Whatcom Marine Resources Committee (MRC) 2025 Beach Seine with Schools Final Report

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Whatcom County Public Works—Natural Resources

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Abstract

In 2022, the Whatcom County Marine Resources Committee (MRC) piloted a new project titled "Beach Seine with Schools". This project provides elementary students with an opportunity to observe the importance of intertidal habitats to juvenile salmon and forage fish, fostering a deeper sense of connection to our shorelines. The Whatcom MRC strives to connect local communities with the marine environment to cultivate a sense of stewardship and to spark interest in marine science and conservation careers and opportunities. This program provides elementary students with an immersive outdoor learning experience to achieve these goals.

Due to the success and demand of this program in its initial years, the project has continued annually through 2025. The program includes pre and post classroom visits by MRC members and the field trip to Boulevard Park in Bellingham where students are able to observe the beach seining process, learn how to collect observational data, and hear from a Tribal Elder or marine scientist about the cultural and ecological importance of salmon.

In 2025, the MRC conducted 3 beach seining events with 4 schools including Harmony Elementary School, Alderwood Elementary School, Acme Elementary School, and Carl Cozier Elementary School. Across the 3 events, 170 total elementary students participated and over 115 volunteer hours were contributed. This year, the MRC also partnered with the Salish Sea School to run activity stations to supplement the beach seine, allowing for smaller learning groups to improve student engagement.

While the MRC would like to expand this program in the future so that more students can participate, some limitations include availability of the field crew with the appropriate seining permits and expertise and having enough volunteers and staff at the field events to ensure each student is properly supported in an outdoor learning environment. Now that the program has been running for 4 years, we have also had teachers who have participated in the past wanting to participate again, but due to the limitations mentioned above, we haven't yet been able to accommodate these requests. In coming years, the MRC will continue to provide this opportunity to as many 4th graders throughout Whatcom County as possible.

Project Goals

The goal of this project was for student and adult participants to develop awareness and appreciation of the importance of the intertidal zone for migrating juvenile salmon and other marine species through observations of the beach seining process. Through this experience, the MRC attempted to connect students with the marine environment to cultivate stewardship of our shorelines and to spark interest in marine science and conservation careers and opportunities.

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

Students from Carl Cozier Elementary School observe a beach seine and catch with the seining crew and volunteers. Photo credits: Dana Flerchinger, MRC staff (left) and Kimberly Cauvel, NWIFC (right).

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.

Partners/Organizations

- **Lummi Natural Resources (LNR):** Provided field biologists, expertise, and the permits and gear necessary to conduct the beach seining.
- **The Salish Sea School (TSSS):** Provided staff and resources to facilitate additional activity stations at each at the field trip events.
- **Northwest Straits Foundation (NWSF):** Provided staff to assist with the field events and provided compensation to Tribal speakers.
- **RE Sources:** Provided staff assistance.
- **Whatcom County Public Works (WCPW):** Provided staff assistance.

Left: The volunteer and staff crew at the April 22nd beach seine event. Photo credit: Dana Flerchinger, MRC staff. Right: Lummi Natural Resources seining crew. Photo credit: Kimberly Cauvel, NWIFC.

Participants

April 22nd: Harmony Elementary School

- 53 students (2 classes)
- Staff and volunteers included: TSSS staff and volunteers (5), NWSF staff (2), MRC staff (1), MRC members (4), RE Sources staff (1), LNR biologists (2).
- Tribal speakers: Jim and Sandra Bura, Nooksack Indian Tribe

Photo credit: Dana Flerchinger, MRC staff

May 6th: Carl Cozier Elementary School

- 47 students (2 classes)
- TSSS staff and volunteers (4), NWSF staff (1), MRC staff (1), MRC members (2), LNR biologists (2), WCPW staff (2).
- Tribal Speaker: Althea Wilson, Lummi Nation

