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## Skagit County Public Works Intern

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# COLLEGE OF THE ENVIRONMENT



**Internship Title:** Skagit County Natural Resources Internship Report

**Organization Worked For:** Skagit County Public Works, Natural Resources Div.

**Student Name:** Cynthia Elston

**Internship Dates:** 9/21/22 6/15/23

**Faculty Advisor Name** Angela Strecker

**Department** ESCI



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**STUDENT SIGNATURE** Cynthia Elston

**DATE:** 6/6/23

SKAGIT COUNTY NATURAL RESOURCES INTERNSHIP REPORT

Cynthia Elston

ENVS 498B - Internship

Western Washington University

Fall 2022, Winter 2023 & Spring 2023

## Introduction

Skagit County Natural Resources Division is a county-level government organization that primarily focuses on drainage, water quality, weed management, and habitat restoration within Skagit County. As a public entity, its goal is to protect and enhance the natural resources of the region. I chose to intern with this organization to gain exposure to various programs and determine my specific interests within the field of environmental science. I also wanted to gain firsthand experience in working for a local government.

During my internship with Skagit County, I had the opportunity to participate in various programs contributing to the organization's mission of protecting and enhancing the natural resources in the county. The following paragraphs provide an overview of my involvement and contributions in each program.

## Skagit Marine Resources Committee

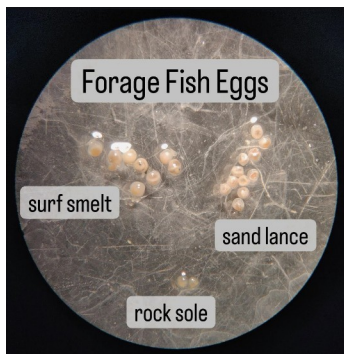
One program I worked with extensively was the Skagit Marine Resources Committee (Skagit MRC). Through my prior involvement in the previous year's Fidalgo Bay Day, which took place on August 20, 2022, I gained valuable experience in event promotion, supply tracking, and booth management (Figure 1).

I had the privilege of actively contributing to the planning and execution of this year's Fidalgo Bay Day, scheduled for August 26, 2023, where I had the honor of co-leading the project. These responsibilities included providing regular updates during meetings, scheduling future meetings, managing volunteers, and delegating tasks to ensure the smooth execution of the event. Through this leadership position, I honed my communication and organizational skills, while also fostering teamwork and collaboration among the volunteers involved in the project.



**Figure 1.** Photo of me hosting the Skagit Marine Resources Committee booth at Fidalgo Bay Day. Picture taken by Kathy Shupe.

In addition to my involvement with Fidalgo Bay Day, I also participated in forage fish beach surveys and trainings (Figure 2), learning to collect samples and identify species of forage fish eggs. I also played a role in creating website content and calendar material for Skagit MRC. In addition, I had the opportunity to create project reports and materials for NOAA grant applications, where I synthesized information. This experience allowed me to develop a deep



understanding of the grant application process, including the importance of clear and concise project descriptions, comprehensive budgets, and compelling justifications for funding. It was a valuable experience that provided me with insights into the strategic planning necessary to secure financial support for important initiatives related to marine resource conservation.

**Figure 2.** Surf smelt, rock sole, and sand lance forage fish eggs labeled respectively. Photo taken by Cindy Elston.

Overall, my experience with the Skagit Marine Resources Committee provided me with a comprehensive understanding of event planning, community engagement, and data collection in the context of marine resource conservations. These diverse responsibilities enhanced my understanding of the multifaceted nature of marine resource management and conservation efforts, while also equipping me with valuable skills in research, data analysis, and effective communication.

### Habitat & Restoration

During my internship, I shadowed a project on the South Fork of the Skagit River, which added 5.3 acres of wetland habitat for salmon (Figure 3). As part of this project, I attended check-in meetings with contractors during the construction phase to ensure that restoration activities were progressing as planned. To showcase the project, I assembled a short video using drone footage, which was shared on social media platforms (<https://vimeo.com/768752183>).



**Figure 3.** Restoration Project on the South Fork of the Skagit River. Main channel width to-scale photo taken by Emily Derenne (left). Total project area photo taken by Rob Burrows (right).

I also joined our habitat restoration specialist during on-site visits with landowners, where we discussed various programs such as the Natural Resource Stewardship Program (NRSP) and the Voluntary Stewardship Program (VSP) as potential funding for restoration projects on their properties. These experiences showed me the importance of building relationships with landowners and engaging them in conservation efforts.

