

# Sword Fern Research Project

## Progress Report

May 15, 2020



# Haven

Ecology & Research

## Accomplishments

### Project Management

During April, I completed the permit applications for sampling in Seattle and Mercer Island. Lisa Ciecko confirmed that we have permission to sample in Seward Park and Schmitz Preserve Park. Kim Frappier confirmed that we have permission to sample in Upper Luther Burbank Park and the NE quadrant of Pioneer Park.

I also coordinated with Ylva Lekberg, Susan Fawcett, Tim Billo and Marianne Elliott on experimental design. Susan Fawcett has yet to receive notice about her grant application for the genomic study. Tim Billo suggested several potential backup sites such as the Fort Ward die-off on Bainbridge Island. Marianne Elliott suggested the ITS6/ITS7 primers for sequencing oomycete communities.

### Research

Through further conversations with Ylva Lekberg, we narrowed down the experimental design and sampling plan. In the absence of within-individual replication, Ylva agreed with Brett Younginger's suggestion to physically pool samples. We now intend to collect 10 samples (pinnae) from each fern and then use a hole punch to create equal-area subsamples which will then be combined and homogenized during the DNA extraction process. Ylva Lekberg advocated for a complete block design out of concern that site conditions could be a confounding factor. Although blocking across parks would be a more robust statistical approach, it would require the identification of pathogen-free ferns within Seward Park to serve as a control. We agreed that using samples from an additional die-off site such as Upper Luther Burbank Park would address the issue of confounding factors. We will also include up to 2 samples from healthy-looking ferns in Seward Park and 2 samples from symptomatic ferns in Schmitz Preserve Park.

I completed a review of pertinent literature on oomycete primers and summarized the findings in an annotated bibliography and table. I selected 5 primer pairs for testing on a subsample of symptomatic tissue. I sent these documents and a tentative sampling plan to Ylva Lekberg.

### Next Steps

I am currently waiting to receive follow-up information and protocols from Lisa Ciecko and Kim Frappier. Lisa Ciecko asked Nelson Salisbury at EarthCorps to send location data for the monitoring plots in Seward Park.

Washington State provided clarification about business activity during the COVID-19 stay-at-home order. Under the “Professional Services” category, Haven Ecology and Research should be able to begin field and lab work during Phase 2 of Governor Inslee’s response plan.