



2022

## Skagit Fisheries Enhancement Group Riparian Restoration Intern

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*Western Washington University*

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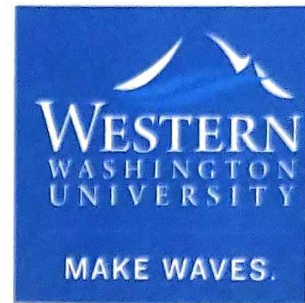
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# COLLEGE OF THE ENVIRONMENT



**Internship Title:** Riparian Habitat Restoration at Skagit Fisheries Enhancement Group

**Student Name:** Connor Garrod

**Internship Dates:** June 13, 2022 - August 17, 2022

**Advisor Name:** John McLaughlin

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**STUDENT SIGNATURE** Connor W. Garrod

**DATE:** November 19, 2022

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## **Executive Summary**

During the summer of 2022, I completed an internship with Skagit Fisheries Enhancement Group (SFEG) in Mount Vernon, Washington. Through the help of local landowners and many helpful Washington-based organizations, SFEG works to improve the success of salmon species, especially those endangered, through many environmental programs. Their mission as an organization is to be very community-oriented, so they have many volunteers helping with the nursery and monitoring programs, as well as educational programs at local schools. Before starting the internship, my goals were to expand on the knowledge I have learned thus far in my college career, learn more about native plants and environments in Washington, and understand more about the environmental science field that I will be joining come spring 2023. During my internship, I monitored at six different sites across the Skagit Valley and participated in two fish seining projects with SFEG staff members. I also spent many days at the SFEG native plant nursery performing tasks that kept the nursery in order and helped ensure the lives of the plants before they are introduced into the riparian habitats that turn into the monitoring sites. My main goal was to gain experience in the environmental science field, whether that be in data collection, asking better questions, or in overall knowledge of environmental organizations. Throughout the internship I did improve on my data collection and communication skills. Communication came in the way of discourse about the data, as well as how to work in a team more effectively. I am incredibly grateful to all of the SFEG staff for this opportunity. I am honored to have worked for such a driven and focused organization that prioritizes salmon and community members above themselves.

## **Introduction**

Skagit Fisheries Enhancement Group is a non-profit and non-governmental agency based in Mount Vernon, Washington. Their main vision as an organization is “healthy watersheds, healthy communities”, with its focus on the greater Skagit River watershed. They also work in the watersheds on the San Juan Islands and northern Whidbey Island. The Skagit River watershed is a unique watershed because it holds five species of salmon and three species of sea-going trout. SFEG is one of fourteen Regional Fisheries Enhancement Groups in Washington, which means they help support healthy communities through education programs. These programs encompass people in schools and the general public and involve them in ongoing projects to ensure healthy lives of the salmon in these watersheds. Each year, they host many school programs and work parties to build a community that is knowledgeable and informed about the current health of salmon since they are very ecologically and culturally valuable to the surrounding Skagit Valley. Currently, they have three programs in operation: education, volunteer monitoring programs, and fish passage restoration (Skagit Marketing, 2022)

My internship during the summer of 2022 fell under the volunteer monitoring programs, with focus on the riparian habitats of the Skagit Valley. SFEG hosts this internship under an Aquatic Lands Enhancement Account (ALEA) volunteer cooperative grant program. The main focus of this internship was to help ensure the success of habitat restoration efforts put on by the organization. This included upkeep of plant wellbeing at their native plant nursery and the completion of vegetation monitoring surveys at riparian sites around Skagit Valley. The native

plant nursery is leased from the Samish Tribe. The nursery is important because it helps create a partnership with native landowners and helps ensure healthy ecosystems with plants that are already adapted to survive in the Pacific Northwest. These plants are then planted at the specified monitoring sites. This is important because it turns bare land adjacent to rivers into areas with high plant percentage for habitat diversity and continuity. The sites that SFEG has planted at are locations owned by private landowners or organizations like Seattle City Light. These sites are monitored over the course of 10 years. The data collected during this internship and from volunteers are then put into a report to analyze the success of each site. Staff members are then able to use these data to assess the situation to ensure the continuation of these sites. The continuation of these riparian habitats demonstrates the SFEG mission perfectly and is why I consider this internship of upmost importance.

