

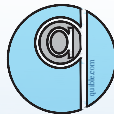
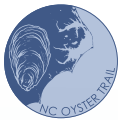
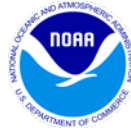


# 2023 STATE OF THE OYSTER REPORT

*on the* OYSTER RESTORATION & PROTECTION  
PLAN FOR NORTH CAROLINA

*Prepared by the North Carolina Coastal Federation and Published July 2024*

## Partners involved in the *Blueprint* effort in 2023 included:





The Oyster Restoration and Protection Plan for North Carolina: A Blueprint for Action 2021-2025 (*Blueprint*) outlines eight strategies and corresponding actions that partners are taking to rebuild and support the state's oyster resources.

The work outlined in the *Blueprint* covers everything from protecting and restoring the state's important shellfishing waters to building new oyster reefs, continuing wild harvest while expanding oyster farming activities, and educating the public and other stakeholders about oysters. This annual **State of the Oyster Report** provides a brief overview and highlights the activities and accomplishments of the diverse partners involved in this work for the year 2023.

# Water Quality

Pristine water quality is critical in supporting oyster habitats, ensuring oysters are safe for human consumption when harvested, and for supporting the oyster farming industry which depends on reliable water quality. All of these uses suffer when temporary or permanent closures of shellfish waters occur. The Shellfish Sanitation and Recreational Water Quality Section of the North Carolina Division of Marine Fisheries monitors water quality and makes harvest closures when they are necessary to protect public health. The State of the Oyster Report tracks annual changes in the closures and summarizes them here.

The top three priority actions identified in the *Blueprint* to protect and restore critical shellfish growing areas of the state and this year's progress toward those actions include:

## 1) Demonstrating success in protecting and restoring the Newport River and Stump Sound, two of the state's most important and endangered shellfish-growing waters.

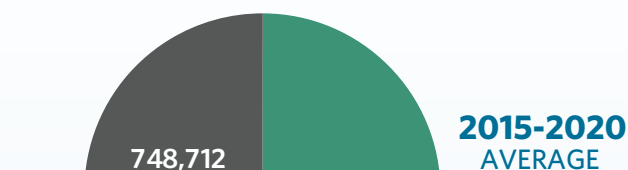
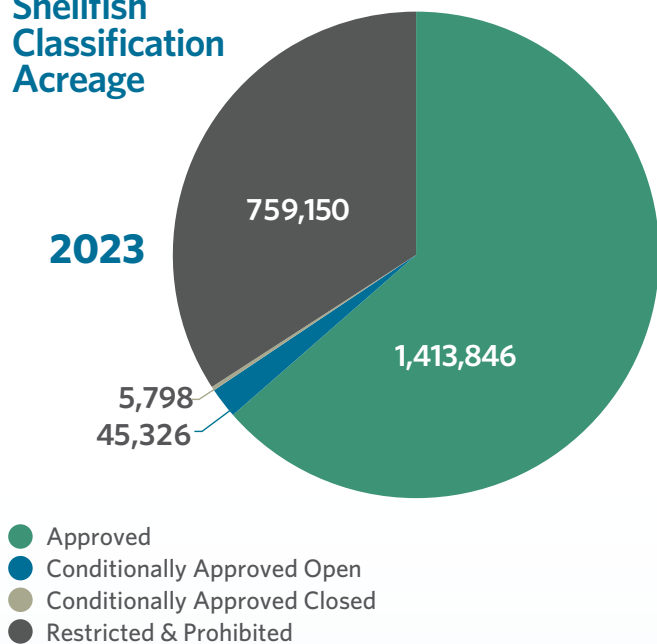
- The Stump Sound Watershed Restoration Plan was finalized and submitted to the state for review and approval.
- The Federation, Greenman-Pedersen, Inc, and local stakeholders worked with the towns of Newport, Morehead City, and Beaufort, as well as Carteret County to draft a watershed restoration plan for the Newport River. Several top actions identified in the plan are moving forward while the plan is approved by the state.
  - 1,400 acres along the Newport River were acquired by the NC Coastal Land Trust and will be transferred to the Federation. A \$1.6 million grant from the NC Land and Water Fund Flood Risk Reduction Program was awarded to support the design and restoration of the ditched and drained timberland to wetlands.
  - Partial funding was secured to acquire an additional 1,600 acres of timberland along the Newport River by the Federation and NC Coastal Land Trust. Additional grant requests are pending.
  - Pervious pavement was installed along Cedar Street in the Town of Beaufort, which is a key best practice identified in the plan.
  - Morehead City acquired a \$5 million grant and is retrofitting stormwater systems along Calico Creek to reduce the rate and volume of runoff.

