



Oyster Restoration and Protection Plan for North Carolina:

A Blueprint for Action 2015-2020



Prepared by: N.C. Coastal Federation

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■ Introduction

For more than a decade, a diverse group of people involved in growing, harvesting, studying, managing and eating oysters has voluntarily and productively worked together to protect and restore N.C.'s oyster habitats and fishery. They did this because the Eastern Oyster, *Crassostrea virginica*, is an ecological, economic and educational treasure for North Carolina. Dramatic declines in oyster abundance, reflected in declining harvest over the past century, have landed oysters on the list of species of special concern that is compiled by the N.C. Division of Marine Fisheries. The decline of oysters results from habitat loss, water pollution, diseases and historic harvest pressures.

Efforts to reverse this decline and restore oysters to their previous ecological and economic glory have created new oyster habitats and improved existing habitats. Tangible benefits associated with successful oyster restoration such as increases in annual commercial and recreational oyster harvests have occurred due to efforts to improve water quality and fisheries habitat and address complex management challenges. This Oyster Restoration and Protection Plan for North Carolina: A Blueprint for Action (Blueprint) provides current and future stakeholders with cohesive direction and guidance that allows them to come together as a united force to implement restoration, management and economic development strategies to produce tangible benefits to the environment and the economy.

The Blueprint enables government, private agencies, fishermen and growers and other shellfish stakeholders to coordinate and link habitat and water quality protection and restoration and fishery management activities. This collaborative approach has resulted in tens of millions of dollars in investments toward oyster-related restoration, watershed management and research programs since 2003.

As a result of this investment, many of the objectives identified in the first two editions of the Blueprint have been realized. In response to new opportunities and challenges, the third edition of the Blueprint has been developed to continue a joint vision among stakeholders for the next five years. The Blueprint continues to be a dynamic document that will be updated and amended by an advisory steering committee.

This new edition of the Blueprint is similar to previous versions in that it focuses on ways to enhance native oyster populations in the state so as to support healthy and productive coastal waters and habitats. The plan recognizes the essential role each stakeholder plays in implementing restoration efforts and allows us learn from our strategies and make necessary adjustments to improve them going forward. This updated Blueprint incorporates the latest science to enhance and improve upon past practices and initiatives, and it integrates the concept of using environmental restoration



As I ate the oysters with their strong taste of the sea and their faint metallic taste that the cold white wine washed away, leaving only the sea taste and the succulent texture, and as I drank their cold liquid from each shell and washed it down with the crisp taste of the wine, I lost the empty feeling and began to be happy and to make plans.

- Ernest Hemingway, *A Moveable Feast*



Volunteers assist with creating an offshore oyster sill.

as an economic development tool as one means to create greater support for oyster restoration efforts.

North Carolina is at a crossroads with its oyster restoration and management efforts. Experienced state fisheries staff, long involved in oyster management efforts, have retired. The institutional knowledge of this staff must quickly be documented and preserved or it will be forgotten. Waters open to oyster harvest are shrinking due to water quality declines. State funding for restoration has become harder to obtain, and many current state leaders have never been fully introduced to or involved in previous oyster restoration initiatives.

Competition for federal restoration funding is intense as other states work aggressively through their congressional leadership to attract federal dollars for their own oyster restoration programs. These increased oyster restoration efforts are also intensifying competition for appropriate reef building materials and other resources. Additionally, private cultivation of oysters in our coastal waters has been in decline over the last 20 years. There are significant opportunities to promote this industry as a way to reduce stress on wild harvest, improve job opportunities along the coast, and improve water quality.

It will take a concerted and well-organized campaign by all stakeholders to overcome these challenges. Having an effective Blueprint to help build a solid foundation for conducting restoration efforts and building an economic development strategy for the coast is an

essential ingredient of success. The following goals, objectives, and action items represent the third five-year cycle of the Blueprint in continued support of a vision of rich populations of oysters that provide for a healthy coastal environment and economy.

