

NORTH CAROLINA NATIONAL ESTUARINE RESEARCH RESERVE

MANAGEMENT PLAN 2009-2014



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.

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ACRONYMS

- APNEP Albemarle-Pamlico National Estuary Program
- BHIC Bald Head Island Conservancy
- CAMA Coastal Area Management Act
- C-CAP Coastal Change Analysis Program
- CCFHR Center for Coastal Fisheries and Habitat Research
- CDMO Centralized Data Management Office
- CERF Carolina Estuarine Reserve Foundation
- CFR Code of Federal Regulations
- CHPP Coastal Habitat Protection Plan
- CICEET Cooperative Institute for Coastal and Estuarine Environmental Technology
- CMS Center for Marine Science
- CTP Coastal Training Program
- CWMTF Clean Water Management Trust Fund
- CZMA Coastal Zone Management Act
- CZMP Coastal Zone Management Program
- DCM North Carolina Division of Coastal Management
- DENR North Carolina Department of Environment and Natural Resources
- DMF North Carolina Division of Marine Fisheries
- DUML Duke University Marine Lab
- DVD Digital Video Disc
- ECSU Elizabeth City State University
- ERD Estuarine Reserves Division
- GIS Geographic Information Systems
- GRF Graduate Research Fellow
- IMS Institute of Marine Sciences (UNC-CH)
- IOOS Integrated Ocean Observing Systems
- KEEP K-12 Estuarine Education Program
- LAC Local Advisory Committees
- MA Market Analysis
- MOU Memorandum of Understanding
- NA Needs Assessment
- N.C. North Carolina
- NCERT National Coastal and Estuarine Research and Technology
- NCNERR North Carolina National Estuarine Research Reserve
- NCNHP North Carolina Natural Heritage Program
- NERRS National Estuarine Research Reserve System
- NOAA National Oceanic and Atmospheric Administration
- OCRM Office of Ocean and Coastal Resource Management
- SAV Submerged Aquatic Vegetation
- SECOORA Southeast Coastal Ocean Observations Regional Association
- SWMP System-Wide Monitoring Program

- UNC University of North Carolina
- UNC-CH University of North Carolina at Chapel Hill
- UNCW University of North Carolina at Wilmington
- U.S. United States
- USC United States Code
- USGS United States Geological Survey
- WRC North Carolina Wildlife Resources Commission

FIGURES

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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 27 Reserves in 22 states and territories, protecting over one million acres of estuarine lands and water.

The NCNERR is managed as a federal-state partnership between the National Oceanic Atmospheric Administration's (NOAA) Office of Ocean and Coastal Resource Management (OCRM) and the North Carolina Department of Environment and Natural Resources' (DENR) Division of Coastal Management (DCM). OCRM implements the National Coastal Zone Management Program and the NERRS with authorization from the Coastal Zone Management Act of 1972 (CZMA). OCRM 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 of 1972 in the 20 coastal North Carolina counties, using rules and policies of the N.C. Coastal Resources Commission. As the state partner, the DCM provides land ownership and management, staff, programming, and matching funds for implementation of the NCNERR. The DCM is well-suited as the NCNERR's state partner as both organizations have similar missions of protecting coastal resources, albeit via different mechanisms. Both the DCM and NCNERR 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 as well as the three regions of the N.C. Coastal Plain. The NCNERR was established as a multi-component Reserve to take advantage of this unique biogeography and is comprised of four geographically disparate components representing diverse estuarine habitats:

1. The 965-acre Currituck Banks component 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 component located in Carteret County between the town of Beaufort, Harkers Island and the Cape Lookout National Seashore;
3. The 5,653-acre Masonboro Island component, 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 component, encompassing tracts in both New Hanover and Brunswick counties, reached via United States (U.S.) 421 south of Kure Beach.

The NCNERR is operationally divided into three distinct sectors to support its mission of *promoting informed management and stewardship of North Carolina's estuarine and coastal habitats through research, education, and example*: education, research, and stewardship. Each sector is devoted to fostering that aspect of the program, under the guidance of the Reserve Manager and according to the management plan.

