

**School of Rockfish
Program Report
(2025–2026)**

October 22, 2026

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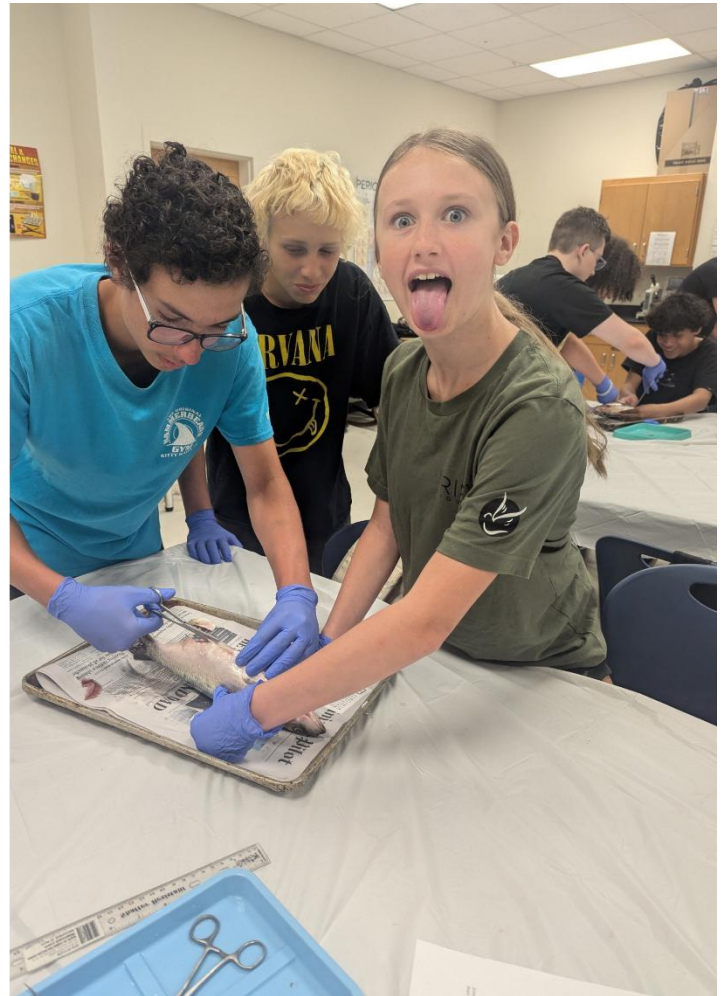


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Executive Summary

Striped bass (Rockfish) are native to the coastal rivers, sounds, and estuaries of North Carolina and other states along the Atlantic coast and eastern Gulf of Mexico and are a popular game and food fish. Similar to American shad and other anadromous fish, Rockfish abundance has drastically decreased due to overfishing, pollution, diminished spawning habitat, and altered water flows. Through the School of Rockfish program, students get a hands-on and real-life connection with their environment while learning about the importance of Rockfish restoration, management, and water quality. Teachers report great enthusiasm for the program, both for themselves and their students.

The School of Rockfish Program is the result of many dedicated partners. The program is managed by the NC Museum of Natural Sciences (Museum) and it receives significant logistical and financial support from the Albemarle-Pamlico National Estuary Partnership (APNEP), the North Carolina Wildlife Resources Commission (NCWRC), and the U.S. Fish and Wildlife Service (USFWS). For the 2026 Rockfish season we received grant funding from APNEP*, USFWS, Triangle Fly Fishers, and the North Carolina Marine and Estuary Foundation.

The School of Rockfish Program is a new program this year following on the heels of the long-running Shad in the Classroom Program. Twenty-five classes in 13 counties (Tier 1 – 5, Tier 2 – 3, Tier 3 – 5) participated in the 2026 School of Rockfish Program (Table 1). This year 2,253 students participated with 703 students being in Title 1 schools. For context, the Shad in the Classroom Program reached 378 classrooms from 2009 to 2025 (contact authors if interested in viewing this information) and many thousands of students. Between 2013–2025, approximately 26,480 students were reached (prior to 2013, the numbers of students were not tracked).

For the School of Rockfish Program, each school received approximately 500-1000 fry from the NCWRC. This year's fry were released in the Tar River Basin per the NCWRC Striped Bass Management Plan. **APNEP funds were not announced until July 1, 2026 so they were not used for spring 2026 School of Rockfish activities.*

ACKNOWLEDGEMENTS

We would like to acknowledge all the teachers and volunteers who help implement the School of Rockfish Program. The teachers and volunteers are dedicated to making the program a success and are invaluable. Specific individuals who assisted with various aspects of the program in 2026 are listed below.

Workshop Guest Speaker

Kirk Rundle kirk.rundle@ncwildlife.org – (NCWRC, District Fisheries Biologist)

Additional Education

Fish Anatomy-Dissection Lecture

Andrew McMains mcmainsa20@students.ecu.edu – (ECU, Grad Student) – Lecturer

Cami Miller millerca23@students.ecu.edu – (ECU, Grad Student) – Lecturer

Daniel Morril daniel.morrill@ncwildlife.gov – (NCWRC, District Fisheries Biologist) – Lecturer

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Danci Guiot danci.guiot@ncwildlife.gov – (NCWRC, District Fisheries Biologist) – Lecturer

Fry Delivery and Release Assistance

Beth Cranford beth.cranford@naturalsciences.org – (NCMNS, Coordinator, Elementary Education)

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Jimmy Johnson ncchpp1@gmail.com – (APNEP, Coastal Habitats Coordinator, retired)

Michelle Moorman michelle_moorman@fws.gov – (USFWS, Inventory & Monitoring Branch, SE Region)

In addition, we are very appreciative of the fish donations for dissections from NCWRC staff Danci Guiot, Daniel Morril, Kelsey Roberts, and Seth Mycko, and from ECU graduate student, Andrew McMains and NC Division of Marine Fishery (NCDMF) staff. Rockfish fry were generously provided by Jeff Evans and the staff at the Watha State Fish Hatchery. We also appreciate Kendall Redies and Daniel Hager, NCSU, and Andrew McMains, ECU for assisting with organizing university students for the fish anatomy-dissection lessons.

