Oyster Survey Results 2020

Helping to Chart the Future of Oysters in the State



2020 NORTH CAROLINA OYSTER SURVEY RESULTS Helping to Chart the Future of Oysters in the State

The N.C. Oyster Steering Committee conducted an online oyster survey to better understand how the respondents value oysters. The survey also asked questions about what threats to oysters are most concerning and solicited ideas on new actions that should be considered to build and enhance the oyster population in North Carolina over the next five years. The results of the survey were used to inform the development of eight conservation and restoration goals and their associated strategies in the new oyster blueprint.

A link to the survey was sent directly to an email list of 731 contacts that consisted of 1) people who have signed up to receive the "On the Half Shell" email newsletter about advancements in oyster work in the state; 2) people who attended previous Oyster Summits in either 2017 and/or 2019; 3) members and other interested parties that attend Oyster Steering Committee meetings; 4) people that were suggested by members of the Oyster Steering Committee; 5) the coastal federation's board members; and 6) all coastal legislators. The survey was open for 12 days from January 6-17, 2020. Two email reminders were sent to encourage responses. A total of 166 responses were collected (23% response rate); some contained only partially completed answers.

Responses reflect a group of stakeholders interested in oyster related activities in the state, not necessarily an expansive survey of public values and priorities for oysters and their restoration. Time and resources required the survey developers to focus on this stakeholder group at this time. It is recommended that future survey efforts cast as wide a net as possible when identifying respondents for a more expansive and higher-resolution understanding of how the public values and prioritizes oysters and their restoration.

The data were sorted and results are reported below.

Which best describes your professional affiliation?



Survey Respondents' Professional Affiliation

A total of 166 responses were collected for this question. The majority of respondents (44) identified as "other" and 32 of them provided a description of their professional affiliations. Descriptions are as follows: business oriented and entrepreneur (6); retired (5); recreational user (4); resident (4); multiple professional affiliations (3); coastal advocate (2); attorney; consultant; lobbyist; medical; NC marine fisheries board; non-profit volunteer/environmental educator; oyster lover; potential oyster grower.

The second largest demographic responding to this survey was recreational fishers (28), followed by state government agency personnel (22), non-profit organization employees (22), academic institutions (16), oyster growers (16), local government staff (6), seafood wholesale/distributor/retailers (5), commercial fishers (4), federal government agency staff (3) and elected officials (1).

Please select all the oyster related activities in which you are currently involved.

Respondents were able to select multiple oyster related activities that they engage in so each activity is reported as a percent of total respondents (out of 166). The most selected oyster related activity to least selected oyster related activity were as follows:



Those in the other category identified the following activities related to oysters: advocacy (6- with two people indicating they advocate for oyster farms, one person advocates against oyster farms, one person advocates for clean water and one person advocates for restoration, the other person didn't provide clarification on their advocacy activities); economic development (2 respondents); policy development (2 respondents); and oyster artwork (1 respondent).

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Which of the following documented oyster benefits are most important to you? Please select up to four.

Respondents were asked to select up to four of the listed oyster benefits as most important to them. A total of 140 respondents made 604 selections. The listed benefits of oysters seem to fall into three tiers of importance: two benefits were most important to a majority of respondents; four benefits were important to approximately half of the respondents; and two benefits were important to relatively few respondents.



Survey Respondents Selected the Benefits of Oysters that were Most Important to Them

The most commonly selected benefits were filtering the water and creating habitat for other fish and marine life (circled in green). Least important to the respondents was oysters' ability to sequester nutrients and the use of oyster reefs for recreational opportunities (circled in blue). Given the number of recreational fishers that completed the survey, this was somewhat surprising. In the "Other" category, respondents indicated that they valued oysters for all of the above benefits (2); aesthetics and access (1); for nature's sake (1); for the NC brand (1); as part of the food web (1). One respondent indicated they felt it was inappropriate to bolster commercial farms and operations along residential shorelines.

The benefits that oysters provide to filtering water and creating habitat for other fish and marine life were most commonly selected as important by survey respondents.



Below is a list of threats or stressors that can directly impact oysters in the state. For each threat or stressor listed below, please indicate how concerned you are that it will harm oysters in the next 5-10 years.

142 respondents completed the ranking. The responses were weighted. "Extremely Concerned" responses were weighted by 5, "Moderately Concerned" by 4, "Somewhat Concerned" by 3, "Slightly Concerned" by 2, and "Not at All Concerned" by 1 to develop the weighted ranking.

