

Pesky Plant Identification

A guide to identifying challenging plants of Galiano Island



ER 412 / ES 471: Advanced Principles and Practice in Ecological Restoration

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Self-location

This report is written from the location of a settler studying Biology and Environmental Studies at the University of Victoria, which is located on the traditional territories of the Lekwungen speaking peoples. I would like to acknowledge the Songhees, WSANEC, and Esquimalt peoples whose ongoing relationship with the land continues to this day.

I am grateful for the opportunity to study with the Galiano Conservancy Association on Galiano Island, which is located on the ceded traditional territory of the Tsawwassen First Nation, and the shared and asserted unceded territories of the Penelakut, Hul'qumi'num, Lelum Sar Augh Ta Naogh, and other Coast Salish peoples. I am grateful to situate myself and acknowledge the people whose land I have had the opportunity to study and learn on.

Summary

The focus of this report is a Pesky Plant Identification project with the Galiano Conservancy Association (GCA). This project was established in 2022 to create streamlined identification guides of Galiano Islands most “pesky plants.” Each unique guide consists of a flowchart with descriptions and photos to narrow down different plant genera to the species found on Galiano Island. In 2022 UVic students created identification guides for a number of genera including forget-me-nots (*Myosotis*), Buttercups (*Ranunculus*), Woodrushes (*Luzula*), Bromes (*Bromus*), Annual Bluegrass (*Poa*), and Fescues (*Festuca*).

This report will outline the assessment and redesign of the previous year’s efforts and the addition of guides for the Speedwell (*Veronica*) and Bentgrass (*Agrostis*) genera. The guides consist of commonly known terms, but in some cases where more technical terminology is needed, definitions and diagrams will be added. Future applications to the Galiano Island

Conservancy restoration monitoring efforts will be discussed, along with a plan to spread the reach of the project to a wider public.

Background Information

The Galiano Conservancy Association (GCA) is a community-based land trust committed to the protection and conservation of a growing network of conservation lands. The flagship site and also the home of the GCA is the 76.1 ha Millard Learning Centre spans and is used as a place for restoration, education, and connecting with nature (Galiano Conservancy Association, n.d.). The Conservancy conducts restoration projects on this land that require consistent monitoring to track changes over time and inform future restoration. In the newly restored wetland ecosystems of the Cedars for the Next Century project, for example, staff and volunteers participate in annual monitoring to identify the presence and abundance of native and introduced species.

Introduced species pose a threat to these restoration efforts due to their strong growing patterns and lack of predators which allow them to take over landscapes and outcompete native species for shade, nutrients, and space (Potts, 2021). There are a number of introduced and native species on Galiano Island that resemble each other making it difficult to distinguish between them for the purpose of monitoring and cataloging species. The Pesky Plant Identification project is intended to support the Conservancy moving forward with restoration project monitoring. Consistent monitoring is an important aspect of ecological restoration because it accounts for unpredictable changes or shifts in the ecosystem, making the ability to record accurate data about plant species essential. Further, the guides created within this project can be expanded to the public as a way to identify plant species around the island.

Goals and Objectives

Goals:

The goal of the Pesky Plant Identification project is to create an efficient, simplified, and accessible tool for identifying and cataloging species for the GCA's restoration projects. The long term goal of the project is to create guides for all of Galiano Islands "pesky plants" to be combined into one compact book that can be used by the Conservancy and distributed to the public.

Objectives:

1. Create identification guides for two of the GCA's top priority genera, the Speedwells (*Veronica*) and Bentgrasses (*Agrostis*). These will be added to the previously made guides for the Forget-me-nots (*Myosotis*), Buttercups (*Ranunculus*), Woodrushes (*Luzula*), Bromes (*Bromus*), Annual Bluegrass (*Poa*), and Fescues (*Festuca*).

2. Provide an alternative method of identification to the commonly used Flora of the Pacific Northwest plant identification book. Although a good identification tool, this book is not practical for use in the field. It is over one thousand pages long and provides an in-depth dichotomous key to determine flowering plants in the Pacific Northwest, of which only a subset occurs on Galiano Island. Further, the keys use technical terminology and often require dissection of specific plant parts under a microscope.
 - a. Create condensed visual flowcharts using a combination of accessible terminology, photos, and diagrams that contain only the species found on Galiano Island.

3. Focus on creating identification guides for the grasses of Galiano Island. Grasses are an important but often overlooked aspect of ecological restoration, as they grow in disturbed sites and cover a large proportion of the land cover (Huff, 2009). Native and introduced grasses are extremely difficult to tell apart and identifying grasses in general is difficult due to their highly variable characteristics and the technical terminology used in many guides. Properly identifying and supporting native grasses can provide benefits such as shade, increased soil health, and erosion control without taking over the landscape once established (Huff, 2009).