Report cover photos: Top left – NC Educators participating in Gyotaku (fish printing) at the teacher workshop; Bottom left – Northwest ES students releasing Rockfish fry at Goose Creek State Park, Pamlico River; Bottom middle – Rockfish fry photo provided by educator Lenae Scafidi; Right – First Flight MS students fish anatomy/dissection lesson.

School of Rockfish Program 2026 Report

This report summarizes the activities accomplished for the 2026 School of Rockfish Program. Twenty-five classes at 19 different schools (Table 1) were accepted into the 2026 program: 6 elementary, 12 middle, and 6 high school classes. Four classes were on hiatus for 2026.



Photo 1. Chaloner MS Rockfish release, Wildwood Park, Tar River.

Table 1. 2026 Schools Accepted to the North Carolina School of Rockfish Program
(Title 1 indicated with an *)

School	County	Tier	Numbers of Classes
Abbotts Creek ES	Wake	3	1
Brinson Memorial ES	Craven	2*	1
Chaloner MS	Halifax	1*	2
Cumberland Polytechnic HS	Cumberland	1*	1
East Cary MS	Wake	3	1
East Duplin HS	Duplin	1*	1
First Flight MS	Dare	2	2
Fuquay-Varina MS	Wake	3	3
Glenwood ES	Orange	3	1
Lakewood ES	Durham	3*	1
Lakewood Montessori MS	Durham	3	2
Moore Square Magnet MS	Wake	3	1
Northwest ES	Lenoir	1*	1

Table 1. 2026 Schools Accepted to the North Carolina School of Rockfish Program – cont'd
(Title 1 indicated with an *)

School	County	Tier	Numbers of Classes
Oberlin Magnet MS	Wake	3	1
Perquimans County HS	Perquimans	2*	1
Seawell ES	Orange	3	1
South Iredell HS	Iredell	3	1
Tabor City ES	Columbus	1*	1
Woods Charter HS	Chatham	3	1
Total Number of Schools			19
Total Number of Classrooms			25

In July of 2022 we received a grant award from the USFWS for Project RESTORE (Rescuing Endangered Species through Outreach, Restoration, and Education) for \$165,000 to be utilized up until September 2027. Project RESTORE employs a multiple species approach focusing on endangered and imperiled species in North Carolina, including Striped Bass (Rockfish) (formerly American shad), Venus flytrap, Carolina madtom, Neuse River waterdog, and the red wolf. For the 2026-2028 School of Rockfish program, we received \$57,915 in grant funding from APNEP; however, this funding began in July of 2026 therefore APNEP funding was not used for this season. Triangle Fly Fishers also gifted us with \$500 and we received \$2500 from North Carolina Marine and Estuary Foundation for the 2026 School of Rockfish Program. In addition, we leveraged over \$25,890 of in-kind support. Very important to the program are the many volunteers, who generously give their time to enhance the program, and the dedicated teachers.

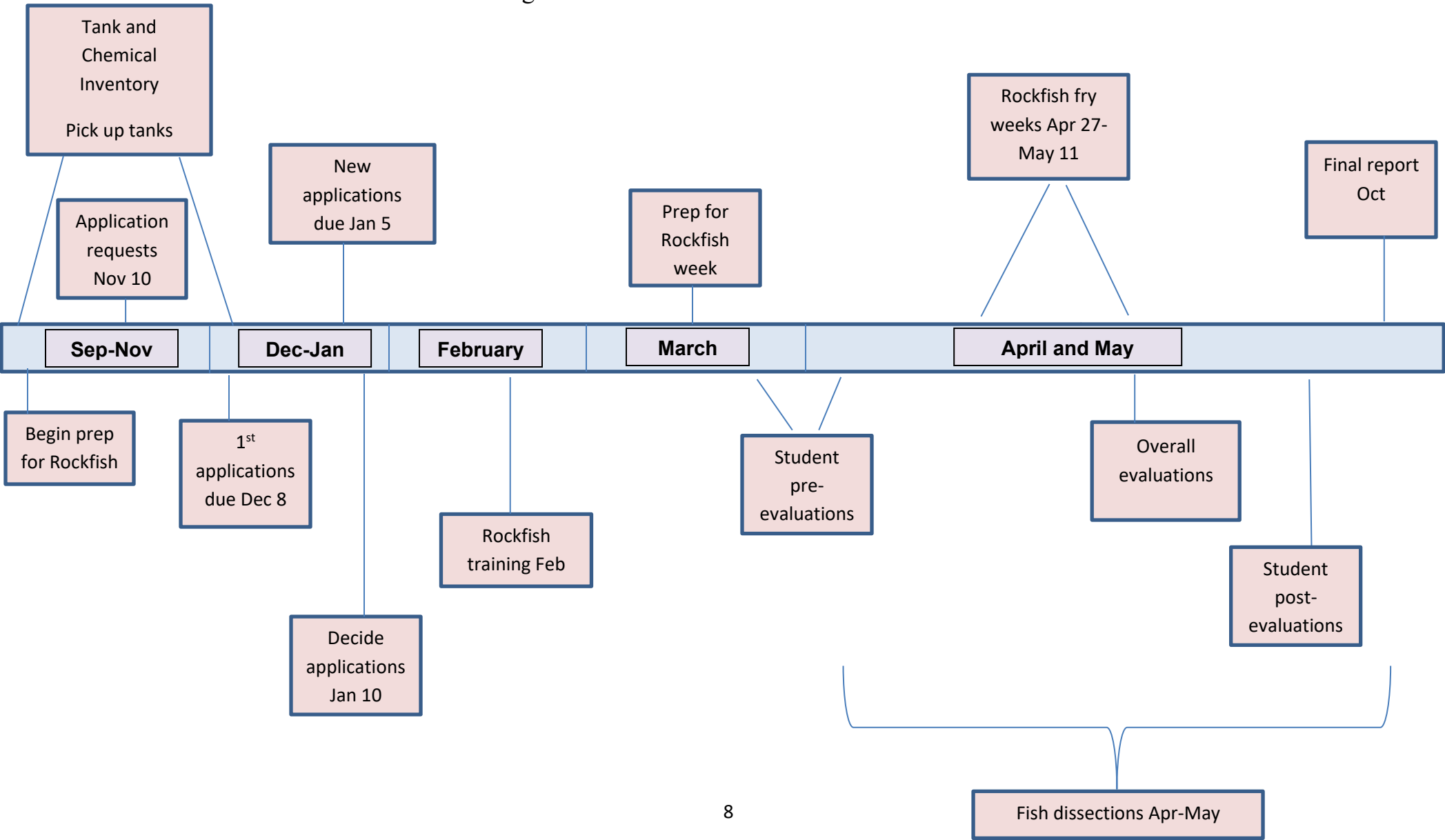
We have transitioned all classes to the plexiglass tank system. The plexiglass tank systems cost approximately \$605 per tank system. Brine shrimp hatchery systems cost approximately \$139 per system. Other substantial expenses include tank refurbishment, chemical resupply, brine shrimp cysts resupply, teacher training workshop, school field trips to release sites, travel for fry delivery and release, and part-time staff. Yearly program planning began with creation of a timeline (Figure 1), reviewing applications, and conducting a tank and parts inventory. School of Rockfish Programing requires schools to release in certain basins determined by the NCWRC. For 2026, schools were required to



