

Fall 2022 Sustainability Scholars Program Internship Opportunity

The UBC Sustainability Initiative (USI) is pleased to offer current UBC graduate students the opportunity to work on funded sustainability internship projects. Successful candidates work under the mentorship of a partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing sustainability across the region.

- Visit the [Sustainability Scholars Program website](#) to learn [how the program works](#) and to [apply](#).
- Be sure to review the [application guide](#) to confirm your eligibility before applying.

Applications close at midnight on Sunday September 18, 2022.

Project title

Investigating invasive plant species distribution and composition within Stanley Park in response to a shifting climate

Project Background & Overview:

Stanley Park is a 405-hectare public park located within Vancouver, British Columbia and is home to a wide variety of diverse ecosystems, including mixed growth forests, meadows, wetlands and aquatic intertidal areas. Stanley Park is inhabited by a wide variety of flora and fauna, being home to at least 1500 native species of fungi, plants, invertebrates, birds and mammals (SPES 2022). The Park provides critical habitat for various threatened species such as Great Blue Heron (*Ardea herodias fannini*), Blue Dasher (*Pachydiplax longipennis*), and Barn Swallow (*Hirundo rustica*; BC CDC 2022).

Invasive species, defined as any organism which does not occur naturally within a given ecosystem and which contributes to harming native organisms, are an increasingly prevalent issue globally (Barney et al., 2013). The spread of these invasive species is now understood to be exacerbated by climate change (Kariyawasam et al., 2019). To mitigate the harmful impacts these alien species have on local ecosystems, and to generate effective management strategies, research into the composition, distribution and patterns of spread of these species is essential.

Much like various other regional, municipal and provincial parks within British Columbia, the spread of invasive plant species is of particular concern for Stanley Park. As climate change continues to cause shifts and changes to native plant communities, these stressors also influence the spread and composition of invasive plant species within the Park. To effectively preserve biological diversity within the Park and its various ecosystems, invasive plants must be managed and their spread halted. Effective invasive plant management relies first on understanding the prevalence of invasive species within the Park, with particular emphasis on identifying invasive plant species' distribution, composition and spread.

Project description

Since the windstorm of 2006, which greatly affected forest habitat within Stanley Park, SPES has continually been expanding the scope of its conservation research, mapping and stewardship programs within the Park. This has led to the generation of large amounts of spatial mapping data, which has the potential to give unique insights into the spread, distribution and composition of invasive plant species within the Park.

The main objective of this project will be to analyze this data and generate various invasive plant species maps using ArcGIS, which give an overview of the number of invasive plant species present, their distribution, and the composition of species throughout the Park. The prospective Scholar can then contrast data collected in previous years to determine changes to species' distribution, composition and identify if any new or emerging invasive species are present.

Through this research we hope to answer the following questions:

- What is the current composition, occurrence and distribution of invasive plant species within Stanley Park?
- How has composition, presence and distribution of invasive plant species changed over time?
- Has the rate of invasion increased in recent years? Does colonization by these non-native species coincide with abiotic conditions linked to climate change (i.e., increasing temperatures, dryer summer, increased winter precipitation etc.)?
- Can we make inferences to expected shifts in invasive plant species' composition, occurrence and distribution coinciding with the impacts of climate change based on our current understanding of the influence climate change has on invasive plant species?

Project scope

- Preliminary review of relevant background information, including research into various invasive plant species within the Lower Mainland, with an emphasis on species identification, mode of spread, and other characteristics that allow them to spread (i.e., allelopathy).
- Review previous State of the Park Reports for the Ecological Integrity of Stanley Park (SOPEI) to understand existing research into the impact that climate change has had on the Park over the past decade, and to contextualize conservation within the Park, the target species of the project, and help to bolster conclusions and recommendations in the final report.
- Standardize, organize and analyze spatial mapping data (using ArcGIS) that has been collected as far back as 2008 to create detailed invasive plant maps.
 - Maps to be developed may include single species maps, multi-species maps and temporal multi-species maps showcasing invasive plant species within Stanley Park.

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- The Scholar can also make use of various data collected by both SPES and external sources (i.e., the Provincial Government, Vancouver Port Authority etc.) to investigate potential links with seasonal abiotic conditions by year and the overall composition of mapped invasive plant species within the Park.
- Time permitting: In addition to analyzing previously collected data, there is potential for the Scholar to also work in the field, mapping previously unmapped areas of the Park for invasive plant species. Other SPES staff and/or volunteers will accompany the Scholar to aid in data collection if there is sufficient time available for additional mapping.