4. Attach diagrams and definitions to guides when technical terminology is used to describe what the terms mean in a simple and condensed format making the guides accessible.

Methods/Design

Using the conservancy's list of top priority genera, guides for the Speedwells (*Veronica*) and Bentgrass (*Agrostis*) were created. Each genus of interest was researched to determine which species are found on Galiano island, and their defining characteristics. A combination of tools such as personal observations, iNaturalist, and the Flora of the Pacific Northwest (Hitchcock & Cronquist 2018) were used.

I found that 8 species of Speedwells (*Veronicas*) and 5 species of Bentgrasses (*Agrostis*) are found on Galiano Island. Using the flowcharts created during the 2022 project as a guide, I used the online platform *Lucid* to produce flowcharts for my genera of focus. For the Speedwells (*Veronica*) the flowchart separated the 8 species into pairs of two by their defining characteristics and a photo of the flowering body. Once separated into pairs, photos and descriptions of the flower's leaves were used to narrow down to individual species. The flowchart for Bentgrass

(*Agrostis*) was created by lining up each species to compare through visuals and descriptions of what makes them unique, as many of them are too similar to separate using common macro-observations. For both guides, definitions and diagrams for technical terms such as “pedicle” were added when necessary.

The 2022 guide for the Forget-me-nots (*Myosotis*) is attached below to demonstrate the template that my guides were adapted from (Figure 1). Due to each genus possessing different characteristics and variability within these characteristics, it was important to customize each flowchart to best fit the genus. For example, it was easier to separate species by macro characteristics such as presence of hair on stems, colour, and leaf shape for the Speedwells. On the other hand, the grasses were more variable and difficult to separate, which is why the Speedwell flowchart follows a more common dichotomous key style, whereas the grasses rely on photos and descriptions.

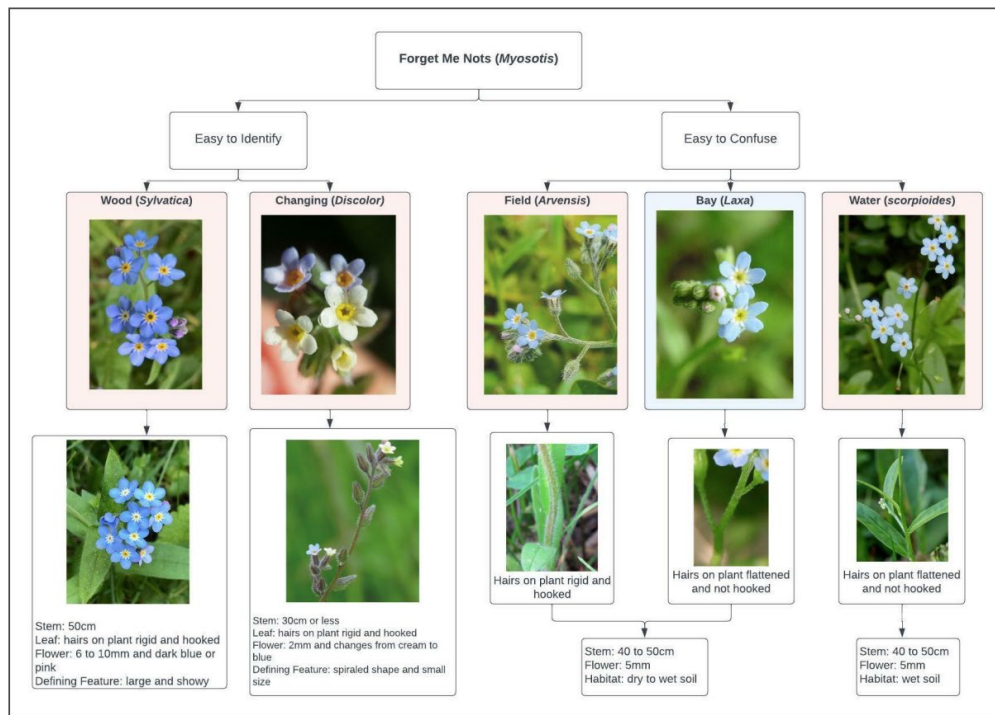


Figure 1. Flowchart for the Forget-me-nots (*Myosotis*) genus from the 2022 Pesky Plant project. From Stevens, C., Chabun, N., and Verheyen, Z. (2022). Pesky Plant Identification.

Results

Plant identification guides were created for the Speedwell (*Veronica*) and Bentgrass (*Agrostis*) genera. Each guide was adapted to the genus and narrowed down to only the species found on Galiano Island. The Speedwell (*Veronica*) guide (Figure 2) is straightforward to follow, and immediately splits the species into native and introduced simply by identifying if the plant stems are hairy or hairless. This is a useful distinction because even if the correct species cannot be identified, it ensures that at the very least somebody could distinguish an introduced Veronica and native Veronica just by that one feature alone. From that point, there are photos of the flowering body and leaf shape for each plant to help narrow it down to species.

