Coordinator and Central Sites Manager on site activities, policies, and issues

- Conduct Currituck Banks Reserve LAC meetings
- Develop and maintain partnerships to enhance stewardship programs
- Supervise temporary staff and interns
- Assist the Stewardship Coordinator in administering stewardship grants and budgets
- Manage a volunteer force to support site activities
- Represent the NCNERR by serving on boards, committees, and workgroups
- Deliver community outreach and education programs as requested and resources allow
- Facilitate and assist with research at the Currituck Banks Reserve in conjunction with research staff as needed

Temporary Staff Responsibilities and Duties

Long-term temporary staff positions are those that are critical for the operation of the program but permanent positions have not been created and who are employed for a longer period than summer seasonal staff. These positions are also listed in the staffing needs section below for this purpose. These positions are staffed when funding is available.

1. Geographic Information Systems (GIS) Specialist (Central Office):
 - Provide GIS services on a wide variety of geospatial needs including dataset, tool, and map development
 - Manage the GIS databases and files
 - Maintain and update GIS/GPS software and equipment as needed
 - Conduct SWMP-like monitoring at the Rachel Carson Reserve
 - Assist with education, research, and stewardship programs as appropriate
 - Support Division-wide GIS needs
2. Communications Specialist (Central Office):
 - Implement outreach campaigns that support education, training, research, and stewardship activities
 - Disseminate Reserve research products and results to increase understanding of their importance to public policy
 - Develop and maintain website content
 - Develop and disseminate triannual Reserve newsletter
 - Implement social media strategy for Reserve communications
 - Disseminate communication pieces to local media
3. Stewardship and Education Specialist (Southern Office):
 - Support stewardship program implementation and site management at Masonboro Island and Zeke's Island Reserves including monitoring and documenting site conditions and uses; maintaining trails and implementing access improvement projects; and assisting with site management projects
 - Coordinate daily operation of species of concern monitoring activities

- Conduct outreach and community engagement activities including managing volunteers; delivering outreach programs and representing the NCNERR at festivals; and supporting communications activities for the southern office
- Support stewardship program administration and logistics

Seasonal Temporary Staff Responsibilities and Duties

The NCNERR employs a variety of seasonal temporary staff and interns to accomplish spring, summer, and fall field activities and to deliver and assist with summer programming. These positions also provide valuable training and program experiences for the students and entry level professionals that fill them. Typical seasonal temporary staff and intern positions include a stewardship intern at the northern office; two to three positions to support education, stewardship and research activities at the central office; and at least three stewardship positions at the southern office. The number of positions varies year to year based on need and funding availability. The positions are funded through 315 funds and the North Carolina State Internship Program. The North Carolina Internship Program provides students with professional work experience that connect their classroom experiences and potential career choices.

Staffing Needs

The geographic distribution of the NCNERR sites resulted in a regional parsing out of programs due to program priorities and location of staff early in the program's implementation. Evaluation of programs, facilities, current staffing levels, and projected staffing needs revealed that there are needs and opportunities for programs at all offices as well as administrative assistance to facilitate operation of the NCNERR. Staffing needs identified in this plan are long-term needs that the program has identified to enhance capacity to meet current workload demands and more fully implement system-wide programs across the sites. The Reserve Program Manager will work to develop position descriptions, seek funding and establish the positions through DCM or UNCW as funding resources allow, without detriment to current programs and based on priority needs. These staffing needs are not necessarily listed in the order of priority and because the order in which positions may be created is unknown, allocation of actual job duties may be adjusted to reflect priority needs at the time of position creation.

1. Create full-time permanent positions for the GIS Specialist, Communications Specialist, and Stewardship and Education Specialist temporary positions that are described in the temporary staffing section above.
 - a. The NCNERR previously had a full-time permanent GIS Specialist position through UNCW; however, the position was eliminated as a result of budget reductions. The NERRS recognizes that GIS support is critical to the operation of a reserve and ongoing GIS needs at the NCNERR justify creation of a permanent position.
 - b. The Communications Specialist position provides critical work to enhance the NCNERR's visibility, and communicate responsible use of the sites and research projects and results

with target audiences. These focus areas represent three of the four themes identified as priorities at the 2014 public input sessions.

- c. The Stewardship and Education Specialist increases the capacity of the Stewardship Coordinator and Southern Sites Manager by assisting with site management at the Masonboro Island and Zeke's Island Reserves. The 2009 NCNERR 312 Evaluation recommended creating a full-time permanent Southern Sites Manager to address similar activities (see below), alleviating excessive workload from the Stewardship Coordinator and Reserve Manager. The Stewardship and Education Specialist position delivers outreach to New Hanover and Brunswick Counties that the Masonboro Island LAC and 2014 public input sessions identified as needed and vital to enhance community understanding of the NCNERR and engagement. These duties are combined into one position to maximize available funds and address two priority needs.

2. Administrative Assistant (Central Office)

The NCNERR does not currently have any dedicated administrative assistance although the DCM Morehead City Office Manager does provide contractual and purchasing support. The program staff in each office has taken on many of the administrative duties themselves to ensure operation of the program and offices. As the program has grown, however, the time spent handling administrative duties such as ordering supplies, making copies, managing grants and contracts, and maintaining office equipment and vehicles, has increased. An administrative assistant located in the central office will assist the three Reserve offices in accomplishing administrative tasks, thereby resulting in more efficient operations and relieving program staff of these duties and providing them with more time for program development and implementation. The 2009 NCNERR 312 Evaluation recommended providing administrative assistance on at least a part-time capacity.

3. Assistant Manager (Central or Southern Office)

The implementation of the Reserve Strategic Plan and programs at the four NCNERR sites given the differences and distances between the sites will benefit from the addition of an Assistant Manager. The purpose of this position will be to support the Reserve Manager with daily operation of the Reserve as well as maintain responsibility for discrete tasks based on need and skill. This will provide the Reserve Manager with more time for broader partnership development, coordination at the state, regional, and national levels, and fundraising for the NCNERR given its unique characteristics described above and the Manager's additional responsibilities of managing the NCCR.

4. Reserve Specialist (Northern Office)

The Currituck Banks site offers many exciting research, stewardship, and education opportunities. Creation of a Reserve Specialist position in the northern office will allow staff to better take advantage of these opportunities. While priorities will be assessed at the time of establishment, this position may allow for the reintroduction of SWMP-like water quality monitoring at the site

and additional SWMP, research, stewardship, training, education and outreach activities. The remoteness of the site also presents a safety concern when the Northern Sites Manager is in the field alone and the two positions will support each other while in the field. Workload challenges and the lack of assistance and colleagues in the northern office are cited as reasons for previous employees leaving the Northern Sites Manager position. The establishment of this position will address these concerns, thereby enhancing longevity in the Northern Sites Manager position. The Reserve Specialist's duties will be informed by the Research Specialist and temporary Stewardship and Education Specialist duties, and be supervised by the Northern Sites Manager, and work closely with research and education staff.

5. Southern Sites Manager (Southern Office)

The Stewardship Coordinator is currently responsible for implementing the stewardship program and initiatives at all four sites in conjunction with other stewardship staff while also implementing a variety of site management and public access activities at the two southern sites, Masonboro Island and Zeke's Island. Given the complexity of the issues at the two southern sites and the distance between all four sites, it is necessary to create a Southern Sites Manager position. This will allow the Southern Sites Manager to focus on management of the Masonboro Island and Zeke's Island Reserves and the Stewardship Coordinator to focus on implementation of the stewardship program for the NCNERR. The 2009 NCNERR 312 Evaluation recommended creating a full-time permanent Southern Sites Manager for these reasons. This position will emulate the Northern Sites Manager duties and will be supervised by the Reserve Program Manager or Stewardship Coordinator.

6. Volunteer Coordinator (Northern, Central, or Southern Office)

A Volunteer Coordinator will assist the Reserve in managing its volunteer program. Duties of a Volunteer Coordinator may include supporting volunteer activities at all four NCNERR sites; produce a volunteer needs assessment; write duty statements for each volunteer position or function; streamline the policies and procedures for recruiting, screening, and placing volunteers; determine volunteer recognition procedures and award scales; develop volunteer orientation and training programs, including a comprehensive docent training program; track and report volunteer hours; and recruit new volunteers through outreach to schools, non-profits, civic organizations, and businesses near the Reserve sites. Volunteers play an important role in enhancing program visibility of and community engagement in the NCNERR, both of which were themes identified at the 2014 public input sessions.

7. Education Specialist (Southern Office)

Many education and outreach opportunities exist at the Masonboro Island and Zeke's Island Reserves. Creation of an Education Specialist position in the southern office will allow staff to better take advantage of these opportunities as education and southern office staff already have full workloads. Duties of the Education Specialist will include the following: deliver outreach

programs; represent the NCNERR at festivals; assist with the Masonboro Island Explorer program; assist the Education Coordinator in delivering teacher workshops in the area; assist the CTP Coordinator in delivering trainings in the area; and support communications activities for the southern office. Expanding education and outreach programming in New Hanover and Brunswick Counties is important because this area is the most densely-populated area of the coast and two of the four NCNERR sites are located in this area. Additionally, the Masonboro Island LAC and 2014 public input sessions identified local education staff as needed and vital to enhance community understanding of the NCNERR and engagement.

Administrative Objectives and Actions

The NCNERR administrative goal, objectives, and actions ensure the administrative, operational, and financial capacities of the Reserve are adequate to effectively support the programmatic and topical area goals, objectives, and actions.

Goal 4: The NCNERR is recognized as a leader in coastal and estuarine ecosystem research, training, education, and stewardship through effective administration and communication strategies.

Objective 4.1 Rules and policies assist in fulfilling the Reserve's mission and local, state, and federal laws.

Action 1: Evaluate and update rules through the Rules Review Process.

The Reserve's rules in the N.C. Administrative Code, 15A NCAC 070, are scheduled to be reviewed by the Rules Review Commission in June 2017 as part of the mandated Legislative Periodic Review and Expiration of Existing Rules process (G.S. 150B-21.3A). This process requires review of existing rules every ten years, which is summarized in a report submitted to the Rules Review Commission. Work to implement this process began in 2016 with the classification of each rule in 070 as necessary with substantive public interest, necessary without substantive public interest, or unnecessary per G.S. 150B-21.3A (c)(1). Input was sought on the classification from the LACs, N.C. Coastal Resources Commission, DEQ, and public through a noticed public comment period to inform the report to the Rules Review Commission. After the Rules Review Commission and Joint Legislative Administrative Procedures Oversight Committee review the report, rules that need to be readopted based on the rule citation classifications will go through the rule readoption process scheduled to begin in fall 2017. The rules will be evaluated and updated, and any proposed amendments to the rules will be considered during this process. Rule changes may be considered to update and clarify existing language and address gaps and changing site conditions and uses to ensure staff and law enforcement partners are able to protect the Reserve's natural resources, ensure safe public use of the sites, and achieve an appropriate balance between uses at the sites. Proposed rule changes will be developed by Reserve, Division, and Departmental staff with input from the LACs and the N.C. Coastal Resources Commission. See also Objective 3.1 Action 6.

Action 2: Update policies as needed based on program and site conditions.

Policies provide additional guidance and clarification to rules on uses and management of the sites. Site conditions and uses change over time and these changes may warrant review of existing policies or development of new policies. Policy changes provide the opportunity to adjust guidance as needed based on the best science and information available at the time to address specific situations as they arise. Potential policy changes will be developed by Reserve and Division staff with input from the LACs. See also Objective 3.1 Action 6.

Action 3: Inform rule and policy updates with program and site assessment information.

Program and site assessment information will be used to provide the best available information on program implementation, site natural resources, and site uses to inform rule and policy updates. Formal data collection efforts such as those described in Objective 4.3 Action 3 will be used as well as less formal but equally important methods including staff observation and documentation, third party reporting, and staff and partner investigation.

Objective 4.2 Reserve core partnerships are enhanced.

Action 1: Strengthen relationship with OCM through annual cooperative agreements and performance reports, and by addressing federal evaluation recommendations, participating in national meetings, and contributing to system-wide initiatives.

OCM is the federal agency in the Reserve's federal-state partnership and it is critical to maintain and strengthen the program's relationship with OCM to ensure that the Reserve is meeting NERRS standards and implementing national system initiatives. Annual cooperative agreements set forth the work plan for the Reserve each year based on the approved management plan, utilizing the federal and state funds that contribute to the Reserve's annual budget. The agreements are developed by the Reserve and approved by OCM, and align with the state fiscal year. Bi-annual performance reports document progress on the cooperative agreements. Progress on federal 312 evaluation recommendations and NCNERR 312 performance measures are reported on annually. Engagement at the system-wide level is important to inform national guidance documents such as the strategic plan and national priorities and to share the NCNERR perspective. This is accomplished through attendance at national and sector meetings and participation in NERRS workgroups. Current examples of NCNERR contributions to system-wide initiatives include staff participation on the SWMP data management and oversight committees, the TOTE workgroup, and the CTP Oversight Committee.

Action 2: Strengthen relationship with DCM by providing technical expertise on education, training, research, and stewardship, and collaborating on mutually beneficial activities and topics.

DCM is the state agency in the Reserve's federal-state partnership and it is important to ensure that the Reserve provides technical expertise and assistance on appropriate and mutually beneficial activities and topics. Current examples of this include CTP assistance on DCM grant planning

workshops and delivery of workshops on barrier island and estuarine shoreline science and regulations. Reserve staff leads and participates in the Division's living shoreline workgroup providing coordination across the Division's programs and training, outreach and research on living shoreline-related priorities. DCM planning and policy and regulatory staff contribute expertise and assistance to Reserve staff on Reserve topics and issues as needed such as shellfish aquaculture policy development. Collaborative opportunities are developed as needs arise through ongoing communications, development and implementation of both Reserve and coastal program cooperative agreements, and implementation of the coastal program's 309 Strategy.

Action 3: Strengthen relationship with UNCW and CCFHR through regular communication with partner administrations, finalization and implementation of memoranda of understanding, participation in facility committees, and collaboration on mutually beneficial activities.

The NCNERR shares facility space with UNCW and CCFHR, employs contract staff through UNCW, and collaborates with both organizations on a variety of mutually beneficial activities. Regular communication between facility leadership and staff is critical to ensure smooth operations and that Reserve, UNCW, and CCFHR needs are communicated and met. This is accomplished through CCFHR lab management meetings and meetings as needed with the CMS Director and CCFHR Director. Staff participate in facility committees such as the Beaufort People Committee, the UNCW Outdoor Spaces Committee as well as participate in several CMS Research Collaborative Meetings. The Reserve and CCFHR continue to work to develop an agreement between the organizations. The Reserve and UNCW will update its MOU in 2017. Collaboration on mutually beneficial activities is developed based on partner needs and expertise. Currently, the Reserve and CCFHR partner on marsh monitoring and living shoreline projects, and stormwater best management practices evaluation. The Reserve and UNCW partner on a wide variety of research projects and water quality monitoring, and Reserve staff employ and mentor student interns and volunteers working on specific stewardship and research projects.

Action 4: Maintain and strengthen education, training, research, and stewardship activities through formal and informal partnerships.

Partnerships are key to the success of the NCNERR and its education, training, research, and stewardship programs. The capacity section of each program chapter in this plan describes the diversity of partners that the program works with to achieve program and partner goals. NCNERR partnerships include long-term formal arrangements codified via memoranda of understanding (See appendices); externally funded project-specific work; joint collaboration on projects that meet mutually beneficial needs; and utilization of space in partner facilities to conduct programs. Partnership development and enhancement is conducted by program staff with support from the Reserve Manager.

Objective 4.3 Reserve operations support the implementation of the mission.

Action 1: Utilize a collaborative decision-making process and effective internal communication mechanisms to provide direction for the Reserve, foster understanding regarding decision-making, and ensure that programs are appropriately supported.

The staff of the NCNERR is distributed across three offices that are considerable distances from one another. As such, it is important to provide regular and open mechanisms for communication and decision-making. Staff meet as follows: monthly coordinator meetings with the Reserve Manager and program coordinators; all staff meetings that occur approximately three times per year; stewardship meetings scheduled as needed; and monthly meetings with supervisors. Agendas for the coordinator and stewardship meetings are shared with all staff, who are also invited to attend, to promote awareness of business that will be conducted.

The coordinator meetings are used to provide administrative and program updates; discuss Reserve-wide input and/or approaches on projects and documents; plan and implement the annual cooperative agreements, including cross-sectoral activities; and discuss budget and Reserve priorities. Staff shares input at these meetings on temporary staffing, program, and office needs and priorities are discussed. The Reserve Manager utilizes this input to allocate funding to address priorities as available.

All staff meetings provide opportunities for information sharing through broader administrative and program updates and project presentations; gathering Reserve-wide input on priorities, projects, and documents relevant to all staff; conducting cross-sectoral work; enhancing safety through presentations and discussions; and strengthening relationships.

Stewardship meetings provide a venue for staff to discuss topics relevant to the stewardship program, plan stewardship initiatives, collaborate on site management strategies, and work together to develop policies and rules. This opportunity for information sharing and problem solving supports staff in their daily, individual work as site managers. Education, training, research, and communications staff attend stewardship meetings as needed to accomplish cross-sector goals and to promote an integrated approach to the Reserve's stewardship efforts.

The Reserve Manager and Research Coordinator meet monthly with their direct reports to provide regular opportunities to receive and share updates, follow-up on action items, and discuss successes, issues, and concerns. This has proven to be very helpful for staff across the program, whether they are located in the same office as their supervisor or not.

Additionally, a number of Reserve documents that are critical to the operation of the Reserve are accessible by all staff on a shared drive to promote efficient and transparent communication. Examples include budget tracking sheets, program and office needs list, purchasing list, active cooperative agreement and grant list, LAC membership, and volunteer tracking.

Action 2: Ensure the Reserve's organizational structure supports staff and programs, including addressing staffing needs as resources are available.

The Reserve's organizational structure is described in the current staff and needs section of this chapter and reviews current full-time, temporary, and seasonal position responsibilities and duties as well as staffing needs. Temporary and seasonal positions are filled based on need and available funding. Staffing needs identified in this chapter are long-term needs that the program has identified to enhance capacity to meet current workload demands and more fully implement system-wide programs across the sites. The Reserve Manager will assess the Reserve's organizational structure on a regular basis to achieve efficiencies and better manage workloads, support existing staff, and create and fund new positions as opportunities to do so arise.

Action 3: Utilize appropriate databases and performance measures to track and evaluate program achievement, natural resources, and site use.

Federal and state authorities require that a variety of data are collected in the form of performance measures and research permits to ensure that the Reserve is meeting national standards and adhering to its rules. NERRS performance measures are reported bi-annually through performance reports and national databases. NCNERR 312 performance measures are reported annually through performance reports using national and NCNERR databases. The NCNERR maintains several internal databases and record keeping systems for gathering information to support these efforts and help staff better understand volunteer contributions and use of the sites. Information collected includes research permit applications and approvals, volunteer hours and numbers, LAC member attendance, and commercial use submitted voluntarily by known users. Additional processes will be developed under this management plan to document natural resources through a natural resource inventory database (See Objective 3.1 Action 7) and third party education program delivery (Insert education action reference). These data will be utilized to assess performance of the NCNERR at the national level and to document trends in volunteers, use, and natural resource condition.

Action 4: Maintain and enhance file and data storage and sharing methods and infrastructure to meet current and future needs.

A variety of efforts will be undertaken during the scope of this management plan to modernize file and data storage, sharing methods, and infrastructure, working towards a long-term, sustainable, and efficient approach to enhance access to files and data across the Reserve offices and ensure information preservation. Examples of specific projects that will be undertaken include: develop a site-based geodatabase, one for internal use and one for external use, to support program activities and management decisions that includes data such as easements, research permits, habitats, access points, trails and infrastructure; create and maintain an internal central repository for administrative documents, using Laserfiche where appropriate (e.g., memoranda of understanding, acquisition files); and transition LAC minutes to Laserfiche to enhance external accessibility.

Action 5: Practice excellent workplace safety for staff, volunteers, and visitors through effective procedures and appropriate equipment, supplies, and signage.

Excellent workplace safety is essential for staff, volunteers, and visitors to Reserve facilities and sites. Staff operate per the Reserve Safety Plan (Appendix R) which includes a matrix that identifies applicable mandatory Division and facility-specific safety documents including hurricane and disaster preparedness and response plans, relevant Departmental and UNCW standard operating procedures, and Reserve-specific standard operating procedures to address unique programs and situations both in the office and the field. Staff are provided with the necessary safety training, equipment, and supplies to ensure staff, volunteer, and visitor safety when working in the office and field. Safety briefings are provided at Reserve all staff meetings and prior to all Reserve-organized and led volunteer efforts and programs (Insert reference to stewardship and education actions).

It is critical that visitors understand site conditions and take the necessary precautions prior to visiting a Reserve site as the sites are often difficult to reach quickly in the event of an emergency given their remote locations and in some cases, accessibility only by boat. Site brochures and site information kiosks provide information about how to visit the sites safely.

Action 6: Demonstrate sustainable and best management practices through use of appropriate supplies, materials, and methods.

The Reserve seeks to lead by example utilizing sustainable and best management practices throughout its work while reducing its environmental footprint. This action provides a filter through which all programs and methods are developed, implemented, and evaluated. Staff acquires sustainable office and program supplies and materials and pursues reuse/repurpose opportunities for items that no longer serve their original purpose. Examples include utilizing reusable and biodegradable/compostable workshop supplies and meeting supplies that contain recycled materials, and using digital copies of materials when possible to avoid excess printing.

Best management practices are demonstrated through projects and work conducted at office facilities and sites as needed and opportunities present themselves. Reserve facilities are owned and managed by partners; staff participate in facility-related initiatives that align with this action as appropriate. Facilities constructed at offices that directly support Reserve needs or on sites will incorporate the NERRS Sustainable Building Principles. Examples of projects that employ and test best management practices include the living shoreline demonstration project at the Rachel Carson Reserve and the stormwater best management practices at the NOAA Beaufort Laboratory.

Methods that utilize technologies that promote efficiencies in data collection, analysis, and delivery will be pursued by staff to promote sustainability and best management practices related to staff time and data management. Examples include using tablets to collect field data and Bad Elf Surveyor to ground truth habitat mapping.

Action 7: Strengthen community and partner involvement in Reserve programs through LACs.

LACs meet at least annually at the request of the Reserve. The committees operate per the Local Advisory Committee Operating Procedures (updated in October 2013). Community membership on the committees will be updated in fall 2017. The Operating Procedures document will be reviewed in 2018. Research, education, and training updates will be incorporated more fully into the committee meetings throughout the implementation of this management plan to provide the committees with a broader perspective of Reserve operations at the sites and in the region.

Action 8: Leverage state and federal investments in the Reserve through internal and external funding opportunities to address needs and advance Reserve initiatives.

Programming and projects conducted by the Reserve are limited by staffing capacity and available discretionary funds. The federal funding provided through annual cooperative agreements and state appropriations used to match federal funds are maximized to address needs and advance Reserve initiatives through collaborative discussions at the Reserve and Division levels. While progress was made to increase state fiscal support of the Reserve as a result of the 2005 312 Evaluation, the Reserve and Division will continue to work to increase state fiscal support of the Reserve to reduce the reliance on federal funds to operate the Reserve.

Reserve staff will continue to seek external funding for discrete projects either directly or in conjunction with partners to enhance capacity and discretionary funding to address needs and expand initiatives that would otherwise not be conducted due to fiscal constraints. Care will be taken to ensure that projects considered can be accommodated in addition to current workloads, address high priorities as identified in this management plan and take advantage of unique opportunities and partnerships.

Objective 4.4 Staff are recognized as valued experts in their fields.

Action 1: Provide professional development opportunities annually to enhance and expand staff skills through appropriate means such as trainings and attendance at professional meetings.

Professional development opportunities ensure staff knowledge and skills are current in order to incorporate the latest information and techniques into programs and innovate novel approaches to Reserve and coastal management. Funding is allocated annually in the NCNERR cooperative agreement to support travel to attend trainings and conferences in and out of state. Specific opportunities are identified, such as the N.C. Science Teachers Association, while retaining the flexibility to attend trainings and conferences as opportunities arise.

Action 2: Encourage staff participation in local, state, regional, and national committees and workgroups.

Participation in local, state, regional, and national committees and workgroups allows staff to share their expertise and provide a local community and N.C. perspective to the topics. These opportunities

also enhance professional development through peer to peer learning and programming through committee and workgroup activities and networking. Staff are encouraged to participate in committees and workgroups that are relevant to and expand expertise and advance NCNERR priorities. Examples of current committee and workshop participation in addition to NERRS examples highlighted previously include the N.C. Oyster Steering Committee, APNEP science and education committees, and the NCSSC.

Action 3: Encourage staff to provide technical assistance to target audiences.

Technical assistance enables staff to work with program target audiences, partners, and local communities to address mutually beneficial coastal management issues at the local, regional, and national level. Staff are encouraged to lend skills and expertise to enhance collaboration and develop and implement approaches to solve challenges or address needs. Examples of current technical assistance include CTP leadership in the Town of Beaufort Stormwater Advisory Committee; stewardship leadership in diamondback terrapin population monitoring within the Masonboro Island Reserve; and research program participation in a marsh vulnerability assessment to gauge resilience to sea level rise and technical assistance on this national coastal management issue.

Action 4: Continue to promote Reserve programs through presenting at conferences, conducting public field trips, participating in partner events, and hosting volunteer activities.

NCNERR visibility is enhanced, services utilized, and value recognized by partners, target audiences and the public through program offerings and staff participation in a variety of activities. Staff promotion of the NCNERR's purpose, programs, and sites occurs regularly through the actions described above and through outreach activities such as public field trips and festivals, volunteer training and engagement, and sharing current work at conferences and with partners.

Action 5: Organize and host a symposium to deliver NCNERR program highlights to a variety of target audiences.

The NCNERR will organize and host a symposium to summarize and showcase program highlights to target audiences. Reserve staff will determine the ongoing frequency of these events based on the success of the symposium. A Reserve research symposium was hosted in February 2012 that was well received and this effort will expand on that success to include all programs. A cross-sectoral workgroup will work with the NCNERR program coordinators to plan the symposium including exploring successful models employed by other reserves within the NERRS and partner organizations, and considering timing to ensure that the symposium complements the timing of other coastal conferences in N.C. Aligning the symposium with upcoming anniversaries will also be considered.

Action 6: Provide students with skills to advance NCNERR programs and to inspire stewardship of coastal and estuarine ecosystems through a structured mentoring program.

Student involvement in the NCNERR is highly valued by staff and students because it enhances students' skills and experiences and accomplishes ongoing NCNERR work and discrete projects. Staff work with students in a variety of capacities such as paid and unpaid internships, independent study projects, fellowships, and graduate student committees that span all programs within the NCNERR. A cross-sectoral workgroup will formalize NCNERR's current work with students through development of a structured mentoring program that outlines opportunities and establishes expectations of staff and students. The workgroup will explore existing mentoring programs and incorporate relevant elements to develop a program that meets the needs of students and the NCNERR to advance the work of the NCNERR and train future coastal management professionals.

Objective 4.5 Reserve communications are enhanced to increase audience engagement and program visibility and share important information.

Feedback obtained during a fall 2014 series of public input and LAC meetings conducted to inform the update of the NCNERR management plan revealed there is more work to be done to enhance program recognition, furthering the need to maintain consistent messaging across programs and sites for the purpose of improving the program's visibility. This feedback was re-enforced by the 2016 NERRS Blue Ribbon panel report. Additional themes that arose from the public input process included sharing more information about research, better understanding visitor use, and enhancing and leveraging partnerships. As a result, the Reserve will implement the following communications actions that are designed to ensure information about the Reserve and its programs reaches target audiences, increase understanding about research conducted by staff and partners, encourage responsible use of Reserve sites, and share information that is relevant to Reserve and coastal management. These communication actions and the content developed as part of the actions will address threats and stressors that are common across the four NCNERR sites and align with the NCNERR Strategic Plan Topical Areas. The Reserve will develop deliverables and use various communications platforms, including social, digital, and print media, to distribute information to researchers, educators, students, citizens, visitors, professionals, volunteers, and partners.

Action 1: Brand the Reserve through consistent messaging and product format.

Style guides developed for the NCNERR outline appropriate design and messaging for presentations, publications, flyers, informational signage at sites, etc. to improve consistency and a cohesive understanding of the NCNERR mission and programs to audiences throughout the state. Staff will use the style guides to develop all public-facing documents and products. NCNERR, NOAA, and DCM logos and language are incorporated into these deliverables as appropriate.

Action 2: Develop messages and products that highlight site research and relevant coastal and estuarine topics.

Reserve-led and partner research activities and project milestones are highlighted in the Reserve newsletter and on the Reserve's website and social media platforms. This content is strategically designed to translate scientific results for relevant target audiences and increase understanding of how the NCNERR sites are utilized for research by the Reserve and partners. Messages and products on coastal and estuarine topics are developed as needed. For example, data downloads and technical papers on topics such as SWMP, invasive species, and ecosystem services are available on the NCNERR website. Research communications can facilitate incorporation of work into education and training programs (See Objective 1.1 Action 3 and 1.4 Action 3). For example, research on the effectiveness of marsh sills to stabilize shorelines during storm events are incorporated into CTP living shorelines workshops, and interactive habitat maps may be used to enhance K-12 field trips to Reserve sites. By distributing information through these outlets, a wide-range of audiences, from teachers and K-12 students to coastal decision-makers and researchers to the public, are informed of partner and Reserve-led research.

Action 3: Share Reserve accomplishments, upcoming activities, publications, data and resources on relevant coastal and estuarine topics to target audiences through the Reserve newsletter, website, and social media.

Reserve accomplishments and upcoming activities are shared on the NCNERR website, where information about programs and sites is readily available and continuously updated to inform target audiences and help unify programs and connect program activities to Reserve sites. The NCNERR website provides general site and program information, along with interactive maps, responsible use policies, short articles featuring recent program initiatives, and a calendar of Reserve events. A downloadable research permit, list of publications, links to real-time weather, water quality, and GIS data are available to students, researchers, and decision-makers for free. Downloadable, age-appropriate curriculum is available on the NCNERR website for educators looking for ready-made lesson plans to share in their classroom. Reserve staff also participate in public events and provide free handouts with information directing audiences to the website for access to these electronic resources.

The Reserve newsletter is distributed tri-annually and includes articles focused on various aspects of the Reserve research, education, training, and stewardship programs. Social media posts on the Reserve Twitter and Facebook pages direct target audiences to resources available on the NCNERR website as well as other NCNERR platforms such as the YouTube Channel and Flickr page. Additionally, program updates, site conditions, responsible use policies, and educational information about coastal and estuarine ecosystems are posted on the Reserve's social media pages on a daily and weekly basis. These communications mechanisms are designed to engage and expand target audiences, including coastal communities, technical professionals, researchers, and state and federal agencies. Partnerships are key to the work of the Reserve. Therefore, communications products highlight these partnerships by describing the role the partner plays in a project and by promoting the work of the partner.

Action 4: Share rules and policies that encourage safety and promote responsible use of sites by visitors.

Reserve staff communicate and promote safe and responsible use of the sites to visitors through interpretive signs, handouts, and website and social media posts in addition to sharing information directly with visitor and community groups. Messages describe responsible use actions that uphold Reserve rules and policies to protect Reserve ecosystems and balance a variety of uses at the sites. Messages also seek to increase the understanding of the value of coastal and estuarine ecosystems at the sites and how responsible use is important in maintaining this value. Site specific messages are developed and shared to address unique visitor use situations. Safety guidelines will be enhanced for each site and communicated through the mechanisms described above. This action will be conducted in collaboration with stewardship staff and supports Objective 3.2 in the stewardship plan. These communication messages and mechanisms allow staff to promote the importance of the sites and educate visitors about minimizing impacts and ensuring their safety.

Action 5: Increase Reserve presence in local media by connecting with reporters to share Reserve accomplishments, program information and opportunities.

Reserve staff are continuously striving to improve the visibility of the Reserve program. One way to accomplish this is by enhancing connections with local reporters to share upcoming events and program information. Stewardship, research, education, and training events that are open to the public are added to community event calendars and broadcasted on the internet and radio. Program opportunities for volunteers and professionals are pitched to reporters for local television and print news in an effort to reach a broader audience and improve the visibility of the program within coastal communities.

Action 6: Enhance engagement and improve Reserve online communication by incorporating more visuals, creating infographics, and exploring additional digital media.

Eye-catching infographics explain responsible use policies and provide educational information about estuaries. Infographics are distributed via social media, posted on the NCNERR website, and included in the Reserve newsletter. All social media posts include a photo or video for the purpose of boosting engagement and increasing followers. Social media metrics have shown that posts with visuals generate a greater response. Priorities for new forms of digital media, such as short, educational videos, will be identified and implemented to expand and inform audiences about Reserve programs and sites. Video content is uploaded to the NCNERR YouTube channel, a platform that provides easy to track viewer metrics and allows for seamless sharing on social media.

Action 7: Use online analysis tools to evaluate audience engagement.

Various online metrics are used to measure audience engagement. Google analytics is used to track page visits, especially to site pages and data download and curriculum pages. These metrics keep staff informed of how data and products are being used by different audiences. Facebook and Twitter track post activity on a daily basis and YouTube tracks viewer activity. Information shared through these avenues is analyzed and used to inform communications strategies based on how target audiences respond to content. The Reserve newsletter is distributed via Constant Contact, an online email

marketing service, which tracks link clicks, email opens, and allows for sharing on Reserve social media outlets. Digital strategies for communicating Reserve information are enhanced based on feedback obtained through online analytics.

VII. NCNERR Strategic Plan Topical Areas

To strengthen alignment of NCNERR programs and efforts with NERRS Strategic Goals and address public input, the NCNERR selected three topical areas of national, regional, state, and local importance: water quality, coastal and estuarine protection, and coastal hazards resilience. These areas were informed by current work and input from Reserve staff, public and local advisory committee meetings, partner surveys, and education and training needs assessments. The topical areas will serve as additional focus and investment for the NCNERR management plan and will be addressed through a strategic and integrated process utilizing the capacity of the NCNERR programs and leveraging its partnerships. The NCNERR is uniquely positioned to address these topical areas using an integrated approach via its education, training, research, and stewardship programs and network of protected sites. Connecting with partners on broader initiatives through collaboration, data sharing, and communication allows the Reserve to expand the scope of work relating to each topical area. The impetus to focus on these topics and the ability of the NCNERR programs to address them through a collaborative approach is described in this section. Each topical area includes objectives and actions that build on the current strengths of the NCNERR programs, address NCNERR needs, and advance work in the topical areas across geographic scales. Actions described in the NCNERR program plans that support topical area actions are noted.

Water Quality

One of the most significant issues for estuaries nationally is water quality. According to the Environmental Protection Agency's National Coastal Condition Report, the water quality index for the nation's coastal and estuarine waters, is rated as "fair," mostly due to degraded water clarity or increased concentrations of dissolved inorganic phosphorus (DIP) or chlorophyll *a*. The report also shows that the largest coastal areas with poor water quality are along the Southeast Coast, from North Carolina to Florida, due to environmental stressors like increased nutrient concentrations and reduced water clarity ([National Coastal Condition Report, 2012](#)). Degradation of water quality is considered a threat and stressor at each NCNERR site, as listed in the Introduction chapter of the management plan. Due to the national significance and local relevance of water quality, the topic has been selected as an area of focus in the NERRS Strategic Plan and a topical area for the NCNERR Strategic Plan.

Decline in water quality in and around NCNERR sites is due, in large part, to point source pollution from wastewater discharges and non-point source pollution from stormwater runoff. Land development, land use change, and stormwater management practices all impact water quality at NCNERR sites and associated watersheds. Long-term water quality monitoring is necessary to document changes in water quality and to begin determining trends in water quality and their connections to various coastal processes. NCNERR has a 20-year history of water quality monitoring which began in 1995 with the initiation of the standardized NERRS System-Wide Monitoring Program (SWMP). NCNERR's long history of implementing SWMP protocols make it a

valuable resource to provide and translate the best available data on local water quality conditions while placing them within a national NERRS-wide context.

NCNERR research staff collect and analyze various water quality parameters, such as pH, turbidity, dissolved oxygen, temperature, salinity, and chlorophyll *a*. These monitoring data can be used by a myriad of stakeholders for a variety of purposes. For example, commercial and recreational fisherman can use near real-time local air and water temperature data for planning fishing trips, and teachers incorporate SWMP data into lesson plans to help students understand how ecosystems are affected by changes in water quality.

NCNERR water quality data can provide valuable information to agencies that track water quality conditions and events such as algal blooms, fish kills, and shellfish closures, all of which can serve as indicators of poor water quality within coastal and estuarine ecosystems. One of the goals of the 2015 N.C. Coastal Habitat Protection Plan, a document intended to guide regulatory agencies in the management of fishery habitats, is to enhance and protect North Carolina's water quality. The Reserve's ability to couple long-term monitoring data with management practices provides an opportunity to study the effectiveness of different management practices and collaborate with water quality stakeholders to improve these methods and inform policy.

The Reserve's long-term research and monitoring on water quality continues to add to a large, robust dataset. However, there is a need to synthesize these data to assess trends and identify mechanisms that cause changes in water quality at NCNERR sites. The Research Program is looking to expand abiotic and biotic SWMP-like monitoring to all four Reserves which would allow research staff to draw conclusions relevant to each site as it pertains to threats to water quality. The Reserve also needs to continue to seek and maintain partnerships that integrate these data into larger monitoring efforts, thus broadening the utility of this research. It is also important to make water quality data more accessible, promote its use, and clearly demonstrate how and why it is relevant so that the use of these data by researchers, teachers, and coastal decision makers is increased.

NCNERR will work to integrate water quality research into education, training, and stewardship programs designed to educate and engage target audiences, such as the general public, students, and decision makers, about best management practices and restoration activities that improve water quality.

Objective T1.1: Increase knowledge of short and long-term water quality trends using data collected through SWMP and other water quality monitoring methods.

Action 1: Research staff continues SWMP monitoring and explores opportunities to expand SWMP monitoring.

The research program is completing transition to upgraded water quality monitoring equipment to ensure the continued collection of high-quality data. The Reserve has established an agreement with UNCW to add an additional SWMP-like station at UNCW's CMS dock within the Masonboro Island Reserve and renewed the MOU with the NPS to continue SWMP-like abiotic monitoring at the Rachel Carson Reserve (Appendix K). Expanding SWMP-like water quality monitoring to Currituck Banks to

include all four Reserve sites would both expand NCNERR's partnership base and collect important data relevant to threats to water quality across a wide range of waterbodies, salinity and tidal amplitudes, and coastal populations. Research and stewardship staff are engaging partners to explore the opportunity to expand water quality monitoring at this site.

- Additional details can be found in Research Program Actions 2.1.3 & 2.1.4.

Action 2: Research staff helps to advance Reserve staff understanding of water quality concepts and the utility of SWMP and water quality data through professional sharing opportunities.

