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Skagit Fisheries Enhancement Group Restoration Internship

Meridith McCannon
Western Washington University

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COLLEGE OF THE ENVIRONMENT



Internship Title: Riparian Habitat Restoration Internship

Student Name: Meredith McCannon

Internship Dates: April 14th 2022 - June 10th 2022

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STUDENT SIGNATURE 

DATE: 06/04/2022

Skagit Fisheries Enhancement Group Riparian Habitat Restoration Internship Report

Over the past two months I have been given the incredible opportunity of working as a riparian habitat restoration intern for Skagit Fisheries Enhancement Group in Mount Vernon. The importance of both the restoration and preservation of riparian habitats was already something I was very interested in, but this internship helped me so much in understanding what it takes to actually restore these precious ecosystems. Skagit Fisheries Enhancement Group, or SFEG, is a nonprofit organization which aims to protect and improve the Skagit River watershed in order to aid in the revitalization of salmon and trout species which depend on it. There are so many different ways in which SFEG has contributed to the restoration of essential habitat along the Skagit River, all of which have shown to be extremely important. One of the ways in which they have accomplished this is through the restoration of off channel habitats and culverts in multiple locations. There are many channels and smaller sections of the Skagit which have been separated from the main channel of the river, which has therefore reduced the amount of crucial habitat for young salmon species. These small off river channels are key to the survival of salmon fry as they offer refuge from many adverse conditions that fish are exposed to in the main river, which makes it even more important for these areas to be restored. With the assistance of SFEG, the Skagit is now being restored to its original shape and complexity, and although this may seem like it would have minimal impact, this restoration is actually incredibly important and effective in helping juvenile salmon.

Another way in which SFEG has contributed to the improvement of the Skagit River ecosystem is through riparian habitat restoration. Riparian habitats are absolutely essential to not only the survival of salmon, but to the health and wellbeing of the river as a whole. Ever since the introduction of farming in this area of Washington, along with many other states, riparian habitats have been decimated for a large majority of rivers. Seeing as soil in areas closest to a river and its delta are considered to be the most fertile and capable of growing crops, these areas have been almost entirely leveled in order to create more farmland. What these farmers failed to recognize with this action is that they were in fact destroying precious ecosystems upon which many species rely, and now the majority of these ecosystems can never be restored to how they were originally. Along the Skagit in particular it is very easy to see the areas in which the riparian vegetation has been entirely removed, leaving absolutely no barrier between the farmland and the water. This leads to a host of issues for both the farms and the river, as the riparian buffer typically exists to buffer flood waters as well as to filter out contaminants which are entering the river, so with the destruction of this ecosystem comes much higher risk of flooding for the farmlands as well as increased concentrations of pollutants in the river. With all of these very important factors in mind, SFEG has dedicated a large portion of their work to the restoration and preservation of the riparian habitat alongside the Skagit. The impact that they have been able to make, and I have had the joy of observing and helping with, is truly incredible.

In order to actually restore these areas, SFEG has to first find landowners whose plots of land fall within the riparian buffer of the Skagit, with whom they then have to discuss the possibility of allowing SFEG to plant new native plants on a section of their land. This can tend to be a long and arduous process seeing as most landowners don't readily give up land which could be used for growing crops, however many people have agreed to it. After an agreement is made between the landowner and SFEG, they determine how large of a buffer is necessary for that area based on both how much land the owner is willing to give as well as what is needed for the ecosystem. SFEG then sends a team to plant as many native plants as can realistically survive in the area, as well as specific species that will thrive in that particular type of environment. After the plants are added, they are monitored at least once a year for their wellbeing and growth.