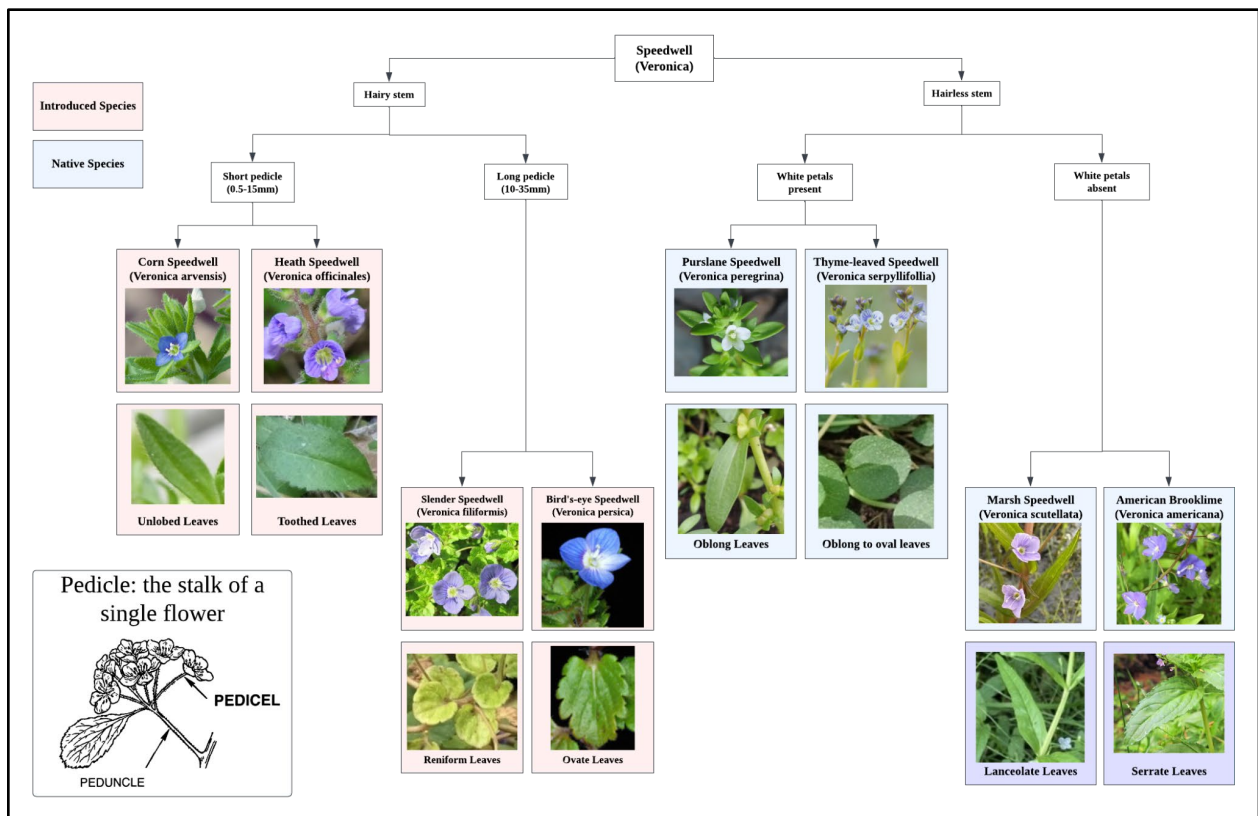


Figure 2. Flowchart for the Speedwell (*Veronica*) genus. The introduced species are highlighted in red, and the native species are highlighted in blue.

The Bentgrass (*Agrostis*) guide (Figure 3) follows a less traditional flowchart format due to the variable nature of grasses which make them difficult to separate dichotomously without using micro observations and technical terms. Therefore, a level of accuracy was sacrificed in order to make the guides usable in the field and by the general public. This revealed the difficulty in making all of the plant identification guides cohesive, as certain genera have more similarities between species than others. For some species, the absolute determination will require further research, but they still hold value in their accessibility, portability, and ability to condense photos and information about all the species of a particular genus found on Galiano Island.