One of the highlights of my experience was participating in fish removal activities with Skagit Fisheries Enhancement Group (SFEG), where I utilized hand and seine nets to catch and identify various juvenile salmon species, including chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), and cutthroat trout (*Oncorhynchus clarkii*). This hands-on involvement deepened my understanding of the local fish populations and their habitats.



**Figure 4.** Photo of me with a salmonid. Photo taken by Erin Matthews.

During my internship, I participated in a training session about native lamprey species in western Washington, including the Pacific and Western Brook lampreys. The training equipped me with skills for conducting lamprey surveys and assessments. Using an electrofisher backpack and hand nets, we captured lampreys, allowing us to handle them, measure them, and identify different species.

As part of the habitat restoration efforts, I removed plastic tubes, zip ties, and stakes from young plants at restoration sites. I also helped plant native trees and shrubs to restore wetlands and disturbed sites (Figure 5). These hands-on activities allowed me to gain practical knowledge and appreciate the time and labor required for habitat restoration.



**Figure 5.** Natural Resource Division employees fostering teamwork through a collaborative planting day. Photographer unknown.

Lastly, I also actively participated in various other aspects of habitat restoration. I created postcards for community meetings and attended planning and stakeholder engagement meetings. During SRF (Salmon Recovery Funding) site visits, I took the responsibility of driving the van, ensuring smooth transportation to and from the sites. Utilizing Geographic Information System (GIS) technology, I created maps of restoration sites, helping to visualize project areas for grant applications. Additionally, I contributed to organizing and digitizing project records by sorting through old files and scanning important documents, ensuring easy access to valuable information for future reference. I checked budgets, entered data into a database, and created flier summaries for habitat restoration projects. I also maintained the County's native plant nursery, which required regular weeding, watering, and planting.

Overall, these experiences gave me a more holistic view of ecological restoration, species conservation, and the critical role of public engagement in achieving sustainable environmental outcomes. Through hands-on activities, field visits, and administrative tasks, I deepened my understanding of the complexities involved in ecosystem restoration projects and developed skills in data management, communication, and collaborative problem-solving.

### Lake Management Districts

During my internship, I had the opportunity to gain hands-on experience in grant writing by assisting in the preparation of a grant application for a study focused on Lakes Erie and Campbell. This involved working closely with the team to compile relevant research and historical data to provide a comprehensive context for the study. Additionally, I was responsible for obtaining cost estimates from various contractors and researching potential solutions. Networking played a crucial role in this project, as I connected with individuals who had previously received the grant or completed similar studies. Their insights and experiences provided valuable guidance in crafting a strong application.



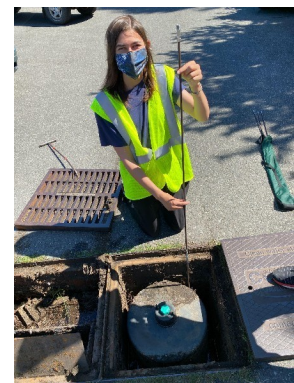
In addition to my involvement in the grant application process, I also contributed to the operational aspects of the Lake Management Districts. This included assisting with the preparation of names and addresses using Excel, as well as preparing the ballots and envelopes. Furthermore, I learned to operate and trained my coworkers on using a folding paper machine, streamlining the ballot preparation process for future projects. These experiences enhanced my administrative skills and provided insight into the operational aspects of managing lake resources through these programs.

### Stormwater

Within the stormwater program, I played a role in developing outreach materials, including an educational video on stormwater management, which was promoted via Skagit 21 TV and social media (<https://www.youtube.com/watch?v=wrsu4yAAL9s>). I also conducted stormwater inspections to ensure compliance with regulations and performed infiltration tests on permeable pavement to assess its effectiveness. Additionally, I contributed to data gathering through GIS analysis, document scanning, and created visual content for social media platforms.

In addition, I conducted stormwater inspections to ensure compliance with regulatory guidelines (Figure 6). To assess the efficacy of permeable pavement in managing stormwater runoff, I also conducted infiltration tests measuring the infiltration rate of the permeable pavement to determine its effectiveness in reducing stormwater runoff volume and improving water quality.

Furthermore, I used GIS analysis techniques to gather and analyze spatial data related to stormwater management to inform grant applications. In support of data management, I also tracked down and digitized stormwater documents.



