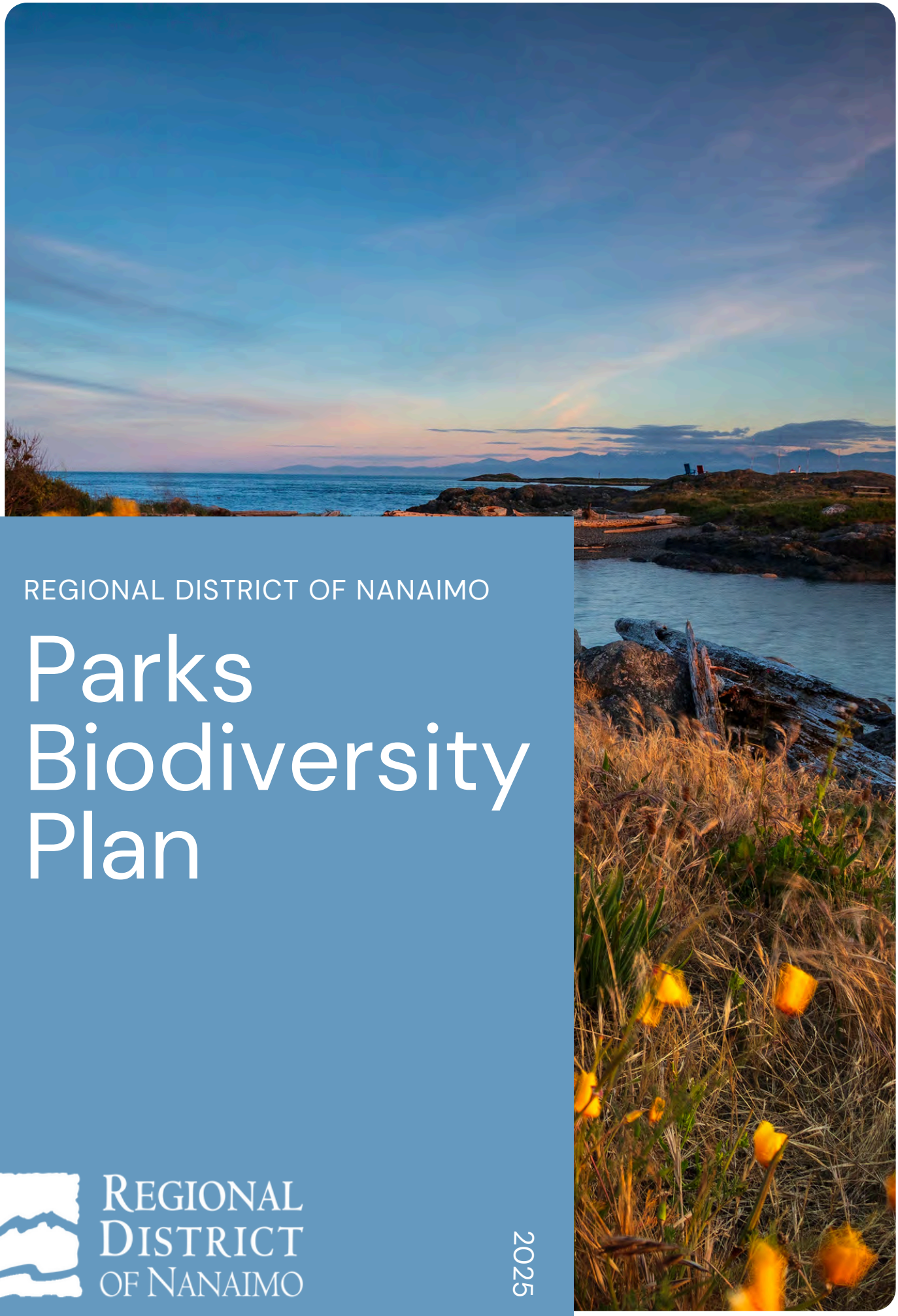

REGIONAL DISTRICT OF NANAIMO

Parks Biodiversity Plan

REGIONAL DISTRICT OF NANAIMO

2025

Acknowledgements

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The Regional District of Nanaimo acknowledges that it is situated on the traditional territories of the Snuneymuxw, Snaw-naw-as, and Qualicum First Nations, who have been deeply connected to the land and waters here for thousands of years.

This Parks Biodiversity Plan has been developed by McTavish Resource & Management Consultants Ltd. for the Regional District of Nanaimo to guide the conservation and enhancement of biodiversity within the district's parks. The plan outlines best practices, management and monitoring strategies, and an implementation plan designed to protect and promote diverse ecosystems while ensuring the sustainable management and recreational opportunities of the Regional District of Nanaimo's parks.

McTAVISH
RESOURCE & MANAGEMENT CONSULTANTS LTD.

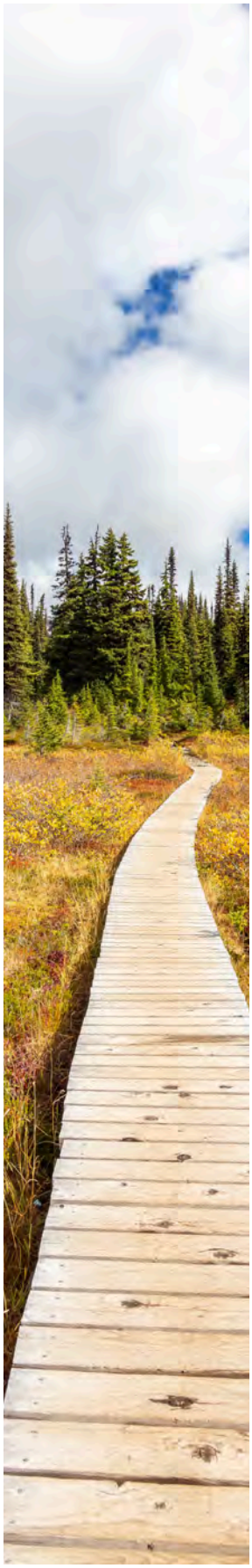
Table of Contents

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

There are many plant and animal images used throughout this report. Those marked with an "*" in the bottom right-hand corner are considered non-native or regionally invasive.



Glossary

Term	Definition
Biodiversity Assets	The various components of biodiversity, including species, habitats, and ecosystems, that contribute to the health and functioning of an environment.
Biodiversity Indicator	A measure or variable that is used to assess the health, diversity, and sustainability of an ecosystem or species population.
Biodiversity Risk	The potential negative impacts to the diversity of life within an ecosystem. This risk can vary depending on the existing level of biodiversity (e.g., low, medium, or high). Examples of biodiversity risks include the introduction of invasive species, pollution, habitat loss, and climate change all of which can disrupt ecosystems and reduce species biodiversity.
Critical Habitat	The habitat that is necessary for the survival or recovery of listed extirpated, endangered, or threatened species, and that is identified as critical habitat in a recovery strategy or action plan.
Ecosystem Resiliency	The ability of an ecosystem to recover from a disturbance (human or natural) such as habitat loss or the introduction of invasive species and return to its natural state.
Ecosystem Services	The benefits provided to humans by natural and functioning ecosystems, including clean air and water, crop pollination, climate regulation, resources, flood control, and cultural services.

Term	Definition
Invasive Species Risk	The potential negative impacts of invasive species on natural ecosystems, which can vary based on the characteristics such as rate of spread, toxicity, dispersal method, and habitat preferences. The risk level will help inform the appropriate management approach, whether it be control, eradication, or prevention.
Member Municipalities	Includes the City of Nanaimo, Town of Qualicum Beach, District of Lantzville, and City of Parksville.
Natural Areas	Areas of land that are largely untouched by human activity.
Natural Assets	Natural resources, such as forests, wetlands, and watersheds, that provide various ecosystem services.
Qualified Environmental Professional	A person with specialized education, experience, and training in environmental science and management who is registered in British Columbia with an accredited professional association and deemed qualified to assess and advise on environmental matters.
Rehabilitation	The process of improving the features, functions, and conditions of a degraded ecosystem or habitat, with a focus on enhancing its current conditions. It may not fully restore the area in question to its original state.
Restoration	The process of returning a degraded or disturbed ecosystem or habitat to a condition that closely resembles its natural, pre-disturbance state.
Riparian	Relating to the area of land adjacent to a river or stream, which plays a key role in maintaining water quality, reducing erosion, and providing wildlife habitat.
Standard Operating Procedures	A set of step-by-step instructions compiled by the RDN to help carry out work to complete a specific task.

Acronym/Abbreviation	Definition
BC	British Columbia
BCIMISWG	BC Inter-Ministry Invasive Species Working Group
BMP	Best Management Practices
CDC	Conservation Data Centre
CISC	Coastal Invasive Species Committee
DFO	Fisheries and Oceans Canada
DWWP	Drinking Water and Watershed Protection Plan
ECCC	Environment and Climate Change Canada
ENV	Ministry of Environment and Climate Change Strategy
ha	Hectare
IAPP	Invasive Alien Plant Program (InvasivesBC)
IPMA	Integrated Pest Management Act
IO	Incidental Observation
ISCBC	Invasive Species Council of British Columbia
LCC	Land Cover Classification
LG	Local Government
MM	Member Municipalities
MOE	Ministry of Environment

Acronym/Abbreviation	Definition
PBP	Parks Biodiversity Plan
PTS	Parks and Trails Strategy
QEP	Qualified Environmental Professional
RDN	Regional District of Nanaimo
SARA	*Species at Risk Act*
SO	Survey Observation
TEM	Terrestrial Ecosystem Mapping
VRI	Vegetation Resource Inventory
WCA	Weed Control Act

SYNOPSIS

INTENT OF THE PARKS BIODIVERSITY PLAN

In response to the rapid growth of the RDN and increased park usage, the RDN has initiated the development of a Parks Biodiversity Plan (PBP). This plan aims to provide a proactive approach to maintaining, enhancing, and restoring biodiversity for the diverse array of users within the region. The intent of the PBP is to identify major biodiversity values in the RDN parks system, and evaluate what parks are most at risk of biodiversity damage due to invasive species. With this knowledge, parks staff can better plan to improve, enhance and restore natural areas to ensure the Regional and Community Parks system:

- Provides a diversity of natural and cultural landscapes;
- Protects and stewards areas of ecological significance;
- Provides a diversity of outdoor recreational opportunities and learning experiences; and
- Provides opportunities for all residents to access, connect with, and enjoy nature (RDN Parks and Trails Strategy, 2022).

HOW TO USE THIS PLAN

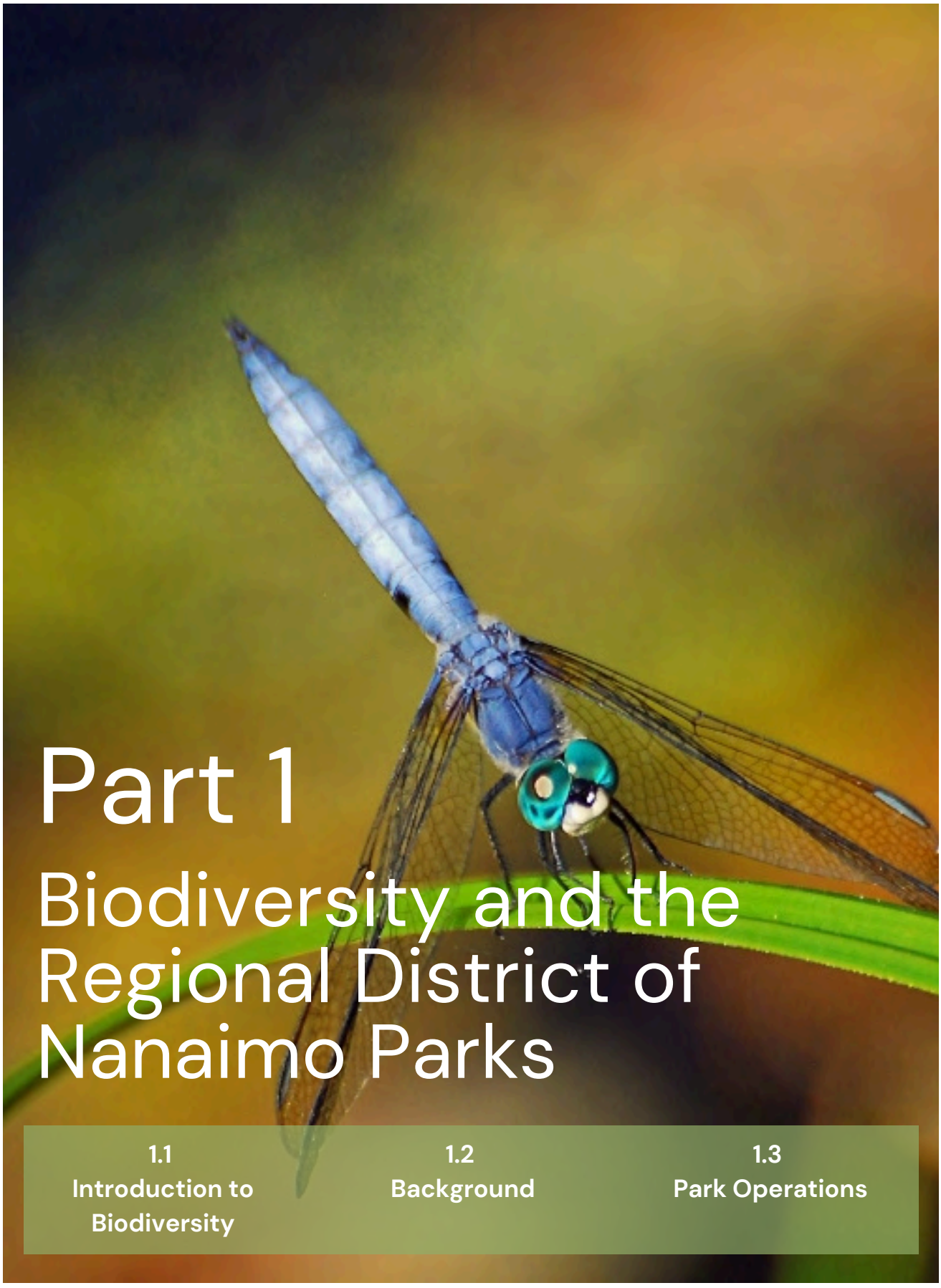
The PBP has four main parts, in addition to comprehensive appendices in order to meet the major objectives detailed below:

1. Learn about key contributors to RDN park biodiversity – **Part I and Part II of the PBP** offers a detailed overview of the fundamental factors that sustain and enhance biodiversity within RDN parks, based on provincial datasets. This knowledge will deepen the understanding of the region's diverse ecosystems and species. Additionally, information was provided to the RDN in a database for their continued use and tracking.

2. Explore invasive species threats to RDN Park Biodiversity – **Part I and Part II of the PBP** examines the impact of invasive species on the RDN park ecosystems, highlighting how their spread threatens biodiversity. Understanding these threats is essential for effectively prioritizing protection and restoration efforts. Additionally, information was provided to the RDN in a database for their continued use and tracking.

3. Identify RDN parks most at risk of biodiversity loss due to invasive species – **Part III and Appendix III of the PBP** provide detail on how Parks were categorized into Priority parks to determine which of the RDN parks may be most vulnerable to a biodiversity decline from terrestrial invasive species. These parks should be prioritized for targeted protection and restoration initiatives. Appendix IV provides detailed results for each park as well as visual representations for each Electoral Area.

4. Apply the outlined strategies to plan and execute biodiversity protection and invasive species management – **Part IV of the PBP** provides actionable strategies for preserving biodiversity and managing invasive species. The use of these guidelines is to help develop and implement effective conservation efforts aimed at safeguarding the natural ecosystems within the RDN. **Appendix VI** was developed to provide infographics for display and handouts on various management practices and invasive species.



Part 1

Biodiversity and the Regional District of Nanaimo Parks

1.1 Introduction to Biodiversity

WHAT IS BIODIVERSITY?

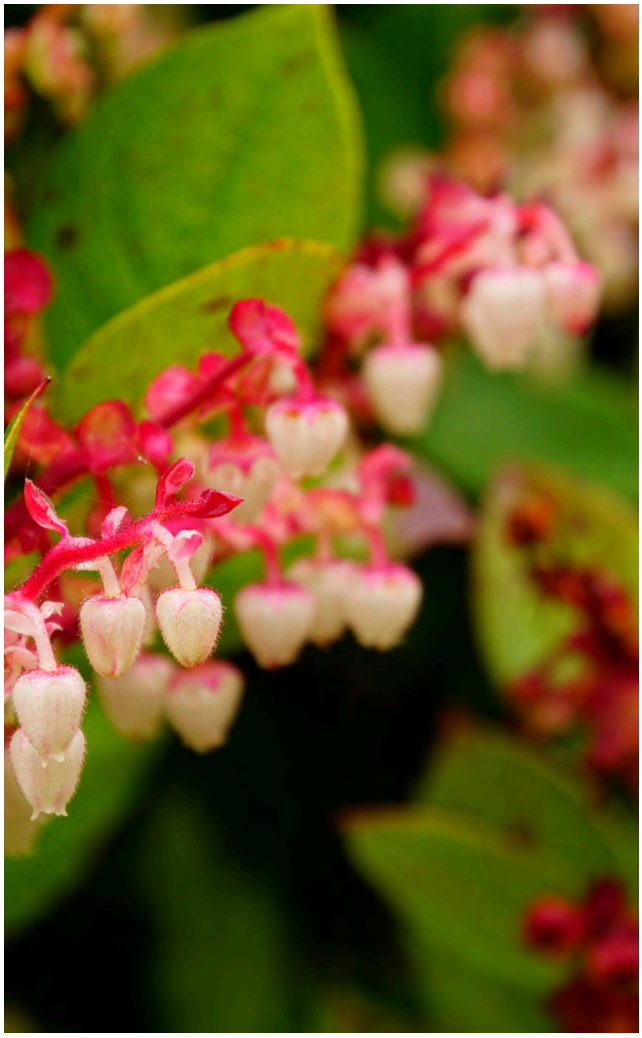
Biodiversity refers to all the different biotic components of an ecosystem and the ecological processes that occur among them. The three different types of biodiversity include species, genetic, and ecosystem diversity.

WHY IS BIODIVERSITY IMPORTANT?

Biodiversity plays a crucial role in maintaining healthy and resilient ecosystems, which in turn provide numerous ecosystem services that benefit people. These services include clean drinking water, stormwater and flood management, pollution absorption, crop pollination, improved air quality, and climate change mitigation.

However, human activities and their impacts have significantly altered biodiversity worldwide. In some areas, such as urban or highly disturbed landscapes, biodiversity is low. In other areas, such as National Parks or Conservation Areas, biodiversity remains high, requiring various levels of management to ensure protection of these natural assets.

The restoration of ecosystems to their historic level of biodiversity has gained prominence in recent years, with the establishment of various organizations and strategies such as Canada's 2030 National Biodiversity Strategy and BCs draft Biodiversity and Ecosystem Health Framework.



A signatory of the Convention on Biological Diversity, Canada has committed to four goals and nineteen targets that contribute to the protection of biodiversity. One primary goal being that by 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional, and national scales (CBD 2010). Consequently, managing and maintaining biodiversity has become an increasingly important aspect of regional planning and initiatives.

WHAT DOES GOOD BIODIVERSITY LOOK LIKE?

Good biodiversity in an area can be represented by some of the following features:

Species Richness – A high number of different species, including plants, animals, fungi, and microorganisms, which contributes to the overall health and resilience of the ecosystem. Species richness is linked as well to genetic diversity within species which is important in order to allow populations to adapt to changing environmental conditions and resist diseases

Ecosystem Complexity and Variety– Complex interactions among species and their environment, including food webs, symbiotic relationships, and nutrient cycling, which support ecosystem stability and productivity. This includes habitat and plant community diversity such as a variety of forests, wetlands grasslands and aquatic environments providing niches for different species to thrive.

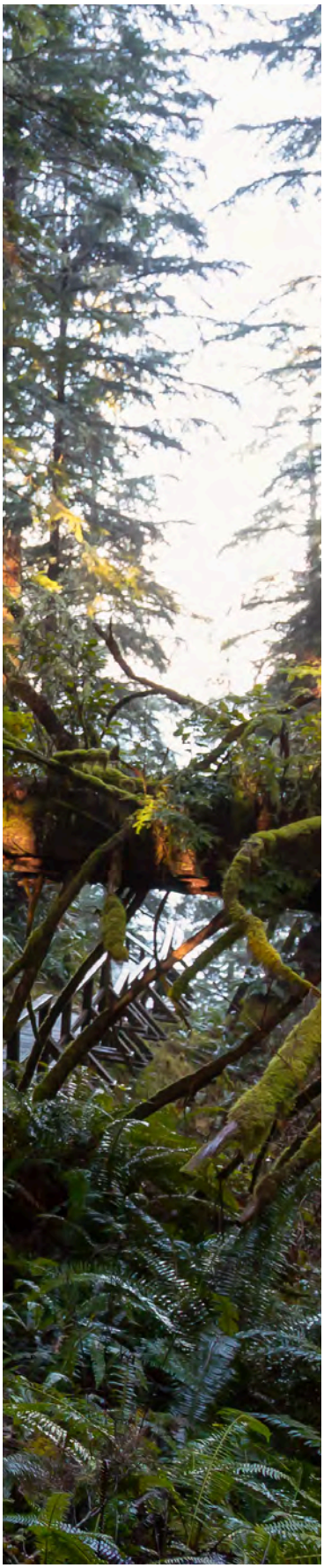
Presence of Keystone and Endemic Species – Species that have a significant impact on their ecosystem, or that are unique to a specific area, helping to maintain the structure and function of the community.

Functional Diversity – A variety of ecological roles or functions performed by organisms, such as pollination, decomposition, and predation, which are essential for ecosystem processes.

Habitat Connectivity – Well-connected habitats that allow for the movement and dispersal of species, promoting genetic exchange and resilience to environmental changes. Habitat connectivity is often fragmented by roads, trails, and hard infrastructure in more urban environments.

Resilience after Natural Disturbance – Natural disturbance can both benefit and damage biodiversity. In healthy ecosystems, disturbances are needed to encourage new stages of growth, build soil nutrients and maintain population equilibrium. Inversely, in fragile ecosystems it can reduce biodiversity and ecosystem function. Resilient ecosystems adapt quickly after natural disturbances.

Ecosystem Services – The benefits provided by the ecosystem to humans, such as clean water, air, food, and recreational opportunities, which are often enhanced by high biodiversity.

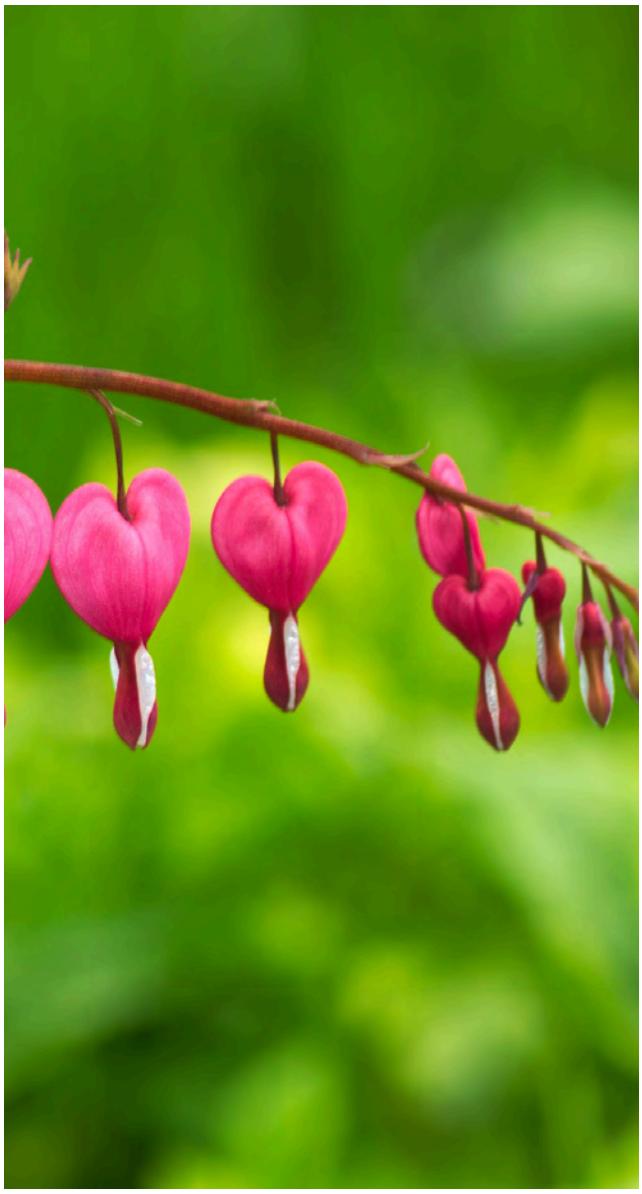


WHAT ARE RISKS TO BIODIVERSITY?

Natural disturbances, such as forest fires and seasonal flooding in areas like the Nanaimo River watershed, pose sudden risks to habitats, threatening the survival of various species. While many ecosystems have adapted to occasional disturbances, the increasing intensity and frequency of fires—aggravated by drier summers—place species such as the endangered Western Screech-Owl and Coastal Cutthroat Trout at greater risk. Additionally, heavy rains can lead to flooding in low-lying coastal areas, which alters habitats and stresses native plant and animal populations.

Pressure from Population Growth, including development and urbanization, further contribute to habitat fragmentation and biodiversity loss, presenting serious risks to biodiversity in the Regional District of Nanaimo. As communities like Nanaimo, Lantzville, and Parksville expand, land conversion for housing developments, commercial areas, and road networks disrupts native habitats. This fragmentation limits the natural movement of animals, impacting species such as the Vancouver Island Marmot and Roosevelt Elk, which rely on large, connected landscapes to thrive. Infrastructure projects, including major highways like the Island Highway, create physical barriers that interfere with migration routes and restrict access to crucial resources, further isolating populations and compounding risks to biodiversity.

Climate change poses additional risks to biodiversity on eastern Vancouver Island, as rising temperatures and shifting weather patterns introduce new ecological pressures. For instance, warmer waters around the island have attracted species like the Humboldt Squid, which prey on local fish and



disrupt the marine ecosystem. Additionally, invasive species such as the European Green Crab have taken hold in coastal areas, outcompeting native crabs and altering the balance of local estuarine habitats. Climate-driven shifts in seasons are also impacting local plants and animals, with species like the Pacific Salmon facing challenges due to altered stream flow patterns and warmer river temperatures, which impact their spawning cycles and add further risks to biodiversity.

Human behavior remains a key factor in the risks to biodiversity on Vancouver Island. A lack of ecological awareness often leads to actions that unintentionally harm local species. For example, the improper disposal of garden waste can introduce invasive plants, such as Scotch Broom and English Ivy, into natural areas where they spread rapidly and crowd out native plants. Similarly, people may unknowingly introduce non-native species into water systems through boating and fishing activities, such as releasing baitfish or transferring invasive aquatic plants on boats. Without an understanding of how these actions impact ecosystems, local biodiversity continues to face increased risks, underscoring the need for more education and responsible practices to protect the unique wildlife of the Regional District of Nanaimo and beyond.

It is important that, as new information is gathered and made available, these data are integrated into our management strategies. Similarly, as new environmental pressures emerge, it behooves us to understand and adapt in order to best manage and protect our biodiversity and important ecosystems.

WHAT ARE INVASIVE SPECIES?

Invasive species, including plants, animals, and insects, are those that occur outside of their natural range and cause significant ecological, economic, and environmental damage. These species tend to be prolific and adaptable, frequently outcompeting native species for resources.

While this plan focuses mostly on invasive plant species, there are a number of invasive animals and insects impacting our region, including Zebra mussels (*Dreissena polymorpha*), common goldfish (*Carassius auratus*), common rabbits (*Oryctolagus cuniculus*), European chafer beetle (*Amphimallon majale*), and Red-eared slider turtles (*Trachemys scripta elegans)*. Management and control of faunal invasive species is often much more challenging on a regional scale, as their populations and migrations are more challenging to track and are therefore and are therefore governed under Provincial and Federal jurisdiction.