## 2) Identifying and publicizing a prioritized list of additional endangered shellfish growing waters for targeted management and restoration planning.

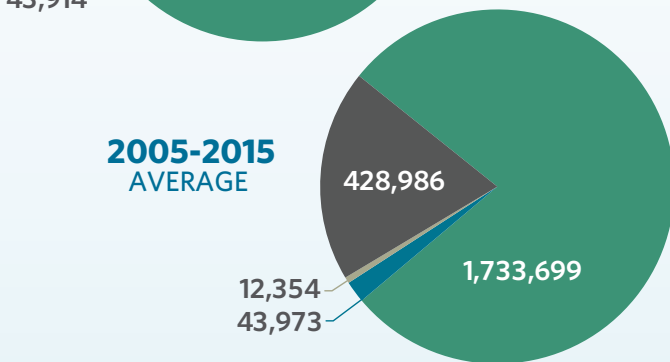
- The Oyster Steering Committee identified 10 coastal water bodies that are priorities for restoration and protection because of their shellfish resources, both wild and farmed, and trend of good but declining water quality. The committee used

### Shellfish Classification Acreage

2023



2005-2015 AVERAGE



**Figure 1:** The Shellfish Sanitation and Recreational Water Quality Section of the Division of Marine Fisheries monitors the health of the state's waters for public safety. Closures are issued based on harmful bacterial levels or stormwater inputs in sensitive areas. Annual changes from 2022 to 2023 include: 2,125 acres downgraded from Approved to Conditionally Approved Open, and 116 acres downgraded from Conditionally Closed to Restricted/Prohibited. These changes are counter to desired water quality trends and reflect declining water quality in North Carolina's shellfishing waters.

Data courtesy of Andy Haines, Environmental Program Supervisor for the Division of Marine Fisheries Shellfish Sanitation and Recreational Water Quality Program, February 2024.

oyster harvest and farming data from the Division and a water quality trends analysis from 2000-2020 performed by NC State University for all coastal waters to identify these water bodies of concern.

- The top water bodies in need of additional restoration and protection measures include: Rose Bay, Swan Quarter Bay, Bay River, Core Sound-Nelson Bay, Core Sound-Jarrett Bay, North River, Chadwick Bay-Sneads Ferry, Chadwick Bay-Alligator Bay, New River, Topsail Sound, Lockwoods Folly, Shallotte River. Stump Sound and Newport River remain priority watersheds for restoration and protection efforts.

### 3) Adopting a state policy that incentivizes using Low Impact Development practices when feasible for state-funded construction projects and showcase projects located in priority shellfish growing waters.

- Under Governor Cooper’s Executive Order 266, the Federation led a series of stakeholder sessions to outline how the state’s Uniform Floodplain Management Policy could incorporate nature-based solutions.
- The state adopted a policy stipulating that all future state construction projects must consider incorporating nature-based infrastructure into the design to mitigate or minimize any adverse effects of the project.



**Figure 2.** Top water bodies in North Carolina in need of additional restoration and protection measures, as identified by the Oyster Steering Committee in 2023. Oysters are considered an important indicator of healthy estuarine waters. Measures to protect water quality for oysters will benefit additional uses such as recreation and fishing. Water bodies that have shellfish resources, both wild and farmed, and have currently good, but trends of degrading water quality—as identified by researchers at NC State University—were ranked as priority waters in this effort.