Photo 2. Glenwood ES Rockfish release, Battle Park, Tar River.

release in the Tar River Basin at any location below the dam at Battle Park. Due to the School of Rockfish Program being new and having different protocol compared to our Shad in the Classroom Program, including raising brine shrimp and feeding the Rockfish, we encouraged all teachers (both return and new) to attend the teacher workshop. Teachers typically began preparing their classrooms for the arrival of the Rockfish fry 2–4 weeks prior to receiving them in April. NCWRC striped bass (Rockfish) broodstock collection began the week of April 20th. Classes released the Rockfish fry between April 30th and May 11th. Many of the classes took advantage of an in-person fish anatomy and dissection lecture by NCSU and ECU students and by the NCWRC staff.

Figure 1. School of Rockfish 2026 Timeline



Tank Inventory

At the start of the program, tank parts and chemicals were inventoried, and items purchased as needed. Tanks were retrieved from schools no longer participating in the program. Existing tanks were refurbished, as needed. All schools that had the original tub style were converted to the plexiglass style of tank system. An updated inventory list is on file.

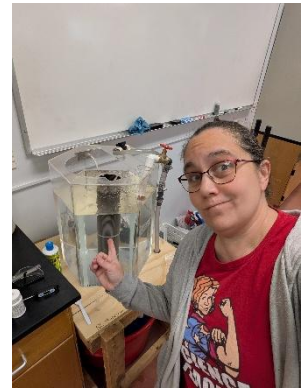


Photo 3. Lenae Scaffidi, S. Iredell HS and Rockfish tank

Teacher Orientation and Training



Photo 4. Teachers learning about Rockfish restoration and management from Kirk Rundle (NCWRC)

A teacher orientation and training session was conducted on February 21, 2026. Danielle Pender, Megan Davis, and Rory McCollum co-led the session. In addition to being provided information about Rockfish life history, restoration, and management, teachers received instructions for raising Rockfish and learned ways to incorporate Rockfish and aquatic ecology into their curriculum. Rockfish fry required feeding during their time with the classrooms. Therefore, teachers were also provided equipment and training to raise brine shrimp (as well as the brine shrimp themselves) and information on how to feed the Rockfish fry.



Photos 5. Teachers learning how to construct their tanks



Photos 6. Teachers participate in Rockfish scents activity (a simulation of fish migration upstream in the rivers using sensory information in the environment).

Twenty-four teachers attended the 2026 workshop (3 were new). All teachers that attended responded to the workshop evaluation. Questions that were quantitative are included in Table 2. For the qualitative responses, many reported that they were excited to raise brine shrimp and liked that the Rockfish could be released on a

more flexible schedule. Most teachers reported that they were very to extremely satisfied with the workshop and that the concepts were explained very to extremely well (Table 2).

Table 2. Workshop Evaluation Results

Question	Response variable
I feel confident in building the Rockfish tank system on my own	75% (18) extremely confident; 13% (3) very confident; moderately confident 13% (3)
I feel comfortable in contacting the other teachers	67% (16) extremely confident; 25% (6) very confident; moderately confident 8% (2)
The information I learned was sufficient to incorporate into my Rockfish curriculum	88% (21) extremely sufficient; 13% (3) very sufficient
This workshop explained the importance of the Rockfish restoration and management program	75% (15) extremely well; 20% (4) very well; moderately well 5% (1)
This workshop explained the life history of Rockfish	80% (16) extremely well; 20% (4) very well
This workshop explained the proper components to raising Rockfish fry to release age	85% (17) extremely well; 15% (3) very well
Overall satisfaction with the workshop	79% (15) extremely satisfied; 16% (3) very satisfied; moderately satisfied 5% (1)

Fry Delivery and Release

We coordinated the arrival and release of the larval fish with the schools, hatchery, drivers, and fisheries biologists. This involved foremost the timing of the spawning of the Rockfish but also considered school schedules. Rockfish collection was successful in the week of April 20th and we were able to deliver fry Monday, April 27. Many people assisted with the delivery and release of the larval fish and are mentioned in the acknowledgements.



Photo 7. Jeff Evans packaging Rockfish fry for schools.



Photo 8. Northwest ES students releasing Rockfish fry at Goose Creek Park, Pamlico River

Since classes were raising brine shrimp and feeding their Rockfish fry they had greater flexibility as to when they could release them. Most educators reported a very positive result with raising brine shrimp and that their classes enjoyed learning about the brine shrimp lifecycle. Classes began releasing fry on Thursday April 30th and the last class released fry on May 11th (Table 3, Figure 2). Classes received between 500 and 1000 fry according to the hatchery. Classes did their best to estimate their numbers (Table 4). Eight of the 25 classes brought students to the release (351 students attending). For those that did not take their students to the release it was mostly due to the logistical constraints on getting them to the Tar River, (including spring break timing). For some of the classes that did not attend a release, it was due to failed tanks (0% survivability). Of those that were able to attend a release, all teachers reported that it enhanced the learning experience for their students.



Photo 9. East Duplin HS release Masons Landing, Tar River.



Photo 10. Glenwood ES students sampling for invertebrates during their release at Battle Park, Tar River.

