Heron Haven Project Proposal

Executive Summary

Home to the largest Douglas-fir on campus and an imperiled heron rookery, Heron Haven has the profound potential to become a thriving, biologically-rich greenspace that students, faculty, and staff can engage with.

If 'empty' spaces on the UW campus were looked at through the lens of an ecologist, many would be identified as ecologically unhealthy and in need of remediation. Heron Haven is currently one of these unhealthy spaces. Though the site beautifully frames a view of Mt. Rainier and the Cascades with its towering stand of mixed conifers, it's ecology is threatened by our changing climate and many common invasive species.

Situated immediately south of Drumheller Fountain is a wedge of greenspace lovingly dubbed Heron Haven, so named because of the heron rookery that exists in its upper canopy. Despite being central to campus and situated immediately in the vicinity of UW's environmentally-focused departments, Heron Haven hopelessly exists without a keeper. It is densely vegetated, but with various monocultures of invasive weeds, including the smothering groundcover English Ivy. Cherry laurel, Himalayan blackberry, English hawthorn, and Italian arum have also successfully outcompeted native species, suppressing much needed plant diversity. A lack of plant diversity means there is also a lack of diversity in all other organisms that inhabit this space, from insects, to mammals, to bacteria. The low diversity of flora and fauna contributes to poor environmental resiliency, especially in the face of imminent climate change.

This project aims to re-establish native flora that can withstand the aforementioned stresses of climate change while also maintaining and restoring populations of native fauna. I propose restoring the site by removing invasive plants, establishing native plantings, and adding human elements, such as paths, seating areas, and interpretive signage. Doing this would turn Heron Haven into an activated, welcoming space that invites students to interact with the environment around them rather than idly passing by. Through close collaboration with the UW chapter of the Society for Ecological Restoration, UW Grounds Management, the Department of Landscape Architecture, the School of Environmental and Forest Sciences, and many individual volunteers, Heron Haven will become a space that embodies the natural character of our unique Cascadia ecoregion, connecting students to the unique landscape in our own backyard.

I am seeking $50,000 to complete the ecological restoration and redesign of Heron Haven. The vast majority of the grant will cover the cost of plants, which must be able to fill a 38,000 square foot site (plant costs were calculated at a rate of $1.00 per square foot). The SER nursery will be the primary source of plants, but due to their small capacity, it is likely that a considerable percentage of the plants will have to be purchased elsewhere. The other costs will be broken down further in the budgetary section of the proposal, and encompass other important costs such as the costs to obtain nurse logs, and a fund to ensure the site is managed into the future.

Education and Outreach

The Heron Haven site is located in the heart of campus, with thousands of students passing by it daily. The high visibility of this project means it will receive organic exposure among students, with increasing awareness each quarter as students alter their routes to accommodate new class schedules. As students learn about the site and its design both during and following completion, it will become a destination for group meetings, spontaneous conversations, and casual gatherings amongst a thriving ecosystem. Activities on the site will be formally publicised using outreach efforts instigated by the Society for Ecological Restoration-UW. The SER-UW is the organization that has thus far overseen work performed on the Heron Haven site, and has connections to a wide range of networks that reach across campus. Events on Heron Haven will be posted on the SER-UW calendar, shared in their weekly newsletters, advertised during club meetings, and discussed during SER-UW outreach events. Additionally, information about the Heron Haven is made available on the SER-UW website under "Current Projects", where the public can go to learn more about the site and reach out to Nikoli with questions.

As information about the Heron Haven site spreads through these outreach techniques, we will also work to build on our established educational partnerships with existing campus programs and curricula. Multiple departments on campus - L ARCH, SEFS, Biology, and ESRM - feature plant identification courses that require students to be exposed to living plant specimens. Two of the primary destinations for plant identification practice are the Union Bay Natural Area and the UW Arboretum, but their distance from main campus presents a challenge for students to access these natural areas. Once restored, Heron Haven will become a native plant demonstration area on main campus where students can learn about plants native to the Pacific Northwest - especially ones typically found in a forest understory.

In addition to the students who are actively seeking out native plant identification practice, interpretive signage and plant ID placards will create low-commitment educational opportunities for students, staff, and incidental visitors alike. This signage will be permanent installations on the Heron Haven site, and will have information on native plant species, the heron rookery, ecosystem services, and anthropogenic impacts on the environment. Alongside this signage, site visitors will be able to witness the decomposition of installed nurse logs and the life they harbor, exposing them to the slow processes that shape our native forests. There will be opportunities to observe the establishment of nesting sites by bird species who have lost many of their favorite food sources and trees to the influx of invasive species. Through making these processes and systems evident, the hope is to promote a sense of biophilia not only within recurring students involved on site, but also among people who may only visit the site once.