**Figure 3:** The Senator Jean Preston Oyster Sanctuary Network is composed of 15 sanctuaries covering 563 acres of protected habitat and 389 acres of restored habitat. A total of 113.9 acres of new sanctuary have been restored from 2021-2023, under the Fourth Edition of the Blueprint.

## Oyster Sanctuaries

Oyster sanctuaries are a restoration strategy that emphasizes the value and importance of protected oyster reefs in Pamlico Sound. The idea is that these protected reefs harbor an abundance of adult oysters that contribute larvae to the wild oyster population, increasing spatfall, or baby oysters, on harvestable oyster reefs. They also serve as an “insurance policy” for the state’s oyster population while providing important fisheries habitat and water quality improvement via oyster filtration while feeding. The state Division of Marine Fisheries manages the sanctuary network.

Year	Acres Restored	Sanctuaries Built	Cumulative Restored Acreage
2021	26.5 acres	Cedar Island and Swan Island	301 acres
2022	22.3 acres	Cedar Island	323 acres
2023	65.2 acres	Cedar Island and Gull Shoal	389 acres

**Table 1:** Three years of sanctuary reef restoration efforts as reported by Bennett Paradis, oyster sanctuary biologist for the Division of Marine Fisheries, April 2024. Note: annual and cumulative acreage has been updated and corrected from previous reports to more accurately reflect the Division’s GIS analysis of annual reef building efforts during the Fourth Edition of the Blueprint.

The top three priority actions identified in the *Blueprint* to advance oyster sanctuaries in the state and this year's progress toward those actions include:

**1) Building an additional 100 acres of oyster sanctuary in Pamlico Sound by 2025.**

- 23.22 acres of oyster sanctuary were added to the Cedar Island Oyster Sanctuary in 2023. This effort involved deploying 15,800 tons of class B marl limestone in a partnership between the Division of Marine Fisheries and the Federation.
- 42 acres of oyster sanctuary were added to the Gull Shoal Sanctuary in 2023. This effort was a partnership between the Division of Mitigation Services and the Division of Marine Fisheries.
- The Federation, the Division of Marine Fisheries, NC State University, NC Central University, NC Aquarium on Roanoke Island and the Research Triangle Institute, International secured nearly \$16 million in funding from the National Oceanic and Atmospheric Administration and General Assembly to add 120 acres of oyster sanctuary in Pamlico Sound by 2027, which will complete the original goal of constructing 500 acres of oyster sanctuary in the sound. This was one of the largest habitat restoration grants issued by NOAA in 2023.
- The Division of Marine Fisheries submitted permit applications for 224 acres of new sanctuary in Pamlico Sound near Maw Point and Brant Island.

**The sanctuary network supports nearly 350 million oysters. These oysters filter 5-17 billion gallons of water daily.**

**2) Monitoring and using the best science available to inform restoration activities.**

- The Division of Marine Fisheries monitors the sanctuaries to determine oyster recruitment trends. In 2023, within the oyster sanctuary network, their monitoring indicated nearly 350 million oysters existed. On the Cedar Island Sanctuary, the most recently completed reef, they found 2,194 oysters per square meter, roughly 107 million oysters within that sanctuary alone. Data courtesy Bennett Paradis, oyster sanctuary biologist, April 2024.
- Staff from the National Oceanic and Atmospheric Administration, NC State University, and the Division of Marine Fisheries partnered to update an oyster habitat suitability model. They used more current data on the size and density of oysters on existing sanctuaries to inform site selection for new sanctuaries in Pamlico Sound.

**3) Determining the need for and feasibility of a protected reef designation in the southern region of the state.**

- The Division of Marine Fisheries and Federation partnered to submit permit applications for the construction of four acres of new oyster habitat in the Cape Fear River.





## LIVING SHORELINES

**4.44 miles**

of estuarine shoreline  
have been protected  
since 2021

Half, or 2.19,  
of those  
miles, were  
built in 2023.