The effects of invasive species include, but are not limited to the following:

Competition for Resources – invasive species often outcompete native species for resources such as food, water, light, and habitat, which can lead to the decline or extinction of native species.

Predation – some invasive species are predators of native species (e.g., brown-headed cowbird) which can dramatically reduce the population of native species, displacing them and potentially leading to extinction.

Diseases – invasive species can introduce new diseases to native populations that may lack immunity or resistance, causing population declines.

Hybridization – invasive species can interbreed with native species, creating hybrid species that can dilute the genetic pool of native species and reduce their numbers.

Alteration of Habitat - invasive species can modify the physical environment in ways that make it less suitable for native species. For example, some plants alter soil properties, which can reduce soil productivity.

Ecosystem Processes – invasive species can disrupt ecosystem processes such as nutrient cycling, fire regimes, and hydrology, leading to cascading effects throughout the ecosystem.

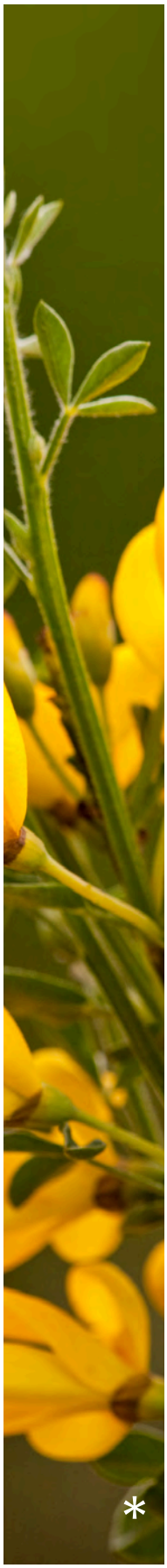
Human Safety and Health – certain invasive species, like giant hogweed or poison ivy, pose threats to human safety if they come into contact with skin. Invasive plants can also cause severe health issues if ingested.

Agricultural – many invasive plants outcompete agricultural crops and can pose severe health risks to livestock.

Cultural – some native plant species are important to Indigenous peoples for foraging, medicinal purposes, and cultural practices. The spread of invasive species can affect the abundance of these native plants through competition.

Social– invasive species can impact community wellbeing and recreational experiences by altering the landscape, diminishing ecosystem functions, and reducing the aesthetic value of natural areas.

Economics – invasive species can impose significant economic costs, including damage to infrastructure, reduced agricultural yields, and decreased property value. Additionally, industries such as forestry and fisheries may face higher operational costs. Failing to implement management plans can result in long-term economic burdens, including more extensive and costly remediation efforts.



1.2 Background

The RDN is situated on the traditional territory of the Coast Salish Peoples. The RDN encompasses 2,068 km^2 along the east coast of Vancouver Island, ranging from Cedar to the south and Deep Bay to the north. The RDN encompasses seven Electoral Areas and includes the Gabriola, Mudge, and DeCourcy Gulf Islands, as well as the Member Municipalities (MM) of the City of Nanaimo, City of Parksville, Town of Qualicum Beach and District of Lantzville. The biological diversity ranges from the sea to alpine terrains, with many areas of cultural significance and recreational opportunities.

The RDN has 12 regional parks, two conservation/preserve areas, and 235 community parks, water accesses and trails. These areas host a diverse array of ecosystems and wildlife species that provide, ecological, social, and economic opportunities for both its users and surrounding citizens.

ABOUT THE RDN PARKS AND TRAILS

Parks and trails in the RDN are divided into two main categories: **regional** and **community**.

The primary goal of **regional parks** is to protect a diversity of natural and cultural landscapes while offering outdoor recreational opportunities. A regional parks classification system is used to clarify each park's primary focus and provide a clear picture of how the park is used and managed.

Currently the regional parks and trails system has two conservation areas, two recreational areas, eight regional natural areas, and ten regional trails. Conservation and natural areas are designated to protect important environmental values and sensitive ecosystems and provide an opportunity for the public to connect with nature.

The primary goal of **regional trails** is to serve as recreation corridors, linking the public to natural spaces across each of the RDN Electoral Areas.

The primary goal of **community parks** is to protect open spaces and the environment and provide social and recreational opportunities to the public. They are designed to serve local electoral area residents.

PARKS BY ELECTORAL AREA

The distribution of parks across electoral areas is uneven, with each electoral area containing a varying number of existing parks. The following summarizes the number of parks in each electoral area:

ELECTORAL AREA A: 18 parks (16 Community Parks including two beach accesses and two boat launches, one Regional Park, one Regional Trail)

ELECTORAL AREA B: 42 parks (29 Community Parks including one boat launch, five Community Trails, two Regional Parks, six water accesses)

ELECTORAL AREA C: 20 parks (14 Community Parks, two Regional trails, four Regional Parks)

ELECTORAL AREA E: 42 parks (31 Community Parks, nine Community Trails, two Regional Parks)

ELECTORAL AREA F: 21 parks (15 Community Parks, four Community Trails, one Regional Park, 1 trail)

ELECTORAL AREA G: 43 parks (33 Community Parks including four beach accesses, seven Community Trails, one Nature Preserve, one Regional Conservation Area, one Regional Park)

ELECTORAL AREA H: 40 parks (32 Community Parks with 10 beach accesses, seven Community Trails, one Regional Park)

MEMBER MUNICIPALITIES: 1 arboretum (while not classified as parkland, this property is owned by the Regional District of Nanaimo, and stewarded by RDN Parks Services

RDN PLANS AND STRATEGIES

As a local government, the RDN is responsible for providing a variety of park services on behalf of its citizens. The RDN follows a series of plans and agreements to ensure all initiatives are in alignment. **Table 1-1** below outlines plans, agreements, and frameworks that influence the development and implementation of this PBP.

Table 1-1. Relevant RDN Plans, Agreements, and Frameworks

Plan/Policy/Framework	Relevant Goals/Actions	Relevance to PBP
2023 - 2026 RDN Strategic Plan	Goal 1: Protect our Vital Lands and Ecosystems.	Defines how the RDN aims to improve and protect sensitive lands through the acquisition of Park lands, collaboration with other opportunities, and refining development approval processes.
2022 RDN Parks and Trails Strategy	Goal 4: Protect and enhance natural parkland areas through management and restoration.	Identifies the need for an invasive species management plan, prioritization of environmental protection in Park Management Plans, and development of a Wildfire Risk Management Strategy that aligns with ecological protection goals.
2014 Community Parks Strategic Plan	Goal 3: Protect the Environment.	Details the function and guidelines for managing community parks in the region and defines the classification of "Natural Parks" as prioritizing natural features.

Plan/Policy/Framework	Relevant Goals/Actions	Relevance to PBP
2021 Climate Action Technical Advisory Committee Actions	Action 2: Review and update existing RDN land use and building policies, bylaws, and regulations to remove barriers to climate mitigation and adaptation and ensure RDN policies support climate-appropriate development and operations.	Recognizes the threat of climate change to natural assets and behoves the RDN to integrate climate adaptation strategies into future plans and policy updates.
2020 Drinking Water and Watershed Protection Action Plan	Goal 1: Protect, manage and restore ecosystems and the overall health and functioning of watersheds and aquifers.	Watershed health is linked to ecosystem health, and the level of invasive species within the RDN compromises the overall resiliency of an ecosystem. In protecting the biodiversity of parks and natural areas, the threats posed by invasive plant species and climate change can be reduced.
Land Use Agreements	Joint ownership agreements, leases, licences and covenants.	Individual agreements define specific actions and limitations allowed on some park properties.

Plan/Policy/Framework	Relevant Goals/Actions	Relevance to PBP
RDN bylaw No. 1801, *Parks Use Bylaw* (2019)	Section 19: No person except the holder of a Park Use Permit specifically authorizing the action shall: Cut down a tree or remove cut or fallen wood or any other vegetative matter; Remove water from a watercourse or body of water in a park; Pick, cut prune, top, apply herbicides, fungicides, insecticides to damage or destroy any natural park feature; Plant vegetation.	Outlines the conditions and limitations to permit reasonable use of parks for outdoor recreation and enjoyment, while at the same time preserving and protecting natural park features. It provides RDN Bylaw Services with the power to enforce and recover costs from violations to the Bylaw.

POLICY AND LEGISLATION

Invasive species are regulated at the federal and provincial levels. Most regulations focus on invasives species that have the potential to result in economic harm. While the RDN does not have any bylaws that explicitly regulate the spread of invasive species, it adheres to provincial and federal regulations. In addition, the City of Nanaimo has several relevant bylaws that regulate pesticide use. Key regulations that restrict and manage invasive species at the federal, provincial, and municipal levels along with best management practices (BMPs) and guidelines are summarized in **Table 1-2**.

Table 1-2. Federal, Provincial, and Municipal Invasive Species Management Regulations and Best Management Guidelines

Authority or Organization	Act/Regulation/Bylaw	Relevance
FEDERAL		
Environment and Climate Change Canada (ECCC)	*Plant Protection Act* (S.C. 1990, c.22)	Identifies a list of species that are considered pests in Canada. Regulates the distribution of these species. Species include diseases insects, plants, nematodes, etc.
ECCC	*Species At Risk Act* (S.C. 2002, c. 29)	Provides protection for at risk species listed under Schedule 1 of the Act from (1) direct harm; and (2) destruction of critical habitat on federally managed lands.
Fisheries and Oceans Canada	*Fisheries Act* s. 36(3) & (4) prohibition	Provides a framework for the proper management and control of fisheries and the conservation and protection of fish and fish habitat, including pollution prevention.
Health Canada Pest Management Regulatory Agency	*Pest Control Products Act* (S.C. 2002, c. 28) & Regulations (SOR/2006-124)	Seeks to minimize health and environmental risks posed by pest control products and encourages the development and implementation of innovative, sustainable pest management strategies by facilitating access to pest control products that pose lower risks. The Act encourages public awareness of pest control products.

Table 1-2. Federal, Provincial, and Municipal Invasive Species Management Regulations and Best Management Guidelines (Continued)

Authority or Organization	Act/Regulation/Bylaw	Relevance
PROVINCIAL		
BC Inter-Ministry Invasive Species Working Group - BC Ministry of Forests, Lands and Natural Resource Operations	BC *Weed Control Act* (WCA; RSBC 1996, c.487) & Regulation (B.C. Reg. 66/85)	Defines provincial and regional noxious plants and imposes a duty on all land occupiers to control them. The purpose of the Act is to protect the province's economy, natural resources, and society from the negative impact of foreign weeds. The BC WCA is enabling legislation that provides a mechanism for the province or local governments to plan, implement and enforce locally developed weed control plans.
BC Ministry of Environment	BC *Integrated Pest Management Act* (SBC 2003, c.58) & Regulation (B.C. Reg. 604/2004)	Governs the use of pesticides and outlines general criteria for integrated pest management programs in BC. the Act regulates the sale, containment, transportation, storage, preparation, application and disposal of pesticides. The IPMA requires that certain applicators be certified and regulates the application of pesticides for commercial and industrial use on all public land and on private lands used for forestry, utilities and transportation.
BC Ministry of Environment and Climate Change Strategy (ENV)	BC *Environmental Management Act* (SBC 2003, c.53)	Regulates waste discharge from prescribed industries, trades, businesses, operations and activities into the environment through the issuance of authorizations under s.6(2) and 6(3).
BC Ministry of Forests (FOR)	BC *Wildlife Act* (RSBC 1996, c.488)	Protects native vertebrates, including migratory birds and raptors, from direct harm and affords protection to the nests of species listed under s.34. Vegetation management activities have the potential negatively impact important features such as an active bird nest, amphibian or fish habitat. Measures to avoid contravention of The Act must be implemented.

Table 1-2. Federal, Provincial, and Municipal Invasive Species Management Regulations and Best Management Guidelines

Authority or Organization	Act/Regulation/Bylaw	Relevance
LOCAL GOVERNMENT (Continued)		
City of Nanaimo	Bylaw No. 7102, *Pesticide Use Bylaw* (2010)	Prohibits the use and/or application of pesticides for maintaining vegetation established for aesthetic and ornamental reasons.
	Bylaw No. 7242, *Property Maintenance and Standards Bylaw* (2017)	Requires every owner or occupier of property to remove from their property all noxious weeds and all brush or overgrowth which becomes a nuisance.
City of Parksville	Bylaw No. 1383, *Property Maintenance Bylaw (2016)*	Prohibits property owners from causing or permitting the growth of noxious weeds on their parcel, and requires property owners to manage the growth of weeds and grasses
	Bylaw No. 1503, *Goats for Vegetation Management Bylaw (2014)*	Permits the use of goats as a means of vegetation management as part of regular land maintenance.
Town of Qualicum Beach	Bylaw No. 650, *Pesticide Use Bylaw (2010)*	Prohibits the use of, or the ability to grant permission to use pesticides (including herbicides) on private property. Defines exceptions for use to protect economy, health, or spread of noxious weeds.
	Bylaw No. 722, *Control of Noxious Weeds and Grasses (2018)*	Requires all property owners to keep properties clear of noxious weeds and grasses, and allows for the enforcement of orders to remove noxious weeds on private property
District of Lantzville	Bylaw No. 200, *Good Neighbour Bylaw (2021)*	Requires landowners to manage any accumulations of vegetation, dead landscaping, weeds or noxious weeds occurring on private property.

Table 1-2. Federal, Provincial, and Municipal Invasive Species Management Regulations and Best Management Guidelines

Authority or Organization	Act/Regulation/Bylaw	Relevance
BEST MANAGEMENT PRACTICES & GUIDELINES		
Invasive Species Council of BC	Best Management Practices for Business, Industry, and Government	Developed to minimize the introduction, establishment, and spread of invasive species depending on the landscape unit, such as the Best Management Practices for Invasive Plants in Parks and Protected Areas of British Columbia (2018).
ECCC	BC Approved Water Quality Guidelines for the Protection of Aquatic Life (2024)	Approved water quality guidelines are policy statements and apply to activities that have the potential to alter/affect water quality within freshwater aquatic ecosystems (e.g., streams, lakes, wetlands). The guidelines are used to protect water values (i.e., aquatic life, drinking water), inform water quality assessments, support resource management decisions, provide a basis for water quality objectives, and promote water stewardship.
BC Ministry of Water, Land and Air Protection (MWLAP)	Standards and Best Practices for Instream Works (2004)	Provides BMPs that vegetation management activities must adhere to, including maintaining coarse woody debris, avoiding disturbance to streamside vegetation, maintaining organic litter, and retaining vegetation within 30 m of the high-water mark of a watercourse.

1.3 Park Operations

Ongoing efforts in RDN Parks, including maintenance, public engagement, and stewardship, play a crucial role in supporting the health of the natural environment and engaging the community in biodiversity and invasive species management. From park maintenance practices to volunteer-led conservation initiatives, these programs provide a solid foundation for future work. The PBP will build upon and complement these efforts, enhancing biodiversity management and encouraging continued community involvement in the long-term care of RDN Parks.

PARK MAINTENANCE

Maintenance and operational standards for infrastructure and amenities are laid out in the 2014 RDN Parks and Trails Guidelines. This document establishes the levels of service and maintenance requirements of different park types, including brushing and trail management. The primary goal of the RDN Parks and Trails Guidelines is to ensure a consistent level of service across all parks, allowing users to safely enjoy the amenities provided.

The PBP will not supersede the Parks and Trails Guidelines but work within their framework to enhance biodiversity while maintaining high standards of service and safety within Parks.

Regular Park maintenance is guided by two key policies within the RDN Parks and Trails Guidelines:

Policy C1: 04 Park Inspection
Outlines the process by which parks are inspected for faults – safety concerns or maintenance requirements.

Policy C1: 07 Tree, Fire Risk, and Invasive Species Management
Describes the process for identification of wildlife and hazard trees, evaluation of wildfire risk, and generalized management of invasive species.

PUBLIC ENGAGEMENT AND OUTREACH

Education and awareness play a significant role in improving public perception of, and willingness to act on, biodiversity and invasive species management. Currently, RDN Parks staff collaborate with RDN Drinking Water and Watershed Protection and RDN Energy and Sustainability groups, to attend public events such as farmers markets, Earth Day celebrations and community events. Similarly, the RDN Parks Operations Coordinator for Natural Areas supports various stewardship groups who focus on providing awareness around invasive species, biodiversity, and riparian protection.

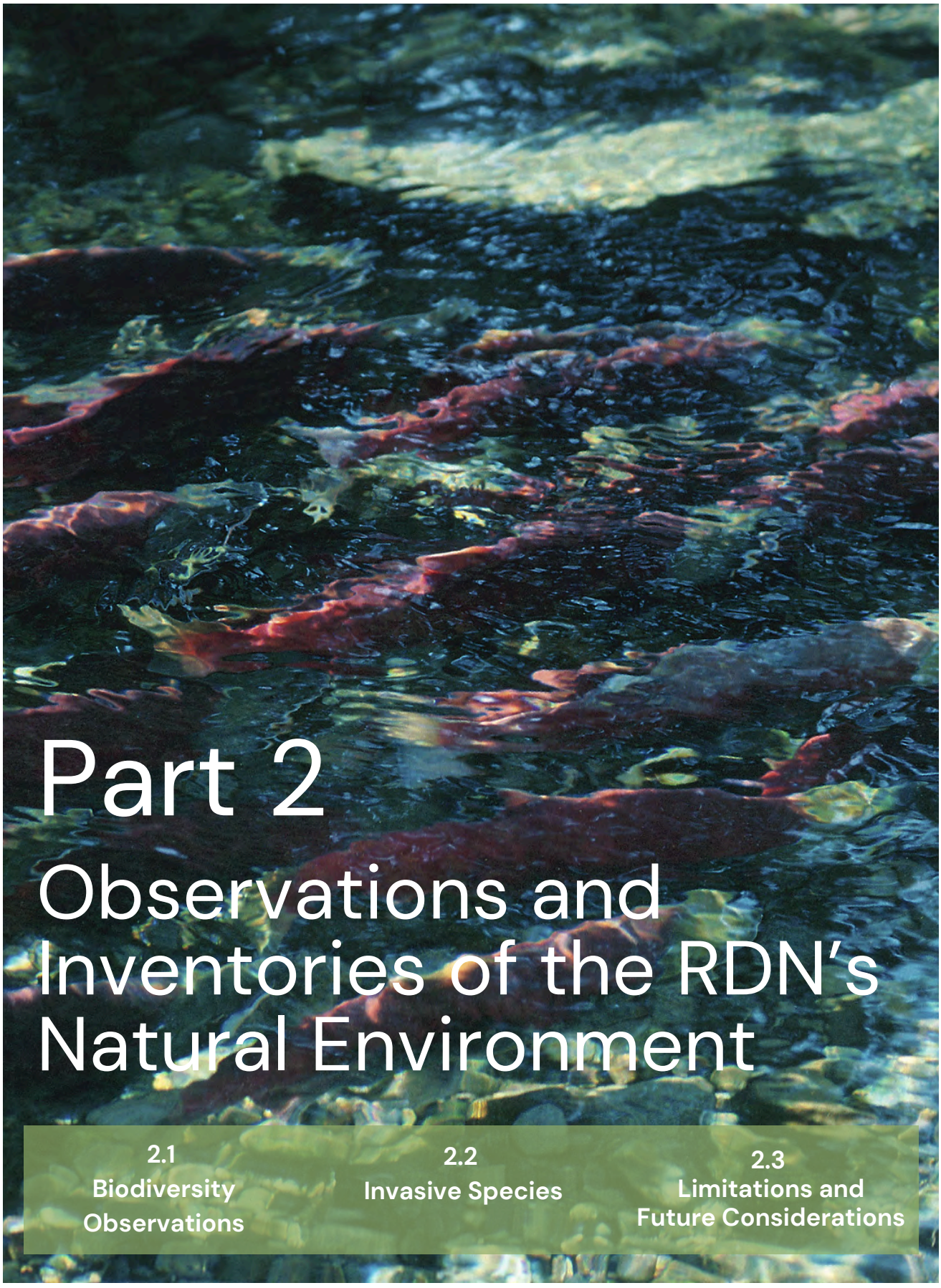
STEWARDSHIP AND VOLUNTEERISM

Volunteers and stewardship groups have been instrumental in protecting and enhancing natural assets within the RDN (**Appendix I**, for a highlight of their efforts). Without the dedicated efforts of these groups and individuals, there would be limited progress and even less awareness of the biodiversity values and invasive species risks within the RDN Parks.

The efforts of volunteers and community stewards extend beyond the boundaries of RDN Parks, helping to protect and restore ecosystems that cross jurisdictional lines, such as coastal areas, watersheds, and wildlife corridors. Through initiatives like the Drinking Water and Watershed Protection (DWWP) Water Quality Monitoring network, volunteers help monitor water quality and safeguard critical freshwater resources that support both human and ecological health. By participating in activities such as invasive species removal, trail maintenance, habitat restoration, and water monitoring, these dedicated individuals support interconnected habitats, enhancing the health of the entire region. Their work fosters a sense of community responsibility, inspiring further conservation efforts across diverse landscapes that benefit both local and migratory species.

Volunteers will be integral to the implementation of many actions in the PBP, and to the long-term stewardship of RDN Parks.

Friends of French Creek volunteers removing *Lamium* and giant hogweed (G. Oliphant 2024).



Part 2

Observations and Inventories of the RDN's Natural Environment

2.1 Biodiversity Observations

RDN parks are rich in biodiversity that cover a variety of ecosystem types, many of which are sensitive and provide unique habitats including, but not limited to, coastal bluffs, woodlands, riparian areas, cliffs, dunes, flooded fields, old forests, and wetlands. They either currently support or have the potential to support diverse wildlife and plant communities. Many species found within RDN parks are protected under provincial and/or federal legislation, with some parks overlapping federally designated critical habitat. Species designated as endangered, threatened, or of special concern are provincially categorized as red- or blue-listed, potentially qualifying for additional protection under the provincial *Wildlife Act* [RSBC 1996] or federal endangered species legislation (*Species at Risk Act* [*SARA*]). Ecological communities at risk currently lack protection under existing legislation.

The RDN currently lacks a detailed system for tracking biodiversity across its parks. While some parks have been the subject of ecological studies documenting their natural assets, there is no standardized or consistent method of collecting, storing, and applying this data across all parks. As part of the PBP a database was developed. It was created using provincial datasets and the RDN's data (summaries are located in **Appendices II and IV**, however due to database size, additional details must be requested through RDN Parks Staff).

DATA SOURCES

Information pertaining to biodiversity can be derived from various datasets and reports that provide information on existing conditions (**Table 2-1**). The data sources were used to compile information on biodiversity observations within the RDN Park system, which is referred to as the Gap Analysis and can be found in **Appendix II**.

Table 2-1. Referenced Data Sources

Data Name	Source
Wildlife Species Inventory - Incidental Observations - Publicly Available	DataBC
Wildlife Species Inventory - Survey Observations - Publicly Available	DataBC
Watercourse	Regional District of Nanaimo
Terrestrial Ecosystem Mapping (TEM) Detailed Polygons with Short Attribute Table Spatial View	DataBC
Critical Habitat for federally-listed species at risk	DataBC
Sensitive Ecosystem Inventory	DataBC
Land Cover Classification	Regional District of Nanaimo
Eagle Trees	Regional District of Nanaimo
Vegetation Resource Inventory	DataBC

BIODIVERSITY OBSERVATIONS

An assessment was conducted to facilitate an understanding of the parks and their potential biodiversity factors. However, a comprehensive review of each park's actual biodiversity through ground truthing of data sets has not yet been performed. The findings presented here are preliminary, and for any definitive understanding regarding a parks' biological and ecological makeup, site assessments should be conducted to 1) verify the data presented in this report; and 2) identify any new/unmapped features. Identifications in this inventory are in reference to all park types.

The inventory identified 47 unique species recorded within and adjacent to the parks (within a 500 m radius). Among these, four non-native species—Virginia Opossum, American Bullfrog, Green Frog, and Pond Slider—have been observed and publicly documented. Additionally, 12 species are provincially listed as red- or blue, including the Sharp-tailed Snake, Townsend's Big-eared Bat, and Winter Wren. Furthermore, 12 species are protected under *SARA*, such as the Painted Turtle, Olive-sided Flycatcher, Barn Swallow, and Western Screech Owl. Of the 235 parks, 61 parks are known to have occurrences of provincially and/or federally listed at risk species.

Critical Habitat

Areas in which critically at-risk species have been observed have been mapped for several species across multiple parks (**Table 2-2**). However, the critical habitats within the parks have not been qualitatively assessed to determine whether they meet the biophysical attributes necessary to facilitate the species' life cycles. Biophyisical assessments of individual parks will be required to specifically map exact habitat locations. Management of these specific locations would be addressed in individual park management plans.

While there are several species of conservation concern, priority species were considered as those with critical habitat overlapping RDN parks. However, it is important to acknowledge the presence of additional significant species, such as salmonids, western screech owls, and sharp-tailed snakes, which also hold considerable ecological importance and are known to occur within or adjacent to the Parks.

BARN OWL

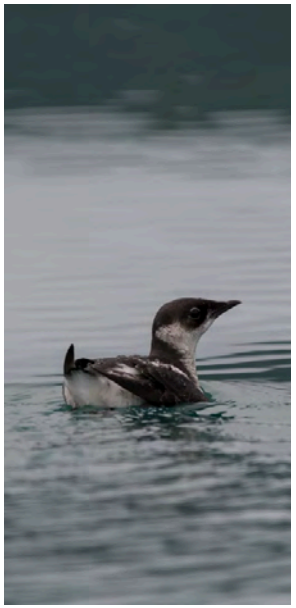
Provincial status: Blue
SARA status: Threatened (2018)
COSEWIC: Threatened
RDN Parks that Overlap with Critical Habitat: 1

DROMEDARY JUMPING-SLUG

Provincial status: Red
SARA status: Threatened (2005)
COSEWIC: Threatened
RDN Parks that Overlap with Critical Habitat: 1

LITTLE BROWN MYOTIS

Provincial status: Blue
SARA status: Endangered (2014)
COSEWIC: Endangered
RDN Parks that Overlap with Critical Habitat: 68



MARBLED MURRELET

Provincial status: Blue
SARA status: Threatened (2003)
COSEWIC: Threatened
RDN Parks that Overlap with Critical Habitat: 3

NORTHERN MYOTIS

Provincial status: Blue
SARA status: Threatened (2003)
COSEWIC: Threatened
RDN Parks that Overlap with Critical Habitat: 35

VANCOUVER ISLAND MARMOT

Provincial status: Red
SARA status: Endangered (2003)
COSEWIC: Endangered
RDN Parks that Overlap with Critical Habitat: 1

Figure 2-1. Priority Species of the RDN Parks

Red- and Blue-Listed Ecosystems

Numerous parks contain ecosystems classified provincially as red- or blue-listed, as identified through various mapping. These ecosystems are of significant ecological value and include site series such as the CDFmm Douglas-fir Salal, CDFmm Pink Spirea-Sitka Sedge Wetlands, CWHmm2 Amabilis Fir Western Redcedar Foamflower, and CWHxm Western Redcedar Salmonberry. While these ecosystems have been mapped, it is important to note that they may not always reflect the current site conditions representative of climax communities, may not have been field verified, and may not be ecologically indicative of these red- or blue-listed ecosystems. This is why we include the term "potential to support" red- and blue- listed ecosystems rather than "documented cases".

TEM identifies 163 parks with the potential to support red- and blue-listed ecosystems, while the LCC dataset highlights 26 parks with such potential. It should be noted that mapping coverage does not encompass all parks, and mapping has been conducted at varying scales, as indicated by the gap analysis.