**Figure 6.** Photo of me completing a stormwater inspection. Picture taken by Cha Thao.

## Outreach

As part of the outreach efforts, I represented Skagit County at various events such as the Skagit County Fair on August 9 - 12, Fidalgo Bay Day on August 20, the Country Living Expo on January 21, and Earth Day on April 22. At these events, I engaged with the public and provided information.



**Figure 7.** Photo of Anna Thomas and I interacting with a member of the public at the Country Living Expo on January 21, 2023. Photo taken by Maddy Loy.

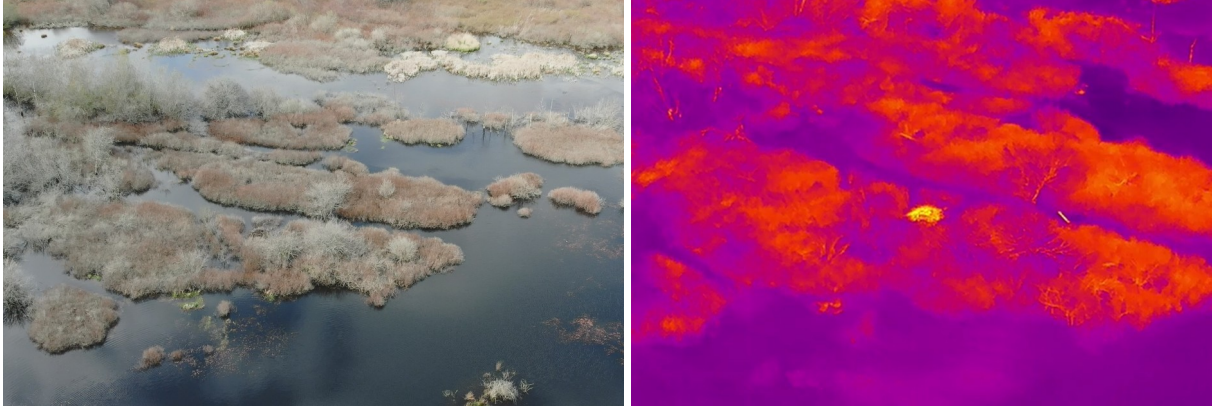
## Drainage

One prominent program I actively engaged in focused on addressing public concerns related to beavers. To effectively tackle this issue, I created a web page that served as a comprehensive resource to educate the public about beavers, providing valuable insights into their ecological significance, behavior, and habitat requirements (<https://skagitcounty.net/Departments/PublicWorksNaturalResourcesManagement/beavers.htm>). It also offered guidance on addressing issues associated with beaver activity and highlighted strategies for promoting coexistence with these important ecosystem engineers.

I also collaborated with a colleague to locate a beaver lodge using a drone equipped with infrared footage capabilities (Figure 9). This approach helped us to locate the beaver lodge, allowing us to take measurements using an underwater drone to assess the size and condition (Figure 8). By gathering precise measurements, we aimed to identify potential solutions for managing beaver-related water flow while minimizing ecological impacts.



**Figure 8.** Emily Derenne and I launching an underwater drone by the beaver lodge. Photo taken by drone by Jason McCauley.



**Figure 9.** Searching for the beaver lodge using drones. Photograph of the area (left) and the same area via infrared (right). Photos taken via drone by Jason McCauley.

### Water Quality

In the field of water quality, I had the opportunity to carry out various tasks aimed at safeguarding the health and integrity of water resources. One important aspect at Skagit County is conducting routine sampling for shellfish bed closure monitoring. This involves collecting water samples from designated locations and assessing the levels of contaminants and bacteria present (Figure 10). I also helped install and remove water loggers to record flow, temperature, and more. By closely monitoring these parameters, we aimed to protect public health.



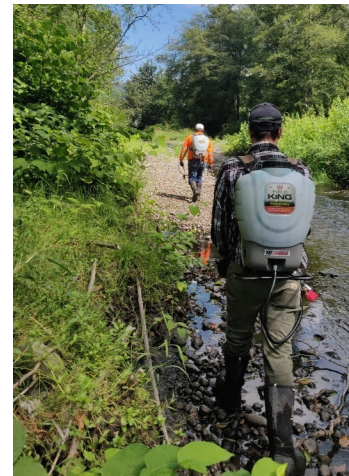
**Figure 10.** Photo of me taking water quality measurements. Picture taken by Dan Sulak.