Photo credit: Kimberly Cauvel, NWIFC

May 20th: Acme Elementary School and Alderwood Elementary School

- 70 students (3 classes)
- Staff and volunteers included: TSSS staff and volunteers (4), MRC staff (1), MRC members (4) and former MRC member (1), LNR biologists (2), community volunteer (1).
- Speaker: Frank Lawrence III, LNR Director

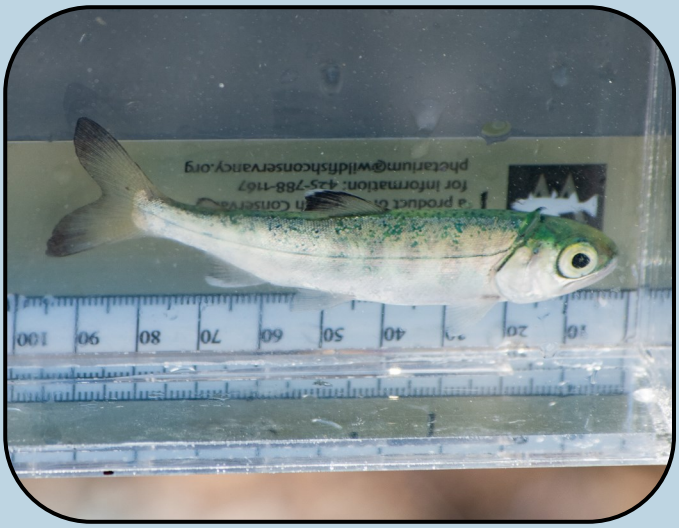
Photo credit: Dana Flerchinger, MRC Staff

170 total fourth grade students participated in 2025!

Communities Involved

The target audience of this program was fourth grade students from schools throughout Whatcom County. Fourth graders were chosen as the target audience because students of this age group are able to comprehend the importance of intertidal habitat to salmon. When fourth grade students observe live fish being caught from the intertidal, they are enthusiastic and curious, and can also become supportive of actions that protect shorelines and enhance salmon habitat.

Most of the participating fourth grade classrooms previously participated in the Nooksack Salmon Enhancement Association's Students for Salmon Program, in which the students raise salmon from eggs to fry in their classroom before releasing them into local waterways. This experience introduces students to salmon life cycles, outlines the importance of healthy watersheds, and emphasizes the role that humans play in salmon recovery. The Beach Seine with Schools project builds off of this experience, accentuating the importance of intertidal habitats to juvenile salmon (that the students may have raised and released themselves), while also highlighting the roles that the Tribes and other local organizations play in salmon recovery.



Left: Juvenile coho salmon. Photo credit: Kimberly Cauvel, NWIFC. Right: Students observe a juvenile salmonid being measured by a biologist with LNR. Photo credit: Dana Flerchinger, MRC staff.

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.

Beach used for seining at Boulevard Park, Bellingham. Source: Google Maps.

In late January, invitations and applications to participate were emailed to 4th grade educators throughout Whatcom County including Bellingham, Meridian, Lynden, Ferndale, Mt. Baker, and Nooksack Valley School Districts as well as Lummi Nation School (See Appendix A). Due to limited staff and volunteer capacity, the program could only be offered to 4 schools with classrooms of 20–30 students each, as not to exceed 70 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, a 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. The classroom curriculum and data forms are included as Appendices B and 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) (See Appendix D). All catch data was shared with both agencies at the end of the project period. 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 staff conducting a beach seine. Photo credit: Dana Flerchinger, MRC staff.