A small, unofficial portion of the internship at Skagit Fisheries was also spent helping staff members under a different program of operation: fish passage restoration. These projects were headed by two SFEG staff members: Kristin Murray and Erin Matthews. Although the internship was more focused on plants, their team needed extra hands in some of these projects. SFEG staff's purpose with the fish passage restoration is to follow guidelines put into place by an important court ruling. In 1974, Judge George H. Boldt made one of the most important court decisions of the twentieth century in what is now referred to as the "Boldt Decision". In *United States v. State of Washington*, tribal members filed a fishing rights issue against the State of Washington because of the violations to 1855 Treaty of Point Elliot made between the U.S federal government and the Coast Salish Nations in the 1850's. Although the treaty said that native populations would still have full access to their fishing and hunting grounds, the new settlers made it difficult for them by trying to go around the laws of the treaty. Many fish canneries were put into place by white settlers, which caused millions of fish to be taken from native populations. The Boldt Decision secured accustomed fishing grounds and stations back to the tribes, secured 50% of the salmon resources to them, and also made them co-managers of the state's fisheries. Judge Boldt also allowed tribal fishermen to fish in all waterways, not just those bound by reservations (Dougherty, 2020). SFEG is helping remedy past actions with their fish passage projects that follow court decisions from 2007. This case was then affirmed by the Supreme Court in 2018. They work together with the Skagit River System Cooperative, Skagit County, and the Upper Skagit Indian Tribe to improve or replace culverts put into streams by 2030 or 2035. SFEG is hired to then go to these construction sites and perform fish seining. The teams consist of SFEG staff, interns, volunteers, and Washington Conservation Corp (WCC) members. Thousands of fish are rescued during these projects using giant, 40-foot nets and varying sizes of hand nets. The fish are then catalogued and released at a site downstream of the projects. The data is then used to report back to the county.

Upon starting the internship, I hoped to gain experience in real life scientific situations that could help me understand how to ask the right questions and to gain experience participating in important ecological projects. Working at a non-profit could be something that is a part of my career, so I hoped to learn about data collection and community outreach work. My main focus for the internship was to further my skills learned at Western Washington University, such as using best management practices in collecting data and using my knowledge from classes such as forest ecology and water quality to help contribute to scientific discussions of data observed out in the field. I believe this experience at Skagit Fisheries Enhancement Group elevated my understanding of what my career will be like after finishing my undergraduate degree.



## **Internship Activities**

My typical internship activities were tasks at their native plant nursery and vegetation monitoring at planting sites across the Skagit Valley. Also, a few times this summer I was given the opportunity to assist on bigger scaled projects with some of the staff members doing fish seining.

### **Nursery**

The SFEG plant nursery holds over 15,000 plants. These plants include 28 different native Washington plants they will then plant in riparian areas at their specified sites in Skagit County, as well as some in Island County if there are special projects SFEG has taken on. A complete list of all of the plants is included in Appendix B. My activities at the nursery included watering, weeding, moving dead plants out of the capillary beds, moving newly potted plants into available beds, inventorying each species, and creating willow stakes. Watering was the most important activity for us to complete at the nursery because I was serving my internship during the heat of the summer. The temperature did reach above 90 degrees Fahrenheit a few of the days I was there. At the nursery, there are many shade beds with canopies over the top that hold plants such as Douglas fir (*Pseudotsuga menziesii*), Western red cedar (*Thuja plicata*), and Grand fir (*Abies grandis*) since they are shade tolerant plants (Figure 1a). There are also sun beds that have 100% exposure to the sun (Figure 1b). Those beds held plants such as a few different kinds of willows and Big leaf maple (*Acer macrophyllum*) Those were the most important to water because of their direct contact with some of the harsher weather conditions. To water them, I would flood the beds so that the soil and sawdust combination would stay wet for longer periods of time and the roots of the plants would have more ready access to the water. I would also top water these beds for longer periods of time because of their full exposure to the sun. The shade beds were also flooded but didn't require as much water as the sun beds did on a daily basis.

