

REGENERATING PACIFIC NORTHWEST SALMON HABITAT THROUGH RIPARIAN RESTORATION

Felicity Strzelec*, Program on the Environment, University of Washington
Faculty Advisor: Jason Toft, Aquatic and Fisheries Sciences, University of Washington
Site Supervisor: Whitney Neugebauer, Whale Scout

BACKGROUND

- Humans are reducing river riparian zones through urbanization and developmental activities.
- And riparian restoration efforts are taking place to revitalize salmon habitat.
- But monitoring how the riparian vegetation is maturing in salmon habitats is important for understanding the benefits of riparian restoration to salmon.
- Therefore, riparian restoration analysis can be used to demonstrate the effects of riparian regeneration on salmon habitat.

RESEARCH QUESTION

How does riparian vegetation affect the habitat of Pacific Northwest salmon?

INTERNSHIP & METHODS

- Riparian restoration on Bear Creek (fig. 5) and the Sammamish River (fig. 4).
- Literature review on riparian ecosystems.
- Vegetation monitoring to test riparian restoration effectiveness on salmon habitat.

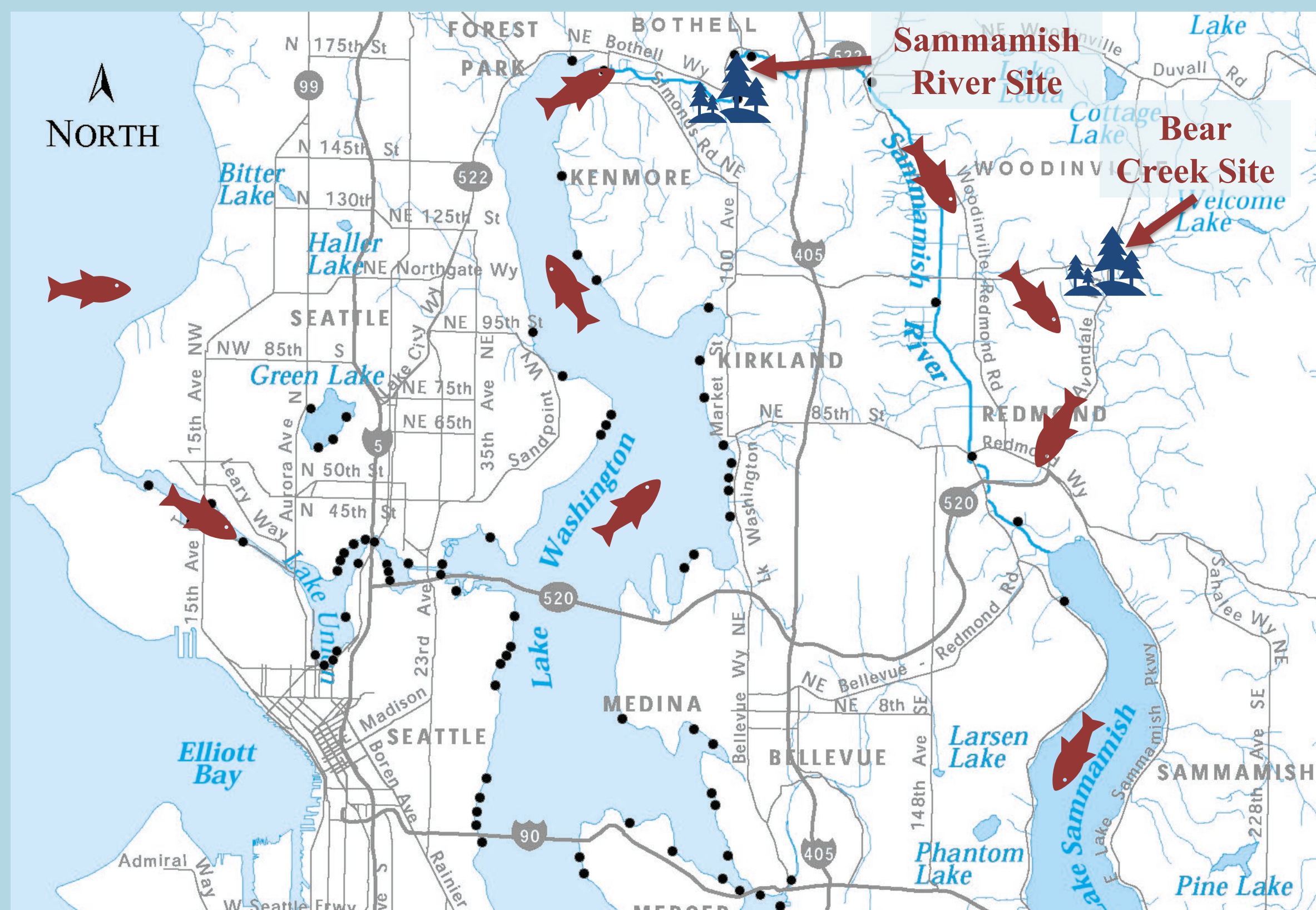


Figure 1. Salmon enter the Washington waterways through Ballard Locks in Seattle and Lake Washington then through the Sammamish River in Bothell to Bear Creek in Redmond and further to Issaquah.
Map Source: Washington Water Trails Association

RESULTS

- As riparian vegetation increases in height, it creates more canopy cover over salmon habitat (fig. 2 and 3).
- Riparian vegetation improves woody debris and litter mass in salmon habitat (fig. 4 and 5).
- Riparian vegetation provides a natural barrier to protect salmon habitat (fig. 4 and 5).