## Living Shorelines

Living shorelines are environmentally friendly shoreline stabilization techniques that help reduce shoreline erosion while simultaneously protecting and restoring valuable habitats. When constructed in areas suitable for oyster settlement and growth, they provide intertidal habitat for oysters.

The top three priority actions identified in the *Blueprint* to advance living shorelines and this year's progress toward those actions include:

**1) Implementing 3 miles of living shorelines by 2025 to continue demonstrating their benefits to oysters and soundfront property owners.**

- In 2023, a total of 11,540 linear feet, roughly 2.19 miles, of living shoreline at 74 sites using granite, recycled oyster shells, marl, QuickReef units, ExoForm units, Oyster Castles, and Oyster Catcher materials were constructed. Of these projects, 76% were constructed in oyster-growing waters, building an additional 1.9 acres of oyster habitat.

**2) Creating and promoting consumer demand for living shorelines by educating, marketing, and providing one-on-one consultations.**

**Figure 4:** Oysters land, encrust and grow on Sandbar Oyster Co.'s Oyster Catcher material used in a living shoreline project. Oyster Catcher is one of several alternative materials being used in living shoreline projects. To date, under the current edition of the *Blueprint*, 4.44 miles of estuarine shoreline have been protected by living shorelines. Half, or 2.19, of those miles, were built in 2023.

- The town of Nags Head adopted its Estuarine Shoreline Management Plan in February 2023. The plan is the first in the state and will serve as a model for other towns to develop. The town and its partners are seeking funds to implement the shoreline stabilization practices identified in the plan.
- The Living Shoreline Steering Committee published a statewide living shoreline accomplishments document in 2023.
- The Federation coordinated the development of the NC Salt Marsh Action Plan, which summarizes the collaborative efforts and valuable insights of numerous experts, stakeholders and partners. The Federation hosted workshops during the summer of 2022 and 2023 that were vital for establishing fundamental elements of the plan and refining the recommended actions. The plan includes actions to facilitate and expand the use of living shorelines to protect and restore salt marsh edges and create oyster habitat.
- Carteret Community College's NC Living Shorelines Academy launched in November 2023. The academy offers comprehensive coursework for private property owners



and marine construction professionals. This effort is funded through a grant from East Carolina University and supported by the Federation and Division of Coastal Management. The inaugural class hosted 21 participants. Additional living shoreline design courses will be offered throughout 2024.

- The Divisions of Marine Fisheries and Coastal Management hosted the workshop, “Habitat Tradeoff Considerations for Design and Permit Review,” to share information across organizations and improve the permitting process to help make large-scale living shoreline implementation more efficient moving forward. Participants developed a comprehensive list of research needs to assist with permitting. The most-discussed categories of research needed were the ecosystem services of living shorelines, and design and engineering questions. Further, there was interest in developing a statewide living shoreline siting tool and suitability index that would be built using existing research findings. Permitting agencies and the public could then weigh costs and benefits to determine the appropriateness of a living shoreline and material types.
- In 2023, the Federation provided 116 one-on-one shoreline consultations to private landowners. 50% of these resulted in the landowner implementing a living shoreline project.

### 3) Testing alternative living shoreline construction materials and methods that increase oyster recruitment.

- Constructed projects this year using QuickReef, ExoForm, Oyster Catcher, and Oyster Castle materials. These materials provide hard surfaces for effective oyster larval attachment.
- Identified two new partners, Natrix and NC State University, who are working independently to develop new bagging materials as an alternative to plastic that could be used to bag marl or shell in living shoreline projects.
- Collaborated with partners from East Carolina University, Duke, and National Oceanic and Atmospheric Administration to test various living shoreline materials and design configurations at five Federation living shoreline sites as part of a NC Sea Grant study. Partners plan to expand the project scope and duration beginning in 2024.

## Shell Recycling

Oyster shells are a valuable resource used to build new oyster reefs. Current efforts in the state rely on voluntary shell recycling efforts to collect shells and make them available in oyster restoration activities. The *Blueprint* outlines a goal to create a



Figure 5. Map of current public shell recycling drop-off locations in North Carolina.