Table 3. Fry Release Timing and Release Site Information

Educator	School	Received Fry	Released Fry	Tar River Release Site
Angela Tyler	Tabor City ES	4/27/2025	5/1/2026	Battle Park
Beth Selig	Fuquay Varina MS	4/27/2025	4/30/2026	Battle Park
Corie Hlavaty	Lakewood Montessori MS	4/27/2025	5/9/2026	Battle Park
Dan Huygens	East Duplin HS	4/27/2025	5/7/2026	Masons Landing
Edward Tidd	Moore Square MS	4/27/2025	5/1/2026	Battle Park
Endiga Holdness	Fuquay Varina MS	4/27/2025	4/30/2026	Battle Park
Fred Pfeiffer	Lakewood Montessori MS	4/27/2025	5/9/2026	Battle Park
Gina Bobbitt	East Cary MS	4/27/2025	5/8/2026	Battle Park
Jackie Smith	East Duplin HS	4/27/2025	5/7/2026	Masons Landing
Kaitlyn Stroud	Northwest ES	4/27/2025	5/4/2026	Goose Creek
Kaley Kiffner	First Flight MS	4/27/2025	5/8/2026	Wildwood
Kim Collier	Chaloner MS	4/27/2025	5/1/2026	Wildwood
Krista Brinchek	Abbotts Creek ES	4/27/2025	5/10/2026	Goose Creek
Lee Deans	First Flight MS	4/27/2025	5/8/2026	Goose Creek
Lenae Scafidi	South Iredell HS	4/27/2025	5/11/2026	Battle Park
Matthew Lanner	Fuquay Varina MS	4/27/2025	4/30/2026	Battle Park
Sarah King	Chaloner MS	4/27/2025	5/1/2026	Wildwood
Shannon Lee	Brinson Memorial ES	4/27/2025	5/2/2026	Goose Creek
Sheryl Kirkey-Dean	Glenwood ES	4/27/2025	5/8/2026	Battle Park
Sophie Hatcher Peters	Lakewood ES	4/27/2025	5/9/2026	Battle Park
Virginia Jones, Christina Davison	Seawell ES	4/27/2025	5/15/2026	Battle Park

Figure 2. — School and release site locations (approximate)

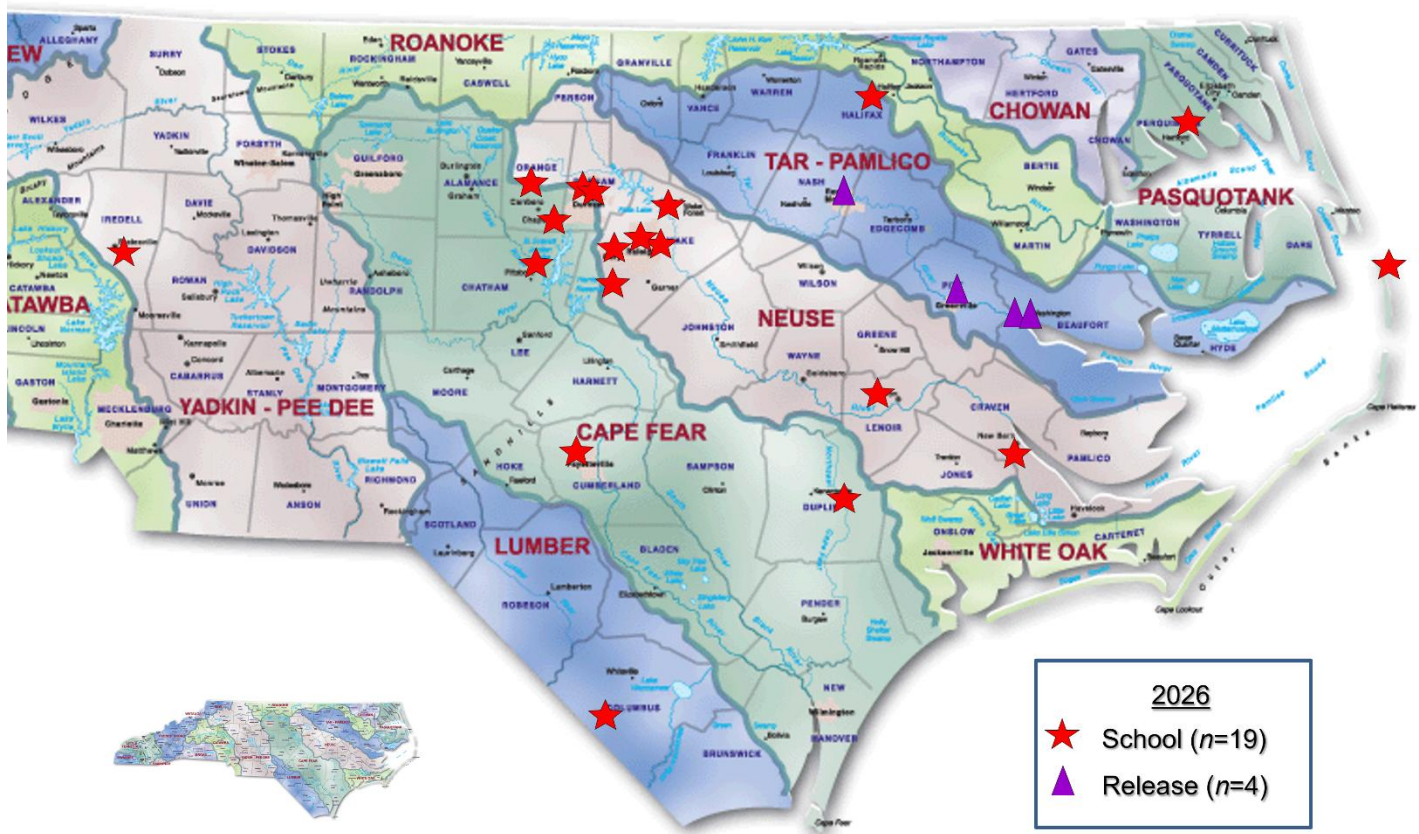


Photo 11. Tabor City ES students painting (Gyotaku)

Overall, the Rockfish rearing and release was fairly successful for the schools, but with some issues reported. Each class was to receive approximately 500 – 1000 fry; however, counts may differ as to what the school reported receiving. Some teachers reported only the fry that survived to the end of the first day and others reported all that they received. This difference in reporting may affect the percent survivability reported. This year all 25 classes received their fry on Monday, April 27th. Of those that turned in their water quality information (23), many reporting lower survivability also reported water quality issues. Two reported low pH and 15 had ammonia issues (including those using river water), and one reported chloramine issues. Some reported that their fry arrived without a visible yolk-sac and speculated that they should have been fed brine shrimp sooner. Four classes used river water rather than tap. It is possible that fry hunger and water quality issues contributed to lower survivability for some schools.