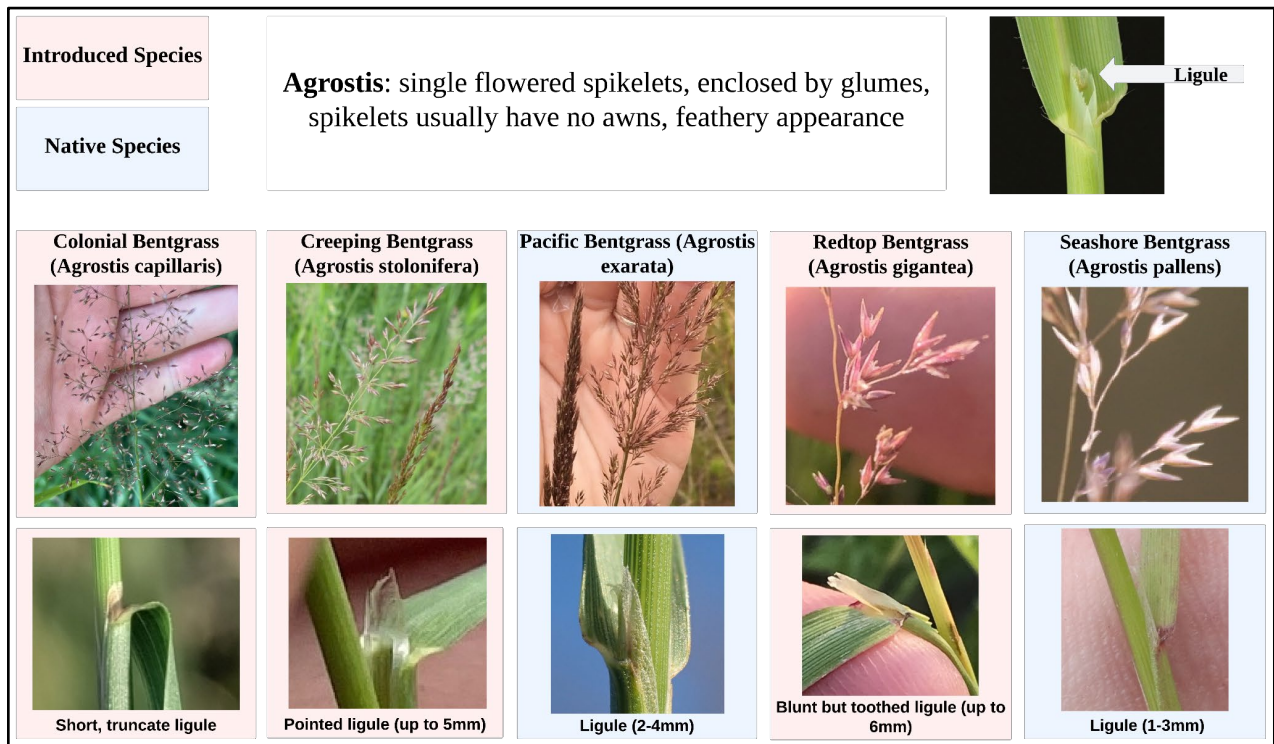


Figure 3. Flowchart for the Bentgrass (*Agrostis*) genus. The introduced species are highlighted in red, and the native species are highlighted in blue.

Future Recommendations

There is more work to be done, not the least being identifying additional genera to include. In the future I recommend creating guides for the following groups: Vetches (*Vicia*),

Clovers (*Trifolium*), Rushes (*Juncus*), Docks (*Rumex*), and Willowherbs (*Epilobium*). The Conservancy identified these as top priority groups based on employees' difficulty identifying species within them and the close resemblance between native and introduced species within the groups. The grasses were the most difficult to create guides for, so I recommend spending a considerable amount of time on the grasses to develop the best way to identify them. This could begin with an overarching guide to narrow down all grasses to genera, as there are currently only guides for each specific genera but not a way to get to the genera.

There are also a few design aspects that could be improved in the future, such as finding a way to increase the size of photos while keeping the guides a relatively portable size. One way to do this could be to create an online format in which photos and descriptions could be expanded to zoom in on features. An online version of the guides would also provide an easy way for people to use them without needing to print paper copies.

Further, a complete terminology page could be added to the front of the book of guides to give people an overview of terms that may be used throughout the guides. This could also be a place where more information on the species mentioned could be added. This could include Indigenous names for the native species mentioned, medicinal or edible uses, benefits to the ecosystem, or their preferred conditions. It is important to note that inclusion of Indigenous information in the guide would need to involve consultation with local First Nations first to ensure that information is accurate and willing to be shared in this format. These recommendations can be implemented within the creation of new guides, as well as added to previous guides. The login information to edit guides has been provided, so the project can be adapted and improved.

Conclusion

Two new guides were added to the Pesky Plant Identification Project with the GCA. The guides followed the template provided by previous guides with adjustments to each specific genus. These guides will provide the staff and volunteers of the GCA a way to efficiently identify species found on the island for the purpose of monitoring and cataloging species for restoration projects. The creation and analysis of guides from this year's project and the 2022 project led to several recommendations for the future including broadening its scope to the public and improving the design and accuracy of the guides. These recommendations can be implemented with the creation of the remaining guides.

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All guides created can be found and edited through the following LucidChart account:

Username: sarahkronner@uvic.ca

Password: PeskyPlants