■ Plan Goals

■ **Goal 1: Link Restoration of Oysters and Water Quality to an Economic Development Strategy for Coastal N.C.** It is critical to demonstrate that investments in oyster and wetlands restoration and improved water quality result in jobs and economic prosperity for coastal communities. The Blueprint includes a five-year strategy for incorporating coastal environmental restoration as part of the formal economic development plan for N.C.

■ **Goal 2: Establish at Least 500 Acres of New Oyster Sanctuaries.** Constructing a network of protected oyster sanctuaries of five to 20 acres in our coastal waters will help ensure that there will always be abundant natural juvenile oysters (spat) to repopulate existing oyster reefs and habitats. The Blueprint calls for expanding the total amount of existing sanctuaries from around 150 acres to 500 acres by identifying where new sanctuaries should be located, how they should be sized, what materials and structure they should have, how they can most economically be built and how they should be funded.

PHOTO: NC COASTAL FEDERATION



Morris Landing serves as a demonstration living shoreline site as well as a stockpile location for the State's shell planting efforts.

■ **Goal 3: Plant Cultch to Provide for Ample Sustainable Wild Oyster Harvest.** For several decades, the state, on average, has placed more than 230,000 bushels of shells and other materials on the bottom of approximately 100 acres of coastal waters each year. These locations, some of which are proclaimed as “Shellfish Management Areas,” are where commercial harvest of oysters is encouraged as a way to sustain a viable oyster industry. The Blueprint calls for renewing the cultch planting efforts through adaptive management and using the outcome of a recent return on investment study to determine the strategy for future support and operation of this program. A study is currently being conducted to evaluate the return on investment that this program provides both historically and potentially in the future. Elements of this review include: (1) the success of existing cultch planting and shellfish management locations, (2) the amount of oysters harvested each year, (3) how many acres of cultch are planted each year, (4) volume of shells and other materials used, (4) construction costs and options, and (5) other valuable ecosystem services provided. The outcome of this review will then determine the strategy for future funding and operation of this program.

■ **Goal 4: Build the Mariculture Oyster Industry to Meet or Exceed Wild Harvest Levels.** Leasing and cultivation of public trust areas by private individuals for

Oysters are a vital part of our coast's economy, cultural heritage and ecosystem.

mariculture of the native oyster is an important strategy for getting more oysters in the water, relieving the strain on wild populations and growing the economic importance of this fishery. The Blueprint calls for a comprehensive effort to encourage expanded oyster mariculture by streamlining leasing and regulatory requirements while still ensuring that public trust rights, public health and fisheries habitats are protected. Initiating oyster mariculture extension training and cost-share programs should be supported. The potential growth of this industry is significant, and this growth will make the state even more invested in perpetually protecting and restoring coastal water quality and habitats.

■ **Goal 5: Sustainably Manage Oyster Harvest on Public Bottoms.** Wild harvest of oysters is a vital part of our coast's economy, cultural heritage and ecosystem. Fishery management plans, harvest rules, seasons, law enforcement and public health safeguards are all vital to maintaining wild harvest. The Blueprint calls for refining strategies through the fisheries management plan process and for seeking adequate resources to ensure that wild harvest can continue for years to come in a sustainable and safe manner.

■ **Goal 6: Protect and Improve Water Quality in Priority Shellfish Growing Areas.** Pristine coastal water quality is necessary for oysters to thrive and to be safe to harvest for human consumption. The Blueprint identifies priority watersheds where protection and restoration efforts should be focused. It also identifies strategies for leveraging private, state and federal funds to protect and restore water quality.

■ **Goal 7: Document Oyster Population Status and Trends Resulting From Successful Implementation of the Blueprint.** The Blueprint calls for the development of a website to contain all the necessary data and reports to enable decision-makers, fishermen, scientists and the public to obtain the information needed to evaluate the success of oyster restoration and management efforts over time. Key statistics for all elements of the Blueprint will be kept up-to-date on the website to ensure transparency of management efforts and prevent large losses of institutional knowledge.



PHOTO: NC COASTAL FEDERATION

Oyster roasts are a fun and important part of the coastal culture and community.

■ Action Steps To Implement Blueprint

■ Action 1: Incorporate coastal environmental restoration into the economic development strategy for N.C.