This monitoring is where a lot of my time is spent as an intern, and it has given me a lot of perspective on the process of restoration. About half of my hours throughout this internship have been spent at multiple different restoration sites along the Skagit monitoring the health and surrounding areas of these plants, and it has helped me better understand how much the success of these projects can vary depending on so many different factors. Sites are monitored in teams of at least two people using either a whole count, which is done for smaller sites and involves taking measurements for all plants in that site, or using plot samples, which are used for larger sites where it is unrealistic to be able to measure all of the plants in the area. So far in my time spent at SFEG all of the sites which I have monitored at have been too large for a total plot count, so I have become very familiar with the process of collecting these types of samples. For each plot sample, there is a post in the middle which we tie a 37.5-foot-long string to and back up until the string is fully extended. We then keep the string fully extended and walk in a circle while taking measurements for all of the plants within the circle, which results in an area of about 4400 square feet being covered. Within each plot sample there are varying amounts of plants, with numbers ranging from only 40 to upwards of 200 depending on the specifics of that particular site. For each plant we take multiple qualitative and quantitative measurements in order to assess which plants are thriving and which are not. The process of taking these measurements starts by identifying the plant, which can be difficult at times due to similarities between different plants as well as some plants being dead and thus being virtually unidentifiable. Once the plant is identified, we measure the height, and if it is tree with a trunk diameter larger than 1 inch, we also record the diameter. After these measurements we then give the plant a mortality rating, with 5 indicating that the plant is completely healthy and a rating of 1 showing that it is dead or nearly dead. Once we give the plant a mortality rating, we then mark if it was planted by SFEG or if it is natural regeneration, which the reason why many of the plots have a greater number of plants than were originally planted there. If there is an identifiable native plant in the plot sample, we are required to take these measurements for it regardless of if it was planted by SFEG or not so that we can actually gauge how well the ecosystem is reacting to the restoration efforts. Once all of the plants within the plot have been measured, we then answer questions about the plot as a whole including the amount of bare ground and canopy cover, as well as the composition of the ground cover, understory, and overstory. The composition is measured based on the percentage of native versus invasive plants, and it ranges from >95% native to >95% invasive. Most of the plots which I have worked on so far have had

the majority of each layer be mostly native, however it is common to see a large amount of Himalayan Blackberry due to how invasive it is in the Pacific Northwest.

I am including some photos here from a restoration site which we monitored, however this one is located in Riverfront Park, which is a public park in Sedro-Woolley, so as to not share photos of someone's personal property. Each of these pictures truly exemplify how much the vegetation and surrounding environments can differ even within a single restoration site.



This photo shows one plot sample area which had a lot of native vegetation but was very close to a large patch of blackberry, which we know could develop into an issue in the coming years, so to notify SFEG about this through data collection we add a note stating approximately how much ground cover is occupied by blackberry. Other than that, most of the plants in this sample were very healthy and had signs of growth.



In this picture you can start to see the effects of an invasive species on an area because a large majority of the sample area is covered in Himalayan blackberry. We did notice that this was causing some problems for the SFEG planted plants in this plot sample, which we noted in our qualitative observations and data for the plot.



Of the plot samples measured at this restoration site, this sample is the most evident example of an area being entirely consumed by an invasive species. What you see here is a plot sample where about 90% of the ground cover is reed canary grass which is another highly invasive species in this part of Washington. With so much of this grass covering the plants, it made measurements much harder, especially because the grass was extremely tall. Many of the plants in the area were not thriving as much as plants in other sample areas because of this, which again was marked down in our observations.

With about half of my time being spent monitoring at established restoration sites, it has become easier and easier to identify native species of the Skagit area properly and quickly, along with being able to identify some of the many invasive plants. This has been very helpful with aiding me in learning about the data collection process in the field, which is incredibly useful knowledge when going into the field of environmental science. With the data we collect, SFEG is able to better understand which plants thrive in particular areas and which do not, allowing them to use that information in future restoration projects. Along with monitoring, the other half of my time in this internship is spent at the SFEG native plant nursery where we care for and prep young plants before they are sent to restoration sites to be planted. This aspect of the internship is based a lot less on data, and mainly involves a large amount of physical activity as we have to carry and move plants for many hours at a time. In particular, most of my time at first in the nursery was spent getting the plants into pots before the heat kicked in, which involved a