- The Education sector, through programs and activities, strives to increase understanding and awareness of estuarine systems and improve decision-making to promote stewardship of North Carolina's coastal resources among the general public, K-12 students and teachers, and coastal decision-makers.
- The Research sector addresses scientific and technical aspects of coastal management problems through a comprehensive, interdisciplinary, and coordinated research program including site-directed research, monitoring, and the Graduate Research Fellowship Program.
- The Stewardship sector is involved in a wide range of activities including land acquisition, ecological restoration, resource inventories, watershed management projects, endangered species protection, visitor use management, regional planning, policy development and more.

Each sector utilizes the four components of the NCNERR to implement its respective programs, promoting site-based management of the Reserve.

The OCRM 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 education, research, stewardship and public access, acquisition, and facilities. The plan must be approved by OCRM and periodically updated. The initial NCNERR management plan was prepared and approved in 1983 with revisions in 1990 and 1998. This document is the third revision of that plan.

Each Reserve is periodically evaluated by OCRM for compliance with NERRS goals and its approved management plan, funding awards, and work plans. The NCNERR was last evaluated in 2005. The evaluation findings acknowledged Reserve accomplishments in the areas of research and monitoring, education, and stewardship. The findings also included actions and recommendations to: develop a new management plan that addresses programmatic priorities, future direction, minimal state support of the NCNERR, facilities, staffing, and safety; complete the NCNERR site profile; take advantage of the many research partnership opportunities available; evaluate the local advisory committees so they may better serve the Reserve and its customers, and work with the Reserve's local and national non-profit groups.

Since its designation in 1985 (Currituck Banks, Rachel Carson, and Zeke's Island) and 1991 (Masonboro Island), the NCNERR has provided high quality education, research, and stewardship programs to the coastal management community, 20 coastal North Carolina counties, and visitors alike. This premise has been the cornerstone of Reserve operations even through periods of transition. Today the Reserve comprises one of three sections within DCM, an increase in the vertical placement of the program on the DCM organizational chart; enjoys a more mutually-beneficial relationship with DCM resulting in collaborative programming and decision-making; boasts two new office facilities with the new Beaufort office now serving as

the Reserve headquarters; implements an updated management philosophy that promotes the Reserve and its sites and programs, and recognizes the need for Reserve programs at all sites; and provides more robust, diverse, and integrated programs that build heavily on partnerships.

This management plan provides a framework for the Reserve to continue, enhance, and expand its operations and programs for 2009-2014 to better address high priority coastal management issues and serve NCNERR customers, thereby promoting healthy estuaries and watersheds. The following five goals and resultant objectives and activities will guide Reserve management during this period (Figure 1).

1. Humans understand the natural systems, their connections to them, and the benefits derived from them.
2. Applicable research informs coastal policy.
3. NCNERR habitats and land use of associated watersheds are characterized and connections understood.
4. Habitat is protected and the public has directed access to NCNERR components.
5. NCNERR operations, infrastructure, and stature are improved.

There are several overarching issues faced by the entire North Carolina coast that threaten all components of NCNERR. These include both anthropogenic as well as natural processes. Issues affecting all NCNERR components include coastal population increase, altered land use, storm water runoff and eutrophication, invasive species, tropical and coastal storm impacts, and sea level rise. In addition to these overarching issues, individual Reserves have specific local challenges as well.

The administration, education, research, and stewardship plans contained herein detail how each program will address the relevant goals, objectives, and activities in Figure 1 and the evaluation recommendations. The plans also identify the types of projects the NCNERR will undertake in an effort to address the threats facing its components and N.C. coastal communities in general.

A coordinated approach will be taken to implement this management plan; this will involve OCRM and DCM, the Reserve's administrative and programmatic partners, local advisory committees, volunteers, and the local non-profit organization, the Carolina Estuarine Reserve Foundation.

Figure 1a: Summary of NCNERR Goal 1 with Objectives and Activities

GOAL 1:
Humans understand the natural systems, their connections to them, and the benefits derived from them.

Objective 1.1
 Education programs will deliver information on N.C. coastal resources to formal and informal educators, and K-12 and college students to foster environmental stewardship and informed decision-making.

- Activities**
1. Conduct educator workshops
 2. Update workshops and curricula based on current techniques and needs
 3. Provide student field trips, hands-on programs and summer programs for K-12 students
 4. Incorporate Reserve research and monitoring data into programs
 5. Conduct local outreach efforts in schools
 6. Design field-based K-12 and college student site management projects with stewardship and research sectors
 7. Conduct post-workshop and trip evaluations and fine-tune programs
 8. Conduct market analysis and needs assessment
 9. Determine efficacy and future of local EstuaryLive events

Objective 1.2
 The greater community, including the general public, visitors, and pre-school children, will receive educational programming.