Overall, the percent survival ranged from a low of 0% to a high of 100% and averaged 29% (Table 4). Twenty-one classes averaged $\leq 50\%$, 4 averaged $>50\%$, and 3 averaged $\geq 75\%$ survival to release. There were 9 classes that averaged 10% survivability or below. Average survivability of Rockfish fry (29%) was comparable to that of American shad in 2025 (27%). The percent of classes that reported $\leq 50\%$ survivability was 84% of the classes in 2026 and 73% in 2025. The percentage of classes that were in the $\geq 75\%$ survival rate was a bit lower (3%) compared to American shad in 2025 (5%).

Table 4. Fry Survival and Release Numbers

Educator	School	No. Fry Received	No. Fry Survived to Release	Percent Survival (%)
Angela Tyler	Tabor City ES	700	690	99
Beth Selig	Fuquay Varina MS	500	5	1
Corie Hlavaty	Lakewood Montessori MS	500	200	40
Dan Huygens	East Duplin HS	1900	500	26
Denise O’Gorman	Woods Charter HS	900	0	0
Douglas Poole	Perquimans County HS	750	0	0
Edward Tidd	Moore Square MS	600	100	17
Endiga Holdness	Fuquay Varina MS	600	1	0
Fred Pfeiffer	Lakewood Montessori MS	500	50	10
Gina Bobbitt	East Cary MS	700	300	43
Jackie Smith	East Duplin HS	1100	498	45
Kaitlyn Stroud	Northwest ES	750	250	33
Kaley Kiffner	First Flight MS	1100	150	14
Katie Dorn	Cumberland polytechnic HS	750	0	0
Kim Collier	Chaloner MS	500	150	30
Krista Brinchek	Abbotts Creek ES	500	150	30
Lee Deans	First Flight MS	1500	500	33
Lenae Scafidi	South Iredell HS	750	200	27

Table 4. Fry Survival and Release Numbers – Cont'd

Educator	School	No. Fry Received	No. Fry Survived to Release	Percent Survival (%)
Matthew Lanner	Fuquay Varina MS	1000	1000	100
Richard Kowaleski	Oberlin Magnet MS	500	0	0
Sarah King	Chaloner MS	625	550	88
Shannon Lee	Brinson Memorial ES	500	345	69
Sheryl Kirkey-Dean	Glenwood ES	800	10	1
Sophie Hatcher Peters	Lakewood ES	1000	200	20
Virginia Jones, Christina Davison	Seawell ES	700	5	1
Average survival percent				29

“Students love this hands-on activity. It completely engaged the students who are normally the least active in class. Just a great program with multiple curriculum entry points in a variety of disciplines. It also offers myriad leadership opportunities for young students and connects them rather profoundly to environmental and conservation education and practices.”

“The kids LOVED checking on the fry each morning as they arrived at school. The 4th and 5th graders LOVED learning about water quality testing and felt very important working with chemicals. Everyone could not believe that they could see the orange brine shrimp inside the bellies of the fish!”

Teachers reported that the students in the program were more engaged and really enjoyed not only working with the Rockfish but also learning about the brine shrimp and feeding the Rockfish. Many reported that the students loved the hands-on aspect of the water quality testing and feeding the fish. The Rockfish Program increases students’ interest and confidence in science. We have received great feedback on the program from the teachers throughout the 2026 program year. However, some reported missing working with American shad, particularly for viewing the hatching of the eggs and for being able to release in the Neuse River Basin, which is a closer trip for many.



Photo 12. Brine shrimp hatchery



Photo 13. East Duplin HS release Masons Landing, Tar River.

Additional Student Education

In addition to learning concepts related to Rockfish survival and its ecological connections to community assemblages and habitat, we have made available additional educational activities to enhance the program. Many of these activities were originally created for the Shad in the Classroom Program but are also applicable to the School of Rockfish Program. All teachers responded to the program evaluation survey (Table 4).

Gyotaku (fish printing)

All teachers who wish to receive a Gyotaku (fish printing kit) for their class can have one. The kit consists of 4 Rockfish casts, supporting instructions, and prints of Rockfish photos. Schools provide the paint and materials to print on (e.g., t-shirts, bags, posters). Sixteen classes reported doing this activity and that it enhanced learning.



Photo 14 Seawell ES Rockfish gyotaku printing

Fish Dissection



Photo 15. Fuquay-Varina MS fish anatomy lesson

We coordinated with the NC State University (NCSU) Student Fisheries Subunit, the East Carolina University (ECU) Student Fisheries subunit, and the NC Wildlife Resources Commission (NCWRC) to conduct fish anatomy/morphology and dissection lessons. Seven graduate and undergraduate students and educators from the above-listed agencies and universities (individuals listed in acknowledgements) conducted these lessons. Because of these volunteers and the generosity of fish donations (~100 collected by NCWRC staff, ~100 collected by ECU students and NCDMF), we were able to facilitate the dissection lecture for 12 classrooms (805 students). All twelve teachers (Table 4) reported that these lectures enhanced learning.

“This is one of the best parts of the entire experience. Even for my kids who fish often, this is a totally different view of life than what they are used to.”

Curriculum Activities and Videos

We added supplementary or modified materials for the teachers to use to augment the learning process in the classroom and at the release focusing on Rockfish. Many of the activities created for Shad in the Classroom are also applicable to learning about Rockfish and anadromous fish in general. Newly updated or created materials include Rocco the Rockfish (lifecycle activity; 22 reported as enhanced learning), Wishes of Fishes (graphic organizer; 11 reported as useful), Something Smelly (scent activity; 7 reported as enhanced learning), and Growing up Rockfish (learning about fish length/weight ratios and condition; 16 reported as enhanced learning). All programs within the Project RESTORE umbrella have supplemental activities that are available to any/all teachers participating in any one or more of the species programs. (See Table 5 for the analysis of activities and videos)



Photo 16. NC educators practicing the Rocco the Rockfish lifecycle activity at the workshop.