Threat	Extremely Concerned	Moderately Concerned	Somewhat Concerned	Slightly Concerned	Not at All Concerned	Weighted Ranking	l don't know
Physical Destruction to Reefs from Human Related Activities (other than harvest)	315	156	75	22	5	573	1
Overharvest of Resource	260	188	60	24	9	541	3
Siltation/Burying of Reefs	215	192	108	22	3	540	3
Incompatible Fishing Practices (e.g. dredging)	260	132	87	28	13	520	3
Low Dissolved Oxygen	215	168	114	18	3	518	7
Lack of Spawning due to Low Oyster Population	210	140	105	36	9	500	5
Shellfish Diseases	110	248	114	20	1	493	9
Salinity Changes (too high/too low)	95	248	108	28	3	482	10
Lack of Settlement due to Low Substrate Availability	145	196	108	22	8	479	11
Introduced Invasive Species	170	132	114	52	6	474	6
Ocean Acidification	155	180	90	22	15	462	10
Physical Destruction to Reefs from Storms or Natural Causes	85	152	159	46	11	453	2
Predation	20	108	153	66	15	362	11
Lack of Sufficient Food for Oysters	85	100	66	48	46	345	10

An alternate way to display the results is this stacked bar graph of the unweighted responses.



Survey Respondent's Level of Concern for Potential Threats to Oysters

One interpretation of the results is that the top six threats (circled in orange) would be considered Extremely Concerning by survey respondents, the next two (circled in mustard) would be considered Moderately Concerning, the following four (circled in grey) would be Somewhat Concerning and the last two threats (circled in green) would not be considered concerning to the survey respondents in the next 5-10 years.

Of all the threats listed above, what do you consider to be the single greatest threat to oysters in North Carolina in the next 5-10 years and why?

Many of the responses to this question combined multiple threats, suggesting that it's complicated to determine the single greatest threat to oysters in the next 5 to 10 years. Respondents made reference to the causative and interrelated nature of many of the threats in the short answers they provided. As best as possible, the threats were coded and categorized into broad groups. One hundred eighteen survey respondents completed this question. Of those, 52 respondents identified one greatest threat, the remaining respondents either provided multiple greatest threats and/or described the complicated, interconnected nature of the threats. Perceived top threats to oysters are captured in the table and word cloud below.

The most commonly identified, single greatest threat to oysters in the next 5-10 years was declining water quality.

Water Quality	11	
Incompatible Fishing Practices	8	Lack of substrate
Overharvest of Resource	5	Shellfish diseases
Land-based Development	4	Physical destruction to reefs
Storms	4	Land-based development
Ocean Acidification	3	Overharvest of resource
Shellfish Diseases	3	It's complicated
Physical Destruction to Reefs	3	IL S COMPLICATEU
Management	3	Water quality
Lack of Spawning	2	vvaler quality
Lack of Substrate	2	Incompatible fishing practices
Siltation	2	Storms
Swings in Salinity	1	Management
Lack of Awareness	1	Lack of spawning
It's Complicated	66	Siltation

A list of direct threats was provided for the survey respondent's consideration. However, respondents could provide short answers to this question and they added to the list of what they considered to be direct threats. Notably, they added: water quality, land-based development, management, physical destruction that was neither identified as natural or human, climate change and lack of awareness.

The most commonly identified single greatest threat to oysters was water quality. And most respondents explained that their concern with water quality is how it's impacted by land-based development. The second most commonly identified greatest threat, incompatible fishing practices, was described by respondents as both dredging and improper siting of oyster farms. And even though physical destruction to reefs was something that survey respondents were extremely concerned about (as summarized in question 4), it was not identified as top single greatest threat in this question.



QUESTIONS 6 & 7

Please describe two strategies or actions that should be taken to enhance oysters in North Carolina.

A total of 241 suggested actions were provided by the survey respondents. Below are commonly suggested actions, organized by strategy, for the Oyster Steering Committee to consider for the next Oyster Blueprint. The top two suggested actions were: to build more oyster habitat (25% of all suggestions made) and to improve water quality (10% of all suggestions made).

Habitat Enhancement	85
Water Quality Improvements	52
Shellfish Aquaculture	52
Fisheries Management	38
Education/Awareness	6
Other	8

Build more oyster habitat was the most commonly suggested action to take to enhance oysters in North Carolina.

1 Habitat Enhancement - A total of 85 suggestions were made to enhance oyster habitat. These included:

- 61 suggestions to build new oyster habitat (25% of all suggestions made).
 - 25 general recommendations to build more reef;
 - 13 suggestions to build more oyster sanctuaries, including in the southern part of the state;
 - 11 suggestions to recycle oyster shell and use for reef building;

- 9 suggestions to plant more cultch reefs; and
- 3 suggestions to build more living shorelines.
- 6 suggestions to increase funding for these efforts.
- 4 suggestions to manage the reefs.
 - quote: "manage so that old reefs don't get smothered out";
 - to review the siting of reefs; and
 - to ensure there is thoughtful placement of material.
- 4 suggestions to research and monitor the reefs.
 - specifically for identifying hurricane impacts.
- 7 other recommendations were made. Consider:
 - policy;
 - partnership opportunities;
 - encourage fishermen to be involved in reef building activities.
- **2** Water Quality A total of 52 suggestions were made related to water quality. These included:
 - 24 suggestions for improving water quality (about 10% of all suggestions made).
 - 10 suggestions to reduce nutrient inputs
 - 5 suggestions to improve building techniques/incorporate low impact development
 - 5 suggestions for general water quality improvement needed
 - 2 suggestions to use oysters and other in-water BMPs to improve water quality
 - 2 suggestions to reduce sediment inputs
 - 9 suggestions for policy changes.
 - 7 recommendations for increased water quality protection measures.
 - 5 suggestions for increased stream/shoreline buffers.
 - 3 suggestions for increased funding.
 - 2 recommendations for improved management.
 - 1 suggestion for more maintenance of stormwater infrastructure.
 - 1 recommendation for monitoring.