Since SFEG is a smaller nonprofit, the three other interns and I were the ones managing the nursery and reporting back to our supervisor Nathan. We would let him know what we had completed at the nursery so he could then send his crew out to then finish the tasks that required heavy equipment. The nursery task I found very interesting was the making of willow stakes. In the back of the nursery, there are three willow trees that had become overgrown. In the process of cleaning up the nursery, Nathan showed us how to cut willow stakes from these trees. Using loppers, we cut stakes that were about three feet long. Skagit Fisheries is able to use these stakes in the field since willows are able to regenerate as new plants from their stalks. I hadn't known this before, and it was an incredible piece of information to learn. It also seems that it is of great economic value, as well as sustainable, to have these trees in the nursery.



*Figure 1a (left).* The shade beds at the SFEG native plant nursery. *Figure 1b (right).* The sun beds at the SFEG native plant nursery.

### **Vegetation Monitoring**

Vegetation monitoring was an activity that was very important for SFEG because I was collecting data for them to use in their yearly reports for grants and other big projects. When it was a monitoring day, I would go out with one of the other interns. The drive to the site took between 10 minutes to over an hour to reach. Thankfully with the use of our own personal vehicles, we were reimbursed for the number of miles we drove each month. When I met the other intern at the nursery, we had to bring certain gear with us: a 25-foot-tall stadia rod, a 50-foot cord, two GPS units, a first aid kit, and our yellow reflective vests. At the sites I had to wear a reflective vests because some of the sites were on landowners' property or on pieces of land that could not be entered by the public. This helped ensure that people knew we were there and knew that we were with an official organization. I was also provided a hard hat to use on sites if there was stormy weather or trees with precarious branches.

To record data at the sites, I used the Survey123 app on my smartphone. In the app, there were many different pieces of data for us to specify. Using the location feature on the phone, the app was able to use the correct coordinates and then I could enter the site name. One important part of monitoring was if it was a total count or a plot sample (Figure 2a), which I also specified in the app. If a site was less than two acres, we had to complete a total count and gather data for every plant on the site. If it was a plot sample for larger sites, I would use the 50-foot cord attached to T-posts already set in the field. I would then enter data for all the plants that fell inside the 50-foot radius when I walked in a circle. Regardless of site size, I would take the same parameter data for each tree: species, height, diameter if greater than 1 inch, health rating between 1-5, and if the plant was coplanted or had a plastic protector on it (Figure 2b). Sitka spruce were usually planted with Douglas fir or Western red cedars to ward away elk and other animals. Sometimes Red alder (*Alnus rubra*) showed up as the coplant as well, but that was very rare. The protectors on the plants are biodegradable plastic to help the saplings grow protected from elk as well. Other parameters included assessing bare ground, canopy cover, and their composition in terms of

native, non-native, and invasive species. After completing as many sites as my partner and I could, we would drive back to the nursery to complete our eight-hour day.

Sampler(s) Name

SiteName

Plot Number

Plot Location

Survey Method

☐ Total Count

☐ Plot Sample

**Health Condition Assessment**

PlantID

Common or Latin name

Height (ft)

Diameter (in)

M. Rating

1=Dead, 5=Healthy

1 Dead or nearly dead   2 Acute stress/ partially dead   3 Signs of stress   4 Mostly healthy   5 Completely healthy

Natural Regeneration

Select if SFEG planted or with protector

☐ SFEG planted

☐ Protector

☐ Coplanted

*Figure 2a (left).* In the app Survey123, it was important that we entered who was monitoring, the site name, which plot is being monitored, entered as VP#, and the location using location features on the smartphone. *Figure 2b (right).* Data fields in Survey123 for recording plant health.

