Watersheds and Salmon, Student-driven habitat restoration projects; increasing engagement and place-based learning through community partnerships

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NSEA educates, inspires and engages the community to take action to keep wild salmon here for future generations.

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The Students for Salmon program is an established, multi-stage watershed education program, which includes learning both outdoors and in the classroom. This program is available to fourth grade classrooms in public, private, tribal and alternative schools throughout Whatcom County at no cost. Students realize the value of their actions, both individual and collective, on the impact of local and global environmental issues. The program consists of three components, which build on each other to encourage lasting awareness and stewardship.
Introductory Presentation

Students begin the program by taking a pre-test to assess initial knowledge, and are introduced to the NSEA Educator who will remain with their class for the duration of the program.

Students explore the importance of salmon, and learn the impact habitat health and degradation has on salmon survival.
Introductory Presentation

Additionally, students are introduced to the five species of Pacific salmon, and their life cycle, along with the threats they face.

Through an interactive, engaging activity, students identify threats at each stage of the life cycle and discover what human and natural processes can lead to increased mortality.
Outdoor Exploration

Field Trip

Students walk or bus to a nearby salmon-bearing stream in their school’s watershed and transform into “stream scientists.”

Field locations are selected based on close proximity to school grounds, accentuating student experiences in a local context.

A majority of the students are able to walk to field locations, which connects them to their watershed, encourages healthy activity into their school day, reduces the carbon footprint and alleviates the complications and expense of bus transportation.
Outdoor Exploration Field Trip

Students participate in place-based, scientific exploration of a local stream and through observation and critical thinking, build environmental literacy by conducting investigations and collecting data, all of which is recorded in scientific field journals.

Field activities connect students to watersheds and the vital link between healthy habitats and salmon populations through three specific stations, which serve as hands-on laboratories:

- Water Quality
- Macroinvertebrates
- Native Plants
Outdoor Exploration
Field Trip

Water Quality Macroinvertebrates Native Plants

Using scientific equipment, including goggles, thermometers, turbidity tubes and reactants, students test a water sample from the stream and collect real data that will later be shared by NSEA and publicly via the EarthEcho platform.

Students learn the relationship between temperature and dissolved oxygen, turbidity and riparian vegetation and how human impacts can affect their results.
Outdoor Exploration
Field Trip

Water Quality  Macroinvertebrates  Native Plants

Using a dichotomous key, students identify and classify macroinvertebrates collected from the stream. They use a pollution tolerance index to determine the water quality of the stream based on their sample and discover that indicator species are a way to assess stream health. Art is incorporated into science, as students get to draw and label the macroinvertebrate they collected from the sample.
Outdoor Exploration
Field Trip

Water Quality  Macroinvertebrates  Native Plants

Students take ownership of learning about one specific plant, whether native or invasive, and delve into the cultural and ecological significance of the plant. While presenting their gathered information and taking notes on their peers’ presentations in their field science journal, students learn that a high diversity of native plants leads to a healthy riparian area, thereby benefitting salmon populations.
Outdoor Exploration
Field Trip

Students finish the field trip by connecting the morning academic components with an environmental stewardship project. Students take direct action to restore the critical salmon habitat of their focal stream.

They get hands-on experience with habitat restoration and build an ethic of responsible stewardship for our shared environment. This helps students understand they have control over the outcome of environmental issues and are able to appreciate the value of their actions.
This is the last component of the program, where students reflect with NSEA staff. One focus is on their ability to become scientists as a career path. This is accentuated through a video, featuring local professionals in science careers, shown to all students. You can watch the video by clicking on this link.

As a result of this, students continue to reach over 90% recognition of science careers as an attainable pathway.
Students also discuss the variety of ways humans impact salmon, whether helpful or hurtful. By presenting their response to their peers, this activity prompts student discourse. Following a post-test assessment, students further their motivation for continued stewardship through a pledge ceremony. Each student completes a “Salmon Pledge” where they commit to adopting one action in their daily lives to help salmon.
Factors for Consistent Delivery

The Students for Salmon Program relies on a variety of factors to ensure consistent, quality delivery of the program to fourth graders throughout Whatcom County. Success of the program depends on factors such as:

- Funding
- Staffing
- Location
- Tools and Materials
- Promotion and Outreach
Students for Salmon is funded primarily through grants, ranging from federal and state government grants to local foundations and businesses.

These funding sources cover program fees, supplies and transportation for students who are unable to walk to their field trip location.

Providing this program at no cost to fourth grade teachers allows us to reach underserved communities that would otherwise lack access for this important experiential learning opportunity.
Upon securing funding, NSEA staff provide program oversight, including identifying field trip locations, coordinating scheduling with teachers and partnering with Washington Service Corps to onboard Environmental Education Associates. These Associates are the face of the program, and communicate with teachers to arrange program details while leading classroom and field components.

They also supervise program interns, typically recruited from local institutions, who help lead field trip and classroom experiences while gaining real-world, practical environmental education experience.
NSEA doesn’t own land that students can continually visit to complete the stewardship component, so we rely on a variety of collaborative partnerships with local municipalities, private landowners, and community-based organizations. Partners identify restoration priorities and work with NSEA to ensure shared goals of healthy habitat and water quality.

Through these lasting collaborations, students see how community partnerships result in cooperative action in a local context.
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Through the 20 years of program delivery, we have streamlined the supplies and materials necessary for consistent program delivery.

Utilizing an on-site plant nursery ensures we have enough plants to use for stewardship projects.

Maintaining tools that are shared with other programs further enhances collective action to support salmon recovery efforts.
Communication with teachers is imperative to continued enrollment on an annual basis. E-newsletters are sent quarterly to fourth grade teachers to encourage early enrollment and facilitate scheduling of classroom and field experiences.

Additionally, sharing student success stories and program metrics to the community promotes increased student and teacher investment and engagement, and promotes continued stewardship efforts beyond our program.
Adapting to Virtual Learning

To support teachers and parents/guardians while students are adjusting to virtual learning, we converted the three components of the Students for Salmon program to an online learning format. Here, students can still complete the program by taking the pre-test, watching a series of videos, and taking the post-test.

The videos focus on the importance of salmon, their life cycle and threats they face, along with a walk-through of water quality testing and macroinvertebrate sampling, followed by a conclusion focused on actions students can take to help salmon.

For more information, or to become a Student for Salmon yourself, click here.
Program Highlights

Through 20 years of program delivery, Students for Salmon has reached thousands of students and helped foster an environmentally aware community of students.

In 2019, we reached 97% of fourth grade classrooms throughout Whatcom County, and students demonstrated over 90% in both increased environmental literacy, and knowledge of science as a potential career.

Through a variety of partnerships and established relationships with teachers, we continue to reinforce the idea that students, our next generation of environmental leaders, have the ability to take action to keep wild salmon here for future generations.
Thank You!

For more information, please visit our [website](#) or reach out via email.

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