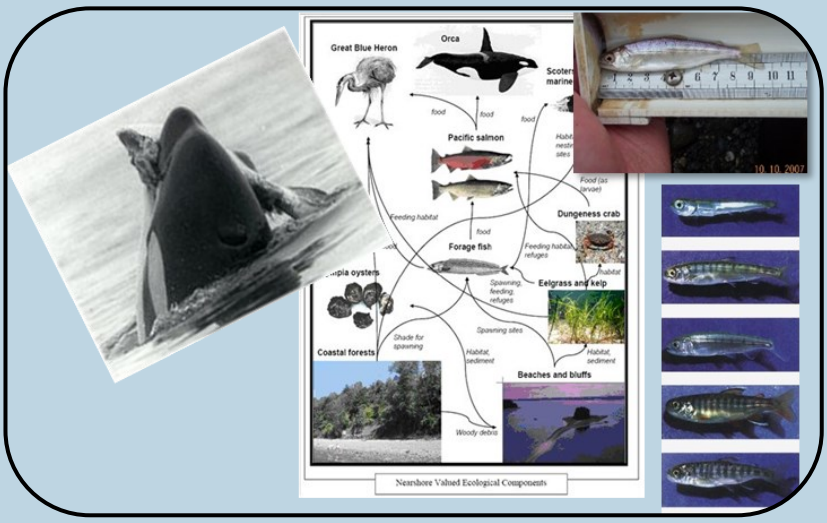
Each field event was preceded by a short talk by a Tribal Elder or marine scientist who discussed the ecological and cultural importance of salmon. Topics shared included fishing through family generations, the importance of appreciating and protecting natural resources, career opportunities in the biological 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.

Lummi Nation member, Althea Wilson, speaking to Carl Cozier Elementary students about the importance of protecting our local waters to support salmon populations. Photo credit: Kimberly Cauvel, NWIFC.

Project Methods

Key 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 assess the efficacy of this program in communicating these takeaway messages, evaluations were sent to the participating teachers following the program. These evaluations are included as Appendix E.

Summary of Project Activities

Project Activity	Date	Location
Project Kickoff Meeting	1/07/2025	Virtual
Invitations Sent to Schools	1/30/2025	Virtual
Applications Reviewed and Schools Selected	2/25/2025	Virtual
Harmony Elementary School Pre-Lesson	4/21/2025	Harmony Elementary
Harmony Elementary School Field Event	4/22/2025	Boulevard Park
Harmony Elementary School Post-Lesson	4/23/2025	Harmony Elementary
Carl Cozier Elementary School Pre-Lessons	5/05/2025	Carl Cozier Elementary
Carl Cozier Elementary School Field Event	5/06/2025	Boulevard Park
Carl Cozier Elementary School Post-Lessons	5/07/2025	Carl Cozier Elementary
Acme Elementary School Pre-Lesson	5/19/2025	Acme Elementary
Alderwood Elementary School Pre–Lessons	5/19/2025	Alderwood Elementary
Acme and Alderwood Elementary School Field Event	5/20/2025	Boulevard Park
Acme Elementary School Post-Lesson	5/21/2025	Acme Elementary
Alderwood Elementary School Post-Lessons	5/21/2025	Alderwood Elementary
Project Wrap-Up Meeting and Evaluation for Next Year	6/18/2025	Virtual

Table 1: Overview of major project activities that occurred during 2025.

Detailed summaries of each of the 3 field events are outlined on the following pages.

Harmony Elementary School: April 22nd, 2025

Our first field event took place with 53 students from Harmony Elementary School. After finishing their lunches, the students heard from Jim and Sandra Bura with the Nooksack Tribe. Jim spoke of how he worked with the Lummi Tribe to capture juvenile salmon in the upper reaches of the Nooksack River in attempt to recover an endangered chinook population that has been very successful in recent years. Lummi Natural Resources (LNR) field crews set out the net along the beach. There was a light west wind that caused some wave action. The catch was very abundant, containing 938 chum, 1 chinook (tagged), 1 coho (tagged), and 1 shiner perch. The fish were distributed into tubs and dispersed among the groups of students, who were delighted to see so many fish. Some of the juvenile salmon were placed into photo-aquariums so the students could better observe the fish up close. While the field crew was preparing to count the catch, the students drew pictures of the fish, comparing the features to provided identification guides. As the fish were identified and measured, the students filled out their datasheets. Because of the large group size, half the kids participated in activity stations run by the Salish Sea School and midway through the seining, they switched groups so that all of the students got the chance observe the beach seine.

