

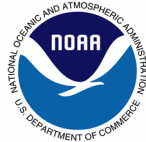


WHATCOM MARINE RESOURCES COMMITTEE (MRC) BEACH SEINE WITH SCHOOLS FINAL REPORT

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Reporting Period: January 2026 - September 2026

Grant Number: OTGP-2026-WhCoPW-00103

This report was prepared by Whatcom County using Federal funds under awards NA23NMF4690358 and NA25NMF463C0077-T1-01 from National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author and do not necessarily reflect the views of the NOAA or the U.S. Department of Commerce.



ABSTRACT

In 2022, the Whatcom County Marine Resources Committee (MRC) launched the Beach Seine with Schools program to provide elementary students with a hands-on opportunity to learn about the critical role intertidal habitats play in supporting juvenile salmon and forage fish. By connecting students directly with local shorelines, the program fosters environmental stewardship and builds awareness of marine science and conservation opportunities.

Following strong demand and positive outcomes, the program has continued annually through 2026. The program combines classroom based pre and post visit lessons with a field experience at Boulevard Park in Bellingham, where students participate in beach seining activities, collect scientific observations, and learn from Tribal Elders about the cultural and ecological significance of salmon.

In 2026, the MRC conducted 3 beach seining events with 3 schools including Kendall Elementary School, Columbia Elementary School, and Cordata Elementary School. A total of 180 fourth grade students from eight classrooms participated, supported by 15 volunteers that contributed over 125 hours of time. The MRC also collaborated with the Salish Sea School to provide supplemental learning stations at each event, creating smaller group experiences that enhanced student engagement and participation.

Results from the pre and post program assessments showed substantial improvements in student understanding of salmon habitat and shoreline ecosystems. Teacher evaluations further validated the program's effectiveness in achieving its intended learning outcomes and overall impact to students.

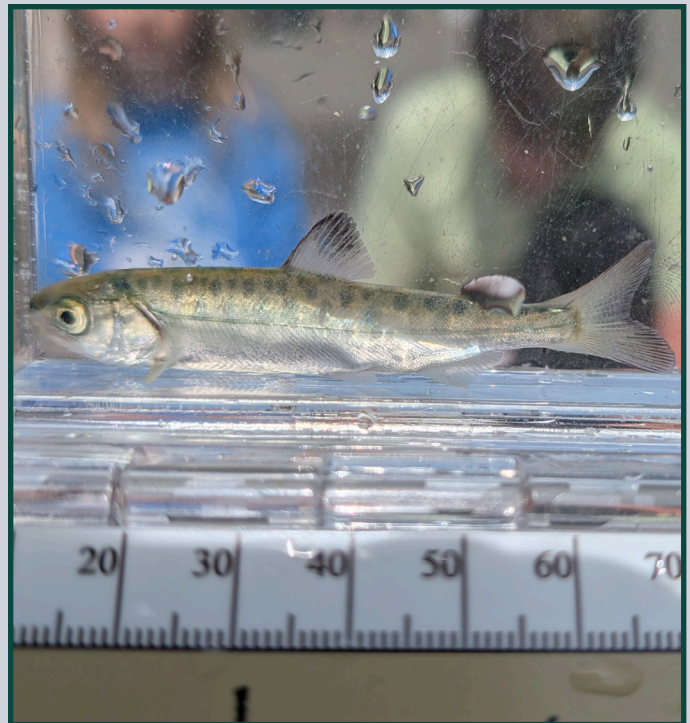
Although interest in the program continues to grow, expansion is currently limited by the availability of trained field staff, access to seining permits, and the number of volunteers and staff needed to safely and effectively support students in an outdoor learning environment. As resources allow, the MRC will continue working to expand access and provide this meaningful learning opportunity to as many fourth grade students throughout Whatcom County as possible.

PROJECT GOALS

The goal of this project was to increase student and community awareness about the vital role intertidal habitats play in supporting migrating juvenile salmon and other marine species through direct observation of the beach seining process. By providing hands-on experiences in the marine environment, the MRC sought to foster environmental stewardship, strengthen connections to local shorelines, and inspire interest in marine science, conservation, and related career pathways.