© Jenny Crofton

coordinated oyster shell recycling program to provide 5% of the material needed to support oyster restoration. Once achieved, this would translate to recycling roughly 16,750 bushels of shell annually.

The top three priority actions identified in the *Blueprint* to advance oyster shell recycling and this year’s progress toward those actions include:

**1) Collecting shell through partnerships and volunteer-led shell collection.**

- Shell recycling partners collected a total of 9,434 bushels of shell from the Triangle to the Coast. Native Shorelines, a private business focused on building living shorelines, recycled 5,300 bushels in the Triangle; the Federation recycled 2,300

bushels along the coast; Ghost Fleet Oyster Co., a private oyster farm in Hampstead, NC, recycled 1,334 bushels from the 14 restaurants they sell to; and the Division of Marine Fisheries recycled 500 bushels.

**2) Improving shell collection and storage logistics.**

- The Federation established four new public drop-off locations to collect oyster shells in 2023. This means there are now 27 public drop-off sites. Shell recycling is available in Brunswick, Carteret, Craven, Dare, New Hanover, Onslow, Orange, Pamlico, and Pender counties.
- On the Outer Banks, two restaurant partners were added to the Restaurant to Reef Oyster Shell Recycling Program: Two Roads Tavern and Goombays Grille & Raw Bar, joining Bluewater Grill and Raw Bar, Sugar Shack, Mulligan’s Grille, Awful Arthur’s Oyster Bar, Black Pelican, Dirty Dick’s Crab House, Roadside Bar & Grill in the 2023 effort. Seven new Restaurant to Reef volunteers were recruited.
- Ghost Fleet Oyster Co., in Hampstead, added three new restaurants to the list of restaurants that they service as part of their shell collection efforts. Wilmington Area Restaurants participating in the 2023 shell recycling effort include Shuckin Shack- Downtown Wilmington, Shuckin Shack - Surf City, Shuckin Shack - Leland, Seabird, Pinpoint, Tidewater, Catch, Rx Chicken & Oysters, Beach Shop and Grill, Buddy’s Crab House, Flying Machine Oyster Bar, Covey, Surf City Crab, Thomas Tackle.
- Native Shorelines collected shells from 42nd Street Oyster Bar, T&W’s Oyster Bar, and Earp’s Seafood.

**3) Using recycled shells in reef-building activities.**

- All collected shells were used in reef-building or living shoreline projects. The Division of Marine Fisheries used recycled shells in a cultch-planted reef in the Newport River. The Federation and The Nature Conservancy used recycled shells in a patch reef on the Outer Banks. The Federation and Native Shorelines used recycled shells in living shoreline reef building projects throughout the coast.

Year	Total Shell Collected	Coastal Federation	Division of Marine Fisheries	Ghost Fleet Oyster Co.	Native Shorelines	Restaurants involved	Public Drop off Locations available
2021	2518 bushels	2518 bushels	*not reported	*not reported	*not reported	4	20
2022	8544 bushels	2820 bushels	1000 bushels	200 bushels	4524 bushels	20	23
2023	9434 bushels	2300 bushels	500 bushels	1334 bushels	5300 bushels	26	27
<b>To Date Totals:</b>	<b>20,496 bushels</b>	<b>7,638 bushels</b>	<b>1,500 bushels</b>	<b>1,534 bushels</b>	<b>9,824 bushels</b>	<b>26</b>	<b>27</b>

**Table 2:** Known and tracked shell recycling efforts in the state 2021-2023 as reported to the Federation.

# Sustainable Wild Harvest

Maintaining a sustainable wild oyster fishery is important to North Carolina. Ensuring wild harvest is sustainable requires adequate oyster reefs to perpetuate the population. A stock assessment is needed to support oyster fisheries management goals and policies. Establishing a methodology to inform a stock assessment for the oyster population is a major focus of the current *Blueprint*.