- A. Include coastal restoration in economic development plans and efforts for the state, coastal communities and coastal rural areas.
- B. Define coastal restoration to include:
 1. Watershed restoration
 2. Wetland restoration
 3. Oyster habitat restoration
 4. Stormwater retrofits efforts
 5. Living shorelines projects
- C. Streamline the approval process for environmental restoration, including:
 1. Update and revise wetland and oyster restoration permitting
 2. Accelerate permit approval process for living shoreline projects
 3. Revise commercial oyster bed/mariculture permit approval process
 4. Perform audit of N.C. stormwater protection program to develop recommendations for decreasing costs and increasing effectiveness
- D. Make oyster restoration part of the N.C. Division of Marine Fisheries' legal mandate.
- E. Designate a state agency to ensure that N.C. is maximizing the use of available federal and other non-state funds for coastal restoration.
- F. Make N.C. economic development resources available for coastal restoration with an emphasis on:
 1. Competition for resources that drives job creation and cost-effectiveness
 2. Incentives for leveraging state funds with private and other non-state dollars
 3. Private sector participation
 4. Clear reporting requirements and performance measures, including job creation and economic impact

■ Action 2: Establish and maintain at least 500 acres of sanctuaries coastwide.

- A. Select sites, determine appropriate size and structure, network and architecture; ensure the sites selected are representative of the status of the N.C. oyster population

PHOTO: NC COASTAL FEDERATION



Private contractors were hired to assist in constructing over 50 acres of oyster sanctuary in 2010.

- B. Determine the most cost-effective and appropriate materials and methods to be used to build sanctuaries.
- C. Develop cost estimates and obtain permits so that projects are shovel-ready. Work with DMF, regulatory agencies, private contractors, NGOs, research institutions, shellfish growers, harvesters and other stakeholders to implement the projects.
- D. Identify needs, develop a plan, and implement long-term site management and monitoring to allow for adaptive management of sanctuary system.
- E. Explore the use of living shorelines, closed areas and other sentinel site designations as possible oyster sanctuaries.

■ Action 3: Ensure that the state's cultch planting program provides an acceptable return on investment.

- A. Complete the funded study of program's cost-effectiveness (both historically and in the future).
- B. Place enough volume of material in the right locations each year to provide effective cultch planting sites for oyster spat settlement.
 1. Select sites, acreage, size, type, and amount of materials required.
 2. Determine appropriate type of materials and their supply chains.
 3. Establish purchasing agreements.

4. Develop and implement a plan to deploy material from strategic stockpile areas and/or large mobile stockpile barges.
- C. Determine the most cost-effective strategies for placing materials.
- D. Develop yearly cost estimates and secure funding.
- E. Document ecosystem services provided by the cultch planting sites.
- F. Identify measures of success and develop evaluation parameters for sites using alternate materials.
- G. Determine appropriate management measures for harvest in cultch sites.

■ Action 4: Encourage the growth and prosperity of the oyster mariculture industry.

- A. Determine the status and trends for mariculture operations in N.C. and update annually.
- B. Set annual and five-year goals for oyster harvest from leased bottoms.
- C. Promote oyster mariculture by:
 1. Expedite siting of leases coupled with building mapping and surveying capabilities of DMF.
 2. Facilitate and streamline lease approval process.
 3. Determine acceptable SAV impacts.
 4. Cultivate disease resistant oysters.
 5. Manage for public health.

6. Minimize public trust concerns.
7. Assess, develop, and provide training needs and cost-share programs for growers.
 - a. Encourage NRCS to provide cost-share programs for growers and public/private hatcheries.
- D. Provide guidance and support efforts for the UNCW Shellfish Research Hatchery.
- E. Adopt a management structure that enables private growers to operate profitably in N.C.
- F. Research environmental and economic benefits of oyster mariculture.

■ Action 5: Devise, implement, evaluate and annually update a five-year comprehensive goal for managing the oyster fishery on public trust bottoms.

- A. Determine the status and trends for oyster harvest.
- B. Set annual and five-year harvest goals from publically available and managed growing areas from baseline of post-dermo.
- C. Reflect revised management strategies in update to Oyster Fisheries Management Plan.