The collaboration between research and other Reserve staff to translate research projects and results into products and programs serves as a professional sharing opportunity that advances staff knowledge of water quality concepts. The research program works closely with other Reserve staff to accurately transfer research results and water quality concepts in a timely manner for incorporation into a wide variety of Reserve programming (See Objective 1.2). Professional sharing also occurs when staff from other sectors accompany research staff in the field to help collect data and maintain equipment.

-Additional details can be found in Research Program Action 2.2.4, Training Program Action 1.4.3, and Education Program Actions 1.1.3.

Action 3: Research staff and partners analyze and synthesize SWMP data to identify locally, regionally, and nationally significant trends and patterns.

Water quality monitoring data are analyzed yearly as part of the required NERRS QA/QC process. More in-depth analyses and syntheses of the research and monitoring data will be conducted with input from Reserve staff and partners to identify water quality trends and patterns.

- Additional details can be found in Research Program Action 2.1.6.

Action 4: Research staff networks with existing partners and forges new partnerships to integrate SWMP data into local and state-wide water quality monitoring programs.

Research staff actively communicate about available datasets, program capabilities, and products relating to water quality monitoring to relevant end users in an effort to integrate this data into broader monitoring programs through stakeholder groups, work groups, professional meetings and conferences, research collaborations, and the research permitting process.

- Additional details can be found in Research Program Action 2.2.1.

Objective T1.2: Integrate water quality concepts and Reserve water quality research into Reserve programs and products to improve understanding and awareness.

Action 1: Education and training staff works with research staff to incorporate water quality concepts and SWMP and water quality data into curricular activities, workshops for professionals, and other education programs.

Research staff work with education and training staff to incorporate data, tools, techniques, and research results into education and training materials and programs. Water quality analyses and syntheses will be used to create products that benefit all NCNERR programs. Water quality concepts and research are incorporated into educational curricula, field trips, the Masonboro Island Explorer program, TOTE workshops, classroom visits and summer programs. SWMP monitoring data can inform the development of curricula for K-12 education programs and inform workshop attendees of local, regional, and national water quality trends. Education staff will work with research staff to incorporate mobile, user-friendly data interfaces into student and teacher activities as more accessible online SWMP water quality data is developed and tablets are available for field programs. The Reserve will continue to provide field trip and/or field study experiences that include water quality concepts and monitoring for K-12 and college students.

Collaborations between the training and research staff ensure that every training program begins with the scientific reasons why coastal resources are protected, including the ecosystem services they provide. Stormwater and low impact development are core training program offerings and include water quality concepts and trends to aid in understanding the need for water quality protection. Additionally, research staff disseminate information through 10 or more forums annually, sometimes in conjunction with training program activities.

- Additional details can be found in Education Program Actions 1.1.3, 1.2.1, Coastal Training Program Actions 1.4.1, 1.5.2, and Research Program Actions 2.1.6, 2.2.1, 2.2.4.

Action 2: Research staff collaborates with other Reserve staff to develop communications products designed to increase awareness of water quality concepts, the Reserve's role in monitoring water quality, and available data.

Communications staff will promote SWMP activity and the benefits of continuous long-term monitoring of water quality at Reserve sites to target audiences via the Reserve's Facebook pages and Twitter page. Reserve staff will work with research staff to incorporate water quality data into site and program presentations.

- Additional details can be found in Administration Program Actions 4.5.2, 4.5.3.

Action 3: Reserve staff engages participants in field-based stewardship activities that promote the importance of water quality and its protection.

Staff across all programs will engage volunteers and/or program participants to take part in hands-on stewardship activities that promote good water quality such as marine debris clean-ups and marsh grass plantings at Reserve sites. Staff or other experts will connect the importance of water quality and its protection to the field activity by providing brief educational explanations to the participants.

- Additional details can be found in Stewardship Program Action 3.1.4 and Education Program Action 1.1.3.

Objective T1.3: Improve water quality in Reserve site watersheds.

Action 1: Reserve staff collaborate with partners on projects that promote stormwater management, habitat restoration, living shorelines, and low impact development.

The Reserve partners with CCFHR, UNCW, and others on projects that improve water quality in Reserve site watersheds. Currently the Reserve and CCFHR work together on marsh monitoring and living shoreline projects, as well as a stormwater best management practices evaluation. Living shoreline projects are also completed with a variety of partners including state agencies, IMS and UNCW. The Reserve and UNCW partner on water quality monitoring as previously described. The Reserve partnered with N.C. Coastal Federation and UNCW on a project that reduced the impact of non-point source pollution in the Masonboro Island Reserve watershed through volume reduction. The Reserve, Duke University Marine Lab and partners in the Town of Beaufort are removing marine debris from the Rachel Carson Reserve through a NOAA Marine Debris funded project. Training staff provide technical assistance to local governments on stormwater management and low impact development.

-Additional details can be found in Administration Program Action 4.2.3.

Action 2: Coastal Training Program staff delivers trainings and technical assistance on water quality best management practices.

The training program works closely with partners to facilitate workshops and core trainings on topics that protect and enhance water quality, such as low impact development basics, stormwater management and living shorelines to encourage implementation within Reserve watersheds. The training program also provides technical assistance to local communities for improvements related to water quality.

-Additional details can be found in Training Program Actions 1.4.1, 1.5.2 and Research Program Action 2.1.6

Action 3: Reserve staff incorporates watershed concepts and impacts of human choices into program activities.

The training and education programs incorporate watershed concepts and impacts of human choice into various program activities such as workshops, field trips and curricula. Staff translates, distills and incorporates new information about watersheds and human impacts into educational materials and other Reserve products. Incorporating activities such as the watershed game and estuary pledge into these programs encourages engagement with the information and inspires local stewardship.

- Additional details can be found in Education Program Actions 1.1.3, 1.2.1, 1.2.3, 1.2.4, 1.3.1 and Training Program Actions 1.4.1.

Coastal and Estuarine Ecosystem Protection

North Carolina has 2.3 million acres of biologically rich coastal and estuarine ecosystems, more than any other state along the Atlantic seaboard. Healthy estuaries are critical for the continued survival of many species of fish and other aquatic life, birds, mammals, and reptiles. These systems function as nurseries, refuges, and foraging areas for commercially valuable fish and shellfish species. In 2013 the economic impact of North Carolina's commercial and recreational fisheries was over \$2 billion (North Carolina's Coastal Habitat Protection Plan 2015). Estuarine habitats, like saltmarsh, seagrass, and oyster reefs, buffer wave energy and filter pollutants, which protects coastal communities from stormwater runoff, storm surge, and flooding. Healthy ecosystems support tourism and recreation, including kayaking, swimming, fishing, and birding, which are vital to North Carolina's coastal economy. Because of the many benefits that coastal and estuarine ecosystems provide to North Carolina, it's important to protect these ecosystems from the many stressors affecting them. Some of these stressors include sea level rise (SLR), invasive species, and coastal development, all of which can result in habitat loss and alterations in ecosystem function.

The NCNERR is well suited to address stressors impacting Reserve sites and surrounding watersheds by monitoring habitat change and developing, testing, and implementing methods for coastal and estuarine ecosystem protection. Habitat distribution and condition at NCNERR sites are evaluated through the NERRS Habitat Mapping and Change component of SWMP. Stewardship staff monitor invasive species, visitor use, presence and absence of species of special concern, and natural or anthropogenic influences that impact habitat quality and ecosystem function at Reserve sites.

While the Reserve is well equipped to assess habitat change, additional information is needed to understand how stressors influence the ecosystem services provided by changing habitats. This information will be used to inform and develop strategies on how to best protect coastal and estuarine ecosystems at Reserve sites and within their watersheds. A centralized online database is needed to document and maintain natural history records to more completely understand the condition of NCNERR sites to inform protection and resilience strategies and to demonstrate their ecological significance.

Using a strategic combination of education, training, and stewardship programming, supported by communications initiatives, the Reserve can encourage ecosystem protection using NERRS and NCNERR-generated science and best practices. Coastal and estuarine ecosystem protection at NCNERR sites is accomplished by collaborating with partners and recruiting volunteers for activities that restore and enhance habitats, including planting vegetation or treating invasive species. Reserve research and monitoring methods, along with best management practices that focus on protecting these ecosystems, are shared through the Reserve's Coastal Training Program, education programs, and volunteer opportunities. Through Reserve programs, the general public and users are educated about their impacts to natural resources and how to minimize them. Habitat restoration activities offered in conjunction with education and training opportunities focused on the value of coastal and estuarine ecosystems will foster public support for natural resource protection.

Objective T2.1: Improve understanding of Reserve ecosystems, including the ecosystem services they provide, the threats they face, and how to best protect them.

Action 1: Research and stewardship staff generate baseline data on Reserve ecosystems and potential stressors and document change through habitat mapping, monitoring programs, and natural history records.

Reserve staff conduct survey and monitoring activities to better understand Reserve ecosystems and condition. Various species of interest, such as the piping plover and diamondback terrapin, are monitored through joint efforts with Reserve partners. Activities are undertaken based on specific site needs to manage, enhance and restore habitats, while supporting the natural integrity of sites. The Reserve also works to address invasive, non-native and feral species on Reserve sites by conducting survey, monitoring and treatment activities. A centralized online database is being developed to document and maintain natural history records with existing geographic and photographic species records and continued observances on sites. Using abiotic and biotic monitoring programs, elevation monitoring and habitat mapping, research staff are documenting habitat change throughout Reserve sites.

- Additional information can be found in Stewardship Program Actions 3.1.3, 3.1.4, 3.1.5, 3.1.7, and Research Program Action 2.1.3.

Action 2: Research staff communicate Reserve research needs relevant to quantifying estuarine ecosystem services to partners and the research community and work with them to quantify estuarine ecosystem services and how services are impacted by stressors.

The Reserve is required to ensure that sites serve as research platforms. Research priorities, including those relevant to estuarine ecosystem services, are circulated among scientific and coastal management communities through informal communication in workgroup settings, the Reserve website, seminars, and NERRS Science Collaborative and Coastal Research Fellowship RFPs.

- Additional details can be found in Research Program Actions 2.1.1, 2.1.2, 2.3.1.

Action 3: Research and stewardship staff collaborate to design studies that address ecosystem protection and inform restoration and management projects.

Studies and monitoring of site resources and concerns help to inform protection and restoration efforts. Stewardship and research staff will work together to design studies that address visitor use of sites, protected species breeding productivity, invasive species impacts, and success of living shoreline projects. Research and stewardship staff will work to restore habitat at Reserve sites and assess the success of demonstration projects through continued monitoring. Species of interest are managed by conducting survey and monitoring activities, for example to study shorebird and sea turtle nesting success. Research staff will continue to work with stewardship staff and research partners to study the impacts of *Phragmites* at Currituck Banks Reserve. Habitat management activities are also undertaken to monitor the impacts of invasive species.

- Additional details can be found in Stewardship Program Actions 3.1.3, 3.1.4, 3.2.6 and Research Program Actions 2.1.1, 2.1.2.

Action 4: Reserve staff work with organizations involved in landscape-scale initiatives to further the protection and understanding of coastal and estuarine ecosystems.

The Reserve is engaged with several initiatives that leverage the NCNERR's network of sentinel sites and the enhance its capacity to address landscape-scale ecosystem changes. The research program continues to explore partnerships with organizations involved in the Alliance for Currituck Sound for opportunities to conduct monitoring at Currituck Banks Reserve. Stewardship staff participate in regional efforts to address habitat protection at landscape scales. Partnerships include the Onslow Bight Forum and Cape Fear Arch Conservation Collaborative, which are efforts to implement community conservation plans and promote stewardship of coastal and estuarine ecosystems regionally. Staff also participate in the N.C. Sentinel Site Cooperative, a NOAA-sponsored sentinel site program focused on the central portion of the coast, that works collaboratively and leverages resources across partners to provide research, monitoring, and information for addressing ecosystem coastal resiliency to flooding, inundation, and sea level rise.

- Additional details can be found in Stewardship Program Action 3.1.4.

Objective T2.2: Inform target audiences about the importance of coastal and estuarine ecosystems to inspire protection.

Action 1: Education staff collaborates with research and stewardship staff to inspire K-College audiences to appreciate and protect coastal and estuarine ecosystems through program offerings such as field trips, classroom visits, and educational programs and materials.

The Reserve will continue to provide field trip and/or field study experiences for K-12 and college students. Field trips are ecology-based nature hikes that present basic estuarine information. Education staff also work with Masonboro.org, Carolina Ocean Studies, and the New Hanover County School System to offer the Masonboro Island Explorer program that directly engages students with local ecosystem protection. Through local outreach in schools, Reserve staff conduct hands-on, inquiry-based activities that provide information about the Reserve and its habitats. The Reserve partners with the N.C. Maritime Museum to offer four summer programs for children that are held in the Reserve's facility in Beaufort with daily field trips to the Rachel Carson Reserve. Stewardship staff directly engage educators to provide information to promote safe and appropriate use of the sites while preserving natural integrity and minimizing human impacts. Site managers also recruit volunteers from local communities and educational institutions to assist with stewardship activities. The research program works with education staff to transfer research results that can be incorporated into the above mentioned activities.

- Additional information can be found in Education Program Actions 1.2.1, 1.2.2, 1.2.3, 1.2.4, Stewardship Program Actions 3.2.3, 3.3.1, and Research Program Actions 2.2.4

Action 2: Reserve staff participates in efforts to educate the general public and site users by providing educational materials through the Reserve website, public presentations and events, and interpretive signage.

The Reserve uses a breadth of communication strategies to engage the general public and site users with information pertaining to ecosystem protection. Messages and products are developed to highlight the

significance of site natural resources, visitor use guidelines, volunteer opportunities, programs and events, site research and relevant coastal and estuarine topics that are disseminated via the Reserve's website and social media platforms. The training and education programs also disseminate these messages and materials via public presentations, events, workshops and education program activities, such as field trips and teacher trainings. Reserve staff communicate and promote these messages to visitors through direct engagement, interpretive signs, handouts, and website and social media posts.

- Additional details can be found in Administration Program Actions 4.5.1, 4.5.3, 4.5.4, 4.5.5, 4.5.6 and Stewardship Program Actions 3.2.1, 3.2.3.

Action 3: Stewardship staff engages community volunteers in species monitoring, research, and protection projects, such as marine debris removal, habitat mapping, marsh grass planting, and other activities.

Stewardship staff provide opportunities for active community participation in Reserve activities on the sites which inspires current and potential site users to appreciate the importance of and support protection efforts for coastal and estuarine ecosystems. Reserve staff provides mentoring, training and hands-on field experiences to volunteers to advance their skills and knowledge of stewardship of coastal and estuarine habitats.

- Additional details can be found in Stewardship Program Actions 3.1.4, 3.2.4, 3.3.2.

Action 4: Training and education staff provide teachers and professionals with training on issues relevant to ecosystem protection such as low impact development, living shorelines, and coastal wetlands.

Education staff conducts hands-on, field-based educator workshops that promote estuarine literacy. Working with partners, the education program is able to offer educator professional development workshops, such as Coastal Explorations and Teachers on the Estuary, that provide training on issues relevant to estuarine and coastal habitat protection. Through programs like Seeds to Shoreline, education staff directly engage both students and teachers in marsh grass restoration projects. The training program offers a suite of core trainings and workshops for professionals on topics ranging from low impact development basics for water quality protection to living shorelines for estuarine protection.

- Additional details are available in Education Program Actions 1.1.1, 1.1.5 and Training Program Actions 1.4.1.

Action 5: Training and stewardship staff provide collaborative opportunities for the natural resource management community to share information and tools to improve management of coastal and estuarine ecosystems.

Training and stewardship staff strive annually to collaborate on a training on stewardship related topics, such as citizen science and volunteer management. Training and stewardship staff prepare for and implement community engagement and expert elicitation aspects of the NERRS Science Collaborative funded project using the Climate Change Vulnerability Assessment Tool for Coastal Habitats (CCVATCH).

- Additional details are available in Training Program Action 1.4.1 and Stewardship Program Action 3.3.2.

Coastal Hazards Resilience

The natural geography and topography of North Carolina's coastline make it vulnerable to coastal hazards, such as flooding, coastal storms, shoreline erosion, and SLR. Forty-two percent of the N.C. coastline is ranked as "very high" in terms of vulnerability to SLR ([Assessment and Strategy of the North Carolina Coastal Management Program 2015](#)). North Carolina's vulnerability to rising sea level magnifies other existing coastal hazards. The coupling of coastal storms and flooding lead to increased coastal erosion. With rising seas and more intense storms, large disruptions to barrier island systems are likely to occur ([Climate Read North Carolina: Building a Resilience Future 2012](#)). Three of the four NCNERR sites - Currituck Banks, Masonboro Island and Zeke's Island Reserves - are barrier island systems that are subject to these coastal hazards. The Rachel Carson Reserve has characteristics of both estuarine island and barrier island ecosystems, making it vulnerable to the same coastal hazards. The Reserve is well-equipped to assess the vulnerability of ecosystems at Reserve sites through SWMP and sentinel site infrastructure and monitoring, as well as species surveys and habitat mapping. The ability to assess vulnerability is important for planning and developing strategies to increase resilience of ecosystems and human communities to coastal hazards. NCNERR's capacity for local engagement can help connect the results of monitoring data at NCNERR sites to help the program and partners understand Reserve site and surrounding communities' vulnerability. Examples of this include NERRS tools to assess resilience of salt marshes to sea level rise and the Climate Change Vulnerability Assessment Tool for Coastal Habitats.

Hazards impacting North Carolina's coastal and estuarine ecosystems pose a significant threat to coastal communities. Twenty-eight percent of coastal county residents live in floodplains and the state has experienced some of the highest coastal storm damage in the country ([Assessment and Strategy of the North Carolina Coastal Management Program 2015](#)). In 2014, total damage from hazardous weather in North Carolina was over \$54 million ([NOAA National Weather Service](#)). Improving knowledge and awareness of coastal community resilience is accomplished through education, training, research, and stewardship activities that translate monitoring program results and promote the importance of natural infrastructure. Natural, or green, infrastructure refers to dune systems, oyster reefs, vegetation, and other healthy habitats that offer multiple benefits to coastal communities, like storm protection and wave attenuation. Living shorelines offer one way to stabilize estuarine shorelines through the use of natural materials such as marsh plants and oyster reefs as an alternative to hardened structures, such as bulkheads. Efforts on a national and state level are focused on encouraging the use of living shorelines to protect property, restore shoreline habitat, and improve water quality and coastal resilience. DCM has identified living shorelines as a priority and its current work and accomplishments are described in the Living Shorelines Strategy and the Living Shorelines Accomplishment Report. Living shorelines are also identified as a priority habitat issue in the 2015 Coastal Habitat Protection Plan. The importance of this technique, these strategic documents and the NCNERR's role in research, education, and training ensures it will continue its efforts on living shorelines for estuarine shoreline erosion control.

There are a number of needs and opportunities associated with NCNERR's focus on coastal hazards resilience. One such need is to increase the capacity of sentinel site type monitoring to assess the impacts of coastal hazards on NCNERR sites beyond the current focus on salt marshes. It is crucial to understand the resilience of living shorelines and other shoreline stabilization methods to coastal hazards like storm events. Assessments to understand the vulnerability of ecosystems and human communities are needed to inform strategies to improve resilience. Clear and effective communication to various stakeholders, such as decision makers, marine contractors and other professionals who work in coastal communities is critical to implementation of resilience strategies.

Objective T3.1: Assess vulnerability of Reserve natural resources to coastal hazards and use results to inform management decisions.

Action 1: Research and stewardship staff continue to implement SWMP, sentinel site, and natural resource monitoring to understand vulnerability of species, habitats, and/or geographic areas.

The research program will continue conducting biological monitoring of emergent marsh vegetation and marsh elevation surveys at Rachel Carson, Masonboro Island and Zeke's Island Reserves. The research program has also completed habitat mapping of all Reserve sites with plans to map again over a 10-year period to assess habitat change. Research and stewardship staff manage species of interest by conducting survey and monitoring activities. Data generated from these efforts will be used in planned vulnerability assessments.

- Additional details can be found in Research Program Actions 2.1.3 and Stewardship Program Actions 3.1.3.

Action 2: Reserve staff and a collaborative team of land managers, researchers, and other relevant stakeholders identify and prioritize Reserve natural resources for vulnerability assessments.

The Reserve and partners at the North Inlet-Winyah Bay National Estuarine Research Reserve, SC (NIWBNERR) were recently awarded a NERRS Science Collaborative grant to facilitate the use of CCVATCH, a new vulnerability assessment tool. This tool will help the Reserves better understand coastal habitat vulnerability to changing climate conditions. The assessment will be applied to marshes at all four sites of the NCNERR (Currituck Banks Reserve, Rachel Carson Reserve, Masonboro Island Reserve, and Zeke's Island Reserve). Information from risk assessments conducted as part of the development of the NCNERR Disaster Response Plan will be incorporated into this assessment. Additional vulnerability assessments may be considered as the need arises and as resources are available.

-Additional details can be found in Stewardship Program Action 3.1.8.

Action 3: Reserve staff plans and implements strategies to improve resilience based on vulnerability assessments as resources are available.

The results of planned and future vulnerability assessments will be used to prioritize species, habitats, and/or geographic areas for development and implementation of strategies to improve resilience.

-Additional details can be found in Stewardship Program Action 3.4.3.

Objective T3.2: Increase understanding and communicate knowledge of the importance of natural infrastructure (e.g., oyster reefs, marsh, living shorelines) to coastal resilience.

Action 1: Research staff continues to conduct and explore opportunities to expand the Sentinel Sites for Sea Level Rise and Inundation application module of SWMP to assess the resilience of marshes to SLR.

The NERRS Sentinel Site Program and SWMP provide data for a number of indicators relevant to the resilience of marshes to sea level rise. These indicators can be applied at all Reserve sites, but three of the four Reserve sites require additional infrastructure. Research staff will explore funding opportunities and partnerships to fill gaps in infrastructure at Currituck Banks, Rachel Carson and Zeke's Island Reserves.

- Additional details can be found in Research Program Action 2.1.5.

Action 2: Research staff continues working with partners to evaluate the performance of living shorelines over time and during storms, and assess the impact of shoreline hardening on marshes.

Research staff, in partnership with CCFHR, will study shoreline resilience in areas where estuarine shorelines are stabilized by traditional structures, such as bulkheads, or by living shorelines, such as marsh sills. Research staff will explore collaborations to assess the performance of natural infrastructure during storms and to identify optimal materials for living shorelines in different conditions. The Research program partners with UNC-CH Institute of Marine Sciences and UNC-Wilmington to assess the resiliency of living shorelines to large storm events. Research staff will continue to explore additional opportunities to collaborate and expand this research.

- Additional details can be found in Research Program Action 2.1.6.

Action 3: Reserve staff uses vulnerability assessments and resilience strategies to educate communities and coastal decision-makers on what coastal hazards are and the importance of natural infrastructure for coastal resilience through educational materials, research presentations, training events, and hands-on stewardship activities.

The training program conducts workshops on living shorelines and natural infrastructure, informed in part by monitoring of shoreline stabilization structures. The training program has historically provided training on sustainable development and a recent needs assessment revealed requests for training on community resilience and preparedness to coastal hazards. The research program presents the Reserve's research and monitoring datasets, results and products to coastal decision-makers and other end users regularly through forums such as presentations at university seminar series. The education program needs assessment identified that more information regarding changing coastal conditions should be incorporated into future education materials. These concepts and current research and stewardship activities will inform the content of new and updated curricula. Community members are actively involved in

stewardship activities that contribute to coastal resilience, such as marine debris removal and marsh plantings. Results from vulnerability assessments will be incorporated into programs and products tailored to target audiences.

-Additional details can be found in Training Program Actions 1.4.1, 1.4.2, Research Program Actions 2.1.6, 2.2.1, Education Program Actions 1.1.2, 1.1.3, and Stewardship Program Action 3.1.4.

Action 4: Training staff delivers trainings on natural infrastructure including living shorelines and coastal wetlands.

The training program coordinates core trainings for decision-makers on a variety of topics, which include those pertaining to natural infrastructure. DCM promotes living shorelines as a shoreline stabilization option where site conditions are appropriate. The training program has worked collaboratively with DCM and other partners to craft trainings and outreach products regarding living shorelines, especially targeting property owners and marine contractors.

-Additional details can be found in Training Program Actions 1.4.1 and 1.4.2.

Action 5: Training staff assists coastal communities to implement actions that increase their resilience to coastal hazards through technical assistance.

Annually, the training program provides technical assistance to at least one local coastal community. This is done by establishing collaborative relationships with local communities within Reserve watersheds, determining communities' technical assistance needs, and then delivering the technical assistance. Technical assistance may come in the form of meeting planning and facilitation to engage stakeholders, community needs assessments and community outreach.

-Additional details can be found in Training Program Actions 1.5.1, 1.5.2.

Objective T3.3: Increase understanding of sea level rise implications for Reserve sites and coastal and estuarine ecosystems by participating in local, regional, and state initiatives.

Action 1: Reserve staff advance the work of the NCSSC through participation in its Core Management Team and research and training activities.

The Reserve and CCFHR enhance their respective research capabilities through collaborative partnerships addressing relevant coastal habitat and management-related questions. One such collaboration is joint participation in the NCSSC which addresses sea level rise impacts by leveraging NOAA trust resources, ecosystem monitoring tools and expertise. Research staff contributes research and monitoring data to the NCSSC Clearinghouse database and Cooperative initiatives. The NCSSC has developed a database of containing metadata on projects relevant to sea level rise and resilience along the coast of North Carolina.

The Research Program contributes projects metadata to this database and shares research project data to support Cooperative initiatives.

Through workshops and technical assistance, the Training Program delivers information regarding sea level rise and coastal hazards resilience to various stakeholder groups. From the 2014 needs assessment, the biggest training need identified revolved around community resilience/preparedness to coastal hazards which includes sea level rise. This need will be addressed in future Training Program activities.

-Additional information is available in Training Program Actions 1.4.2, 1.5.1, 1.5.2, Research Action 2.1.2 and Administration Program Chapter 4.4.1.

Action 2: Reserve staff support DCM initiatives to address sea level monitoring and resilience planning.

DCM plans to develop a North Carolina Coastal Community Resilience Guide that will include a vulnerability and needs assessment. The Reserve, N.C. Sea Grant, and regional planning organizations will be key partners in outreach to communities while preparing the guide, working with pilot communities, and training local communities in using the guide after it is released.

VIII. Facility Development and Improvement Plan

The NCNERR has a responsibility to provide the facilities necessary to implement the education, training, research and monitoring, and stewardship programs of the NCNERR in accordance with federal and state guidelines and laws. This facilities plan is organized by NCNERR site and describes the existing and needed office and laboratory facilities, equipment, on-site infrastructure, and exhibits for each location. Purposes of the facilities are described, and challenges and gaps are included in the needs sections. Existing SWMP infrastructure and needs are included in the research plan.

The NCNERR's focus on its sites and programs and the geographic distribution of the NCNERR along the coast heavily influence the facilities plan, resulting in the program's effective implementation of office and laboratory facilities utilizing partnerships. The Reserve currently operates from three offices due to the geographic distribution of the sites: the northern office in Kitty Hawk supports the Currituck Banks site; the central office in Beaufort supports the Rachel Carson site; and the southern office in Wilmington supports the Masonboro and Zeke's Islands sites (Figure 21). All office and laboratory facility buildings are located off-site (northern and central offices) or within the buffer (southern office) to avoid and minimize impacts to the sites. The buildings are leased or shared with partners to promote collaborative opportunities and maintain economical prudence. Upkeep of office buildings and grounds is included in lease and program support costs and as such, the NCNERR does not employ office and laboratory facility maintenance staff.

Equipment is owned and maintained by the NCNERR for implementation of the program. On-site infrastructure is kept to a minimum as described in the public access plan to protect site ecosystems and provide public access and interpretation. Exhibits are an opportunity to increase awareness of the NCNERR in the local communities and with only one exhibit currently in place, needs and possible partnerships are described to fill gaps. Partnerships are the preferred method for exhibits given the type and location of the NCNERR's office and laboratory facilities, and opportunities at highly visible locations and the ability to reach target audiences.

The needs sections within this plan detail planned facilities and facility upgrades that may be considered within the scope of this management plan. Accomplishing a number of these needs relies on establishing new partnerships or augmenting current partnership agreements as well as securing external funding. As office and laboratory and exhibit needs are pursued in conjunction with partners, efforts will be made to ensure that construction activities and resultant facilities encourage sustainable practices and meet the NERRS Sustainable Building Principles. These include: integrated design & sustainable siting; water efficiency; energy efficiency; materials and resource conservation; indoor environmental quality; and operational efficiency. On-site infrastructure that may be pursued during the scope of this management plan will be designed and sited such that projects meet the applicable NERRS Sustainable Building Principles.

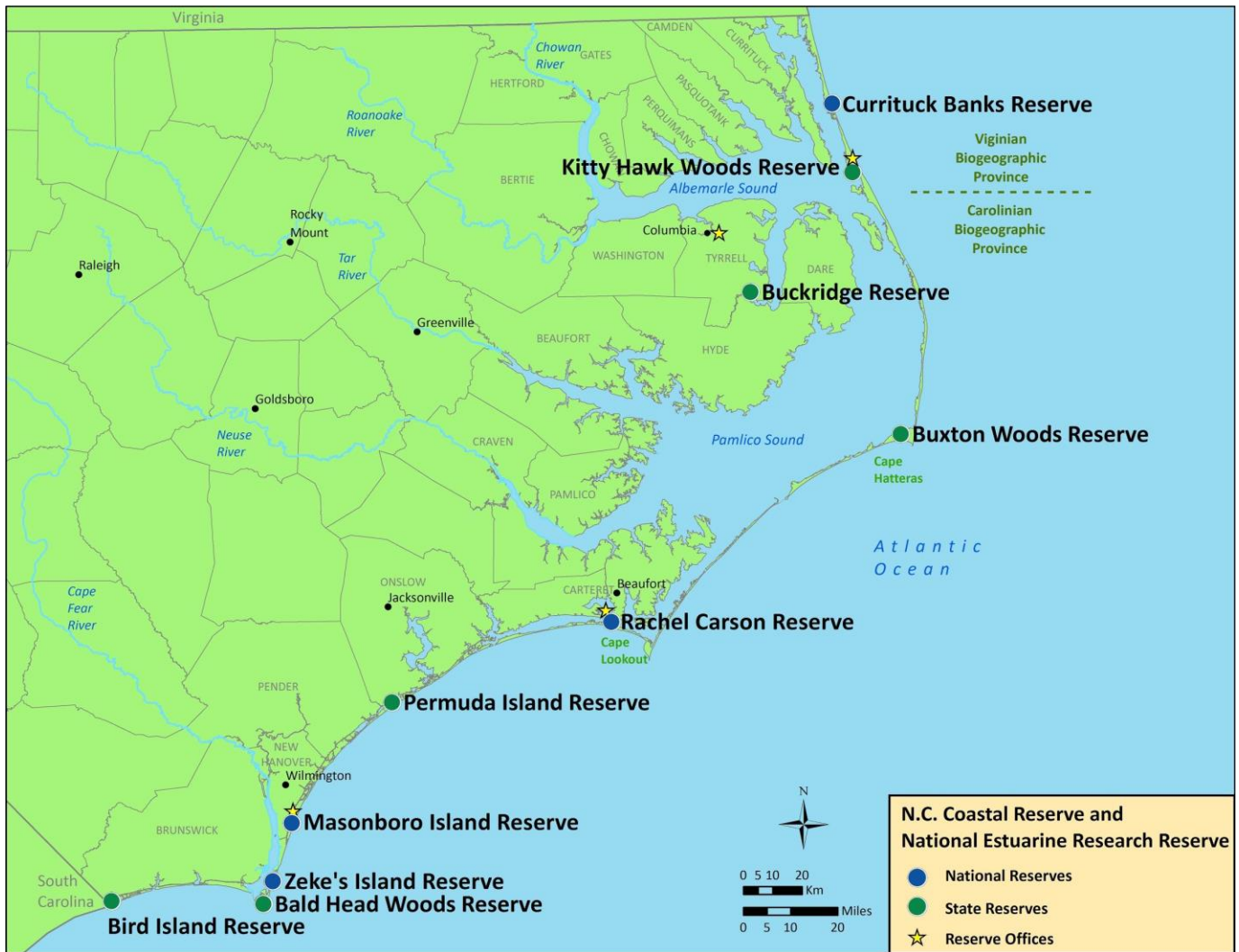


Figure 21. North Carolina National Estuarine Research Reserve Sites and Offices Map

Facility, Equipment, On-site Infrastructure, and Exhibit Descriptions and Needs

Currituck Banks Reserve

Office and Laboratory Facilities:

Existing: Office space is leased from the Town of Kitty Hawk to house the Northern Sites Manager (Appendix S), lease effective through 2017), who manages the Currituck Banks site of the NCNERR and two state sites (Kitty Hawk Woods and Buxton Woods Coastal Reserves). The office is located approximately 25 miles south of the Currituck Banks site (Figure 22). The office is approximately 700 ft² and contains field and office storage space, small common meeting space, and three work stations. Boat and vehicle storage is also provided at the office. Public meetings and education events are held at partner facilities such as the Town of Kitty Hawk Town Hall and WRC's Outer Banks Center for Wildlife Education in Corolla, just a few minutes south of the Currituck Banks site.



Figure 22. Reserve Northern Office

Needs: The office space currently leased from the Town of Kitty Hawk is workable but does not meet long-term needs. These long-term needs include co-location with partner(s) conducting complementary work to provide a peer network for staff and enhance collaborative opportunities and safety; several offices; available laboratory space; and indoor/outdoor storage for vehicles, boats, and field equipment. Given the limited Reserve staff and the lack of maintenance staff, it is the preference of the DCM to develop and maintain a long-term partnership agreement with a local or state agency for a facility that meets the long-term needs identified above in which the agency maintains ownership of the facility and the DCM pays an established fee for use. The Reserve Program Manager, Northern Sites Manager, and DCM staff will explore partnership opportunities with local or state agencies and organizations to locate permanent, suitable office and lab space within an existing facility to accommodate the needs of Currituck Banks.

Equipment

Existing: The northern office has one boat used for stewardship and research, a 16 ft. Jones Brother semi-V hull equipped with a four-stroke 50 hp Johnson outboard engine. The N.C. Division of Motor Fleet Management leased vehicle is a 2007 four wheel-drive Grand Jeep Cherokee. The Northern Sites office is

equipped with computers, a camera, GIS/GPS, a utility trailer, foot-powered kayak, and tools needed for site management and maintenance.

Needs: The northern office does not have any identified equipment needs at this time. When it is time to replace the Motor Fleet Management vehicle, staff will pursue getting a truck that is better suited for the work conducted from this office. Equipment needs will be evaluated if additional staff are located at this office to meet the needs identified in the administrative plan.

On-site Infrastructure

Existing: A concrete parking lot with a rain garden provides access to the Currituck Banks Reserve from N.C. 12. From the parking lot, visitors may walk along the 1/3-mile boardwalk through the maritime forest to Currituck Sound. Plants and trees are identified by small signs along the boardwalk. Interpretive signs were installed along the boardwalk in 2006. A 1.5-mile primitive trail departs from the boardwalk and heads north through the maritime forest with benches located along the trail. Currituck County holds an access easement on a portion of the Reserve to facilitate pedestrian access along its multi-use path to the oceanfront beach and maintains the fences and gates along this easement.

Needs: To increase visitor awareness of the Reserve and its appropriate use, a variety of signage needs exist. Types of signage needed include: rules signs, informational signs about parking lot policies, boundary identification signs, and trail markers. There is a need for an elevated interpretive area at the end of the primitive trail to better protect habitats while enjoying the viewscape of Currituck Sound. The boardwalk will need to be resurfaced as the treated lumber is demonstrating age and wear.

Exhibits

Existing: There are no exhibits currently for the Currituck Banks Reserve.

Needs: Staff will explore the feasibility of installing an exhibit about the Currituck Banks Reserve at nearby partner and public access facilities to increase understanding of the program, site, and appropriate use of parking lot.

Rachel Carson Reserve

Office and Laboratory Facilities

Existing: The joint NOAA-NCNERR administration building at the NOAA Beaufort Laboratory on Pivers Island was completed in 2007 and Reserve staff has been operating from this facility since July of that year (Figure 23). This location provides quick access to the Rachel Carson Reserve that is located across Taylor's Creek from the island. The facility is two stories and totals 17,270 ft². The Reserve occupies 2,405 ft² of office space including the teaching classroom. The auditorium and large conference room are shared with NOAA for workshops and meetings, in addition to a shared office storage area located next to the auditorium. The NCNERR office space contains eight offices, two cubicles, a reception area and a small conference room providing space for the Reserve Program Manager, Education Coordinator, Central Sites Manager, CTP Coordinator, and Research Coordinator as well as temporary staff and interns. The NCNERR uses 2 outdoor sheds on Pivers Island to store field equipment. The Reserve has two boats and currently leases dock space from the DUML for the 17' Jones Brothers and utilizes the NOAA floating T-dock for the 27 ft. Carolina Skiff passenger vessel. An agreement for this facility partnership with CCFHR at the NOAA Beaufort Laboratory is under development.



Figure 23. Reserve Central Office

Needs: The administration building was designed for education and training programs prior to the Reserve's reorganization in the early 2000s. As a result, the central office does not comprehensively serve all program needs and new needs have arisen since occupation of the building. The Reserve Program Manager participated in the development of the CCFHR Master Plan which seeks to address facility and program needs of all parties on the CCFHR campus on Pivers Island (December 2008). Federal appropriations have limited NCCOS' ability to implement the Master Plan. The following needs are an updated list of what was included in the Master Plan. Planning for and implementation of these needs will be conducted collaboratively with NCCOS leadership and staff.

Laboratory space: The research and stewardship programs do not currently have designated laboratory space at the central office; research and stewardship activities are currently staged in the teaching classroom. Six hundred square feet of laboratory space is needed to support the research and stewardship programs at the Rachel Carson Reserve including calibration and post-sample processing of water quality monitoring sondes, sample processing, and marine operations. The space should include a laboratory bench, sink, electrical outlets and internet access, and space for a flammable cabinet, refrigerator/freezer, and cart.

Outdoor classroom: An outdoor classroom will support Reserve K-12, public education, and training programs conducted at or initiated from Pivers Island, taking advantage of the natural setting and close proximity of the Rachel Carson Reserve and Gallants Channel. The space should include a covered area with benches to seat approximately 20 people at one time. The classroom should also have locking storage bins to house educational materials and a sturdy chalkboard and display area. The location of the classroom would offer views of the estuary habitat, allowing for a dynamic, experiential teaching space. CCFHR also has an interest in an outdoor meeting facility and this space will be designed to address needs of both organizations.

Boat docks: A boat lift is needed at the CCFHR floating T-dock to better accommodate the Reserve's 27ft. Carolina Skiff. CCFHR and Reserve staff will work together to develop a long-term dock plan that addresses mutual needs.