The top three priority actions identified in the *Blueprint* to advance sustainable wild harvest and this year's progress toward those actions include:

## 1 & 2) Conducting sampling, analyzing data, and implementing a methodology to establish an oyster stock assessment. Develop a fishery-independent oyster abundance index to assist with oyster management decisions.

- In developing the stock assessment methodology, a years-long, multipronged study, funded by The Nature Conservancy and carried out by researchers at NC State University in partnership with the Division and commercial fishers, has been implemented. The study's goal is to design a population survey method for subtidal and intertidal oysters that is statistically robust and adequately assesses the oyster population. For example, the study does not just rely on reported harvest to understand the population size. The methods need to be accepted by the Division and have coastwide application. To date, the following efforts have been conducted:
  - **Part 1:** Subtidal Research (2018 - 2021) to assess the utility of using a dredge for estimating oyster populations, as well as dredge-related discard mortality during harvest.

- **Part 2:** Intertidal Research (2020 - Present) to evaluate the utility of remote sensing technology such as satellites and drones for estimating the size and condition of reefs. Evaluating change over time via
  - Drone imagery
  - Sentinel sites
  - Satellite imagery
  - Developing workflows and tools for end users
- **Part 3:** Dredge Discard and Survivorship (2019 - 2021) to extend the study on the subtidal and oyster dredge fishery research to better understand fishery effort, incidental catch of sub-legal oysters, discard and survivorship through onboard fishery observations and cage studies.
- Researchers have completed data collection, submitted a final report, and are developing workflows, tools, and supporting publications to guide adoption of these approaches for a state-wide stock assessment.

## 3) Refining oyster landing data collection to provide more information to assist with management.

- The Division continued to work on updating the Oyster Fishery Management Plan (FMP) in 2023. Internally, their staff worked to identify issues and topics of the FMP that needed to be addressed.

## 2023 WILD HARVEST

55,116  
BUSHELS

68%  
OCCURRED FROM  
CORE SOUND SOUTH  
TO THE STATE LINE

Harvest from  
private leases  
was 3 times  
that of wild  
harvest.

Preliminary data courtesy of Meredith Whitten biologist with the Division of Marine Fisheries, May 2024.



## 2023 CULTCH PLANTING

**277,922**  
BUSHELS

**38**  
ACRES

**6**  
SITES

Data courtesy Doug Munroe, oyster cultch biologist for the Division of Marine Fisheries, April 2024.

**Figure 6.** RV Oyster Creek, the Division of Marine Fisheries' newest barge that will serve as a cultch planting flagship to support cultch planting activities. The barge will service all of the state's shellfishing waters including many remote and formerly underserved parts of the coast.

## Cultch Planting

Cultch planted reefs are constructed by the Division of Marine Fisheries throughout the state's shellfish waters to restore commercially harvested reefs. These reefs are built with limestone marl, recycled shells, or other suitable materials, collectively called "cultch." The goals for the state's cultch planting effort outlined in the 2021 *Blueprint* are to build 200 acres of cultch-planted reefs to support wild harvest and to study the existing program to make recommendations to improve the program's return on investment.

The top three priority actions identified in the *Blueprint* to advance cultch planting and this year's progress towards those actions include:

### 1) Conducting a cultch planting program study.

- A multi-disciplinary study funded by the NC Coastal Recreational Fishing License Program and NC Sea Grant, and conducted by researchers at NC State University completed all field work in 2023. Researchers are analyzing data and publishing the results. Key findings include:

- Larger, intact reefs are less likely to be buried by sedimentation and therefore support the survival of more dense and larger oyster populations than smaller, more fragmented reefs.
- Well sited reefs promoted oyster recruitment and survival which in turn made the reefs resistant to sedimentation, which in turn promoted more oyster recruitment and survival. This positive relationship was likely driven by

Year	Sites Planted	Acres restored	Bushels of material used
2021	9 sites	48 acres	334,875 bushels
2022	9 sites	37 acres	277,859 bushels
2023	6 sites	38 acres	277,922 bushels
<b>To Date Totals:</b>	<b>24 sites</b>	<b>123 acres</b>	<b>890,656 bushels</b>

**Table 3:** The Division of Marine Fisheries' cultch planting efforts during the Fourth Edition of the *Blueprint*, 2021-2023. Data courtesy cultch biologists, Abby Williams and Doug Munroe, with the Division of Marine Fisheries.

landscape-scale processes such as sediment dynamics and larval supply.