To achieve this goal, the expected outcomes of the program were:

- Development of pre and post classroom lesson plans
- Development of agendas for each of the field events
- Coordination with Lummi Nation and the Nooksack Indian Tribe to provide guest speakers to discuss the cultural and ecological importance of salmon
- Attendance by 25 or more students at each of the beach seining events
- Collection of sample catch data
- Creation of a post-event evaluation for teachers to provide feedback on the program
- Creation of a pre and post event evaluation to assess student learning



Left: Students observe juvenile salmon from a beach seine. Right: Close-up of a juvenile salmon in a photo-aquarium. Photo credits: Dana Daniels, MRC staff.

PROJECT ENGAGEMENT

The Beach Seine with Schools project relies on various partners, organizations, and volunteers to successfully facilitate the program. The MRC was responsible for all project planning and coordination, including selecting dates and times for the beach seine events, contacting fourth grade classrooms throughout Whatcom County about the program and application process, selecting schools for participation, contacting speakers and field volunteers, communicating with selected classrooms to conduct pre and post field trip classroom visits, generating lesson plans for the classroom visits, coordinating with partner organizations, developing a datasheet for the students to use in the field, and leading the beach seining field trip events. Other key project partners and their roles are listed in the next section. A list of participating volunteers is shown in Appendix A.

PARTNER ORGANIZATIONS

- **Lummi Natural Resources Department (LNR):** Provided field biologists, expertise, and the permits and gear necessary to conduct the beach seining at each of the events.
- **The Salish Sea School (TSSS):** Provided staff, lesson plans, and resources to facilitate additional activity stations at each at the field trip events.
- **The Salish Sea Alliance:** Provided honorariums for each of the tribal speakers.



Left: Biologists with the Lummi Natural Resources Department conduct a beach seine. Photo credit: Dana Daniels, MRC staff. Right: Salish Sea School staff, MRC staff, and volunteers display a mural painted by a 4th grade classroom at a beach seine event. Photo credit: MRC volunteer.

PARTICIPANTS

Kendall Elementary School

- Field event date: April 14th, 2026
- 45 students from 2 classrooms
- Staff and volunteers included: TSSS staff and volunteers (4), MRC staff (1), MRC members and volunteers (7), LNR biologists (2)
- Tribal Speaker: Heather Jefferson, Lummi Nation



Photo credit: Dana Daniels, MRC staff.

Columbia Elementary School

- Field event date: May 12th, 2026
- 72 students from 3 classrooms
- Staff and volunteers included: TSSS staff and volunteers (4), MRC staff (1), MRC members and volunteers (8), LNR biologists (2)
- Tribal Speaker: Frank Lawrence III, Lummi Nation



Photo credit: Dana Daniels, MRC staff.

Cordata Elementary School

- Field event date: May 22nd, 2026
- 63 students from 3 classrooms
- Staff and volunteers included: TSSS staff and volunteers (4), MRC staff (1), MRC members and volunteers (6), LNR biologists (2)
- Tribal Speakers: Jim and Sandra Bura, Nooksack Tribe and Lummi Nation



Photo credit: Kimberly Cauvel, NWIFC.

COMMUNITIES INVOLVED

The Beach Seine with Schools program was designed to serve fourth grade students from schools across Whatcom County. This age group was selected because students are developmentally able to understand the ecological importance of intertidal habitats and their connection to salmon survival. When fourth graders observe live fish being caught in the intertidal zone, they often respond with enthusiasm and curiosity, fostering a greater appreciation for shoreline conservation and salmon habitat restoration.

Many participating classrooms had previously taken part in the Nooksack Salmon Enhancement Association's Students for Salmon Program, in which students raise salmon from eggs to fry in their classrooms before releasing them into local waterways. Through this hands-on experience, students learn about salmon life cycles, the importance of healthy watersheds, and the critical role humans play in salmon recovery efforts. The Beach Seine with Schools project builds upon this foundation by highlighting the importance of intertidal habitats for juvenile salmon, including fish that students may have personally raised and released. The project also expands students' understanding of salmon recovery by showcasing the contributions of Tribal Nations and local organizations working to protect and restore salmon populations.



Left: Biologists with the Lummi Natural Resources Department explain the components of a beach seine to 4th graders from Cordata Elementary School. Photo credit: Dana Daniels, MRC staff. Right: Students observe a juvenile salmon up close. Photo credit: Kimberly Cauvel, NWIFC.