Sensitive Ecosystems

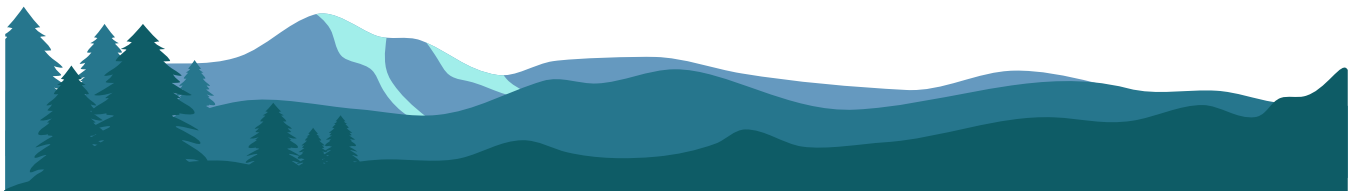
Sensitive ecosystems, including wetlands, watercourses, riparian areas, floodplains, and old forests, have been considered in the assessment. A detailed review of the condition and extent of these ecosystems was not conducted. However, the analysis identified 29 parks with mapped wetlands and 45 parks with known watercourses. Old forests, defined as stands older than 250 years, were identified in only three parks: Mount Arrowsmith Regional Park (managed by Alberni Valley Regional District), Mount Arrowsmith Massif Regional Park, and Blue Heron Drive Community Park. The presence of old forests was extrapolated from TEM and VRI data.

BIODIVERSITY BY ELECTORAL AREA

Table 2-2 provides an overview of biodiversity indicators across different Electoral Areas, highlighting the variability in their distribution. Notably, Electoral Areas F and H show the highest occurrences of mapped critical habitats within their parks, with totals of 16 and 38, respectively. The table also indicates the presence of *SARA*-listed species occurrences and provincially listed species, with Electoral Areas G and H having the highest number of occurrences for both categories. Old Forests are mapped in only two Electoral Areas: C and H. There is potential for provincially listed ecological communities across all Electoral Areas, with B, G, and E having the highest potential. Additionally, the majority of parks identified as having a higher degree of naturalness (i.e., native vegetation and forest cover) are located in Electoral Areas B, E, and H. Overall, the data illustrate the diversity of biodiversity indicators within each Electoral Area. However, it is important to emphasize the necessity of field validation for the presence of the various components of biodiversity, as preliminary fieldwork has revealed misrepresentations of habitat and the conversion of ecosystems.

Table 2-2. Distribution and Variability of Biodiversity Indicators Per Electoral Area

BIODIVERSITY INDICATOR	ELECTORAL AREA								GRAND TOTAL
	A	B	C	E	F	G	H	MM	
Mapped critical habitat	-	-	4	-	16	11	38	1	70
Mapped watercourse(s)	2	3	10	1	3	8	7	3	37
Mapped wetland(s)	6	7	1	6	3	3	6	1	33
SARA-listed species occurence(s)	5	8	5	12	-	17	17	3	67
Provincially-listed species occurrence(s)	3	7	2	11	-	16	17	3	59
Potential for provincially-listed ecosystems	16	40	12	34	19	38	30	7	196
Old forest	-	-	2	-	-	-	1	-	3
Natural areas	12	36	17	30	19	23	26	7	170
Fringe vegetation	6	5	2	12	2	19	14	2	62
Minimal vegetation	-	1	1	-	-	1	-	-	3
GRAND TOTAL	50	107	56	106	62	136	156	25	700



2.2 Invasive Species

The presence of invasive and non-native species is diverse and widespread throughout the RDN. In the context of the PBP invasive species are introduced plants that can cause ecological, economic, or social harm. In contrast, non-native species are those that exist outside of their natural range but may coexist without significantly disturbing local ecosystem and are not inherently harmful (e.g., tulips).

Invasive species, however, outcompete native species for resources, disrupt ecosystems and may lead to biodiversity loss. The PBP considers all non-native species but give special attention to priority species identified for their significant potential impact.

PRIORITY INVASIVE SPECIES

The RDN has observed five priority species for management concern throughout their parks based on management effort, public concern, and potential for impacting public safety; Daphne/spurge laurel, English ivy, English holly, Scotch broom, and Himalayan blackberry. Additional invasive species species are still considered important due to their perceived threat level. **Table 2-3** lists these species and their designation under the *Weed Control Act* (RSBC 1996, c. 487). This list is meant to be updated over time, and is not intended to limit management activities.

DATA SOURCES

Information on the presence of non-native and invasive species was sourced from the Invasive Species Inventory obtained from the Ministry of Environment and Climate Change Strategy (ENV). Although provincial datasets can provide valuable insight into the distribution, the data may be collected inconsistently and certainty on coverage is unknown.

Table 2-3. Priority Invasive Species for Management Consideration

Common Name	Latin Name	Status*	*Weed Control Act* Designation
Bur chervil	*Anthriscus caucalis*	Manage	Provincially noxious
Common tansy	*Tanacetum vulgare*	Regional containment/control	Regionally noxious**
Daphne/Spurge laurel*	*Daphne laureola*	Manage	Not designated
English holly	*Ilex aquifolium*	Manage	Not designated
Giant hogweed	*Heracleum mantegazzianum*	Provincial containment	Provincially noxious
Himalayan blackberry	*Rubus armeniacus*	Regional containment/control	Not designated
Knapweed spp.	*Centaurea spp.*	Manage & regional containment/control	Regionally noxious**
Knotweed spp.	*Fallopia/Reynoutria & Polygonum spp.*	Regional containment/control	Provincially noxious

Common Name	Latin Name	Status*	*Weed Control Act* Designation
Lamium spp.	*Lamium sp.*	Regional Containment/Control	No status
Periwinkle spp.	*Vinca sp.*	N/A	No status
Russian knapweed	*Acroptilon repens*	N/A	Regionally noxious**
Scotch broom	*Cytisus scoparius*	Regional containment/control	No status
Spotted knapweed	*Centaurea stoebe*	Regional containment/control	Provincially noxious
St. John's-wort	*Hypericum perforatum*	N/A	No status
Tansy ragwort	*Senecio jacobeae*	Manage	Provincially noxious
Wild chervil	*Anthriscus sylvestris*	Regional containment/control	Regionally noxious**

Table Notes:
* Status under the BC Inter-Ministry Invasive Species Working Group Provincial Priority Invasive Species List.
** Regionally noxious outside of the RDN's boundary.

DISTRIBUTION OF INVASIVE SPECIES OBSERVATIONS IN RDN PARKS

Invasive species data was obtained from BC Invasives 2022 Invasive Alien Plant Program database (IAPP/BC Invasives). This dataset includes observations inside and within 30 meters of an RDN Park property or trail. It is important to note that available invasive species data is based on reports and sightings, therefore cannot be relied upon as representative of actual invasive species distribution across the landscape. These data can help staff estimate the most common invasive plants in a given region, and help to identify areas of particular concern.

Records in the IAPP/BC Invasives database are verified observations reported by the public, scientific community, environmental professionals, and naturalists.

Figure 2-2 shows the number of recorded invasive species observations in each Electoral Area by park/trail type. A total of 301 observations were recorded, with the majority located in Electoral Area G (29%), followed by E and H (19%), B (12%), F (10%), A (8%) and the fewest documented observations in C (3%).

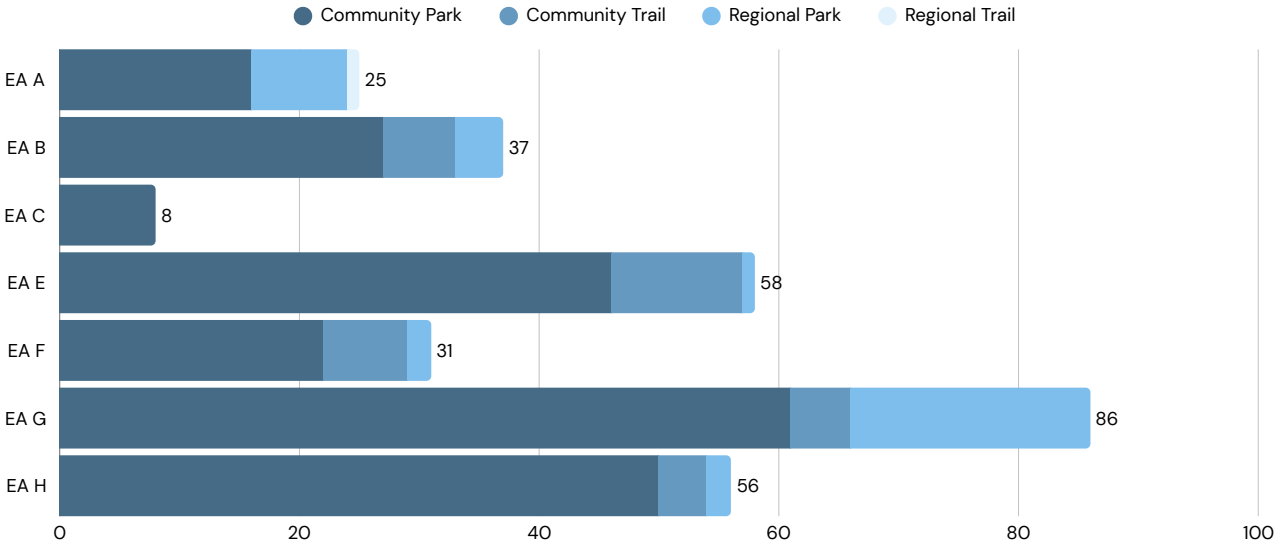
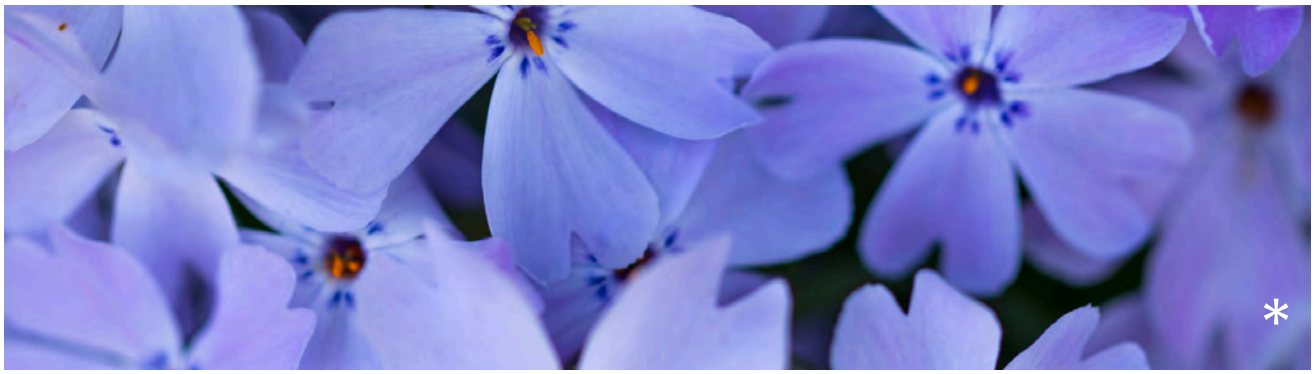


Figure 2-2. Count of Invasive Species Observations in each Electoral Area by Park Type



INVASIVE SPECIES BY ELECTORAL AREA

Figure 2-3 and Table 2-4 provide an overview of the most abundant invasive species observations amongst the various Electoral Areas. Scotch broom is the most frequent species and is concentrated in Electoral Area E, G, and H. Himalayan blackberry is the second most frequent recorded species and is commonly recorded in Electoral Area E and B, with Japanese knotweed being prevalent in Electoral Area H. The data underscores that there is diversity of abundance within each region, which may warrant targeted efforts per Electoral Area.

It is important to note that there are no recorded observations of Daphne/Spurge laurel (*Daphne laureola*), English ivy (*Hedera helix),* and English holly (*Ilex aquafolium)*, three species which have been abundantly observed by RDN Parks staff and through field verification. This further underscores that an absence of a documented observation does not indicate an absence of that species from an area, in addition to the importance of field verification of all publicly available data.

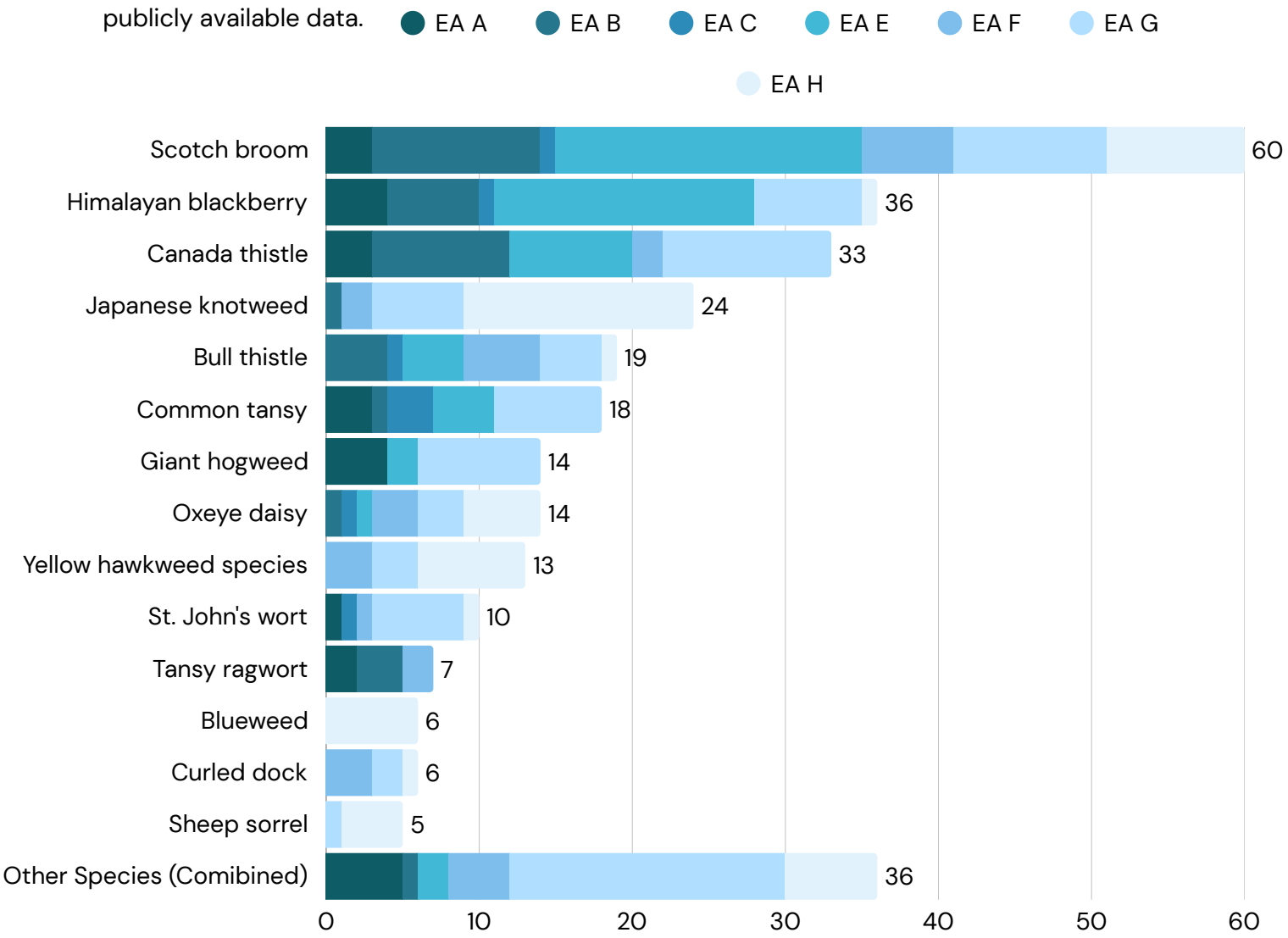


Figure 2-3 Distribution of Invasive Species Observations by Electoral Area

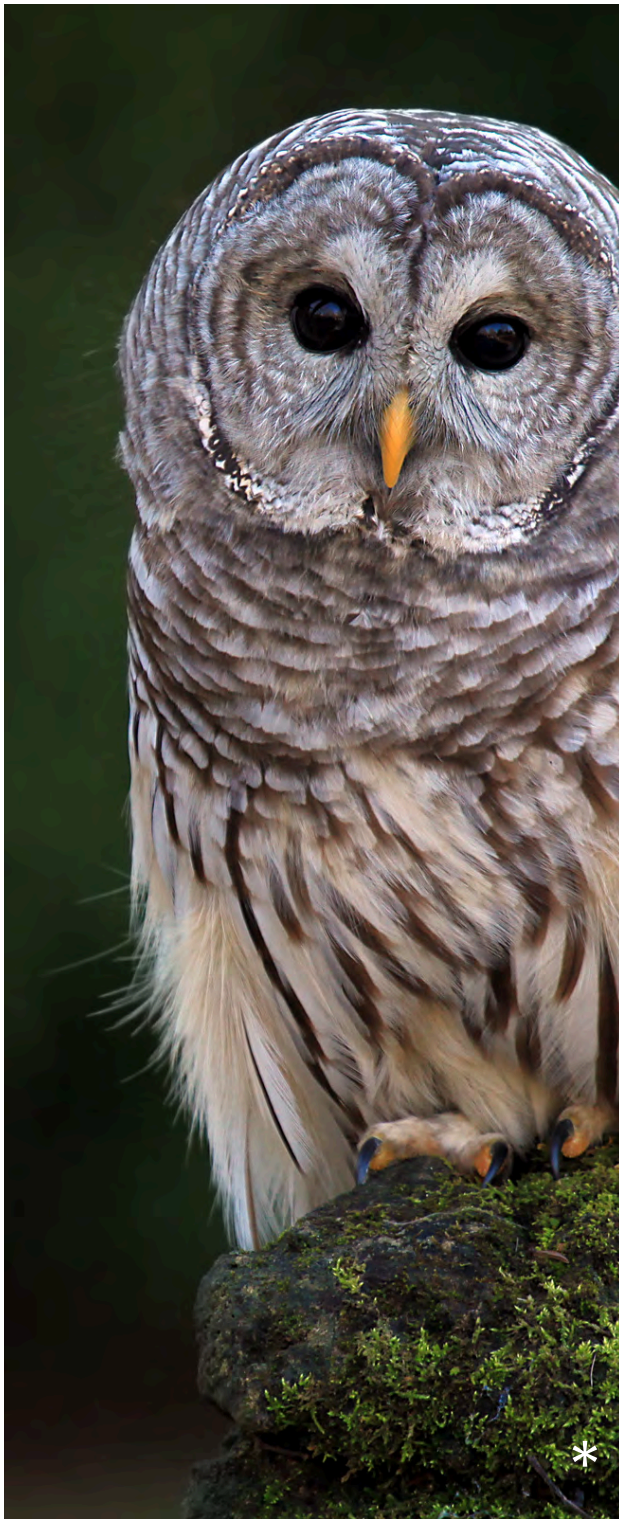
Table 2-4. Invasive Species IAPP/BC Invasives observations by Electoral Area

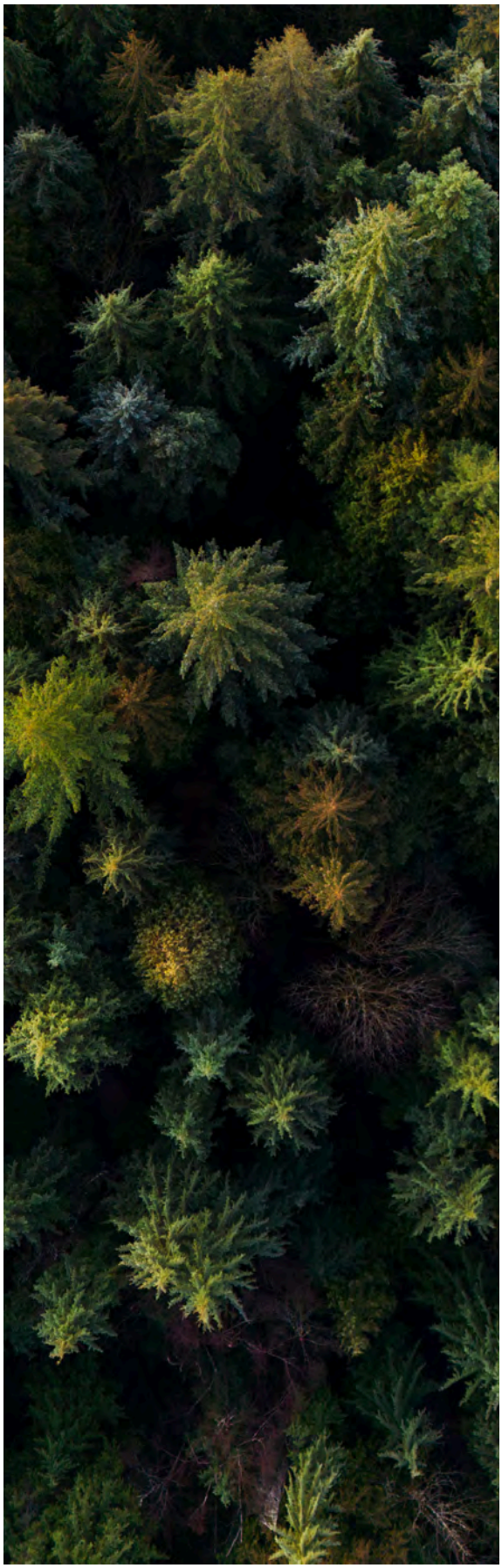
COMMON NAME	ELECTORAL AREA							
	A	B	C	E	F	G	H	TOTAL
Scotch broom	3	11	1	20	6	10	9	60
Himalayan blackberry	4	6	1	17	-	7	1	36
Canada thistle	3	9	-	8	2	11	-	33
Japanese knotweed	-	1	-	-	2	6	15	24
Bull thistle	-	4	1	4	5	4	1	19
Common tansy	3	1	3	4	-	7	-	18
Giant hogweed	4	-	-	2	-	8	-	14
Oxeye daisy	-	1	1	1	3	3	5	14
Yellow hawkweed species	-	-	-	-	3	3	7	13
St. John's wort	1	-	1	-	1	6	1	10
Tansy ragwort	2	3	-	-	2	-	-	7
Blueweed	-	-	-	-	-	-	6	6
Curled dock	-	-	-	-	3	2	1	6
Sheep sorrel	-	-	-	-	-	1	4	5
Other Species (Combined)	5	1	-	2	4	18	6	36
TOTAL	25	37	8	58	31	86	56	301

2.3 Limitations and Future Considerations

It is important to note that the presence of spatial data in some parks, such as incidental species observations, does not necessarily indicate the absence of a species in a park; rather, it may reflect gaps in available information. In some cases, the absence of data may also indicate that specific datasets are not applicable to certain parks. For example, critical habitat for species like the Marbled Murrelet might be limited to coastal areas due to the species' specific biophysical requirements, meaning parks located inland would not be identified as containing critical habitat.

The distinction between an inventory and observation-based data is key to understanding the biodiversity data used in this analysis. An inventory is a systematic, comprehensive collection of data following standardized methods, designed to minimize data gaps, provide consistent results, and serve as a baseline for future comparisons. In contrast, observation-based data is collected opportunistically during specific events, projects, or studies and does not aim to document all components of an area. The biodiversity data in this analysis is observational, built from existing datasets collected at different scales, methods, and times. While these datasets offer valuable insights into the natural components of a park, they lack the systematic coverage and methodology of an inventory and will have gaps. For instance, incidental species observations provide a snapshot of biodiversity rather than a complete or replicable account.

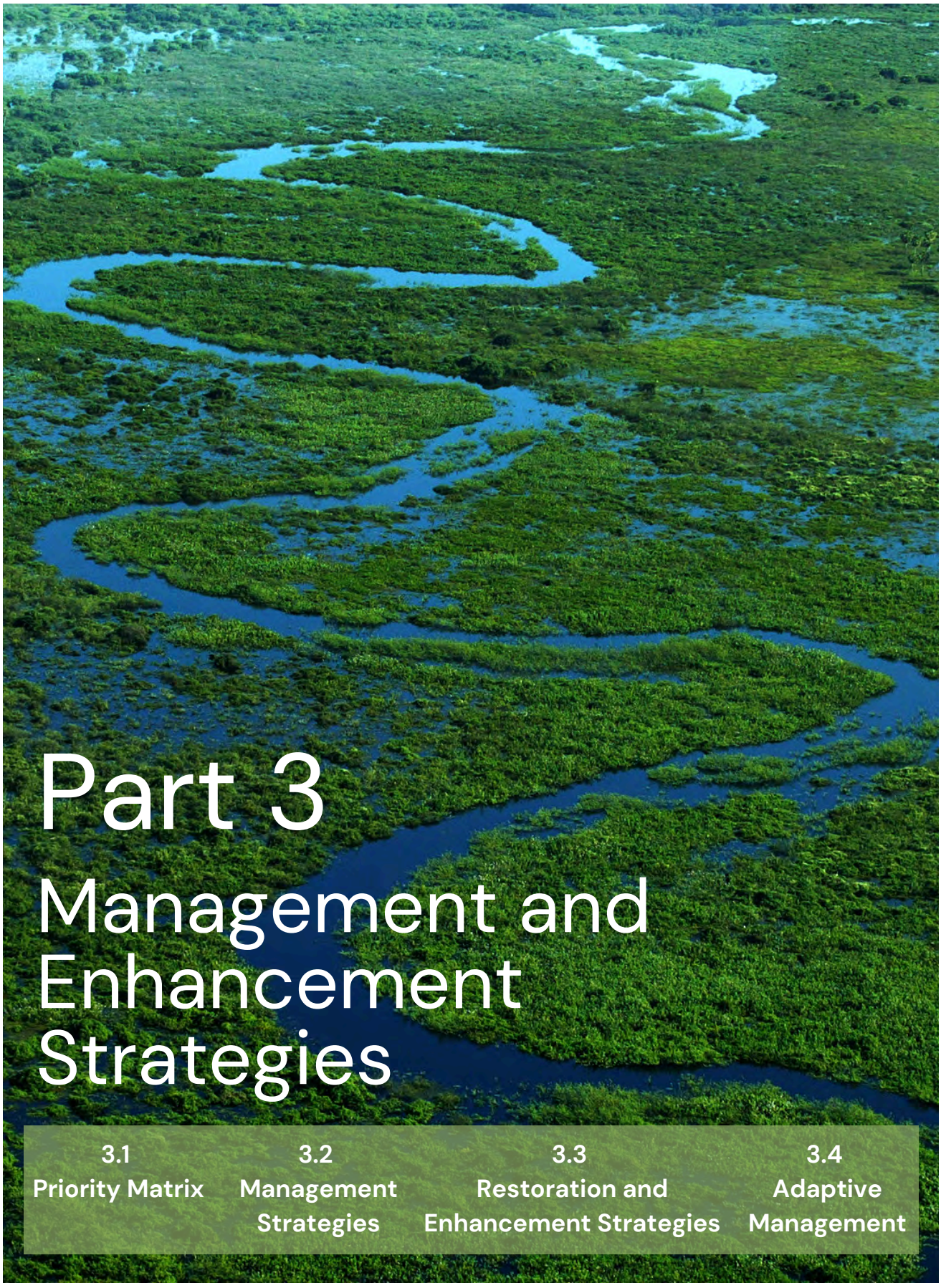




In contrast, the invasive species data aligns more closely with the definition of an inventory. These datasets were collected following provincial guidelines, ensuring consistency in methodology and reporting. They include detailed information on the location, distribution, and density of invasive species. The structured approach to collecting invasive species data allows it to serve as a baseline inventory.

While invasive species pose a significant threat to biodiversity, they are not the only concern when assessing risk to biodiversity. Other threats to biodiversity not included in this analysis are fragmentation of parks and green spaces, size and connectivity of natural areas, isolation of habitat which limit species movement and gene flow. General Park use and trail overuse (e.g., expanding trail networks and increased visitor numbers) can lead to habitat degradation and soil compaction, further reducing biodiversity. Climatic factors, such as changing temperatures and shifting precipitation trends, as well as proposed development plans and long-term community strategies, can alter land use and create cumulative pressures on native ecosystems. Additionally, wildfire risks, along with management treatment aimed at protecting community safety, can also have long-term impacts. Though these factors were not part of the current analysis, they remain important considerations for future biodiversity planning efforts to ensure comprehensive plans and management of natural assets.