Equipment

Existing: The central office is equipped for a variety of program-related tasks. The Reserve owns two boats that are housed at this office: a 17 ft. Jones Brothers boat equipped with a 50 hp Yamaha outboard motor for research and stewardship purposes, and a 27 ft. extra-wide Carolina Skiff with rails and seats for passengers and equipped with a Suzuki 250 hp outboard engine for education programs and general purposes. In addition, the office has a N.C. Division of Motor Fleet Management leased 2007 four wheel-drive Dodge Durango, a utility trailer, and two kayaks. Computers, projectors, copier, plotter, color printers, and keypad polling units (60 cards, 2 receivers, and 1 "response anywhere card") are owned by the Reserve for staff use. Water quality testing equipment and twelve microscopes are maintained for use with student groups. The Reserve also owns three cameras and GPS units for research and stewardship projects.

Needs: A new 17-19 ft. flat-bottomed skiff is needed to replace a 20-year-old vessel that currently supports stewardship and research operations at and around the Rachel Carson Reserve. Replacement kayaks are also needed. Equipment needs will be evaluated if additional staff are located at this office to meet the needs identified in the administrative plan and as office and laboratory facility needs are addressed.

On-Site Infrastructure

Existing:

Nature trail: The nature trail consists of two primitive loops that guide visitors through representative habitats found at the site. A brochure and audio podcasts accessible through QR codes describe posted points of interest.

Boardwalk: A boardwalk crosses Carrot Island and is located across Taylor's Creek from the WRC's Lennoxville Road public boat ramp. The boardwalk is approximately 500 ft. in length, allowing visitors to view the cross-section of habitats on the island and terminates with an observation deck overlooking the North River

Channel. The boardwalk was constructed in 2007 of composite decking and railings. Interpretive signs highlight the different habitats and species located along the boardwalk.

Living shoreline demonstration site:

Living shorelines prevent erosion through strategic placement of natural substances, like vegetation and oysters. In many settings, living shorelines represent an effective and relatively inexpensive approach to long-term shoreline stabilization. The Reserve has been involved in the implementation of several demonstration sites.

The living shoreline project at the east end of Carrot Island on the Rachel Carson Reserve was led by researchers from the Reserve and CCFHR. Scientists at IMS Sciences installed oyster shell parallel to the shoreline to encourage reef formation, and volunteers planted saltmarsh cordgrass behind the oyster reefs. Additional partners included the N.C. Coastal Federation and the DCM. Reserve and CCFHR staff continue to monitor the project to evaluate success and additional steps that may be taken.

Needs:

Signage: To increase visitor awareness of the Reserve and its appropriate use, a variety of signage needs exist. Types of signage needed include: rules signs, informational signs, boundary identification signs, and trail markers. Interpretative signs at the boardwalk also need to be replaced due to sign degradation.

Dredging pipes: The pipes at Town Marsh used by the COE for remnant dredging activities need to be removed for safety purposes as this area of the Reserve is heavily used for student and public field trips and for recreation.

Exhibits

Existing:

N.C. Maritime Museum: The display at the North Carolina Maritime Museum contains information about the Rachel Carson Reserve as well as more general information about North Carolina's coastal habitats. The display also features a description of ecosystem services that estuary and coastal habitats provide and a robust shell collection that allows for an interactive learning experience.

Living shorelines: The Reserve assists in monitoring two demonstration sites on Pivers Island and regularly uses the sites for education and training purposes.

NOAA Site (Pivers Island): The living shoreline on the east side of Pivers Island was constructed in collaboration with the DMF and volunteers from the NOAA Beaufort Laboratory and DUML. It consists of marsh plantings and loose oyster shell that now supports a live oyster reef.

Duke Site (Pivers Island): With funding from NOAA, the N.C. Coastal Federation constructed a stone sill on the west side of Pivers Island to replace a failing asbestos bulkhead and abandoned flounder containment pens. Oysters were placed at the base of the sill and the site behind it was graded and planted with native vegetation.

Stormwater best management practices on Pivers Island: A variety of stormwater best management practices (BMPs) installed on the NOAA and DUML campuses demonstrate ways to more effectively manage and improve the quality of stormwater runoff on Pivers Island. The BMPs include stormwater wetlands, bioretention cells, rock check dams, cisterns, and a permeable parking lot. Performance of the BMPs is monitored by NOAA and Duke staff. Informational signs are located at select sites informing visitors of the function of the BMPs. The CTP uses these sites as a field trip in workshops related to stormwater management and low impact development. This project was funded by the N.C. Clean Water Management Trust Fund through a grant to the DCM.

Needs: There are no needs identified at this time.

Masonboro Island Reserve

Office and Laboratory Facilities

Existing: The Masonboro Island and Zeke's Island Reserves and programs implemented at the sites are managed from the southern office at CMS (Figure 24). The CMS is located across the Intracoastal Waterway from the Masonboro Island Reserve providing quick access to that site and is included as buffer within the Masonboro Island site boundary. While NCNERR has had a presence at CMS since the early days of the program, staff have been operating from upgraded dedicated office and laboratory space at CMS since May 2008. The space is approximately 1450 ft² and contains four offices, a laboratory for research and monitoring operations, a common area/workspace for shared equipment, computers, and supplies, and a storage area/mud room. CMS has conference rooms and an auditorium that are regularly used by staff for meetings and outreach presentations. There are also two 300 ft² storage sheds at CMS that are used for storing Reserve field equipment. The Reserve has dedicated use of a boat lift on the CMS docks that is sufficient for a 24 ft. vessel. The office houses the Stewardship Coordinator, two Research Specialists, and temporary and seasonal staff. The Reserve Manager maintains a shared satellite office at CMS.



Figure 24. Reserve Southern Office

Educator professional development workshops and coastal training workshops held in the region utilize partner facilities free of charge to best meet the needs of the individual programs. These include the New Hanover County Arboretum, New Hanover County Government Complex, Fort Fisher State Recreation Area Visitor Center, and the North Carolina Aquarium at Fort Fisher.

Needs:

Planning for and implementation of the needs below will be conducted collaboratively with CMS leadership and staff.

Indoor storage space for field and transportation equipment: 1200 ft² of dedicated indoor storage space is needed at CMS to replace and consolidate the one old and one new existing storage sheds that are workable but do not meet current needs. A replacement facility or space should include the following for a more effective and efficient work area: garage for the John Deere utility vehicle and all-terrain vehicle, storage space for kayaks, beach bikes, research and monitoring equipment, signs, tools, and boat and field chemicals, fuel cabinet for boat gasoline, and a work bench. The facility or space should be climate controlled and equipped with electricity.

Rainwater cistern and boat/vehicle washing station: A rainwater cistern and boat/vehicle washing station at CMS will reduce water consumption and energy costs associated with municipal water processing and transport, thereby supporting NERRS Sustainable Building Principles. Rainwater harvested from the roof of the operations wing will be captured in a cistern and used for boat and vehicle washing. Planning and design of this facility will involve students through a partnership between NCNERR, CMS operations, and UNCW's Sustainability Committee. The facility will be utilized by both NCNERR and UNCW and serve as a demonstration for the visiting public.

Office space expansion: Additional office space is needed in the long-term to accommodate permanent and temporary staffing needs. Temporary and seasonal staff currently share one office, and use the common work area and a workspace in the laboratory during the peak field season. At these times, existing office space is over capacity. An expansion of existing office space into adjacent space as it becomes available will allow for a more productive work environment, maintain a cohesive work unit, and provide safer working conditions in which staff are not conducting office work in the laboratory and are able to exit from existing offices through a hallway rather than the laboratory.

Equipment

Existing: The Wilmington office is equipped for a variety of Reserve program-related tasks. The NCNERR owns three vessels designated for research and stewardship that are housed at the Wilmington office: a 19 ft. Jones Brother's Bateau equipped with a 90 hp Mercury outboard engine, a 16 ft. Carolina Skiff equipped with a Yamaha 30 hp outboard engine, and a 24 ft. Carolina Skiff boat equipped with a 115 hp Yamaha outboard engine. In addition, the office has a N.C. Division of Motor Fleet Management leased four wheel-drive Nissan Pathfinder, seven kayaks, John Deer utility vehicle, utility trailer, two beach bikes, and an all-terrain vehicle for staff and equipment transportation. Computers, color printer, plotter, water quality and meteorological dataloggers, autosamplers, telemetry equipment, handheld GPS units, RTK Trimble GPS unit, 30 keypad polling units, cameras, and necessary software and supplies needed for maintaining equipment are also on location.

Needs:

A new plotter is needed to replace a 2003 model. A new replacement for the 19 ft. Jones Brother's Bateau and trailer are needed to support stewardship and research operations. Equipment needs will be evaluated if additional staff are located at this office to meet the needs identified in the administrative plan.

On-Site Infrastructure

Existing:

Signage: The Masonboro Island site has informational signage and bulletin cases, site identification signs, rules signs, and site markers. There is also an informational sign and bulletin case with a site description at Trails End Park in New Hanover County.

Nature trail: There is a primitive nature trail on Masonboro Island that includes trail markers with QR codes that provide visitors with interpretive content.

Needs:

Signage: To increase visitor awareness of the Reserve and its appropriate use, a variety of signage needs exist. Types of signage needed include additional rules signs, informational signs, boundary identification signs, and trail markers.

Nature trail: Raised boardwalks over areas submerged at high tide, interpretative signs, and a viewing platform at the trail's highest elevation are needed to fully equip this trail and provide visitors with an increased understanding of the habitats present at the Masonboro Island Reserve. A kayak trail will also increase visitor awareness of the Reserve, its ecosystems, and appropriate use as well as enhance the visitor experience.

Exhibits

Existing: No exhibits currently exist that serve the Masonboro Island Reserve or the local community.

Needs:

Exhibits at UNCW: Exhibits targeting UNCW faculty, staff, and students will increase awareness of the NCNERR and will include information on research, education, and stewardship opportunities and needs, SWMP data availability, and the research permit process. Exhibit locations to be considered include the lobby at CMS and at science buildings on the main campus to promote partnerships throughout the University. NCNERR staff will discuss opportunities with the CMS director and other appropriate University leaders. Such exhibits will support the Masonboro Island and Zeke's Island Reserves as well as the NCNERR as a network.

Exhibit at Wrightsville Beach: Partnerships will be explored to develop and locate an exhibit at an existing facility at Wrightsville Beach targeting the general public. The exhibit will increase understanding of the NCNERR and Masonboro Island Reserve, why it is protected and how it is used by researchers, educators, and the public, promote responsible use of the Reserve, and describe the importance of estuaries. The Masonboro Island Reserve is south of Wrightsville Beach across Masonboro Inlet and is visible from its southern tip.

Zeke's Island Reserve

Office and Laboratory Facilities

The Zeke's Island Reserve and Masonboro Island Reserve are managed from the same office and laboratory facility. See existing and needs descriptions for the Masonboro Island Reserve.

Equipment

The Zeke's Island Reserve and Masonboro Island Reserve are managed from the same office and laboratory facility and therefore, staff utilize the same equipment to implement programs at both sites. See existing and needs descriptions for the Masonboro Island Reserve.

On-Site Infrastructure

Existing:

Signage: The Zeke's Island site has informational signage at the WRC boat ramp at Federal Point and site identification and rules signs on the site. An additional informational sign is located at the Fort Fisher State Recreation Area near an overlook platform at the terminus of a natural trail that provides views of the Zeke's Island Reserve.

Needs:

Signage: To increase visitor awareness of the Reserve and its appropriate use, a variety of signage needs exist. Types of signage needed include additional rules signs, informational signs, interpretive signs, boundary identification signs, and trail markers.

Nature and kayak trails: A nature trail with interpretive signs and a kayak trail will increase visitor awareness of the Reserve, its ecosystems, and appropriate use as well as enhance the visitor experience.

Exhibits

Existing: No exhibits currently exist that serve the Zeke's Island Reserve or the local community.

Needs:

Exhibits at UNCW: Exhibits targeting UNCW faculty, staff, and students will increase awareness of the NCNERR and will include information on research, education, and stewardship opportunities and needs, SWMP data availability, and the research permit process. Exhibit locations to be considered include the lobby at CMS and at science buildings on the main campus to promote partnerships throughout the University. NCNERR staff will discuss opportunities with the CMS director and other appropriate University leaders. Such exhibits will support the Masonboro Island and Zeke's Island Reserves as well as the NCNERR as a network.

Exhibit at N.C. Aquarium at Fort Fisher: A partnership will be explored with the N.C. Aquarium at Fort Fisher to develop and locate an interactive, real-time data exhibit at the Aquarium targeting the general public. The exhibit will display data telemetered from SWMP stations located at the nearby Zeke's Island Reserve, share the importance of maintaining good water quality, and how the public can serve as water quality stewards.

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Public Input Process for the NCNERR Management Plan 2017 - 2022

This appendix summarizes the public input process used by the NCNERR to inform the 2017-2022 NCNERR Management Plan update. Input was gathered through the following forums during the update process:

- Public meetings were held in fall 2014 to explain the purpose of the Reserve and the management plan update, and solicit comments from Reserve users, community members, and the general public about programs and management of the four NCNERR sites (Currituck Banks, Rachel Carson, Masonboro Island, Zeke's Island). This was also an opportunity for the public and Reserve staff to engage in a "Q & A" about the Reserve's mission, goals, and programs.
- Focus groups were held in fall 2014 with the Reserve's local advisory committees for the four NCNERR sites. Facilitators with OCM guided committee members through structured exercises to identify site-specific management issues and review Reserve-wide strategic planning goals and priorities. Follow-up reports and conversations at additional committee meetings kept the committees engaged throughout the update process.
- An online survey of Reserve-wide partners was conducted during November 2014 to gather input from programmatic partners at the federal, state, and regional level on issues related to the Reserve's role in addressing North Carolina's coastal management priorities.
- An education and training needs assessment was conducted in fall 2014 by the education and training programs to determine appropriate target audiences, programs, and trainings for future education offerings.
- NCNERR local advisory committees for the four sites provided input on the draft NCNERR Strategic Plan section in spring 2015.
- The full draft management plan was reviewed by the four NCNERR local advisory committees in March 2017. Committee members were provided the draft plan in advance of the advisory committee meetings and the meetings served as a venue to discuss and comment on the draft. Committee members were also given the opportunity to submit written comments.
- The Reserve's education advisory committee and other partners also had the opportunity to provide input on the draft management plan in spring 2017.
- *Coming in April 2017:* The full draft management plan, updated to address local advisory committee and other partner input, will be presented to the N.C. Coastal Resources Commission at its April 2017 meeting.
- *Coming later in 2017:* The Department of Environmental Quality will review the draft management plan and then NOAA will complete a technical and content review. A NOAA-required 30-day public comment period will be held on the draft management plan following NOAA's review and prior to its finalization and be announced in the Federal Register. Interested parties will be encouraged to submit comments electronically or at the public meetings held in the northern, central and southern regions of the coast during the comment period.



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON C. DAVIS
Director

MEMORANDUM

CRC-17-10

TO: Coastal Resources Commission

FROM: Charlan Owens, AICP, DCM Elizabeth City District Planner

SUBJECT: Certification of an Amendment to the Perquimans County / Town of Hertford / Town of Winfall Joint CAMA Land Use Plan

DATE: April 12, 2017

Recommendation

Certification of an Amendment to the *Perquimans County / Town of Hertford / Town of Winfall Joint CAMA Land Use Plan (LUP)* based on the determination that the County has met the substantive requirements outlined in the 15 NCAC 7B Land Use Plan Guidelines and that there are no conflicts evident with either state or federal law or the State's Coastal Management Program.

Overview

Perquimans County is seeking certification of a policy text amendment to exclude the County from the shoreline setback within waterfront subdivisions indicated in the joint land use plan (LUP). Policy WQ #2 on Page IX-14 is to be amended as follows (text underlined to be added):

“Perquimans County, Hertford, and Winfall shall require, as appropriate, subdivision development to control and treat the storm water runoff generated by a 1.5-inch rain event and; that Hertford and Winfall shall require all buildings or related structures within waterfront subdivisions to be set back 50 feet from the shoreline.”

The County will rely on the *Perquimans County Zoning Ordinance* for the waterfront setback standard which is currently 40 feet from normal water level.

Under this amendment the setback will not be changed for the Towns. Since the joint LUP was initially adopted by each local government, the Towns retain their sole and independent authority to amend the LUP as it relates to their jurisdiction. Any amendment applicable to the Towns will require public hearings and local adoption actions through the Town governing bodies.

The Perquimans County Board of Commissioners held a duly advertised public hearing on the amendment at their March 6, 2017 regular meeting and it was unanimously adopted.

The public was provided the opportunity to submit written comments on the LUP amendment up to 30 days after the local adoption (April 5, 2017). No written comments or objections were received.





ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON C. DAVIS
Director

CRC-17-11

April 11, 2017

MEMORANDUM

TO: Coastal Resources Commission
FROM: Daniel Govoni
SUBJECT: Amendments to 15A NCAC .2700 GP for the Construction of Marsh Sills

DCM has undertaken substantial efforts to advance marsh sills and other forms of living shorelines as alternatives to traditional bulkheads for estuarine shoreline stabilization in North Carolina. Living shorelines include a suite of options for shoreline erosion control that maintain existing connections between upland, intertidal, estuarine, and aquatic areas which are necessary for maintaining water quality, ecosystem services, and habitat values. Unlike vertical stabilization measures such as bulkheads, living shoreline techniques typically use native materials such as marsh plants, oyster shells, and occasionally minimal amounts of structural materials (e.g. stone) to stabilize estuarine shorelines, minimize erosion, and enhance habitats.

Over the past several years, DCM has developed a “Living Shorelines Strategy” to facilitate the use of living shorelines. The Strategy includes outreach, public awareness, financial incentives, monitoring and short and long-term implementation actions, which have included several training courses, a marsh sill evaluation effort, and development of an Estuarine Shoreline Stabilization Guide/Handbook for property owners. Additionally, the State and research community have collected significant data demonstrating that these small-scale marsh sills can be effective structures for erosion protection and habitat enhancement.

General Permit (15A NCAC 7H .2700)

During the 2003 legislative session, the North Carolina Legislature approved House Bill 1028, a bill which authorized the Coastal Resources Commission to adopt temporary and permanent rules to establish a general permit for the construction of “riprap sills.” This was implemented as a temporary rule in 2004, and became a permanent rule on April 1st, 2005. Significant discussions on the relative merits and use standards of this general permit took place during its development, including important issues such as the distance offshore that sill structures could be built, the consequences of trading one

type of habitat (shallow bottom) for another (marsh protected by riprap), navigational and public trust concerns, the suitability of such structures along different types of shorelines, and the permitting requirements of other agencies such as the U.S. Army Corps of Engineers (USACE), the Divisions of Marine Fisheries (DMF) and Water Resources (DWR). Due to these concerns, the current General Permit for the construction of marsh sills requires coordination with the DMF, DWR, and the USACE before issuance, and this process can take more time than is normally associated with other CAMA General Permits. Since its inception, there has been an ongoing effort to modify the marsh sill general permit to remove the more time-consuming conditions.

DCM has held numerous coordination meetings with other Department agencies to revise the General Permit 15A NCAC 7H .2700 for marsh sills in an effort to streamline the permitting of these structures. Since several marsh sill studies have been concluded and numerous sills have been constructed, DMF has agreed that there is no longer a need for DMF review of each marsh sill general permit application. In 2016, the U.S. Army Corps of Engineers (USACE) submitted a federal consistency determination to DCM on the reissuance of the USACE Nationwide Permits (NWP). NWPs are issued by the USACE on a national basis and are designed to streamline USACE authorization of projects that produce minimal impacts to the nation's aquatic environment. Included in this consistency determination was the new USACE NWP 54 for living shorelines.

NWP 54 requires a Pre-Construction Notification (PCN) even for the small-scale structures that can be permitted under the General Permit 15A NCAC 7H .2700. This PCN requirement will add additional processing time to the CAMA General Permit process, which is generally designed to take no more than a week. DCM has been working with a large stakeholder group that includes the USACE, marine science community, DWR, DMF, N.C. Coastal Federation, NC Sea Grant, and the National Oceanic and Atmospheric Administration (NOAA) to determine how best to move forward with creating a streamlined permitting process for marsh sills. These stakeholder's meetings are now complete. DCM is compiling all comments and recommendations and will draft an amended general permit 15A NCAC 7H .2700. For there to be an efficient streamlined general permit, all interested parties' concerns must be addressed within the permit conditions. The USACE has explained that they are willing to use this draft amended GP .2700 as a guidance document as they explore creating a Regional General Permit (RGP) for Marsh Sills. A RGP would have specific terms and conditions and would not require a PCN. If the USACE is able to create a RGP, it was agreed by all regulatory parties to begin the rule making process concurrently both at the State and Federal levels so as to streamline the permitting process for marsh sills.

NC COASTAL RESOURCES COMMISSION (CRC)

**February 8, 2017
Hilton DoubleTree
Atlantic Beach, NC**

Present CRC Members

Frank Gorham, Chair
Renee Cahoon, Vice-Chair
Neal Andrew, Second Vice-Chair

| | |
|---------------|----------------|
| Larry Baldwin | Greg Lewis |
| Rick Catlin | Phil Norris |
| Denise Gibbs | Russell Rhodes |
| Marc Hairston | Bill White |

Present CRAC Members

Greg "Rudi" Rudolph, Chair
Spencer Rogers, co-Vice Chair
John Brodman
Jett Ferebee
Beth Midgett
Mike Moore
David Moye
Kris Noble
Kathleen Riely
Todd Roessler
Frank Rush
Debbie Smith
Dave Weaver

Present from the Office of the Attorney General

Mary Lucasse

Present from the Department of Environmental Quality, Office of the General Counsel

Christine A. Goebel

CALL TO ORDER/ROLL CALL

Frank Gorham called the meeting to order reminding the Commissioners of the need to state any conflicts due to Executive Order Number One and the State Government Ethics Act. The State Government Ethics Act mandates that at the beginning of each meeting the Chair remind all members of their duty to avoid conflicts of interest and inquire as to whether any member knows of any conflict of interest or potential conflict with respect to matters to come before the Commission. If any member knows of a conflict of interest or a potential conflict of interest, please state so when the roll is called.

Angela Willis called the roll. John Snipes and Jamin Simmons were absent. No conflicts were reported. Based upon this roll call Chairman Gorham declared a quorum.

CHAIR COMMENTS

Chairman Gorham mentioned the passing of Bill Morrison, long-time member of the Advisory Council and former CRAC Chair. The Commission presented Bill with a Certificate of Service and Appreciation at their September 2015 meeting. Chairman Gorham asked Mary Lucasse, CRC Counsel, to draft a letter to his widow conveying the Commission's condolences. Chairman Gorham stated the Commission decided to hold a conference call meeting for variances in July and only have four in-person meetings in 2016. We should reconsider this plan. Renee Cahoon commented that variances are difficult to participate in when they are done by conference call. Chairman Gorham directed staff to search for a meeting location and overnight accommodations for a summer meeting.

MINUTES

Renee Cahoon made a motion to approve the minutes of the November 30-December 1, 2016 Coastal Resources Commission meeting. Neal Andrew seconded the motion. The motion passed unanimously. (Gorham, Andrew, Baldwin, Cahoon, Catlin, Gibbs, Hairston, Lewis, Norris, Rhodes, White).

EXECUTIVE SECRETARY'S REPORT

Braxton Davis, DCM Director, gave the following report:

Regulatory

On the regulatory side of the program, some final permit numbers for 2016: Last year the Division issued 154 Major Permit with an average processing time of slightly less than 70 days. Also during 2016, staff issued 1,685 General Permits, of which 163 were emergency General Permits. As you may remember, Emergency General Permit 7H .2500 was enacted on October 10th following Hurricane Matthew. Notable permit actions since your last meeting included the issuance of an emergency major permit to a property owner in Salter Path allowing for the rapid shoreline stabilization of the property to prevent the potential failure of an adjacent condominium structure. The Division also issued permits to the Town of Ocean Isle Beach authorizing the implementation of an island-wide 30-year beach shoreline protection strategy, and to Dare County authorizing continuing maintenance excavation for a portion of the Hatteras Inlet navigation channel.

The Central East Coast Chapter of ASBPA hosted a coastal permitting workshop in Wilmington in January. It was attended by representatives from federal and state permitting and resource agencies, coastal engineering and environmental practitioners, and beach nourishment and navigation project sponsors, with the intent of discussing what is working well and what can be improved with the permitting of coastal projects in the region. Doug and I made a presentation on CAMA permit procedures and requirements as they relate to the permitting of nourishment and navigational projects. The conference resulted in very good discussions on areas of potential improvement and possible innovative solutions for the permitting processes for beach nourishment and navigation projects.

In 2015 DCM initiated a project to develop a statewide biological opinion for beach sand placement projects to satisfy the requirements of the Endangered Species Act (ESA) consultations with the US Fish and Wildlife Service. This project included compilation of existing data for presently listed, and soon to be listed, endangered species. The data was analyzed for potential threats and mitigation opportunities. Dial Cordy and Associates completed the draft Programmatic Biological

Assessment (PBA) in October. Comments were provided by our Interagency Review Team (incl. Corps of Engineers, Fish and Wildlife Service, National Marine Fisheries Service, Bureau of Ocean Energy Management, NCDCM, NCDMF, and North Carolina Wildlife Resources Commission). The Corps submitted the PBA to the USFWS in December to begin the consultation process. Under federal regulations, USFWS has 90 days to consult and negotiate the terms of the Biological Opinion (BO) and 45 days after that to issue the BO. The USFWS met with the Corps, NCDCM and BOEM earlier this week, and we anticipate a final BO by mid-April.

Coastal Reserves

The Division is hosting four "dinner and a living shoreline movie" events throughout the coast in February and March. These free events are designed for marine contractors and other professionals involved in estuarine shoreline stabilization. Regulatory staff will provide an overview of the permitting process and answer questions. More information is available on the Reserve's website. The Reserve is also hosting a "Coastal Explorations" educator workshop in Wilmington on February 10. The workshop is open to all educators and highlights the Reserve program. It is approved for NC teacher certification renewal credits and for the NC Environmental Educators certification program. The Reserve and the Town of Kitty Hawk are conducting a survey to develop an access plan for the Kitty Hawk Woods Coastal Reserve to maintain a balance between the site's ecology and recreational use. The survey results will provide a better understanding of how and when visitors access the Kitty Hawk Woods Reserve and what access and trail enhancements may be appropriate. The survey is available on the Reserve's website and is open through March 10.

Policy & Planning

Flood maps

Rudi will provide a report on this issue later today, but I wanted to give you a quick update on staff's work since the last CRC meeting. We had a good phone call in January with John Dorman and Tom Langan from the Division of Emergency Management's Floodplain Mapping Program discussing where DEM is in the flood map update process, and whether or how the CRC and DCM can be helpful in identifying possible technical issues in the coastal maps, or with outreach to local communities. The background and the proposed maps had been cleared by FEMA and an independent third-party reviewer. They are now in the appeals phase of the process. They are open to making specific adjustments where there is data to support it, and they have already made a few changes based on feedback, but did not anticipate performing another coastwide analysis. They are willing to come and talk to the Commission at a future meeting and welcomed our help with community outreach and education. We have also reached out to the State Building Code Council and are hoping to meet with them in the coming weeks to discuss the connectivity between the State Building Code, the flood maps, and the CRC's rules. We hope that DEM and Sea Grant can be a part of that discussion, and we will report back to you on any recommended or necessary rulemaking.

Public Access Grants

DCM will be notifying local governments in the 20-county coastal area that grant funding is available for Public Beach and Coastal Waterfront Access projects for the upcoming 2017-18 fiscal year. Local governments are invited to apply for funding for projects that are anticipated to begin after November 2017 and will be completed within eighteen months. DCM estimates that approximately \$1 million dollars will be available for public beach and coastal waterfront access projects in FY 2017-18. Pre-applications are due by April 10, 2017. We are also pleased to announce that the Division will once again be notifying local governments in the 20-county coastal area that grant funding will be made available for Local Planning and Management projects for the

upcoming 2017-18 fiscal year. The Division has \$75,000 available for grants up to \$15,000 each. Local governments are invited to apply for funding for projects that are anticipated to begin in July and to be completed by June 30, 2017. As you know, the Planning staff have worked over the past couple years on revisions to the CAMA Planning Program, most recently on the focus of the Planning and Management Grant Program. We expect the rulemaking associated with today's public hearing to be effective for this coming round of grant awards. The intent of the rulemaking is to provide more flexibility to the Division for the types of projects that are funded. A solicitation for projects will be sent to local governments later this week with proposals due to the Division in early April.

Staffing News

At the last meeting, I mentioned that the Elizabeth City office of the Divisions of Coastal Management and Marine Fisheries has been closed for facility repairs for an undetermined amount of time. DCM staff have successfully relocated to 401 South Griffin Street and are fully operational. DCM fisheries resource specialist, Gregg Bodnar, has moved into a new role as an assistant Major Permits Coordinator. Gregg will remain in the Division's Morehead City office. The process for hiring a replacement fisheries resource specialist is ongoing. Also, I'm pleased to announce that Yvonne Carver has accepted a position as a field representative in our Elizabeth City Office. Yvonne has been part of the DCM Staff in the Elizabeth City Office since 2003 and is already well versed in permitting, and as a native of Perquimans County, she is very familiar with northeastern coastal North Carolina.

CRAC REPORT

Rudi Rudolph, CRAC Chair, stated the main topic of the CRAC meeting was the white paper to the CRC updating information regarding the CRAC membership, role, and guidebook. The CRAC consists of 20 members and there are currently four vacancies. The CRAC recommends that the composition should include local government representatives. The feeling of the CRAC is that recently a lot of the priorities have focused on oceanfront issues and we could use more estuarine expertise on the CRAC. There aren't enough members on the CRAC to allow for standing subcommittees. The CRAC's role is directed by the CRC and issue-specific.

Renee Cahoon made a motion to approve the white paper as presented and direct DCM staff to update the CRAC guidebook. Larry Baldwin seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

Chairman Gorham directed Mr. Rudolph to add a member from each CAMA county to the CRAC contact/interested parties list and to send a letter to all CAMA counties to solicit issues that may need to be addressed.

Mr. Rudolph stated the CRAC also discussed bulldozing on unnourished beaches as well as Hurricane Matthew's impacts on the development lines. The CRAC did not come up with any recommendations on either of these issues.

VARIANCES

Thexton (CRC VR-16-11), Topsail Beach, Oceanfront Setback & Repair/Replace

Christine Goebel/Debbie Wilson

Christine Goebel, DEQ Asst. General Counsel, represented staff. Mr. Andrew Thexton was present and represented himself in the variance request. Debbie Wilson, Wilmington District Manager, presented the PowerPoint to the Commission showing the site location of the proposed development. Ms. Goebel stated Petitioners Andrew and Deborah Thexton purchased an oceanfront lot in 2016 located at 1117 Ocean Boulevard in Topsail Beach. As part of a voluntary FEMA mitigation program for homes that have made repetitive loss claims, Pender County contacted the Petitioners about participating in a program where the cost to elevate their structure within its existing footprint would be covered 100% by FEMA if Petitioners and future owners would agree to keep flood coverage on the elevated structure. Petitioners agreed to participate. The consultant hired by Pender County to manage several similar claims, along with Pender County's Planning Director, acted as agents for Petitioners and applied for a CAMA permit on their behalf. DCM denied the CAMA permit as the existing location of the structure does not meet the applicable 60-foot ocean erosion setback on the site. Additionally, the work proposed exceeded 50% of the value of the house structure and was not consider "repair", but rather considered "replacement" under the Commission's rules and CAMA statute. Petitioners seek a variance from the oceanfront erosion setback to elevate the existing house within the same footprint. Ms. Goebel reviewed the stipulated facts of the variance request and stated that staff and petitioners disagree on all four statutory criteria which must be met for the variance request to be granted. Mr. Thexton reviewed the stipulated facts which he contends supports the granting of the variance request. After discussion, the CRC determined that additional facts were required before it could decide the variance request.

Greg Lewis made a motion to remand the variance request back to the staff of the Division and the Petitioners to allow the parties to provide additional stipulated facts and exhibits. Russell Rhodes seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

ACTION ITEMS

Fiscal Analysis Approval – 15A NCAC 7H .2200

Free Standing Moorings – Osprey Poles (CRC 17-01)

Mike Lopazanski

Mike Lopazanski stated changes have been made to the free-standing mooring rules, primarily to address osprey poles. The existing rules required the permit request for osprey poles to go through the Major Permit process. The rules have been amended to allow the location of osprey poles under the General Permit process. We also made changes to the mooring rules to bring them up to date with the changes for docking facilities. The fiscal analysis for these amendments indicates a savings to the permit applicant. The fiscal analysis has been approved by the Department and is currently under review by OSBM. If there is a substantial change to the fiscal analysis following OSBM review, then we will bring the analysis back to the Commission for approval.

Neal Andrew conditionally approved the fiscal analysis for amendments to 15A NCAC 07H .2200 based on OSBM approval. Marc Hairston seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

Fiscal Analysis Approval – 15A NCAC 7H .1300 Development Line Procedures (CRC 17-02)

Mike Lopazanski

Mike Lopazanski stated amendments have been made to the development lines rules. During one of the previous development line approvals, there was some question about how far seaward the development line could be sited by the local government. At the time, only the mean high water line was included in the rule. There are other lines that can be taken into consideration including easements. This rule language has been amended to clarify that in no case shall the development line be created or established on state owned lands or oceanward of the mean high water line or perpetual property easement line whichever is more restrictive. These amendments were approved by the CRC at the last meeting and the fiscal analysis indicates that there is no fiscal impact associated with these amendments. The fiscal analysis has been approved by the Department and OSBM.

Renee Cahoon made a motion to approve the fiscal analysis for amendments to 15A NCAC 07H .1300. Larry Baldwin seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

Periodic Review of Existing Rules (7A, 7H, 7I, 7J, 7K, 7L, 7M) (CRC 17-03)

Mike Lopazanski

Mike Lopazanski stated prior to 2013, rules did not expire. The Legislature now requires each rulemaking body to review and readopt its rules every ten years. Rules that are deemed unnecessary expire and are removed from the Administrative Code. Rules that are necessary with substantial public interest must be readopted by the Commission. Rules that are necessary without substantive public interest do not expire and do not need to be readopted. In 2015, the Commission reviewed and readopted the rules in 7B in 2015. The Coastal Reserve rules located in 7O are currently going through the review process. We have begun the rule review process for rules in 7A, 7H, 7I, 7K, 7L, and 7M. We have classified most of the CRC's rules as necessary with substantive public interest. We have categorized some of the CRC's rules as unnecessary as they are obsolete, simply repeat the Statute, or are outdated. The Office of Administrative Hearings will review these classifications and they will be posted for a 60-day comment period. Following the comment period, any comments received will be addressed and classifications will be changed as needed. The final report will be submitted to the Rules Review Commission for approval. The final report will then go to the Joint Legislative Administrative Oversight Committee for review and final determination on the classification of the Commission's rules. If this Committee doesn't meet within 60-days of submission, then the report is approved. The final report is due to RRC by December 2017.

Renee Cahoon made a motion to approve the initial classifications proposed for the existing Rules in 7A, 7H, 7I, 7J, 7K, 7L, and 7M and open the comment period. Marc Hairston seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

Gates County LUP Certification (CRC 17-04)

Charlan Owens

Charlan Owens stated Gates County has submitted their comprehensive land use plan for certification. The Gates County Board of Commissioners unanimously adopted their plan. A duly advertised public hearing was held on December 2. The Division has not received any comments or

objections on this plan. DCM recommends certification of the plan based on the determination that the document has met the substantive required outlined within the 7B land use plan guidelines and that there are no conflicts evident with either state or federal law or the State's coastal management program.

Phil Norris made a motion to certify the Gates County Land Use Plan. Neal Andrew seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

**Oak Island LUP Certification (CRC 17-05)
Mike Christenbury**

Mike Christenbury stated the Town of Oak Island is seeking certification of the 2017 Oak Island comprehensive land use plan. Oak Island held a duly advertised public hearing on January 10 and voted unanimously by Resolution to adopt the plan. Staff has reviewed the plan and has determined that it meets the substantive requirements outlined in the 7B land use planning guidelines and is consistent with state and federal law and the State's coastal management program. DCM recommends certification of Oak Island's land use plan.

Phil Norris made a motion to certify the Oak Island Land Use Plan. Marc Hairston seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

**COASTAL RESERVES
Research Overview
Brandon Puckett**

Brandon Puckett, Reserve Research Coordinator, stated the purpose of the Reserve is to preserve coastal ecosystems, provide information to inform management, increase understanding of coastal ecosystems, and accommodate compatible uses. There are three programs that work together to fulfill these purposes the research program, stewardship, and education. The Coastal Reserve is made up of ten sites that protect 44,000 acres of coastal ecosystems in North Carolina. Six of the sites are State sites and four sites comprise the North Carolina National Estuarine Research Reserve (NERR). The NC Estuarine Research Reserve is one of 29 national reserves. This network spans from Hawaii to Alaska, Puerto Rico, and all the coastal and Great Lakes states. Management of the NERRS is done through partnerships with NOAA and local coastal programs. The goals of the research and monitoring program is to advance the understanding of coastal ecosystems to inform coastal managers. We strive to do work that is both nationally significant and locally relevant. The current priorities include estuarine shoreline stabilization, water quality and vegetation monitoring, species and habitat restoration, impacts on non-native and invasive species, and resilience of coastal ecosystems to coastal hazards. To accomplish these priorities, we work with several partners including universities, state and federal agencies, and non-profit groups. The research and monitoring programs are conducted through the long-term system-wide monitoring program (SWMP), site-based research, and off-site research. The system-wide monitoring program is a program that is implemented at all 29 of the NERRs and is designed to look at short-term variability and long-term change. Water quality and weather monitoring has been done since 1997 and is ongoing. Marsh vegetation monitoring has been ongoing since 2008 and is an annual effort. Habitat

mapping has been occurring since 2013. Marshes are some of the most productive systems on Earth and occupy a narrow elevation range within the tidal window. In the face of sea level rise the marsh platform can accrete vertically or migrate landward. We have developed five indicators of resilience and applied them to 16 sites across the country. Research conducted within the Reserve boundaries is conducted by research staff and through a research permit program. In the last five years, we have permitted 74 research projects on the ten sites mainly concentrated at Masonboro and Rachel Carson. The research on the Reserves is very diverse ranging from bacteria to birds and from conducted by several organizations. We also co-sponsor a graduate fellowship program with Sea Grant. We require that research done must be conducted within Reserve boundaries. Work outside of the Reserve boundaries occurs in the 20 coastal counties and has focused on estuarine shoreline stabilization and oyster restoration. In 2016, the Research and Monitoring program had 31 active projects within the Reserves, had mapped 2,667 acres of habitat, and produced seven peer-reviewed publications.

PUBLIC INPUT AND COMMENT

No public comments were received.

