

*Year Three of an Invasive Species Re-Occurrence Study Within Selected North Saanich Parks*

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## Introduction

The Coastal Douglas–Fir moist maritime subzone (CDFmm), forms less than .3% of the province; it extends from Victoria to Bowser along the eastern coastline of Vancouver Island including the Saanich Peninsula, as well as occurring within the Gulf Islands south of Cortes and near Halfmoon Bay on the BC mainland (Meidinger, D. and J. Pojar, 1991. ) The subzone climate consists of mild wet winters and dry summers that produce long growing seasons compared to other subzones within BC. It contains some of the most threatened ecosystem types in British Columbia. The Garry oak meadow and Arbutus-Douglas fir-Shore Pine types, for example, that once constituted a significant portion of the Greater Victoria and Saanich Peninsula landscapes at European settlement, have been much reduced first due to agriculture and then due to suburban and urban expansion. An internet site described the CDF as:” ... the least protected zone in BC and has the lowest number of large (>250 ha) protected areas. Of the 80 protected areas, only five are larger than > 250 ha, together covering 1% of the zone. Most of the protected areas are small, isolated land parcels surrounded by development. Almost one third of the land has been converted or altered by logging, agriculture, grazing, mining, and residential development. Less than 1% of the forest is old growth and <10% is older than 120 years.”) University of British Columbia, Faculty of Forestry Conservation Genetics Website, (2023). (<https://cfcg.forestry.ubc.ca/resources/cataloguing-in-situ-genetic-resources/cdf>).

Given the CDFmm’s limited extent and fragile nature, it is important to preserve the natural ecosystems found in the North Saanich municipality where long term residential development and agriculture has been the dominant pattern.

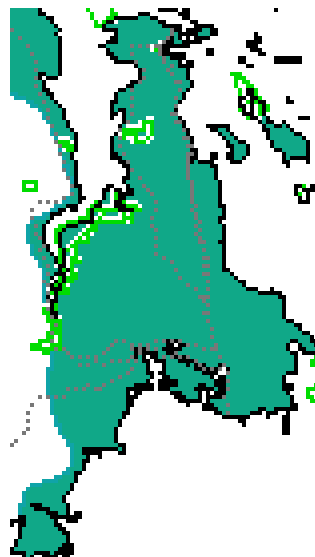


Figure 1: The CDFmm in Greater Victoria and the Saanich Peninsula. After: Integrated Land Management Bureau, Terrestrial Ecosystem Mapping. In: Madrone Environmental Services Ltd. Duncan BC. 2008. Coastal Ecosystem Mapping of the Coastal Douglas fir Biogeoclimatic Zone.

## Local Invasive Species Distribution and Removal

Since the 1850s in Greater Victoria and the Saanich Peninsula, invasive plants have been encroaching into most of the CDFmm undeveloped lands causing a gradual reduction in ecosystem health. However, over the last 40 years or more, a number of local volunteer groups have formed to address removal of invasive species and to undertake, in a number of cases, restoration of natural ecosystems on public lands. Most of the Greater Victoria public lands where invasive plant removal has occurred, consist of designated parks or small undeveloped natural protected areas. The subsequent restoration and/or monitoring of these lands have usually been conducted by local municipalities in collaboration with existing volunteer groups or by independent volunteer groups acting with the consent of local governments. Environmentally oriented organizations have also addressed invasive plant removal on their own holdings and a few volunteer organizations have liaised with private and institutional land holders.

Some key species removed by volunteers under the auspices of the organization Friends of North Saanich Parks (FNSP) include Daphne (*Daphne laureola* L.), English ivy (*Hedera helix*), Himalayan blackberry (*Rubus armeniacus*), as well as English or common holly (*Ilex aquifolium*). Invasive English laurel, privet, burdock, laburnum and thistle to name only a few, are also targets for removal.

Daphne has been an enduring popular garden plant chosen for its attractive leaves and its delicately scented flowers. Daphne, however, has proven to be one of the most resilient and persistent BC invasive plants. Daphne seeds are poisonous to humans, dogs and cats and its sap is toxic causing skin rashes on some persons who come in contact with the plant (M. Strelau, D.R. Clements, C. Webb, and R. Prasa 2018).

Because of the risk to the public, particularly to small children, the reappearance of many Daphne seedlings after adult removal is a cause for concern. As a result, understanding the nature of Daphne and its continued presence within North Saanich public parks is an important topic of study.

Over the past four years in several North Saanich parks, Daphne reoccurrence seemed linked to a long lasting seed bed; thick clusters of seedlings regrew in certain parks for several years after the adult plant removal. Studies substantiating this pattern have been made: "...Trials removing dense stands of Daphne on southern Vancouver Island showed a large germination event in year one and two following removal of mature plants, with hundreds of seedlings per square meter germinating in year one alone and at most a few tens of seedlings in year three (Webb, unpublished data)." (M. Strelau, D.R. Clements, C. Webb, and R. Prasa 2018).