Provincial datasets are continuously being updated, and newly available data may shift the values and trends currently observed. As the RDN builds its own internal datasets, there may be deviations from provincial data. This evolving information can influence biodiversity assessments, making adaptive planning essential.



Part 3

Management and Enhancement Strategies

This section establishes the foundation for park management strategies by outlining the categorization of parks within the Priority Matrix. The matrix serves as a framework for prioritizing maintenance and tailoring strategies to the unique needs of each park. It also introduces consistent approaches for managing invasive species and implementing ecosystem restoration and rehabilitation practices. These practices will be integrated into the RDN Parks Invasive Species Management Policy and Standard Operating Procedure, ensuring a unified and sustainable approach to park management across the region (refer to Part 4, Section 4.1; Objective 3, Action 6).

3.1 Priority Matrix

The Priority Matrix is a tool designed to organize, prioritize, track, and allocate resources effectively while supporting risk assessments to guide management decisions. It helps prioritize parks for various management activities, such as invasive species treatment, monitoring, or assessment. However, community knowledge and insights about the parks should always be considered when determining management priorities.

The matrix categorizes parks based on biodiversity observations and invasive species distribution into high, medium, and low priority actions (**Figure 3-1**). These categories provide a framework for evaluating the urgency of management needs:

HIGH PRIORITY PARKS: These parks typically have a high biodiversity distribution and a high invasive species distribution.

MEDIUM PRIORITY PARKS: These parks have a medium biodiversity distribution and an unknown to medium distribution of invasive species.

LOW PRIORITY PARKS: These parks generally exhibit low biodiversity and either an unknown or low distribution of invasive species.

Appendix III provides a detailed methodology for categorization parks into these discrete priority levels based on biodiversity observations and invasive species distribution.

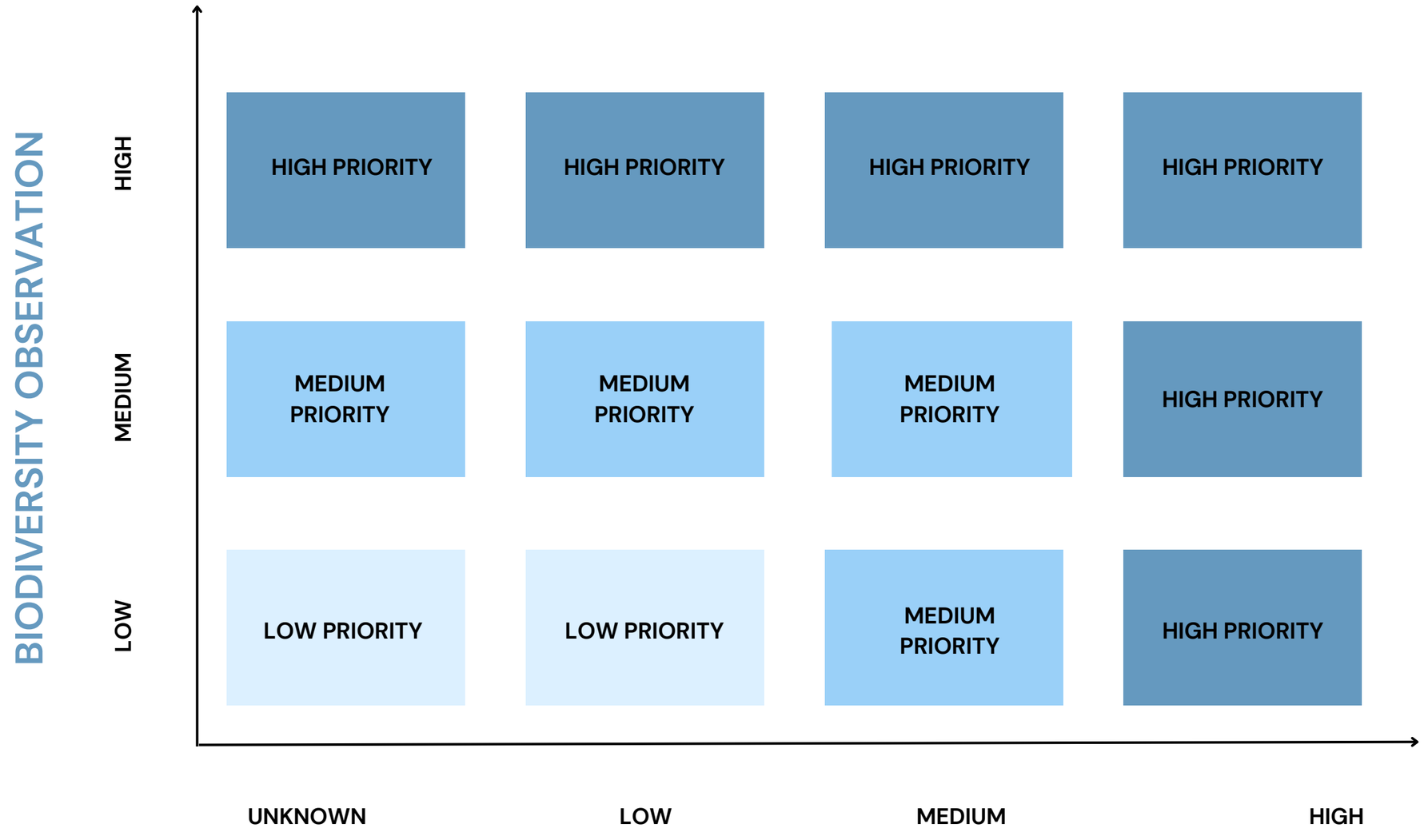


Figure 3-1. Priority Matrix to Assign Parks Priority

CATEGORIZATION OF BIODIVERSITY OBSERVATION

The categorization of Parks into discrete categories (i.e., high, medium, and low) is based on biodiversity observations. This categorization is intended to identify potential hotspots within the RDN Parks and considers where multiple biodiversity interests overlap as more significant than those with minimal or no overlap. The guiding principle is that natural habitats with available habitat and species presences are more crucial, and thus face higher risks from habitat loss, which could disproportionately impact biodiversity with the RDN.

The biodiversity risk assessment evaluates several factors including:

- Available habitat;
- Distribution of native ecological communities;
- Presence of critical habitat;
- Observed provincial red- and blue-listed species (through both incidental encounters and surveys); and
- Presence of old growth forests and wetlands.

Parks with high biodiversity distribution were designed to be viewed as being at most at-risk for irreparable damage from invasive species. Therefore, prioritizing efforts to manage and restore these parks are considered highly important.

CATEGORIZATION OF INVASIVE SPECIES

The categorization of invasives species into discrete categories (i.e., high, medium, and low) was not based solely on abundance, but based on the presence of invasives species within and adjacent to a park (i.e., 30 m of a park) and a species' ability to spread (i.e., priority species such as Japanese knotweed). It considers the species' characteristics and unique ecological impacts

The invasive species risk assessment considers:

- The threat to biodiversity,
- The species' ability to spread, and
- Economic and social impacts.

The underlying principle is that the greater the species' presence, potential for spread and ecological impact, the higher the risk of the invasive species displacing the natural assets of a park. This approach ensures that both proximity and ecological risk are considered when determining management priorities. The priority matrix acknowledges the limited data on invasive species distribution, indicating that parks lacking data should be a focus for a management strategy.

PARK PRIORITY RESULTS

Table 3-1 provides a breakdown of park priorities across Electoral Areas based on biodiversity observations and invasive species distribution. A total of 235 parks were evaluated, with 49 classified as high priority, 70 as medium priority, and 116 as low priority. This distribution highlights the concentration of high-priority parks in Electoral Area H (19 parks) and the larger proportion of medium and low-priority parks in areas like B and G.

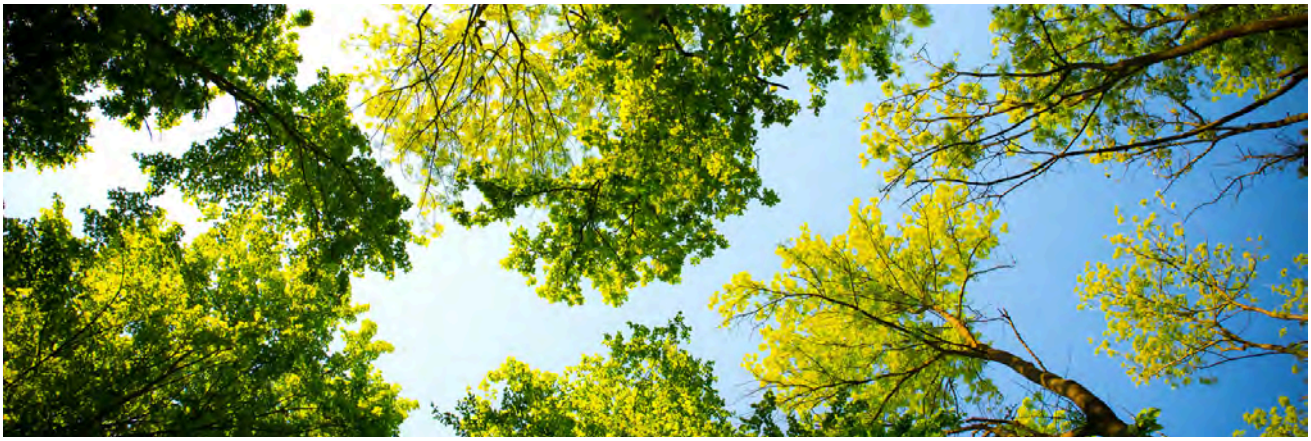
Appendix IV provides the classification of each park for the biodiversity and invasive species categorization. It also provides the biodiversity observation for each park base on field verification and the various datasets.

Table 3-1. Distribution of Parks Per Electoral Area Based on Perceived Priority

	ELECTORAL AREA								
PARK PRIORITY	A	B	C	E	F	G	H	MM	GRAND TOTAL
High	4	4	5	6	2	8	19	1	49
Medium	6	11	6	15	7	12	10	0	70
Low	8	27	9	21	12	23	11	0	116
GRAND TOTAL	18	42	20	42	21	43	40	1	235

BENEFITS AND LIMITATIONS OF THE PRIORITY MATRIX

The priority matrix serves as a structured tool for prioritizing and managing parks based on biodiversity and invasive species. However, it should be viewed as a guide rather than a definitive implementation strategy.



Benefits of the priority matrix include:

- Providing a systematic approach to resource allocation;
- Offering a structured method for organizing, prioritizing, and tracking management actions and how a parks priority action may change over time;
- Highlights parks that may require immediate management actions; and
- Creating a visual representation of priorities to facilitate communication among various stakeholders.

Limitations of the priority matrix include:

- Reliance on accurate data;
- Potential for oversimplification of complex ecosystems and community needs; and
- The requirement for regular updates to reflect changes in data and understanding.

3.2 Management Strategies

The management strategies outlined below are designed to provide a framework for consistent management of invasive species and ecosystem restoration practices. These strategies are intended to be integrated into the RDN Parks Invasive Species Management Policy and Standard Operation Procedures (See Objective 3, Action 6). The integration of these strategies will support efforts required to effectively manage, protect, and enhance biodiversity within the RDN.

Prevention and Education – This plan focuses on physical management strategies, however without consistent messaging around prevention of new invasive species, physical management strategies are not as effective. Field cards and information flyers have been developed to support prevention and education efforts, as well as specific actions directed at growing the capacity of RDN Parks staff to deliver educational programs

Physical Management strategies include:

- Monitoring and Tracking;
- General Methods of Control;
- Individualized Park Specific-Management; and
- Restoration and Enhancement.

It is important to note that there is no single method of controlling invasive species that will fit every scenario. Factors such as species, location, cost of management, potential for damage, public views and safety all play a part in defining the best path forward. As more information is collected and capacity of the RDN Parks team expands, management classifications should be adapted as part of an overall adaptive management process. Should conditions change, RDN Parks staff would re-evaluate the park and consider applying a new management classification.

MONITORING AND TRACKING

Monitoring and Tracking is applied to a variety of instances, typically assigned in situations where an area is inaccessible, are not financially feasible to manage, where there is no apparent need for intervention to protect or enhance these locations. In these instances, regular check-ups and monitoring may suffice.

Components of the monitoring and tracking program should be more clearly defined in the RDN Parks Standard Operating Procedure, however may include:

- Review of Park Evaluation Field Card (**Appendix V**);
- Review of new information and datasets integrated into the Biodiversity and Invasive Species Risk Analysis;
- Evaluations of invasive species faults registered during regular park inspections; and
- Observations or reports from the public.

The overall goal of a monitor and track classification is to ensure that conditions of biodiversity and invasive species risk are static and acceptable.

Parks ranked as '**Low**' in the priority matrix may fall under the monitor and track strategy. This classification is typically contingent upon the distribution of invasive species being categorized as 'Unknown' and the categorization of 'Low' biodiversity.

GENERAL MANAGE AND CONTROL

General management and control strategies focus on invasive species populations that are unlikely to be completely eradicated or pose an immediate risk to biodiversity.

The **primary goals** for parks within this category are to:

- Prevent additional spread of invasive species;
- Prevent introduction of new invasive species; and
- Protect known biodiversity features from further impact/degradation.

Control methods include biological, chemical, manual, and cultural approaches to localized populations to prevent further spread. While new methods for control are continuously being developed, they generally fall into the four primary categories. **Table 3-2** below outlines each category, example actions, and limitations of each.
The most commonly used control method is physical, which encompasses a multitude of implementation techniques. **Figure 3-2** provides an overview of some of the most common activities, their objectives, and methods of implementation.

Table 3-2. Overview of General Methods of Control

Method of Control	Example Activities	Limitations
Physical – Manual or mechanical removal or destruction of invasive species.	• Mowing • Girdling • Excavation (mechanical) • Hand pulling • Creating barriers (fencing)	• Labour-intensive • Often requires consistent repeat treatments over multiple years
Biological – Introduction of other organisms to outcompete or prey upon invasive species.	• Planting native vegetation • Reducing population through predation • Introduction of targeted plant-feeding insects	• Requires extensive research and planning • Difficult to control the spread of introduced species • Can be expensive
Cultural – Adapting human habits to increase mortality or decrease impacts of invasive species.	• Education campaigns • Changes in policy/legislation • Selection of pest resistant crops • Prescribed burning	• Requires community support • Long time frame to see results • Needs consistent monitoring and support
Chemical – Application of chemicals to eliminate invasive species.	• Application of pesticides, herbicides, fungicides, and natural remedies	• Expensive • Requires specialized equipment and trained staff • May harm other species and ecosystems • Potential public and environmental health concerns • Legislation may restrict chemical use in specific regions and environments

Parks ranked as '**Low**', '**Medium**' or '**High**' in the priority matrix may fall under this management strategy. This classification is typically contingent upon the distribution of invasive species categorized as 'Low' or 'Medium' and the categorization of 'Low' or 'Medium' biodiversity.

PHYSICAL CONTROL STRATEGIES

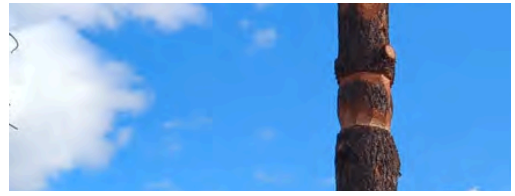
METHOD	APPLICATION	EXAMPLE
MECHANICAL BRUSHING	Brushing involves cutting back invasive species, such as Himalayan blackberry, to prevent their spread and reduce their impact on native ecosystems. This method is particularly effective for managing species that are rapidly expanding and can help to restore native vegetation by removing dense invasive growth.	
FENCING	The addition of fencing can prevent the spread of invasive species to native areas by reducing the ability of individuals to access these areas. It can be used as a passive tool for restoration by encouraging people to stay out of or recognize areas where restoration activities have occurred.	
HAND PULLING	Hand pulling is a common and effective method that can engage individuals in park conservation. It is easy to implement, requires minimal training, and is cost-effective.	
GIRDLING	Girdling involves removing a strip of bark from the trunk of invasive trees or shrubs, which interrupts the flow of nutrients and eventually kills the plant. This technique is particularly effective for large, woody invasive species like Scotch broom and English holly.	
MATTING	Placing fabric or other materials over the soil to suppress the growth of invasive species. This method blocks sunlight and reduces the ability to spread. It is useful for controlling dense, aggressive species, such as reed canary grass, and can support restoration by creating conditions that favor native plant growth. It helps to minimize soil disturbance.	

Figure 3-2. Examples of Commonly Implemented Physical Control Strategies

INDIVIDUALIZED SITE-SPECIFIC MANAGEMENT

Individualized and site-specific management strategies are designed to manage invasive species in sensitive areas, such as those adjacent to watercourses or wetlands, and for target species that are priorities for the RDN requiring specialized protocols and control methods. These unique strategies are typically developed and implemented under the oversight of a QEP to ensure they are tailored to the specific needs of both the environment and the species.

Individualized site-site specific management plans are likely to incorporate a multi-disciplinary approach and usually require the ongoing involvement of a QEP. Individualized site-specific management plan may include, but are not limited to, the following components:

- Assessment of environmentally valuable resources (e.g., critical habitat, sensitive watercourse, species and ecosystem of ecosystems at risk) that may be negatively impacted by a treatment if mitigation measures are not carefully implemented.
- Prescriptive invasive plant removal.
- Development of a long-term planting plan and monitoring plan.
- Implementation of management actions for invasive goose populations.
- Development of Shoreline and spit erosion management.
- Development of Fish and Wildlife monitoring programs.

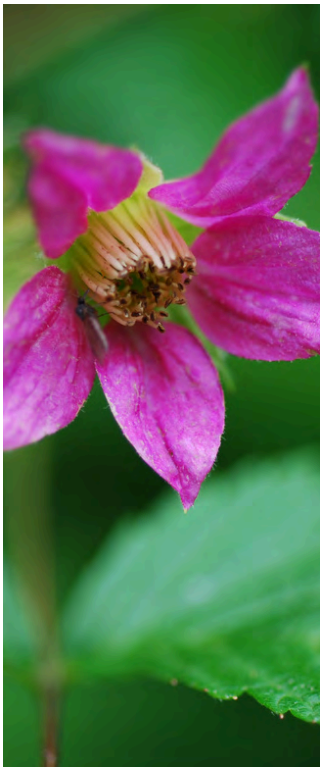
Parks ranked as '**Medium**' or '**High**' in the priority matrix may fall under this management strategy. This classification is typically contingent upon the distribution of invasive species categorized as 'Low,' 'Medium', or 'High' and the presence of 'Medium' and 'High' biodiversity categorization.

3.3 Restoration and Enhancement Strategies

Restoration strategies are key for enhancing biodiversity and restoring ecosystems impacted by invasive species. These strategies aim to prevent the spread of invasives by increasing native species occupancy and improving habitat quality. Several key components that enhance biodiversity should be included in restoration and enhancement strategies:

INVASIVE SPECIES REMOVAL

Removal of communities of invasive plants. This may include mechanical removal, smothering or suppression, or chemical control. This strategy is often followed by native species planting.

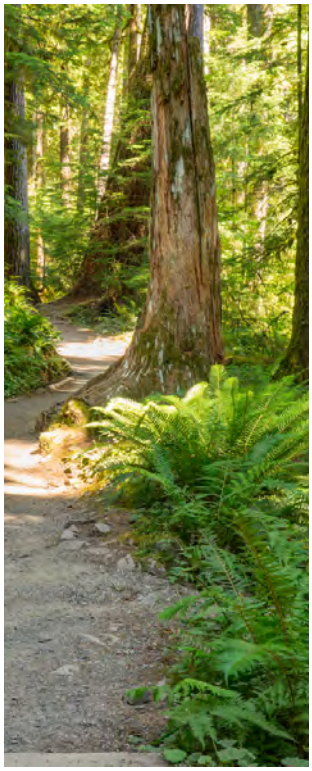


NATIVE SPECIES PLANTINGS

Prioritize planting native species in areas well-suited to local environmental conditions to support diverse wildlife populations. Select plants establish quickly and adapt to climate change, such as suitable riparian species along watercourses.

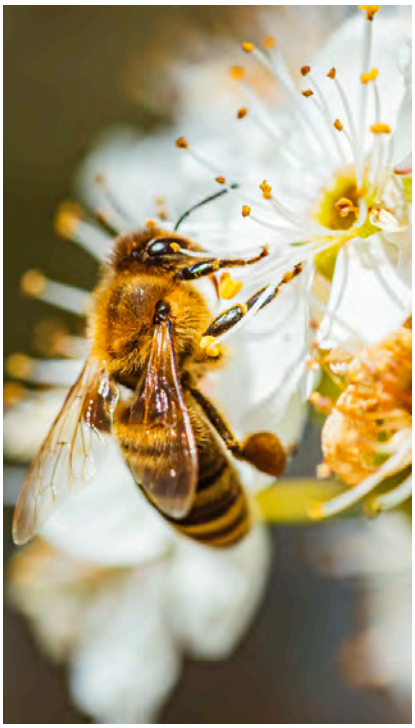
HABITAT ENHANCEMENT

Create brush piles, install suitable nest boxes for target species, or add coarse woody debris. Ensure these enhancements mimic natural habitats effectively.



ECOSYSTEM CONNECTIVITY

Enhance corridors and connectivity between habitats to facilitate species movement, supporting genetic diversity and resilience to environmental changes. For example, plant shrubs along walking corridors to connect parks.



POLLINATOR HABITAT

Plant species that promote pollinators, crucial for ecosystem health and plant reproduction.

WATER MANAGEMENT

Restore wetlands to improve water quality. Plant shrubs along wetland margins to reduce soil erosion. Develop water access points to promote trails and minimize shoreline use.

EDUCATION AND ENGAGEMENT

Involve community members in restoration efforts through volunteer programs, educational workshops, and citizen science initiatives. Raise awareness about biodiversity's importance and the role of restoration in preserving natural ecosystems.

3.4 Adaptive Management

As invasive species management evolves and new information becomes available, the recommended strategies and actions may change over time. Therefore, Adaptive Management approaches are crucial for flexibility and effectiveness. Adaptive strategies are approaches or methods that will allow for the adjustment and response to effectively change the result of the treatment program to ensure that biodiversity is not at risk or to promote biodiversity. Adaptive strategies will involve continuous learning, flexibility, and the ability to modify actions based on feedback, additional information, and the changing environment. Several methods of adaptive strategies include the following:

MONITORING AND EVALUATION

Regular monitoring and evaluate performance, outcomes, and external factors to identify areas for improvement. This will include collecting data and analyzing trends.

ITERATIVE PLANNING

Adoption of an iterative approach to planning and implementation, where strategies will be continually reified and adjusted based on monitoring, on going evaluation, feedback from stakeholder groups.

COMMUNITYSTEWARDSHIP

Foster collaboration and partnership with a diverse array of stakeholders, including community organizations, school groups, and interested individuals.

CAPACITY BUILDING

Invest in building the capacity of individuals to be able to identify invasive species and biodiversity abundance, both within the local government, and the greater stewardship community.

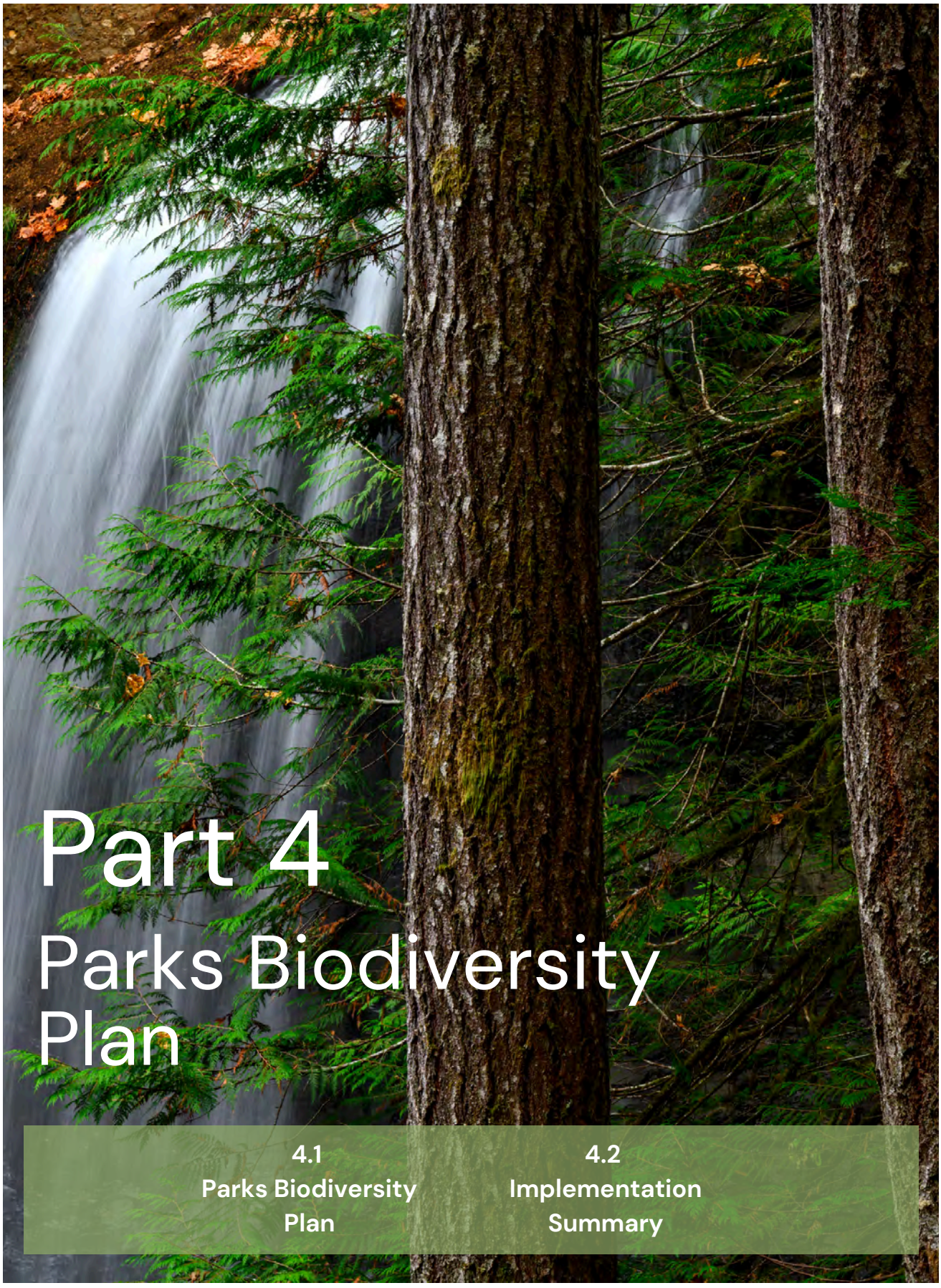
FLEXIBLE RESOURCE ALLOCATION

Allocate resources in a flexible manner that allows for reallocation based on evolving priorities and needs. This may involve adopting flexible budgeting and resource management practices to ensure resources are being directed to where they can be most effective.

EDUCATION

Foster a culture of continuous learning and knowledge sharing within the RDN and amongst interest groups and local organizations. This includes documenting lessons learned, sharing best practices, and facilitating knowledge exchange and experiences to support adaption.

Adaptive strategies for successful management are cyclical in nature. A treatment or restoration activity is applied followed by a period of monitoring to assess effectiveness. Based on the results, adjustments are made to the treatment or restoration activity to address deficiencies, challenges, or improve outcomes. This iterative process ensures that management approaches are continually refined and adapted to changing conditions and experiences.



Part 4
Parks Biodiversity Plan

4.1 Parks Biodiversity Plan

The intent of the PBP is to safeguard, preserve, and enrich biodiversity while mitigating the spread of invasive species. Through the systematic implementation of the PBP and adherence to its detailed implementation plan, the RDN aims to achieve the following:

PROTECTION OF BIODIVERSITY

Implement measures to protect and maintain the diversity of plant and animal species within RDN parks.

CONSERVATION OF ECOSYSTEMS

Conserve and restore ecosystems by addressing threats posed by invasive species.