Left: Students gather around to view the catch from the beach seine. Right: Nooksack Tribal members, Jim and Sandra Bura, talk with students from Harmony Elementary. Photo credits: Dana Flerchinger, MRC staff.

Many project partners and volunteers contributed to making this a successful event. LNR was essential in providing the seining crew. Our Nooksack speakers, Jim and Sandra Bura, were also very inspiring. The Salish Sea School provided educational activities to supplement the beach seine, and the Northwest Straits Foundation staff helped students record the data. Volunteer chaperones assisted in keeping students focused, and the bus drivers were key in transporting the students to and from the field event. The MRC provided key staff and volunteers and financial assistance for school transportation. We are grateful to all of the folks who made the event possible!

Carl Cozier Elementary School: May 6th, 2025

Our second Beach Seine event with 47 fourth grader students from Carl Cozier was a great success! After the students arrived at the Boulevard Park Pavilion, they were introduced to Lummi Nation member, Althea Wilson. Althea was a graduate of the Northwest Indian College who studied environmental science. She discussed the importance of connecting our experiences with places familiar to us, speaking about the places across Bellingham Bay and the San Juan Islands where her ancestors lived, following the migration route of the salmon. After her talk, half the students went to the beach to observe the beach seine while the other group participated in activity stations run by the Salish Sea School.

Left: Students observe a juvenile salmon being measured. Photo credit: Dana Flerchinger, MRC staff. Right: An LNR biologist points out identifying characteristics on a juvenile salmon. Photo credit: Kimberly Cauvel, NWIFC.

The first seine was set by the Lummi Natural Resources biologists, Don and Devin. The first catch contained 5 juvenile chum salmon and 1 shiner perch. The second seine set was made in the opposite direction towards the mouth of the Nooksack River. The resulting catch was much more abundant and varied, containing 2 juvenile chum, 9 chinook, 2 coho, and 1 shiner perch. Two of the chinook and all of the coho were wild (not of hatchery origin). These were distributed among the three clear totes containing seawater for all to see. The seine crew then demonstrated how each fish was measured and examined for a hatchery tag. This catch provided an excellent opportunity for the students to identify the different salmonid species and determine if they were of hatchery or wild origin. The third and final seine set was also deployed to the north and resulted in our largest catch of 9 chum, 9 chinook, 2 coho, and 2 shiner perch. The biologists described the key characteristics to distinguish each species and called out lengths for the students to record on their field forms.

Alderwood and Acme Elementary Schools: May 20th, 2025

Our third and final Beach Seine event was our largest group of the year, with 70 fourth graders from Alderwood and Acme Elementary Schools. After lunch, the students listened quietly as Frank Lawrence III was introduced. Frank is the Deputy Director of the Lummi Natural Resources Department (LNR), who is supporting this project by providing the field staff for the beach seine. Frank spoke of his appreciation of his fishing experiences throughout his life and discussed the salmon life cycle, emphasizing that their journey is full of struggles and hardships. He encouraged the students to follow their hearts and described several potential occupations that could contribute to protecting and restoring the environment. Frank concluded by expressing gratitude for what the salmon and the water and the other animals provide for our growth. He encouraged the kids to reflect on their experience by writing a story, poem, or song. Before ending, Frank sang one of his family songs.

Students observe the catch from the beach seine. Photo credits: Dana Flerchinger, MRC staff.

The LNR crew, Devon and Jared, set out the net at noon. On the first set, we caught 7 juvenile chinook, 1 coho, and 1 chum. Six of the chinook were clipped, indicating they were from the hatchery. The coho and chum were native origin. The diverse catch provided an excellent opportunity for the kids to examine specimens in the photo aquariums and compare them to identification guides. The seine crew demonstrated how each fish was identified using key characteristics, and showed the students showed how to measure each fish. The students switched activities. In the second seine set we caught 2 chinook, 4 chum and an unidentified larval forage fish (perhaps a surf smelt). The catch was distributed between the three clear totes positioned in front of groups of students. Individual specimens of each size were placed in clear photo-aquariums that were rotated between the three groups of kids. We would like to thank the many folks who supported this project including the Whatcom MRC, the Lummi Nation's Natural Resources Department, Lummi speaker, Frank Lawerence III, the Salish Sea School, the Northwest Straits Foundation, and the Alderwood and Acme teachers, parent chaperones, and bus driver.