lot of shoveling dirt and carrying plants into beds. Once we had gotten all of the new plants into pots, the priorities at the nursery shifted to getting plants which require shade into the designated shade beds so that they can survive and thrive throughout the summer. This has taken a lot of hard work, including moving hundreds of plants a day from the non-bed areas into beds using carts and wheelbarrows. In addition to this, many of the beds required replacement as the plastic which holds the water in had been torn or damaged, which would make them unable to properly saturate the plants with water in the summer. Overall, the work we have done in the nursery has been difficult and tiring, but it is extremely rewarding to see all of the plants start to do better once they are in an environment that is best suited to them.

With all of the work that I have done for SFEG throughout this internship, this same statement can be applied. Much of the work is very difficult at times, with variable weather conditions and a lot of walking long distances and transporting heavy objects, however it has all been so rewarding. Since the beginning of my school career in environmental science I have dreamed about one day getting to work in the field and understand the complexities of ecosystem restoration, and getting to see it and be actively involved in it has been one of the best experiences of my life. Getting to develop my skills in field data collection and ability to see and understand trends in a real-life setting has been such a wonderful experience which has given me so much invaluable information to take with me into my future career opportunities. Many of the classes which I took at WWU prepared me for this internship in multiple ways, however there are two classes in particular which provided me with knowledge that has been extremely helpful in this area. The first class is Wetlands Ecology, or environmental sciences 440, which involved a lot of plant identification and learning about what plants are typically seen in certain environments. This class allowed me to go into this internship with the ability to identify many of the plants which we now have to identify for SFEG which was so incredibly helpful in my transition from class or lab data collection into field data collection. Wetlands ecology was also one of my absolute favorite classes that I have ever taken, so if someone is looking to go into ecosystem restoration in the Pacific Northwest, I highly recommend taking this class. The other course I took at Western which helped prepare me for this internship was Habitat and Ecology of Pacific Salmon and Trout or environmental sciences 410. This class is the entire reason behind my interest in this internship as it went in depth into the importance and function of riparian habitats for salmon and river health. Going into this internship after taking this class allowed me to have so much more of an appreciation and passion for riparian habitat restoration efforts, especially because I understood exactly why salmon rely on these ecosystems. For anyone considering an internship with SFEG or any of the other Fisheries Enhancement Groups for other major rivers located in Washington I would highly recommend taking this course as it really helped me prepare for and understand the importance of riparian habitat restoration. Altogether, this internship has been one of the absolute best aspects of my college career and I am so thankful that I have been able to participate in it. Throughout my time at SFEG I was able to learn so many new things, and having the ability to implement the knowledge I acquired in my 4 years at WWU in a field setting has been a dream come true. If someone were to ask if I would recommend this experience to future students, my answer would be yes, absolutely yes. Being able to actually contribute to environmental restoration and getting to see and experience so many beautiful and unique areas has let me understand exactly why I chose to major in

environmental science, and I cannot recommend it enough to other aspiring environmental scientists.



Internship/Learning Agreement

Section 1 – Student Identification			
Last Name, First Name:	McCannon, Meredith	Western ID:	W01395128
Email Address	MCCANNM4@wwu.edu	Major/PreMajor	Environmental Science

Section 2 – Registration Information			
Total Credits:	5	Faculty Advisor:	Erika McPhee-Shaw
Internship Start Date:	April 14th, 2022	Internship End Date:	August 20th, 2022
Number Credits Per Quarter (F/W/S/Sum)	5 Spring		
<i>Note: You must be registered for credits during quarters you perform any part of the internship work (Including Summer Session) to include writing of reports...this can be spread over multiple quarters. You are expected to register an appropriate number of credits based on anticipated hours worked BY Quarter (Example: Working 120 hours during Summer = 4 Credits Summer Enrollment)</i>			