MINIMIZATION OF INVASIVE SPECIES IMPACT

Strategically manage and control invasive species to reduce their impact on native biodiversity and ecosystem functions.

INTEGRATION WITH RDN STRATEGIES

Align the objectives and actions of the PBP with other regional strategies and plans to ensure a cohesive approach towards environmental conservation and sustainable park management.

FOSTERING RELATIONSHIPS WITH THE COMMUNITY

Engage and collaborate with communities, stakeholders, and First Nations to promote awareness and action in biodiversity conservation and invasive species management.

By utilizing the PBP and diligently following its implementation plan, the RDN aims to achieve its goals of protecting cultural heritage and promoting ecosystem health and resilience through proactive management, community engagement, continuous monitoring, and adaptive practices, coupled with a commitment to education and outreach. This comprehensive approach ensures the long-term health and sustainability of RDN Parks while effectively addressing the challenges posed by invasive species.

Objective 1: Mapping and Spatial Information
Improve the Understanding of Invasive Species and Biodiversity Values through Mapping and Spatial Information

Maps provide a visual representation of the landscape and its dynamics. By layering spatial information, it is possible to visualize the relationship between biodiversity values and potential risks, such as infestations of invasive species, encroaching development, flood zones, or activities on adjacent environments. The following actions aim to develop visual representations of the results of this PBP and streamline the collection and integration of new and existing data.

ACTION 1: Develop an application (e.g., webmap or dashboard) that displays the results of the PBP, including unique biodiversity values in each park, significant invasive species observations, and restoration project details.

ACTION 2: Regularly (every 2 – 3 years) update RDN Parks Priority Analysis when new information becomes available, such as new public invasive species observations, field verification and park use metrics.

Objective 2: Monitoring and Tracking
Monitor and Report Trends in Invasive Species and Biodiversity Distribution

Maintaining accurate and up-to-date records of the natural assets in each RDN park is key for effective management strategies. This PBP provides baseline data collected from various publicly available sources, and field verification of representative examples of Parks Priority Analysis categorizations. Notably, tracking and documentation of invasive species removals and restoration projects have not been consistent. Actions implemented under Monitoring and Tracking initiatives will refine and supplement existing baseline information and support the consistent monitoring of natural areas by RDN Parks Staff.

ACTION 3: Field verify parks to establish an accurate invasive species data set, prioritizing parks with no recorded invasive species occurrences (**Appendix III**).

ACTION 4: Field verify parks with high biodiversity ratings for risk to invasive species.

ACTION 5: Integrate invasive species data into internal asset management software, maintain or adapt current actions and restoration activities, and schedule follow-ups based on RDN Parks Operation Reporting Software.

Objective 3: Management and Planning
Integrate Invasive Species Management and Biodiversity Enhancement into Standard Operating Procedures, Management Plans, and Policies

Currently, operational objectives for managing invasive plants in RDN Parks relies on reports from the public or from routine park inspections. To transition to a proactive and consistent management approach, development and implementation of an invasive species management policy and Standard Operating Procedure for identifying and attending to invasive species issues regularly. As management plans and capital projects are developed and updated, particular attention should be given to how these plans can support and improve biodiversity.

ACTION 6: Establish an Invasive Species Management Policy and Standard Operating Procedure for RDN Parks Operations Staff using **Part 3 - Management and Enhancement Strategies** as guidance.

ACTION 7: As management plans and capital projects are developed or updated, incorporate specific biodiversity enhancement and invasive species management objectives into these plans and projects.

ACTION 8: Develop a park planting specifications guide focused on enhancing biodiversity while minimizing the introduction of exotic and invasive species in newly developed parks and during park improvement projects.

Objective 4: Community Stewardship, Partnerships and Awareness
Engage and Support Community-Led Restoration and Protection Initiatives

Community stewards play a vital role in promoting and fostering ecosystem awareness and protection. Volunteers can contribute to environmental initiatives through various activities, from removing invasive species and planting native species, to leading biodiversity monitoring programs. Raising awareness to biodiversity values, threats, and challenges through public outreach helps individuals understand how their actions impact the environment. When community members recognize the importance of protecting and enhancing nature, they are more likely to adopt environmentally friendly practices, such as avoiding pesticides, planting native species, and responsibly managing garden waste. Education initiatives can foster community ownership and appreciation for well-managed natural areas.

ACTION 9: Promote best management practices, volunteer opportunities and educational awareness through outreach events, social media, print media and updates on RDN's get involved webpage, utilizing Invasive Species of Concern and Management Strategies Infographics.

ACTION 10: Identify and engage in Citizen Science initiatives that allow the public to contribute to the collection of biodiversity and invasive species information

ACTION 11: Support Goal 7 of the RDN Parks and Trails Strategy to increase volunteerism and stewardship, by developing a volunteer and stewardship policy or set of guidelines to direct and support the growth of volunteerism within RDN Parks.

ACTION 12: Host stewardship workshops and/or information sessions for stewardship groups and the public to educate on best practices, protocols, safety and other relevant topics of interest.

ACTION 13: Organize and/or participate in regional conferences and seminars directed at sharing information on restoration, invasive species management and inter-governmental collaboration

4.2 Implementation Summary

The implementation summary provides a framework to guide the prioritization, scheduling, resource allocation, and monitoring of the objectives and actions outlined in the PBP. While it does not specify step-by-step instructions for each action, it offers a structured approach to ensure that efforts are strategically focused and progress is effectively tracked. As part of the adaptive management process, the PBP will be revisited in 5 years to assess objectives, actions, and re-evaluate performance metrics as needed.

Table 4-1 summarizes the objectives and associated actions listed in Section 4.1, and provides an implementation plan showing start date, resource allocation, lead and supporting parties, and measures of success.

START DATE

Proposed year the action will start. Actions listed as ongoing have already been initiated, and will continue into 2025. Actions with 2025 align with projects proposed in the 2025 budget.

RESOURCES (STAFF/COST)

Reflects the level of funding or other resources required to implement each action and is based on an estimate of similar projects or communication with the RDN. Most actions have been developed with the intent of being completed by current RDN Parks Staff, in particular the Parks Operations Coordinator for Natural Areas, and the Parks Stewardship Coordinator using funds currently identified in the current financial plan.

LEAD (SUPPORT)

Refers to the department responsible for leading the action, and potential parties who will support the lead in implementing the action. Support may not be limited to the listed parties, and additional interested parties may be included.

MEASURES OF SUCCESS

Performance metrics to determine if objectives and their associated actions are either being met, in progress of being met, or not being met. Each objective is supported by specific metrics aimed at quantifying progress and guiding adaptive management practices. These metrics will be regularly reviewed and adjusted as necessary to ensure alignment with conservation goals and the overall effectiveness of the PBP.

Table 4-1. Implementation Summary

Objective	Action	Action Description	Start Date	Resources	Lead (Support)	Measures of Success
Mapping & Spatial Information	1	Develop an application (e.g., webmap or dashboard) that displays the results of PBP analysis for the RDN's Staff and the public.	2027	External (2027 - 2031 Financial Plan One Time)	RDN Parks (RDN GIS, Consultant)	• Creation of web application. • Increases of traffic to RDN's website/public mapping systems.
	2	Regularly (2 – 3 years) update the Park Priority Analysis when new information becomes available, such as new public invasive species observations, field verification and park use metrics.	2027	Staff	RDN Parks (RDN GIS)	• Documentation of GIS data updates and version releases.
Monitoring & Tracking	3	Field verify parks to establish an accurate invasive species data set, prioritizing parks with no recorded invasive species occurrences (**Appendix V**).	2025	Staff	RDN Parks	• Document number of parks Field Verified.
	4	Field verify parks with high biodiversity ratings and parks with high risk to invasive species ratings (**Appendix V**).	2025	Staff	RDN Parks	• Document number of parks Field Verified.
	5	Integrate invasive species data into internal asset management software, maintain or adapt current actions and restoration activities, and schedule follow-ups based on the RDN Parks Operation Reporting Software.	TBD	Staff	RDN GIS (RDN Parks)	• Input current data into software • Analyze data and develop a preventative maintenance schedule for monitoring condition of natural assets and control of invasive species
Management & Planning	6	Establish an Invasive Species Management Policy and Standard Operating Procedure, for the RDN Parks Operations Staff.	2026	Staff	RDN Parks	• Completion and implementation of a Species Management Policy. • Completion and implementation of a Standard Operating Procedure.
	7	As management plans and capital projects are developed or updated, incorporate specific biodiversity enhancement and invasive species management objectives whenever possible	Ongoing	Staff	RDN Parks	• Contribute to management plan updates and capital projects for 2025 (including but not limited to: Englishman River RP, Mount Benson RP, Cox CP management plans, Coats Marsh weir replacement, French Creek Estuary Nature Preserve restoration, Little Qualicum River Estuary Regional Conservation Area restoration and Green shores planning, Sea Fern CP and Sunny Beach CP bank stabilization and protection)
	8	Develop a park planting specifications guide focused on enhancing biodiversity while minimizing the introduction of exotic and invasive species in newly developed parks and during park improvement projects.	2026	Staff	RDN Parks	• Completion of a planting specifications guide. • Distribution of planting specifications guide to RDN Parks staff, contractors and relevant RDN departments

Table 4-1. Implementation Summary

Objective	Action	Action Description	Start Date	Resources	Lead (Support)	Measures of Success
Community Stewardship, Partnerships, and Awareness	9	Promote best management practices, volunteer opportunities and educational awareness through outreach events, social media, print media, branded promotional materials and updates on the RDN's Get Involved webpage, utilizing Invasive Species of Concern and Management Strategies Infographics.	2026	External (2026 - 2030 Financial Plan Core)	RDN Parks (RDN Communications, Consultant)	• Develop and distribute best management practices print media, giveaways and tools for outreach • Document number of social media posts and campaigns • Participate in "Invasive Species Action Month" annually
	10	Identify and engage in Citizen Science initiatives that allows the public to contribute to the collection of biodiversity and invasive species information.	2027	Staff	RDN Parks (Stewardship Groups Volunteers)	• Maintain a comprehensive record of all Citizen Science projects engaged in, including participation rates and data collected. • Create a detailed list and provide support for public participation in ongoing Citizen Science projects • Measure the level of public participation by tracking the number of volunteers involved in Citizen Science initiatives, aiming for at least 50 active participants annually.
	11	Develop Volunteer and Stewardship action plan for the RDN Parks aimed at enhancing capacity to manage invasive species and implement enhancement projects.	2026	Staff	RDN Parks (RDN Drinking Water and Watershed Protection, RDN Climate Change and Resilience)	• Create, finalize, and distribute the Volunteer and Stewardship Action Plan • Track implementation of projects and actions, their level of success • Partner with other RDN Departments to enhance success of related projects
	12	Host stewardship workshops and/or information sessions for stewardship groups and the public to educate on best practices, protocols, safety and other relevant topics of interest.	2025	Staff	RDN Parks (RDN Drinking Water and Watershed Protection, RDN Climate Change and Resilience)	• Conduct workshops focused on invasive species management and stewardship best practices • Gather feedback and topic recommendations from participants through post-workshop surveys, • Track of the number of stewardship groups represented in the workshops. • Monitor the number of participants who apply learned practices in their stewardship activities
	13	Organize and/or participate in regional conferences and seminars directed at sharing information on restoration, invasive species management and inter-governmental collaboration	2025	Staff	RDN Parks (Member municipalities, Regional Districts, Provincial Resources	• Host or present seminar on restoration stewardship for member municipalities and adjoining regional districts • Document number of cross-jurisdictional events attended • Attend ISCBC Conferences in 2026/2027

CONCLUSION

The Parks Biodiversity Plan underscores the importance of preserving and enhancing the unique ecological values within the Regional District of Nanaimo (RDN). By recognizing the threats posed by invasive species and leveraging science-based methodologies, this plan provides a strategic framework to restore and enhance biodiversity across the Parks Portfolio.
Through the classification of parks based on management priorities, we ensure resources are directed where they are needed most. Integration of adaptive management strategies ensures that our approach remains responsive to emerging challenges and evolving ecological conditions. Collaboration with stewardship groups further strengthens community engagement, fostering shared responsibility for the preservation of natural spaces.

As the RDN continues to grow, this plan serves as a vital tool to maintain the ecological integrity of our parks. By embracing sustainable practices, restoring native ecosystems, and promoting stewardship, we can safeguard the biodiversity that makes these spaces invaluable for current and future generations.

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Appendix I

Stewardship and Volunteer Spotlight

In 2022, a native replanting project was conducted in Queequeg Community Park in partnership with volunteers from Gabriola Island Lands and Trails Trust, to reintroduce native plants to an area overtaken by *Daphne laureola*.

Gord Oliphant, along with the Friends of French Creek volunteers, dedicated hours to removing invasive giant hogweed and other species of concern from French Creek Community Park.

Volunteers from the Save Estuary Lands Society, Friends of French Creek, Arrowsmith Naturalists, Mid Island Habitat Enhancement Society, and the Mount Arrowsmith Biosphere Region Research Institute, and many others supported fundraising efforts to purchase the French Creek Estuary Nature Preserve, helping protect environmentally valuable resources.

Qualicum Beach Stream Keepers established planting enclosures in the Little Qualicum River Estuary Regional Conservation Area and maintained these areas to mitigate erosion, enhance biodiversity, and support riparian stream habitats.

In 2023, the Nanaimo Areas Lands Trust partnered with Vancouver Island University and the RDN Parks team to plant trees in Nanaimo River Regional Park to slow the spread of invasive Scotch Broom.

Yellowpoint Ecological Society volunteers salvaged and replanted trees and shrubs in Nanaimo River Canyon Community Park to decommission an unauthorized trail and make way for a new sanctioned trail connection.

Appendix II

Gap Analysis

The graph below provides a summary of the various datasets utilized and the number of parks that are covered by the existing spatial data. The presence of spatial data in some parks, such as incidental species observations, does not necessarily indicate the absence of a species in a park without data; rather, it may reflect gaps in available information. In some cases, the absence of data may also indicate that specific datasets are not applicable to certain parks. For example, critical habitat for species like the Marbled Murrelet might be limited to coastal areas due to the species' specific biophysical requirements, meaning parks located inland would not be identified as containing critical habitat.

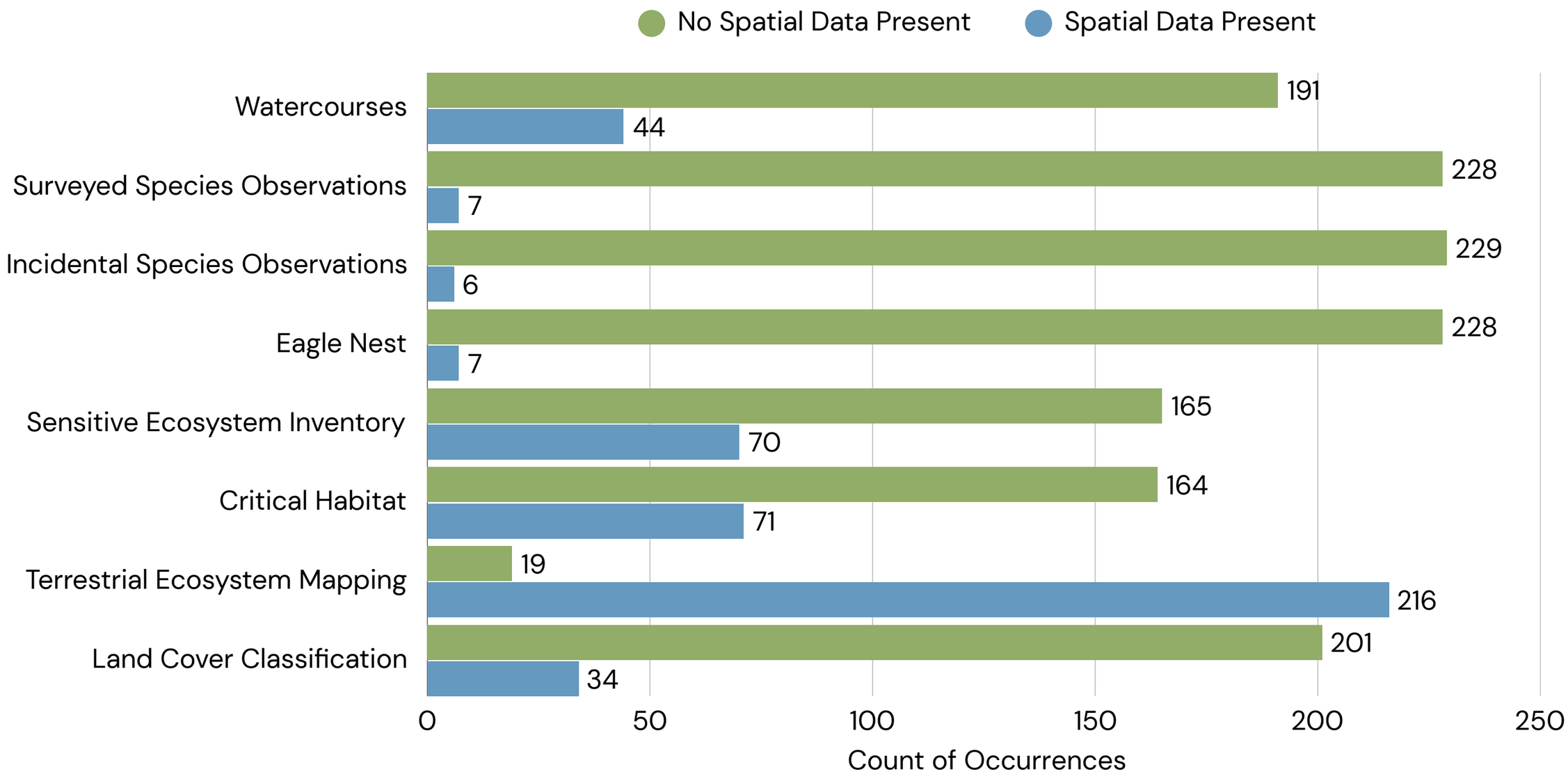

Table A2-1. Description of Data Sources

Data Layer	Description	Source	Year
Aerial Photos	15 cm aerial photography resolution	RDN	2020
TEM	Upper Qualicum mapped at a 1:20 000 scaled - Business Area Project ID (BAPID) 243	DataBC	1999
	Terrestrial Ecosystem Mapping (TEM) of the Coastal Douglas-Fir Biogeoclimatic Zone at a 1: 20 000 scale - BAPID 4522	DataBC	2008
	Weyerhouser TEM - BAPID 4902	DataBC	Unknown
	TEM for the Coastal Western Hemlock very dry (CWHxm1) biogeoclimatic subvariant: Southern Comox Valley Regional District at a 1:10 000 scale - BAPID 6641	DataBC	2022
SEI	Sensitive Ecosystems Inventory (SEI): East Vancouver Island and the Gulf Islands (Includes 2002 Disturbance Mapping)	Canadian Wildlife Service and BC Ministry of Environment	1998
VRI	Provincially derived information on forests, including age, crown cover, stand composition, etc.	DataBC	2023

Data Layer	Description	Source	Year
RDN Parks	235 Parks located within the RDN; this includes all park types	RDN	2024
Watercourses	All watercourses spatially identified within the RDN boundary. Linework was derived from TRIM, SHIM, and unknown data sources	RDN	2020
Biogeoclimatic Ecosystem Classification (BEC; v12)	BEC boundaries including Zone/Subzone/Variant/Phase	DataBC	2021
Land Cover Classification (LCC)	LCC developed for the RDN to identify ecosystems and condition of riparian areas surrounding priority watercourses within the RDN.	McTavish	2021
Critical Habitat	Displays the geographic areas within which critical habitat for species at risk listed on Schedule 1 of the federal *Species at Risk Act* (SARA) occurs, not all the area within these boundaries is necessarily critical habitat.	DataBC	2023
Eagle Nests	Known eagle nests within the RDN.	RDN	2020

Data Layer	Description	Source	Year
Surveyed Occurrences (Non-Sensitive)	Encounters with species or its sign that have been documented and are part of a formalized survey.	DataBC	2024*
Incidental Observations	Recorded detection of a species or its sign that was not part of a formalized survey. This can occur when a non-focal species is observed during a survey for another species, outside of the study area, or as a chance observation made at random. Validity of these sightings is widely variable depending on the level of expertise of the observer and how visible the animal was. This is the publicly available version of the incidental observation dataset. Observation dates range from 1907 - 2021	DataBC	2024*
IAPP	Data provided by MOE upon request for locations of recorded invasive plant species that have been submitted to date.	MOE	2020

Table Notes:
*Data was downloaded in the spring of 2024 but we are unsure of the posterity of the data.

PARK NAME	ELECTORAL AREA	INVASIVE PLANT	IMAGERY REVIEW	LAND COVER CLASS	CRITICAL HABITAT	SENSITIVE ECOSYSTEM INVENTORY	EAGLE NESTS	WATERCOURSE	TEM	INCIDENTAL OBSERVATIONS	SURVEY OBSERVATIONS	PARK TYPE
Peterson Rascal Community Park	-	No	Fringe vegetation	No	No	Yes	No	No	Yes	No	No	Community Park - predominantly vegetated
Addison Way Community Park	A	Yes	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Cedar Plaza Community Park	A	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Cedar Skatepark	A	Yes	Fringe vegetation	No	No	Yes	No	Yes	Yes	No	No	Community Park - predominantly vegetated
Driftwood Road Beach Access	A	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Fawcett Road Community Park	A	No	Natural	No	No	No	No	Yes	Yes	No	No	Community Park - undeveloped
Glynneath Road Community Park	A	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Kipp Road Community Park	A	No	Natural	Yes	No	Yes	No	Yes	Yes	Yes	No	Community Park - undeveloped
MacMillan Road Community Park	A	Yes	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Morden Colliery Community Park	A	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Morden Colliery Regional Trail	A	No	Natural	Yes	No	Yes	No	Yes	Yes	No	No	Regional and Community Trail
Nanaimo River Regional Park	A	Yes	Natural	Yes	No	Yes	No	Yes	Yes	Yes	No	Regional Park
Nelson Road Community Boat Launch	A	No	Other	No	No	No	No	No	Yes	No	No	Water access/Parking lot
Pylades Drive Beach Access	A	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Water access/Parking lot
Quennell Lake Car Top Boat Launch	A	Yes	Fringe vegetation	No	No	No	No	No	Yes	No	No	Water access/Parking lot
South Wellington Community Park	A	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - rec hub
Thelma Griffith Community Park	A	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - rec hub
Whiting Way Community Park	A	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Woodridge Road Community Park	A	Yes	Natural	No	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
707 Community Park	B	No	Natural	No	No	Yes	Yes	Yes	Yes	No	Yes	Community Park - undeveloped
Bell's Landing Water Access	B	No	Natural	No	No	No	No	No	Yes	No	No	Water access/Parking lot
Blue Heron Community Park	B	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Bluewhale Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Burnside Drive Community Trail	B	No	Other	No	No	No	No	No	Yes	No	No	Regional and Community Trail

PARK NAME	ELECTORAL AREA	INVASIVE PLANT	IMAGERY REVIEW	LAND COVER CLASS	CRITICAL HABITAT	SENSITIVE ECOSYSTEM INVENTORY	EAGLE NESTS	WATERCOURSE	TEM	INCIDENTAL OBSERVATIONS	SURVEY OBSERVATIONS	PARK TYPE
Captain Ahab's Terrace Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Cardale Road Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Clamshell Drive Community Park	B	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Coast Road Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Coats Marsh Regional Park	B	No	Natural	No	No	Yes	No	Yes	Yes	No	No	Regional Park
Cox Community Park	B	Yes	Natural	Yes	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
Decourcy Drive Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Decourcy Penninsula Water Access 2, 3, 5	B	No	Natural	No	No	No	No	No	Yes	No	No	Water access/Parking lot
Descanso Bay Regional Park	B	No	Natural	No	No	No	Yes	Yes	Yes	No	Yes	Regional Park
Descanso Bay Road Water Access	B	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Water access/Parking lot
Dodd Narrows Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Dunlop Flewett Community Trail	B	No	Natural	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Dunlop Lane Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
El Verano Boat Launch	B	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Water access/Parking lot
Hummingbird Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Huxley Community Park	B	No	Other	No	No	No	No	No	Yes	No	No	Community Park - rec hub
Hyham Road Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Joyce Lockwood Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Link Bay Road Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Malaspina Galleries Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Paisley Place Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Pequod Crescent Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Petroglyph Community Trail	B	No	Natural	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
Petroglyph Way Federal Crown Community Trail	B	No	Natural	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
Pilot Bay Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped

PARK NAME	ELECTORAL AREA	INVASIVE PLANT	IMAGERY REVIEW	LAND COVER CLASS	CRITICAL HABITAT	SENSITIVE ECOSYSTEM INVENTORY	EAGLE NESTS	WATERCOURSE	TEM	INCIDENTAL OBSERVATIONS	SURVEY OBSERVATIONS	PARK TYPE
Queequeg Place Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Rollo McClay Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - rec hub
Sea Fern Lane Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Seymour Road Community Trail	B	No	Natural	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
South Road Community Park	B	No	Fringe vegetation	No	No	No	Yes	No	Yes	No	No	Community Park - undeveloped
Spring Beach Drive Water Access	B	No	Natural	No	No	No	No	No	Yes	No	No	Water access/Parking lot
Stalker Road Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
The Strand Community Park	B	No	Natural	No	No	No	No	Yes	Yes	No	No	Community Park - undeveloped
Town Ho End Community Park	B	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Anders & Dorrit's Community Park	C	No	Natural	Yes	Yes	Yes	No	Yes	Yes	No	No	Community Park - predominantly vegetated
Benson Creek Falls Regional Park	C	No	Natural	No	No	Yes	No	Yes	No	No	No	Regional Park
Creekside Place Community Park	C	No	Natural	No	No	Yes	No	Yes	No	No	No	Community Park - undeveloped
Extension Miners Community Park	C	No	Natural	No	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
Extension Playground	C	Yes	Other	No	No	No	No	No	Yes	No	No	Community Park - rec hub
Heather Way Community Park	C	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Meadow Drive Community Park	C	No	Natural	No	No	No	No	Yes	Yes	No	No	Community Park - predominantly vegetated
Mount Arrowsmith Massif Regional Park	C	No	Natural	Yes	Yes	No	No	Yes	No	Yes	No	Regional Park
Mount Arrowsmith Regional Park (ACRD)	C	No	Natural	No	Yes	No	No	Yes	No	No	No	Regional Park
Mount Benson Regional Park	C	No	Natural	Yes	Yes	No	No	Yes	No	Yes	No	Regional Park
Nanaimo River Canyon Community Park	C	No	Natural	Yes	No	Yes	No	Yes	No	No	No	Community Park - undeveloped
Plecas Road Community Park	C	No	Other	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Riverbend Community Park	C	No	Natural	Yes	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Riverbend Road Community Park	C	No	Natural	Yes	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
South Forks Community Park	C	No	Natural	No	No	No	No	Yes	No	No	No	Community Park - undeveloped
South Forks Road Community Park	C	No	Natural	No	No	No	No	No	No	No	No	Community Park - undeveloped
Twilight Way Community Park	C	No	Natural	No	No	Yes	No	Yes	No	No	No	Community Park - undeveloped

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Virostko Road Community Park	C	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Virostko West Community Park	C	No	Fringe Vegetation	No	No	Yes	No	No	Yes	No	No	Community Park - predominantly vegetated
Ainsley Place Community Trail	E	No	Other	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
Amelia Crescent Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Anchor Way Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Arbutus Grove Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Armstrong Crescent Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Beachcomber Regional Park	E	No	Natural	No	No	No	Yes	No	Yes	No	Yes	Regional Park
Blueback Drive Community Park	E	No	Fringe vegetation	Yes	No	Yes	No	No	Yes	No	No	Community Park - predominantly vegetated
Blueback Drive Community Park	E	No	Other	No	No	Yes	No	No	Yes	No	No	Water access/Parking lot
Bonnington Carmichael Community Trail	E	No	Fringe vegetation	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
Bonnington Coventry Community Trail	E	No	Fringe vegetation	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
Bonnington GC N Community Trail	E	No	Other	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
Bonnington GC S Community Trail	E	No	Fringe vegetation	No	No	Yes	No	No	Yes	No	No	Regional and Community Trail
Brickyard Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Carlisle Carmichael Community Trail	E	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Carmichael Road Community Park	E	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Claudet Creek Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Claudet Road Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Coventry Place Community Trail	E	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Craig Creek Estuary Community Park	E	No	Fringe vegetation	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Crowsnest Lane Community Park	E	Yes	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Davenham Road Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Dolphin Lake Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Dolphin Marsh Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	Yes	Community Park - undeveloped
Enos Creek Community Park	E	No	Natural	No	No	No	No	Yes	Yes	No	No	Community Park - undeveloped
Es-hw-Sme~nts Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped

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Fairwinds Drive Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Henley Place Community Park	E	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Highland Road Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Jack Bagley Community Park	E	No	Other	No	No	No	No	No	Yes	No	No	Community Park - rec hub
La Selva Place Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Moorecroft Regional Park	E	No	Natural	No	No	Yes	Yes	No	Yes	No	No	Regional Park
Nanoose Road Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Park Place Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Redden Road Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Redden Rockhampton Community Trail	E	No	Natural	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Richard Place Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Rowland Road Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Rumming Road Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Schooner Ridge Community Park	E	No	Fringe vegetation	No	No	No	Yes	No	Yes	No	Yes	Community Park - undeveloped
Sea Ridge Davenham Community Trail	E	No	Natural	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Stone Lake Drive Community Park	E	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Weston Place Community Park	E	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - predominantly vegetated
Allsbrook Road Community Park	F	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Braddock Leffler Community Trail	F	No	Natural	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Brooklin Hilliers Community Trail	F	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Brooklin Lane Community Park	F	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Coombs Station Community Park	F	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Cranswick Matterson Community Trail	F	No	Natural	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Dolly Varden Way Community Park	F	No	Natural	No	Yes	Yes	No	No	Yes	No	No	Community Park - undeveloped
Errington Community Park	F	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Errington School Trail	F	No	Natural	No	No	No	No	No	Yes	No	No	Regional and Community Trail
French Creek School Community Park	F	No	Natural	Yes	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated

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Harris Crescent Community Park	F	No	Natural	No	Yes	No	No	Yes	Yes	No	No	Community Park - undeveloped
Kerr Road Community Park	F	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Little Qualicum Falls Community Park	F	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Little Qualicum River Regional Park	F	No	Natural	No	Yes	Yes	No	Yes	Yes	No	No	Community Park - predominantly vegetated
Malcolm Community Park	F	No	Natural	No	Yes	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
Meadowood Community Park	F	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Melon Road Community Park	F	No	Natural	No	Yes	Yes	No	No	Yes	No	No	Community Park - undeveloped
Old Alberni Hwy Community Park	F	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Price Road Community Trail	F	No	Natural	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Romain Road Community Park	F	Yes	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Wild Road Community Park	F	No	Natural	No	Yes	No	No	No	No	No	No	Community Park - undeveloped
Ackerman Wally Community Trail	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Arrowsmith Tara Community Trail	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Barclay Crescent Community Park	G	No	Natural	Yes	No	No	No	No	Yes	No	No	Community Park - undeveloped
Blue Water Place Community Park	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Boultbee Drive Community Park	G	No	Fringe vegetation	Yes	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Brookfield Windridge Community Park	G	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Centre Crescent Community Park	G	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Chatell Road Community Park	G	No	Natural	Yes	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Cinnamon Sedge Matuka Community Park	G	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Columbia Drive West Side Community Trail	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Craig Creek Community Park	G	No	Natural	No	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
Dalmation Drive Community Park	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Dashwood Community Park	G	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Englishman River Regional Park	G	Yes	Natural	Yes	No	Yes	No	Yes	Yes	Yes	No	Regional Park

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French Creek Community Park	G	Yes	Natural	Yes	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
French Creek Estuary Nature Preserve	G	Yes	Natural	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Conservation/ Preservation Area
Hawthorne Rise Community Park	G	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Huckleberry Lane Community Park	G	No	Natural	No	Yes	Yes	No	No	Yes	No	No	Community Park - undeveloped
Johnstone Road Beach Access	G	Yes	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Kaye Peterson Community Park	G	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Kaye Rivers Edge Community Park	G	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Kaye Road Community Park	G	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Lee Road Community Park	G	No	Natural	Yes	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
Lee Road Community Trail	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Lee Road West Community Trail	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Regional and Community Trail
Little Qualicum River Estuary Regional Conservation Area	G	No	Natural	No	Yes	Yes	No	No	Yes	No	No	Conservation/ Preservation Area
Mallard Road Beach Access	G	Yes	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Maple Lane Community Park	G	Yes	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Matuka Drive Community Park	G	No	Natural	No	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
Miller Road Community Park	G	Yes	Natural	Yes	Yes	Yes	No	No	Yes	No	No	Community Park - undeveloped
Neden Way Community Park	G	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Peterson Rascal Community Park	G	No	Natural	No	No	Yes	No	No	Yes	No	No	Community Park - undeveloped
Riley Sanika Community Park	G	No	Fringe vegetation	No	No	No	No	No	Yes	No	No	Community Park - undeveloped
Rivers Edge Community Park	G	No	Fringe vegetation	No	No	Yes	No	No	Yes	No	No	Community Park - predominantly vegetated
Rivers Edge Community Trail N	G	No	Natural	Yes	No	No	No	No	Yes	No	No	Regional and Community Trail
Rivers Edge Community Trail S	G	No	Natural	Yes	No	Yes	No	No	Yes	No	No	Regional and Community Trail
San Malo Crescent Community Park	G	No	Fringe vegetation	No	No	Yes	No	Yes	Yes	No	No	Community Park - predominantly vegetated
Stanhope Community Park	G	No	Natural	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Stormwater Community Park	G	No	Fringe vegetation	Yes	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated

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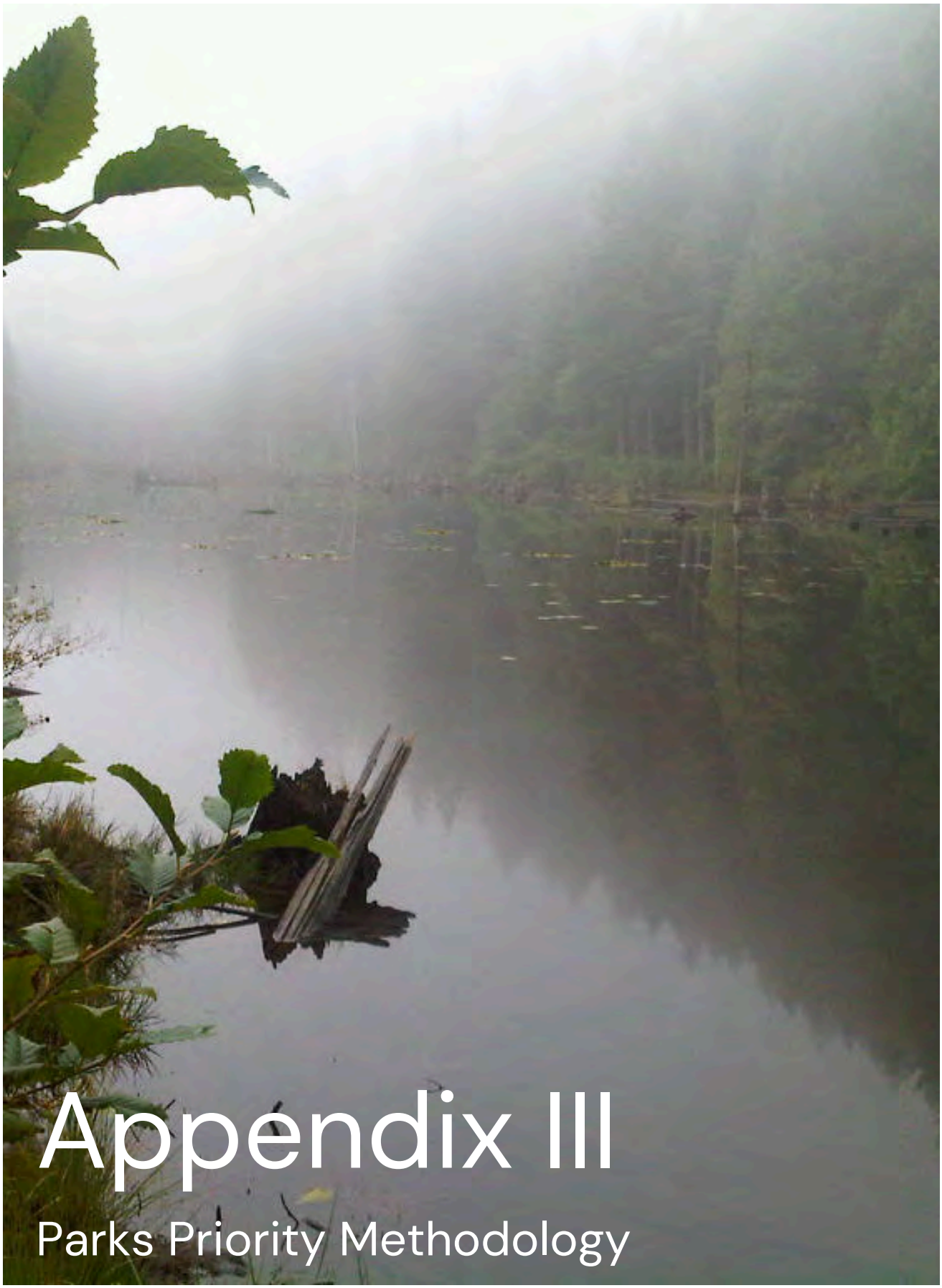
Sumar Lane Community Park	G	No	Other	No	No	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Surfside Drive East Beach Access	G	Yes	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Surfside Drive West Beach Access	G	Yes	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Top Bridge Community Park	G	No	Natural	Yes	No	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
1950 Gazetted Hwy Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Alert Road Beach Access	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Baywater Road Beach Access	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Blue Heron Drive Community Park	H	No	Natural	No	Yes	No	No	Yes	Yes	No	No	Community Park - undeveloped
Bovanis Road Community Park	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Bowser Road Beach Access	H	No	Fringe vegetation	Yes	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Buccaneer Beach Road Beach Access	H	Yes	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Coburn Henry Morgan Community Trail	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Crane Road Beach Access	H	Yes	Natural	Yes	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Creekside Islewood Community Trail	H	No	Fringe vegetation	Yes	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Deep Bay Creek Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Deep Bay Drive Beach Access	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Dunsmuir Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - rec hub
Franksea Road Beach Access	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Gainsberg Pearl Community Trail	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Henry Morgan Community Park	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Horne Lake Regional Park	H	No	Natural	No	Yes	No	No	Yes	No	No	Yes	Regional Park
Huson Road Community Park	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Hwy 19A Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Illusion Lakes Community Park	H	No	Natural	No	Yes	Yes	No	No	Yes	No	No	Community Park - undeveloped

PARK NAME	ELECTORAL AREA	INVASIVE PLANT	IMAGERY REVIEW	LAND COVER CLASS	CRITICAL HABITAT	SENSITIVE ECOSYSTEM INVENTORY	EAGLE NESTS	WATERCOURSE	TEM	INCIDENTAL OBSERVATIONS	SURVEY OBSERVATIONS	PARK TYPE
Kelsey Road Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Kenmuir Road Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Larkdowne Oakdowne Community Trail	H	Yes	Natural	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Leon Marshall Community Trail	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Lions Community Park	H	No	Fringe vegetation	No	Yes	No	No	Yes	Yes	No	No	Community Park - rec hub
Nile Creek Community Park	H	No	Natural	Yes	Yes	Yes	No	Yes	Yes	No	No	Community Park - undeveloped
Nile Road Beach Access	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Nile Road Community Park	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Community Park - predominantly vegetated
Oakdowne Community Park	H	Yes	Natural	No	Yes	Yes	No	No	Yes	No	No	Community Park - undeveloped
Oakdowne Community Trail	H	No	Natural	No	Yes	Yes	No	No	Yes	No	No	Regional and Community Trail
Oakdowne Wetland Community Park	H	No	Natural	No	Yes	Yes	No	No	Yes	No	No	Community Park - undeveloped
Ocean Trail Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Palm Pacific Road Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Pearl Road Community Park	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Rose Community Park	H	No	Natural	Yes	Yes	No	No	Yes	Yes	No	No	Community Park - undeveloped
Shoreline Drive Beach Access	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Community Park - undeveloped
Sunnybeach Road Beach Access	H	No	Fringe vegetation	No	Yes	No	No	No	Yes	No	No	Water access/Parking lot
Thompson Clarke Ocean Trail	H	No	Natural	No	Yes	No	No	No	Yes	No	No	Regional and Community Trail
Wildwood Community Park	H	No	Natural	No	Yes	No	No	Yes	Yes	No	No	Community Park - undeveloped
Wildwood Place Community Park	H	No	Natural	Yes	Yes	No	No	No	Yes	No	No	Community Park - undeveloped



Appendix III

Parks Priority Methodology

1. Introduction

Using a combination of ArcGIS Pro 3.2.0 and R Studio, biodiversity observations, invasive species inventory assessments, and subsequent park priority categorization were conducted for 235 of the RDN parks (ESRI 2024; R Studio Team 2024). To determine the distribution of biodiversity observation and invasive species distribution, and create a parks priority based on a developed matrix, available data were reviewed, and a methodology was developed to establish a repeatable process. This methodology ensures that future data can be incorporated and parks can be updated accordingly. The following section provides an overview of the methodology, with results presented in the **Part II, "Observation and Inventories,"** of the RDN Parks Biodiversity Plan.

2. Data Collection

Data compilation involved reviewing potentially applicable layers from the RDN and DataBC (**Table A2-1**). Existing Terrestrial Ecosystem Mapping (TEM), Sensitive Ecosystem Inventory (SEI), and Land Cover Classification (LCC), provided partial coverage for the 235 Parks and are detailed in **Appendix II, Gap Analysis**.

3. Analysis

The biodiversity and invasive species analyses was conducted using ArcGIS Pro 3.2.0 with Model Builder to spatially relate the data to the RDN parks. Subsequently, a processing script was developed in R to prioritize biodiversity invasive species priority within the RDN parks system, which were then given a categorization based on the priority matrix.

3.1 Biodiversity Observations

To classify parks into biodiversity observation categories, provincial datasets and imagery analysis were integrated to form a comprehensive dataset with various attributes. A data dictionary detailing the dataset, attributes, and definitions is available in an Excel database (RDN_PBP_DataDictionary_2024.xlsx).

A set of rules was developed and applied to the dataset:

- Only ecosystem data directly within a park was considered; mapped ecosystems surrounding parks were excluded.
- Surveyed and incidental observations point data within 500 m of any park were included to account for wildlife movement.
- All surveyed and incidental observations point data were included regardless of their documentation year.
- All eagle trees within 500 m of any given park were included in the analysis.
- Watercourse line work directly within a park was considered; watercourse line work outside of a park was excluded.

3.1.1 Park Biodiversity Categorization

Following data integration, biodiversity classes (high, medium, low) were assessed. A numerical ranking system was used to categorize the parks into classes based on ten biodiversity indicators. The ten biodiversity indicators were selected based on data availability, literature, and ecosystem functions. These indicators were ranked based on a scale of 1 – 3, with 1 being a lower biodiversity indicator and 3 being the highest.

Table A2-2 describes each of the ten indicators, its assigned score, relevance to biodiversity, and underlying assumptions. Some of the indicators will have overlapping properties and will lead to a compounding score which will increase the overall ranking of a given park.

As the dataset included points, lines, and polygons, scores were not applied to the entire park as a whole but rather to each polygon representing various ecosystem units obtained from the data. Subsequently, the highest score among polygons within each park was applied conservatively to classify the park.

Table A2-2. Numerical Ranking of the Assessment of Biodiversity Based on its Applicability and Assumptions

Biodiversity Indicator	Score	Applicability	Assumption
Critical Habitat	3	Parks with overlapping critical habitat received a higher score.	This indicator assumes that all critical habitat mapped meets the necessary requirements to support specific life stage needs of species. It is based on the premise that these habitats provide functional natural environments essential for promoting additional biodiversity. The presence of critical habitat suggests a supportive ecosystem that enhances species diversity and ecological resilience within the park.
Old Forest	3	Parks overlapping with mapped Old Forests (structural stage 7 or age greater than or equal to 250 years) received a higher score.	This indicator assumes that mapped old forests, identified through TEM, SEI, VRI or LCC classifications, represent diverse ecosystems due to their climax state. These forests typically exhibit complex stand structure including large pieces of course woody debris, snags, well-developed understory, and gap dynamics. It is based on the premise that such conditions support a diversity of species needs, contributing significantly to overall biodiversity within the park.
Wetlands	3	Parks overlapping with mapped wetlands (includes all wetland types) received a higher score.	This indicator recognizes wetlands as biodiversity hubs due to their provision of unique habitats for various wildlife and plant species and ecological communities. It considers the presence of a wetland ecosystem as significant for biodiversity, irrespective of the wetland's condition or its associated riparian area.
Sensitive Ecosystem Inventory (SEI)	2	Parks overlapping with areas identified as sensitive ecosystems in the SEI data set received a moderate score.	This indicator recognizes the importance of sensitive ecosystems in maintaining current biodiversity levels. These ecosystems are identified as remnants of rare and fragile terrestrial ecosystems, contributing to ecological integrity within parks. However, their presence does not necessarily indicate areas of high biodiversity, as their significance lies more in their rarity and ecological sensitivity.
Red- or blue-listed ecosystems identified in within the Land Cover Classification (LCC)	2	Parks with red- or blue- listed ecosystem identified through the LCC data set received a moderate score.	This indicator recognizes the importance of red- and blue-listed ecosystems that are provincially listed and identified within the LCC dataset. While these ecosystems do not necessarily indicate areas of high biodiversity, their significance lies more in their rarity and ecological sensitivity.
Provincially red- or blue-listed species / Federally listed species (both incidental and surveyed observation point data)	2	Parks with provincially red- or blue-listed species, or species federally listed under the *Species At Risk Act* (SARA), received a moderate score.	This indicator recognizes the importance of provincially red- and blue-listed species, as well as species federally listed under the SARA. While the park may not provide habitat for these species, a conservative approach includes all observed points within the park and adjacent areas within 500 m. This approach is based on the premise that such conditions support a diversity of species needs, contributing to overall biodiversity within a park.
Red- or blue-listed Ecosystems in Terrestrial Ecosystem Mapping (TEM)	1	Parks with red- or blue-listed ecosystems identified through the TEM dataset receive a low score.	This indicator recognizes the importance of red- and blue-listed ecosystems, provincially listed and identified within the TEM dataset. However, as the dataset is mapped at a relatively large scale, there is uncertainty in the precise location of the ecological communities. While these ecosystems do not necessarily indicate areas of high biodiversity, their significance lies in their rarity and ecological sensitivity. They are important for maintaining biodiversity at broader scales, potentially contributing to ecological integrity within parks.

Biodiversity Indicator	Score	Applicability	Assumption
Eagle Nest	1	Parks that have eagle nests or eagle nests within 500 m received a low score.	This indicator assumes that the presence of eagle nests or nests within 500 m of parks provides essential habitat for nesting or foraging activities of eagles. However, while significant for eagle habitat requirements, this specific indicator does not necessarily correlate directly with high overall biodiversity across multiple species or ecosystems within the park. Its inclusion emphasizes a specific habitat preference for eagles rather than measuring broad biodiversity richness.
Watercourse	1	Parks with mapped watercourses received a low score.	This indicator acknowledges the presence of watercourses (i.e., streams) within parks, which can provide essential habitat for fish, amphibians, and foraging opportunities for various mammals. However, the presence of watercourses alone does not necessarily indicate high biodiversity levels within the park.
Imagery Review	1 - 3	Parks are scored based on their vegetation coverage observed in orthophotos from 2020: • Score 3: Parks with more natural vegetation coverage. • Score 2: Parks with fringe vegetation. • Score 1: Parks with minimal to no vegetation	This indicator acknowledges that parks with more natural vegetation are likely to support higher biodiversity levels. Natural vegetation provides crucial habitats and resources for diverse species, contributing significantly to overall biodiversity within the park. Imagery was reviewed internally using RDN's 2020 orthophotos.

To categorize parks into high, medium, and low categories, the distribution of data was reviewed. It appeared to be normally distributed, so specific thresholds from classification were set based on quartiles. These thresholds aim to evenly distribute parks into three categories based on available data and may need adjustments if scores require changes. **Table A2-3** below provides a summary of the park categorization.

Table A2-3. Distribution of Parks Based on Categorization of Biodiversity Resulting from the Nine Indicators

Biodiversity Category	Number of Parks
High	35
Medium	54
Low	146

3.2 Invasive Plant Distribution

To classify parks by invasive species risk, a provincial dataset was obtained upon request in 2020 from the Range Branch. This dataset provides point records of invasive plant species, their distribution, and density. The dataset was intersected with the parks, and any recorded occurrences within 30 m of the park was included in the analysis to account for potential errors in GPS locations and records.

3.2.1 Park Invasive Species Categorization

Following the data selection species were given a ranking based on their density, and if they were considered a focal species or a species of concern (**Table A2-4**). There is some overlap for species of concern and as such the level of importance increased. A ranking system based on perceived level of importance was developed.

Table A2-4. Numerical Ranking of the Assessment of Invasive Species Based on its Applicability and Assumptions

Invasive Risk	Score	Applicability	Assumption
Focal Species	3	Parks where the RDN's focal species overlap or are within 30 m receive a higher ranking	This indicator is referenced in Section 3.2, Table 3-2 of the Parks Biodiversity Plan.
Species of Concern	3	Parks that have species of concern or are within 30 m receive a higher ranking	This indicator is referenced in Section 4.1, Table 4-2 of the Parks Biodiversity Plan.
Distribution	1 - 4	Parks with different levels of distribution of recorded invasive species receive scores as follows: • Score 4: Species with a high distribution rating (6 – 9). • Score 3: Species with a moderate distribution rating (3 – 4). • Score 2: Species with a low distribution rating (1 – 2). • Score 1: Parks with no known distribution of recorded invasive species	This indicator refers to parks with a higher distribution of recorded invasive reflect an increased likelihood of these species reducing habitat availability for native species. This scoring approach aims to highlight the potential impact of invasive species on native biodiversity within park environments.

The dataset consisted entirely of points, and as such, each park was assigned an aggregate score by summing these values. To categorize parks into high, medium, and low risk categories, the distribution of scores was reviewed. The data did not follow a normal distribution, as many parks did not receive a score due to a lack of recorded invasive species. Therefore, the scores were grouped into even thresholds, with parks that received no scores treated similarly. Like the biodiversity categorization, adjustments to scores can be made as more data becomes available. **Table A2-5** below provides a summary of the park categorization.

Table A2-5. Distribution of Parks Based on Categorization of Invasive Species Occurrence Resulting from the Three Indicators

Invasive Species Category	Number of Parks
High	34
Medium	41
Low	5
NIL	155

3.3 Park Priority

Based on the priority matrix developed in **Part III, Section 1** of the PBP, the biodiversity observation categorization and the invasives species distribution categorization were combined to classify the number of parks that fall within the three priority categories. **Table A2-6** below shows the distribution of parks based on the priority matrix.

Table A2-6. Distribution of Parks Based on Park Priority Categorization, Pre-field Assessment

Park Priority	Number of Parks
High	42
Medium	73
Low	120

4. Field Assessment

A field assessment was conducted from May 9–11 and June 14, 2024. The assessment involved two McTavish representatives and one representative from the RDN Parks Department on May 9–11 and was conducted solely by the RDN Parks Department on June 14, 2024. The purpose of the field assessment was to review the data collection form, document the presence of invasive species, assess the biodiversity categorization, and evaluate the applicability of the priority matrix. While there are various methods for collecting field data, time constraints limited the scope of gathering information on invasive species and biodiversity to be more of general approach. Given these limitations, the assessment was designed to field-test a data collection method that could be implemented by RDN Parks staff and QEPs, efficiently. This approach ensures that data can continue to be collected and integrated into future iterations of the park priority analysis.

A total of 29 out of 235 parks were assessed (12%), assessed parks ranged in classification (i.e., park type) but not all classifications were assessed. Most of the assessments occurred within community parks (19), with Regional Parks (4) and Community Trails (2) being visited, a single Beach Access, Nature Preserve, Regional Trail and Water Access was assessed.

Parks assessed were a combination of their park priority categorization with the majority of parks being visited within the Low category (**Table A2-7**). Parks chosen for assessment were based on accessibility, location, and size due to the limited amount of sample time. Additionally, parks were chosen for diversity on their various biodiversity categorization and perceived level of use based on advisement from the RDN.

Table A2-7. Distribution of Parks Based on Park Priority Categorization and the Number of Parks Field Assessed in 2024

Priority Matrix	Number of Parks	Number of Parks Assessed	% of Parks Assessed
High	42	5	12
Medium	73	9	12
Low	120	15	13
Total	**235**	**29**	**12**

5. Data Integration

Integrating the field data into the PBP analysis and subsequent priority matrix was completed following the same method as above with minor differences in processing

5.1 Updated - Biodiversity Observation Categorization

Field assessments were designed to be conducted by a broad, diverse group of individuals to capture a wide range of perspectives and expertise, as such the field assessments are general and don't speak to detailed biophysical attributes of each park. Data collection focused on identifying the presence of streams, wetlands, presence of potential red- and blue- listed communities. There was a shift in the biodiversity categorization of nine parks, which represents 31% of the assessed parks. . One park was upgraded from a 'low' to a 'high' biodiversity category, and two parks were upgraded from a 'medium' to a 'high' biodiversity category. Four parks were upgraded from a 'low' to a 'medium' biodiversity category. In contrast, two parks were downgraded: one from a 'high' to a 'medium' biodiversity category and the other from a 'medium' to a 'low' biodiversity category.

The categorization of parks as of the end of the 2024 field season is outlined in **Table A2-8**.

Table A2-8. Updated Distribution of Parks Based on Categorization of Biodiversity Resulting from the Nine Indicators Following Field Assessments of 2024

Biodiversity Observation Categorization	Number of Parks
High	37
Medium	56
Low	142

5.2 Updated - Invasive Plant Distribution

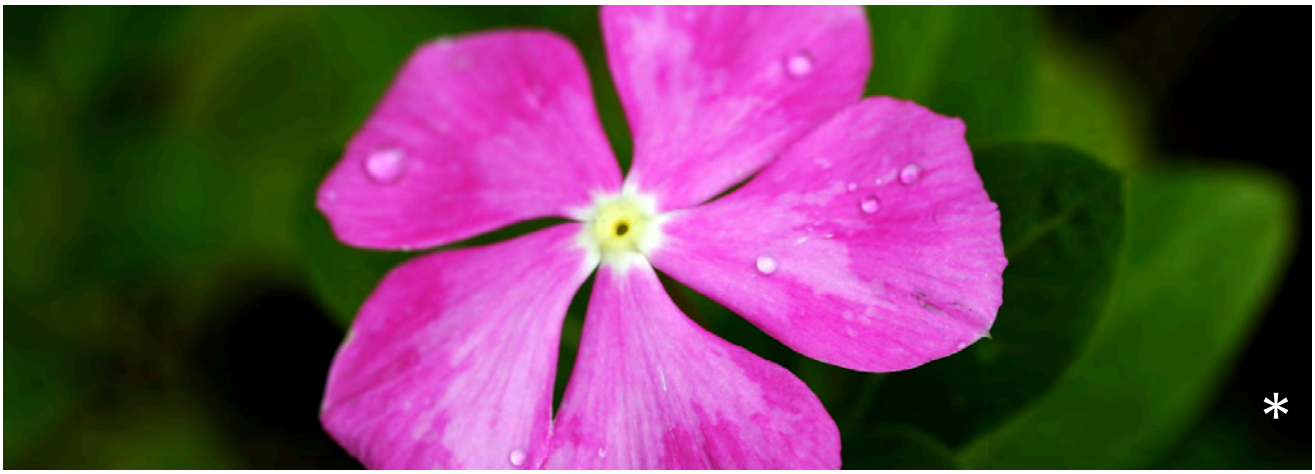
As the field assessments and data collection was largely restricted to the park boundaries, invasive plant species identified from the IAPP dataset within 30 m of the park boundaries was retained. This approach was taken to account for potential species migration into the parks, ensuring that nearby invasive species are still considered a risk to a park's ecological integrity. For parks that underwent ground sampling, the IAPP data was removed within the park boundaries to reflect the most current on-the-ground conditions. Conversely, for parks that were not ground sampled, the original IAPP data was retained. This allowed for a comprehensive evaluation that integrated both field-verified data and existing records.