PROJECT METHODS

The MRC hosted three, 2.5-hour field trips for students to observe the deployment and catch of a beach seine during the peak juvenile salmon outmigration period that occurs from April-June. Boulevard Park, located in Bellingham, was chosen as the field location as it offers ideal seining characteristics, provides easy beach access for large groups of students, and is located right in the heart of Bellingham. Additionally, the pocket beach that was used for seining was restored by the City of Bellingham in 2014, providing the opportunity to demonstrate and discuss the positive impacts of a local restoration project.



Location of field events at Boulevard Park, Bellingham with the seining beach circled in teal. Source: Google Earth.

In January of 2026, invitations and applications to participate in the program were emailed to fourth grade educators throughout Whatcom County including Bellingham, Blaine, Meridian, Lynden, Ferndale, Mt. Baker, and Nooksack Valley School Districts as well as Lummi Nation School (See Appendix B). Due to limited staff and volunteer capacity, the program could only be offered to 3 schools with classrooms of 20–30 students each, as not to exceed 75 total students per event. Classrooms were selected by MRC project leads based on classroom size and relevance of the field experience to the current classroom curriculum.

Prior to and after each field event, an MRC member or staff visited participating classrooms to provide students with information about the beach seining process, the importance of the intertidal corridor to juvenile salmon, and expectations for the field event and data collection. During these visits, the MRC also administered pre and post field event evaluations to assess student learning. The classroom curriculum is included in Appendix C.



MRC staff conducts a pre-lesson classroom visit. Photo credit: Mike MacKay, MRC project lead.

PROJECT METHODS

The beach seine protocols that were utilized were developed by LNR and the Washington Department of Fish and Wildlife (WDFW) and are included as Appendix D. LNR field biologists conducted each beach seine, identified and measured the fish, and shared their knowledge of the species captured in the net with students.



LNR field biologists conduct a beach seine at Boulevard Park. Photo credit: Dana Daniels, MRC staff.

Each field event was preceded by a short talk by a Tribal member who discussed the ecological and cultural importance of salmon. Topics shared included fishing through family generations, the importance of appreciating and protecting natural resources, career opportunities in the biological sciences, the history of salmon fishing using traps and reef net gear, the significance of place-based connections, and the importance of salmon hatcheries in supplementing natural salmon populations.



Left: Lummi tribal member, Frank Lawrence III plays a song for 4th grade students. Right: Jim and Sandra Bura speak to students from Cordata Elementary School about the importance of salmon. Photo credits: Dana Daniels, MRC staff.

PROJECT METHODS

Learning Objectives and Takeaway Messages

The key takeaway message for this project is that marine intertidal zones serve as migratory corridors for juvenile salmon. Intertidal habitats provide migrating salmon with a place to forage and seek refuge from predators.

Other key messages included:

- Juvenile salmon migration occurs during the spring and summer.
- Shoreline fill and dredge projects can interrupt intertidal migration and cause increased predation of juvenile salmon.
- Salmon and forage fish (such as herring, surf smelt, and sand lance) are important components of the food chain in the Salish Sea. Many organisms, from seabirds to orcas, rely on salmon and forage fish. Both types of fish depend on the intertidal shoreline.
- Tribes are involved in field studies that monitor salmon and are concerned for the health of these populations.
- Careers in the biological sciences can be fun and exciting, and are important for protecting marine populations for future generations.

Evaluation Methods

To evaluate the effectiveness of the program in communicating its key learning objectives, brief pre and post program assessments were administered to participating students during the classroom visits. These assessments included questions about the intertidal zone, species that depend on these habitats, and actions students can take to support salmon conservation. In addition, participating teachers were asked to complete post-program evaluations to provide feedback on the educational experience and program delivery. Copies of both the student and teacher evaluations are included in Appendix E.

PROJECT ACTIVITIES

Date	Project Activity	Location
01/21/26	Project kickoff meeting	Virtual
01/23/26	Invitations sent to schools	NA
02/23/26	Application review and selection meeting	Virtual
03/30/26	Program evaluation meeting	Virtual
04/13/26	Kendall Elementary School pre-lesson	Kendall Elementary School
04/14/26	Kendall Elementary School field event	Boulevard Park
04/15/26	Kendall Elementary School post- lesson	Kendall Elementary School
04/23/26	Event 1 debrief meeting	Virtual
05/11/26	Columbia Elementary School pre-lesson	Columbia Elementary School
05/12/26	Columbia Elementary School field event	Boulevard Park
05/13/26	Columbia Elementary School post- lesson	Columbia Elementary School
05/21/26	Cordata Elementary School pre-lesson	Cordata Elementary School
05/22/26	Cordata Elementary School field event	Boulevard Park
05/26/26	Cordata Elementary School post- lesson	Cordata Elementary School