## Fish Seining

Although not in the original internship description, I got to participate in ongoing SFEG fish seining projects with some of the staff members. I participated at two locations: Cedar Grove near Concrete, Washington and South Fork near Conway, Washington. The uniform for these fish sites was waders, wader boots, life jackets, yellow reflective vests, and hard hats. Our team was not allowed onto sites without the vests and hard hats since it was a construction site (Figure 3a). At South Fork, raincoats, leather gloves, and bug nets were added to the attire as protection from the clouds of mosquitoes (Figure 3b).

The project at Cedar Grove took one day. There, I helped staff member Erin Matthews sein for fish in the bigger pond. Then, I helped her watch the smaller pond while the construction team pumped down the water in the big pond on the other side of the culvert. While we watched for



stranded fish as the water levels went down, we put up a block net at the end of the small pond so that the fish we released on the other side wouldn't be able to come back into the construction area. At this site we rescued many three-spined sticklebacks (*Gasterosteus aculeatus*), as well as some species of salmon and some amphibians like frogs and salamanders. After the water had been pumped down, our whole team used hand nets to rescue the remaining fish in the small pond.

At South Fork, the project took four days and I helped for the final two days. At this site, I helped watch ponds for stranded fish like I did at Cedar Grove and also helped with the fish seining. I did have the opportunity to use the full-length 40-foot net in two of the fish seines. This was at some times quite hard because the net could get stuck on branches and the bottom of the river was muddy. I also assisted Erin with holding the lead line when someone else did the seining. It was important to keep the lead line on the river bed so that fish couldn't escape out the bottom. On both days, I was also stationed at the fish release station for a few hours. Here, I worked with one other intern and another SFEG staff member. I was given the job of recording the numbers of fish and amphibians. I used proper recording methods by repeating back the numbers given to me by the other members that were releasing the fish into the Skagit River. Because there were so many fish and it was very warm days, we didn't identify the fish to their exact species, but just in the categories of "salmonid", "non-salmonid", and "amphibians". I would also make note of some of the invasive species, like bull frogs. On the first day, I recorded almost 2,000 fish in total and about 1,000 on the second day. After the completion of the project, I had to wash my own gear and spray it down so that invasive snail species wouldn't be carried on to the next project. At the nursery the next day, I also helped Erin wash the nets we had used during the South Fork project.



*Figure 3a (left).* An example of the baseline gear that was worn during fish seining projects. This photo features a cutthroat trout in a glass viewing box. *Figure 3b (right).* An example of the extra gear that was needed to be worn to protect from mosquitoes.

## **Internship Achievements**

I believe the biggest achievements I made while serving my internship at Skagit Fisheries Enhancement Group was performing field work in group settings, specifically in the importance of data collection. I would also say I achieved my goal of conceptualizing my future career in environmental science by getting involved with SFEG and asking bigger, important questions. Overall, I feel like my experience helped me achieve more confidence in myself as an environmental scientist.

Throughout my time in the College of the Environment at Western Washington University (WWU), best data collection practices were always presented, but I wasn't able to implement them. This is not the fault of the university, but because of the pandemic I was not able to be in any in-person lab setting for four consecutive quarters. This internship came at a critical time in my academic career, as I just had finished a year of in-person classes where I learned most of my data collection methods. I now get to enter my senior year at WWU with real world data collection experience gained while with SFEG.