During the field assessments, 17 parks experienced a shift in their categorization, representing 57% of the assessed parks. Ten parks that previously had no documented invasive species were identified as having them; of these, 6 received a "Medium" categorization, and 4 received a "High" categorization. Two parks had no noted invasive species. Twelve parks showed no change in their invasive species ranking: 9 remained classified as "High," and 3 as "Medium." Additionally, 9 parks experienced an increase in their invasive species category.

The categorization of parks as of the end of the 2024 field season outlined in **Table A2-9**.

Table A2-9. Updated Distribution of Parks Based on Invasive Species Occurrence Following Field Assessments of 2024

Invasive Species Category	Number of Parks
High	37
Medium	56
Low	142



5.3 Updated - Park Priority

Based on the fieldwork and an update to the data, there was an increase in the number of parks classified as high priority, from 42 to 49, a 3% increase. This indicates that the field assessment has elevated the priority of certain parks. The number of parks classified as medium priority decreased from 70 to 73, while the number of low-priority parks decreased from 120 to 116. This shift suggests that the assessment has identified emerging ecological concerns that were not fully captured by the existing data.

Table A2-10 illustrates the distribution of parks across each park priority category both before and after the field assessment. The pre-field and post-field classifications demonstrate how the data collection and subsequent analysis have altered the categorization of the parks.

Table A2-10. Comparison of Distribution of Parks Based on Park Priority Categorization Pre Field and Post Field Assessments

Park Priority	Number of Parks - Pre Field	Number of Parks - Post Field
High	42	49
Medium	73	70
Low	120	116

6. Limitations

Overall, the data analysis provides a starting point for the RDN to assess their parks, it provides a baseline for them to understand parks that have ecosystem components that are beneficial. However, there are several limitations that affect the process:

DATA COMPLETENESS AND BIAS: The categorization of both biodiversity and invasive species relies on the completeness of the data sets. Parks lacking overlapping data may have ranked lower than their actual biodiversity potential. An attempt to address this included a cursory imagery review of vegetation cover for each park.

SPATIAL RESOLUTION ISSUES: Datasets consisted of point data, polygon, and high-resolution imagery. While the high-resolution imagery was not a limitation, the delineation of ecological units in the LCC, TEM, and SEI at varying scales introduces uncertainty in the exact location of the mapped ecological communities.

STATIC DATASETS: Many of the datasets do not get updated on a yearly basis and may not capture changes in invasives species distribution over time or surveyed or incidental species occurrences. Provincial data sets tend to lag in updates and the new introduction or changes post-data analysis will likely affect the categorization of parks for management activities. However, as the RDN builds their own datasets and incorporates it into the process with updates the uncertainty and reliance on provincial datasets will likely decrease.

THRESHOLD SENSITIVITIES: Categorizing parks based on thresholds may oversimplify the nuances in biodiversity and invasive species interactions. Fine-tuning these thresholds may be necessary as more data becomes available or as ecological understanding of each of the parks improves.

RICHNESS AND ABUNDANCE: The biodiversity analysis focuses on provincially or federally listed species that have been documented, not species richness (number of species) or species abundance (number of individuals), which are diversity measures. Integrating these could provide a more comprehensive view but would require complex data synthesis due to varying collection methods and times.

ACCURACY OF GPS RECORDS: The inclusion of point data occurrences within a fixed radius of parks accounts for potential errors in GPS data records. However, inaccuracies in these data points could affect the precision of the biodiversity and invasive species risk assessments.

Outlining these limitations is intended to provide a balanced perspective on the robustness of and applicability of the data analysis will also provide a stepping stone for consideration for future steps.

7. Future Steps

Assessing biodiversity and invasive species within the RDN park systems requires recognition of the diverse ecosystems present and their dynamic nature. The process for data entry, analysis, and categorization was designed to accommodate updates, ensuring ongoing relevance. Enhancing robustness with additional data sources, such as LiDAR, could reduce gaps within the existing dataset. Field assessments outlined in the PBP will increase certainty in rankings and decision-making. Implementing systematic field data collection via tools like Field Maps in ArcGIS and ESRI will ensure consistency and community involvement.

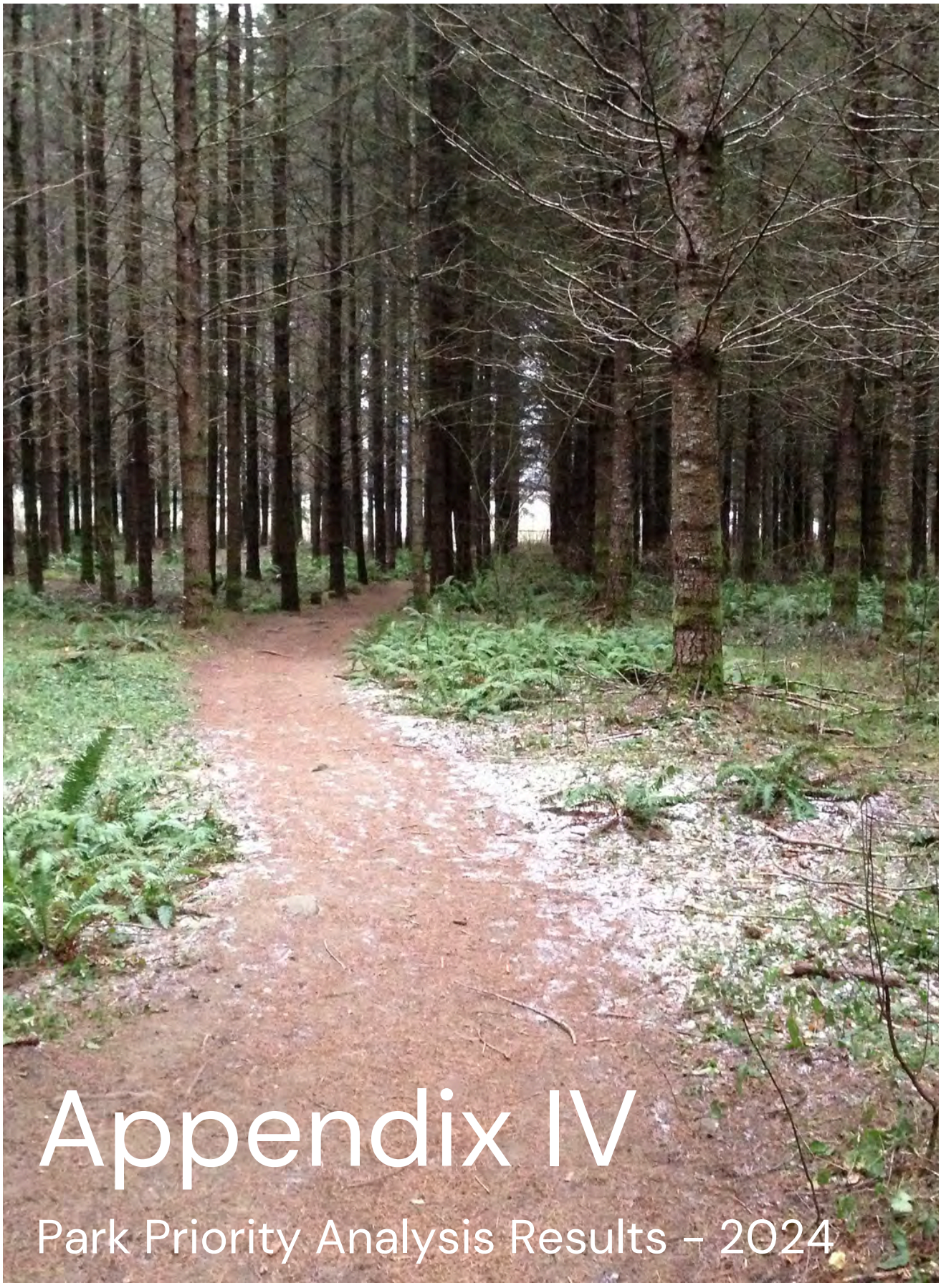
SUGGESTIONS FOR FUTURE STEPS:

Enhance Field Assessment: The results of the field assessment revealed a shift in the rankings for park biodiversity and invasive species categorization, leading to changes in the priority matrix categorization. While theses shifts were minor (i.e., not all field assessments resulted in a subsequent recategorization), they warrant further assessments to determine the accuracy of the categorization and refine the parameters with statistical analysis. The recommendations based on the post-field analysis are as follows:

Prioritize Assessment of Parks with No Recorded Invasives: Parks with no recorded invasives showed the greatest shift in categorization. Assessing these parks should be prioritized.
Prioritize Assessment of Parks with Limited Biodiversity Data: Focus on parks lacking comprehensive biodiversity data, such as streams, wetlands, and terrestrial ecosystem mapping. Pay special attention to parks with known unique features that may provide niche habitats for potential red- or blue-listed species. Develop a more comprehensive and technical biodiversity assessment to improve the accuracy and reliability of the biodiversity evaluations.

Additional Biodiversity Indicators: Use provincial datasets to look a species abundance and species richness and try to determine areas of high priority.
LiDAR Data Integration: Utilize LiDAR data to analyze vegetated structure and integrate into the biodiversity assessment based on measurable structural characteristics.
Systematic Data Collection: Implement structured data collection methods by park staff to maintain up-to-date categorization and monitor changes consistently.
Expand Biodiversity Plan: Consider expanding to include biodiversity assessment and invasive species risk of freshwater and marine habitats, which can be found within RDN parks and protected areas as well.

By integrating these future steps, the aim is to continually improve the accuracy and relevance of biodiversity and invasive species categorization within RDN park systems.



Appendix IV

Park Priority Analysis Results – 2024

PARK NAME	ELECTORAL AREA	MAPPED WATERCOURSE	MAPPED CRITICAL HABITAT	RED- AND BLUE-LISTED SPECIES OCCURENCE	*SARA* LISTED SPECIES OCCURENCE	SEI MAPPED OCCURENCE	POTENTIAL RED- AND BLUE-LISTED ECOLOGICAL COMMUNITY (LCC)	TEM LIST	WETLANDS	EA	OLD FOREST	IMAGE GROUPS	FIELD ASSESSED (2024)	INVASIVE SPECIES DISTRIBUTION	BIODIVERSITY OBSERVATION	ACTION PRIORITY
Addison Way Community Park	A	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Cedar Plaza Community Park	A	No	No	No	No	No	No	No	No	No	No	Fringe Vegetation	Yes	Medium	Low	Medium
Cedar Skatepark	A	No	No	No	Yes	No	No	No	No	No	No	Fringe Vegetation	Yes	High	Low	Low
Driftwood Road Beach Access	A	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Fawcett Road Community Park	A	Yes	No	No	No	No	No	Yes	Yes	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Glynneath Road Community Park	A	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Kipp Road Community Park	A	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Natural Areas	-	Unknown	High	High
MacMillan Road Community Park	A	No	No	No	No	Yes	No	Yes	Yes	No	No	Natural Areas	-	Medium	Medium	Medium
Morden Colliery Community Park	A	No	No	Yes	No	No	Yes	No	No	No	No	Natural Areas	Yes	High	Low	Low
Morden Colliery Regional Trail	A	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Natural Areas	Yes	Medium	High	High
Nanaimo River Regional Park	A	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Natural Areas	Yes	High	High	High
Nelson Road Community Boat Launch	A	No	No	No	No	No	No	No	No	Yes	No	Fringe Vegetation	-	Unknown	Low	Low
Pylades Drive Beach Access	A	No	No	No	No	No	No	No	No	Yes	No	Fringe Vegetation	-	Unknown	Low	Low
Quennell Lake Car Top Boat Launch	A	No	No	No	No	No	No	Yes	Yes	No	No	Fringe Vegetation	-	Medium	Low	Medium
South Wellington Community Park	A	No	No	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	High	Low	Low
Thelma Griffith Community Park	A	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Whiting Way Community Park	A	No	No	No	No	Yes	No	Yes	Yes	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Woodridge Road Community Park	A	No	No	No	Yes	No	Yes	Yes	No	No	No	Natural Areas	Yes	High	Medium	High
707 Community Park	B	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Natural Areas	-	High	High	High
Bell's Landing Water Access	B	No	No	No	No	No	Yes	No	Yes	No	No	Natural Areas	Yes	Medium	Medium	Medium
Blue Heron Community Park	B	No	No	No	No	No	No	No	No	No	No	Natural Areas	-	High	Low	Low
Bluewhale Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Burnside Drive Community Trail	B	No	No	No	No	No	No	Yes	No	No	No	Other	-	Medium	Low	Medium
Captain Ahab's Terrace Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Low	Low	Low
Cardale Road Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Clamshell Drive Community Park	B	No	No	Yes	Yes	No	No	No	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Coast Road Community Park	B	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	High	Low	Low

PARK NAME	ELECTORAL AREA	MAPPED WATERCOURSE	MAPPED CRITICAL HABITAT	RED- AND BLUE-LISTED SPECIES OCCURENCE	*SARA* LISTED SPECIES OCCURENCE	SEI MAPPED OCCURENCE	POTENTIAL RED- AND BLUE- LISTED ECOLOGICAL COMMUNITY (LCC)	TEM LIST	WETLANDS	EA	OLD FOREST	IMAGE GROUPS	FIELD ASSESSED (2024)	INVASIVE SPECIES DISTRIBUTION	BIODIVERSITY OBSERVATION	ACTION PRIORITY
Coats Marsh Regional Park	B	Yes	No	No	No	Yes	No	Yes	Yes	No	No	Natural Areas	-	Medium	Medium	Medium
Cox Community Park	B	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Natural Areas	-	High	High	High
Decourcy Drive Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Medium	Low	Medium
Decourcy Penninsula Water Access 2, 3, 5	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Descanso Bay Regional Park	B	No	No	No	No	No	Yes	No	Yes	No	No	Natural Areas	Yes	High	Medium	High
Descanso Bay Road Water Access	B	No	No	Yes	Yes	No	No	No	No	No	No	Fringe Vegetation	-	High	Low	Low
Dodd Narrows Community Park	B	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Dunlop Flewett Community Trail	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Dunlop Lane Community Park	B	No	No	No	No	No	No	Yes	Yes	Yes	No	Natural Areas	-	Unknown	Medium	Medium
El Verano Boat Launch	B	No	No	No	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Unknown	Low	Low
Hummingbird Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Huxley Community Park	B	No	No	No	No	No	No	Yes	No	No	No	Fringe Vegetation	Yes	High	Low	Low
Hyham Road Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Joyce Lockwood Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Link Bay Road Community Park	B	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Malaspina Galleries Community Park	B	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Paisley Place Community Park	B	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Pequod Crescent Community Park	B	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Petroglyph Community Trail	B	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	High	Low	Low
Petroglyph Way Federal Crown Community Trail	B	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Pilot Bay Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Queequeg Place Community Park	B	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Rollo McClay Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	High	Low	Low
Sea Fern Lane Community Park	B	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Seymour Road Community Trail	B	No	No	Yes	Yes	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Medium	Medium
South Road Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Fringe Vegetation	-	Unknown	Low	Low
Spring Beach Drive Water Access	B	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low

PARK NAME	ELECTORAL AREA	MAPPED WATERCOURSE	MAPPED CRITICAL HABITAT	RED- AND BLUE- LISTED SPECIES OCCURENCE	*SARA* LISTED SPECIES OCCURENCE	SEI MAPPED OCCURENCE	POTENTIAL RED- AND BLUE- LISTED ECOLOGICAL COMMUNITY (LCC)	TEM LIST	WETLANDS	EA	OLD FOREST	IMAGE GROUPS	FIELD ASSESSED (2024)	INVASIVE SPECIES DISTRIBUTION	BIODIVERSITY OBSERVATION	ACTION PRIORITY
Stalker Road Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
The Strand Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	Yes	High	Low	Low
Town Ho End Community Park	B	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Medium	Low	Medium
Anders & Dorrit's Community Park	C	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	Natural Areas	-	Unknown	High	High
Benson Creek Falls Regional Park	C	Yes	No	Yes	Yes	Yes	No	No	No	No	No	Natural Areas	-	Unknown	Medium	Medium
Creekside Place Community Park	C	Yes	No	No	No	Yes	No	No	No	No	No	Natural Areas	-	Medium	Low	Medium
Extension Miners Community Park	C	No	No	No	Yes	No	Yes	No	No	No	No	Natural Areas	Yes	High	Low	Low
Extension Playground	C	No	No	No	No	No	No	No	No	No	No	Fringe Vegetation	-	High	Low	Low
Heather Way Community Park	C	No	No	No	No	Yes	No	No	Yes	No	No	Natural Areas	-	Unknown	Medium	Medium
Meadow Drive Community Park	C	Yes	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Mount Arrowsmith Massif Regional Park	C	Yes	Yes	No	Yes	No	No	No	No	No	Yes	Natural Areas	-	Unknown	High	High
Mount Arrowsmith Regional Park (ACRD)	C	Yes	Yes	No	No	No	No	Yes	No	No	Yes	Natural Areas	-	Low	High	High
Mount Benson Regional Park	C	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	Natural Areas	-	Unknown	High	High
Nanaimo River Canyon Community Park	C	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Natural Areas	Yes	High	Medium	High
Plecas Road Community Park	C	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Riverbend Community Park	C	No	No	No	No	Yes	Yes	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Riverbend Road Community Park	C	Yes	No	No	No	Yes	Yes	No	No	No	No	Natural Areas	-	Unknown	Medium	Medium
South Forks Community Park	C	Yes	No	No	No	No	No	No	No	No	No	Natural Areas	-	Medium	Low	Medium
South Forks Road Community Park	C	No	No	No	No	No	No	No	No	No	No	Natural Areas	-	Medium	Low	Medium
Twilight Way Community Park	C	Yes	No	No	No	Yes	No	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Virostko Road Community Park	C	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Virostko West Community Park	C	No	No	No	No	Yes	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Ainsley Place Community Trail	E	No	No	No	No	Yes	No	Yes	No	Yes	No	Natural Areas		High	Low	Low
Amelia Crescent Community Park	E	No	No	No	No	No	No	No	No	Yes	No	Natural Areas		Unknown	Low	Low
Anchor Way Community Park	E	No	No	No	No	No	No	No	No	No	No	Natural Areas		Unknown	Low	Low
Arbutus Grove Community Park	E	No	No	No	No	Yes	No	Yes	No	Yes	No	Natural Areas		Unknown	Low	Low
Armstrong Crescent Community Park	E	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	Yes	High	Low	Low

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Beachcomber Regional Park	E	No	No	No	No	No	Yes	No	Yes	No	No	Natural Areas	Yes	High	Medium	High
Blueback Drive Community Park	E	No	No	No	No	Yes	No	No	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Bonnington Carmichael Community Trail	E	No	No	No	No	No	No	No	No	No	No	Fringe Vegetation	Yes	Medium	Low	Medium
Bonnington Coventry Community Trail	E	No	No	No	No	Yes	No	Yes	No	No	No	Fringe Vegetation	-	Medium	Low	Medium
Bonnington GC N Community Trail	E	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Bonnington GC S Community Trail	E	No	No	No	No	Yes	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Brickyard Community Park	E	No	No	No	No	Yes	No	No	No	Yes	No	Natural Areas	-	Medium	Low	Medium
Carlisle Carmichael Community Trail	E	No	No	No	No	No	No	No	No	No	No	Fringe Vegetation	-	Medium	Low	Medium
Carmichael Road Community Park	E	No	No	No	No	No	No	No	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Claudet Creek Community Park	E	No	No	No	No	Yes	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Claudet Road Community Park	E	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	Yes	High	Low	Low
Coventry Place Community Trail	E	No	No	No	No	No	No	No	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Craig Creek Estuary Community Park	E	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Fringe Vegetation	-	Unknown	High	High
Crowsnest Lane Community Park	E	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Medium	Medium	Medium
Davenham Road Community Park	E	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Dolphin Lake Community Park	E	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Natural Areas	-	Unknown	High	High
Dolphin Marsh Community Park	E	No	No	No	No	Yes	No	Yes	Yes	Yes	No	Natural Areas	Yes	High	Medium	High
Enos Creek Community Park	E	Yes	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Es-hw-Sme~nts Community Park	E	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Fairwinds Drive Community Park	E	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Henley Place Community Park	E	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Fringe Vegetation	-	High	Low	Low
Highland Road Community Park	E	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Jack Bagley Community Park	E	No	No	No	No	No	No	No	No	Yes	No	Fringe Vegetation	Yes	Medium	Low	Medium
La Selva Place Community Park	E	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Moorecroft Regional Park	E	No	No	No	Yes	No	Yes	Yes	Yes	No	No	Natural Areas	Yes	Medium	High	High
Nanoose Road Community Park	E	No	No	Yes	Yes	No	No	Yes	No	No	No	Natural Areas	-	Medium	Medium	Medium

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Park Place Community Park	E	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Redden Road Community Park	E	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Redden Rockhampton Community Trail	E	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Richard Place Community Park	E	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	High	Low	Low
Rowland Road Community Park	E	No	No	No	No	No	Yes	Yes	Yes	No	No	Natural Areas	Yes	High	Medium	High
Rumming Road Community Park	E	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Schooner Ridge Community Park	E	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Fringe Vegetation	-	High	Low	Low
Sea Ridge Davenham Community Trail	E	No	No	Yes	Yes	No	Ecological	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Stone Lake Drive Community Park	E	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Weston Place Community Park	E	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	High	Low	Low
Allsbrook Road Community Park	F	No	No	No	No	No	No	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Braddock Leffler Community Trail	F	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Brooklin Hilliers Community Trail	F	No	Yes	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	Medium	Low	Medium
Brooklin Lane Community Park	F	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Coombs Station Community Park	F	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Cranswick Matterson Community Trail	F	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Dolly Varden Way Community Park	F	No	Yes	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Medium	Medium
Errington Community Park	F	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Errington School Trail	F	No	No	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
French Creek School Community Park	F	No	Yes	No	No	No	Yes	Yes	No	Yes	No	Natural Areas	-	Medium	Medium	Medium
Harris Crescent Community Park	F	Yes	Yes	No	No	No	No	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Kerr Road Community Park	F	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Little Qualicum Falls Community Park	F	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Little Qualicum River Regional Park	F	Yes	Yes	No	No	Yes	No	Yes	Yes	No	No	Natural Areas	-	Unknown	High	High
Malcolm Community Park	F	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Natural Areas	-	Unknown	High	High
Meadowood Community Park	F	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low

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Melon Road Community Park	F	No	Yes	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Medium	Medium
Old Alberni Hwy Community Park	F	No	Yes	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Price Road Community Trail	F	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Romain Road Community Park	F	No	No	No	No	No	No	Yes	Yes	No	No	Natural Areas	-	Medium	Low	Medium
Wild Road Community Park	F	No	Yes	No	No	No	No	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Ackerman Wally Community Trail	G	No	No	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Arrowsmith Tara Community Trail	G	No	No	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Barclay Crescent Community Park	G	No	No	Yes	Yes	No	Yes	Yes	No	No	No	Natural Areas	-	Unknown	Medium	Medium
Blue Water Place Community Park	G	No	No	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Boultbee Drive Community Park	G	No	Yes	No	No	No	No	No	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Brookfield Windridge Community Park	G	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Centre Crescent Community Park	G	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Unknown	Medium	Medium
Chatell Road Community Park	G	No	No	No	No	Yes	Yes	Yes	No	Yes	No	Natural Areas	-	High	Medium	High
Cinnamon Sedge Matuka Community Park	G	No	No	No	No	Yes	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Columbia Drive West Side Community Trail	G	No	No	Yes	Yes	No	No	Yes	No	Yes	No	Fringe Vegetation	-	High	Low	Low
Craig Creek Community Park	G	Yes	No	No	No	Yes	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Dalmation Drive Community Park	G	No	No	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Unknown	Low	Low
Dashwood Community Park	G	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Medium	Medium	Medium
Englishman River Regional Park	G	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Natural Areas	-	High	High	High
French Creek Community Park	G	Yes	No	No	No	Yes	Yes	Yes	No	No	No	Natural Areas	Yes	High	Medium	High
French Creek Estuary Nature Preserve	G	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	Natural Areas	Yes	High	High	High
Hawthorne Rise Community Park	G	No	Yes	No	No	No	No	No	No	No	No	Natural Areas	-	High	Low	Low
Huckleberry Lane Community Park	G	No	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	High	High
Johnstone Road Beach Access	G	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Medium	Medium	Medium
Kaye Peterson Community Park	G	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Kaye Rivers Edge Community Park	G	No	No	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Kaye Road Community Park	G	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	High	Low	Low

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Lee Road Community Park	G	Yes	No	No	No	Yes	Yes	Yes	No	No	No	Natural Areas	-	Unknown	Medium	Medium
Lee Road Community Trail	G	No	No	No	No	Yes	No	No	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Lee Road West Community Trail	G	No	No	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Little Qualicum River Estuary Regional Conservation Area	G	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Natural Areas	-	Medium	High	High
Mallard Road Beach Access	G	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Medium	Medium	Medium
Maple Lane Community Park	G	No	No	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Low	Low	Low
Matuka Drive Community Park	G	Yes	No	No	No	Yes	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Miller Road Community Park	G	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	Natural Areas	-	High	High	High
Neden Way Community Park	G	No	No	No	No	No	No	No	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Peterson Rascal Community Park	G	No	No	No	No	Yes	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Riley Sanika Community Park	G	No	No	No	No	No	No	Yes	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Rivers Edge Community Park	G	No	No	No	No	No	Yes	No	No	No	No	Fringe Vegetation	Yes	High	Low	Low
Rivers Edge Community Trail N	G	No	No	No	No	Yes	Yes	No	No	No	No	Natural Areas	Yes	Low	Low	Low
Rivers Edge Community Trail S	G	No	No	No	No	Yes	Yes	Yes	No	No	No	Natural Areas	-	Unknown	Medium	Medium
San Malo Crescent Community Park	G	Yes	No	Yes	Yes	Yes	No	No	No	No	No	Fringe Vegetation	-	Unknown	Medium	Medium
Stanhope Community Park	G	No	No	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Low	Low
Stormwater Community Park	G	No	No	No	No	No	Yes	Yes	No	No	No	Fringe Vegetation	Yes	High	Low	Low
Sumar Lane Community Park	G	No	No	Yes	Yes	No	No	No	No	Yes	No	Other	-	Unknown	Low	Low
Surfside Drive East Beach Access	G	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Medium	Medium	Medium
Surfside Drive West Beach Access	G	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Medium	Medium	Medium
Top Bridge Community Park	G	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No	Natural Areas	-	Unknown	High	High
1950 Gazetted Hwy Community Park	H	No	Yes	No	No	No	No	Yes	No	Yes	No	Natural Areas		Unknown	Medium	Medium
Alert Road Beach Access	H	No	Yes	No	No	No	No	No	No	Yes	No	Fringe Vegetation		Unknown	Low	Low
Baywater Road Beach Access	H	No	Yes	No	No	No	No	No	No	No	No	Fringe Vegetation		Unknown	Low	Low
Blue Heron Drive Community Park	H	Yes	Yes	No	No	No	No	Yes	No	No	Yes	Natural Areas		Unknown	High	High
Bovanis Road Community Park	H	No	Yes	Yes	Yes	No	No	No	No	No	No	Fringe Vegetation		High	Medium	High