Instilling students with knowledge in the field of restoration ecology is a central goal for the Heron Haven site. Heron Haven will act as a living laboratory for students of ecological restoration and other programs in the ESRM and SEFS departments. As long as this project is stewarded by SER-UW, its care, management, planning, and labor will be overseen entirely by students. The opportunities for students to learn by managing a real restoration site, participating in boots-on-the-ground restoration work, and collaborating interdisciplinarily will help create well-rounded students who are better prepared to solve restoration problems outside the university environment. The site can even act as an inspiration for students to undertake similar projects on campus as it matures.

Student Involvement

The Society for Ecological Restoration-UW, an environmental group on campus, has been instrumental in the creation and development of the Heron Haven project. The Heron Haven Site Manager, Nikoli, has already involved members from every aspect of the organization in the restoration process. Site Managers of the SER-UW organize volunteer events, in which students interested in learning about restoration techniques are invited on a site tour, a tools safety lesson, and led through restoration activities that involve removal of invasive species and planting of native plants. Once Nikoli graduates, the management of the Heron Haven site will be passed onto another student, who will take on the task of maintenance and upkeep of the site. A new officer position will be created in SER-UW that is in charge of ensuring the success of Heron Haven, and our many other completed sites. Julianna Hoza, the Site Manager for the recently completed Paccar Site, will be assisting Nikoli in the leadership of Heron Haven, by monitoring the survival of many key species. Annabel Weyhrich, and Xavaar Quaranto will also be shadowing Nikoli during the entire process, holding work events with volunteers.

The Heron Haven site, as a site that requires extensive removal of English ivy and planting of hundreds of native plants, will host dozens of volunteer work events throughout the school year. Once the site is established, the Heron Haven site will need yearly maintenance performed by volunteers, which will provide ample opportunity for students of every background to become involved in restoration and sustainability activities. Several thousand volunteer hours will be required to restore Heron Haven, providing ample opportunity for students to become involved throughout the year long process. Volunteerism is just one of the many student activities that restoration of the Heron Haven will provide for students. In previous years, the SER-UW has hosted Service Learners, who are committed to volunteering with the SER-UW for the quarter. Heron Haven is a site that is uniquely large enough to allow the SER-UW to take on Service Learners again. Volunteers and Service Learners may become inspired by their time spent on the Heron Haven site to take on their own leadership position. And if not, the time spent on Heron Haven will still remain a valuable part of their ecological education at our university.

Research throughout the School of Environmental and Forestry Science has largely depended on students ability to travel great distances to perform field work. However, there are many students who are unable to travel to perform research, as they are constrained by time, finances, disabilities, or other factors. The presence of the Heron Haven site on campus, and with such close proximity to SEFS laboratories, allows for the unique opportunity for forestry and restoration research to be performed by students without the additional burden of travel. Already, an undergraduate student Julianna Hoza is designing a research project to monitor the survival of plant species established on restoration sites throughout campus to compare restoration practices. Some species that she will specifically monitor on this site are sword fern, salal, thimbleberry, and redwood sorrel. Research opportunities can be largely self-determined, and will be a collaborative effort between the student researcher and the current manager of the Heron Haven. Research projects have been conducted with

the SER-UW as a part of student capstones, and thus implementing further research projects at the Heron Haven site will be likely.

Explain How the Impacts Will be Measured

The environmental impacts of restoration sites are commonly measured by the ecological services the restoration site provides. The Heron Haven site will provide ecosystem services in the form of carbon sequestration, water filtration, oxygen provisioning, nutrient cycling, soil retention, and habitat provisioning. Current estimates suggest that individual trees can sequester several pounds of carbon per year (depending on the growth rate of the species of tree), sequestering up to nearly 50 pounds of carbon for mature trees. 50+ of trees will be planted on the Heron Haven site, and an estimated number of 30 trees surviving to maturity. Thus, with 20 trees pre-existing, the Heron Haven site has the ability to sequester roughly 2500 pounds of carbon in just trees alone. The Heron Haven site will sequester additional tons of carbon as felled logs from the UW Grounds log lot are installed on campus, saving the logs from being burned or otherwise disposed of. Additional calculations for water filtration, oxygen provisioning, nutrient cycling and soil retention can be made in similar ways with current plant physiological models.