Results

In 2025, the MRC conducted 3 Beach Seine with Schools events with 4 schools including Harmony Elementary School, Carl Cozier Elementary School, Alderwood Elementary School, and Acme Elementary School.

Outcomes

The goal of this 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 2025, the Whatcom MRC was able to provide this opportunity to 170 fourth grade students throughout Whatcom County.

Outputs

In 2025:

- 3 Beach Seine with Schools events took place
- 4 schools participated in the program
- 170 total students participated
- 10 volunteers participated in the events
- Over 115 hours of volunteer time were contributed
- Pre and post classroom lesson plans were developed
- 4 Tribal speakers spoke at the events

Since the program started in 2022:

- 12 Beach Seine with Schools events have taken place
- 13 total schools have participated in the program
- 620 total students have participated

Photo credits: Dana Flerchinger, MRC Staff

Project Highlights from Participating Teachers

"The pre lesson was the perfect review for my students after doing the Students for Salmon NSEA program in the fall. I think they already had a good understanding of salmon life cycle and impacts on food web, so the intertidal, beach seine, and estuary learning was beneficial to preview before the field trip. The field trip experiences were GREAT! The data collection was a little inconsistent between groups, but it didn't hinder student understanding or experience necessarily. Overall, I would absolutely recommend this to other 4th grade classes. Alex did a fabulous post lesson as well - the kids loved the bingo game! Thank you for hosting us!

- Bethany Arnason, Harmony Elementary School Teacher

"This is such a valuable program. I cannot think of any critiques. The only recommendations I can think of is if someone could compile some reliable digital resources that align with the key messages. That way we can continue to deepen our knowledge back in the classroom. I hope you get the funding you deserve!"

-Doss Herndon, Carl Cozier Elementary School Teacher

"This was an extremely well organized program! Thank you so much!"

- Emily Jones, Carl Cozier Elementary School Teacher

"This field trip was a lot of fun for our students. I loved that they got the chance to be outside all day, had time to play, and had interactive learning experiences. Alex also did a great job with the classroom visits. Students had a solid understanding of the learning before they went on the field trip. Thank you!"

- Emily Cashmere, Alderwood Elementary School Teacher

"Great connection to the NSEA program that 4th grade participates in, very meaningful connection to see the hatchery and wild fish along the shore. The children were engaged and had fun; I really appreciate that you have created this program, would love to do it again."

- Paul Spring, Acme Elementary School Teacher

Project Highlights from MRC Project Lead, Mike MacKay

This was the fourth year of the MRC's Beach Seine with Kids program at Boulevard Park in Bellingham. In all, 170 fourth grade students participated. This year, we included some schools in Eastern Whatcom County. All together, four schools were represented including Acme Elementary School, Harmony School near Deming, and Bellingham's Carl Cozier and Alderwood Schools. Three beach seine events were held on 4/22, 5/6, and 5/20. As in past years, MRC members met with classrooms before and following each field trip to share about the salmon life history, answer any questions from the students, and prepare the classes for each field trip.

The Lummi Nation's Natural Resources Department once again generously provided the field crews for conducting the beach seine sampling at each event. They demonstrated the use of the net and showed how to identify and record each fish in the catch. This year was noteworthy in the interactions between the seine crews and the students as they tried to identify the juvenile salmon by comparing scientific drawings they saw in class with those fish that were shown to them in small photo aquariums. Our seine catch this year was the most diverse and abundant yet. At each of the three events, we were fortunate enough to catch and observe at least two species of juvenile salmon. In total, we caught and released 19 chinook, 959 chum, and 6 coho.