During my internship, the data collection was the same for each site, allowing for repeated practice of data collection methods. As described in the vegetation monitoring section of the internship activities, I had several different measurements for each plant. For ten weeks, either once or twice a week, these monitoring skills were put into practice. This really helped advance my data collection skills because I became so familiar with what we were looking for that it became easier and easier to assess the health of trees. Comparisons of different plants and the explanations to back up our decisions about their health became easier. While monitoring, I was only with one other intern and our supervisor was rarely in the field with us. I was accompanied by Nathan White on my first day on the internship, but afterward my fellow intern and I were trusted to continue the data collection by ourselves, which is an accomplishment and a compliment. While doing this, I participated in regular conversations about how we assessed the health of the trees. These important scientific conversations were backed up by the knowledge I have learned from WWU and the knowledge my fellow intern brought from her university. These conversations were always very mature, and we were able to achieve conclusions that included the best possible data for SFEG.

For the fish seining project at South Fork, I was able to help with data collection as well. This was a very important achievement for me because I was trusted by a SFEG staff member with recording numbers that would then be put into an official report for the county. While taking water quality at WWU, I learned during our stormwater project the importance of repeating the collected data back to the person with the instruments or organisms in front of them. This is to lessen the occurrence of errors. I did forget that in the beginning of recording data, but I am grateful for the reminder by one of the staff members. The data collection went smoothly after that, and I felt more confident in my contribution to these very important projects.



## **Discussion and Evaluation**

I believe that my work done during the SFEG internship was an incredibly fulfilling experience. During meetings with my supervisor, my fellow interns and I were able to see past data from the sites that we monitored, which shows how effective their work in riparian habitat restoration has been over the years. Although some sites were harder to monitor because of the presence of larger trees, it was important to remember that this was synonymous with the success of the sites. I feel very honored to be a part of the work that has been going on for decades, which my internship is helping to continue. One of my goals was to learn about continuity of data and the importance of it. I have only been part of projects on a small scale, so seeing the effects of environmental work on a larger scale over time is incredibly valuable to me.

One of the most important things I learned during my internship was the value of communication and specificity. In scientific work, it is of utmost importance to reduce the number of errors in the work by being precise and accurate in our actions. There were times in the internship where we could have saved more plants from heat stress if we had been told the exact way we should set the plants in the beds. However, I could have clarified more myself by asking questions, but in everything there should be a balance. I think this is important to mention because it shows that not everyone is perfect and working as a team makes us stronger. Working as a team is what gets the job done and, in the end, does better work for the environment. As the internship went on, the communication between me and the other interns became better so that we achieved more of our best work. I think one of the things I would improve about this would be more inclusion of the supervisors in the work we were doing. My recommendation for this would be to have more meetings at the beginning of the week so we can have a clear plan of the upcoming week. We only had two of these meetings over the course of the internship. During the two meetings we did have, all of the interns and our supervisor were able to be in the same room and talk through the data we were getting, the importance of it, and discuss upcoming projects. I think these meetings were very helpful for me as an intern because I wasn't going into the monitoring sites blind. It was also very helpful when we talked about the nursery because we were able to talk through more in-depth the way they were wanting things to go at the nursery, such as nursing plants back to health or tasks to keep the nursery clean and in order.

I am very thankful that my educational goals for the internship aligned with the mission of Skagit Fisheries, and in the end were accomplished. Salmon play important ecological and historical roles in Washington State. I have come to realize in my time at WWU that I would prefer to take my career in environmental science towards the terrestrial aspects. This internship at SFEG was really eye-opening to me in the way of showing me how working with native plants actually is direct work with salmon. Plants are important for salmon because their presence in the surrounding environment can prevent damage to streams, control the flow of water from being over-abundant or under-abundant, and maintain essential nutrients that can be laterally transferred. My goal is to continue to live in Washington after I graduate next spring, so I'm glad I now have this knowledge that the work I love doing can directly affect what is so important to this state, a state I have come to love through my studies. My goal for this internship was to learn what careers in environmental science look like, and SFEG has done that in numerous ways.