BEACH AND INLET MANAGEMENT

Flood Insurance Rate Maps (FIRMs) Work Group Update

Greg “rudi” Rudolph/Spencer Rogers

Rudi Rudolph stated the basic tenant is that the risk shown on the flood maps do not represent the risks on the ground. This should be a concern to the CRC because that might be working at cross-purposes of what the CRC rules are intending. The work group’s job is to identify the areas where there are problems and what the issues are. The recommendation from the working group was to meet with John Dorman and have him talk to the CRC about how they generate the flood maps. Then we could illustrate areas where we think there are issues. The maps are supposed to improve over time so this update should be an improvement in identifying risk and it is apparent in some areas that this is not the case and it should be addressed. Spencer Rogers stated the CRC has a mutual interest with the flood insurance program to identify oceanfront hazards. The bottom line is that their methods are not working, for example, some oceanfront sand dunes are labeled safe from 500-year floods and this is incorrect. This isn’t necessarily a criticism of North Carolina Floodplain Mapping. They are constrained by FEMA’s models and methods. If they do something different then they lose the appeals. It is not an issue between agencies. It is an issue relating to FEMA’s models and requirements and is not something that can be quickly or easily fixed. The CRC should address these issues. Mr. Rudolph added that the appeals process is very site specific. Property owners will retain consultants to argue the elevation of their property. The bigger issues and regional problems are not addressed in the appeals process. We should invite John Dorman to a Commission meeting and talk with him about these issues.

Renee Cahoon made a motion that a letter be sent from the Chairman requesting John Dorman make a presentation at the next CRC meeting. Greg Lewis seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

Sediment Criteria – Sampling Methodology (CRC 16-44)

Mike Lopazanski

Mike Lopazanski stated there are criteria for beach nourishment projects that requires you to match the sand from the borrow area with the sand on the native beach where it will be placed. The Science Panel was engaged to develop sediment criteria and came up with grain size requirements. As a result of this work, there is a sampling protocol to use when doing a beach nourishment project. Over the years we have been amending these rules as we have gotten more practical experience with their application. There is still a problem with the rigidity associated with the sampling protocol being in the rule. It does not allow for any flexibility. Amendments will be drafted to remove the sampling protocol from the rules. We want to keep the criteria in terms of the percentages of grain sizes that are deemed acceptable

PUBLIC HEARING

15A NCAC 7L Planning & Management Grants

Mike Lopazanski

Mike Lopazanski opened the public hearing to receive comments on changes to 15A NCAC 7L and stated that a comprehensive review of the CAMA planning program has occurred over the past couple of years. We have focused on separating the land use planning provisions from the planning grants. 7L now contains the planning and management grant program and the categories for the types of projects that are eligible have been broadened. The comment period ends March 6 and the CRC can adopt the amendments at the April meeting.

No comments were received.

COASTAL PROGRAM IMPLEMENTATION

CAMA Permit Application Requirements – Plans, Drawings & Surveys

Doug Huggett

Doug Huggett gave a presentation to the Commission about permit application requirements relating to plans, drawings, and surveys. He began by noting that during some previous variance requests, Commissioners asked questions during the discussion about the accuracy of permit drawings submitted to DCM. Doug Huggett explained that in the mid-70s when CAMA was passed, it was intended to be a simple permit process available to as many applicants as possible. Staff work with the applicants to fill out the applications. Applicants are not required to hire engineers or surveyors to complete the application process. This process has worked well over time. The Division issues between three and four thousand permits per year and only about ten come before the Commission for a variance request. Water depth surveys can be particularly difficult to do. While surveys may be technically accurate, they may not accurately reflect the amount of water at the site. If the Commission wants to make a change to the permitting process, staff suggests it consider any of the following four options. The first option would be to require survey drawings for all permit applications. There would be a greater level of precision and accuracy with this option and there would be an increased legal defensibility. However, the cost and time to the applicant would be increased and there may be a need to coordinate with other agencies. The major drawback to this option is that it would add a level of complexity to even the simplest of projects. The second option would be to require surveys only for Major Permit applications. The benefit of this option is that it would add precision, accuracy, and increased legal defensibility for the complex permit applications. The drawbacks for this option is that it would also require surveys for modifications

and it would not alleviate the problem of the Commission not seeing a survey on a variance relating to a Minor or General permit. The third option would be to require surveys based upon staff judgment or discretion. Under this scenario, surveys would only be required for the most complex projects and staff would have the flexibility to require surveys on other projects as needed. This option would, however place a significant amount of pressure on DCM's field staff. This discretion could also result in an inconsistent standard applied across different regions of the Division resulting in difficulty figuring out the ground rules for each project. The last option is to only require surveys if a project is pursuing a variance from the Commission. The advantages of this option are that the survey requirement would apply to approximately 10 permit applications per year. This will provide the precision and accuracy the Commission would like to see as well as increased legal defensibility. The disadvantage of this option is that if we don't know at the time of initial permit application that a variance request may be coming, it is impossible to require this survey during the application process which would enable the survey drawings to be included in the variance packet. We could require as part of the variance process that the applicant go get the required information, but that may slow down the variance process. Legally, the application drawings that were submitted originally with the application would also be included in the variance packet. Mr. Huggett suggested applicants could view this additional requirement for variance requests as punitive. It would be an added burden for an applicant, who has been denied a permit for development, to pay an additional cost for a survey and possibly retain legal counsel to represent them before the Commission. Staff does not recommend any changes to the permit application process.

During discussion, the Commission noted that if it needs additional information to make a ruling on the variance request, the variance can be remanded back to the DCM staff and the petitioner to provide the additional information. Mary Lucasse, CRC Counsel, reminded the Commission that if a Commissioner determines prior to a meeting that additional information would be helpful, the Commissioner can notify CRC counsel who can then request additional information from DCM and the petitioner. The Commission determined that no changes would be made to the permit application process.

COASTAL PLANNING

Planning & Management Grant Program Priorities (CRC 17-06)

Mike Christenbury

Mike Christenbury stated as part of our most recent review of the entire CAMA land use planning program, we looked at the 7L Planning and Management Grant funding rules. In the past, emphasis was placed on land use plans. We recognized that we would like to build more flexibility in these rules to allow for funding a greater range of projects. We have also built into the rules the ability for the Commission to give feedback to staff on the types of projects the Commission would like to see funded. Solicitations will be sent out soon to the 20 coastal counties for this year's grant funds. Staff recommends that grant funding be prioritized for natural hazards and storm recovery projects.

Neal Andrew made a motion to approve the Planning and Management Grant Program priorities as presented. Greg Lewis seconded the motion. The motion passed unanimously (Norris, Hairston, Catlin, White, Cahoon, Gorham, Andrew, Gibbs, Lewis, Rhodes, Baldwin).

Hyde County Drainage Project Update

David Moye

David Moye stated in 2012, the CRC and CRAC attended a field trip in Hyde County. A little over a year ago the Commission directed staff to work with Hyde County to establish a steering committee to identify specific issues of concern and explore possible solutions. A steering committee was made up of individuals from Hyde County, NRCS, the local storm and water board, agricultural consultants, DCM staff, as well as soil and water staff. The original plan was to come up with the committee and decide on the issues that needed addressed and set up meetings with three specific stakeholder groups. The local stakeholders were the local government officials, local land owners, and farmers from Hyde County. The second group were the federal and state agencies that would deal with any permit activities associated with on-going issues in Hyde County. The third stakeholder group included the non-governmental groups that had been working with different people in the County on ways to fix their problems. After the first meeting with the local stakeholders it came out that the original plan to subdivide the three groups was probably not a viable option. Director Davis sent out an email about another stakeholder meeting to talk about this concern. Recommendations came out of this meeting. The first thing everyone agreed upon was that the County could benefit from a point person capable of taking the lead on drainage related projects from conception to permitting, construction and operation maintenance. The County has put this position in their budget. The second recommendation was for the County to explore the drainage districts within the County to establish easements for work corridors, responsible parties, and operating procedures. The County is working on establishing drainage districts for the entire County. A document also need to be developed as a step-by-step tutorial on the process for obtaining permits for various drainage related projects. DCM has the developer's handbook on its website which works through the permit process. The problem with this document is that it includes every DCM permit and is not specific to drainage projects. DCM took this document and pulled out processes related to drainage and agricultural permits. The final document will be available for any county to use when they apply for an agriculture related permit. Also, included in this document are technical and funding sources available to the county. We were able to identify three different funding sources. We asked WRC to modify the language within their document to make it easier for agricultural drainage ditches to be cleared and snagged. WRC has done this. Some questions were raised about cutting and removing vegetation within DWR's buffers. Specific legislation was written to remove agricultural drainage ditches from the buffer requirements. It was also agreed that Hyde County should move forward to develop a county-wide comprehensive water management plan. The County is working with Lake Matamuskeet on a watershed management plan. This is an important step because the federal side is working with Hyde County to come up with a plan for watershed management. The Division is also considering whether the CRC should develop rules to make it easier for some of these projects to move forward. Staff is currently looking at a General Permit to streamline the permitting process for straightforward agricultural drainage projects, pumps and water control structures in place of the Major Permit process. All this information is in draft. Once the report is completed it will be presented to the Commission.

OLD/NEW BUSINESS

Riggings Annual Report (CRC 17-07)

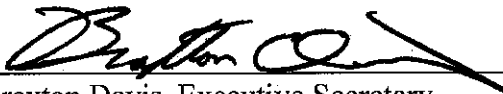
Mary Lucasse

Mary Lucasse stated the Riggings Homeowners Association was notified that the CRC would review their report at this meeting and invited to attend. Ted Sampson, environmental consultant for the Riggings, was present on behalf of the Riggings. Ms. Lucasse stated the Riggings HOA has had sandbags since 1992 to protect their buildings. Sandbags, by statute and rule in North Carolina, are considered temporary erosion control structures. This site has had erosion problems since the buildings were built. The most recent variance granted by the CRC in December 2015 provided a five-year time frame for the HOA to have sandbags to protect their buildings and to explore permanent responses to the erosion at the site. This permit will expire in 2020. The Commission conditioned the variance on the requirement that an annual report be provided to the CRC on measures taken to address the erosion on this site. The Riggings' annual report was submitted to DCM and provided to the CRC in their meeting materials. Mr. Sampson produced the report for the Riggings. DCM has reviewed the report and provided comments to the Commission.

Christy Goebel, counsel for DCM, stated the site was designated by the Natural Heritage Program as the coquina rock outcropping. The record for the variance request does not indicate what this designation means and whether there are any limitations because of the designation. Braxton Davis stated, we are not aware that the Riggings has formally asked the Corps to include the area in front of their buildings in the next nourishment project. Commissioner Greg Lewis stated that at the next annual update the Riggings should include what steps they have taken to answer these and other questions. Mr. Sampson stated the HOA has asked his firm to request a meeting with the Corps to find out what could occur at this site. Anything alternate to sandbags would either be a hardened structure or beach nourishment. There appears to be solid resource agency objection to putting nourishment anywhere south of the northern-most outcrop. The Corps' representative did not raise objections to nourishment, but there are processes that must take place by the Riggings or the Town. Commissioner Neal Andrew asked if the conclusions made in the report are the conclusions made following the interagency meeting with the Riggings or are they Mr. Sampson's personal conclusions? Mr. Sampson stated the conclusions belong to himself based on discussions at the meeting. Mr. Andrew also stated that New Hanover County staff do not believe beach nourishment will work at this location. One reason is that a lot of sand has been placed just north of this area on Kure Beach and none of it has tried to remain in place at this location. Another option that is available to the Riggings is relocation. Without support from the local County officials, it is unlikely that the Corps will change their template for sand placement. Commissioner Renee Cahoon agreed with Commissioner Andrew's comment about relocation. She further stated that there has been no documentation that the Riggings HOA has tried to work with the State that made this designation to have it modified or help with a process if the designation is causing harm. The HOA had done nothing outside of asking the CRC for multiple variances. Mr. Sampson stated the Riggings HOA has looked at what can be done and based on what they have done so far it appears that beach nourishment is what needs to be pursued. Mr. Sampson stated the problem doesn't appear to be that the site has been listed on the Registry, the resource agencies of the State and federal government have objections based on what the effect nourishment would have to the habitat along the unique shoreline. This will need to be dealt with in a permit process if a permit application goes forward. Ms. Goebel added that the record is lacking in proof that agencies have objected. Chairman Gorham stated that the Riggings HOA needs to use the time it has been provided with a sandbag variance to consider all possible remedies. Mr. Sampson stated he will try to find something proposed solution that DCM can approve and then get the other agencies to find a

solution that is acceptable. Braxton Davis stated the Division will make itself available to discuss options with The Riggings and other resource agencies review the options and suggested that The Riggings should contact the Corps and DNCR. The Riggings should also talk to the County to see if they would be supportive of nourishment. The Commission, DCM staff and Mr. Sampson continued their discussion of steps The Riggings should take in the next year and include in the second annual report to the Commission. At the conclusion of the discussion, the Commission directed counsel to forward a letter to The Riggings incorporating the requests made by the Commission during the discussion.

With no further business, the CRC adjourned.
Respectfully submitted,



Braxton Davis, Executive Secretary



Angela Willis, Recording Secretary



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON DAVIS
Director

April 11, 2017

MEMORANDUM

CRC-16-44

TO: Coastal Resources Commission
FROM: Ken Richardson, *Shoreline Management Specialist*
SUBJECT: Sediment Criteria – Sampling Methodology

Program Description:

The Coastal Resources Commission (CRC) adopted 15A NCAC 07H.0312 Technical Standards for Beach Fill Projects with an original effective date of February 1, 2007. The rule is often referred to informally as the “sediment criteria rule.” The CRC adopted the rule to ensure that sand used for beach nourishment closely matches the sand on the existing beach. The rule requires that the sediment intended for beach placement, as well as the sand on the existing beach be analyzed for grain size and composition, and that they be within defined ranges of similarity before the project can begin.

The sampling protocol associated with the sediment criteria rules is highly precise with regards to sample design, spacing, numbers of cores, etc. This precision can limit flexibility in sample design, and can also limit the ability of communities to pursue small projects or respond to nourishment opportunities in a rapid fashion. The sampling protocol can also severely limit applicants’ ability to use existing data. Additionally, the sampling protocol may eliminate the ability of communities to take advantage of beneficial use projects that present themselves late in the planning process (i.e. too late to be able to hire a firm and/or mobilize to take the extra samples required). Finally, even with the detailed sampling required by the rule, an applicant can still satisfy the criteria and have unsuitable sediment placed on the beach (including rock that was missed during the sampling) and argue that they met the sampling standards, and therefore are not in violation.

DCM staff propose eliminating this rigid protocol in favor of a simpler process where the project’s consultant/engineer designs a sampling protocol that assures sediment compatibility between the beach and borrow area. We propose to keep existing standards for the various grain sizes (e.g. the percentage of “fines” shall not exceed more than 5% over the recipient beach), but substitute language similar to that in the terminal groin legislation, which requires the applicant’s consultant/engineer attest to sediment compatibility (e.g. “*Compatibility with these sediment standards shall be documented by a professional engineer licensed to practice pursuant to Chapter 89C of the General Statutes.*”)

In this manner, compatibility between the borrow areas and recipient beach are ensured, with the burden and flexibility for establishing the sampling protocol placed on project applicants, allowing staff to devote more time to the environmental review components of the project and possibly decreasing the time of permit issuance.

If the Commission approves of this approach, DCM Staff will meet with stakeholders to refine the amendments with the intention of having final rule language ready by the July CRC meeting.

15A NCAC 07H .0312**TECHNICAL STANDARDS FOR BEACH FILL PROJECTS**

Placement of sediment along the oceanfront shoreline is referred to in this Rule as "beach fill." Sediment used solely to establish or strengthen dunes or to re-establish state-maintained transportation corridors across a barrier island breach in a disaster area as declared by the Governor is not considered a beach fill project under this Rule. Beach fill projects including beach nourishment, dredged material disposal, habitat restoration, storm protection, and erosion control may be permitted under the following conditions:

- (1) The applicant shall characterize the recipient beach according to the following methodology. **Initial characterization of the recipient beach shall serve as the baseline for subsequent beach fill projects:**
 - (a) Characterization of the recipient beach is not required for the placement of sediment directly from and completely confined to a maintained navigation channel or associated sediment basins within the active nearshore, beach or inlet shoal ~~system.~~ **system;**
 - (b) Sediment sampling and analysis shall be used to capture the three-dimensional spatial variability of the sediment characteristics including grain size, sorting and mineralogy within the natural system;
 - (c) **Beach profiles shall be established using shore** ~~Shore-perpendicular~~ **transects for** topographic and bathymetric surveying of the recipient beach. ~~beach shall be conducted to determine the beach profile. Transects shall be evenly spaced throughout the entire project area, and spacing between transects shall not exceed 5,000 feet (1,524 meters) in the shore-parallel direction. Each transect shall extend from the frontal dune crest seaward to a depth of 20 feet (6.1 meters) or to the shore perpendicular distance 2,400 feet (732 meters) seaward of mean low water, whichever is in a more landward position. Transect spacing shall not exceed 5,000 feet (1,524 meters) in the shore-parallel direction.~~ Elevation data for all transects shall be referenced to the North American Vertical Datum of 1988 (NAVD 88) and the North American Datum of 1983 (NAD 83);
 - (d) **No fewer than 13 sediment samples shall be taken along each beach profile transect. Along each transect, at** ~~At~~ least one sample shall be taken from each of the following morphodynamic zones where present: frontal dune, frontal dune toe, mid berm, mean high water (MHW), mid tide (MT), mean low water (MLW), trough, bar crest and at even depth increments from 6 feet (1.8 meters) to 20 feet (6.1 meters) or to a shore-perpendicular distance 2,400 feet (732 meters) seaward of mean low water, whichever is in a more landward position. ~~The total number of samples taken landward of MLW shall equal the total number of samples taken seaward of MLW;~~
 - (e) For the purpose of this Rule, "sediment grain size categories" are defined as "fine" (less than 0.0625 millimeters), "sand" (greater than or equal to 0.0625 millimeters and less than 2 millimeters), "granular" (greater than or equal to 2 millimeters and less than 4.76 millimeters) and "gravel" (greater than or equal to 4.76 millimeters and less than 76 millimeters). Each sediment sample shall report percentage by weight of each of these four grain size categories;
 - (f) A composite of the simple arithmetic mean for each of the four grain size categories defined in Sub-Item (1)(e) of this Rule shall be calculated for each transect. A grand mean shall be established for each of the four grain size categories by summing the mean for each transect and dividing by the total number of transects. The value that characterizes grain size values for the recipient beach is the grand mean of percentage by weight for each grain size category defined in Sub-Item (1)(e) of this Rule;
 - (g) Percentage by weight calcium carbonate shall be calculated from a composite of all sediment ~~samples.~~ **samples along each transect defined in Sub-Item (1)(d) of this Rule.** The value that characterizes the carbonate content of the recipient beach is a grand mean calculated by summing the average percentage by weight calcium carbonate for each transect and dividing by the total number of transects. For beaches on which fill activities have taken place prior to the effective date of this Rule, the Division of Coastal Management shall consider visual estimates of shell content as a proxy for carbonate weight percent;
 - (h) The total number of sediments and shell material greater than or equal to three inches (76 millimeters) in diameter, observable on the surface of the beach between mean low water (MLW) and the frontal dune toe, shall be calculated for an area of 50,000 square feet (4,645

- square meters) within the beach fill project boundaries. This area is considered a representative sample of the entire project area and referred to as the "background" value;
- (i) Beaches that received sediment prior to the effective date of this Rule shall be characterized in a way that is consistent with Sub-Items (1)(a) through (1)(h) of this Rule and shall use data collected from the recipient beach prior to the addition of beach fill. If such data were not collected or are unavailable, a dataset best reflecting the sediment characteristics of the recipient beach prior to beach fill shall be developed in coordination with the Division of Coastal Management; and
 - (j) All data used to characterize the recipient beach shall be provided in digital and hardcopy format to the Division of Coastal Management upon request.
- (2) The applicant shall characterize the sediment to be placed on the recipient beach according to the following methodology:
- (a) The characterization of borrow areas including submarine sites, upland sites, and dredged material disposal areas shall be designed to capture the three-dimensional spatial variability of the sediment characteristics including grain size, sorting and mineralogy within the natural system or dredged material disposal area;
 - (b) The characterization of borrow sites shall include sediment characterization data provided by the Division of Coastal Management where available. These data can be found in individual project reports and studies, and shall be provided by the Division of Coastal Management upon request and where available;
 - (c) Seafloor surveys shall measure elevation and capture acoustic imagery of the seafloor. Measurement of seafloor elevation shall cover ~~the 100 percent of each~~ submarine borrow site and use survey-grade swath sonar (*e.g.* multibeam or similar technologies) in accordance with current US Army Corps of Engineers standards for navigation and dredging. Seafloor imaging without an elevation component (*e.g.* sidescan sonar or similar technologies) shall also cover ~~100 percent of~~ each borrow site and be performed in accordance with US Army Corps of Engineers standards for navigation and dredging. Because shallow submarine areas can provide technical challenges and physical limitations for acoustic measurements, seafloor imaging without an elevation component may not be required for water depths less than 10 feet (3 meters). Alternative elevation surveying methods for water depths less than 10 feet (3 meters) may be evaluated on a case-by-case basis by the Division of Coastal Management. Elevation data shall be tide- and motion-corrected and referenced to NAVD 88 and NAD 83. Seafloor imaging data without an elevation component shall be referenced to the NAD 83. All final seafloor survey data shall conform to standards for accuracy, quality control and quality assurance as set forth by the US Army Corps of Engineers (USACE). The current surveying standards for navigation and dredging can be obtained from the Wilmington District of the USACE. For offshore dredged material disposal sites, only one set of imagery without elevation is required. Sonar imaging of the seafloor without elevation is not required for borrow sites completely confined to maintained navigation channels, sediment deposition basins within the active nearshore, beach or inlet shoal system;
 - (d) Geophysical imaging of the seafloor subsurface shall be used to characterize each borrow ~~site. site and shall use survey grids with a line spacing not to exceed 1,000 feet (305 meters). Offshore dredged material disposal sites shall use a survey grid not to exceed 2,000 feet (610 meters) and only one set of geophysical imaging of the seafloor subsurface is required. Survey grids shall incorporate at least one tie point per survey line.~~ Because shallow submarine areas can pose technical challenges and physical limitations for geophysical techniques, subsurface data may not be required in water depths less than 10 feet (3 meters), and the Division of Coastal Management shall evaluate these areas on a case-by-case basis. Subsurface geophysical imaging shall not be required for borrow sites completely confined to maintained navigation channels, sediment deposition basins within the active nearshore, beach or inlet shoal system, or upland sites. All final subsurface geophysical data shall use accurate sediment velocity models for time-depth conversions and be referenced to NAD 83;
 - (e) Sediment sampling of all borrow sites shall use a vertical sampling device no less than 3 inches (76 millimeters) in diameter. ~~Characterization of each borrow site shall use no fewer~~

than five evenly spaced cores or one core per 23 acres (grid spacing of 1,000 feet or 305 meters), whichever is greater. Characterization of borrow sites completely confined to maintained navigation channels or sediment deposition basins within the active nearshore, beach or inlet shoal system shall use no fewer than five evenly spaced vertical samples per channel or sediment basin, or sample spacing of no more than 5,000 linear feet (1,524 meters), whichever is greater. Two sets of sampling data (with at least one dredging event in between) from maintained navigation channels or sediment deposition basins within the active nearshore, beach or inlet shoal system may be used to characterize material for subsequent nourishment events from those areas if the sampling results are found to be compatible with Sub-Item (3)(a) of this Rule. In submarine borrow sites other than maintained navigation channels or associated sediment deposition basins within the active nearshore, beach or inlet shoal system where water depths are no greater than 10 feet (3 meters), geophysical data of and below the seafloor are not required, and sediment sample spacing shall be no less than one core per six acres (grid spacing of 500 feet or 152 meters). Vertical sampling shall penetrate to a depth equal to or greater than permitted dredge or excavation depth or expected dredge or excavation depths for pending permit applications. All sediment samples shall be integrated with geophysical data to constrain the surficial, horizontal and vertical extent of lithologic units and determine excavation volumes of compatible sediment as defined in Item (3) of this Rule;

- (f) Two sets of sampling data (with at least one dredging event in between) from maintained navigation channels or sediment deposition basins within the active nearshore, beach or inlet shoal system may be used to characterize material for subsequent nourishment events from those areas if the sampling results are found to be compatible with Sub-Item (3)(a) of this Rule. Vertical sampling shall penetrate to a depth equal to or greater than permitted dredge or excavation depth or expected dredge or excavation depths for pending permit applications.
 - (g)(f) For offshore dredged material disposal sites, the grid spacing shall not exceed 2,000 feet (610 meters). Characterization of material deposited at offshore dredged material disposal sites after the initial characterization are not required if all of the material deposited complies with Sub-Item (3)(a) of this Rule as demonstrated by at least two sets of sampling data with at least one dredging event in between;
 - (h)(g) Grain size distributions shall be reported for all sub-samples taken within each vertical sample for each of the four grain size categories defined in Sub-Item (1)(e) of this Rule. Weighted averages for each core shall be calculated based on the total number of samples and the thickness of each sampled interval. A simple arithmetic mean of the weighted averages for each grain size category shall be calculated to represent the average grain size values for each borrow site. Vertical samples shall be geo-referenced and digitally imaged using scaled, color-calibrated photography;
 - (i)(h) Percentage by weight of calcium carbonate shall be calculated from a composite sample of each core. A weighted average of calcium carbonate percentage by weight shall be calculated for each borrow site based on the composite sample thickness of each core. Carbonate analysis is not required for sediment confined to maintained navigation channels or associated sediment deposition basins within the active nearshore, beach or inlet shoal system; and
 - (j)(i) All data used to characterize the borrow site shall be provided in digital and hardcopy format to the Division of Coastal Management upon request.
- (3) Sediment ~~The Division of Coastal Management shall determine sediment~~ compatibility is determined according to the following criteria:
- (a) Sediment completely confined to the permitted dredge depth of a maintained navigation channel or associated sediment deposition basins within the active nearshore, beach or inlet shoal system is considered compatible if the average percentage by weight of fine-grained (less than 0.0625 millimeters) sediment is less than 10 percent;
 - (b) The average percentage by weight of fine-grained sediment (less than 0.0625 millimeters) in each borrow site shall not exceed the average percentage by weight of fine-grained sediment of the recipient beach characterization plus five percent;

- (c) The average percentage by weight of granular sediment (greater than or equal to 2 millimeters and less than 4.76 millimeters) in a borrow site shall not exceed the average percentage by weight of coarse-sand sediment of the recipient beach characterization plus 10 percent;
 - (d) The average percentage by weight of gravel (greater than or equal to 4.76 millimeters and less than 76 millimeters) in a borrow site shall not exceed the average percentage by weight of gravel-sized sediment for the recipient beach characterization plus five percent;
 - (e) The average percentage by weight of calcium carbonate in a borrow site shall not exceed the average percentage by weight of calcium carbonate of the recipient beach characterization plus 15 percent; and
 - (f) Techniques that take incompatible sediment within a borrow site or combination of sites and make it compatible with that of the recipient beach characterization shall be evaluated on a case-by-case basis by the Division of Coastal Management.
- (4) Excavation and placement of sediment shall conform to the following criteria:
- (a) Sediment excavation depths for all borrow sites shall not exceed the maximum depth of recovered core at each coring location;
 - (b) In order to protect threatened and endangered species, and to minimize impacts to fish, shellfish and wildlife resources, no excavation or placement of sediment shall occur within the project area during times designated by the Division of Coastal Management in consultation with other State and Federal agencies. The time limitations shall be established during the permitting process and shall be made known prior to permit issuance; and
 - (c) Sediment and shell material with a diameter greater than or equal to three inches (76 millimeters) is considered incompatible if it has been placed on the beach during the beach fill project, is observed between MLW and the frontal dune toe, and is in excess of twice the background value of material of the same size along any 50,000-square-foot (4,645 square meter) section of beach.

History Note: Authority G.S. 113-229; 113A-102(b)(1); 113A-103(5)(a); 113A-107(a); 113A-113(b)(5) and (6); 113A-118; 113A-124; Eff. February 1, 2007; Amended Eff. August 1, 2014; September 1, 2013; April 1, 2008.



Coastal Management
ENVIRONMENTAL QUALITY

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON DAVIS
Director

April 11, 2017

MEMORANDUM

CRC-17-13

TO: Coastal Resources Commission
FROM: Ken Richardson, *Shoreline Management Specialist*
SUBJECT: Figure Eight Island Development Line Approval Request

On April 1, 2016, the Commission's rules were amended to allow oceanfront communities with large-scale beach nourishment or inlet relocation projects to establish a "development line" as an alternative to the static vegetation line exception. You will recall that a static vegetation line represents the vegetation line that existed just prior to a large-scale (300,000 cubic yards) beach nourishment project, and must be established and used for measuring construction setbacks. The development line is established by a local government or a qualified owner's association to represent the seaward-most allowable location of oceanfront development, provided the development can meet the setback measured from the first line of stable and natural vegetation rather than the static vegetation line. Under your development line rule, buildings and accessory structures could move seaward up to the approved development line as long as minimum setbacks are met. Petitioners are required to request approval for a development line from the Commission according to the procedures outlined in 15A NCAC 7J. 1300.

In order to receive the CRC's approval for a Development Line, the petitioner shall establish the Development Line using on-ground observation and survey, or aerial imagery along the oceanfront jurisdiction or legal boundary. The proposed development line must be applied to the entire large-scale beach nourishment project area (length of static vegetation line) and can extend beyond the boundaries of the large-scale project to include the entire oceanfront jurisdiction or legal boundary of the petitioner. In establishing the Development Line, an adjacent neighbor sight-line approach is to be utilized, resulting in an average line of structures. In areas where the seaward edge of existing development is not linear, the Development Line may be determined by average line of construction on a case-by-case basis. In no case shall the development line be established seaward of the most seaward structure within the petitioner's oceanfront jurisdiction. In addition, a Development Line must not be sited on state owned lands, or oceanward of the mean high water line or perpetual property easement line, whichever is more restrictive.

Once adopted, the petitioner shall then submit the following to the Director of the Division Coastal Management in accordance with CRC's rules (15A NCAC 07J. 1300):

1. A detailed survey of the development line; to also include the static vegetation line.
2. Copy of local regulations/ordinances associated with the development line.
3. Record of local adoption of the development line by the petitioner.

On March 1, 2017, the Figure Eight Island Beach Homeowner's Association adopted the HOA's development line into their Architectural Review Guidelines, and is now requesting the Coastal Resources Commission's (CRC) approval. Staff have reviewed the information submitted by the petitioner, and have determined that all required supporting documentation has been submitted and attached for the Commission's consideration at the upcoming meeting in Manteo. In reviewing the documentation, Commissioners should note that Figure Eight Island currently does not have a Static Vegetation Line.

Attachment A: Figure Eight Island Beach Homeowner's Association letter requesting the CRC's approval of Development Line

Attachment B: Figure Eight Island Beach Homeowner's Association Consent to Action by the Board of Directors of the Association adopting a regulation requiring structures to be located landward of the Development Line.

Attachment C: Figure Eight Island Beach Homeowner's Association Consent to Action by the Board of Directors of the Association adopting the Development Line

Attachment D: Figure Eight Island Beach Homeowner's Association Architectural Review Guidelines dated January 1, 2001 with amendments adopted May, 2007 to March 1, 2017. The provisions regarding setbacks are found on page 6 of the 2001 Guidelines.

Attachment E: Figure Eight Island Beach Homeowner's Association Architectural Review Amended and Restated Declaration of Restrictive Covenants Figure Eight Island recorded in Book 5012, Page 74 of the New Hanover County Register of Deeds. Paragraphs 4 and 5 of the restrictions address the approval of improvements on residential lots by the Association.

Attachment F: Figure Eight Island Beach Homeowner's Association Development Line Maps

Attachment A: Figure Eight Island Beach Homeowner's Association letter requesting the CRC's approval of Development Line

WESSELL & RANEY, L.L.P.
ATTORNEYS AT LAW
POST OFFICE BOX 1040
WILMINGTON, NORTH CAROLINA 28402-1040

JOHN C. WESSELL, III
WESSELL@BELLSOUTH.NET

WILLIAM A. RANEY, JR.
WARANEY@BELLSOUTH.NET

STREET ADDRESS:
107-B NORTH 2ND STREET
WILMINGTON, NC 28401

TELEPHONE: 910-762-7475
FACSIMILE: 910-762-7557

March 13, 2017

Mr. Braxton Davis, Director
NC Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

Re: **Request by Figure "8" Beach Homeowners' Association, Inc. for
Approval of a Development Line Pursuant to 15A NCAC 7J.1300**

Dear Mr. Davis:

I represent Figure "8" Beach Homeowners' Association, Inc. ("Association"). On behalf of the Association, I request approval of a Development Line for the ocean beach at Figure Eight Island pursuant to 15A NCAC 7J.1300. In support of this request, I have enclosed the following documents:

1. Aerial imagery in printed form showing the proposed "Development Line," the existing structures, and the approximate normal high water line for the entire ocean beach and a portion of the Rich Inlet shoreline at Figure Eight Island. (There is no "static line" established for Figure Eight Island.) This imagery has also been provided in electronic form to Ken Richardson, who I understand is the DCM staff person in charge of the technical aspects of this submittal.
2. A copy of a Consent to Action by the Board of Directors of the Association adopting a regulation requiring structures to be located landward of the Development Line.
3. A copy of a Consent to Action by the Board of Directors of the Association adopting the proposed Development Line.
4. A copy of the Architectural Review Guidelines dated January, 2001 along with amendments adopted May, 2007, August, 2008, September, 2008, December, 2009 and March 1, 2017. The provisions regarding setbacks are found on page 6 of the 2001 Guidelines.
5. A copy of the Amended and Restated Declaration of Restrictive Covenants Figure Eight Island recorded in Book 5012, Page 74 of the New Hanover County Register of Deeds. Paragraphs 4 and 5 of the restrictions address the approval of improvements on residential lots by the Association.

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Attachment B: Figure Eight Island Beach Homeowner's Association Consent to Action by the Board of Directors of the Association adopting a regulation requiring structures to be located landward of the Development Line.


**CONSENT TO ACTION
BY DIRECTORS WITHOUT A MEETING**

The directors of The Figure "8" Beach Homeowners Association, Inc. (Association) adopt the following resolution by unanimous consent given in electronic form pursuant to G.S. 55A-7-04(a).

RESOLVED, the Board adopts an amendment to the Architectural Review Guidelines which constitute rules and regulations of the Association pursuant to the authority granted in Article VIII, Section 3, of the By-Laws and pursuant to the authority granted in N.C.G.S. 47F-3-102.

The Architectural Review Guidelines, revised January, 2001, as amended, are amended by adding a new paragraph on page 1 to the section entitled "SETBACKS" as follows:

Structures subject to oceanfront setbacks pursuant to Ocean Hazard Area Rule 15A NCAC 7H, Section 300, shall comply with any "Development Line" as defined in 15A NCAC 7H.0305(a)(10) and approved by the North Carolina Coastal Resources Commission pursuant to 15A NCAC 7J.1300.

 Approved by unanimous consent of directors by electronic means on or before the 2nd day of February, 2017, copies of which are recorded with the records of the Association.

March



David Kellam, Island Administrator

WARCORP02-120-305
ICTW

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Attachment C: Figure Eight Island Beach Homeowner's Association Consent to Action by the Board of Directors of the Association adopting the Development Line

**CONSENT TO ACTION
BY DIRECTORS WITHOUT A MEETING**

The directors of The Figure "8" Beach Homeowners Association, Inc. (Association) by unanimous consent given in electronic form pursuant to G.S. 55A-7-04(a) hereby approve a proposed "Development Line" prepared by Patrick Bristow, RLS, and depicted on a series of fifteen aerial photographs submitted to the Board at a meeting of the Board on February 3, 2017; and authorize the Island Administrator to put the proposed lines in an appropriate form to be submitted to the North Carolina Coastal Resources Commission for approval pursuant to 15A NCAC 7J.1300.

[Handwritten initials]
March

Approved by unanimous consent of directors by electronic means on or before the *2nd* day of February, 2017, copies of which are recorded with the records of the Association.

David Kellam

David Kellam, Island Administrator

WARICORP02-120-306
KTW

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Attachment D: Figure Eight Island Beach Homeowner's Association Architectural Review Guidelines dated January 1, 2001 with amendments adopted May, 2007 to March 1, 2017. The provisions regarding setbacks are found on page 6 of the 2001 Guidelines.

<separate document> name: DVL_F8_attach_D_architectural_guidelines.pdf

Attachment E: Figure Eight Island Beach Homeowner's Association Architectural Review Amended and Restated Declaration of Restrictive Covenants Figure Eight Island recorded in Book 5012, Page 74 of the New Hanover County Register of Deeds. Paragraphs 4 and 5 of the restrictions address the approval of improvements on residential lots by the Association.

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Attachment F: Figure Eight Island Beach Homeowner's Association Development Line Maps

<separate document> name: DVL_F8_attach_F_maps.pdf



Figure "8" Beach Homeowners' Association, Inc.
15 Bridge Road ♦ Wilmington, North Carolina 28411
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www.figure8homeowners.com

Figure "8" Beach Homeowners' Association, Inc.

Architectural Review Guidelines

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Revised January, 2001

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Amended May 2007, August 2008, September 2008, And
December 2009

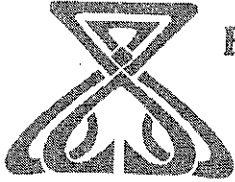


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**Figure "8" Beach Homeowners' Association, Inc.
Amendment to the Architectural Review Guidelines
March 1, 2017**

The Figure "8" Beach Homeowners' Association Board of Directors unanimously consented on March 1, 2017 to adopt an amendment to the Figure Eight Architectural Review Guidelines revised January, 2001, as amended, by adding a new paragraph on page 1 to the section entitled "SETBACKS" as follows:

SETBACKS.

"Structures subject to oceanfront setbacks pursuant to Ocean Hazard Area Rule 15A NCAC 7H, Section 300, shall comply with any "Development Line" as defined in 15A NCAC 7H.0305(a)(10) and approved by the North Carolina Coastal Resources Commission pursuant to 15A NCAC 7J.1300."

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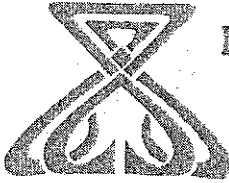


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Figure "8" Beach Homeowners' Association, Inc.
Amendment to the Architectural Review Guidelines
December 12, 2009

The Figure "8" Beach Homeowners' Association Board of Directors voted on December 12, 2009 to amend the Figure "8" Architectural Review Guidelines 2001 amended, as follows:

CONSTRUCTION AND SERVICES SCHEDULE.

By inserting the following sentence in the Contractor Regulations:

"From the Friday before Memorial Day through the Friday before Labor Day, construction activities for projects subject to ARC approval must cease on Fridays by 11:30 a.m. and workers must leave the Island by 12:00 noon. This does not apply to Fridays on which all work is prohibited in accordance with an annual schedule determined by the Administrator."

PIERS.