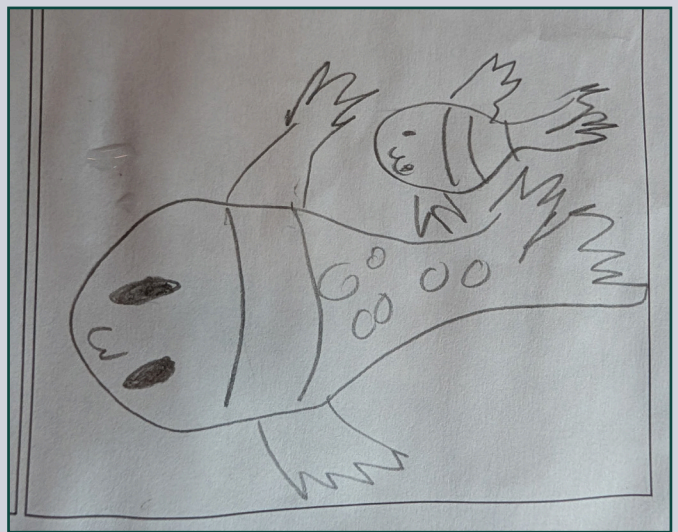
Table 1: Overview of Beach Seine with Schools project activities that occurred during 2026.

RESULTS

In 2026, the MRC conducted 3 Beach Seine with Schools events with 3 schools including Kendall Elementary School, Columbia Elementary School, and Cordata Elementary School. Detailed summaries of each of the 3 field events are outlined on the following pages.

KENDALL ELEMENTARY SCHOOL

Despite cold, rainy, and windy weather, 45 fourth graders from Kendall Elementary School enjoyed a successful salmon education field trip at Boulevard Park. Just after the students arrived, Lummi tribal member Heather Jefferson shared stories about perseverance, determination, and the importance of caring for salmon habitat. Down at the beach, the LNR crew explained the various components of the seining net before setting the seine out. Although the first seine attempt only caught a sculpin, a second effort produced dozens of chum and pink salmon, allowing students to learn how to identify and measure different species. The catch from the day included 1 chinook salmon, 42 chum salmon, 18 pink salmon, and 2 sculpins. The day was a memorable success thanks to the efforts of many volunteers, educators, and community partners.



Photos from the Beach Seine with Schools event with Kendall Elementary School students. Photo credits: (Top and bottom left): Alexi Guddal, MRC member. (Top and bottom right): Dana Daniels, MRC staff.

COLUMBIA ELEMENTARY SCHOOL

72 students from Columbia Elementary School attended the Beach Seine with Schools program on May 12th. This group was the largest yet that the MRC has accommodated through this program. Upon arrival, the students heard from Lummi Tribal member Frank Lawrence III who spoke of the cultural importance of salmon and sang a traditional Lummi song for the students. Down at the beach, the LNR crew explained the various components of the seining net before setting the seine out. The beach seining yielded several fish for observation and measurement including juvenile chinook and chum salmon as well as shiner perch.



Photos from the Beach Seine with Schools event with Columbia Elementary School. Photo credits: Dana Daniels, MRC staff, Tyler Owens, volunteer, and Eleanor Hines, volunteer.

CORDATA ELEMENTARY SCHOOL

63 students from Cordata Elementary School attended the final Beach Seine with Schools program on May 22nd. The students heard from Jim and Sandra Bura from the Lummi and Nooksack tribes. Jim and Sandra spoke about fishing in Bellingham Bay and their experiences learning how to prepare salmon dinners with their families. May was particularly warm this year, and as a result, the sea surface temperatures along the shoreline were very warm, likely causing many of the juvenile salmon to swim out to deeper, cooler water. Because of this, several beach seining attempts had to be made, and the catch was quite minimal. After several seines, the LNR crew was able to bring in a few chum salmon, 1 hatchery coho salmon, and a few shiner perch for the students to observe.



Photos from the Beach Seine with Schools event with Cordata Elementary School. Photo credits: Dana Daniels, MRC staff and Kimberly Cauvel, NWIFC.