### **Acknowledgements**

I would like to thank everyone at SFEG for giving me an amazing opportunity to learn and grow. I would like to thank Adam Airoidi and Nathan White for their service as my supervisors and all their help and instruction throughout the summer. Additionally, I would like to thank Erin Matthews and Joe George for the advice they gave me about careers in environmental science, especially in how to be a better candidate on all of the job applications I will be handing out next year after I graduate. I truly appreciate each and every one of these people for giving me information and wise words that I will carry with me throughout the rest of my career.



## **Appendices**

### **Appendix A: Resources**

Dougherty, P. (2020, August 24). Boldt decision: United States v. state of Washington.

HistoryLink.org. Retrieved September 1, 2022, from

<https://www.historylink.org/File/21084>

Skagit Marketing. (2022). Skagit Fisheries Enhancement Group. Retrieved September 1, 2022,

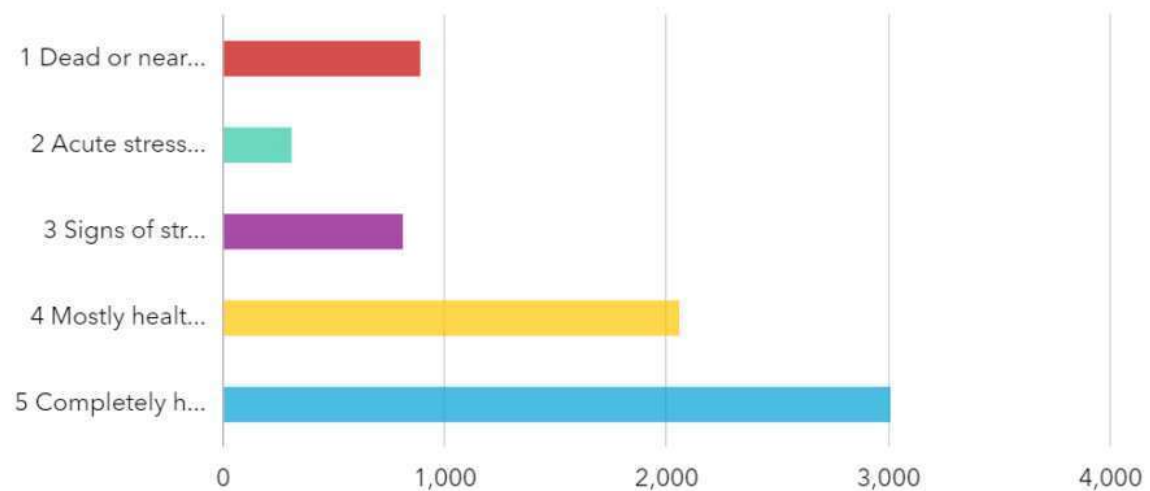
from <https://www.skagitfisheries.org/>

## Appendix B: Complete SFEG Plant List

Nursery Plants			Serviceberry	<i>Amelanchier alnifolia</i>	AMAL
Common Name	Scientific Names	CODES	Snowberry	<i>Symphoricarpos albus</i>	SYAL
Conifer			Spirea	<i>Spiraea douglasii</i>	SPDO
Alaskan yellow cedar	<i>Callitropsis nootkatensis</i>	CANO	Sweet gale	<i>Myrica gale</i>	MYGA
Douglas fir	<i>Pseudotsuga menziesii</i>	PSME	Thimbleberry	<i>Rubus parviflorus</i>	RUPA
Grand fir	<i>Abies grandis</i>	ABGR	Vine Maple	<i>Acer circinatum</i>	ACCI
Incense cedar	<i>Calocedrus decurrens</i>	CADE	Forbs		
Mountain hemlock	<i>Tsuga mertensiana</i>	TSME	Douglas Aster	<i>Sumphyotrichum subspicatum</i>	SUSU
Shore Pine	<i>Pinus contorta</i>	PICO	Chocolate Lily	<i>Fritillaria affinis</i>	FRAF
Sitka spruce	<i>Picea sitchensis</i>	PISI	Gumweed	<i>Grindelia squarrosa</i>	GRSQ
Western hemlock	<i>Tsuga heterophylla</i>	TSHE	Nodding Onion	<i>Allium cernuum</i>	ALCE