Deliverables

- A final report containing a summary of the work completed
- A final report for the online public-facing [Scholars Project Library](#).
- A presentation to the Conservation department of SPES in regards to invasive plant species presence, composition, and distribution within the Park.
- Updated, useable maps detailing past and current distribution, composition and presence of invasive plant species within the Park.

Time Commitment

- This project must be completed between October 17, 2022 and March 15, 2023
- The scholars are to complete hours between 9 am and 5 pm, Monday to Friday, approximately 10 to 12 hours per week.
- The Scholar will have a weekly check-in (time to be determined based on availability) with the Conservation Project Manager (CPM) to go over project progress, answer any questions, and resolve any other outstanding issues.
- If the Scholar is interested, they may also devote some of the time to attending SPES' Dedicated Invasive Plant Removal (DIRT) sessions, where they can get hands on experience removing invasive plants within the Park. This would be beneficial, as it would serve to contextualize the project, and aid in verifying the accuracy of previously mapped sections of the Park.

Required/preferred Skills and Background

- Excellent research and writing skills
- Demonstrated interest in sustainability
- Strong analytical skills
- Ability to work independently
- Deadline oriented
- Proficient in the use of ArcGIS
- strong background in data management
- GIS training or experience
- Familiar with GPS mapping equipment
- Familiar with identification of invasive plant species within the Lower Mainland/Metro Vancouver
- Familiar with Microsoft Office programs (Word, Excel etc.).

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☒ Familiarity with R and RStudio, an asset for this project

Additional project requirements.

The Scholar will be given a dedicated workspace within the SPES office (610 Pipeline Road) including a desktop computer (with access to ArcGIS and any other relevant programs), and will regularly interact with the CPM and other SPES staff throughout the week. If suitable, there is also potential that the Scholar can work remotely, providing the Scholar is able to access SPES servers via their own personal computer and can effectively coordinate with the CPM regarding scheduling.

For any potential field work done off-trails or in evenings, the Scholar will always be accompanied by at least one staff or volunteer. Safety equipment will be provided (gloves, safety vest, safety glasses).

GPS mapping, if applicable to the project, will be done either via a handheld GPS provided by SPES, or via personal mobile phone.

Applications close **midnight Sunday September 18, 2022**

Apply here: [Click here to apply](#)

Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions

Useful Resources

Below are some links to useful resources to help you with your resume and cover letter (there are many more online). Some of these resources also provide information on preparing for your interview.

<https://students.ubc.ca/career/career-resources/resumes-cover-letters-curricula-vitae>

<https://www.grad.ubc.ca/current-students/graduate-pathways-success>

<https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services>

About the Stanley Park Ecological Society:

Stanley Park Ecological Society (SPES) is a non-profit organization, which has a joint operating agreement with the Vancouver Parks Board (VPB), and advises the Park Board on conservation issues and matters pertaining to park management. In addition, SPES is responsible for stewardship within the Park, of which a large portion of work is dedicated to invasive plant removal. To better effectively manage the spread of invasive species within the Park, having a

more extensive overview of the distribution, composition and apparent spread of invasives within the Park will allow for more effective stewardship and management. Ultimately, this will lead to better long-term preservation of undisturbed native vegetation, and ensure that critical habitat is persevered and local ecosystems remain intact.

References

- Barney, J. N., Tekiela, D. R., Dollete, E. S., & Tomasek, B. J. (2013). What is the “real” impact of invasive plant species?. *Frontiers in Ecology and the Environment*, 11(6), 322-329.
- B.C. Conservation Data Centre: CDC iMap [web application]. 2022. Victoria, British Columbia, Canada. Available: <http://maps.gov.bc.ca/ess/sv/cdc/> (accessed 28 June 2022).
- Kariyawasam, C. S., Kumar, L., & Ratnayake, S. S. (2019). Invasive plant species establishment and range dynamics in Sri Lanka under climate change. *Entropy*, 21(6), 571.
- Stanley Park Ecological Society. 2022. Vancouver, British Columbia, Canada. Available: <https://stanleyparkecology.ca/ecology/wildlife/> (accessed 28 June 2022)