Teachers continue to use the short videos we developed focusing on the diversity of North Carolina fish/aquatic biologists and accompanying questions in 2020 (12 teachers reported enhanced learning). These videos were created as an attempt to address the difference in learning revealed in the student surveys from 2016–2019 and 2021–2025 for Shad in the Classroom and continued in 2026 for School of Rockfish where students who self-identified as white showed greater increases in learning relative to students who self-identified as other races, particularly those that self-identified as Black or African American and Hispanic or Latino (Figure 3; contact authors if interested in viewing past analytics). We hope that having the opportunity to hear from experts from diverse backgrounds will help students of color to envision themselves pursuing careers more readily in science and/or fisheries.

Additional curriculum activities are available for the teachers to use including “Who’s your Shaddy” (5 teachers reported this as “just right” as far as complexity), Food Web Activities (17 teachers reported this as useful), GIS Watershed Activity (6 reported as useful), Dichotomous Key Activity (10 reported as enhanced learning), Fintastic Sort (5 reported as enhanced learning), and a pipette art activity (5 reported as enhanced learning). Seven videos were created for the Shad in the Classroom Program previously. We recommend three of the videos to also apply to the School of Rockfish Program. Most teachers (64–76%) utilized these videos. A few teachers mentioned that they would like additional videos to directly apply to the School of Rockfish Program.

Table 5. Additional Education and Video Use Survey Results

Question	Response variable
Catch you later! – enhanced learning?	12% (3) greatly enhanced; 8% (2) somewhat enhanced; 81% (21) did not use
Dichotomous Key – enhance learning?	12% (3) greatly enhanced; 19% (5) enhanced; 8% (2) somewhat enhanced; 62% (16) did not use
Fintastic Sort – enhance learning?	12% (3) enhanced; 88% (23) did not use
Fish Dissection – enhance learning?	42% (11) greatly enhanced; 4% (1) enhanced; 54% (14) did not attend
Fish Weir Story Board – enhance learning?	4% (1) greatly enhanced; 96% (25) did not use
Food Web Activities – usefulness?	31% (8) very useful; 23% (6) useful; 12% (3) somewhat; 35% (9) did not use
Genetic Exercise – complexity or understanding?	15% (4) just right; 4% (1) too hard; 4% (1) too easy; 81% (21) did not use
GIS Watershed Activity – usefulness?	4% (1) very useful; 15% (4) useful; 4% (1) somewhat; 77% (20) did not use
Growing up Rockfish – enhance learning?	19% (5) greatly enhanced; 31% (8) enhanced; 12% (3) somewhat; 38% (10) did not use
Gyotaku – enhanced learning?	23% (6) greatly enhanced; 23% (6) enhanced; 15% (4) somewhat; 38% (10) did not use
Migration Madness – enhanced learning?	4% (1) greatly enhanced; 19% (5) somewhat; 77% (20) did not use
Rockfish Lifecycle Activity – enhance learning?	42% (11) greatly enhanced; 38% (10) enhanced; 4% (1) somewhat; 15% (4) did not use
Rockfish Pipette Art – enhance learning?	12% (3) greatly enhanced; 4% (1) enhanced; 4% (1) somewhat; 81% (21) did not use
Something Smelly – enhance learning?	8% (2) greatly enhanced; 8% (2) enhanced; 12% (3) somewhat; 73% (19) did not use
Wishes of Fishes Activity – usefulness?	23% (6) very useful; 15% (4) very useful; 4% (1) somewhat useful; 58% (15) did not use
Video –Build the Tank – usefulness?	20% (5) very useful; 44% (11) useful; 4% (1) somewhat useful; 32% (8) did not use

Table 5. Additional Education and Video Use Survey Results – Cont’d

Question	Response variable
Video – Migratory Fish Research – usefulness?	32% (8) very useful; 28% (7) useful; 16% (4) somewhat useful; 24% (6) did not use
Video – It is Time usefulness?	24% (6) very useful; 28% (7) useful; 12% (3) somewhat; 36% (9) did not use

Program Outcomes

Student Impact

The School of Rockfish Program exposes students to important science and math concepts including those listed below.

1. History, cultural and biological importance, and life cycle of the Rockfish
2. Rockfish’s ecological connections to other species
3. Scientific procedures for measuring, testing, collecting, and organizing data
4. Mathematics to estimate, calculate, and predict results
5. Charts, maps, and graphs to aid in summarizing information
6. Information exchange among other classes in the school and to parents and adults
7. The delicate balance of nature and work toward conserving or improving natural resources
8. Rockfish restoration in rivers
9. Reporting and presentation techniques, both oral and written

This program provides a valuable experiential learning opportunity for students in the classroom that houses the tank (direct involvement) and those indirectly involved (e.g. collecting and recording water quality during their science period).

Student Analytics 2026

We continue our evaluation of the School of Rockfish Program’s impact on student’s understanding and learning with a questionnaire that uses multiple choice questions to determine a participant's knowledge of Rockfish (similar to our American shad analysis in previous years). Demographic questions about age, gender, grade level, and whether the participant hunted or fished are included. Teachers who agreed to participate (17) provided the pre- and post-tests to their students ($n=682$). Contact authors for a detailed explanation of the analysis for School of Rockfish or Shad in the Classroom past data.

All students in the program had a significantly positive increase in learning. However, like in prior years with the Shad in the Classroom Program, we saw unequal learning growth and final scores across races. Black/African American and Hispanic students showed significantly smaller percent increase in knowledge

compared to their peers. Students that self-identified as Black or African American showed a significant difference in learning from White and Asian students ($p=0.0001$), other ($p=.0065$), “two or more races” ($p=.0031$), and Hispanic ($p=.0035$) (Figure 3). Similarly, there were significant differences in learning among those identifying as Hispanic to White, Asian, Other, and “two or more races” ($p=0.0001$). What this means is that although *all* students gained knowledge, students identifying as Black or African American and Hispanic race/ethnicities fell behind their peers. Those that identified as “two or more races” showed a slight significant difference in learning to White students ($p=.0497$). This year students that identified as Asian showed a significant difference in learning to White students ($p=.0013$); showing the strongest increase in learning. There was no significant difference in learning detected among students who identified as males, females, or other/preferred not to say (these were combined due to low numbers) (Figure 4).