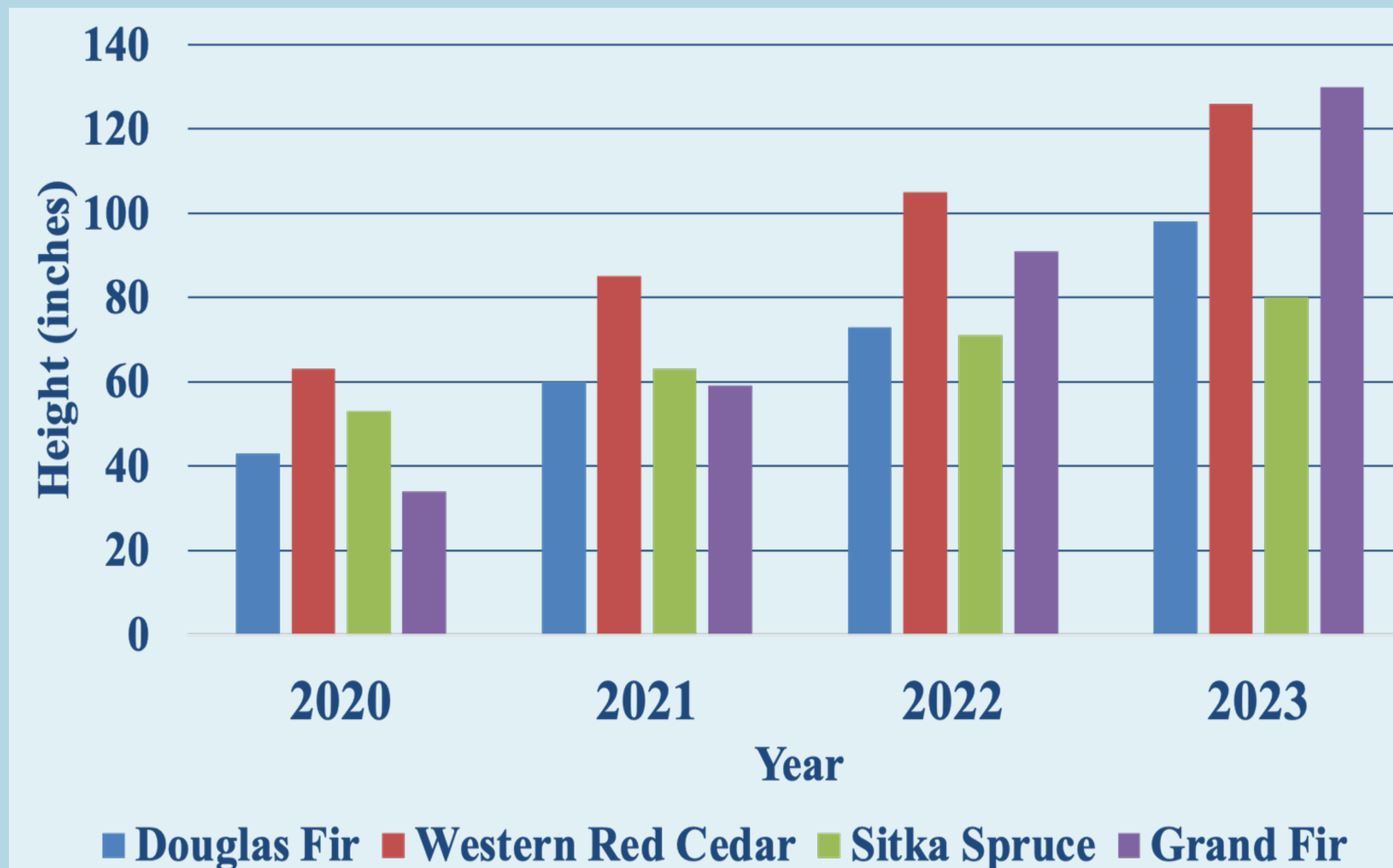


Figure 2. Average heights of native trees, Douglas Fir, Western Red Cedar, Sitka Spruce and Grand Fir respectively on the Bear Creek restored riparian zone from 2020-2023. Grand Firs had the greatest annual rate of height change while the Sitka Spruce had the lowest annual rate of height change.