Section 3 – Organization for Internship	
Organization Name:	Skagit Fisheries Enhancement Group
Intern Supervisor Name:	Adam Airoidi
Mailing Address:	1202 S 2nd St. Unit C, Mount Vernon, WA 98273
Email Address:	aaroidi@skagitfisheries.org
Phone Number:	360-770-7391
Description of Duties (Or Attach Job Description): Field work in remote restoration sites, conducting nursery operations under supervision of SFEG's nursery manager, nursery facility maintenance (watering, weeding, mowing), conducting vegetation inventory according to SFEG protocols, monitor restoration project sites and collect data using SFEG vegetation monitoring methodology, prepare summary reports using vegetation performance metrics	

Section 4 – Learning Objectives

What do I intend to learn from this experience:

From this internship I intend to learn:

- How to properly identify native and invasive species in the Skagit area
- How to care for and monitor the health and condition of plants in a nursery setting before they are sent to restoration sites
- More information on how to collect and analyze data in accordance with GIS methods
- Details about the process of planning and implementing a restoration project
- How to monitor restoration sites as well as how to process the data collected from them

How does this experience contribute to my educational goals:

This internship will contribute greatly to my education goals by providing me with very relevant experience in my field of study, as well as allowing me to work in the field and learn what steps and methods are required in order to have a successful restoration project. This will improve my knowledge of plant identification, GIS, and collaborative data collection and analysis, all of which are highly important in environmental science.

If Faculty require any additional Learning Objectives, they should be listed here:

Section 5 - Deadlines, Evaluation, and Assessment (Completed by faculty advisor)

Meet with Advisor: _____	Additional Learning Objectives (as assigned by faculty)	Yes <input type="radio"/>	No <input type="radio"/>
First Draft Due: _____	Oral Presentation Required	<input type="radio"/>	<input type="radio"/>
Final Draft Due: _____	Daily/Weekly Log Require	<input type="radio"/>	<input type="radio"/>

Section 6 – Students Certification

I certify that I have read the University Policy on Risk Management Considerations for Student Internships and I will report any injuries suffered while performing internship promptly to WWU.
[http://www.wvu.edu/bfa/Risk_Mgmt/documents/Internship%20Considerations%20\(14\).pdf](http://www.wvu.edu/bfa/Risk_Mgmt/documents/Internship%20Considerations%20(14).pdf)

I will endeavor to represent myself and my college well and will abide by the relevant policies, procedures and ethical standards of the university and the internship organization.

I understand that 30-hours of work per credit earned is expected for an internship. I understand that I am expected to enroll in a number of credits commensurate with hours worked each quarter.

Student's Signature/Date	<i>Brandon Hanson</i> March 30 th , 2022
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Section 7 – Internship Site Supervisor Certification

I have reviewed the student's indicated learning objectives and on behalf of my organization agree:

- To enrich the Student's knowledge by orienting him/her to the occupation, the work setting, and the responsibilities relating to the assignment
- To regularly evaluate/provide feedback to student on progress, projects and areas of growth
- At or near the completion of the assignment to provide an evaluation of the student's performance
- To review and approve the Student's Learning Plan and communicate with Huxley College if areas are not going to be met.
- To supply the student with, and abide by the organization's policy against discrimination and/or harassment in the workplace
- To contact the instructor or the Huxley Internship Coordinator (360) 650-3646, ed.weber@wvu.edu should any problems arise

Internship Site Supervisor Signature/Date	<i>Adam Aioldi</i> 03/31/2022
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Section 8 – Faculty Advisor Certification

I certify that the student intern and I have reached agreement on the learning objectives and academic expectations for this experience. These objectives are challenging and enriching to the student's academic and/or career goals. I will award grades after satisfactory completion of all learning objectives/tasks/reports assigned and load final internship report onto the Huxley Server. P:\Huxley\PUBLIC_folders\COLLEGE_OFFICE\Intern_Reports

Faculty Advisor's Signature/Date	
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Section 9 – Huxley College Internship Coordinator

- Actions:
1. Review Agreement
 2. Update Course Override
 3. File Agreement in Student Records
 4. Communicate with Employers as necessary during internship