Figure 3. — Change in student knowledge by race ($n=682$)

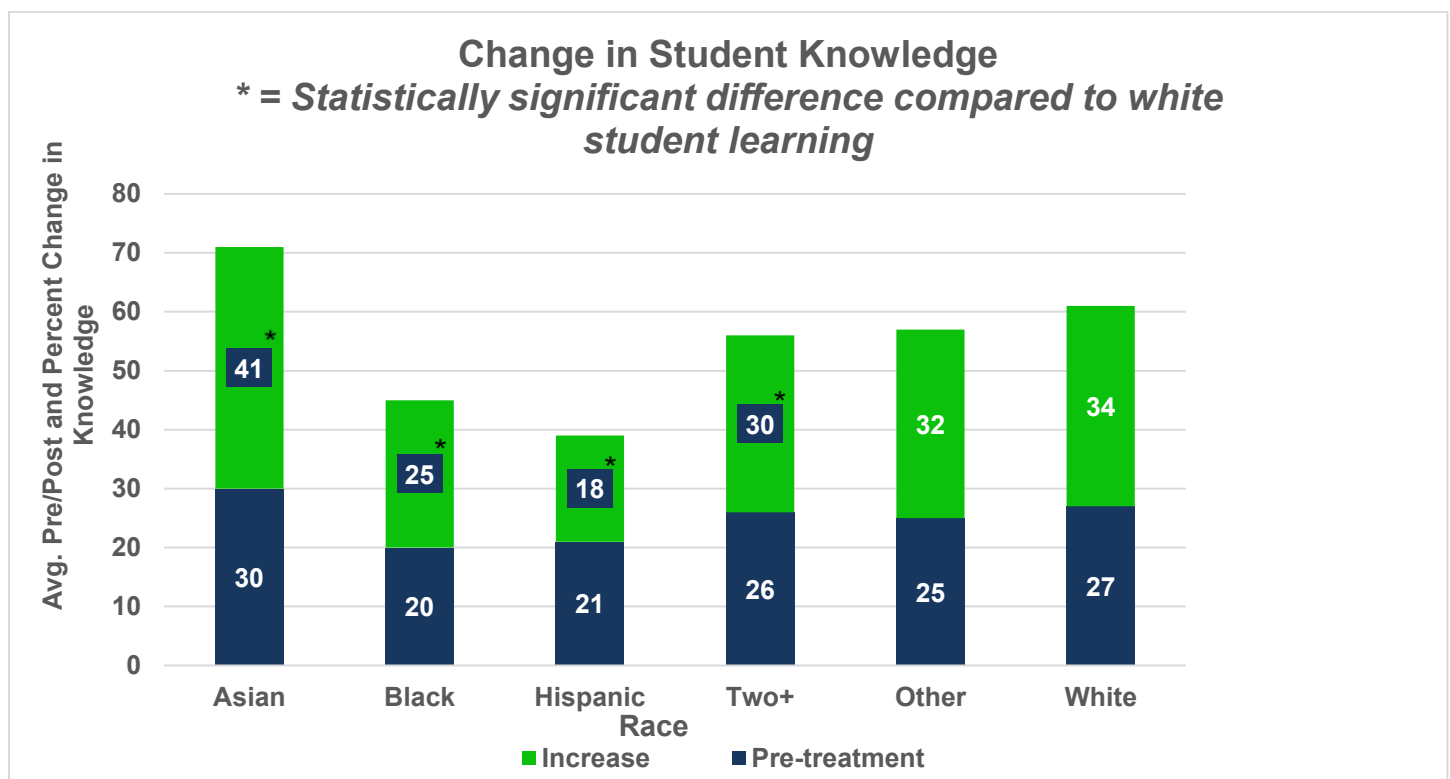
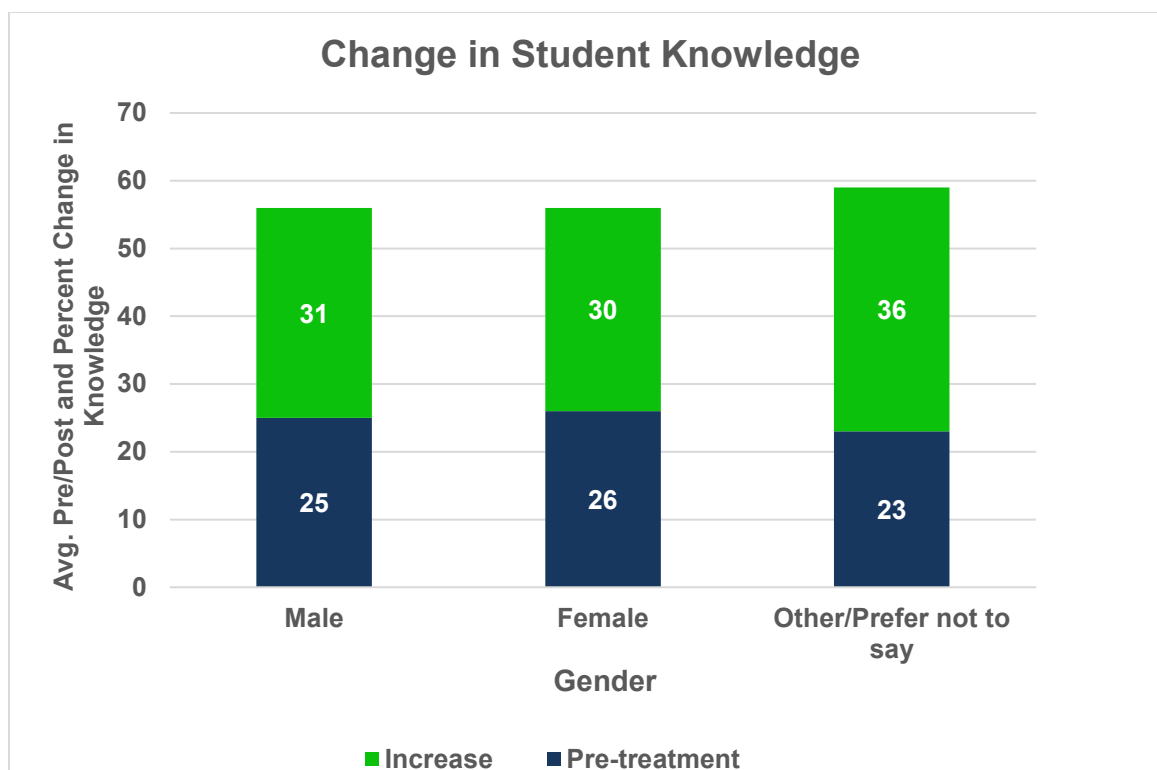