Western red cedar	<i>Thuja plicata</i>	THPL	Pacific Silverweed	<i>Argentina egedii</i>	AREG
Western white pine	<i>Pinus monticola</i>	PIMO	Pearly Everlasting	<i>Anaphalis margaritacea</i>	ANMA
Deciduous			Shooting Star	<i>Dodecatheon hendersonii</i>	DOHE
Big leaf maple	<i>Acer macrophyllum</i>	ACMA	Tiger Lily	<i>Lilium columbianum</i>	LICO
Bitter Cherry	<i>Prunus emarginata</i>	PREM	Wood Strawberry	<i>Fragaria vesca</i>	FRVE
Black cottonwood	<i>Populus balsamifera</i>	POBA	Wooly Sunflower	<i>Eriophyllum lanatum</i>	ERLA
Cascara	<i>Frangula purshiana</i>	FRPU	Grass		
Crabapple	<i>Malus fusca</i>	MAFU	Cascade Fescue	<i>Festuca romerii</i>	FERO
Oregon ash	<i>Fraxinus latifolia</i>	FRLA			
Oregon white oak	<i>Quercus garryana</i>	QUGA			
Paper Birch	<i>Betula papyrifera</i>	BEPA			
Pacific Dogwood	<i>Cornus nuttallii</i>	CONU			
Quaking Aspen	<i>Populus tremuloides</i>	POTR			
Red alder	<i>Alnus rubra</i>	ALRU			
Shrubs					
Black Twinberry	<i>Lonicera involucrata</i>	LOIN			
Beaked hazelnut	<i>Corylus cornuta</i>	COCO			
Dewberry	<i>Rubus ursinus</i>	RUUR			
Douglas hawthorn	<i>Crataegus douglasii</i>	CRDO			
Douglas maple	<i>Acer glabrum</i>	ACGL			
Gooseberry	<i>Ribes divaricatum</i>	RIDI			
Hooker's Willow	<i>Salix hookeriana</i>	SAHO			
Mock Orange	<i>Philadelphus lewisii</i>	PHLE			
Nootka Rose	<i>Rosa nutkana</i>	RONU			
Oceanspray	<i>Holodiscus discolor</i>	HODI			
Osoberry	<i>Oemleria cerasiformis</i>	OECE			
Pacific Ninebark	<i>Physocarpus capitatus</i>	PHCA			
Pacific Willow	<i>Salix lucida</i>	SALU			
Pea-fruited rose	<i>Rosa pisocarpa</i>	ROPI			
Red Elderberry	<i>Sambucus racemosa</i>	SARA			
Red flowering currant	<i>Ribes sanguineum</i>	RISA			
Red osier dogwood	<i>Cornus sericea</i>	COSE			
Salal	<i>Gaultheria shallon</i>	GASH			
Salmonberry	<i>Rubus spectabilis</i>	RUSP			
Scouler's willow	<i>Salix scouleriana</i>	SASC			
Sitka Willow	<i>Salix sitchensis</i>	SASI			