By rewriting the first sentence of MARINE IMPROVEMENTS, Piers as follows:

"Piers can extend no more than 200 feet from the landward-most portion of the following features on the lot:

- a. A bulkhead.
- b. The normal high water line.
- c. The landward edge of coastal wetlands as defined in the North Carolina Coastal Area Management Act."

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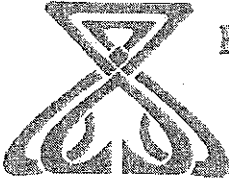


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**Figure "8" Beach Homeowners' Association, Inc.
Amendment to the Architectural Review Guidelines**

September 26, 2008

The Figure "8" Beach Homeowners' Association, Inc. Board of Directors voted unanimously to amend the Figure "8" Architectural Review Guidelines, revised 2001, amended May 2007 and August 2008, by inserting the following new section to General Policy found on page 2 of the Guidelines.

Real estate sales signs.

"No sign of any character shall be displayed except signs required by a governmental authority, or a real estate sales sign to identify the property and which complies with the following standards:

- Real estate sales signs shall be installed entirely on the lot, and must not obscure the view of oncoming traffic. Real estate sales signs are limited to one per lot.
- *Dimensions:* Signs may not exceed 15 inches high by 20 inches wide and must be rectangular in shape. The height of the top of sign may be no more than 4 feet above the existing grade.
- *Materials* for the sign - Wood or heavy duty synthetic. The sign post may be a 2x4 or a 4x4 wooden post. Fasteners- stainless steel.
- *Color and Finish* of the sign and post: Painted in medium sand or gray color, in matte finish.
- *Text* is limited to the lot's street number, one contact telephone number, and if desired, either, but not both, the word "Broker" or the word "Owner". If used, the location of either the word "Broker" or "Owner" on the sign shall centered at the bottom of the sign. No company logos, drawings, or other illustrations are permitted. *Text size* for the street number may not exceed 4.5 inches tall, the size of the telephone number may not exceed 3.25 inches tall and the size of the word "Broker" or "Owner" may not exceed 1 inch tall.
- The *color* of the sign's lettering must be black or brown."

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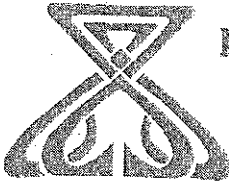


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Figure "8" Beach Homeowners' Association, Inc.

Amendment to the Architectural Review Guidelines.

August 15, 2008

The Figure "8" Beach Homeowners' Association, Inc. Board of Directors voted unanimously to amend the Figure "8" Architectural Review Guidelines, revised 2001, by inserting the following changes. The changes to Marine Improvements found on page 7 of the 2001 Guidelines are underlined for reference purposes.

MARINE IMPROVEMENTS: The number of piers or other marine structures installed on or adjacent to a residential lot is limited to one per lot. Plans must be submitted for bulkheads, piers, docks and boat lifts. A plat must be included showing the lot riparian corridor lines, and must also show piers, docks and bulkheads at adjacent property. Approval is subject to all state and federal permits and regulations. A copy of the CAMA permit or exemption certificate is required. Lighting fixtures must conform and be shown on the plan. A cut sheet illustrating all light fixtures must be attached. Erosion control bulkhead or seawall and associated return projects are subject to guidelines regulating location, height, backfill and grading. Plans must clearly illustrate existing lot and street elevations and height of the proposed structure, and the depth of fill (see FEES.)

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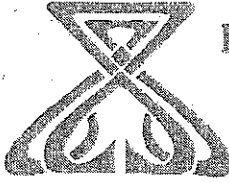


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FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC.

Amendment to the Architectural Review Guidelines

May 11, 2007

The Figure "8" Beach Homeowners' Association, Inc. Board of Directors voted unanimously to amend the Figure "8" Beach Homeowners' Association, Inc. Architectural Review Guidelines, revised 2001, by inserting the following changes. The changes to SETBACKS found on page 6 of the 2001 Guidelines are underlined for reference purposes.

SETBACKS: County codes require a 15 ft. setback on the sides of the lot, 25 ft. setback from the rear of the lot and 30 ft. from the front (street) side. The county setbacks are the minimum required setbacks. Shoreline CAMA setbacks also apply. Wetland areas, including those which may appear small, are likely to be subject to special permits and setbacks. Developer's setback lines are platted across certain lots, and must be honored. All setback lines must be clearly shown on plans. Variances generally will not be allowed for new construction, including modifications or renovations, that result in new or greater encroachment into required setbacks, even if the footprint of the structure is not increased. Grade and fill activities are regulated within setback areas (See GRADE AND FILL.)

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Figure "8" Beach Homeowners'
Association, Inc.

Architectural Review
Guidelines

January, 2001

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FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC.

15 Bridge Road • Wilmington, North Carolina 28411 • Telephone (910) 686-0635
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ARCHITECTURAL REVIEW GUIDELINES

January 2001 Edition

The Restrictive Covenants, ByLaws, Rules and Regulations, and Architectural Review Guidelines of the Figure "8" Beach Homeowners' Association, Inc. provide the Board of Directors with the framework to govern all improvements and construction at residential lots on Figure Eight Island. The Board of Directors appoints an Architectural Review Committee (ARC) to assist them in developing and instituting policies, and to see that they are properly applied.

The Architectural Review Committee of the Figure "8" Beach Homeowners' Association, Inc., does not review plans or inspect construction to insure compliance with the North Carolina building code or with any other governmental rules, codes or standards. It is the responsibility solely of the owner and the owner's architects and contractors to assure that structures, improvements and activities meet all applicable rules, codes and standards and that they do not violate any legal standards governing the effect of the construction, improvements and activities on other property or other property owners.

The Association requires a Notice and Indemnity Agreement in which the property owner(s) indemnify and hold harmless the Figure "8" Beach Homeowners' Association, Inc., its officers, directors and employees, and the Architectural Review Committee of the Association and its members from any claims, demands and liability (including all costs, expenses and reasonable attorney's fees) that arise out of the approval of the owner's plans for construction, improvement or activities on the owner's lot at Figure Eight Island.

In an effort to maintain efficiency, the Architectural Review Committee periodically recommends revisions of the Guidelines to the Board of Directors for approval. Supplemental guidelines to the March 1998 edition of the Architectural Review Guidelines were unanimously approved at the October 28, 2000 meeting of the Figure "8" Beach Homeowners Association, Inc. Board of Directors. The Committee presented a fully revised edition of the Guidelines to the Board of Directors for approval at their January 20, 2001 meeting. This edition, dated January 2001, was adopted and now supercedes previous guidelines to govern all island projects. Modifications chiefly address a new ARC meeting schedule, a plan submission deadline, all lot fill and grade activities, and all seawall or bulkhead activities. New plan submission checklists have been developed to assist architects, marine contractors, and landscape designers. A schedule of projected ARC meeting dates for the year 2001 is included, and the text contains various modifications designed to assist Association members through the approval process. Requests for clarification or assistance should be directed to the Association office at (910) 686-0635.

Forms attached to this booklet include: a projected schedule for 2001 ARC meetings; Architectural Review Checklists for use when submitting plans for approval; a Contractor's Agreement, Property Owner's Statement, and the Indemnity Agreement; and a copy of the Contractor Regulations. Additional copies of the Guidelines and attachments are available upon request.

MAR 15 2017

GENERAL POLICY

All lot improvements and construction activities must be from plans that have been submitted for review and approved in writing by the Architectural Review Committee. Plans are approved for one year only. Plans must be resubmitted to the committee for approval after one year, and are subject to the regulations in force at that time.

In addition to new construction projects, proposals for all exterior improvements or modifications to existing structures, including painting, must be submitted for review and approval. For reference, activities requiring approval include, but are not limited to: new construction, additions, remodeling, replacement of siding material or roofing, exterior painting, installation of exterior lighting fixtures, fencing, landscape, grade or fill, piers, docks, boat lifts, bulkheads, and lot stabilizing or erosion control structures.

Strict coastal regulations apply to all island projects. Therefore, appropriate permits must be obtained prior to seeking ARC approval. In general, one should assume all projects modifying land or the exterior of a structure are subject to certain coastal regulations. Copies of the CAMA Permit or Exemption Certificate, and the New Hanover County Health Department Improvement Permit are required before any building plans are reviewed by the Committee.

House plans must be drawn and sealed by a licensed architect. The Committee recommends using architects, builders, and landscape designers who are thoroughly familiar with the special techniques and ever-changing rules involved in designs for coastal areas. Construction must follow Windstorm Resistant Construction of the North Carolina building code. Special North Carolina and FEMA rules apply to various construction practices, for example, depth of pilings. Emphasis should be placed on house designs that are in harmony with a barrier island setting and are compatible with existing homes in both character and quality. Building materials should be capable of withstanding harsh weather conditions (see EXTERIOR MATERIALS AND COLORS.) Building above flood elevations on pilings frequently makes the house appear too tall and "perched" on its lot. To compensate, the architect must employ various devices to lessen the appearance of height such as the use of tall shrubs at the base, fencing to provide a transition to a sharp increase in height, and imaginative treatment of yards, courts and drives to draw attention to ground level. Structural screening and planting is required to conceal exposed pilings under the house. Structural screening includes lattice, louvers or other systems which provide at least 50% open area.

Landscape plans must take into consideration proper stewardship of the island's water supply, and must not impact the roadside right of way. All lot grading and fill activities, including that for landscape, bulkheads or seawalls, must meet certain standards to protect neighboring property and road areas (See ~~GRADE AND HDL~~.)

MAR 15 2017

-2-

DCM- MHD CITY

Pile driving must be approved and follow proper procedures (see SITE DEVELOPMENT.) If the island's water supply is used to jet pilings, the date and time must be coordinated with the office. A separate fee is charged for this water use (See FEES.)

The contractor is to stake out the corners of the house and decks and run a string along the side lot lines for the site inspection. Prior to construction, the contractor must meet with the Administrator to review island policies and furnish the Association with a site phone number for emergency use. Fees are payable upon approval of plans, but may be paid by the contractor at this meeting (See FEES.)

A Contractor's Agreement to abide by the Association Rules and the Architectural Guidelines is required. Island speed limits are enforced with the use of radar; violators are cited with a \$50 fine. If a cited subcontractor or employee does not pay a fine to the Association office within 10 days, the uncollected fee will be charged to the contractor. Violation of island rules may result in denial of access to the island for individuals or may result in suspension of construction. Contractor regulations are included in the guideline booklet. It is the contractor's responsibility to furnish the most recent regulations to subcontractors and employees.

It is the contractor's responsibility to maintain a clean, orderly job site. Dumpsters are required at all sites and must be located at least 10 feet from the paved road. If visible, they must be screened. For small projects, a closed trash container area may be approved. Free standing port-a-johns must be out of sight and attractively screened with lattice. It is acceptable to screen the port-a-john within the same structure as the dumpster. Sites must be policed daily and dumpsters emptied on a regular schedule, and especially for weekends and holidays.

Access to the construction site is from the owner's frontage on the hard surface road. Vehicles should be parked on the site, but if absolutely necessary, may be parked along the roadway, completely off the pavement in a manner that does not impede traffic.

Start of construction or site clearing without approval can result in suspension of work and denial of island access to the contractor. The Committee reserves the right to require changes during construction or upon final inspection to bring a project into compliance with the regulations.

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THE REVIEW PROCESS

ARCHITECTURAL REVIEW MEETINGS: ARC meetings are projected for the first and third Monday of each month, subject to the enclosed schedule, availability of a quorum, and receipt of plans that conform to the Committee's requirements. It is recommended the meeting date be confirmed by calling the office at (910) 686-0635. To qualify for review, all required information must be submitted. Plans will not be reviewed without proper documentation. All items presented to the Architectural Review Committee must be submitted to the Association office for processing in a timely manner. Current policy is that the complete submission packet shall be received no later than fourteen days prior to a scheduled review meeting. In cases of submission of plans which include any lot fill, grading, or bulkhead activity, adjacent property owners will be notified by the Association to assure an opportunity to comment. The Committee encourages the architect to attend the initial meeting, and reserves the right to require an architect, engineer, or builder to attend a meeting to explain plans and specifications before they are approved.

Conceptual reviews may be granted. However, no approval is issued for conceptual or preliminary plans. It is highly recommended that the architect or builder be present for conceptual reviews.

CHECKLISTS AND FORMS: In order to facilitate proper submission of plans Architectural Review Checklists are attached to the Guideline booklet. The appropriate checklist must be completed and attached to the plans when submitted. An incomplete checklist will delay or cancel a requested review. Before approval of any plan is given, the property owner and the contractor must sign standard statements that they have read and understand these guidelines and will completely abide by them. An indemnity agreement is also required.

BUILDING PLAN SUBMISSION REQUIREMENTS: Detailed plans are required showing the following to scale: Site plan to include lot boundaries; all setback lines including the developer's setback if applicable; road right of way; existing lot elevation and proposed grade and fill; elevation at street; house and deck outline; adjacent house lines; driveway and parking; paths and detached decks; septic system; and trash receptacle, HVAC, and propane tank enclosures.

Color and material samples are required. Building height with reference to the basis of this measurement must be illustrated on the elevation showing the street side of the structure. Square footage and elevations of all sides of a building or other structure, including beach paths, must be illustrated. A landscape plan keyed to show quantity and size of plants selected is required. Presence of an irrigation system, if any, and the type of moisture sensing cutoff must be clearly noted. All exterior lighting locations must be shown and keyed to cut sheets illustrating the exterior fixtures.

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MAR 15 2017

-4-

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Detached workshops, storage buildings and garages are allowed, provided they are not placed closer toward the water than the house or deck, are not within setbacks, and are structurally compatible with the house. These structures are subject to the same submission requirements and guideline regulations as other construction projects.

Plans for renovations and additions must clearly show all exterior changes to the existing structure. A highlighter or a different colored ink must be used to illustrate proposed modifications on all elevations. The checklist must address the pertinent items and accompany the plans. All activity makes an existing house subject to the guidelines currently in force. Therefore, non-conforming items must be brought into compliance during the project.

MARINE PLAN SUBMISSION REQUIREMENTS: All proposed marine improvements such as bulkheads, piers, docks and boat lifts must be submitted for approval. Erosion control bulkhead or seawall and associated return projects are subject to guidelines regulating location, height, backfill and grading (See MARINE IMPROVEMENTS.)

LANDSCAPE PLAN SUBMISSION REQUIREMENTS: Plans for landscaping lots or renovating existing landscaping must be approved by the Committee. Emphasis must be placed on proper stewardship of the island water supply when developing the landscape design. All grade and fill activities are regulated (See GRADE AND FILL.) Plans must note the road right of way is free of encroachment, and must indicate the presence of an irrigation system. A moisture sensing cut-off is required for all irrigation systems, the type is to be indicated on the plan. All landscape lighting must be approved. Light fixture locations must be clearly shown on the plans, and must be keyed to a cutsheet. In certain cases, the Committee may require a sample of the fixture (See LANDSCAPE.)

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CONSTRUCTION GUIDELINES

SITE DEVELOPMENT: Site clearing may not begin without approval. Prior to delivery of fill material or the start of any grading, the lot's original and proposed grades must be shown on a site plan and submitted to the committee for review (See **GRADE AND FILL.**)

In addition to the island's guidelines regarding fill and grade activities, strict coastal regulations are enforced by CAMA officers. The site should be disturbed as little as possible with special effort to protect dunes and vegetation. Provide ground cover for bare areas and disturbed soil around the house, drive and road during and after construction. Excavated material may not be placed on other property and must not be placed within ten feet of the roadside. Grade or fill activities must not bury or obstruct the Utility Company's water meters.

Pile driving procedures must be followed. If the island's water supply is used, the date and time must be coordinated with the office, and a fee is payable prior to installing the pilings (See **FEES.**) A cutoff must be supplied at the hydrant and piling locations. A proper hydrant wrench is required to prevent damage to the hydrant. If a hose crosses the street, it must be placed at a right angle and have wooden 2 x 6 planks on each side of the hose.

SETBACKS: County codes require a 15 ft. setback on the sides of the lot, 25 ft. setback from the rear of the lot and 30 ft. from the front (street) side. Shoreline CAMA setbacks also apply. Wetland areas, including those which may appear small, are likely to be subject to special permits and setbacks. Developer's setback lines are platted across certain lots, and must be honored. All setback lines must be clearly shown on plans. Grade and fill activities are regulated within setback areas (See **GRADE AND FILL.**)

In all cases no house can be closer to the water than the house closest to the water of any of the three adjoining houses in both directions. The same is required of the deck and stair lines. The Committee strongly suggests if there are questions about this requirement that these setback lines be staked and approved before finished plans are submitted.

The Association owns a 60 foot wide right of way for roads on the island. Landscaping, irrigation systems and installation of berms or other barriers within 30 feet of the center of the roadway must be approved by the Committee. The use of sod capable of withstanding parking within the 10 foot area adjacent to the road is required. Utility Companies have easement in this area for service lines, and this area must be available for roadside parking. Care should be taken to consider that future projects to widen the roads will affect this area. Grade and fill activities are regulated within this area (See **GRADE AND FILL.**)

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GRADE AND FILL ACTIVITIES: All grade and fill activities are regulated for the

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purpose of reducing the impact of continued development and weather events on common property and private lots at Figure Eight Island. Height of a house is impacted by grade and fill activities (See DIMENSIONS.)

Lot Grading within 15 foot side setback for marsh and sound front lots: Lot grading within the 15 foot side setback for marsh front and sound front lots is permitted only for purposes of assuring drainage towards the water or marsh and only in accordance with the minimum slope standards established in the provisions for *Bulkhead Height Within the Side Setback Area* (See Marine Improvements.) The provision states that within the area between the side setback line and the property line, height will not exceed the height of the lot's natural contour at the location of the bulkhead. Exceptions occur when the height of the natural contour does not exceed the elevation of the centerline of the road adjacent to the lot's 15 foot setback road frontage, minus .005 times the lot's depth minus 1 foot.

Grading, filling or landscaping within the Road Right-of-Way: Any grading, filling or landscaping within the road right-of-way must be done so as to provide drainage and water retention on the road's shoulder. The road shoulder must be graded to provide a slope of 1 inch per foot for a minimum of 12 feet from the edge of the road. This graded and sloped area may be left in a natural state or landscaped with grass.

Any improved parking area on the road's shoulder must be engineered to allow storm water infiltration equal to or better than lawn grass.

Lot fill within 15 foot side setback for marsh front or sound front lots: The natural elevation of the area of a lot which is between the side setback line and property line on marsh front or sound front lots may not be increased above the height resulting from the following formula:

$$\text{Centerline road elevation} - (.005 \times \text{lot depth}) - 1 \text{ foot}$$

Lot fill for all other lots - other than 15 foot side setback area of marsh or sound front lots: In general, no fill may be placed on a lot which results in a final elevation which is in excess of the existing elevation of adjacent streets or property. An exemption for fill contrary to this limitation may be requested from the ARC upon providing a detailed proposal for the installation of a professionally engineered and sealed storm water control system. With its approval, the ARC assumes no responsibility for the satisfactory performance of such systems, and the individual property owners requesting exemption from the fill limitations stated above will remain liable for the performance of their systems. The elevation of the area not included within the 15 foot side setback areas for marsh front and sound front lots may not be increased by filling above 9.5 feet mean sea level.

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MARINE IMPROVEMENTS: Plans must be submitted for bulkheads, piers, docks and boat lifts. A plat must be included showing the lot riparian corridor lines, and must also show piers, docks and bulkheads at adjacent property. Approval is subject to all state and federal permits and regulations. A copy of the CAMA permit or exemption certificate is required. Lighting fixtures must conform and be shown on the plan. A cut sheet illustrating all light fixtures must be attached. Erosion control bulkhead or seawall and associated return projects are subject to guidelines

regulating location, height, backfill and grading. Plans must clearly illustrate existing lot and street elevations and height of the proposed structure, and the depth of fill (see FEES.)

Bulkheads and Return - Location: Installation of a bulkhead is permitted only along a lot's waterfront or marsh front. Bulkhead returns may not exceed 16 feet in length. No retaining wall or bulkhead is permitted beyond the bulkhead return.

Bulkhead Height: Bulkhead height across the area between the side setback line and the property line will not exceed the height of the lot's natural contour at the location of the bulkhead; except that a bulkhead may be built above the natural contour if the height does not exceed the elevation of the centerline of the road adjacent to the lot's 15 foot setback road frontage, minus .005 times the lot's depth minus 1 foot.

Bulkhead height = Centerline road elevation - (.005 x lot depth) - 1 foot

Bulkhead Height Between the 15 Foot Setback Areas: Bulkhead height across the area of the lot that is between the 15 foot side setbacks may not exceed 9.5 feet mean sea level.

Piers may not cross more than 200 feet of marsh and water and may not extend beyond those of near neighbors. Piers along curving shore lines must not interfere with the potential use of a pier on adjacent lots. Piers, docks and lifts may not have overhead cover, and may not have any flood or high intensity lights. Lighting of any kind is discouraged, but if it is absolutely necessary, must be low wattage and shielded so the bulb or lens are not visible. Lighting design should take into consideration that outdoor lights should not be left on all night. Type of fixture and its location must be clearly shown on the plan and keyed to a cutsheet. The committee may require that samples of fixtures be submitted for approval. If a pier is installed across a beach used for walking, stairs must be installed on both sides of the pier to allow uninterrupted access to the walking beach.

DIMENSIONS: Houses on the island must have at least 2,000 sq. ft. of heated space. The maximum height of the peak of a roof may not exceed 44 feet as measured from the highest of the following:

- a. Natural mean ground elevation at the front of the house prior to grading or filling.
- b. Ground elevation after allowable fill (See GRADE AND FILL.)

Plans must plainly indicate the heated square feet. Height must be illustrated on the street side elevation, with a reference to the basis for the measurement. The committee reserves the right to request measurements during construction.

EXTERIOR MATERIAL AND COLORS: Color, material, and manufacturer of siding and roofing must be noted on the checklist. Treated pine may not be used as siding. All siding must be painted or treated with a transparent bleaching or weathering stain to ensure uniformity of wear. Treated lumber must be painted or stained to match the exterior of the house.

MAR 15 2017

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Man-made siding materials must be addressed in the submission packet, and must be specifically approved by the committee prior to installation. If approved, installation of vinyl siding requires use of stainless steel nails, and vinyl soffits must be reinforced.

Exterior paint or stain color must be clearly identified, small samples are required. No pastel or bright colors will be approved. Only white and neutral tones are approved for exterior finish and trim.

Exterior stairs must be carefully designed to be an integral part of the house and blend with its design, to avoid the appearance of an add-on structure. They must be painted or stained. Risers are required between treads. Metal chimneys must be boxed in, preferably with the same material as the siding. No roof-top platform, or exterior access to same, that appears to be attached to the exterior of a house rather than integrated into the design of the building will be approved.

Gas storage tanks are suitable if approved for installation by the appropriate agencies. Gas tanks may be buried. In all cases the area must be entirely concealed with housing and plants. Plans must show location and details of the tank area housing, whether installed above or below ground.

Trash receptacle areas must be screened and should be under the house or near it. Plans must clearly indicate the area's location and materials of the housing. This area must be as "animal proof" as possible to prevent access to household refuse by raccoons, rodents, and other animals. Care must be taken to provide a location that does not impede access by the garbage collectors, for example, the receptacle area may not be housed inside a garage.

HVAC areas must be screened. Plan elevations must clearly show the location and materials of the housing. Use of wood or vinyl lattice may be approved.

Arbors, trellises, etc. must be clearly illustrated on a plan. Location, dimensions, materials, and color must be approved. This type of structure must be painted or stained.

Proposals for installation of all satellite dishes must be submitted for approval. The type and size of such dishes must be noted in accompanying details, and the proposed location is to be clearly shown on a sketch of the house.

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MAR 15 2017

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OUTDOOR LIGHTING: Floodlights and "Harris" type lights on houses, piers and landscape are prohibited. New construction or landscape projects make all existing exterior light fixtures subject to the regulations in the most recent edition of the guidelines. Therefore, all nonconforming fixtures must be removed. Exterior lighting of any kind is discouraged. If such lighting is absolutely necessary, it must be of low wattage and shielded so that the bulb and lens are not visible. Light must not shine directly out, but should wash up and down from the fixture. Selection of the proposed fixtures must also take into consideration factors such as the impact the installed height of the fixture will have on adjacent dwellings. Illumination of stairs, drives and parking areas, or landscape must be by subdued, recessed lighting

mounted as low as practical. Lighting design should take into consideration that outdoor lights are not to be left on all night. Houses on the ocean must not use lighting which may disturb nesting sea turtles.

Exterior lighting of all types must be clearly shown on an electrical plan which is keyed to cut sheets illustrating the fixtures. The committee may require that samples of fixtures be submitted for approval.

LANDSCAPE: All landscape plans should take into consideration proper stewardship of the island's water supply. Consider "Xeriscape" landscape techniques and other water conserving measures. All irrigation systems for new construction and landscape renovations must include sensors to control the system during rain or high moisture situations. Timers must be set to avoid sprinkling during peak demand hours, 6:00 a.m. to 9:00 a.m. and 6:00 p.m. to 9:00 p.m.

Landscape plans for new house construction and for renovations to existing landscape must be from approved plans (See **LANDSCAPE PLAN SUBMISSION REQUIREMENTS**.) Submission of plans for renovations subject a lot to the regulations included in the most current edition of the guidelines; therefore, any non-conforming items must be removed or replaced. All grade and fill activities are regulated (See **GRADE AND FILL**.) Installation of berms and other barriers, irrigation systems, and landscaping other than sod in the area within 30 feet of the center of the roadway require special treatment (see **SETBACKS**.)

Landscape plans must be detailed and plants keyed to a boxed table on the plan listing the name of each species to be planted, their total number and their size. Plans must include sufficient plants to screen and break up the house foundation and screen driveways and parking areas adjacent to the property line. Provide ground cover for bare areas around the house, drive and road. If sod is not used in bare areas, topsoil must be placed over the ground and then planted with a ground cover. The minimum ground cover is Bermuda grass. Screening shrubbery requires planting with maximum four foot centers. Plants installed along the house must be types capable of growing eight feet or more. Quality plants are needed to survive the initial acclimation period. Minimum sizes are three gallon containers or six feet tall, balled and burlaped plants. Ground cover plants like Shore Juniper can be in smaller containers. Landscaping should be installed within 90 days of completion of construction. Landscape lighting must be shown on the plan and a cut sheet illustrating all fixtures included for approval (See **OUTDOOR LIGHTING**.)

DRIVEWAY: Drives must be hard surfaced, or if soft surfaced with materials such as marl or loose stone, must be edged, use a concrete apron of at least 6 feet at the road junction, and have a top coating of gravel. Hard surface drives require drainage to handle a heavy downpour. Drives along a lateral property line, especially if they run to the rear of the house, must be screened by shrubs. A buffer of at least two feet is required between the driveway pavement and the property line.

PARKING: In addition to parking provided by any garage or carport, each house is required to provide off-street parking spaces for at least three cars. These areas are subject to the same requirements as driveways.

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FENCES: Installation of fencing must be approved. Location, height, materials and colors must be clearly shown on plans. Fencing may be used as a wind break, for planting, and to lower the appearance of a house. Fences that run the entire length of the property line and are intended as property delineators are not permitted. Fencing systems should be of a type which leaves 40-50% open space to allow air passage. Such systems cannot exceed 6 feet in height.

DETACHED DECKS: Detailed plans must be submitted for approval. Decks that are not an integral part of a house cannot be more than 18 inches above the ground or have overhead cover. Benches or other additions may not be more than 36 inches above the ground line. Railings must meet state code. Lighting of any kind is discouraged, but if absolutely necessary, must be low wattage and shielded so the bulb or lens are not visible. Final location must be approved. This type of deck is expressly prohibited on any dunes.

BEACH PATHS: Oceanfront homes should provide a walkway over the frontal dune which follows grade and is raised no more than 18 inches above the ground line. If there is an adjacent public beach path, a private path may tie into it. Overhead cover is not allowed. Railings must follow state code. Seating may not be installed without approval by the Committee.

PRIVATE WELLS: The only sources for drinking water on the island are the Utility Company wells, and any interference or contamination would be disastrous. Therefore, the construction of private wells, air to water heat pumps, or any other non-authorized access to the island's fresh water lens is prohibited by the restrictive covenants.

WATER METERS: Meters are the property of the Utility Company and may not be tampered with, or used to control water supply to houses. Figure Eight Island Utility Company requires installation of a cut-off valve with a bleeder between the meter and a structure or irrigation system. Meter valves are not designed to withstand frequent use for purposes such as winterizing or preparing the dwelling for long vacancies. Water meters may not be buried or obstructed. The Utility Company is not responsible for water lines beyond the water meter.

SEPTIC SYSTEMS: Septic systems must comply with state and county health department regulations. All above ground equipment used with septic systems must be screened from the view of the road or adjacent lots with plants or fencing. A copy of the improvement permit must be included with all building plans submitted for approval.

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FEES AND SERVICES

The large number of trucks and contractor vehicles involved at a construction site causes considerable damage to the right of way. An Impact Fee in the amount of \$1,500 is payable to Figure "8" Beach Homeowners' Association, Inc., for new construction to compensate for this expense. The fee is payable upon approval of the plans. In the event construction is not completed within 18 months after the site inspection approval, an additional impact fee of \$1,500 will be charged.

Quantity of fill for all projects must be indicated on the checklist. Lot fill is subject to a 720 yard maximum of material such as dirt, sand, rocks, gravel or concrete. An additional fee of \$3 per yard is charged for fill in excess of 720 yards, and is payable in advance to the Figure "8" Beach Homeowners' Association, Inc.

The Figure Eight Island Utility Company charges \$1500 for connection to the water system. Once installed, a meter fee of \$25 is included in the bi-monthly water bill. This fee does not include water use. The cost of consumption is calculated using the current water rates. A fee of \$8 per piling is charged by the Utility Company if the island's water is used to jet pilings. Both of these fees are payable upon approval of plans and in advance of construction.

A fee of \$100 is charged for new mailbox materials and installation. The cost of trash collection is prorated through fiscal year-end, based on the current year's Annual Assessment. These fees are payable to the Figure "8" Beach Homeowners' Association, Inc.

SERVICES: The builder or owner must notify the Association office upon the completion of a construction project. Services including trash collection and installation of a mailbox may be ordered at that time. Please indicate the preferred mailbox location, allowing one to two weeks for installation (See FEES.)

Please note that all fees are subject to change. For additional information or clarification of these guidelines, call the Association Administrator at (910) 686-0635.

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FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC.

15 Bridge Road • Wilmington, North Carolina 28411 • Telephone (910) 686-0635
FAX (910) 686-1558

**Architectural Review Committee
Projected Meeting Schedule - 2001**

Architectural Review Meetings are subject to the availability of a quorum and the proper receipt of suitable plans. Effective February 19, 2001, the Committee is scheduled to meet at 9:30 a.m. on the first and third Monday of each month at the Association office. Please note that certain holidays* cause an adjustment to the meeting schedule. The Committee or Association Administration reserves the right to change the schedule without notice if deemed necessary. It is highly recommended the meeting date be confirmed by calling the Association office at (910) 686-0635. Plans and all supporting documentation must be submitted to the office no later than 14 days prior to a scheduled meeting to qualify for review.

Projected Schedule 2001:

January 4 and 18

February 1 and 19

March 5 and 19

April 2 and 23*

May 7 and 21

June 4 and 18

July 2 and 16

August 6 and 20

September 4* and 17

October 1 and 15

November 5 and 19

December 3 and 17

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FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC.

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ARCHITECTURAL REVIEW CHECKLIST

FOR CONSTRUCTION PROJECTS

January 2001 Edition.

Please attach to plans for review of construction projects including:
A new house, an addition, or any other exterior changes to an existing structure.

DATE SUBMITTED: _____

OWNER'S NAME _____

ARCHITECT'S NAME _____

PROPERTY ADDRESS _____

ARCHITECT'S PHONE _____

PROJECT DESCRIPTION _____

REQUIRED:

- | | | |
|--|-----|----|
| 1. Architect's seal on drawings | Yes | No |
| 2. Final site plan includes: original and proposed topography, lot boundaries, setback lines, road right of way, house and deck outline, adjacent house lines, driveway, parking, paths, detached decks, septic system, trash receptacle, HVAC, and gas tank enclosures | Yes | No |
| 3. Fill in excess of 720 cubic yards: _____ (Additional fee required) | | |
| 4. Landscape Project checklist and plan attached (Required for review of new house plans) | Yes | No |

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ARC checklist - Construction projects
Continued

- | | | | |
|-----|--|-----|----|
| 5. | Concealed garbage receptacle area illustrated on elevation Material and color _____ | Yes | No |
| | Concealed HVAC area illustrated on elevation Material and color _____ | Yes | No |
| | Concealed gas tank area illustrated on elevation Material and color _____ | Yes | No |
| 6. | Electrical plan locating all exterior light fixtures Cutsheets illustrating all exterior fixtures keyed to plan | Yes | No |
| 7. | Siding material _____ Color samples for siding and trim included | Yes | No |
| | Roofing material _____ Color sample included | Yes | No |
| | Driveway material _____ | | |
| 8. | Maximum height of roof peak _____ Height illustrated on street side elevation With notation referencing basis of measurement | Yes | No |
| 9. | Heated Square footage _____ Deck Square footage _____ | | |
| 10. | Piling depth _____ Number of Pilings _____ (Fee required) | | |
| 11. | CAMA Permit or Exemption Certificate Attached | Yes | No |
| 12. | Copy of current Improvement (Septic) Permit enclosed Number of bedrooms approved on septic permit _____ | Yes | No |
| 13. | Property Owner's Statement Attached | Yes | No |
| | Indemnity Agreement Attached | Yes | No |
| 14. | Contractor's Name, Address, Phone Number Attached | Yes | No |
| | Contractor's Agreement Attached | Yes | No |
| 15. | House, deck and side-lot lines staked for site inspection | Yes | No |

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FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC.

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ARCHITECTURAL REVIEW CHECKLIST

FOR LANDSCAPE PROJECTS

January 2001 Edition

Please attach to plans for review of all landscape projects.

Note: Landscape plans are required for review of plans for new house construction.

Date submitted: _____

PROPERTY OWNER: _____

PROPERTY ADDRESS: _____

CONTRACTOR NAME: _____

PHONE: _____

Project Description: _____

Landscape site plan illustrates:

Property lines, setbacks, road right of way. Yes No

Original and proposed grade Yes No

Quantity of fill _____

Plant type and size keyed to boxed table. Yes No

Electrical plan locating all landscape lighting
keyed to cutsheet illustrating all fixtures. Yes No

Irrigation system in use Yes No
If yes, moisture sensing cutoff device
manufacturer and model _____

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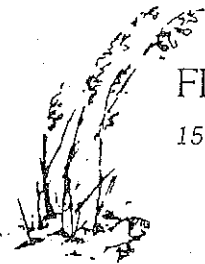


FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC.

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ARCHITECTURAL REVIEW CHECKLIST

FOR MARINE IMPROVEMENTS

January 2001 Edition

Please attach to plans when submitting for approval.

Date submitted: _____

OWNER'S NAME: _____

PROPERTY ADDRESS: _____

MARINE CONTRACTOR NAME: _____

TELEPHONE: _____

PROJECT DESCRIPTION: _____

- | | | | |
|----|---|-----|----|
| 1. | CAMA or Exemption Certificate attached | Yes | No |
| 2. | Bulkhead / seawall: Site plan including existing elevations at road, bulkhead and setback areas; height of bulkhead; height and length of return. Quantity of fill _____. | Yes | No |
| 3. | Piers / docks / boatlifts / etc.: Site plan including lot boundaries, riparian corridors marine improvements at adjacent properties, location of all lighting shown and keyed to cutsheets illustrating all light fixtures. | Yes | No |

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FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC.

15 Bridge Road • Wilmington, North Carolina 28411 • Telephone (910) 686-0635
FAX (910) 686-1558

NOTICE AND INDEMNITY AGREEMENT

The Architectural Review Committee of the Figure "8" Beach Homeowners' Association, Inc. does not review plans or inspect construction to insure compliance with the North Carolina building code or with any other governmental rules, codes or standards. It is the responsibility solely of the owner and the owner's architects and contractors to assure that structures, improvements and activities meet all applicable rules, codes and standards and that the structure, improvements and activities do not violate any legal standards governing the effect of the construction, improvements and activities on other property or other property owners.

The Owner (s) hereby indemnifies and holds harmless the Figure "8" Beach Homeowners' Association, Inc., its officers, directors and employees, and the Architectural Review Committee of the Association and its members from any claims, demands and liability (including all costs, expenses and reasonable attorneys' fees) that arise out of the approval of the owners plans for construction, improvement or activities on the Owner's lot at Figure Eight Island.

Property Owner's Signature

Property Address

Date

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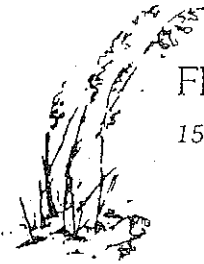


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PROPERTY OWNER'S STATEMENT

I have read the Architectural Review Guidelines which, by the authority of the Association's Restrictive Covenants, By Laws and Board of Directors, govern all construction and improvement activities on residential lots on Figure Eight Island. I understand these guidelines and I, the architect or project's designer, and the contractor or subcontractors for my project will abide by all island rules, regulations and guidelines.

Property Owner

Date

Project Address

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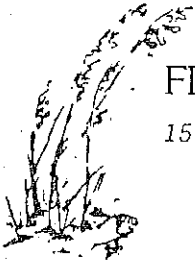


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CONTRACTOR AGREEMENT

I have read and understand the Architectural Review Guidelines which govern all construction and improvement activities on Figure Eight Island. I agree to abide by all island rules, regulations and guidelines and understand that failure to do so may result in denial of island access or the suspension of my right to continue working on Figure Eight Island.