Additionally, invasive and unwanted non-native species will be removed from site. These plants have detrimental effects on native flora and fauna, by replacing prime habitat with vegetation that provides little shelter or food. The amount of invasive English ivy removed per work party is recorded, with a total of over 1500 pounds of English ivy having already been removed from the site. An additional 4000 pounds of English ivy and other invasive species will need to be removed from the Heron Haven site. The number of volunteers who participate in activities on the Heron Haven site are also recorded in the required sign in sheet that is provided at SER-UW events, as well as the number of hours that individual volunteers had contributed to the project. Thus, both the number of individual volunteers who participated in the project and the total number of volunteer hours contributed to this site will be essential measurable impacts throughout the restoration process.

Sustainability Challenge

When looked at in reference to the three pillars of sustainability, Heron Haven currently lacks in all categories. Economically, maintenance on Heron Haven by UW Grounds includes many tasks that amount to several thousand dollars a year in costs to the university. Socially the site doesn't have any glaring equity or inclusion issues, but lacks in spaces for general use. Finally, the environmental condition of the site is deplorable and in dire need of restoration as discussed throughout this proposal.

The environmental issues with Heron Haven are numerous, and the primary reason for undertaking this work in the first place. The site has a limited ability to filter stormwater, function as habitat, provision oxygen, cycle nutrients, and act as functional habitat for countless native species. Two of the most critical issues that need to be addressed, are the site's ability to sequester carbon, and the survival of certain species given the harsh reality of climate change. Plants for the project will be sourced from various nurseries with the hope of obtaining as many unique genetic individuals as possible. In completing this project, all of these valuable systems will be returned to a functional state, and given the genetic variability needed to combat the changing climate.

A key piece of this project is the implementation of social spaces designed for anyone to utilize. These designed spaces range from a large wood round repurposed as a bench/table, to a therapeutic trail with ample seating for contemplation and casual chat; all of which will stand up to the elements for decades to come. The most valuable space for social activities, and the change that will save UW Grounds the most money, are the proposed forest meadows. These native floral plantings will replace the grassy knolls both on the southeast corner of the site, and northern triangle. The current turf grass lawns require biweekly mowing by grounds staff, emitting CO2, costing the university money, and disturbing the imperiled herons who require a near silent nesting habitat.

Project Longevity

One of the main goals of restoring this site is to make this forest grove more resilient and sustainable. The replacement of invasive weeds with native plants is inherently sustainable and will require diminishing effort to maintain over time. Installing a diverse understory will prevent invasive species from returning, and their natural propagation will eliminate the need for weed pulling and other maintenance activities that already have to occur yearly.

Restoration of the site depends on clearance of weeds, after which native plants can be installed. Plant installation will follow a schedule of initial planting, active maintenance, and then passive maintenance over time. Any planting done in a particular season will be actively maintained over a period of 5 years following installation. Active maintenance will include regularly scheduled volunteer events, plant replacement, and identification and analysis of plant mortality. After a period of 5 years, passive maintenance will begin to ensure the investment's survival. Passive maintenance will include volunteer events to remove weeds, with declining frequency over time.

This project will remain under the management of the SER-UW, which has been continuously and consistently stewarding restoration projects on campus since its inception in 2008. Funding for future volunteer events and plant replacement will be earmarked out of this funding request, and used at the discretion of the future Site Manager in SER-UW who will be individually dedicated to the continued oversight of Heron Haven. Stewardship of the site will be featured in future iterations of the Intro to Restoration Ecology course led by Jon Bakker, with work also slated to be done through the Restoration in North America course led by Caren Crandall. Over the course of the next year, the project will likely be seen by other SEFS and ESRM professors who want to get their students out in the field.

Potential Funding Reductions

Funding reductions would greatly affect the number of plants we would be able to purchase, and therefore the amount of ground we would be able to cover. Therefore, a 10% reduction in funding would be possible, but result in approximately a 10% reduction in the square footage that this project would be able to cover, and so on. Note that removing anything less than 100% of the weeds on the site within the project year will result in decreased sustainability and increased costs to maintain the site in the future, opening the door for invasives to recolonize the site, and wasting

Project Stakeholders

- Erik Brihagen (Heavy Equipment Manager)
- Kristine Kenney (Campus LA)
- Victoria Fox (SER-UW President and M.S. Student)
- Julianna Hoza (Site Monitoring)
- Grounds Crew Leads (Janelle Paterson, Natasha Lozano)
- SER Nursery Team (Chloe, Will)
- Professors (Jon Bakker, Caren Crandall, and likely others)
- Howard Nakase (UW Grounds)