## Summary Results for 2022

In 2022, FNSP reported the results of systematic invasive plant removal within a series of 9, 10X10m plots in selected North Saanich parks. The plots were located within several site

associations (Adams 2021, Williams 2021) representing a range of moisture and nutrient regimes; at least two plot locations were in the relatively drier Douglas fir-Arbutus-ocean spray (*Holodiscus discolor*), while several more were located in the mesic Douglas fir types, dull Oregon grape (*Mahonia nervosa*) and Salal (*Gaultheria shallon*). One treatment location was in the moister Cottonwood–red osier dogwood (*Cornus stolonifera*) and one in a Western redcedar-slough sedge (*Carex obnupta*) association.

The goal was to measure the rate of return of invasive species at these sites and to assess how successful the FNPS group was in their removal efforts. Another objective was to understand more about the yearly return for Daphne seedlings. The 2022 results indicated that for English ivy, there was regrowth from existing undetected roots remaining from 2020 where ivy was dominant invasive plant at the time of removal. However, there were only a few English ivy plants present as seedlings. There was small presence of H. blackberry canes in plots where adults had been present in 2020.

Based on the results of the 2022 assessment it was evident that: 1) removal by volunteers was understandably not completely effective even if the removal of invasive plants was rigorous, 2) that seeding in for English ivy was a more gradual process than for some other invasive species on these sites and, as a result, English ivy should be controllable in future with volunteers or municipal staff and 3) there was a need for continued monitoring of the selected parks where invasive removal had been conducted since further invasive species could vector in at any time or regrow from previously undetected roots.

The finding that there were a large number of Daphne seedlings after two years in some 10X10m plots where adults had been removed (over 8000 seedlings in one case) was a strong motivating factor to continue the removal study for several more years.

## 2023 Study Methods

Methods for the first study year are described in Hope and Zerrath (2022). In 2023, with a student assistant, FNPS members examined the same 9, 10X10m plots in North Saanich parks used in 2022 for further evidence of invasive species. Members counted each invasive plant removed and then calculated the total species number per plot according to plant age categories. The main age categories for 2023 were: Daphne seedlings < 1 year, Daphne 1+years, 2+years, 3+years and 4+plus years. Similar plant age categories were applied to English ivy and to any additional newly discovered invasive species. In 2023 we dried the harvested plant materials at 76C for 48 hours in an oven owned by The Restoration of Natural System's Program at UVIC. The dried material was subsequently weighed and recorded according to the plant species, numbers and age. The exception was Green Park where, due to logistics, the plant material was given estimated weights based on the current and previous harvestings for the species and its age category.

## Results and Discussion

Table 1 includes the species counts and dry weights as well as the percentage reduction from 2022 totals where the age classes were compatible. New invasive species and additional age categories were noted per plot compared to the 2022 listings.

Almost all North Saanich plots where the age classes of 2022 and 2023 could be compared showed a reduction in invasive species numbers. Holly seedlings did not persist in the Lillian Hoffar Park plots nor did Himalayan blackberry or privet return in the Nymph Point or Gulf View plots respectively. English ivy in both the Lillian Hoffar plots only totaled 27% of its previous year's numbers. However, English laurel was a new addition in one plot in this park.

The 2023 Daphne seedlings in Gulf View Park Plot 1 were reduced by 97% compared to 2022 and there was an accompanying 67% reduction of Daphne seedlings in Plot 2. Daphne seedlings which were the most abundant in Nymph Point Plot 2 during 2022, achieved a 39% reduction this year. The overall reduction from 2022 in invasive species for all similar categories and species was 74%. Quarry Park however showed a modest increase in Daphne seedlings that indicates, perhaps, a residual seedbed or a vector source that continues to bring seed in.

Older plants harvested in 2023 indicate that removal through human observation continues to be less than 100% especially on sites with thick ground cover. Newly vectored invasive species in the form of English laurel that appeared in Gulf View Plot 2 (34 individuals) was rather unexpected since this species was not heavily distributed in the park at the time of our initial removal.

Although more specific age categories were created this year compared to 2022 and most of these were new for the plots where Daphne, for example, was found. The reduction in English ivy and Daphne in most plots is the key finding for 2023. The persistence of Daphne seedlings at Nymph Point Park may be attributed not only to a large seed bed created by long term adult occupancy but the fact that Nymph Point Park contains a First Nations shell midden which would provide nutrients and moisture to the seedlings during drier conditions.