Contractor's Signature

Date

Project Address: _____

Project Type: _____

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CONTRACTOR REGULATIONS

January 2001

1. **CONSTRUCTION HOURS.** Construction activities are allowed from 7:00 A.M. to 6:00 P.M. Monday thru Friday. Workers may not enter the island before 6:30 A.M. and may not start work before 7:00 A.M. Workers must leave the island each evening by 6:30 P.M. unless approved by the office. Exceptions are granted solely at the discretion of the Administrator.
2. **ACCESS TO ISLAND.** Workers must use the left lane at the gate and must be logged in before proceeding onto the island. All vehicles are issued a contractor's pass which must be displayed in the vehicle at all times while on the island. This pass must be turned in upon leaving the island for the day. A box at the exit side of the gate house is provided for returning daily passes. Visitors are not permitted at construction sites. Island facilities such as the beach are off limits. Workers are permitted to travel to and from the authorized work site only. Pets may not be brought onto the island by any workers.
3. **APPROVED PLANS.** All building, renovation, painting and landscaping activities must be approved by the Architectural Review Committee before construction. Significant changes during construction must be submitted for approval. **NO WORK INCLUDING PAINTING MAY BEGIN WITHOUT APPROVAL.** Contractors in violation of this rule risk revocation of island privileges.
4. **SITE PREPARATION.** Site clearing or grading may not begin without ARC approval. Existing dunes, vegetation, and neighboring property must be protected during construction. Excavated or fill material may not be stored on other property and must be at least 10 feet in from the edge of the road.
5. **ACCESS TO CONSTRUCTION SITE.** Access to the site is only from the owner's frontage on the hard surface road. Do not cross over adjacent lots or public land. Do not store materials or equipment on adjacent lots. Vehicles should be parked on the site only. If it is necessary to park along the road, **VEHICLES MUST PARK COMPLETELY OFF THE PAVEMENT.** Parked vehicles must not obscure the view of oncoming traffic.
6. **HEAVY EQUIPMENT** may not be left on the roadside without permission from the office. Equipment left overnight must have a visible note inside with a name and phone number for emergency contact.
7. **TRAFFIC SAFETY.** Speed limit on Bridge is 15 m.p.h. -- for trucks with a heavy load, 5 m.p.h. The island speed limit is 25 m.p.h. or as posted. **REDUCE SPEED IN CONGESTED AREAS.** Do not stop vehicles or otherwise block traffic on island roads, if necessary to stop, vehicles must be entirely off pavement. Tailgates or covers are required for loose cargo.
7. **SIGNS.** No signs of any kind are permitted at any time. Advertising and soliciting is prohibited.
8. **FACILITIES.** Port-a-Johns are required, must be out of sight, and attractively screened with a minimum of lattice. No exceptions will be made.
9. **TRASH.** Dumpsters are required and must be set a minimum of 10 feet from the paved roadway. If the dumpster is visible, screening is required. Site must be kept clean and policed daily, especially before leaving on Friday. Dumpsters must be emptied prior to weekends and holidays.
10. **TELEPHONE.** A site phone or emergency phone number must be registered with the office. A pay phone is located in the parking lot next to the gate for your convenience.
11. **RADIOS.** Radios, tape players and the like are not permitted on job sites. Commercial 2-way radio volume must be set at minimum while on the island.
12. **FIRES.** No open fires of any kind, even in a metal barrel.
13. **FIREARMS.** Firearms are strictly prohibited on Figure Eight.

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Call the Administrator, Art Poineau with questions (910) 686-0635. Your cooperation is appreciated. Serious violations of the rules can result in denial of access to the island for individuals or suspension of construction.



FOR REGISTRATION REGISTER OF DEEDS
REBECCA P. SMITH
NEW HANOVER COUNTY, NC
2006 APR 26 09:21:37 AM
BK:5012 PG:74-704 FEE:\$1,901.00

INSTRUMENT # 2006023131

**AMENDED AND RESTATED
DECLARATION OF RESTRICTIVE COVENANTS
FIGURE EIGHT ISLAND**

Prepared by: W. A. Raney, Jr., Attorney at Law, P.O. Box 1049, Wilmington, NC 28402.

Return to: Wessell & Raney, L.L.P.

STATE OF NORTH CAROLINA
COUNTY OF NEW HANOVER

KNOW ALL MEN BY THESE PRESENTS

The undersigned owners of lots on Figure Eight Island, on behalf of themselves and all lot owners on Figure Eight Island, and their successors, personal representatives, heirs and assigns, do hereby amend the restrictive covenants applicable to all lots on Figure Eight Island as stated hereinafter and approve the Amended and Restated Restrictive Covenants set forth herein.

WITNESSETH:

That the residential lot development known as Figure Eight Island began with the recording of a set of restrictive covenants in 1966, recorded in Book 789, Page 358, New Hanover County Registry, and lots were sold by the developers subject to these restrictions.

That the restrictions have been amended by successive developers on several occasions with the restrictions being completely rewritten in 1972 and 1978 and consolidated in 1993 by the action of the lot owners.

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The history of restrictions on lots is as follows:

| | | |
|------|----------------------|--|
| 1966 | Book 789, Page 358 | First Complete Set of Restrictions |
| 1966 | Book 796, Page 388 | Amendment of Paragraph 9 of Restrictions in Book 789, Page 358 |
| 1968 | Book 839, Page 607 | Amendment of Paragraph 31 of Restrictions in Book 789, Page 358 |
| 1972 | Book 933, Page 286 | Amendment to Completely Re-Write Restrictions in Book 789, Page 358 |
| 1978 | Book 1135, Page 954 | Amendment to Completely Re-Write Restrictions in Book 789, Page 358, Book 839, Page 607 and Book 933, Page 286 |
| 1980 | Book 1162, Page 1883 | Amendment of Paragraph 1(a) of Restrictions in Book 1135, Page 954 |
| 1993 | Book 1657, Page 317 | Amendment to adopt 1978 Restrictions for all lots and to amend Paragraph 8 |

That the current Restrictions provide that the restrictions may be changed or amended when an instrument signed by a majority of the lot owners has been recorded, agreeing to change said covenants in whole or in part.

That under the 1993 Amended Restrictions the Figure "8" Beach Homeowners' Association, Inc. or Association was substituted for Continental Illinois Realty or CIR where appropriate.

That at a duly called meeting of the Board of Directors of Figure "8" Beach Homeowners' Association held on the 26th day of March, 2005, the Board of Directors adopted a Resolution recommending to the membership that certain amendments be made to the existing Restrictions and that the Restrictions incorporating the amendments approved by the membership be restated and recorded in the New Hanover County Registry.

That the undersigned lot owners on Figure Eight Island, being a majority of the owners of lots on Figure Eight Island, by signing these Amended and Restated Restrictive Covenants, Figure Eight Island, do adopt the following as covenants applicable to Figure Eight Island and the

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residential lots on Figure Eight Island.

1. Definitions. As used in this Declaration of Restrictive Covenants, the following terms shall mean:

- (a) (Deleted by Amendment).
- (b) "Record or Recording" refers to record or recording with the Register of Deeds for New Hanover County or Pender County, North Carolina.
- (c) "Property" generally means the lands known as Figure Eight Island, New Hanover County, North Carolina. Said lands are also known as Figure "8" Beach.
- (d) "Residential lots" or "lots" means those portions of the property specifically allocated, platted and/or recorded as lots for sale and/or use as single family residences.
- (e) "Association" shall mean the Figure "8" Beach Homeowners' Association, Inc., its successors and assigns.
- (f) "Restrictions" shall mean this Amended and Restated Declaration of Restrictive Covenants.
- (g) "Island Administrator" shall mean the chief executive officer of the Association.

2. Applicability. These Restriction shall apply to all residential lots on Figure Eight Island and, where the context requires, to the common areas and other areas owned by the Association.

3. Reservations. The Association reserves the right absolutely to change, alter or redesignate the allocated, planned, platted or recorded use or designation of any property on any of the lands known as Figure Eight Island including, but not limited to, the right to change, alter or redesignate roads, utility and drainage facilities, and to change, alter or redesignate such other present and proposed amenities or facilities as may, in the sole judgment of the Association, be necessary or desirable.

4. Building and Site Improvements. No building, fence, wall, bulkheading or other structure shall be erected, placed or altered on any residential lot, nor shall the grade or elevation or

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physical characteristics, including, but not limited to, dunes and ridges, of any such lot, or portion thereof, be altered in any way whatsoever, until the proposed building plans, specifications, exterior colors and finishes, site and grading plans (showing the proposed location of such building or structure, drives, parking areas and proposed alterations to the grade, elevation or physical characteristics of the site), and construction schedule shall have been approved in writing by the Association. Refusal of approval of any such plans, location or specifications may be based by the Association upon any ground, including environmental considerations, that in the sole and uncontrolled discretion of the Association shall seem sufficient. Without the prior written consent of the Association, no changes or deviations in or from such plans or specifications as approved shall be made. No alterations in the exterior appearance of any building or structure, or in the grade, elevation, or physical characteristics of any lot shall be made without like approval by the Association. One (1) copy of all plans and related data shall be furnished to the Association for its records. The Association shall not be responsible for any structural or other defects in plans or specifications submitted to it or in any structure erected according to such plans and specifications.

5. Approval of Plans.

(a) No house plans will be approved unless prepared by an architect and bear an architect's seal, and unless the proposed house has the minimum required square footage of enclosed dwelling area.. Such minimum requirements for each lot may be specified in each deed. The term "enclosed dwelling area" as used in these minimum size requirements shall mean the total enclosed area within a dwelling; provided, however, that such term does not include garages, boat sheds, terraces, decks, open porches, and like areas; provided further, that shed-type porches, even though attached to the house, are specifically excluded from the definition of the aforesaid term "enclosed dwelling area". If for any reason any deed recorded might not specify the minimum required square footage of enclosed dwelling area, the minimum for said house will be 2,000 square feet. However, if the minimum square footage in the deed specifies otherwise, such amount shall be controlling.

(b) Since the establishment of standard inflexible building setback lines for location of houses on lots tends to force construction of houses both directly behind and directly to the side of other homes with detrimental effects on privacy, view of the ocean, preservation of dunes, important trees and other vegetation, ecological and related considerations, no specific setback lines

are established by these Restrictions. In order to assure, however, that the foregoing considerations are given maximum effect, the Association reserves the right to control and approve absolutely the site and location of any house or dwelling or other structure upon any lot. The Association may grant variances from property line setback restrictions set forth on recorded subdivision maps for Figure Eight Island upon a finding of unnecessary hardship and a finding that the variance is consistent with the spirit, purpose and intent of the Restrictive Covenants.

(c) All houses and other structures must be completed within eighteen (18) months after the construction of same shall have commenced, except where such completion is impossible or would result in great hardship to the owner or builder due to strikes, fires, national emergency or natural calamities.

(d) Each lot owner shall provide receptacles for garbage, in a screened area not generally visible from the road, or provide underground garbage receptacles or similar facility in accordance with reasonable standards established by the Association.

(e) Each lot owner shall provide space for parking three automobiles off the street prior to the occupancy of any dwelling constructed on said lot in accordance with reasonable standards established by the Association.

(f) No trees, bushes, shrubs, beach or marsh grasses or other vegetation whatsoever may be removed, planted or installed from or on any lot without prior written approval of the Association, based upon a site plan, landscaping plan or planting plan submitted to the Association.

(g) No structure, except as hereinafter provided, shall be erected, altered, placed or permitted to remain on any lot other than a detached single family dwelling not to exceed two (2) stories in height, unless the Association approves in writing a structure of more than two stories pursuant to paragraphs 4(a) and 5(a) hereof, and one or more small accessory buildings (which may include a detached private garage, cabana, servants' quarters, or guest facilities) provided the use of such dwelling or accessory buildings does not in the opinion of the Association overcrowd the site, and provided further, that such buildings are not used for any activity normally conducted as a business. Such accessory building may not be constructed prior to the construction of the main building.

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6. Residential Use.

(a) All lots shall be used for residential purposes exclusively.

(b) No trailer, tent or other structure of a temporary character shall be placed upon any lot at any time, provided, however, that this prohibition shall not apply to shelters used by the contractor during the construction of the main dwelling house, it being clearly understood that these latter temporary shelters may not, at any time, be used as residences or permitted to remain on the lot after completion of construction, and provided further that tents to provide shelter for social events may be erected on a lot for a period not to exceed five (5) days. Small tents, cabanas and similar structures may be placed on a lot or on the ocean beach for daily use, but must be removed at the end of each day.

(c) No fuel tanks or similar storage receptacles may be exposed to view. Any such receptacles may be installed only within the main dwelling house, within an accessory building, within a screened area, or buried underground; provided, however, that nothing contained herein shall prevent the Association or a utility company owned by the Association from erecting, maintaining, placing or permitting the placing of tanks, or other apparatus, on the property for uses related to the provisions of utility or other service.

(d) A guest suite or like facility may be included as a part of the main dwelling or accessory building, but such suite may not be rented or leased except as part of the entire premises including the main dwelling, and provided, however, that such guest suite would not result in overcrowding the site.

(e) Prior to the occupancy of a residence on any lot, proper and suitable provision shall be made for the disposal of sewage by means of a septic tank or other method, provided that any such method must be approved by the Association and the appropriate State or County health authorities.

7. Maintenance, Noise.

(a) It shall be the responsibility of each lot owner to prevent the development of any unclean, unsightly or unkept conditions of buildings or grounds on such lot which shall tend to substantially decrease the beauty of the neighborhood as a whole or the specific area.

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(b) No noxious or offensive activity shall be carried on upon any lot, nor shall anything be done thereon tending to cause embarrassment, discomfort, annoyance, or nuisance to the neighborhood. There shall not be maintained any plants or animals, or device or thing of any sort whose normal activities or existence is in any way noxious, dangerous, unsightly, unpleasant or of a nature as may diminish or destroy the enjoyment of other property in the neighborhood by the owners thereof.

(c) The following restrictions on noise apply to all lots and piers:

- (i) At all times noise levels from any lot or pier, other than the normal operation of customary construction, maintenance and landscaping equipment must not exceed the level that unreasonably interferes with normal conversation on the open areas of adjacent lots.
- (ii) In addition to (i) above, the Association may adopt rules and regulations regarding control of noise.
- (iii) Notwithstanding the provisions of 7(c)(i) and (ii), the Association may approve the use of amplified speech, music or other noise under such conditions as the Association determines will not unreasonably disturb other lot owners. The Association may require notification of other owners within a certain distance of the proposed noise producing activity prior to granting or denying approval herein. The Association may delegate authority to grant or deny approvals hereunder to the Island Administrator under standards and policies established by the Board of Directors of the Association.

8. Assessments.

(a) The owner of each residential lot shall, by the acceptance of a deed or other conveyance for such lot, be deemed obligated to pay to the Association an annual assessment or charge to be fixed, established and collected on a lot by lot basis as hereinafter provided. Said annual assessment or charge shall be due on the day established by the Association for the year for which it is assessed, provided that the Association may make provision for payment thereof in installments. Each annual assessment or charge (or installment thereof) shall, when due, become a

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lien against the lot against which such assessment or charge is made. Upon demand, the Association shall furnish to any owner or mortgagee a certificate showing the assessments or charges due, or installments thereof, as of any given date. Each lot subject to these restrictions is hereby made subject to a continuing lien to secure the payment of each assessment or charge (or installment thereof) when due.

(b) Such assessment or charge shall be in an amount to be fixed from year to year by the Association, which may establish different rates from year to year as it may deem necessary and may establish different rates for various general classifications of lots according to the use or location of said lots. The Association may levy additional assessments if necessary to meet the needs of the entire Island or portion thereof. Such additional assessments or changes shall be in amounts to be fixed by the Association which may establish different assessments or changes for different classifications of lots according to the location of the lot, the benefit to be obtained from the project by the lot owners, the ad valorem tax valuation of the lot (to include or not include dwelling) as established by the New Hanover County Tax Assessor, and any other factors or criteria deemed sufficient by the Association.

(c) The funds arising from said assessment or charge or additional assessment may be used for any or all of the following purposes: Maintaining, operating, improving and replacing the bridges; protection of the property from erosion; channel dredging; beach nourishment; collecting and disposing of garbage, ashes, rubbish and the like; maintenance, improvement and lighting of the streets, roads, drives, rights of way, community land and facilities, tennis courts, marsh and waterways; employing watchmen; enforcing these restrictions; paying taxes, indebtedness of the Association, insurance premiums, governmental charges of all kinds and descriptions and, in addition, doing any other things necessary or desirable in the opinion of the Association to keep the property in neat and good order and to provide for the health, welfare and safety of owners and residents of Figure Eight Island.

(d) Upon the failure of the owner of any lot to pay any such assessment or charge, additional assessment, or installment thereof when due, the Association shall have the right to collect the amount thereof by an action at law against the owners as for a debt, and may bring and maintain such other suits and proceedings at law or at equity as may be available. Such rights and powers

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shall continue in the Association and the lien of such charge shall be deemed to run with the land and the successive owners of each lot, by the acceptance of deeds therefor, shall be deemed personally to assume and agree to pay all unpaid assessments or charges or additional assessments which have been previously levied against the property, and all assessments or charges or additional assessments as shall become a lien thereon during their ownership. Unpaid assessments or charges, additional assessments, or installments thereof, shall bear interest at the rate of one and one-half (1½%) percent per month, or at the maximum legal rate, whichever is less, from the due date thereof, until paid. All costs and reasonable attorney's fees incurred in collection of delinquent assessments together with accrued interest shall become a lien against the lot.

(e) The monies collected by virtue of the assessments or charges or additional assessments, or the lien provided by this section, shall be paid to the Association to be used in such manner and to the extent as the Association may determine, in accordance with paragraph 8(c) hereof, for the benefit of the residents of Figure Eight Island. The judgment of the Association in the making of assessments or charges or additional assessments and the expenditure of funds shall be final.

(f) The Association shall not be obligated to spend in any one calendar year all of the sums collected during said year by way of assessments or charges or additional assessments and may carry forward to surplus any balance remaining. The Association shall not be obliged to apply any such surplus to the reduction of charges in the succeeding year.

(g) The Association shall have authority, in its discretion, to borrow money to expend for the purposes set forth in paragraph 8(c) hereof upon such terms and security and for such periods as it may determine, and to repay said borrowings and the interest thereon from the assessments or charges or additional assessments provided for in this paragraph 8.

9. Entry. The Association, its successors and assigns, and its agents are granted the right to enter upon any residential lot, such entry to be made by personnel with suitable devices and equipment, for the purpose of mowing, removing, clearing, cutting or pruning underbrush, weeds or other unsightly growth, repairing or maintaining exteriors of structures, or for the purpose of building or repairing dunes or other earthwork, which in the opinion of the Association detracts from or is necessary to maintain the overall beauty, ecology, setting and safety of the property. Such

entrance shall not be deemed a trespass. The Association and its agents may likewise enter upon any lot to remove any trash which has collected without such entrance and removal being deemed a trespass. The Association is authorized to make reasonable charges to the owner for such services, which shall become a lien upon the lot. The provisions of this paragraph shall not be construed as an obligation on the part of the Association to undertake any of the foregoing.

10. (Deleted by Amendment).

11. (Deleted by Amendment).

12. Signs. No sign of any character shall be displayed except signs required by governmental authority and a property identification sign that complies with the Architectural Guidelines or other rules adopted by the Association. The Association may erect signs on Association property which it deems appropriate to conducting the business of the Association.

13. Miscellaneous Easements. The Association reserves unto itself, its successors and assigns, a perpetual, alienable, assignable and releasable easement and right on, over and under the ground with men and equipment to erect, maintain, inspect, repair and use electric and telephone poles, wires, cables, conduits, sewers, water mains and other suitable equipment for the conveyance and use of electricity, telephone equipment, gas, sewer, water or other public conveniences or utilities on, in or over the rear ten (10) feet of each lot and ten (10) feet along one (1) side of each lot and such other areas as are shown on the applicable plat; provided further, that the Association may cut drainways for surface water whenever action may appear to the Association to be necessary in order to maintain reasonable standards of health, safety and appearance. These easements and rights expressly include the right to cut any trees, bushes or shrubbery, make any grading of the soil, or to take any other similar action reasonably necessary to provide economical and safe utility installation and to maintain reasonable standards of health, safety and appearance. It further reserves the right to locate wells, pumping stations, and tanks within residential areas on any walkway, or on any residential lot now or subsequently designated for such use or to locate same upon any lot with the permission of the owner of such lot. Such rights may be exercised by any licensee of the Association, but this reservation shall not be considered an obligation of the Association to provide or maintain any such utility or service.

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14. Wells. No private water wells may be drilled or maintained on any residential lot without the prior written consent of the Association.

15. Subdividing.

(a) No lot shall be subdivided, or its boundary lines changed, except with the prior written consent of the Association.

(b) No lot shall be increased in size by filling in the waters on which it abuts without the prior written approval of the Association and state and federal agencies.

16. Docks, etc.

(a) No private docks, piers, moorings, boat houses, slips or similar structure may be erected on, placed on or connected to any lot, unless specifically approved by the Association. All piers and docks constructed in compliance with applicable governmental standards prior to January 1, 2005 shall be deemed approved by the Association. In the event of such approval, the following terms and conditions must be complied with:

- (i) Complete plans and specifications including site, material, color and finish must be submitted to the Association in writing;
- (ii) Written approval by the Association of such plans and specifications must be secured, the Association being granted the right in its uncontrolled discretion to disapprove such plans and specifications on any grounds;
- (iii) Any alterations of the plans and specifications or of the completed structure must also be submitted to the Association in writing, and the Association's approval in writing must be similarly secured prior to construction, the Association having the same rights to disapprove alterations as it has for disapproving the original structures;
- (iv) The Association shall not be responsible for any structural or other defects in plans or specifications submitted to it or in any structure erected according to such plans or specifications.
- (v) Pier length is in the discretion of the Association. In no case shall a pier exceed 200' in length from the normal high water line on any lot

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or the bulkhead on any lot, whichever is farther landward.

(b) All lot owners who construct or cause to be constructed private docks, piers, moorings, boat houses, slips or similar structure pursuant to paragraph 16(a) hereof must maintain said structures in good repair and keep the same clean and orderly in appearance at all times, and further agree to paint or otherwise treat with preservatives all wood or metal located above the high water mark, exclusive of pilings, and to maintain such paint or preservatives in an attractive manner. The Association shall be the judge as to whether such structures are clean, orderly in appearance, and properly painted or preserved in accordance with reasonable standards, and where the Association notifies the particular lot owner in writing that such structures fail to meet acceptable standards, said lot owner shall thereupon remedy such condition within thirty (30) days to the satisfaction of the Association, and that failing to so remedy such conditions, the lot owners hereby covenant and agree that the Association may make the necessary repairs, but is not obligated to make such repairs or take such action as will bring such structures up to acceptable standards, all such repairs and actions to be at the expense, solely, of the lot owner in question, and same shall become a lien upon the lot.

17. Approval.

(a) Prior to purchasing any lot, the purchaser must be approved as a member of the Association and by the recording of the deed to the lot purchased becomes and agrees to continue to be a member of the Association and agrees to abide by, and be subject to, the charter and by-laws of the Association and these Restrictions. Any purchaser, his heirs or assigns, who purchases residential property on Figure Eight Island at a sale held pursuant to foreclosure of, or sale under a power of sale contained in, a deed of trust or mortgage executed to secure an indebtedness to a bank, savings and loan association or insurance company, shall be automatically approved as a member of the Association.

(b) For lots owned by other than natural persons, the Association may, by rule, establish a limit on the number of individual persons who are entitled to exercise the owner's membership rights and to usage of common areas such as the bridge and roads which are owned by the Association.

(c) For lots owned jointly by natural persons, the Association may, by rule, establish a limit on the number of owners who are entitled to membership rights and to usage of

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common areas such as the bridge and roads owned by the Association; except that no limitations on access to lots will be placed on owners of lots which are owned entirely by persons who are related by blood, legal adoption or marriage.

(d) Interval ownership, also known as time share ownership, is not permitted. No owner may lease, deed, sell, convey or otherwise transfer ownership of a lot under any time sharing or interval ownership arrangement or subject a lot to a time share instrument as defined in G.S. 93A-41.

(e) The Association may adopt rules requiring the owner(s) of lots to designate the person or persons authorized to receive official notices of the Association and authorized to cast votes for the lot on behalf of the owner(s) in matters involving a vote of members.

18. Covenants Run with the Land. All covenants, restrictions, and affirmative obligations set forth in these Restrictions shall run with the land and shall be binding on all parties and persons claiming under them to specifically include, but not be limited to, the successors and assigns, if any, of the Association, for a period of ten (10) years from the date hereof after which time all said covenants shall be automatically extended for successive periods of ten years, unless an instrument signed by a majority of the then owners of lots has been recorded, agreeing to change said covenants in whole or in part.

19. Violations. In the event of a violation or breach of any of the Restrictions by any lot owner, or agent of such owner, the Association or owners of any other property on Figure Eight Island, or any of them jointly or severally shall have the right to proceed at law or equity to compel a compliance to the terms hereof or to prevent the violation or breach. The Association shall have the right to proceed at law or equity to compel compliance with the By-Laws or rules and regulations of the Association or to prevent their violation or breach. In addition to the foregoing, the Association shall have the right, whenever there shall have been built on any lot any structure which is in violation of these Restrictions, to enter upon such property where such violation exists, and summarily abate or remove the same at the expense of the owner, if after thirty (30) days written notice of such violation it shall not have been corrected by the owner. Any such entry and abatement or removal shall not be deemed a trespass. The failure to enforce any right, reservations, restrictions, or condition contained in these Restrictions, however long continued, shall not be deemed a waiver

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of the right to do so hereafter as to the same breach, or as to a breach occurring prior or subsequent thereto and shall not bar or affect its enforcement.

19.1 Fines. The Association may levy fines against any lot owner or any family member, guest, employee, tenant, contractor, trustee, beneficiary, member, shareholder or director of a lot owner for violations of the Declaration, By-Laws or rules and regulations of the Association. Any lot owner against whom a fine is levied is entitled to notice of the alleged violation and the proposed fine and to a hearing before the fine shall become final. A fine not to exceed the maximum allowed under the North Carolina Planned Communities Act, as it may be amended from time to time, may be imposed for each violation and, without further hearing, for each day the violation continued after the decision that a violation occurs. Persons who are not members of the Association against whom a fine is levied are not entitled to a hearing unless such person is a person authorized to exercise membership rights on behalf of a lot owner that is not a natural person.

19.2 Suspension of privileges and services. The Association may suspend privileges or services for a reasonable time to any lot owner or any family member, guest, employee, contractor, trustee, beneficiary, member, shareholder, director of a lot owner for a violation of the Declaration, By-Laws or rules and regulations of the Association. Before privileges or services are suspended to a lot owner or to a person authorized to exercise membership rights for a lot owner that is not a natural person, the owner or person is entitled to notice of the alleged violation and proposed suspension and to a hearing before the suspension is final. Suspension of privileges or services to persons other than lot owners or persons authorized to exercise membership rights for a lot owner that is not a natural person may be imposed by the Association without a hearing.

19.3 Adjudicatory panel. The Board of Directors of the Association may appoint an adjudicatory panel to hold hearings under paragraph 19.1 and 19.2 above. In the absence of such a panel the hearing shall be held by the Board of Directors.

20. Invalidation. The invalidation by any Court, agency or legislation of any provision of these Restrictions shall in no way affect any of the other provisions of these Restrictions, but they shall remain in full force and effect.

21. (Deleted by Amendment).

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22. Dedication to Public Use. Nothing in these Restrictions, nor in the recording of any plat or deed pursuant hereto, shall dedicate (or be deemed to dedicate) to public use any of the streets, bridges, common lands or other grounds within Figure Eight Island.

23. Easements of Access and Open Space.

(a) Each and every lot owner is hereby granted an easement to pass over, use and enjoy open spaces now or subsequently designated on recorded plats as community open space, and all roads, bridges, and rights of way, provided, however, that the Association, its successors or assigns shall, in its sole discretion, retain the right to establish rules and regulations for the use and enjoyment of all such property.

(b) The Association reserves the right to erect and maintain utilities, drainways and other public conveniences in common lands, including the right to cut any trees, bushes or shrubbery, make any gradings of the soil, build buildings or take any similar action reasonably necessary or desirable to provide economical and safe installation and service, to establish reasonable fees, and to maintain reasonable standards of health, safety and appearance. Such rights may be exercised by a licensee of the Association.

(c) (Deleted by Amendment).

(d) (Deleted by Amendment).

(e) It is expressly understood and agreed that the granting of these easements in no way places a burden of affirmative action on the Association.

24. Miscellaneous.

(a) Where the Association is permitted by these covenants to correct, repair, clean, preserve, clear out or do any action on the restricted property, entering the property and taking such action shall not be deemed a breach of these covenants.

(b) Hunting on the property shall not be allowed.

(c) No change of condition or circumstances shall operate to extinguish, terminate or modify any of the provisions of these restrictions, but they shall be extinguished, terminated or modified only by their action and in the manner provided in this Declaration.

(d) In all cases the restrictions set forth or provided for in these restrictions shall be construed together and shall be given that interpretation or construction which will best tend

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toward their strict enforcement, and, if necessary, they shall be so extended or enlarged by implication as to make them fully effective.

(e) (Deleted by Amendment).

IN WITNESS WHEREOF, the Figure "8" Beach Homeowners' Association, Inc. has caused this instrument to be signed in its name by the authority of its Board of Directors and the approval of this instrument is given by a majority of the lot owners as indicated by the signatures attached hereto.

FIGURE "8" BEACH HOMEOWNERS
ASSOCIATION, INC.

By: *Earl Johnson Jr*
Earl Johnson, Jr., President

NORTH CAROLINA
WAKE COUNTY

I, TERRE A. EDWARDS, a Notary Public, certify that EARL JOHNSON, JR., President of FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC., a North Carolina corporation, personally came before me this day and acknowledged that he is President of FIGURE "8" BEACH HOMEOWNERS' ASSOCIATION, INC., and that he, as President, and being authorized to do so, executed the foregoing on behalf of the Corporation.

WITNESS my hand and notarial seal this 31ST day of MARCH, 2006.

Terri A. Edwards

TERRE A. EDWARDS, Notary Public
(Printed Name of Notary Public)

My commission expires:

2-28-2011



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MHW

Development Line

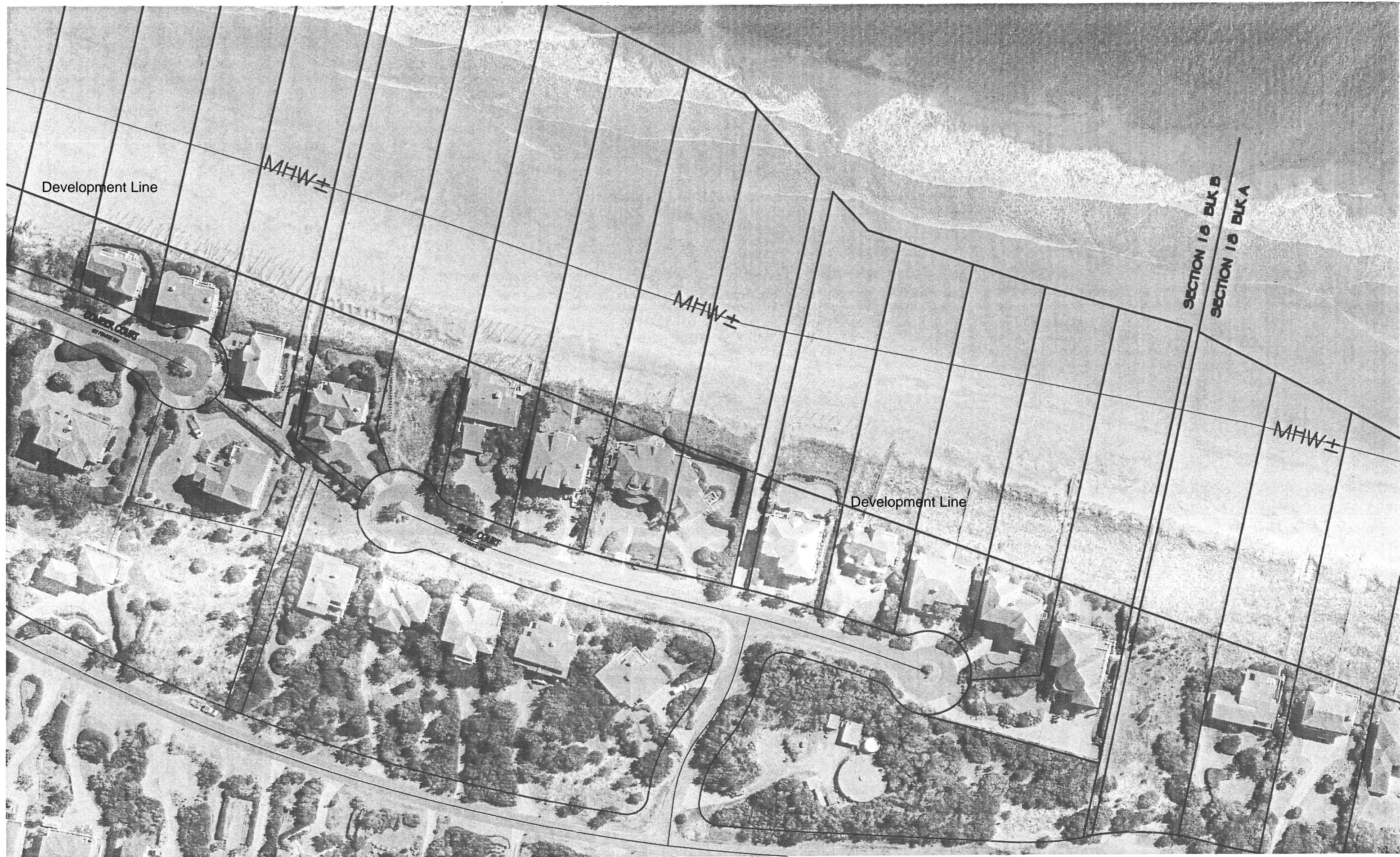
MHW

INLET HOOK
60' PRIVATE RW

COMBER ROAD
60' PRIVATE RW

OYSTER CATCHER ROAD
60' PRIVATE RW

BEACH ROAD NORTH
60' PRIVATE RW



Development Line

MHW ±

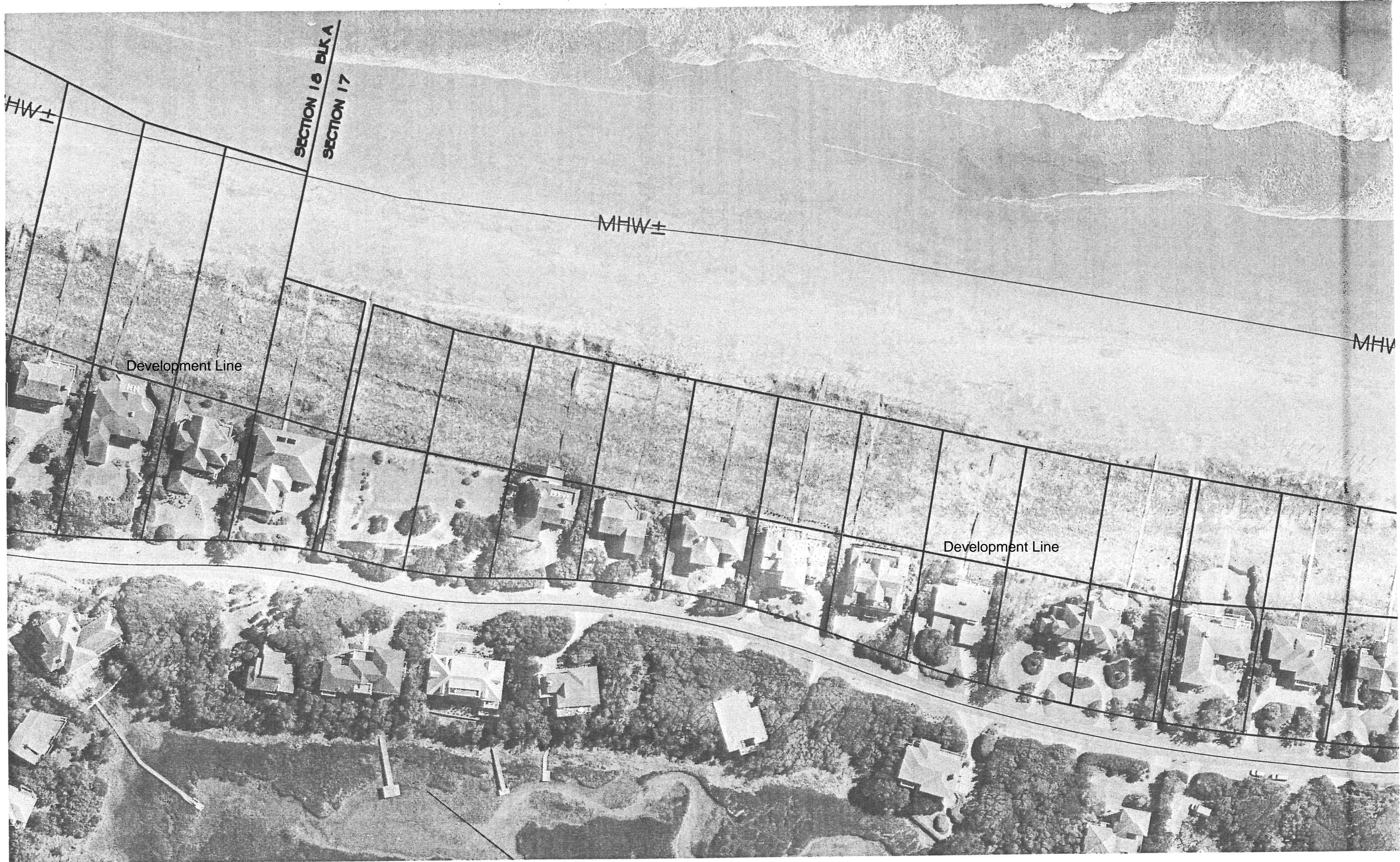
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SECTION 16 BLK B