3 Shellfish Aquaculture - A total of 52 suggestions were made related to shellfish aquaculture. These included:

- 15 suggestions to expand aquaculture in the state.
- 7 suggestions to improve distribution/promotion of NC farm raised oysters. Including:
 - start the oyster trail;
 - travel to promote NC product;
 - increase local processing of NC product.
- 7 policy suggestions for oyster farming. Including:
 - lobby for the farming industry;
 - update lease process to include expediting lease issuance.

Improve water quality was the second most commonly suggested action to take to enhance oysters in North Carolina.

- 6 suggestions to improve access for potential and existing growers. Such as:
 - boat/work access be improved;
 - train new growers;
 - inspire the next generation of new growers.
- 4 suggestions to increase awareness of oyster growers.
 - highlight/celebrate local growers.
- 3 suggestions to provide insurance for growers (especially storm related insurance).
- 3 suggestions of research needs to advance the industry. Specifically:
 - improve hatchery and nursery operations for more seed.
- I suggestion for enforcement of oyster farms, ensuring protection against theft.
- 4 Fisheries Management A total of 38 suggestions were made related to fisheries management. These included:
 - 10 suggestions to phase out or eliminate dredging for oysters.
 - 9 suggestions to reduce wild harvest or otherwise manage harvest to protect habitat.
 - 5 suggestions to develop a stock assessment and regularly map the resource.
 - 5 suggestions to adaptively management or rotationally manage reefs. Management recommendations included:
 - remove old growth from reefs;
 - implement a comprehensive management protocol; and/or
 - implement rotational harvest recommendations.
 - 3 suggestions to improve research related to harvest methodologies.
 - 3 suggestions to promote oyster farming over wild harvest.
 - 3 suggestions to end the oyster relay program.

5 Education/communication - A total of 6 general suggestions were made related to education/communication (note: outreach/communication specific to a topic above are reported accordingly). These included:

- 4 suggestions to improve general understanding of the benefits of oysters and drive awareness of the unique oyster opportunities that exist in NC.
- 1 suggestion to communicate successes to policy makers.
- 1 suggestion to teach people how to prepare/cook/eat oysters.
- 6 Other A total of 8 general suggestions were made that didn't seem to fit well in the above defined categories but are important to consider and keep in mind moving forward. These include
 - A general call for more funding from the state legislature.
 - Support for Oyster fishers.
 - Support non-profits who build reefs.
 - Allow non-profits to serve as official advisors to NC government committees and commissions.
 - Suggestion to study other state programs like the Billion Oyster Project.
 - Address climate change.
 - Co-exist with the planet.
 - Quit talking, just do it.

Are you familiar with the term ecosystem services?

One third of survey respondents reported a mastery of the term "ecosystem services", described as being able to define or use the term in a sentence. 141 responses were collected.

The survey asked about respondents' familiarity with the term ecosystem services because of its expanding use as a way to refer to oyster benefits in communication materials for lay audiences. To help determine whether using the term would improve oyster restoration communications, survey developers wanted to know if their target audience would be comfortable talking about oyster benefits as ecosystem services. Nearly a third of respondents did not know what the term means. The results are therefore interpreted to mean that the term will either need to be clearly defined, or alternate ways of describing oyster benefits should be used. Additional message testing could further shed light on helpful language for oyster communications and outreach materials.



Survey Respondent's Familiarity with the Term Ecosystem Services

Respondents were asked to select the county in which they live.

The majority of respondents lived in Carteret County or did not live in a Coastal County. 143 responses were collected for this question.



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Please select the coastal county in which you primarily carry out your oyster-related activities.

Respondents were able to select more than one county in which they carry out their oyster related activities. The majority of survey respondents carried out their oyster activities in Carteret and New Hanover Counties. As Currituck, Washington, Gates, Tyrell and Chowan Counties do not have prime oyster growing waters these responses may indicate oyster related businesses such as wholesale, distribution or eating.



NC County Where Survey Respondents Conduct their Oyster Related Activities



Would you like to continue to take part in the process of refining the vision and goals for building back oysters in the state of North Carolina? This may involve additional surveys, workshops and/or small group meetings.

Of the 143 respondents who completed the survey 102 indicated that they would like to continue being involved and part of the future work on oysters. Ninety-one respondents provided a means to stay in touch.





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The survey team is grateful for the interest and feedback from the North Carolina Oyster Steering Committee, the NC SPat regional workgroup and the 166 anonymous survey respondents. Input and ideas from this survey will be incorporated into the fourth edition of the *North Carolina Oyster Blueprint*, 2021-2025.

www.ncoysters.org

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