- Activities**
1. Conduct public educational field trips
 2. Hold summer programs for children
 3. Plan and coordinate new educational events to respond to needs
 4. Deliver information on NCNERR programs and coastal ecosystems

Objective 1.3
 Coastal Training Program (CTP) activities will deliver science-based knowledge and skills appropriate to the needs of target audiences and relevant to sustainable coastal management.

- Activities**
1. Conduct assessments of information and training needs of coastal decision-makers
 2. Coordinate fundamental trainings for decision-makers
 3. Coordinate new training events in response to needs
 4. Use coastal and estuarine science in training and support materials
 5. Conduct post-workshop evaluations and fine-tune training efforts

Figure 1b: Summary of NCNERR Goal 2 with Objectives and Activities

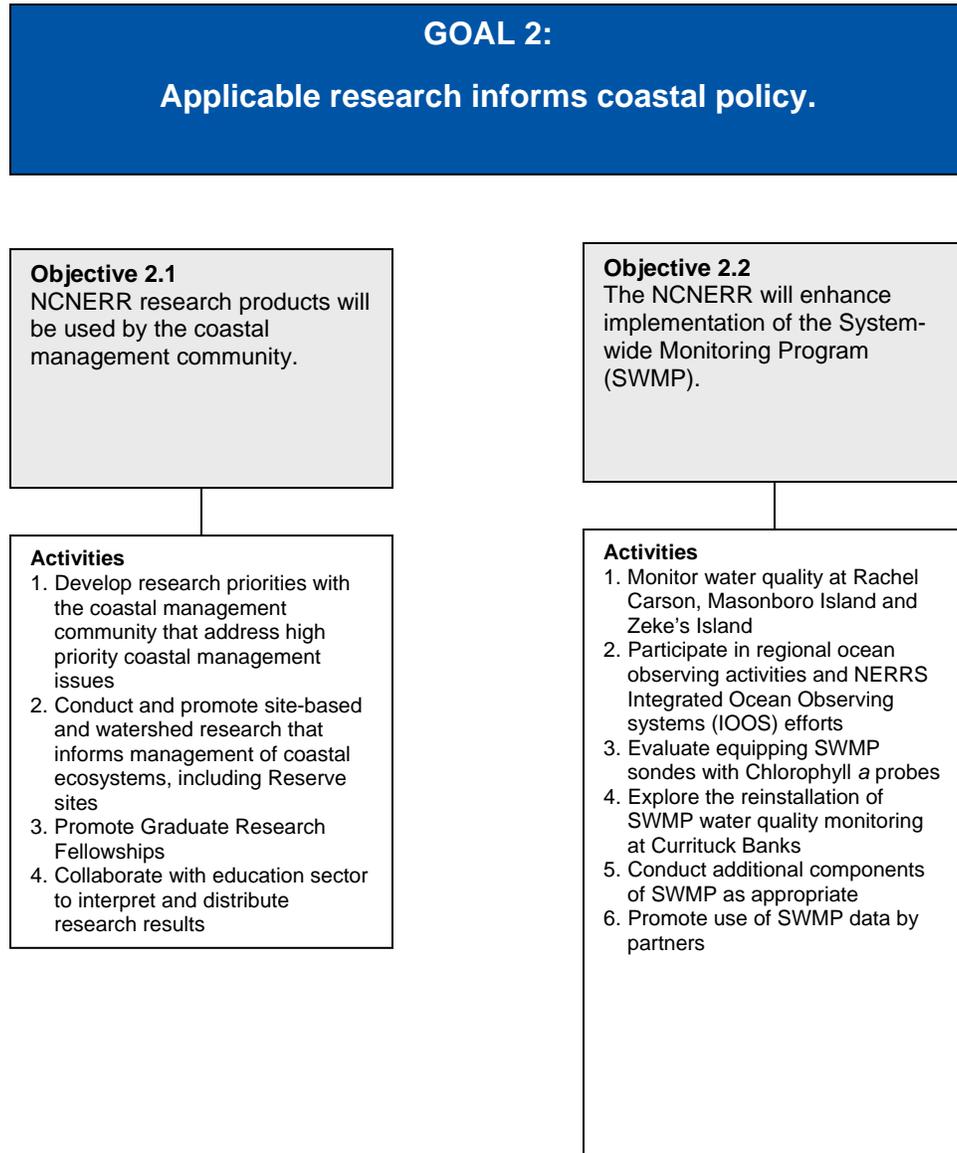


Figure 1c: Summary of NCNERR Goal 3 with Objectives and Activities

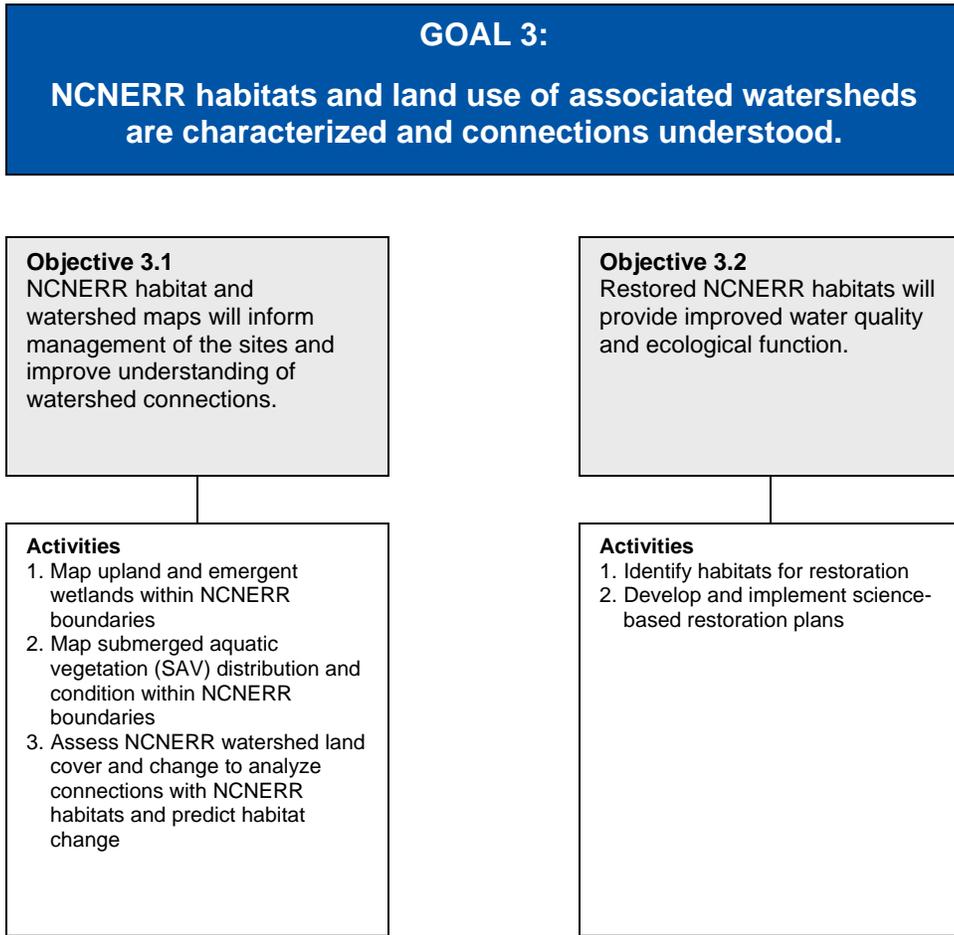


Figure 1d: Summary of NCNERR Goal 4 with Objectives and Activities

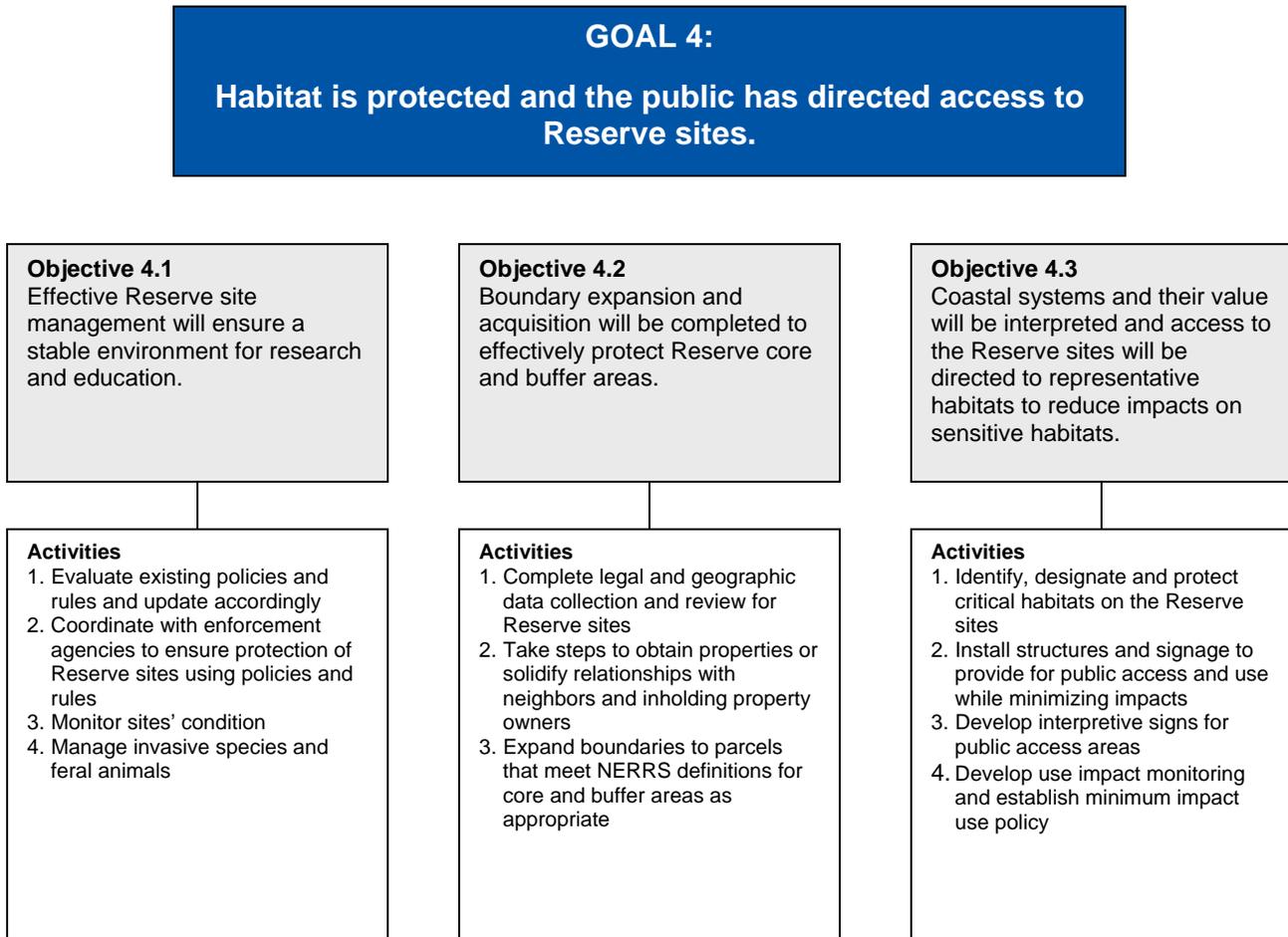


Figure 1e: Summary of NCNERR Goal 5 with Objectives and Activities

GOAL 5:
NCNERR operations, infrastructure, and stature are improved.