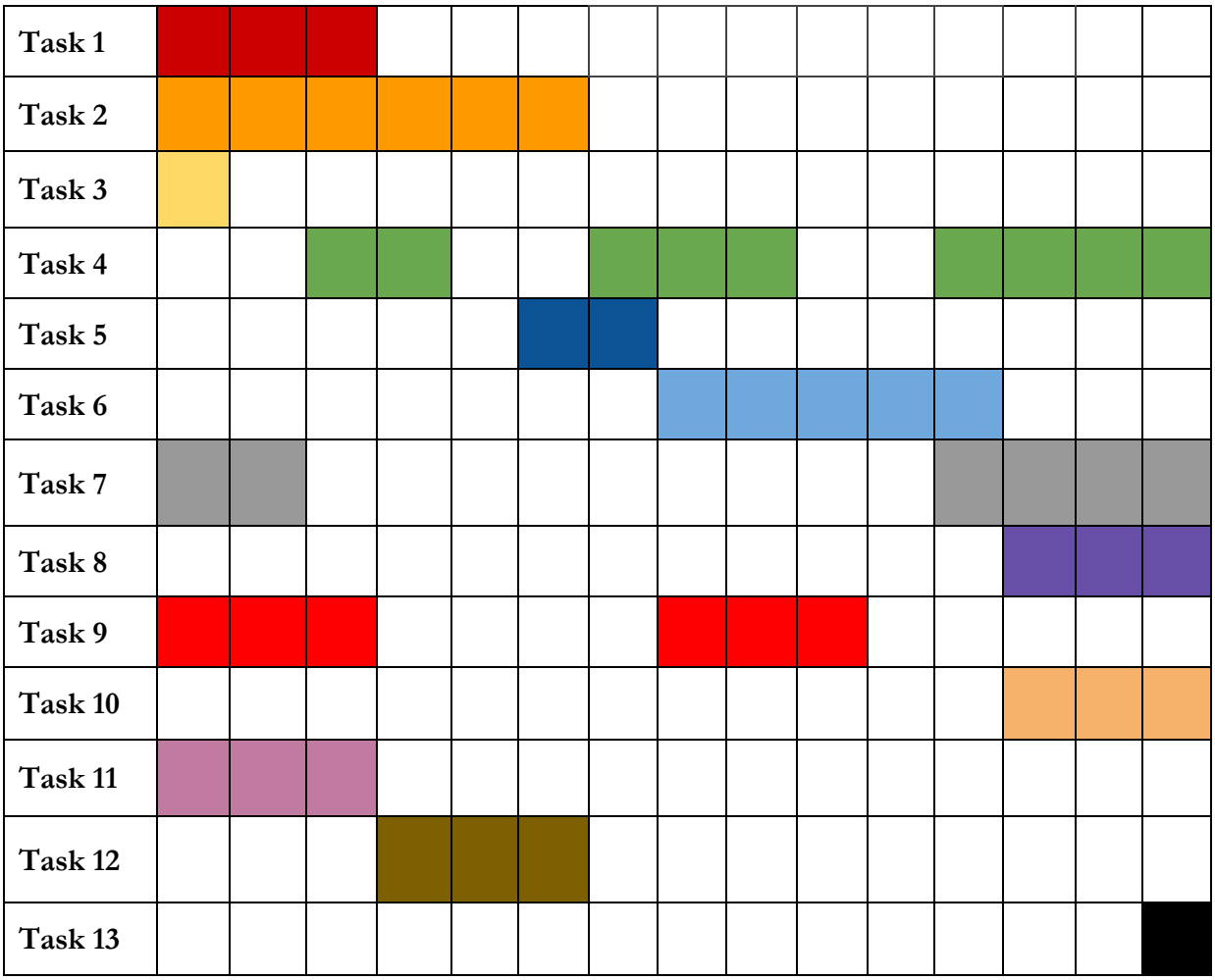
Work Timeline

The Gantt Chart below was created to keep our project on track and accountable for due dates. This Gantt chart will show what monthly tasks will be performed on site. This work schedule will also include dates or when important paperwork or other plans such as working on volunteer work parties will need to be completed. The chart is color coded depending on what the task requires, and will be updated as the project continues in the future.

Tasks:

1. **Design Planting Plan and Invasive Removal Technique Research**
2. **Removal of Invasive English Ivy and Other Invasives**
3. **Nurse Log Installation**
4. **Mulch Application**
5. **Ordering Plants**
6. **Planting Plants**
7. **Caging Plants**
8. **Preparing Future Management Framework**
9. **Large Volunteer Events**
10. **Final Report Submission**
11. **Capstone Coursework**
12. **Trail Building**
13. **Grand Opening Event**

Tasks: Color coded on task	Spring 2020			Summer 2020			Autumn 2020			Winter 2021			Spring 2021		
	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May


Task 1
Task 2
Task 3
Task 4
Task 5
Task 6
Task 7
Task 8
Task 9
Task 10
Task 11
Task 12
Task 13