■ Action 6: Protect and improve water quality in priority shellfish growing areas.

- A. Identify and prioritize the most critical coastal watersheds that determine water quality in prime oyster growing areas of N.C.
 1. Maintain updated shellfish mapping.
 2. Maintain updated SAV mapping.
- B. Document the status and trends of water quality in priority watersheds.
- C. Establish water quality management plans.
 1. Devise Watershed Restoration Plans for priority watersheds with impaired waters as well as for priority watersheds with pristine water quality.
- D. Implement watershed management plans.
 1. Partner to implement plans.
 2. Secure funding to implement watershed management plan recommendations.
 3. Establish measures of implementation success.
 4. Document and evaluate progress towards plan goals.



PHOTO: JOEY DANIELS

Typical oyster lease in North Carolina.

5. Communicate priorities and lessons learned.
- E. Reflect watershed management strategies in related planning and management efforts.
 1. Coastal Area Management Act land use plans
 2. Albemarle-Pamlico National Estuary Partnership's Comprehensive Conservation and Management Plan
 3. Coastal Habitat Protection Plan
 4. Funding guidance for state grant programs
- F. Partner and secure funding from diverse granting and non-granting sources to implement, evaluate monitor and communicate progress.

■ Action 7: Obtain adequate funding to implement the *Blueprint*.

- A. Secure adequate annual appropriation to enable DMF to staff its core responsibilities related to oyster restoration.
 1. Maintain adequate staff and equipment to implement agreed-upon priorities.
 2. Devise simple procedures to facilitate the appropriate use of private contractors.
- B. Obtain restoration funds from federal sources to leverage state and private funds.
- C. Use state and federal economic development resources to fund restoration activities that enhance the coastal economy.
 1. Project and document employment provided by implementing restoration efforts.
 2. Document the long-term economic value of restoration activities.
 3. Integrate oyster restoration in the state's economic development framework.

■ Action 8: Cultivate and organize the leadership and partnerships that are necessary to develop progressively refined, effective and efficient strategies for managing and restoring oyster habitats and fisheries in N.C.

- A. Organize and engage a steering committee and continue the work of the two regional workgroups to identify, select, monitor, implement and evaluate restoration strategies with key stakeholders.

PHOTO: N.C. COASTAL FEDERATION



Oyster reef created behind Bodie Island.

- B. Convene at least one steering committee meeting each year to coordinate the work of workgroups and other stakeholders.
- C. Hold at least two regional workgroup meetings each year to guide restoration efforts.
- D. Hold at least one technical workshop each year to encourage communication and partnership opportunities.
- E. Communicate a strategic vision and plan, and share progress and lessons learned with stakeholders, decision-makers and the general public at one major public oyster summit every two years.
- F. Work with the General Assembly to enact legislation that establishes oyster population restoration as a legislative mandate.

■ Action 9: Prepare and distribute an annual State of the N.C. Oyster Report.

- A. Record work accomplished, evaluate successes and failures and evolve blueprint based upon lessons learned.
- B. Evaluate and refine research questions being studied to make sure management questions and needs are constantly evaluated, identified and prioritized.
 1. Develop or maintain a list of priority research questions and needs related to oyster restoration for funding organizations.



Hand harvesting oysters in N.C.

2. Catalogue research studies taking place and completed in N.C. and what management questions or needs these studies address.
3. Make sure completed research results are communicated to appropriate decision-makers and disseminated to a wide audience.
- C. Capture lessons learned from restoration projects and programs to inform future restoration efforts.
- D. Develop and publicize tools that predict restoration success.
 1. Develop a more advanced model that predicts restoration/oyster growth and survival success.
 2. Establish long-term, efficient, consistent and strategic baseline database.
 3. Determine measures of success.
- E. Publish updated links to shellfish maps.
- F. Determine necessary budget to fund monitoring essential to evaluate the success of restoration efforts.
- G. Establish oyster restoration website and populate it with historic and current data on oyster restoration activities, costs and benefits in N.C.

The organizations below are just a few of those involved in water quality and oyster protection and restoration in North Carolina. Many others serve as active participants in the plan development including shellfish growers and harvesters and members of the public.