Figure 4. — Change in student knowledge by gender ($n=682$)



The student surveys also contained questions assessing environmental attitudes and behaviors of the students. The analysis focused on the following 4 questions:

1. **I talk to my family or friends outside of school about what I've learned about science**
2. **I feel I can do something to help my local watershed or river**
3. **I feel like I can help fish like Rockfish**
4. **I ask others about things I can do about environmental problems**

Table 6 shows pre- and post-program percentages for those that answered “Agree or Strongly Agree” for questions 1-3 or “sometimes, often, or always” for question 4. We looked at all students and groupings by general grade (Elementary Students ES, Middle School Students MS, and High School students HS), gender, and race. Attitude and behavior changes that reflect an increase of 10% or more from pre- to post-survey are marked with an asterisk in the table. We found no discernable pattern between pre- and post-responses with a few notable exceptions. However, elementary students had higher increases and post-values than the upper grades for the first two

Q: Have you seen any changes in the students who participated in this program?

“Students were engaged the whole time. My students really loved looking under the microscope every day and, in the tank, they did not even wait for me to get started, they were too excited.”

“Students stepped into new leadership roles when they felt responsible for raising and caring for the fish.”

questions. For all other student-identifying factors, there was variation by race and gender as to whether there was any increase in attitude and behavior for each question.

Table 6. Analysis of Student Attitude and Behavior (*= notable increase of more than 10%) (*n* =682)

Category	Q.1 % Pre	Q.1 % Post	Q.2 % Pre	Q.2 % Post	Q.3 % Pre	Q.3 % Post	Q.4 % Pre	Q.4 % Post
All	68	71	63	65	60	58	58	59
ES	69	81*	64	81*	58	58	55	56
MS	65	68	56	54	69	59	66	57
HS	69	71	64	65	58	58	57	60
Female	71	76	65	70	60	58	58	55
Male	68	68	64	63	62	60	59	62
Other/Prefer not to answer	54	59	41	41	41	51	51	68*
Asian	81	78	58	78*	69	56	47	53
Black	64	76*	59	57	59	59	66	59
Hispanic	64	66	61	63	71	61	57	56
Other	71	68	65	65	65	45	81	58
Two	69	71	53	58	55	56	61	65
White	69	71	66	67	58	59	55	60

In summary, it is notable that all student groups in the program had a significantly positive increase in learning for all the years that these parameters have been evaluated for both the School of Rockfish Program and the Shad in the Classroom Program, (2016–2019, 2021–2026). However, students identified as Black or African American were found to fall behind their peers in learning in each year (reports 2016-2026). Other groups showing significantly lower learning levels for some comparisons were those self-identified as Hispanic or Latino (7 of the years) and those self-identified as “Other” (2 of the years). We plan to continue collecting student questionnaires and refine questions as necessary so that we can monitor student learning and attitudes and behavior in all groups between the beginning and end of the School of Rockfish program. We are presently working with our Statewide Initiatives staff to identify strategies to address differences in learning among non-white students to then share strategies with our classroom teachers.

Public Outreach

Information on the School of Rockfish Program is available on the Museum’s website. The program also receives a lot of publicity by word-of-mouth from those who have participated in the Shad in the Classroom Program previously (including teachers, students, and volunteers). In addition to the students and teachers reached, the School of Rockfish Program and Project Restore was featured through:

- NCMNS News Release “The School of Rockfish is Now in Session” May 2026
- Presentation “Schools Foray into North Carolina’s Rare Species” to members at Church at Clayton Crossing June 2026

- An update on the School of Rockfish Program was published in the North Carolina Chapter American Fisheries Society Fall Newsletter in 2026

Future Planning

We will continue to make additional curriculum activities available for in-classroom and at-release use.

The School of Rockfish Program had a successful first year, 56% of teachers reported that they were extremely satisfied and 28% reported they were very satisfied with the School of Rockfish experience [16% (4) teachers reported being moderately satisfied]. For teachers with the lower satisfaction level, it seemed to stem from a few different issues. Some return teachers reported missing seeing the development of the shad embryos, some reported missing having the ability to release fish closer to their schools in the Neuse River Basin, and a few mentioned missing the breath of activities and information that was in the Shad in the Classroom Program. In contrast, most teachers reported positive experiences with raising brine shrimp and feeding the Rockfish. Most teachers and students provided positive feedback on most aspects of the program including the activities and the overall program. Twenty-two of the 25 teachers participating in the School of Rockfish Program in 2026 reported that they would like to continue with the program next year (one class is unsure). We have a few teachers that were on hiatus for 2026 that may like to return for 2027. At present, we have 22 new teachers on the waiting list for the program in 2027. We received invaluable assistance from partners and volunteers helping with the deliveries of fry and educational lectures. Working with this program is a positive experience for all involved.

“I would recommend this program. This program incorporating this hands-on experience generates a lot of great discussion points within our science curriculum.”

“The release is always so much fun. I find so much joy watching the students be free in nature and discover all of the life that lives in the river.”

“Students enjoyed raising the brine shrimp, looking under the microscope at various stages, and seeing the Rockfish grow/eat. They really thought it was neat to see the pink bellies of the Rockfish after they ate.”

*Please contact Danielle Pender at danielle.pender@naturalsciences.org or Megan Davis at megan.davis@naturalsciences.org if you would like to see past Shad in the Classroom reports, including the schools that participated in the program 2009-2025 and student analytics 2016-2025.