Additionally, I regularly stocked dog waste bags at popular hiking trailheads and parks to encourage pet owners to clean up after their pets. By providing convenient access to dog bags we were preventing the contamination of water sources and maintaining the cleanliness of public spaces.

These activities were crucial components of our broader strategy to protect water quality and promote sustainable practices. By conducting routine sampling and implementing measures to mitigate potential sources of contamination, we contributed to the overall well-being of water resources and worked towards fostering a healthier and more environmentally conscious community.

### Noxious Weeds

A significant portion of my summer was dedicated to addressing the issue of noxious weeds, specifically spartina (*Spartina alterniflora*) and knotweed (*Fallopia spp.*). I sprayed and mapped these invasive species to control their spread and minimize their ecological impact. Equipped with backpack sprayers, I applied targeted herbicides to the infested areas, ensuring precise and effective treatment (Figure 11). By carefully following established protocols and safety guidelines, I aimed to selectively eradicate spartina and knotweed while minimizing harm to surrounding native vegetation.



**Figure 11.** Evan Emrick and Joe Shea walking by knotweed with backpack sprayers. Photo taken by Cindy Elston.

### GIS Trainings

In addition to my aforementioned responsibilities, I took on the role of hosting monthly GIS training sessions for my colleagues in the Natural Resources Division. These sessions aimed to enhance their knowledge and proficiency in Geographic Information System (GIS) tools and applications. As the facilitator of these training sessions, I planned the meetings and selected relevant topics. Whether it was introducing new GIS techniques, exploring advanced analytical tools, or discussing best practices for data visualization, each session was thoughtfully designed to introduce practical skills. Recognizing that not everyone could attend these training sessions, I also created meeting summaries for those who were unable to attend to ensure that everyone in the division had access to the information shared during the training sessions.

## Reflection

Throughout my time with the Skagit County Natural Resources Division, I have been exposed to a wide range of programs, each offering unique insights and hands-on experiences. From engaging in outreach initiatives to actively participating in habitat restoration and stormwater management, I have gained invaluable practical skills and a deeper appreciation for environmental science.

Undoubtedly, this internship has strengthened my passion for environmental conservation and solidified my commitment to pursuing a career in this field. However, the breadth of experiences I encountered did not narrow down my areas of interest but instead reinforced my fascination with all aspects of environmental science. Every program and initiative I had the privilege to be a part of left me inspired and motivated to explore further.

One significant realization I gained from this internship is the significance of interdisciplinary collaboration and the value of a strong educational foundation in subjects such as GIS, ecology, and stakeholder engagement. It highlighted the importance of coursework in an applied context and motivated me to pursue courses like Environmental Communication, Salmon Habitat & Ecology, and Water Quality. Furthermore, the internship emphasized the critical role of GIS in environmental resource management, strengthening my resolve to pursue a minor in GIS to enhance my skill set in this essential tool.

Moreover, through this internship I gained invaluable networking opportunities with professionals working in related fields. These interactions have not only helped me find mentors, but have also facilitated relationships for future career development. Their experiences and insights have significantly shaped my understanding of environmental science and further clarified my career goals.

Additionally, my experience within the Skagit County Natural Resources Division reinforced my interest in working for government organizations. I gained a deeper understanding of the inner workings of governmental agencies, their interactions with each other, and their relationship with other organizations and the general public. These experiences have given me valuable insights into the complexity of environmental governance.

In conclusion, I am grateful for the opportunity to intern with the Skagit County Natural Resources Division. This experience has equipped me with practical skills, exposed me to real-world challenges, and deepened my understanding of various programs and initiatives related to environmental resource management. I would like to express my sincere appreciation to Skagit County for their unwavering support throughout this internship, as their guidance has been instrumental in my personal and professional growth.

Western Washington University has done well to prepare me for this internship. I gained experience in scientific and professional writing through various courses with associated labs, and interdisciplinary collaboration. As constructive feedback, I would suggest that an additional statistics course after biostatistical analysis would be a valuable educational resource to offer. Moreover, it would be beneficial to offer training in GIS platforms other than ArcGIS. Lastly, incorporating more environmental studies courses that focus on societal issues into the degree program would be advantageous; however, my minor in Salish Sea Studies has effectively prepared me in this aspect.

Overall, this internship experience has solidified my passion for environmental conservation and equipped me with the knowledge and skills necessary to pursue a successful career in this field. I am excited to enter the environmental science field as a working professional, fully confident in the path I have chosen, and eager to contribute to the preservation and sustainable management of our natural resources.