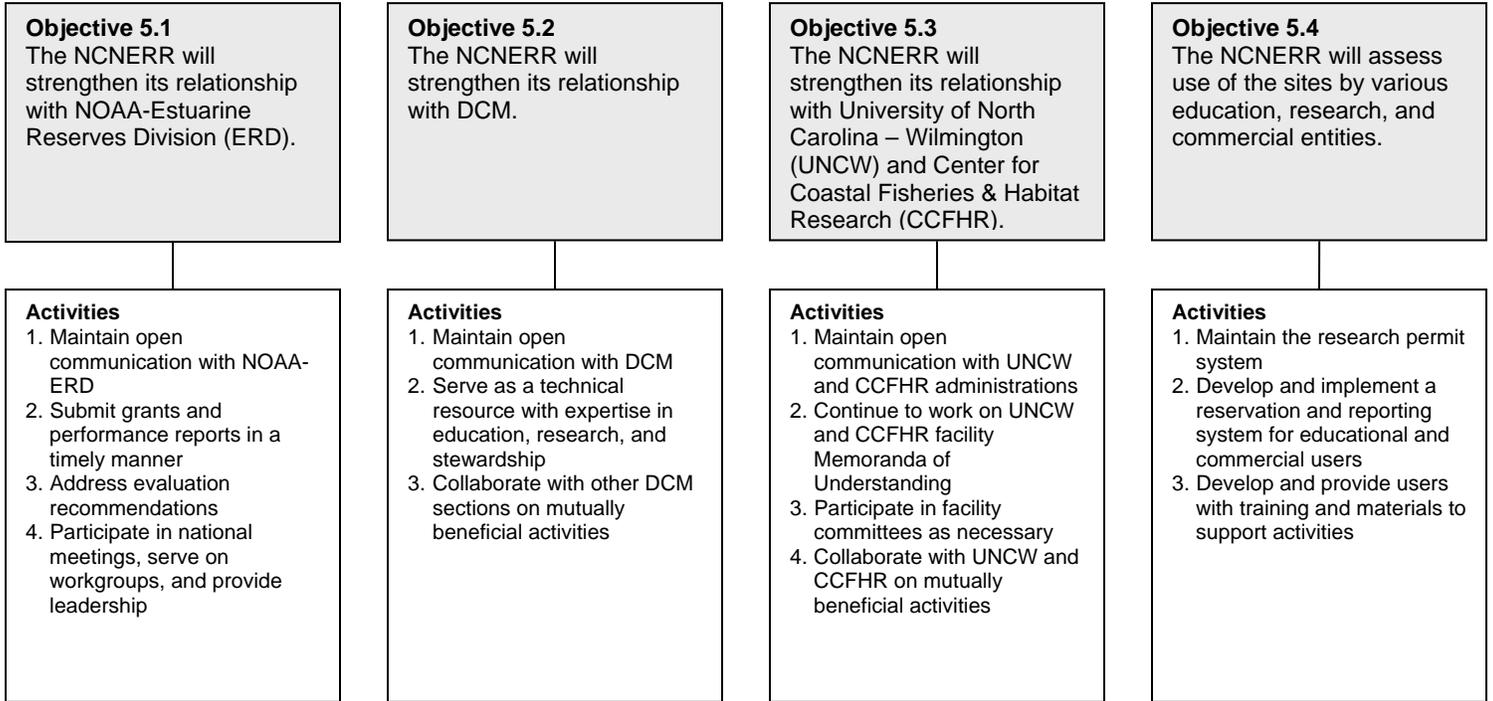


Figure 1f: Continuation of NCNERR Goal 5 with Objectives and Activities

**GOAL 5 - continued:
NCNERR operations, infrastructure, and stature are improved.**

Objective 5.5
The NCNERR will ensure its operating infrastructure is adequate to fulfill the program mission.

- Activities**
2. Maintain infrastructure and partner relations to ensure longevity
 3. Assess infrastructure needs on a regular basis
 4. Increase state monetary support of the NCNERR
 5. Seek outside funding to help administer program

Objective 5.6
The NCNERR will ensure its staff has the skills necessary to perform their jobs and are able to do so safely.

- Activities**
1. Provide and participate in training opportunities to enhance and expand staff skills
 2. Address staffing needs as resources allow
 3. Ensure staff are equipped to perform job duties safely
 4. Review safety and hurricanes plans annually to ensure effectiveness
 5. Participate in relevant safety committees

Objective 5.7
The community will recognize the NCNERR and understand how the Reserve serves the citizens and visitors of North Carolina.

- Activities**
1. Develop and implement an external marketing and communication plan
 2. Assess plan effectiveness at regular intervals

Objective 5.8
The NCNERR needs will be more fully met by volunteers and volunteers will be trained in coastal issues.

- Activities**
1. Develop, evaluate, and implement a volunteer training program based on stewardship, education, and research needs and volunteer interests
 2. Increase on-site volunteer opportunities
 3. Increase coordination with NCNERR non-profit organization, Carolina Estuarine Reserve Foundation
 4. Conduct local advisory committee meetings