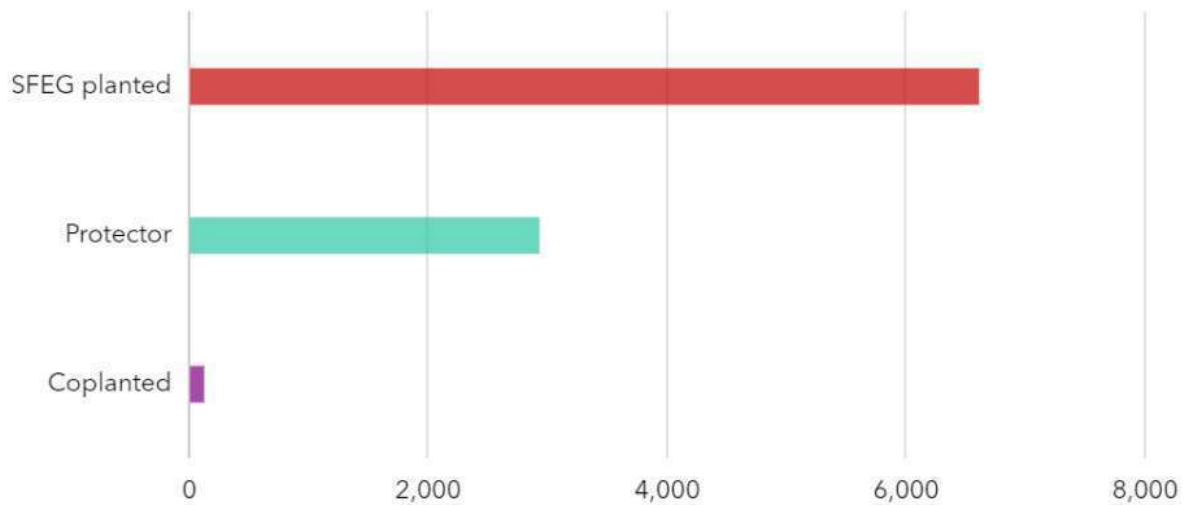
## Appendix C: Data Collection During the Internship

Health ratings collected during the internship:



Answers	Count	Percentage
1 Dead or nearly dead	885	12.51%
2 Acute stress/partially dead	305	4.31%
3 Signs of stress	807	11.41%
4 Mostly healthy	2,053	29.02%
5 Completely healthy	3,005	42.48%

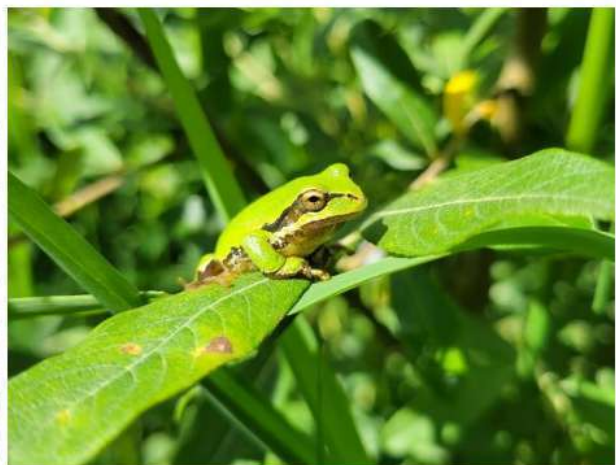
Notes on Natural Regeneration important to SFEG:



Answers	Count	Percentage
SFEG planted	6,604	93.36%
Protector	2,925	41.35%
Coplanted	118	1.67%

#### Appendix D: Additional Photos

My first two days of monitoring was spent at Lower Day Slough, a site off of Old Skagit Highway.





Cornet Bay was one of the few sites that is not in Skagit County, but in Island County. I have the privilege of monitoring here twice. The sites were total counts with lots of natural regeneration, specifically Sitka Spruce. There were many species here that were difficult to identify since this is a habitat that we aren't used to seeing in the Skagit Valley.



Granstrom was one of my favorite sites, as well as one of the farthest ones from the nursery, at about an hour's drive. It was quiet and had exceptional views all around. At this site I saw one of a Pacific Silver Fir, which is something SFEG doesn't plant very often.





Anderson was a site that could only be accessed with help from SFEG staff. It took 2 hours to get to because we had to go around private land. We encountered fresh bear scat, blackberry thorns, stinging nettle, elk bugling, quite possibly a bear itself, a cow bone graveyard, and the biggest thunderstorm of the summer. We didn't get to monitor at the site because of the quick onset of thunder and lightning.