- Improved restoration success could be achieved by creating larger reef surfaces with low perimeter-to-area ratios in locations that limit sedimentation and promote oyster survival.

### 2) Incorporating cultch planting program evaluation recommendations into program development and implementation.

- No changes to the cultch planting program were incorporated in 2023.

### 3) Planting cultch to build 200 acres of harvestable oyster habitat over five years.

- The Division deployed a total of 277,922 bushels on 38 acres in 2023.
- The Federation and Division partnered to operate the Morris Landing oyster stockpile site and barge loading pier, using it to deploy 36,622 bushels of cultch material into Stump Sound and surrounding areas.
- The Division finished upgrading and outfitting their new flagship, RV Oyster Creek, to support cultch planting activities.
- The Division hired two shellfish rehabilitation FTEs to support cultch planting efforts.

## Shellfish Aquaculture

Shellfish aquaculture, or shellfish farming, allows growers to meet the demand for shellfish products, provides economic development opportunities along the coast, and when properly sited, leases can provide many environmental benefits such as filtering water and providing habitat for a variety of estuarine species. The Shellfish Lease and Aquaculture Program of the North Carolina Division of Marine Fisheries accepts, reviews, and administers oyster leases. The State of the Oyster Report tracks annual changes and summarizes them here:

Year	Bottom Lease Applications	Water Column Lease Applications
2021	34	29
2022	43	41
2023	28	27

**Table 4.** Number and type of shellfish lease applications made to the Division 2021-2023, during the Fourth Edition of the Blueprint. In 2023, 51 leases were added, bringing the total number of leases in the state to 499 covering 2,439 acres. Data courtesy Division of Marine Fisheries Shellfish Lease and Franchise webpage and Zach Harrison, Habitat and Enhancement Section Chief, April 2024.





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## 2023 AQUACULTURE

**\$24.66**  
million

INDUSTRY  
VALUE

**499**  
LEASES

**2,439**  
ACRES

Top 3 counties with shellfish farms:  
Carteret, Onslow, and Pender

Data courtesy NC Sea Grant/NC State University publication by Eric Edwards, September 2023 and Division of Marine Fisheries Shellfish Lease and Franchise webpage April 2024.

The *Blueprint* outlines a goal of growing the shellfish aquaculture industry to a \$45 million industry by 2025. The top three priority actions identified in the *Blueprint* to advance shellfish aquaculture and this year’s progress toward those actions include:

### 1) Supporting and assisting shellfish growers.

- Ensured lab facilities are available to provide required water quality testing. Testing is needed to support oyster harvest.
- Shellfish Sanitation’s Manteo Lab opened in September 2023, and the final FDA evaluation was completed in January 2024.
- Shellfish Sanitation’s Morehead City and Wilmington Labs completed periodic FDA evaluations in December 2023 to maintain operational status.
- All necessary funding, over \$1.8 million, was secured for the construction of an aquaculture hub in Carteret County. The hub addresses the logistical needs of the industry identified through a feasibility study: it will provide water access, refrigeration and storage for shellfish products, and a place to work and exchange business knowledge and acumen. Grants from EDA, Golden Leaf, The Nature Conservancy’s SOAR program, and State appropriations will ensure the aquaculture hub proceeds as planned in 2024 and be operational by 2025.
- Carteret Community College provided two trainings through their NC Shellfish Farming Academy. They have now offered this training nine times. In 2023, the course reached 22 new or prospective shellfish farmers. Of the 22 enrolled, 17 participants graduated, roughly 77% of the enrollment. A total of 107 students have participated in the training over the years and at least 37 have gone on to actively hold leases or enter the mariculture industry. As part of their curriculum, the Shellfish Academy tours Downeast Mariculture Supply where they learn about local shellfish heritage and experience

shellfish hatchery techniques and management on a commercial scale.