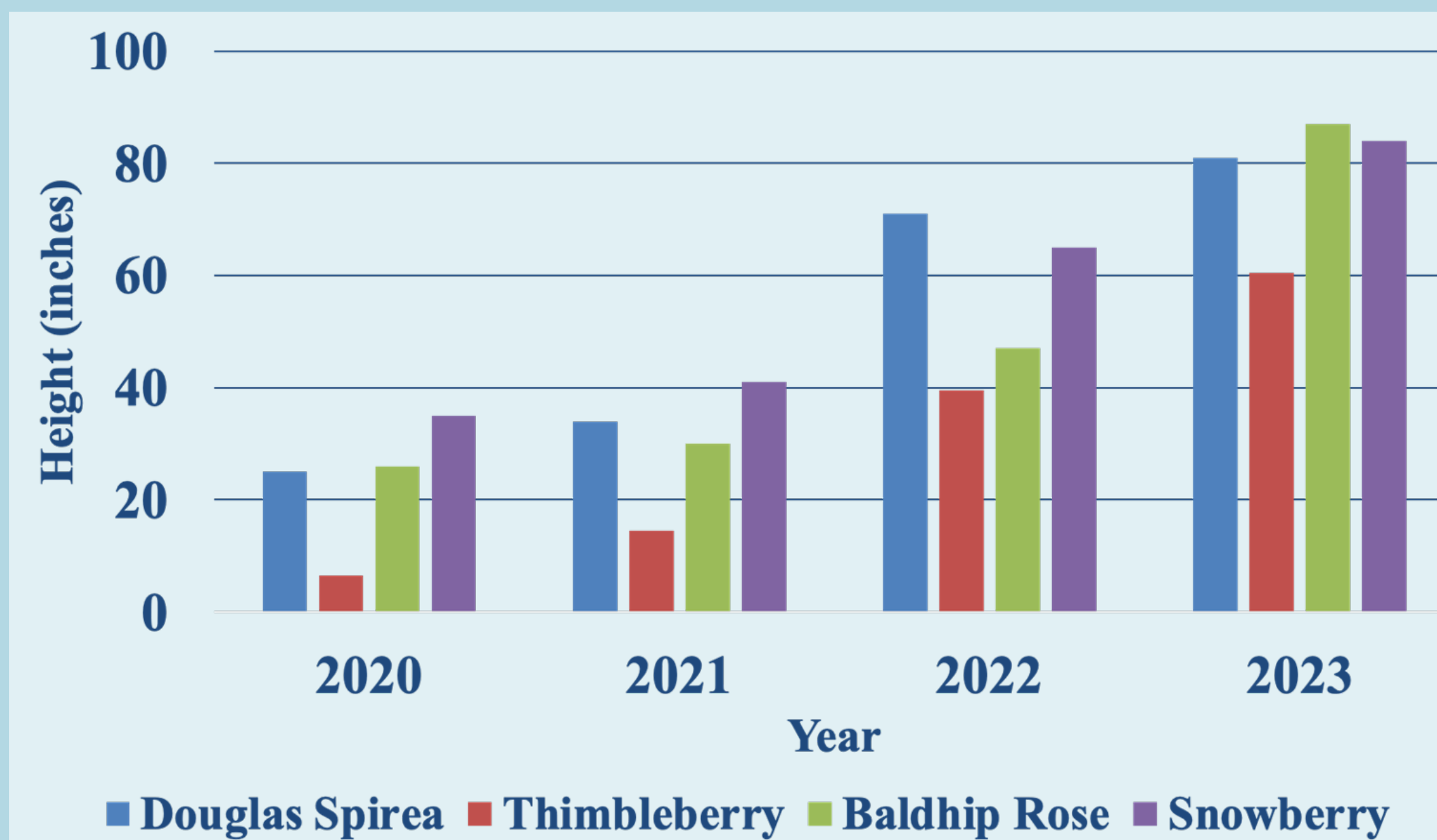


Figure 3. Average heights on native shrubs, Douglas Spirea, Thimbleberry, Baldhip Rose and Snowberry respectively on the Bear Creek restored riparian zone from 2020-2023. Baldhip Roses had the greatest annual rate of height change while the Snowberries had the lowest annual rate of height change.

ACKNOWLEDGEMENTS: Thank you to my site supervisor, Whitney Neugebauer and faculty advisor, Jason Toft. I am also grateful to my family and friends.

KEY TAKEAWAYS

- Canopy cover from riparian vegetation adds shade to the riverside which cools water for salmon.
- Woody debris increases the availability of insects for juveniles.
- Litter mass from riparian vegetation provides a natural filtering mechanism against toxins that seep into rivers.



Figure 4. Riparian restoration on the Sammamish River from July 2023 to October 2023. The riparian restoration technique consists of clearing invasive species and planting native species.



Figure 5. Progression of Bear Creek riparian restoration from 2018 to 2023. This image shows that woody debris and litter mass increase as native vegetation is re-established on the riparian zone. In 2023, it is clear now that the natural barrier between the land and river is healthy and strong.

BROADER SIGNIFICANCE

- Riparian restoration can help control the emergence and spread of invasive species in salmon river habitats.
- Planting of native species along salmon rivers and streams can improve salmon spawning, rearing and migrating in developed areas.
- Riparian vegetation monitoring and analysis enables a better understanding of how to use the riparian restoration technique to strengthen salmon populations.