Table 1 Individual Invasive Species Count and Weight per 100m<sup>2</sup> for Selected Parks 2023

| Park           | Plot | Species | Age of Invasive | Counted Individuals | Dry Weight (gms)/100 m <sup>2</sup> | Comments: Reduction %, Additional Age Category/Plot, New Entry |
|----------------|------|---------|-----------------|---------------------|-------------------------------------|--|
| Lillian Hoffar | 1    | Daphne  | 1yr seedling    | 1                   | .15                                 | Additional Age Category  |
| Lillian Hoffar | 1    | Daphne  | <1yr seedling   | 6                   | .11                                 | 91%  |
| Lillian Hoffar | 1    | Ivy     | 2+years         | 33                  | 44.97                               | 74%  |
| Lillian Hoffar | 1    | Ivy     | 1yr seedling    | 1                   | .09                                 | 75%  |
| Lillian Hoffar | 2    | Ivy     | 1+years         | 1                   | .20                                 | Additional Age Category  |
| Lillian Hoffar | 2    | Ivy     | 2+years         | 34                  | 92.38                               | 70%  |
| Gulf View      | 1    | Laurel  | 1yr seedling    | 1                   | .17                                 | New Entry  |

|             |   |        |               |       |           |                         |
|-------------|---|--------|---------------|-------|-----------|-------------------------|
| Gulf View   | 1 | Ivy    | 2+years       | 2     | 1.75      | 82%                     |
| Gulf View   | 1 | Daphne | <1yr seedling | 10    | .40       | 97%                     |
| Gulf View   | 1 | Daphne | 1+years       | 4     | .40       | Additional Age Category |
| Gulf View   | 2 | Daphne | <1yr seedling | 1,188 | 89.62     | 67%                     |
| Gulf View   | 2 | Daphne | 1+years       | 11    | .60       | Additional Age Category |
| Gulf View   | 2 | Daphne | 2+years       | 1     | .10       | 99%                     |
| Gulf View   | 2 | Laurel | 1+years       | 34    | 2.45      | New Entry               |
| Nymph Point | 1 | Daphne | 3+years       | 1     | .21       | Additional Age Category |
| Nymph Point | 1 | Daphne | 1+years       | 15    | 1.02      | Additional Age Category |
| Nymph Point | 1 | Daphne | <1yr seedling | 154   | 4.02      | 86%                     |
| Nymph Point | 2 | Daphne | 1+years       | 11    | .84       | Additional Age Category |
| Nymph Point | 2 | Daphne | <1yr seedling | 5055  | 130.33    | 39%                     |
| Denham Till | 1 | Laurel | 3+years       | 1     | 124.81    | New Entry               |
| Denham Till | 1 | Daphne | 1+years       | 1     | .55       | Additional Age Category |
| Quarry      | 1 | Daphne | 3+years       | 1     | 5.63      | Additional Age Category |
| Quarry      | 1 | Daphne | 2+ years      | 9     | 1.18      | *Increase from 2022     |
| Quarry      | 1 | Daphne | <1yr seedling | 85    | 2.32      | *Increase from 2022     |
| Quarry      | 1 | Laurel | 1+ years      | 1     | .10       | New Entry               |
| Green       | 1 | Daphne | <1yr seedling | 9     | .23 Est.  | 36%                     |
| Green       | 1 | Daphne | 2+years       | 11    | 1.44 Est. | *Increase from 2022     |

## Acknowledgements

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## References

- Adams, K. 2021. The Assessment and Restoration of Seven Parks in North Saanich. 60pp.
- Hope, S. and A. Zerrath. 2022. Two Year Invasive Species Re-Occurrence Study in Selected North Saanich Parks. 5pp.
- Faculty of Forestry, University of British Columbia 2023. Centre for Forest Conservation Genetics website. <https://cfcg.forestry.ubc.ca/resources/cataloguing-in-situ-genetic-resources/cdf>.
- Madrone Environmental Services Ltd. (2008). Coastal Ecosystem Mapping of the Coastal Douglas fir Biogeoclimatic Zone.
- Meidinger, D. and J. Pojar. (1991). Ecosystems of British Columbia. British Columbia Ministry of Forests. 330 pp.

Strelau, L.M., D.R. Clements, C. Webb, and R. Prasad 2018. *Daphne laureolo* L. The Biology of Canadian Weeds: 156/Canadian Journal of Plant Science March 2018  
<https://doi.org/10.1139/cjps-2017-0247>

Williams, H. 2021. Ecological assessment of 7 parks in North Saanich, BC. Unpublished report prepared for the Friends of North Saanich Parks by Madrone Environmental Services.

**Cover Photo:**

Daphne seedlings growing in Nymph Point Park during 2023, taken by: Sharon Hope.