RESULTS / EVALUATIONS

To evaluate the effectiveness of the program in communicating its key learning objectives, brief pre and post program assessments were administered to participating students during the classroom visits.

These assessments included 3 questions in the following format:

1. What is the intertidal zone? (Circle one)
 - a. The place where big ships go
 - b. The shoreline between high tide and low tide
 - c. The deepest area of the ocean
 - d. I don't know
2. What animals use intertidal zones? (Circle all that apply)
 - a. Salmon
 - b. Frogs
 - c. Forage Fish
 - d. Great Blue Herons
 - e. I don't know
3. What is one action you could take to protect salmon? (Write in your answer)

The post assessments demonstrated significant gains in student learning following participation in the Beach Seine with Schools program. For Question 1, the percentage of students answering correctly increased from 47% on the pre-lesson survey to 88% on the post-lesson survey. Similarly, correct responses to Question 2 rose from 32% before the program to 80% afterward. Responses to Question 3 also reflected a stronger understanding of the program's key learning objectives. There was a noticeable decline in "I don't know" responses, accompanied by increased recognition of actions that support salmon habitat, including removing shoreline armoring, planting trees, reducing carbon emissions through biking or public transportation, picking up pet waste, and educating others about the importance of protecting salmon habitat. These findings suggest that the Beach Seine with Schools program was highly effective in increasing student knowledge and enhancing understanding of its key messages and learning objectives.

RESULTS / EVALUATIONS

In addition to the student assessments, a program evaluation form was sent to each of the teachers of participating classrooms. Responses could be ranked 1-5 with 5 being the most effective / impactful, and 1 being the least effective / impactful. The evaluation included the following questions:

- Please indicate how effective this program was in explaining the key messages to your students.
- How effective were the 3 activity stations run by the Salish Sea School in reinforcing the key messages?
- How useful were the pre and post lesson classroom visits?
- How would you score the project on its overall impact to the students?

All of the teachers rated the program highly, providing scores of 4 or 5 for each evaluation question. These ratings indicate that participants found the program to be very effective in meeting its educational objectives.

Teachers were also invited to provide feedback and recommendations for future improvements to the program. Suggestions included incorporating an additional interactive activity into the pre lesson and having volunteers meet students on the bus to review logistics before releasing them to Boulevard Park for lunch. The second recommendation was implemented after the first event to enhance the flow of the program.

Additional positive feedback provided by the teachers is shown in the “Project Highlights” section of this report. Overall, the teacher evaluations demonstrate that the program was highly successful in increasing student knowledge, strengthening understanding of key concepts, and effectively communicating its core educational messages and learning objectives.



Photo credit: Dana Daniels, MRC staff.

OUTCOMES

The goal of the Beach Seine with Schools project was to provide an opportunity for elementary school students to observe juvenile salmon using their intertidal habitat along the shoreline, allowing students to foster a deeper sense of connection to the local environment. In 2026, the Whatcom MRC provided this opportunity to 180 fourth grade students across Whatcom County. Results from pre and post program student assessments, along with teacher evaluations, demonstrated significant gains in student knowledge and understanding of salmon habitat, indicating that the program was highly effective in achieving its educational objectives and reinforcing its key learning messages.

OUTPUTS

In 2026:

- **3 Beach Seine with Schools events** took place
- **3 schools** participated in the program
- **180 students** participated
- **15 volunteers** participated
- Over **125 hours of volunteer time** were contributed
- Pre and post classroom lesson plans and evaluations were developed



Photo credit: Dana Daniels, MRC staff.

RESULTS IN CONTEXT

Since the program began in 2022:

- **15 Beach Seine with Schools events** have taken place
- **16 schools** have participated
- **800 students** have participated



Photo credit: Dana Daniels, MRC staff.

PROJECT HIGHLIGHTS

"This was a wonderful experience for our 4th graders. Many had never been down to the park and being able to see the fish (and other animals) in the water was really meaningful. Learning with real life experiences is so powerful."

- Adrya Dubel
Cordata Elementary School Teacher

"It was very meaningful to get North side students to the beach! I am absolutely going to try to do this field trip with Cordata 4th graders again next year. We loved it! Hearing from the tribal elders was also incredibly impactful."

- Shannon Phillips
Cordata Elementary School Teacher

"This was a great opportunity for our students, and we are grateful to have had the opportunity to participate this year!"

- Graham Essex
Cordata Elementary School Teacher

"Thank you so much for providing this opportunity to our students! We had such a great time."