SECTION 16 BLK A

MHW ±

Development Line



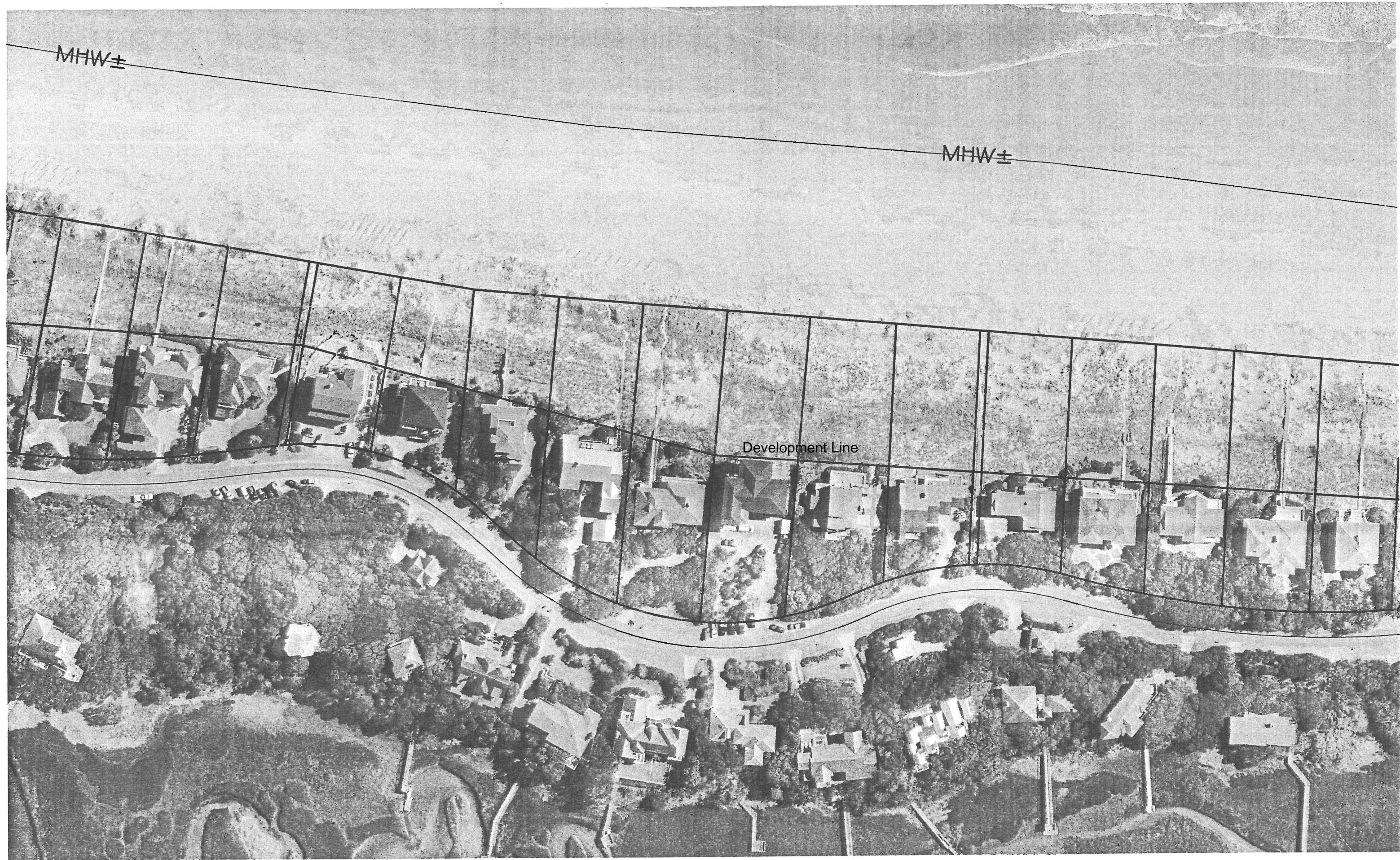
SECTION 16 BLK A
SECTION 17

MHW±

MHW

Development Line

Development Line



MHW±

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Development Line

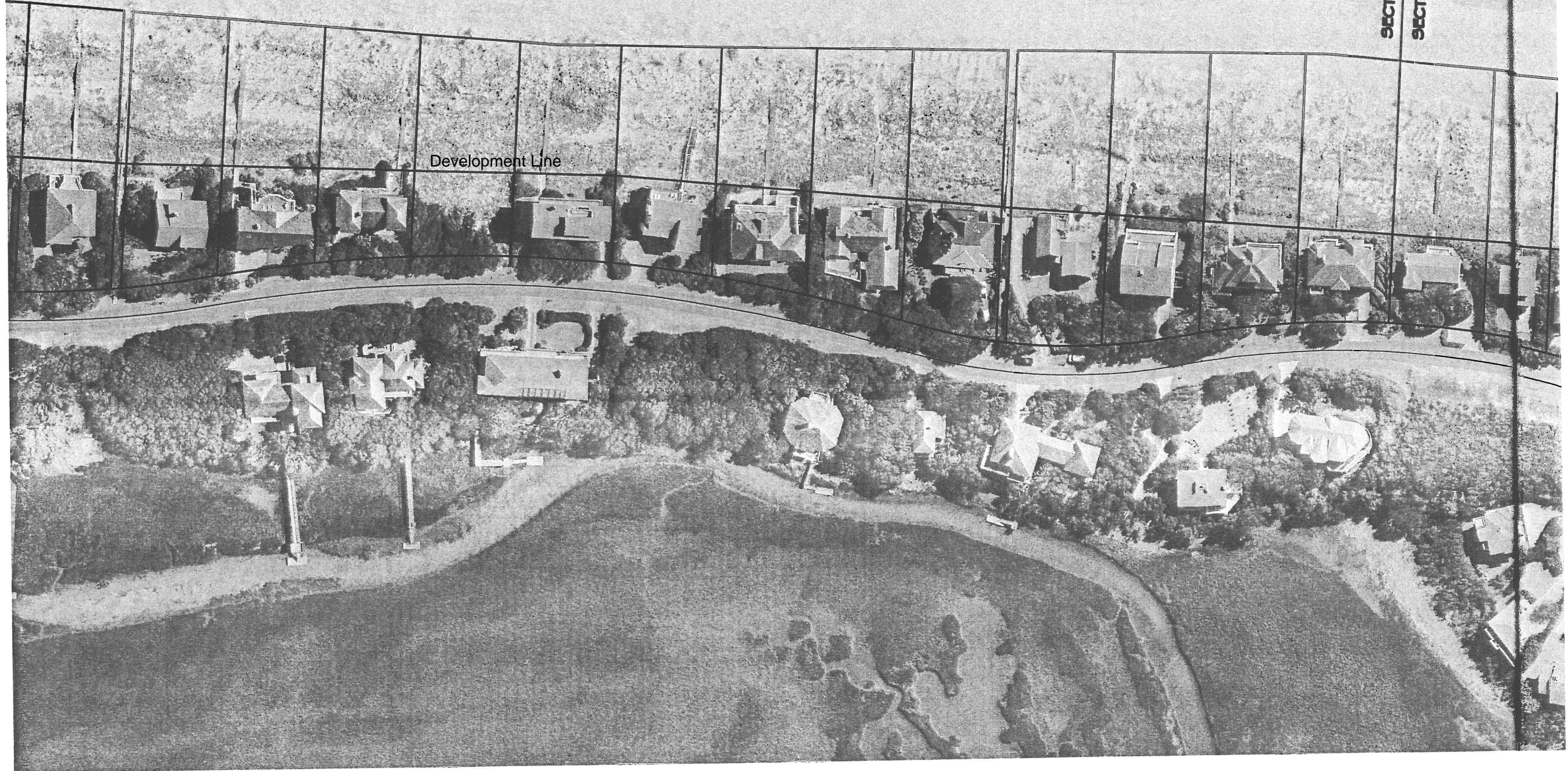
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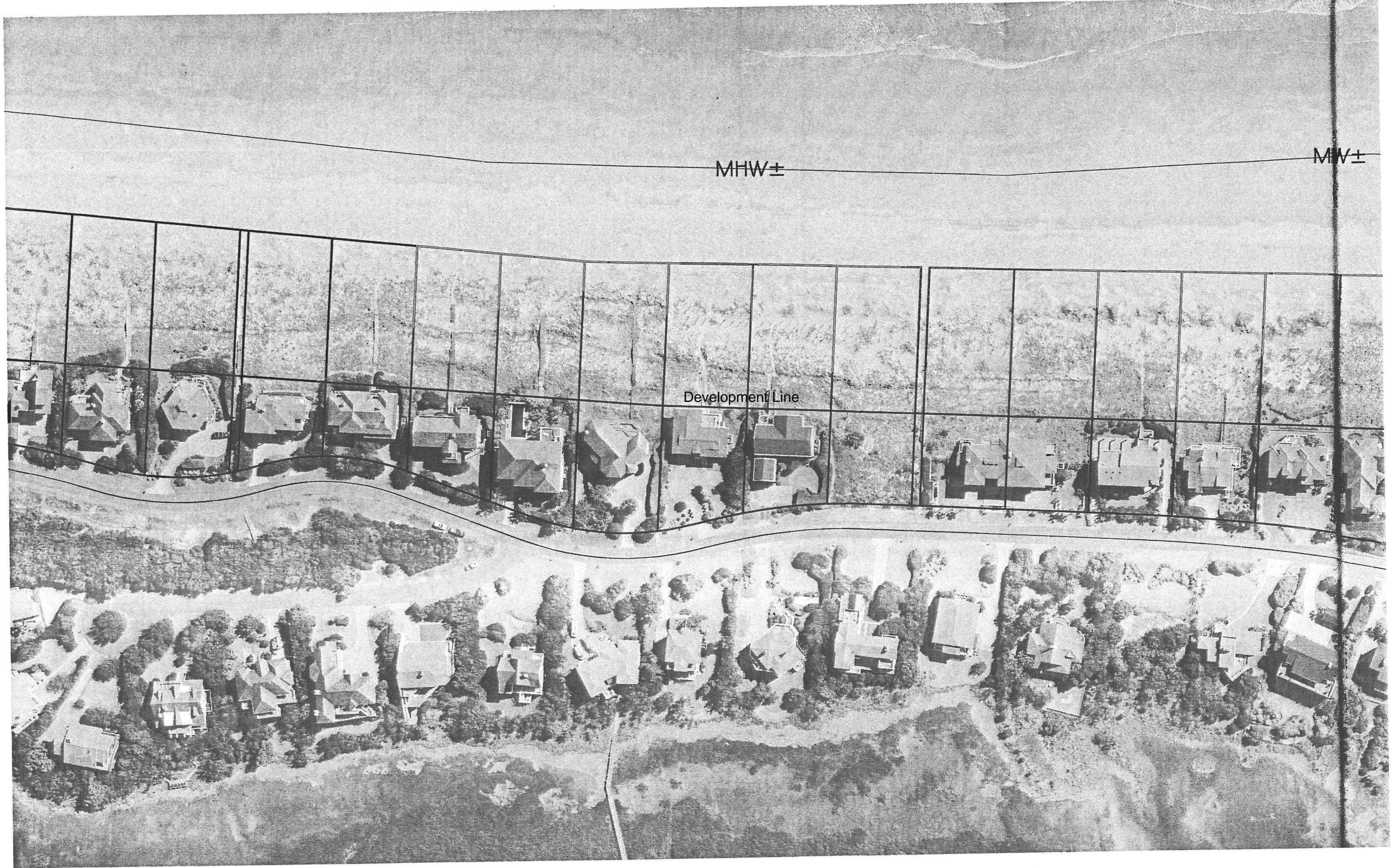
MHW±

SECTION 16

SECTION 15

Development Line





MHW ±

MHW ±

Development Line

MHW±

MHW±

SECTION 19

SECTION 19

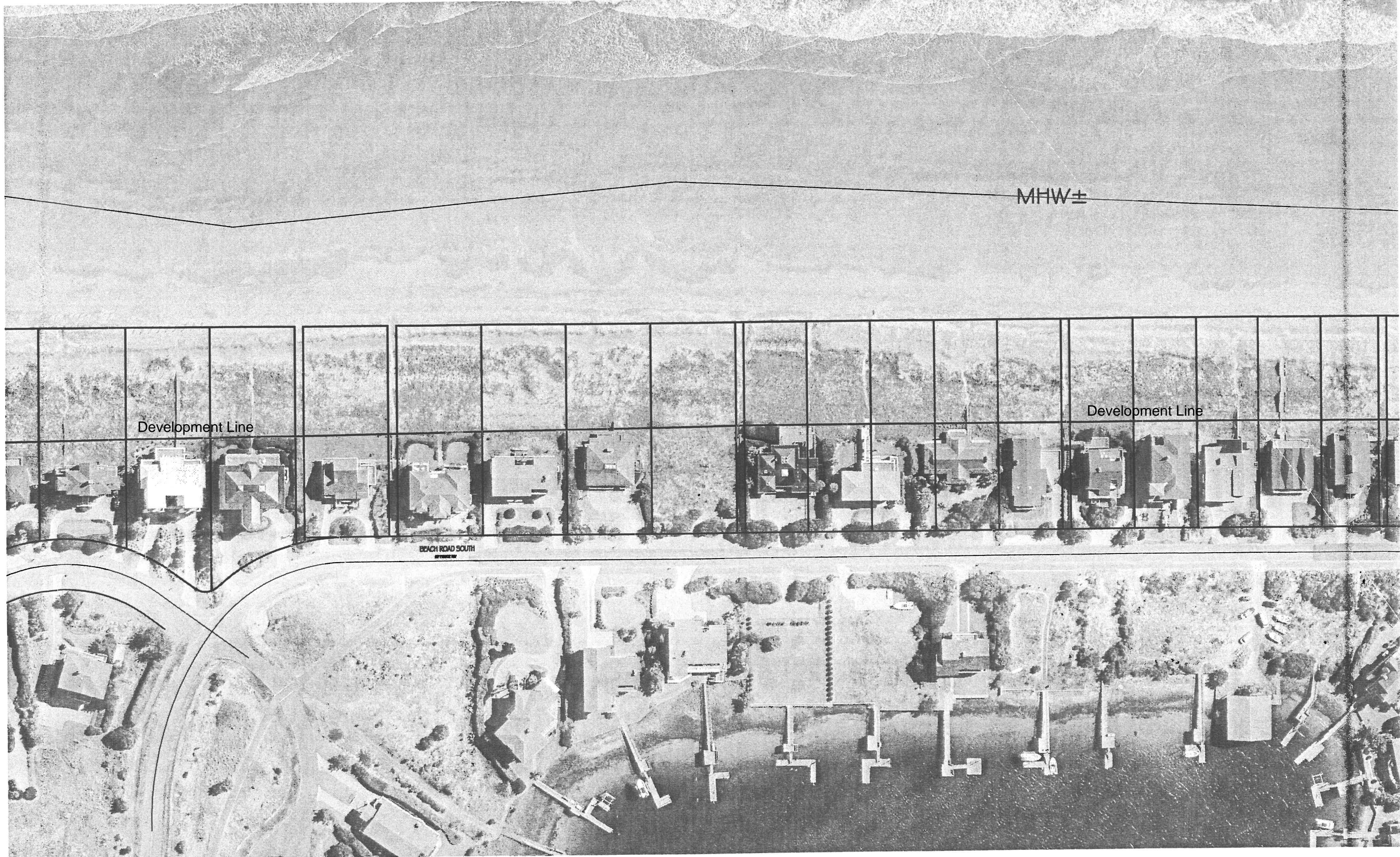
Development Line

Development Line

BEACH ROAD NORTH

CHERRY FLAGE

EAST BEACH BAY LANE

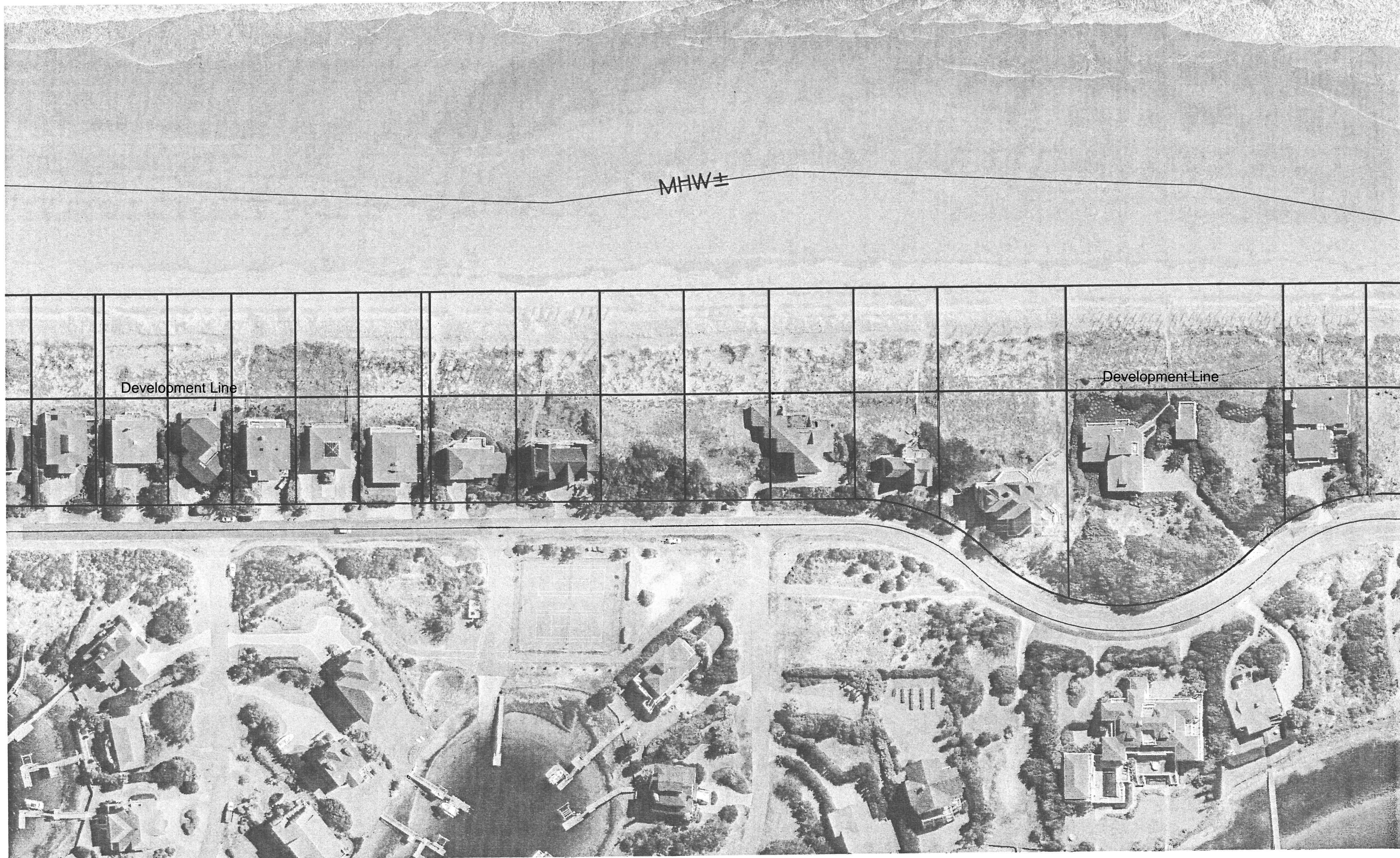


MHW ±

Development Line

Development Line

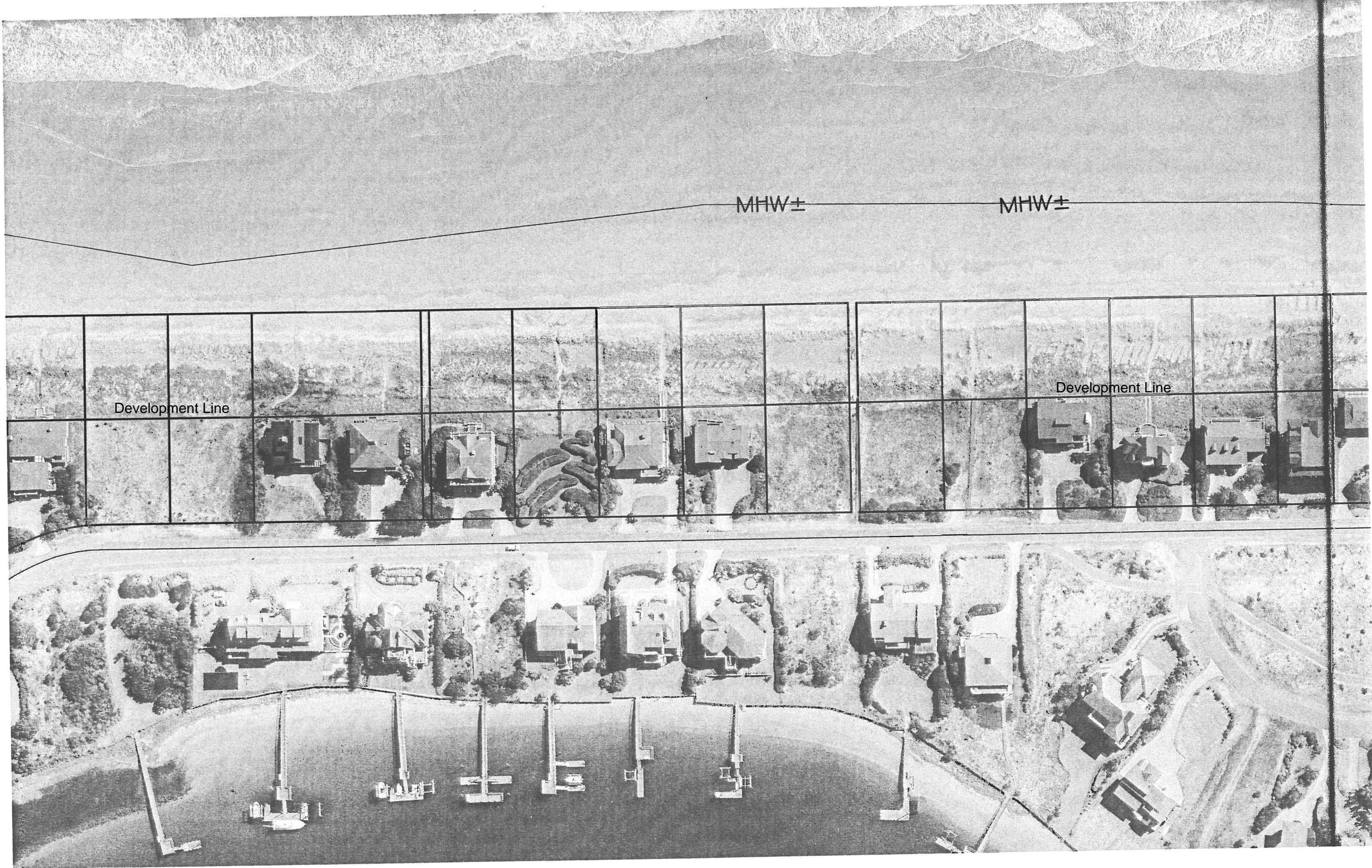
BEACH ROAD SOUTH



MHW ±

Development Line

Development Line

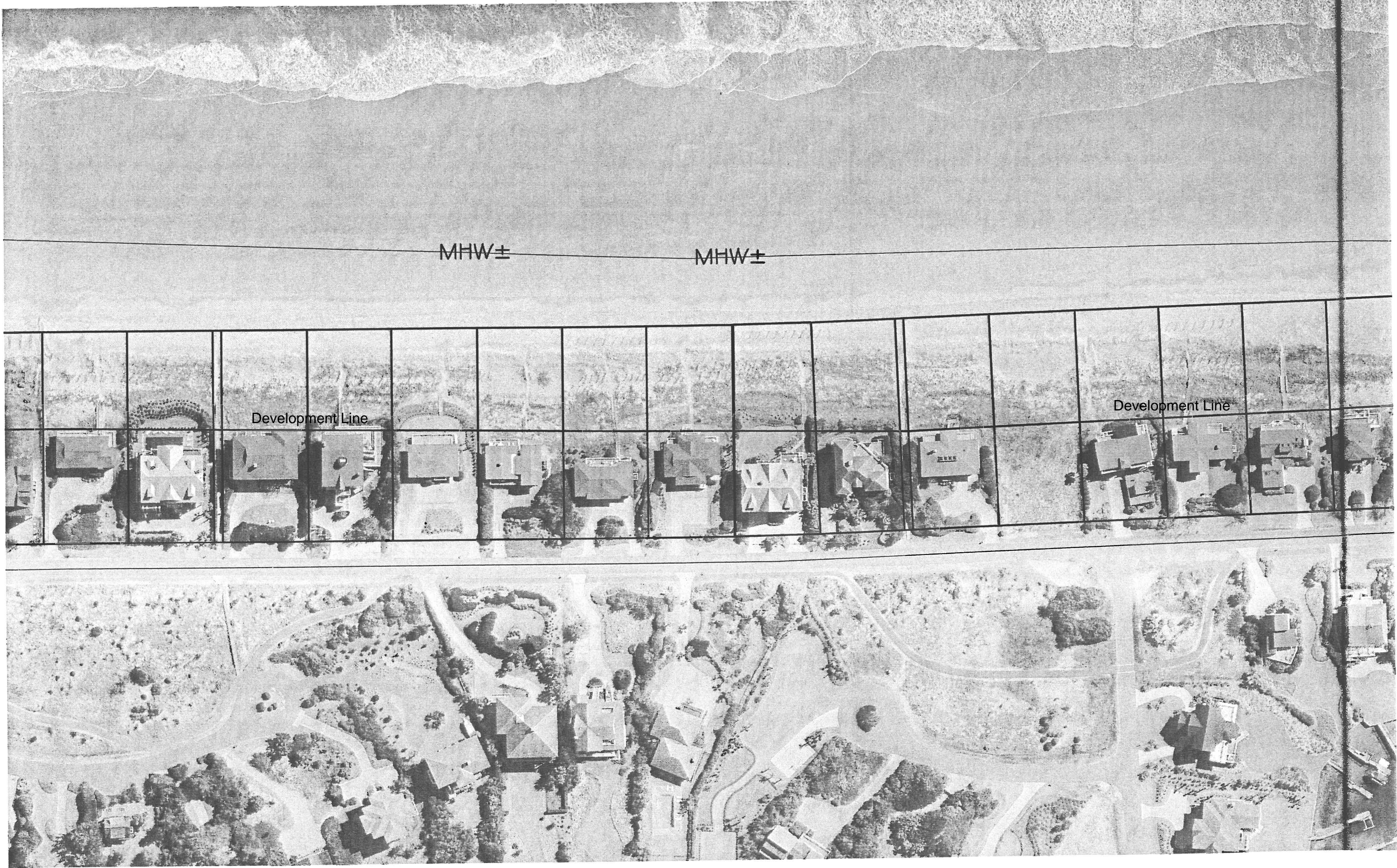


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Development Line

Development Line

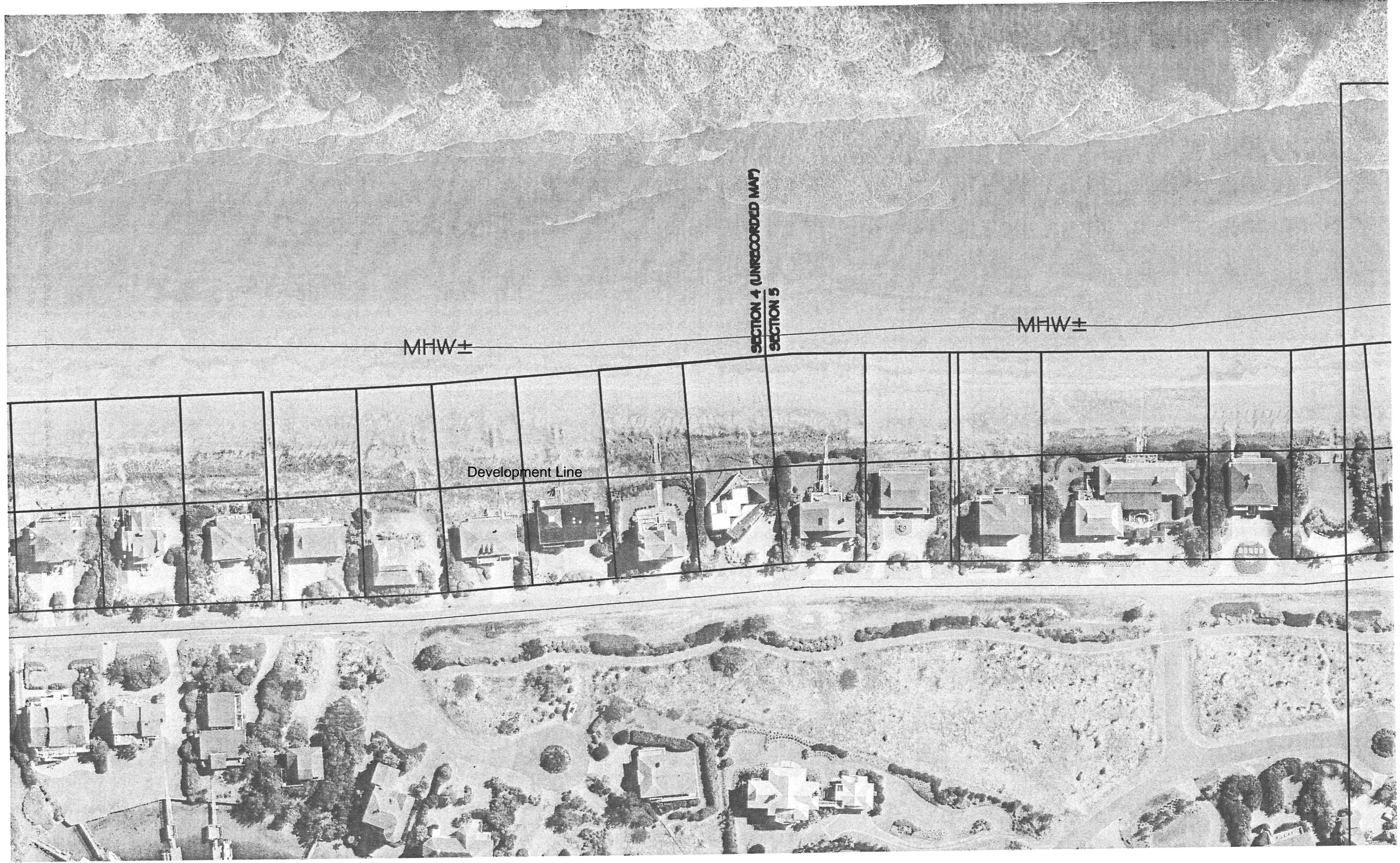


MHW±

MHW±

Development Line

Development Line

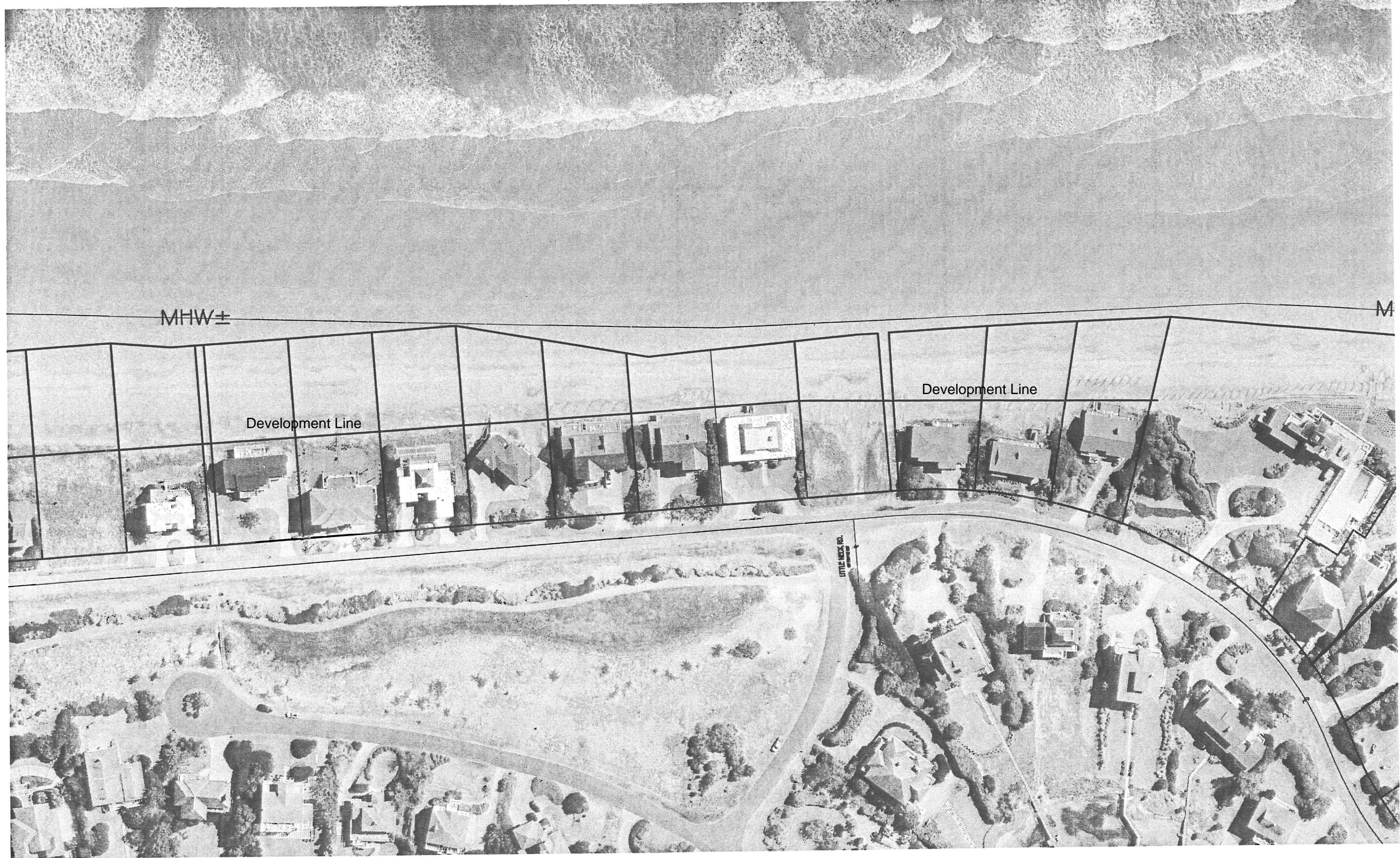


MHW ±

SECTION 4 (UNRECORDED MAP)
SECTION 5

MHW ±

Development Line



MHW ±

Development Line

Development Line

LITTLE ROCK RD.

PROPOSED RULES

testing. Written courses that are more than four credits in length are required to have a written test comprising of a minimum of 20 questions. The Firearms Training and Qualifications in-service course and topics delivered pursuant to Rule .0104(1) of this Section shall be exempt from this written test requirement;

- (2) A student shall pass each test by achieving 70 percent correct answers; and
- (3) A student who completes a topic of in-service training in a traditional classroom setting or online and fails the end of topic exam shall be given one attempt to re-test. If the student fails the exam a second time, the student shall complete the in-service training topic in a traditional classroom setting before taking the exam a third time.

Authority G.S. 17C-6; 17C-10.

TITLE 14B – DEPARTMENT OF PUBLIC SAFETY

Notice is hereby given in accordance with G.S. 150B-21.2 and G.S. 150B-21.3A(c)(2)g. that the Alcoholic Beverage Control Commission intends to readopt without substantive changes the rule cited as 14B NCAC 15A .1403.

Pursuant to G.S. 150B-21.2(c)(1), the text of the rule proposed for readoption without substantive changes is not required to be published. The text of the rule is available on the OAH website: <http://reports.oah.state.nc.us/ncac.asp>.

Link to agency website pursuant to G.S. 150B-19.1(c): abc.nc.gov

Proposed Effective Date: July 1, 2017

Public Hearing:

Date: April 12, 2017

Time: 10:00 a.m.

Location: ABC Commission Hearing Room, 400 East Tryon Road, Raleigh, NC 27610

Reason for Proposed Action: Rules Review Commission determination that the rule is "necessary with substantive public interest" pursuant to mandatory review process.

Comments may be submitted to: Renee C. Metz, 400 East Tryon Road, Raleigh, NC 27610, phone (919) 779-8331, email renee.metz@abc.nc.gov

Comment period ends: May 15, 2017

Procedure for Subjecting a Proposed Rule to Legislative Review: If an objection is not resolved prior to the adoption of the rule, a person may also submit written objections to the Rules Review Commission after the adoption of the Rule. If the Rules Review Commission receives written and signed objections after

the adoption of the Rule in accordance with G.S. 150B-21.3(b2) from 10 or more persons clearly requesting review by the legislature and the Rules Review Commission approves the rule, the rule will become effective as provided in G.S. 150B-21.3(b1). The Commission will receive written objections until 5:00 p.m. on the day following the day the Commission approves the rule. The Commission will receive those objections by mail, delivery service, hand delivery, or facsimile transmission. If you have any further questions concerning the submission of objections to the Commission, please call a Commission staff attorney at 919-431-3000.

Fiscal impact (check all that apply).

- State funds affected
- Environmental permitting of DOT affected Analysis submitted to Board of Transportation
- Local funds affected
- Substantial economic impact (≥\$1,000,000)
- Approved by OSBM
- No fiscal note required by G.S. 150B-21.4
- No fiscal note required by G.S. 150B-21.3A(d)(2)

CHAPTER 15 - ALCOHOLIC BEVERAGE CONTROL COMMISSION

SUBCHAPTER 15A - ORGANIZATIONAL RULES: POLICIES AND PROCEDURES

SECTION .1400 - PURCHASE OF ALCOHOLIC BEVERAGES BY LOCAL BOARDS

14B NCAC 15A .1403 SPECIAL ORDERS (READOPTION WITHOUT SUBSTANTIVE CHANGES)

TITLE 15A – DEPARTMENT OF ENVIRONMENTAL QUALITY

Notice is hereby given in accordance with G.S. 150B-21.2 that the Coastal Resources Commission intends to amend the rules cited as 15A NCAC 07H .0306 and 07J .1301.

Link to agency website pursuant to G.S. 150B-19.1(c): <http://deq.nc.gov/permits-regulations/rules-regulations/proposed-rules>

Proposed Effective Date: September 1, 2017

Public Hearing:

Date: April 27, 2017

Time: 1:30 p.m.

Location: Dare County Government Complex, 954 Marshall C. Collins Drive, Manteo, NC 27954

Reason for Proposed Action: General Use Standards for Ocean Hazard Areas 15A NCAC 07H .0306(a)(3) define the seaward limit where an oceanfront Development Line can be established. 15A NCAC 07J .1300 are procedures for requesting, approving and managing oceanfront Development lines, and specify

information that is to be submitted to the Coastal Resources Commission by the Petitioner. The proposed amendments are intended to both clarify how to determine the oceanward limit, and what information is to be submitted to the Coastal Resources Commission.

Comments may be submitted to: Braxton Davis, 400 Commerce Avenue, Morehead City, NC 28557; email Braxton.Davis@ncdenr.gov

Comment period ends: May 15, 2017

Procedure for Subjecting a Proposed Rule to Legislative Review: If an objection is not resolved prior to the adoption of the rule, a person may also submit written objections to the Rules Review Commission after the adoption of the Rule. If the Rules Review Commission receives written and signed objections after the adoption of the Rule in accordance with G.S. 150B-21.3(b2) from 10 or more persons clearly requesting review by the legislature and the Rules Review Commission approves the rule, the rule will become effective as provided in G.S. 150B-21.3(b1). The Commission will receive written objections until 5:00 p.m. on the day following the day the Commission approves the rule. The Commission will receive those objections by mail, delivery service, hand delivery, or facsimile transmission. If you have any further questions concerning the submission of objections to the Commission, please call a Commission staff attorney at 919-431-3000.

Fiscal impact (check all that apply).

- State funds affected
Environmental permitting of DOT affected Analysis submitted to Board of Transportation
Local funds affected
Substantial economic impact (≥\$1,000,000)
Approved by OSBM
No fiscal note required by G.S. 150B-21.4

CHAPTER 07 - COASTAL MANAGEMENT

SUBCHAPTER 07H - STATE GUIDELINES FOR AREAS OF ENVIRONMENTAL CONCERN

SECTION .0300 - OCEAN HAZARD AREAS

15A NCAC 07H .0306 GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS

(a) In order to protect life and property, all development not otherwise specifically exempted or allowed by law or elsewhere in the Coastal Resources Commission's rules shall be located according to whichever of the following is applicable:

- (1) The ocean hazard setback for development is measured in a landward direction from the vegetation line, the static vegetation line, or the measurement line, whichever is applicable.
(2) In areas with a development line, the ocean hazard setback line shall be set at a distance in accordance with Subparagraphs (a)(3) through (9) of this Rule. In no case shall new

development be sited seaward of the development line.

(3) In no case shall a development line be created or established below the mean high water line on state owned lands, or oceanward of the mean high water line or perpetual property easement line, whichever is more restrictive.

(4) The setback distance shall be determined by both the size of development and the shoreline long term erosion rate as defined in Rule .0304 of this Section. "Development size" is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

- (A) The total square footage of heated or air-conditioned living space;
(B) The total square footage of parking elevated above ground level; and
(C) The total square footage of non-heated or non-air-conditioned areas elevated above ground level, excluding attic space that is not designed to be load-bearing.