Our Tribal Speakers also reflected a diverse group. The speakers at our first event were Nooksack Tribal members Jim and Sandra Bura who spoke of the importance of salmon as a food source for both people and orcas. Jim spoke of a captive brood project he participated in with the Lummi Tribe that resulted in the restoration of a native chinook stock in the Nooksack River. Althea Wilson was our second speaker with the Lummi Nation. She spoke of the importance of connecting our experiences with places such as Bellingham Bay and the San Juan islands that were where her ancestors fished. That is why her tribe is known as the "salmon people". Our final Lummi speaker was Frank Lawrence III who spoke of his fond memories fishing with his relatives. He also spoke of the salmon life history and how the life of a salmon is full of struggles and hardships. He explained this was similar to the struggle of young people growing up, attending school, and finding a career.

Perhaps most memorable part for the students was the realization that young salmon are migrating along this shoreline, but are not visible from the surface. For those kids and adults who attended, they will forever be reminded that these fish are present, even if at most times they are invisible.

Project Highlights from MRC Project Lead, Mike MacKay

As in past years, many participants helped us to make these events a success. The Tribal speakers and the Lummi seine crews were key players in this project. Staff with the Salish Sea School were also instrumental in keeping the students that were not observing the beach seine entertained with educational activity stations. The Northwest Straits Foundation (NWSF) also generously provided gifts for the Tribal speakers.

One future goal might be to extend this project to schools in the north county like Lynden, Everson, and Blaine school districts. This could result in a location change to a marine shoreline closer than Bellingham's Boulevard Park. The advantage of this would be a shorter bus ride if it was located at, for example, Birch Bay State Park or the Gulf Road beach at Cherry Pt. A major risk with this approach is the uncertainty of the seine site to produce good juvenile salmon catches and unknown factors like the best tidal elevation to conduct the seining.

One of my favorite aspects of this project is how it showcases the Tribe's role in protecting fish habitat and recovering endangered salmon populations.

Lessons Learned and Next Steps

At the end of the project period, the MRC Beach Seine with Schools planning team met to discuss the program and how to proceed going forward. While the MRC would like to expand this program in the future so that more students can participate, some limitations include regular access to a beach seining crew and making sure each student is properly supported in an outdoor learning environment. The overall number of field trip events is highly dependent on the availability of the seining crew with LNR. Because we are currently only able to conduct 3 events per year based on LNR's staff capacity, this also limits the amount of schools that can participate in the program. Realistically, the MRC cannot offer this experience to more than 70 students per event as it becomes quite chaotic to manage this volume of students in an outdoor learning environment while still meeting our educational objectives.

The planning team also discussed the success of partnering with the Salish Sea School to integrate additional activity stations into the field day. These activities provided a small, interactive learning environment so that students were better supported. One of the biggest challenges for this program is allowing as many fourth grade students the opportunity to attend these events, while also ensuring that each student is supported in an outdoor learning environment. With the additional activity stations and volunteer help, we were able to split the participants into smaller groups to improve student engagement.

Another change we made this year was simplifying the datasheet to allow more space for drawings and observations. We also provided laminated identification guides to each group so students could more easily identify the key defining characteristics of each of the salmon species. Lastly, we divided the students on the beach (usually around 30 students total) into 3 smaller groups with assigned volunteers and educators, allowing them to better observe the catch, ask questions, and interact with the field crew. One challenge that was identified was communication with the LNR crew prior to the events. We are hoping for earlier communication to set up a clear game plan for each of the field events prior to the day of.

Appendices

- **Appendix A:** List of Schools Contacted, Classroom Invitations, Blank Application, and Application Responses
- **Appendix B**: Pre and Post Lesson Materials
- **Appendix C:** Field Data Sheet
- **Appendix D:** Beach Seining Protocols
- **Appendix E:** Program Evaluations