- UNC Wilmington launched their Shellfish Mariculture Propel program—an asynchronous, online business startup and entrepreneurship training program which is free to NC growers or potential growers and includes an array of support materials.
- UNCW received funding to update the NC Shellfish Aquaculture Siting Tool to include input from growers and regulators.

### 2) Modernizing regulatory schemes and reducing user conflicts.

- The Division conducted a Cumulative Impact Analysis study that helps to inform when a waterbody is reaching its carrying capacity and helps to determine if additional oyster lease areas are warranted. It strives to balance uses of access/navigation, public recreation, recreational and commercial fishing as well as oyster farming.

### 3) Supporting aquaculture-related research.

- Researchers from NC State University, UNC Chapel Hill, UNC Wilmington, Duke University, and the Virginia Institute of Marine Science developed a collaborative research team to understand and address recurring farmed oyster mortality events across the state and broader region. Funding for this effort was provided by the NC Commercial Fishing Resource Fund, NC Sea Grant, and the NC Collaboratory. Ongoing research is working to
  - understand the causes of diseases and pathways of transmission that result in farmed oyster die offs
  - breed oysters that are more resilient to disease at UNCW’s Shellfish Research Hatchery
  - summarize farming practices that mitigate impacts to the farmers.

# Outreach and Engagement

Outreach and engagement allow for the involvement of many stakeholders in the development and implementation of the *Blueprint*. The *Blueprint* identifies an overarching goal of creating communication and outreach strategies that engage stakeholders and the general public to actively support its goals, strategies, and actions.

The top three priority actions identified in the *Blueprint* to advance outreach and education and this year's progress toward those actions include:

## 1) Engaging the Oyster Steering Committee and members' organizations to convey the work being done through the *Blueprint*.

- A two-day Oyster Summit was held in Raleigh to share major *Blueprint* accomplishments with the over 235 people in attendance.
- Two Oyster Steering Committee meetings were held in 2023 with nearly 40 members participating in each of the meetings.

## 2) Using digital and online media to expand the reach of the *Blueprint*.

- The Federation launched a new shell recycling communications toolkit containing resources for local and state partners that encourage more shell recycling.
- Social media campaigns and posts focused on advancements of the *Blueprint* and encouraged actions from the public to support these efforts.
- NC Oyster Trail's online presence via social media, website and news coverage supported
  - 24 organic news stories about the Trail reaching eight million people.
  - 6,000 social media followers.
  - 17,000 unique visitors to the NCOystertrail.org website.

## 3) Engaging stakeholders beyond the Oyster Steering Committee to advance the work of the *Blueprint*.

- Field trips, camps, and hands-on education lessons by *Blueprint* partners reached over 4,000 people.
- The Department of Cultural and Natural Resources, in collaboration with the NC Oyster Trail and partners, secured a Governor's Proclamation of October as NC Oyster Month. This effort helped raise awareness about the value and importance of oysters and promoted 30 oyster themed events throughout the month of October.
- The NC Oyster Trail hosted 80 trail sites state-wide and has expanded membership to include a Friends of the Trail designation- encouraging oyster lovers and enthusiasts to support this grassroots effort to promote NC oysters, oyster farms and tourism/educational opportunities around oysters.



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## NC OYSTER TRAIL

80

TRAIL SITES  
STATE-WIDE

8 million

PEOPLE REACHED  
WITH NEWS COVERAGE

### 2023 BY THE NUMBERS

30

EVENTS HELD  
DURING NC OYSTER  
TRAIL MONTH

17,000

UNIQUE  
VISITORS TO  
NCOYSTERTRAIL.ORG



**For the latest progress and information visit: [ncoysters.org](https://ncoysters.org) or [nccoast.org/oysters](https://nccoast.org/oysters).**

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