- Sarah Brownell
Kendall Elementary School Teacher

PROJECT HIGHLIGHTS

Our fifth season of the Beach Seine with Schools project brought challenges and successes. Small refinements seemed to make the events more impactful and enjoyable to the students. These were the result of thoughtful ideas from a dedicated project team, many who have worked several years with this project.

We are very grateful for their contributions!

This year, we made several improvements to the student's field data sheet. Weather and tide data were eliminated to allow more space for drawing pictures of the specimens caught in the net. Use of the photo aquariums to display live fish was a particularly important feature of each field trip as they make close up viewing by the students possible.

The Salish Sea School provided excellent assistance again this year by providing educational activity stations for the half of the group not observing the beach seine. Dividing each day's total number of students into two groups makes the events more manageable and effective. This was apparent as we were able to effectively accommodate our largest group of 72 students this year.

The first event on April 14th presented particularly challenging weather with strong winds that threatened to topple the tents that were set out along the shoreline to keep students out of the rain. The unfavorable weather did not seem to dampen the excitement of the students viewing the fish caught in the seine.

One of my worries each year is that we won't catch any juvenile salmon in the beach seine. This almost happened at the May 22nd event. Because it was later in the season, warmer water along the shoreline meant that fish were already moving into deeper water. On this day, several beach seine attempts resulted in only a few shiner perch being caught! Fortunately, due to the resourcefulness of the Lummi seine field crew, they were able to capture a few chum and one hatchery coho in the seine made at a beach nearby. Fortunately, we have never failed to catch salmon at each Beach Seine with Schools event!

Tribal speakers always provide reflective comments during our events. Our first speaker on April 14th was Heather Jefferson who told the story of the Salmon Woman who would return to the river each year and the importance of caring for the waters and habitat of the salmon so they will survive and return.

Frank Lawrence III provided some thoughtful memories of his childhood fishing with his relatives and concluded with "If you have a good heart, good things will happen. Be the best you can be. Make the world a better place!"

- Mike MacKay
Project Lead

LESSONS LEARNED

While the MRC hopes to expand this program to reach more students, several factors currently limit participation. A primary constraint is the availability of the beach seining crew from LNR, whose staff are heavily committed during peak salmon outmigration season. Because LNR's capacity currently allows for only three field events each year, the number of schools that can participate is also limited.

In addition, managing large groups of students in an outdoor learning environment while maintaining educational quality presents logistical challenges. Partnership with the Salish Sea School has helped address this challenge by expanding the program's capacity by incorporating additional activity stations into the field day. These stations, along with volunteer support, allowed participants to be divided into smaller groups, improving student engagement, supervision, and overall learning experience. Even with this partnership, the MRC has found that about 70 students per event is the maximum number that can be effectively supported while ensuring meaningful engagement and achieving learning objectives.

Another enhancement made this year was simplifying the data sheet to provide students with more space for drawings and field observations. We also supplied each group with laminated species identification guides, making it easier for students to recognize the key characteristics of the different salmon species. In addition, the approximately 30 students participating on the beach were divided into three smaller groups, each supported by dedicated volunteers and educators. This structure gave students more opportunities to closely observe the catch, ask questions, and engage directly with the field crew, resulting in a more interactive and meaningful learning experience.

LESSONS LEARNED AND NEXT STEPS

Following the first event in 2026, the project team met to identify opportunities to better support teachers and volunteers during field events.

The MRC developed volunteer guides outlining roles and responsibilities before and during each event. The MRC also created a checklist for event leads to review with classroom teachers and students on the bus, ensuring everyone understood expectations and logistics before arriving on site.

These additions provided greater structure and clarity for volunteers, teachers, and event staff, helping the events run more smoothly and efficiently. These guides and checklists are shown in Appendix F.

In 2027, the MRC will continue the Beach Seine with Schools program, building on lessons learned and implementing ongoing improvements to maximize the educational impact and overall experience for students, teachers, and volunteers.

APPENDICES

- **Appendix A:** Volunteer List
- **Appendix B:** List of Schools Contacted, Classroom Invitations, Blank Application, and Application Responses
- **Appendix C:** Classroom Curriculum
- **Appendix D:** Beach Seining Protocols
- **Appendix E:** Teacher and Student Evaluations
- **Appendix F:** Volunteer Guide and Event Checklist