Decks, roof-covered porches, and walkways shall not be included in the total floor area unless they are enclosed with material other than screen mesh or are being converted into an enclosed space with material other than screen mesh.

(5) With the exception of those types of development defined in 15A NCAC 07H .0309, no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback distance. This includes roof overhangs and elevated structural components that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings. The ocean hazard setback is established based on the following criteria:

- (A) A building or other structure less than 5,000 square feet requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;
(B) A building or other structure greater than or equal to 5,000 square feet but less than 10,000 square feet requires a minimum setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;
(C) A building or other structure greater than or equal to 10,000 square feet but less than 20,000 square feet requires a minimum setback of 130 feet or 65 times the shoreline erosion rate, whichever is greater;
(D) A building or other structure greater than or equal to 20,000 square feet but

- less than 40,000 square feet requires a minimum setback of 140 feet or 70 times the shoreline erosion rate, whichever is greater;
- (E) A building or other structure greater than or equal to 40,000 square feet but less than 60,000 square feet requires a minimum setback of 150 feet or 75 times the shoreline erosion rate, whichever is greater;
- (F) A building or other structure greater than or equal to 60,000 square feet but less than 80,000 square feet requires a minimum setback of 160 feet or 80 times the shoreline erosion rate, whichever is greater;
- (G) A building or other structure greater than or equal to 80,000 square feet but less than 100,000 square feet requires a minimum setback of 170 feet or 85 times the shoreline erosion rate, whichever is greater;
- (H) A building or other structure greater than or equal to 100,000 square feet requires a minimum setback of 180 feet or 90 times the shoreline erosion rate, whichever is greater;
- (I) Infrastructure that is linear in nature such as roads, bridges, pedestrian access such as boardwalks and sidewalks, and utilities providing for the transmission of electricity, water, telephone, cable television, data, storm water, and sewer requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;
- (J) Parking lots greater than or equal to 5,000 square feet require a setback of 120 feet or 60 times the shoreline erosion rate, whichever is greater;
- (K) Notwithstanding any other setback requirement of this Subparagraph, a building or other structure greater than or equal to 5,000 square feet in a community with a static line exception in accordance with 15A NCAC 07J .1200 requires a minimum setback of 120 feet or 60 times the shoreline erosion rate in place at the time of permit issuance, whichever is greater. The setback shall be measured landward from either the static vegetation line, the vegetation line, or measurement line, whichever is farthest landward; and
- (L) Notwithstanding any other setback requirement of this Subparagraph, replacement of single-family or duplex residential structures with a total floor area greater than 5,000 square feet, and commercial and multi-family residential structures with a total floor area no greater than 10,000 square feet, shall be allowed provided that the structure meets the following criteria:
- (i) the structure was originally constructed prior to August 11, 2009;
 - (ii) the structure as replaced does not exceed the original footprint or square footage;
 - (iii) it is not possible for the structure to be rebuilt in a location that meets the ocean hazard setback criteria required under Subparagraph (a)(5) of this Rule;
 - (iv) the structure as replaced meets the minimum setback required under Part (a)(5)(A) of this Rule; and
 - (v) the structure is rebuilt as far landward on the lot as feasible.
- (6) If a primary dune exists in the AEC on or landward of the lot where the development is proposed the development shall be landward of the crest of the primary dune, the ocean hazard setback, or development line, whichever is farthest from vegetation line, static vegetation line, or measurement line, whichever is applicable. For existing lots, however, where setting the development landward of the crest of the primary dune would preclude any practical use of the lot, development may be located oceanward of the primary dune. In such cases, the development may be located landward of the ocean hazard setback, but shall not be located on or oceanward of a frontal dune or the development line. The words "existing lots" in this Rule shall mean a lot or tract of land which, as of June 1, 1979, is specifically described in a recorded plat and cannot be enlarged by combining the lot or tract of land with a contiguous lot(s) or tract(s) of land under the same ownership.
- (7) If no primary dune exists, but a frontal dune does exist in the AEC on or landward of the lot where the development is proposed, the development shall be set landward of the frontal dune, ocean hazard setback, or development line, whichever is farthest from the vegetation line, static vegetation line, or measurement line, whichever is applicable.
- (8) If neither a primary nor frontal dune exists in the AEC on or landward of the lot where

development is proposed, the structure shall be landward of the ocean hazard setback or development line, whichever is more restrictive.

- (9) Structural additions or increases in the footprint or total floor area of a building or structure represent expansions to the total floor area and shall meet the setback requirements established in this Rule and 15A NCAC 07H .0309(a). New development landward of the applicable setback may be cosmetically, but shall not be structurally, attached to an existing structure that does not conform with current setback requirements.
- (10) Established common law and statutory public rights of access to and use of public trust lands and waters in ocean hazard areas shall not be eliminated or restricted. Development shall not encroach upon public accessways, nor shall it limit the intended use of the accessways.
- (11) Beach fill as defined in Rule .0305(a)(7) of this Section, represents a temporary response to coastal erosion, and compatible beach fill as defined in 15A NCAC 07H .0312 may be expected to erode at least as fast as, if not faster than, the pre-project beach. Furthermore, there is no assurance of future funding or beach-compatible sediment for continued beach fill projects and project maintenance. A vegetation line that becomes established oceanward of the pre-project vegetation line in an area that has received beach fill may be more vulnerable to natural hazards along the oceanfront if the beach fill project is not maintained. A development setback measured from the vegetation line may provide less protection from ocean hazards. Therefore, development setbacks in areas that have received large-scale beach fill as defined in 15A NCAC 07H .0305 shall be measured landward from the static vegetation line as defined in this Section, unless a development line has been approved by the Coastal Resources Commission in accordance with 15A NCAC 07J .1300.
- (12) In order to allow for development landward of the large-scale beach fill project that cannot meet the setback requirements from the static vegetation line, but can or has the potential to meet the setback requirements from the vegetation line set forth in Subparagraphs (a)(1) and (a)(5) of this Rule, a local government, group of local governments involved in a regional beach fill project, or qualified "owners' association" defined in G.S. 47F-1-103(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association, and has jurisdiction over at least one mile of ocean shoreline, may petition the Coastal Resources

Commission for a "static line exception" in accordance with 15A NCAC 07J .1200. The static line exception applies to development of property that lies both within the jurisdictional boundary of the petitioner and the boundaries of the large-scale beach fill project. This static line exception shall also allow development greater than 5,000 square feet to use the setback provisions defined in Part (a)(5)(K) of this Rule in areas that lie within the jurisdictional boundary of the petitioner, as well as the boundaries of the large-scale beach fill project. The procedures for a static line exception request are defined in 15A NCAC 07J .1200. If the request is approved, the Coastal Resources Commission shall allow development setbacks to be measured from a vegetation line that is oceanward of the static vegetation line under the following conditions:

- (A) Development meets all setback requirements from the vegetation line defined in Subparagraphs (a)(1) and (a)(5) of this Rule;
- (B) Development setbacks shall be calculated from the shoreline erosion rate in place at the time of permit issuance;
- (C) No portion of a building or structure, including roof overhangs and elevated portions that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings, extends oceanward of the landward-most adjacent building or structure. When the configuration of a lot precludes the placement of a building or structure in line with the landward-most adjacent building or structure, an average line of construction shall be determined by the Division of Coastal Management on a case-by-case basis in order to determine an ocean hazard setback that is landward of the vegetation line, a distance no less than 30 times the shoreline erosion rate or 60 feet, whichever is greater;
- (D) With the exception of swimming pools, the development defined in Rule .0309(a) of this Section shall be allowed oceanward of the static vegetation line; and
- (E) Development shall not be eligible for the exception defined in Rule .0309(b) of this Section.

(b) In order to avoid weakening the protective nature of ocean beaches and primary and frontal dunes, no development shall be permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon that would adversely affect the integrity of the dune. Other dunes within the ocean

hazard area shall not be disturbed unless the development of the property is otherwise impracticable. Any disturbance of these other dunes shall be allowed only to the extent permitted by 15A NCAC 07H .0308(b).

(c) Development shall not cause irreversible damage to historic architectural or archaeological resources as documented by the local historic commission, the North Carolina Department of Natural and Cultural Resources, or the National Historical Registry.

(d) Development shall comply with minimum lot size and set back requirements established by local regulations.

(e) Mobile homes shall not be placed within the high hazard flood area unless they are within mobile home parks existing as of June 1, 1979.

(f) Development shall comply with the general management objective for ocean hazard areas set forth in 15A NCAC 07H .0303.

(g) Development shall not interfere with legal access to, or use of, public resources, nor shall such development increase the risk of damage to public trust areas.

(h) Development proposals shall incorporate measures to avoid or minimize adverse impacts of the project. These measures shall be implemented at the applicant's expense and may include actions that:

- (1) minimize or avoid adverse impacts by limiting the magnitude or degree of the action;
- (2) restore the affected environment; or
- (3) compensate for the adverse impacts by replacing or providing substitute resources.

(i) Prior to the issuance of any permit for development in the ocean hazard AECs, there shall be a written acknowledgment from the applicant to the Division of Coastal Management that the applicant is aware of the risks associated with development in this hazardous area and the limited suitability of this area for permanent structures. By granting permits, the Coastal Resources Commission does not guarantee the safety of the development and assumes no liability for future damage to the development.

(j) All relocation of structures requires permit approval. Structures relocated with public funds shall comply with the applicable setback line as well as other applicable AEC rules. Structures including septic tanks and other essential accessories relocated entirely with non-public funds shall be relocated the maximum feasible distance landward of the present location. Septic tanks may not be located oceanward of the primary structure. All relocation of structures shall meet all other applicable local and state rules.

(k) Permits shall include the condition that any structure shall be relocated or dismantled when it becomes imminently threatened by changes in shoreline configuration as defined in 15A NCAC 07H .0308(a)(2)(B). Any such structure shall be relocated or dismantled within two years of the time when it becomes imminently threatened, and in any case upon its collapse or subsidence. However, if natural shoreline recovery or beach fill takes place within two years of the time the structure becomes imminently threatened, so that the structure is no longer imminently threatened, then it need not be relocated or dismantled at that time. This permit condition shall not affect the permit holder's right to seek authorization of temporary protective measures allowed under 15A NCAC 07H .0308(a)(2).

Authority G.S. 113A-107; 113A-113(b)(6); 113A-124.

SUBCHAPTER 07J - PROCEDURES FOR PROCESSING AND ENFORCEMENT OF MAJOR AND MINOR DEVELOPMENT PERMITS, VARIANCE REQUESTS, APPEALS FROM PERMIT DECISIONS, DECLARATORY RULINGS, AND STATIC LINE EXCEPTIONS

SECTION .1300 - DEVELOPMENT LINE PROCEDURES

15A NCAC 07J .1301 REQUESTING THE DEVELOPMENT LINE

(a) Any local government, group of local governments involved in a regional beach fill project, or qualified owner's association with territorial jurisdiction over an area that is subject to ocean hazard area setbacks pursuant to 15A NCAC 07H .0305, may petition the Coastal Resources Commission for a development line for the purposes of siting oceanfront development in accordance with the provisions of this Section. A "qualified owner's association" is an owner's association defined in G.S. 47F-1-103(3) that has authority to approve the locations of structures on lots within the territorial jurisdiction of the association and has jurisdiction over at least one mile of ocean shoreline.

(b) A development line request applies to the entire large-scale project area as defined in 15A NCAC 07H .0305(a)(7), and at the petitioner's request may be extended to include the entire oceanfront jurisdiction or legal boundary of the petitioner.

(c) The petitioner shall utilize an adjacent neighbor sight-line approach, resulting in an average line of structures. In areas where the seaward edge of existing development is not linear, the petitioner may determine an average line of construction on a case-by-case basis. In no case shall a development line be established seaward of the most seaward structure within the petitioner's oceanfront jurisdiction.

(d) An existing structure that is oceanward of an approved development line may remain in place until damaged greater than 50 percent in accordance with Rule .0210 of this Subchapter. At that time it may only be replaced landward of the development line, and shall meet the applicable ocean hazard setback requirements as defined in 15A NCAC 07H .0306(a).

(e) A request for a development line or amendment shall be made in writing by the petitioner and submitted to the CRC by sending the written request to the Director of the Division of Coastal Management. A complete request shall include the following:

- (1) A detailed survey of the development line using on-ground observation and survey, or aerial imagery along the oceanfront jurisdiction or legal boundary; any local regulations associated with the development line; a record of local adoption of the development line by the petitioner; and documentation of incorporation of development line into local ordinances or rules and regulations of an owner's association.
- (2) The survey shall include the development line and static vegetation line, static vegetation line, mean high water line, and any other

information the Coastal Resources Commission deems necessary for a review of the petitioner's proposed development line.

(3) Surveyed development line spatial data in a geographic information systems (GIS) format referencing North Carolina State Plane North American Datum 83 US Survey Foot, to include Federal Geographic Data Committee (FGDC) compliant metadata.

(f) Once a development line is approved by the Coastal Resources Commission, only the petitioner may request a change or reestablishment of the position of the development line.

(g) A development line request shall be submitted to the Director of the Division of Coastal Management, 400 Commerce Avenue, Morehead City, NC 28557. Written acknowledgement of the receipt of a completed development line request, including notification of the date of the meeting at which the request will be considered by the Coastal Resources Commission, shall be provided to the petitioner by the Division of Coastal Management.

(h) The Coastal Resources Commission shall consider a development line request no later than the second scheduled meeting following the date of receipt of a complete request by the Division of Coastal Management, except when the petitioner and the Division of Coastal Management agree upon a later date.

Authority G.S. 113A-107; 113A-113(b)(6); 113A-124.

Notice is hereby given in accordance with G.S. 150B-21.2 that the Wildlife Resources Commission intends to amend the rules cited as 15A NCAC 10F.0303 .0323, and .0339.

Link to agency website pursuant to G.S. 150B-19.1(c): www.ncwildlife.org

Proposed Effective Date: October 1, 2017

Public Hearing:

Date: April 4, 2017

Time: 10:00 a.m.

Location: WRC Headquarters 5th Floor, 1751 Varsity Drive, Raleigh, NC 27606

Reason for Proposed Action:

15A NCAC 10F .0303 – Beaufort County submitted an application for a no-wake zone in the waters of Little Creek, a tributary of Blounts Creek. Staff identified hazards to boater safety that include a shallow creek with approximately 15 docks. Boaters who use the nearby Blounts Creek Boating Access Area enter and exit Little Creek at high speeds, posing dangers to those who swim and recreate in the creek.

15A NCAC 10F .0323 – Burke County submitted a formal application and resolution requesting a no-wake zone on Lake James in the waters of Sherman's Hollow Cove and contiguous with the waters within 50 yards of Linville Point. The no wake zone is necessary to mitigate hazards to boater and swimmer safety. Sherman's Hollow Cove is narrow with obstructed views,

and heavy boat traffic along Linville Point poses dangers to swimmers and kayakers.

15A NCAC 10F .0339 – McDowell County submitted an application for amendments to 15A NCAC 10F .0339 for no-wake zones on Lake James to mitigate hazards to boater safety. An extension of the no-wake zone at Marion Moose Club is requested because the area is heavily populated with many docks and a narrow shallow channel. There is a blind bend in the channel and there have been several boating incidents there. A no-wake zone within 50 yards of the shoreline of the peninsula at Waterglynn Cove Subdivision will mitigate hazards to boaters and swimmers near shore who are endangered by vessels travelling at high speeds in the area. A technical correction is requested to clarify the parameters of the existing no-wake zone at Plantation Point Cove. A no-wake zone is already marked within 50 yards of a boating access area at hidden Cove. This no-wake zone needs to be codified in the NCAC. Amendments under 10F .0339 (a)(11) and (a)(12) will remove no-wake zones at campgrounds that no longer exist or are not navigable and enforceable.

Comments may be submitted to: Betsy Haywood, 1701 Mail Service Center, Raleigh, NC 27699-1701; phone (919) 707-0013; email betsy.haywood@ncwildlife.org

Comment period ends: May 15, 2017

Procedure for Subjecting a Proposed Rule to Legislative Review: If an objection is not resolved prior to the adoption of the rule, a person may also submit written objections to the Rules Review Commission after the adoption of the Rule. If the Rules Review Commission receives written and signed objections after the adoption of the Rule in accordance with G.S. 150B-21.3(b2) from 10 or more persons clearly requesting review by the legislature and the Rules Review Commission approves the rule, the rule will become effective as provided in G.S. 150B-21.3(b1). The Commission will receive written objections until 5:00 p.m. on the day following the day the Commission approves the rule. The Commission will receive those objections by mail, delivery service, hand delivery, or facsimile transmission. If you have any further questions concerning the submission of objections to the Commission, please call a Commission staff attorney at 919-431-3000.

Fiscal impact (check all that apply).

- State funds affected
Environmental permitting of DOT affected
Analysis submitted to Board of Transportation
Local funds affected
Substantial economic impact (>=\$1,000,000)
Approved by OSBM
No fiscal note required by G.S. 150B-21.4

CHAPTER 10 - WILDLIFE RESOURCES AND WATER SAFETY

SUBCHAPTER 10F - MOTORBOATS AND WATER SAFETY



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

BRAXTON C. DAVIS
Director

April 11, 2017

MEMORANDUM

CRC-17-14

TO: Coastal Resources Commission

FROM: Frank Jennings, District Manager, Northeastern District
Division of Coastal Management

SUBJECT: CRC Dune Protection, Restoration and Repair

The oceanfront dunes provide protection from storms and are a vital part of the Ocean Hazard Area of Environmental Concern. One of the goals of the CAMA is to provide a management system capable of preserving and managing the natural ecological conditions of the barrier dune system (and the beaches) to safeguard and perpetuate their natural productivity.

For management purposes, your rules (15A NCAC 7H .0305) include definitions of various land forms associated with the Ocean Hazard Area including Ocean Beaches, Nearshore, Primary Dunes, and Frontal Dunes. Frontal Dunes are defined as the first mound of sand located landward of the ocean beach that has stable and natural vegetation present. Primary Dunes are the first mounds of sand located landward of the ocean beaches having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet. Primary Dunes extend landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the "dune trough").

If a Primary Dune exists in the AEC on or landward of the lot where the development is proposed the development is required to be landward of the crest of the primary dune, the ocean hazard setback, or development line, whichever is farthest from vegetation line, static vegetation line, or measurement line, whichever is applicable. For existing lots (platted by June 1, 1979), however, where setting the development landward of the crest of the primary dune would preclude any practical use of the lot, development may be located oceanward of the primary dune. In such cases, the development may be located landward of the ocean hazard setback but is not be located on or oceanward of a frontal dune or the development line. If no primary dune exists, but a frontal dune does exist in the AEC on or landward of the lot where the development is proposed, the development is to be set landward of the frontal dune, ocean hazard setback, or development line, whichever is farthest from the vegetation line, static vegetation line, or measurement line, whichever is applicable. If neither a primary nor frontal dune exists in the AEC on or landward of the lot where development is proposed, the structure is to sited landward of the ocean hazard setback or development line, whichever is more restrictive.

To avoid weakening the protective nature of Ocean Beaches and Primary and Frontal dunes, no development is permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon that would adversely affect the integrity of the dune. Other dunes within the ocean hazard area are not to be disturbed unless the development of the property is otherwise impracticable. Any disturbance of these other dunes is allowed only to the extent permitted by 15A NCAC 07H .0308(b).

Under 15A NCAC 07H .0308(b) for Dune Establishment and Stabilization, the creation or alteration of dunes is allowed so long as the following conditions are met:

- (1) Any new dunes established shall be aligned to the greatest extent possible with existing adjacent dune ridges and shall be of the same general configuration as adjacent natural dunes.
- (2) Existing primary and frontal dunes shall not, except for beach nourishment and emergency situations, be broadened or extended in an oceanward direction.
- (3) Adding to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The filled areas shall be immediately replanted or temporarily stabilized until planting can be successfully completed.
- (4) Sand used to establish or strengthen dunes shall be of the same general characteristics as the sand in the area in which it is to be placed.
- (5) No new dunes shall be created in inlet hazard areas.
- (6) Sand held in storage in any dune, other than the frontal or primary dune, may be redistributed within the AEC provided that it is not placed any farther oceanward than the crest of a primary dune or landward toe of a frontal dune.
- (7) No disturbance of a dune area shall be allowed when other techniques of construction can be utilized and alternative site locations exist to avoid unnecessary dune impacts.

Based on review of meeting minutes and CRC documents, the original intent of the CRC's dune rules (1981) was to address the practice of dune creation and set standards to require following natural dune alignment and configuration as much as possible, and also to avoid "steep pushed-up dikes" on the oceanfront. The Commission also intended to prevent the creation of artificial dunes out on the "storm beach" that would "not last very long" and create a false sense of security. The Commission intended to restrict the building of primary and frontal dunes on the beachfront. From reviewing the CRC meeting minutes and materials in the early days of the coastal program, it seems there was concern by the Commission that allowing the pushing of dunes out on the beach (past the frontal dune) would lead to an abuse of the setback rules and create a "false sense of permanence" particularly in inlet areas. The Commission also did not want other dunes within the AEC to be destroyed by being used as a sand supply for additional dunes.

In 1992, staff realized that strict application of the rules restricting the pushing of sand oceanward was impractical as some degree of this activity was "necessary to accommodate normal development of oceanfront lots" and some degree of land leveling should be allowed. To address these issues, the rule was amended to allow redistributing sand "held in storage" in other dunes within the AEC, but no farther oceanward than the crest of the primary dune or landward toe of the frontal dune.

More recently, Staff has noted shifting sand blown by hurricanes, tropical storms and northeasters has been covering decks, driveways, swimming pools, houses and buildings, both on the oceanfront as well as landward of the oceanfront area. Property owners are at times conflicted with current rules in trying to maintain their properties by removing storm driven sand.

Additionally, property owners are looking for ways to enhance the barrier dune system while being able to utilize and enjoy their property including the redistribution of sand on individual lots.

At our upcoming meeting in Manteo, I will review your current rules on dune protection, restoration and repair as well as present examples of local barrier dune issues.

15A NCAC 07H .0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS

(a) This Paragraph describes natural and man-made features that are found within the ocean hazard area of environmental concern.

- (1) Ocean Beaches. Ocean beaches are lands consisting of unconsolidated soil materials that extend from the mean low water line landward to a point where either:
 - (A) the growth of vegetation occurs; or
 - (B) a distinct change in slope or elevation alters the configuration of the landform, whichever is farther landward.
- (2) Nearshore. The nearshore is the portion of the beach seaward of mean low water that is characterized by dynamic changes both in space and time as a result of storms.
- (3) Primary Dunes. Primary dunes are the first mounds of sand located landward of the ocean beaches having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet. Primary dunes extend landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the “dune trough.”)
- (4) Frontal Dunes. The frontal dune is the first mound of sand located landward of the ocean beach that has stable and natural vegetation present.
- (5) Vegetation Line. The vegetation line refers to the first line of stable and natural vegetation, which shall be used as the reference point for measuring oceanfront setbacks. This line represents the boundary between the normal dry-sand beach, which is subject to constant flux due to waves, tides, storms and wind, and the more stable upland areas. The vegetation line is generally located at or immediately oceanward of the seaward toe of the frontal dune or erosion escarpment. The Division of Coastal Management or Local Permit Officer shall determine the location of the stable and natural vegetation line based on visual observations of plant composition and density. If the vegetation has been planted, it may be considered stable when the majority of the plant stems are from continuous rhizomes rather than planted individual rooted sets. Planted vegetation may be considered natural when the majority of the plants are mature and additional species native to the region have been recruited, providing stem and rhizome densities that are similar to adjacent areas that are naturally occurring. In areas where there is no stable and natural vegetation present, this line may be established by interpolation between the nearest adjacent stable natural vegetation by on-ground observations or by aerial photographic interpretation.
- (6) Static Vegetation Line. In areas within the boundaries of a large-scale beach fill project, the vegetation line that existed within one year prior to the onset of project construction shall be defined as the “static vegetation line.” The “onset of project construction” shall be defined as the date sediment placement begins, with the exception of projects completed prior to the effective date of this Rule, in which case the award of the contract date will be considered the onset of construction. A static vegetation line shall be established in coordination with the Division of Coastal Management using on-ground observation and survey or aerial imagery for all areas of oceanfront that undergo a large-scale beach fill project. Once a static vegetation line is established, and after the onset of project construction, this line shall be used as the reference point for measuring oceanfront setbacks in all locations where it is landward of the vegetation line. In all locations where the vegetation line as defined in this Rule is landward of the static vegetation line, the vegetation line shall be used as the reference point for measuring oceanfront setbacks. A static vegetation line shall not be established where a static vegetation line is already in place, including those established by the Division of Coastal Management prior to the effective date of this Rule. A record of all static vegetation lines, including those established by the Division of Coastal Management prior to the effective date of this Rule, shall be maintained by the Division of Coastal Management for determining development standards as set forth in Rule .0306 of this Section. Because the impact of Hurricane Floyd (September 1999) caused significant portions of the vegetation line in the Town of Oak Island and the Town of Ocean Isle Beach to be relocated landward of its pre-storm position, the static line for areas landward of the beach fill construction in the Town of Oak Island and the Town of Ocean Isle Beach, the onset of which occurred in 2000,

shall be defined by the general trend of the vegetation line established by the Division of Coastal Management from June 1998 aerial orthophotography.

- (7) Beach Fill. Beach fill refers to the placement of sediment along the oceanfront shoreline. Sediment used solely to establish or strengthen dunes shall not be considered a beach fill project under this Rule. A “large-scale beach fill project” shall be defined as any volume of sediment greater than 300,000 cubic yards or any storm protection project constructed by the U.S. Army Corps of Engineers.
- (8) Erosion Escarpment. The normal vertical drop in the beach profile caused from high tide or storm tide erosion.
- (9) Measurement Line. The line from which the ocean hazard setback as described in Rule .0306(a) of this Section is measured in the unvegetated beach area of environmental concern as described in Rule .0304(3) of this Section. Procedures for determining the measurement line in areas designated pursuant to Rule .0304(3) of this Section shall be adopted by the Commission for each area where such a line is designated pursuant to the provisions of G.S. 150B. These procedures shall be available from any local permit officer or the Division of Coastal Management. In areas designated pursuant to Rule .0304(3)(b) of this Section, the Division of Coastal Management shall establish a measurement line that approximates the location at which the vegetation line is expected to reestablish by:
 - (A) determining the distance the vegetation line receded at the closest vegetated site to the proposed development site; and
 - (B) locating the line of stable and natural vegetation on the most current pre-storm aerial photography of the proposed development site and moving this line landward the distance determined in Subparagraph (a)(1) of this Rule.

The measurement line established pursuant to this process shall in every case be located landward of the average width of the beach as determined from the most current pre-storm aerial photography.

- (10) Development Line. The line established in accordance with 15A NCAC 07J .1300 by local governments representing the seaward-most allowable location of oceanfront development. In areas that have development lines approved by the CRC, the vegetation line or measurement line shall be used as the reference point for measuring oceanfront setbacks instead of the static vegetation line, subject to the provisions of Rule 07H .0306(a)(2) of this Section.

(b) For the purpose of public and administrative notice and convenience, each designated minor development permit-letting agency with ocean hazard areas may designate, subject to CRC approval in accordance with the local implementation and enforcement plan as defined in 15A NCAC 07I .0500, an identifiable land area within which the ocean hazard areas occur. This designated notice area must include all of the land areas defined in Rule .0304 of this Section. Natural or man-made landmarks may be considered in delineating this area.

15A NCAC 07H .0308 SPECIFIC USE STANDARDS FOR OCEAN HAZARD AREAS

(b) Dune Establishment and Stabilization. Activities to establish dunes shall be allowed so long as the following conditions are met:

- (1) Any new dunes established shall be aligned to the greatest extent possible with existing adjacent dune ridges and shall be of the same general configuration as adjacent natural dunes.
- (2) Existing primary and frontal dunes shall not, except for beach nourishment and emergency situations, be broadened or extended in an oceanward direction.
- (3) Adding to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The filled areas shall be immediately replanted or temporarily stabilized until planting can be successfully completed.
- (4) Sand used to establish or strengthen dunes shall be of the same general characteristics as the sand in the area in which it is to be placed.
- (5) No new dunes shall be created in inlet hazard areas.
- (6) Sand held in storage in any dune, other than the frontal or primary dune, may be redistributed within the AEC provided that it is not placed any farther oceanward than the crest of a primary dune or landward toe of a frontal dune.
- (7) No disturbance of a dune area shall be allowed when other techniques of construction can be utilized and alternative site locations exist to avoid unnecessary dune impacts.

(c) Structural Accessways:

- (1) Structural accessways shall be permitted across primary dunes so long as they are designed and constructed in a manner that entails negligible alteration on the primary dune. Structural accessways shall not be considered threatened structures for the purpose of Paragraph (a) of this Rule.
- (2) An accessway shall be conclusively presumed to entail negligible alteration of a primary dune provided that:
 - (A) The accessway is exclusively for pedestrian use;
 - (B) The accessway is less than six feet in width;
 - (C) The accessway is raised on posts or pilings of five feet or less depth, so that wherever possible only the posts or pilings touch the frontal dune. Where this is deemed impossible, the structure shall touch the dune only to the extent absolutely necessary. In no case shall an accessway be permitted if it will diminish the dune's capacity as a protective barrier against flooding and erosion; and
 - (D) Any areas of vegetation that are disturbed are revegetated as soon as feasible.
- (3) An accessway which does not meet Part (2)(A) and (B) of this Paragraph shall be permitted only if it meets a public purpose or need which cannot otherwise be met and it meets Part (2)(C) of this Paragraph. Public fishing piers shall not be deemed to be prohibited by this Rule, provided all other applicable standards are met.
- (4) In order to avoid weakening the protective nature of primary and frontal dunes a structural accessway (such as a "Hatteras ramp") shall be provided for any off-road vehicle (ORV) or emergency vehicle access. Such accessways shall be no greater than 10 feet in width and shall be constructed of wooden sections fastened together over the length of the affected dune area.

(d) Building Construction Standards. New building construction and any construction identified in .0306(a)(5) and 07J .0210 shall comply with the following standards:

- (1) In order to avoid danger to life and property, all development shall be designed and placed so as to minimize damage due to fluctuations in ground elevation and wave action in a 100-year storm. Any building constructed within the ocean hazard area shall comply with relevant sections of the North Carolina Building Code including the Coastal and Flood Plain Construction Standards and the local flood damage prevention ordinance as required by the National Flood Insurance Program. If any provision of the building code or a flood damage prevention ordinance is inconsistent with any of the following AEC standards, the more restrictive provision shall control.

- (2) All building in the ocean hazard area shall be on pilings not less than eight inches in diameter if round or eight inches to a side if square.
- (3) All pilings shall have a tip penetration greater than eight feet below the lowest ground elevation under the structure. For those structures so located on or seaward of the primary dune, the pilings shall extend to five feet below mean sea level.
- (4) All foundations shall be adequately designed to be stable during applicable fluctuations in ground elevation and wave forces during a 100-year storm. Cantilevered decks and walkways shall meet this standard or shall be designed to break-away without structural damage to the main structure.



Topsail Island *Shoreline Protection Commission*



March 18, 2017

Renee Cahoon,
CRC Chairwoman
N.C. DEQ Administration
1601 Mail Service Center
Raleigh, N.C. 27699-160

Subject: CRC Chairman request for feedback from users of CRC Regulations

Dear Ms. Cahoon,

The Topsail Shoreline Protection Commission (TISPC) held a workshop to review Coastal Resources Commission (CRC) regulations that impact our beaches, inlets and sounds. We offer the suggestions below to the CRC on areas that might be considered for improvement as part of the CRC normal review process.

The TISPC is chartered by the towns of North Topsail Beach, Surf City and Topsail Beach to keep their respective town boards and the county boards of Onslow and Pender informed concerning items related to our area beaches, inlets and sound.

Please consider our suggestions in your review process. Our desire is to improve and protect the quality of our beaches for the benefit of all who use them.

RECEIVED

MAR 30 2017

DCM- MHD CITY

TOPSAIL ISLAND SHORELINE PROTECTION COMMISSION (TISPC)

TISPC Contact Info: PO Box 2475 - 214 N New River Dr., Surf City, NC 28445 - Phone: 910-328-4131 - Fax: 910-328-1476
Chairman Contact: Steven G. Smith – Mobile: 910-547-2677 – Fax 910-328- 5833 – email: SteveSmithTB@aol.com

1. **Suggested Changes to CRC and NC Regulations:** (no order of importance)

- a. Now that terminal groins have been approved for NC and some have been constructed, the need to get approval from 21 federal and state agencies seems excessive and delays construction of new groins since 3-4 years pass before final approval.
 - i. Terminal groins are very expensive to construct for small beach towns and are a last resort for keeping sand out of the inlet and on the beach; so once a town has made the financial commitment to construct, then the approval process should flow quicker.
 1. As an example, when Environmental Impact Studies (EIS) have been done in the last 3-4 years for the area proposed for a new terminal groin, the data from that EIS which applies to terminal groin construction should be used to shorten approval time.
- b. The CRC should modify the rule requiring adjacent property owners to be notified before issuing a CAMA permit. The current requirements are misleading and confusing to the adjacent property owners because it gives them the impression they have to approve the project. While they can comment about the project, it does not require their approval before issuance of a permit.
 - i. Is there a real need to contact the adjacent property owner given as they have no rights to approve or deny a project?
- c. The CRC rule against cantilevering a roof line into the sixty-foot (60') setback on the oceanfront should be reviewed. Cantilevers used to be allowed, but that rule was abused with excessively long cantilevers. Applying a cap on cantilever extension; for example, allowing a two foot (2') maximum cantilever extension would allow for a small encroachment but avoid the problem of excessive cantilevers into the setback zone.
- d. CRC rules as posted on the web on coastal development are difficult to navigate for the average person planning a project. A summary or step by step guide of some sort would be helpful.
- e. Some of the CRC rules are vague or not self-explanatory. The examples below are left up to interpretation; as well as to the official who makes the final call when interpretation is needed:
 1. The rule allowing the impervious surface to be covered if more than 30% then "innovative design" is submitted – what is an "innovative design?"
 2. The rule prohibiting disturbance to other dunes unless it's not practical to build. What is considered "not practical"?

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- f. The rule prohibiting placement of sand on the backside of a frontal dune seems counterproductive to beach stabilization. One would assume adding sand to the frontal dune would only increase the stability and protection the dune provides. In discussions with CAMA officials; it appears many are unclear why this rule is in effect or the history of why it was written.
- g. The rules regulating the size of sandbags and use of geotubes should be reviewed because alternatives are more effective and economical. If you are using sandbags to protect one house it would make sense to use 3'X5' sandbags, but if you are protecting a whole row of houses it would make sense to use geotubes instead of larger sandbags. Use of geotubes for the NTB north end revetment would have been the best and most cost-effective solution rather than stacks of large sandbags that can be moved out of alignment by strong ocean waves.
 - i. The issue of when large sandbags or geotubes can be removed seems to be a CRC concern but the ease of cutting the exposed fabric and removing that part of the geotube fabric above the sand surface makes aesthetics a non-issue.
- h. When a CAMA major permit is required to construct a seawall because of some form of sea grass, require that the questionable grass be transplanted to areas agreed to during the permitting process rather than on inspection of project.
- i. Allow wider, public-finger docks to conform with guidelines for providing access to persons with disabilities.

2. Suggested Changes to Proposed CRC Rule Changes:

- a. The proposed bill exempting all sediment criteria rules from Cape Lookout, Diamond and Frying Pan Shoals is a concern as it may reduce standards. We caution CRC about possible support of any kind of project with no testing as dredge materials may not be suitable for beach nourishment.
- b. The requirement of a multibeam survey of potential borrow areas should be looked at because these surveys are expensive and in some cases, are not necessary. At times the older method of coring will give better data due to the nature of the sediment profile.

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3. NC Wildlife Federation and Proposed Rule for Secondary Nursery Areas:

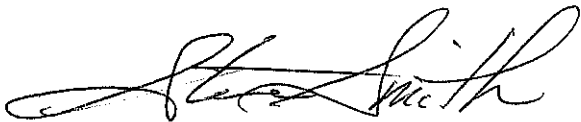
- a. The proposed regulations to reduce and restrict shrimp trawling would have a drastic effect on the NC Seafood Industry as well as shoreline protection.
 - i. The proposed regulations designating all coastal waters other than primary nursery areas, as secondary nursery areas that extend 3 miles offshore will add another layer of comments needed from the various agencies during the CAMA permitting process.
 - ii. The secondary nursery area regulation should be altered to specific areas based on fisheries biology rather than all coastal waters not in a primary nursery area.
 - iii. It was also noted that if shrimping is limited to three (3) days a week and daytime only, it will decimate the NC shrimping industry.

4. Other Issue:

- a. In some cases, the State does not have enough certified engineers available to evaluate CAMA permit requests. Possible solution would be to accept the certified seal of the private engineer who did the plan and project survey. Certified engineers must stand by their work legally and professionally so relying on the certified stamped studies and plans submitted by the applicants would save time and money for the State.

If the TISPC can be of any assistance, please contact me. We also wish you the best as Chairwoman of the CRC.

Regards,



**Steven G. Smith, Chairman
Topsail Island Shoreline Protection Commission**

cc: Michael Moore, CRAC member
Mayors: North Topsail Beach, Surf City & Topsail Beach
TISPC Members

RECEIVED

MAR 30 2017

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MEMORANDUM

CRC – Information Item

TO: Coastal Resources Commission
FROM: Charlan Owens, AICP, DCM Elizabeth City District Planner
SUBJECT: Dare County Land Use Plan (LUP) - Implementation Status Report
DATE: April 12, 2017

Background

Local governments submit an implementation status report every two (2) years following the date of LUP initial certification per the following:

15A NCAC 07B .0804 REQUIRED PERIODIC IMPLEMENTATION STATUS REPORTS

Jurisdictions with a locally adopted and certified land use plan shall submit an Implementation Status Report to the Division of Coastal Management every two years from the date of initial certification by the CRC. This report shall be based on implementation actions that meet the CRC's Management Topic goals and objectives, as indicated in the action plan pursuant to Rule 07B .0702(e)(3) of this Subchapter. The Implementation Status Report shall also identify:

- (1) All local, state, federal, and joint actions that have been undertaken successfully to implement its certified land use plan;
- (2) Any actions that have been delayed and the reasons for the delays;
- (3) Any unforeseen land use issues that have arisen since certification of the land use plan; and
- (4) Consistency of existing land use and development ordinances with current land use plan policies.

The Dare County implementation status report is available on DCM's Land Use Planning web page at:

<https://deq.nc.gov/about/divisions/coastal-management/coastal-management-land-use-planning/certified-lups/dare-county>

It is not provided in the CRC packet.

Discussion

The implementation status report does not require approval by the CRC. The report is based on the LUP Action Plan and identifies activities that the local government has undertaken in support of the LUP's policies and implementation actions. Staff has reviewed the submitted report and finds that the community has met the minimum requirements.