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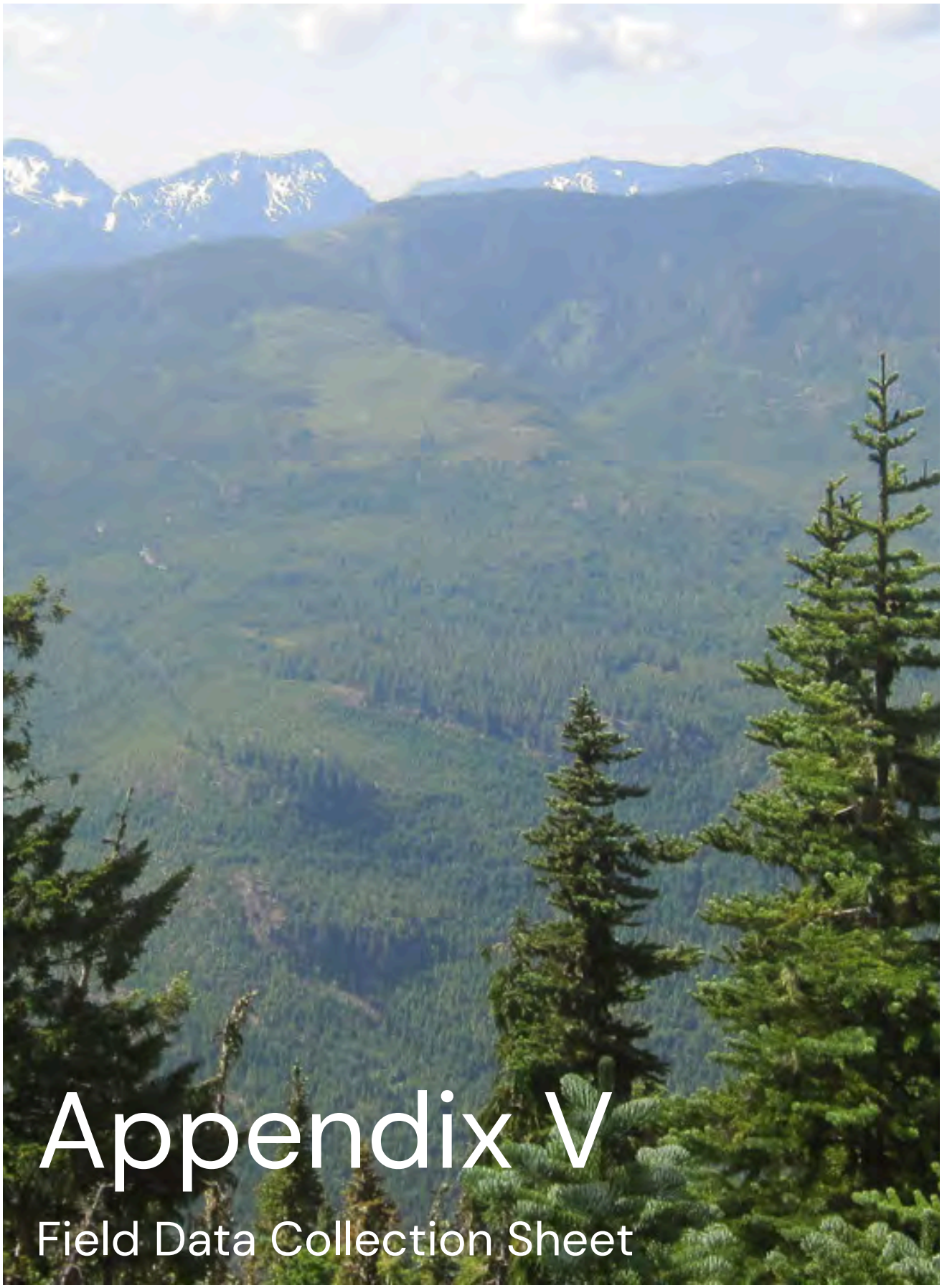
Bowser Road Beach Access	H	No	Yes	No	No	No	No	No	No	Yes	No	Fringe Vegetation	-	Unknown	Low	Low
Buccaneer Beach Road Beach Access	H	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Natural Areas	-	Medium	High	High
Coburn Henry Morgan Community Trail	H	No	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	High	High
Crane Road Beach Access	H	No	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Natural Areas	-	Medium	High	High
Creekside Islewood Community Trail	H	No	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Fringe Vegetation	-	Unknown	High	High
Deep Bay Creek Community Park	H	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Natural Areas	-	Unknown	High	High
Deep Bay Drive Beach Access	H	No	Yes	No	No	No	No	No	No	Yes	No	Fringe Vegetation	-	Low	Low	Low
Dunsmuir Community Park	H	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	High	Low	Low
Franksea Road Beach Access	H	No	Yes	No	No	No	No	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Gainsberg Pearl Community Trail	H	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Fringe Vegetation	-	Unknown	High	High
Henry Morgan Community Park	H	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Fringe Vegetation	-	Unknown	Medium	Medium
Horne Lake Regional Park	H	Yes	Yes	Yes	No	No	No	No	No	No	No	Natural Areas	-	Unknown	Medium	Medium
Huson Road Community Park	H	No	Yes	No	No	No	No	No	No	No	No	Fringe Vegetation	-	Unknown	Low	Low
Hwy 19A Community Park	H	No	Yes	No	No	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	Medium	Medium
Illusion Lakes Community Park	H	No	Yes	No	Yes	Yes	No	Yes	Yes	No	No	Natural Areas	-	Unknown	High	High
Kelsey Road Community Park	H	No	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Natural Areas	-	Unknown	High	High
Kenmuir Road Community Park	H	No	Yes	No	No	No	No	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Larkdowne Oakdowne Community Trail	H	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Medium	Low	Medium
Leon Marshall Community Trail	H	No	Yes	No	No	No	No	No	No	No	No	Fringe Vegetation	-	Medium	Low	Medium
Lions Community Park	H	Yes	No	No	No	No	Yes	No	Yes	No	No	Fringe Vegetation	Yes	Medium	Low	Medium
Nile Creek Community Park	H	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Natural Areas	-	Unknown	High	High
Nile Road Beach Access	H	No	Yes	Yes	Yes	No	No	No	No	No	No	Fringe Vegetation	-	Unknown	Medium	Medium
Nile Road Community Park	H	No	Yes	Yes	Yes	No	No	Yes	No	No	No	Fringe Vegetation	-	High	Medium	High
Oakdowne Community Park	H	No	Yes	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	High	Medium	High
Oakdowne Community Trail	H	No	Yes	No	No	Yes	No	Yes	No	No	No	Natural Areas	-	Unknown	Medium	Medium
Oakdowne Wetland Community Park	H	No	Yes	No	No	Yes	No	Yes	Yes	No	No	Natural Areas	-	Unknown	High	High
Ocean Trail Community Park	H	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low

PARK NAME	ELECTORAL AREA	MAPPED WATERCOURSE	MAPPED CRITICAL HABITAT	RED- AND BLUE- LISTED SPECIES OCCURENCE	*SARA* LISTED SPECIES OCCURENCE	SEI MAPPED OCCURENCE	POTENTIAL RED- AND BLUE- LISTED ECOLOGICAL COMMUNITY (LCC)	TEM LIST	WETLANDS	EA	OLD FOREST	IMAGE GROUPS	FIELD ASSESSED (2024)	INVASIVE SPECIES DISTRIBUTION	BIODIVERSITY OBSERVATION	ACTION PRIORITY
Palm Pacific Road Community Park	H	No	Yes	Yes	Yes	No	No	Yes	No	No	No	Natural Areas	-	Unknown	High	High
Pearl Road Community Park	H	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Natural Areas	-	Unknown	High	High
Rose Community Park	H	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Natural Areas	-	Unknown	High	High
Shoreline Drive Beach Access	H	No	Yes	Yes	Yes	No	No	Yes	No	No	No	Natural Areas	-	Unknown	High	High
Sunnybeach Road Beach Access	H	Yes	No	No	No	No	No	No	No	No	No	Fringe Vegetation	Yes	Medium	Low	Medium
Thompson Clarke Ocean Trail	H	No	Yes	No	No	No	No	No	No	No	No	Natural Areas	-	Unknown	Low	Low
Wildwood Community Park	H	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Natural Areas	Yes	Medium	High	High
Wildwood Place Community Park	H	No	Yes	No	No	No	No	Yes	No	No	No	Natural Areas	-	Unknown	Low	Low
Arboretum	N*	No	No	No	No	No	No	Yes	Yes	Yes	No	Natural Areas	-	Unknown	Medium	Medium

Table notes:
*Member Municipalities



Appendix V

Field Data Collection Sheet

BIODIVERSITY AND PRE-TREATMENT VEGETATION MONITORING FORM

Effective Date:	Reviewed Date:	Revision:	Page: 104 of 2

Date:	Click here to enter a date.	Assessor:	Click here to enter text.	Surrounding Land Use:	Choose an item.
Park:	Click here to enter text.		Photos Obtained: Yes ☐ No ☐	General Location:	Choose an item.
Biodiversity Rating:	Choose an item.	Invasive Risk Rating:	Choose an item.	Priority:	Choose an item.
Desktop Review:	Critical Habitat ☐ Old Forest ☐ Wetland(s) ☐ Sensitive Ecosystem ☐ Watercourse ☐ Eagle Nest ☐ Red/Blue-listed Ecosystems (TEM/LCC) ☐ Red/Blue-listed Species Occurrences ☐ COSEWIC Species ☐				

Site Invasive Species Assessment

Invasive Species Observed Across Site	Location	Growth Stage (select all that apply)	Distribution Code	Density Code
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				

Invasive Species Observed Across Site	**Location**	**Growth Stage** (select all that apply)	**Distribution Code**	**Density Code**
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				
Point ID:	UTM:	E:	N:	
BC Weed Species Other: Click here to enter text.	Onsite	Seedling ☐ Juvenile ☐ Mature ☐	Choose an item.	Choose an item.
	Adjacent	Seedling ☐ Juvenile ☐ Mature ☐		
Estimated Invasive Species Area for Site (m^2): Click here to enter text.				
Comments/Issues: Click here to enter text.				

SITE OVERVIEW: BIODIVERSITY ASSESSMENT

Environmental Features			
Mapped Critical Habitat?	Yes ☐	No ☐	Comments Choose an item.
Wetland(s) Present?	Yes ☐	No ☐	Comments: Choose an item.
Watercourse within/within 10 m of site?	Yes ☐	No ☐	Comments: Click here to enter text.
Native Vegetation?	Yes ☐	No ☐	Comments: Click here to enter text.
Wildlife Observed?	Yes ☐	No ☐	Comments: Click here to enter text.
Public Considerations?	Yes ☐	No ☐	Comments: Click here to enter text.
Comments/Issues: Click here to enter text.			

SITE OVERVIEW: NATURAL VEGETATION ASSESSMENT

Vegetation Type:	Cultivated Field ☐	Forested ☐	Other ☐ (describe below)
Vegetation Comments:	Click here to enter text.	Click here to enter text.	Click here to enter text.

Site Percent Cover-Type Estimate:	**Road(s) or Structure(s)**		**Footpath(s) or Trail(s)**		**Vegetation**	
1. Cover To Total 100% 2. Describe Cover	___ %	Click here to enter text.	___ %	Click here to enter text.	___ %	Click here to enter text.
	___ %	Click here to enter text.	___ %	Click here to enter text.	___ %	Click here to enter text.
	___ %	Click here to enter text.	___ %	Click here to enter text.	___ %	Click here to enter text.
Cover Comments/Issues:	Click here to enter text.		Click here to enter text.		Click here to enter text.	

TREATMENT THRESHOLDS FOR THE NOXIOUS WEED AND INVASIVE PLANT PROGRAM

Invasive Plant Category	Site Risk Level		
	1	2	3
1	Priority 1 ☐	Priority 1 ☐	Priority 1 ☐
2	Priority 2 ☐	Priority 3 ☐	Priority 4 ☐
3	Priority 2 ☐	Priority 3 ☐	Priority 4 ☐
4	Priority 3 ☐	Priority 4 ☐	Priority 5 ☐
Not Assigned	Priority 4 ☐	Priority 5 ☐	Priority 5 ☐

As the above table shows, the priority assigned to an invasive plant infestation is determined by the plant category and the site priority.

Plant Category:

Categories are based on provincial rankings in BC. Weed species are categorized according to aggressiveness, range of habitat, and the ability to control.

1- Weeds are described as extremely invasive and often are the most abundant species in the area.

2- Weed species are described as very invasive and can become very prevalent in an area.

3- Weeds are described as being invasive and often require some disturbance to establish.

4- Weeds are aggressive and relatively easy to control.

Not Assigned - Little concern or likelihood to appear in a specific region.

Site Risk Level:

1 - Extremely high risk: To stop the spread of invasive plants threatening non-infested, highly susceptible areas.
2 - To stop the enlargement of sites in less susceptible areas. This includes sites adjacent to lands such as forested lands that have a well-established vegetation cover, and are therefore less susceptible to invasive or seed species introduction. Weedy areas will be considered to be a Priority 1 if a qualified professional identifies a high potential for the noxious weeds or invasive plants to spread and invade adjacent lands.
3 - Stop the enlargement/contain sites on, and adjacent to, park land.

Treatment Priority:

1-3: Is treatment priority 1 to 3? Yes ☐ No☐ If yes, recommend CONTROL METHOD

4-5: Is treatment priority 4 or 5? Yes ☐ No ☐ if yes, recommend PREVENTION METHOD

It must be recognized that treatment priorities may change as new species are identified as being detrimental to biodiversity, natural plant communities, adjacent agricultural land, or as land uses change.

Treatment Options					
Prevention Methods:	Seeding ☐	Manual ☐	Mechanical ☐	Chemical ☐	Biological ☐
Rationale/Comments:	Click here to enter text.				
Control Methods:	Manual ☐	Mechanical ☐	Chemical ☐	Biological ☐	
Rationale/Comments:	Click here to enter text.				

Site Photos

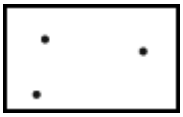
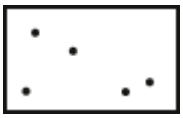
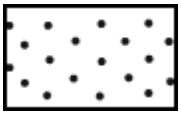
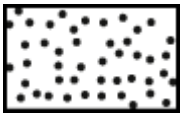
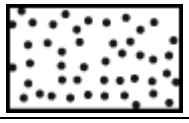
Facing Click here to enter text.

Facing Click here to enter text.

Facing Click here to enter text.

Facing Click here to enter text.

BC IAPP Distribution Codes

Code	Description	Distribution
1	Rare individual, a single occurrence	
2	Few sporadically occurring individuals	
3	Single patch or clump of a species	
4	Several sporadically occurring individuals	
5	A few patches or clumps of a species	
6	Several well-spaced patches or clumps	
7	Continuous uniform occurrence of well-spaced individuals	
8	Continuous occurrence of a species with a few gaps in the distribution	
9	Continuous dense occurrence of a species	

BC IAPP Density Codes

Code	Description
1	<= 1plant/m2 (Low)
2	2-5 plants/m2 (Med)
3	6-10 plants/m2 (High)
4	>10 plants/m2 (Dense)

Appendix VI

Invasive Species of Concern Management Infographics *

COMMON TANSY

Tanacetum vulgare

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

OVERVIEW

The Regional District of Nanaimo (RDN) has listed Common tansy as a priority invasive species. Common tansy has been identified over a total area of 82 ha within the RDN.[1]

Common tansy was introduced for its medicinal properties from Europe and Asia. The plant is toxic to grazing cattle and is considered a Regionally Noxious Weed under Schedule A Part II of the Weed Control Act for the Bulkley-Nechako, Central Kootenay, Columbia-Shuswap, East Kootenay, and North Okanagan Regions of BC.[2]

Common tansy is a perennial herbaceous plant that reproduces by seed (jump dispersal) and seeds can remain viable for up to 25 years.[2]

HABITAT & DISTRIBUTION

Common tansy is found in pastures and roadside areas, and it is frequently found in riparian areas. Full sun and well-drained soils are optimal conditions for common tansy.[2]

Asides from the regional areas where the plant is considered a Noxious Weed, common tansy is also on the Southeast coast of Vancouver Island, the Lower Mainland, Sunshine Coast, Gulf Islands, and Squamish/Pemberton.[2]

KEY CHARACTERISTICS[2]

Stems

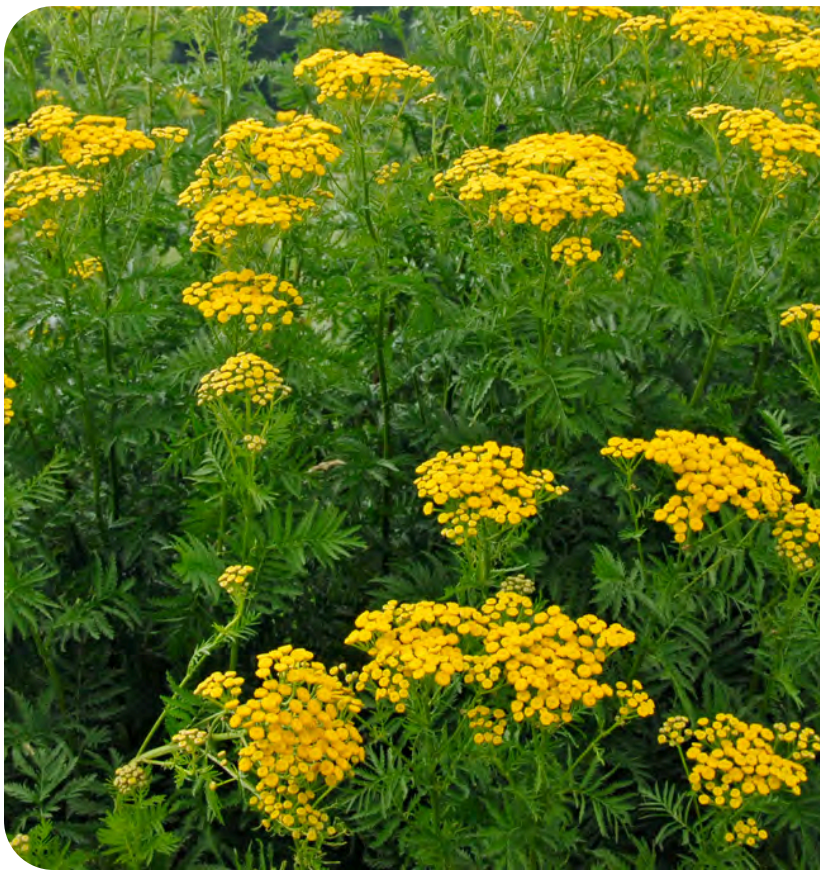
Stems are purple-red with glands on the outside that give it a dotted appearance. The stems can be up to 1.8 m tall.

Leaves

Leaves are serrated, dark green and divided.[2]

Flowers

Flowers are yellow disc flowers arranged in a flat-topped cluster.[2]



Prepared by:
McTavish July 2024

COMMON TANSY

THREATS TO BIODIVERSITY

The extent of common tansy impacts on natural ecosystems of BC has not been fully studied or understood. Further research is required to determine how this invasive plant affects biodiversity, asides from displacing native vegetation.[3]

The biggest cause of concern is for ranchers, since it spreads rapidly in pasture fields and is unpalatable/toxic to livestock.[3]

Invasive species are one of the leading causes of reduced biodiversity in RDN parks and trails. Management is focused on control of infestations, rather than full eradication. Want to help? Send an email to invasivespecies@rdn.bc.ca and you'll be added to our mailing list!

Please contact us before removing any plant from an RDN Park. It is against our bylaw to remove any vegetation from an RDN park without instruction from RDN Parks Staff.

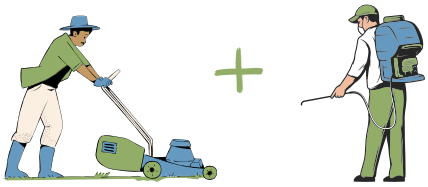
TREATMENT METHODS

Common tansy is most effectively managed by using a combination of manual/mechanical and chemical treatment methods because the plant is rhizomatous, so manual methods alone may not kill the plant (i.e., it can re-sprout from severed roots).[4]

Manual
Mowing over several years in combination with chemical treatment appear to be the most effective elimination method, as determined by both BC and Alberta Invasive Species Councils. Young or seedling plants can be manually hand-pulled. The plant can also still produce viable seeds from cut stems.[4]

Chemical
Chemical control is often the most effective treatment method but is not always feasible since common tansy is often found near bodies of water or in remote locations.[4]

Biological
No biological control agents are currently available for distribution in treating common tansy in BC.[4]



TIMING

Mowing should before seed set or flowering, which is typically before July.[4]

Chemical treatments should be applied between the early flowering stage and the bloom stage, but may be dependent on the type of chemical used.[4]

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Invasive Species Council of BC. 2019. Common Tansy Factsheet. https://bcinvasives.ca/invasives
3 Province of BC. n.d. A Guide to Weeds in BC: Common Tansy. https://www2.gov.bc.ca
4 Alberta Invasive Species Council. 2014. Common Tansy Factsheet. https://abinvasives.cas
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146

Prepared by:
McTavish July 2024

DAPHNE LAUREL

Daphne laureola

Warning: toxic

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

KEY CHARACTERISTICS[3]

Stems

Daphne laurel can grow to about 1.5 m in either a single stem or multi-branching shrub.

Leaves

Leaves are oval, dark green, and glossy and grow in a spiral pattern near the top of the stem when the plant reaches its full height.

Flowers

Flowers are tiny, fragrant, light yellow-green. The flowers grow in axial clusters. Berries are black.

OVERVIEW

The Regional District of Nanaimo (RDN) has listed Daphne laurel as a priority invasive species. Daphne laurel has been identified over a total area of 265 ha within the RDN.[1]

Daphne laurel is native to Western Europe and the Mediterranean. It was introduced as a garden ornamental plant. Daphne laurel is heavily concentrated in the RDN and Capital Regional District.[1]

Daphne laurel is a toxic plant and the sap can cause irritation of the skin. Birds and small mammals are able to digest the berries, which contributes further to its dispersal. Daphne laurel cannot re-sprout from roots, but it can re-sprout from stem tissue at or below the soil.[2]

HABITAT & DISTRIBUTION

Daphne laurel is a shade-tolerant plant that can grow in areas where most other invasive plants are not found, especially the shady understory of Douglas-fir stands. Soil conditions do not appear to be a limiting factor for this plant. Daphne laurel grows in isolated clusters or dense stands.[2]

Daphne laurel is found throughout all of the provinces, including Yukon territory, and is very common in southwestern coastal BC.[2]

Tualatin Soil and Water Conservation District 2024

Prepared by:
McTavish July 2024

DAPHNE LAUREL

THREATS TO BIODIVERSITY

Shading out native vegetation:
Daphne laurel is able to thrive in partial to full shade areas. It is often associated with Douglas-fir stands, where it shades out native understory species such as salal and Oregon-grape.[2]

Reducing wildlife value:
Although many birds and small mammals are able to eat the berries of Daphne laurel, other species such as Black-tailed deer do not forage on it, therefore reducing its value as a forage resource for most other woodland wildlife.[2]

Impacting endangered ecosystems:
Since Daphne laurel thrives on southeastern Vancouver Island (VI), it has become an increasing concern for endangered Garry Oak and Associated Ecosystems. Its origin from the Mediterranean allows it to thrive in this kind of open, meadow ecosystem, which supports many other at-risk species that would not benefit from Daphne laurel. The spread of Daphne and other invasive species in Garry Oak and Associated Ecosystems threatens the historical plant composition.[4]

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TREATMENT METHODS

Manual
Manual control is the recommended method for removing Daphne laurel. However, the method of removal is highly dependent on the stage of the plant (i.e., seedling, young, or mature plant). Large patches of seedlings can be removed with a weed-eater, although this may damage native plants. Individual seedlings or shrubs can be pulled by hand. Mature and young plants should be cut where the colour change appears between the stem and the root (below the soil line), which changes from a brown stem to orange roots.[2]

Chemical
Chemical control is less effective at removing Daphne due to its thick, waxy leaves. However, spot treatment using triclopyr on leaves and stems can be effective and a good alternative when manual or mechanical methods are not feasible.[1]

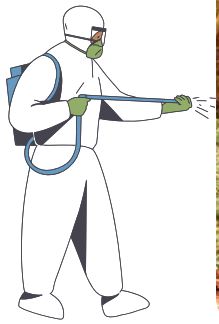
Biological
No biological control agents are currently available for distribution in treating Daphne Laurel in BC.[1]

TIMING

Manual treatment methods of removing Daphne have been shown to be successful during the summer. However, it can also be effective in late winter/spring before berries ripen and the ground is wet.[2]

Chemical treatment should also be conducted in the spring/summer.[2]

Daphne laurel seedlings can be easily pulled out (left) while younger or mature plants can be cut below the root collar where the plant changes to orange in colour (right).



1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Invasive Species Council of BC. 2022. Best Management Practices for Spurge Laurel in the Metro Vancouver Region. https://metrovancouver.org
3 Coastal Invasive Species Committee. 2024. Daphne/Spurge Laurel. https://www.coastalisc.com/daphne-spurge-laurel/
4 Garry Oak Ecosystems Recovery Team. 2007. Best Practices for Invasive Species Management in Garry Oak and Associated Ecosystems: Daphne (Daphne laureola). https://goert.ca/about/invasive-species/
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146

Prepared by:
McTavish July 2024

ENGLISH HOLLY

Ilex aquifolium

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

KEY CHARACTERISTICS[3]

Stems

English holly is an erect shrub that averages from 2 -10 m tall. Stems have minute hairy branchlets and green in younger plants, but grey on mature plants.

Leaves

Leaves are thick, glossy, dark green, and wavy with sharp spines along the edges. Leaves are arranged in alternate pattern.

Flowers

Flowers are small and white. Female trees produce red-orange berries in winter, which are toxic to humans.

OVERVIEW

The Regional District of Nanaimo (RDN) has listed English holly as a priority invasive species. English holly has been identified over a total area of 262 ha within the RDN.[1]

English holly is native to Europe and was introduced in North America as an ornamental plant for hedges. It is also popular as floral decoration during the winter holidays.[4]

English holly is considered a significant urban and forest pest. The berries, while toxic to humans, are eaten by birds and dispersed widely across BC. English holly can also grow from stumps in what is known as 'suckering' or 'layering'.[4]

HABITAT & DISTRIBUTION

English holly is generally found in moist forested areas at lower elevations, and can grow in shade or sun and tolerate a wide range of soil conditions.[3]

English holly is commonly distributed throughout the south coast region of BC. Common habitats where they can be found in include mixed forest types, wetland fringes, and residential areas.[1]

Prepared by:
McTavish July 2024

ENGLISH HOLLY

THREATS TO BIODIVERSITY

Shading out native vegetation:
English holly, like many other invasive plants, grows rapidly and in dense, evergreen thickets. The deep shade provided by larger holly trees suppresses native species growth and reduces understory diversity.[1]

Competing for resources:
English holly is known to extract water and nutrients from its surrounding habitat, which can prohibit from other plants growing in its vicinity. In addition to hogging nutrients, holly can also change soil conditions by decreasing the pH, depositing overabundant amounts of organic matter, and increasing the amount of sulfur.[2]

Altering natural ecosystems:
Considered a forest pest, English holly changes the composition of forests and is actively managed in cut blocks. Its characteristics in outcompeting native vegetation for valuable resources may impact the rate of forest regrowth, shading out native seedlings planted in clear cuts. English holly can also increase risks of forest fires due to the flammable vapor found in holly leaves.[1]

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Please contact us before removing any plant from an RDN Park. It is against our bylaw to remove any vegetation from an RDN park without instruction from RDN Parks Staff.

TREATMENT METHODS

Manual
Manual control is the recommended method for removing English holly. Pulling or digging out small plants has been shown to be an effective method of removing holly. For larger plants, mechanical methods such as girdling are effective. Cutting holly is not effective as it can re-sprout at the base of the tree and would require repeated treatments.[1]

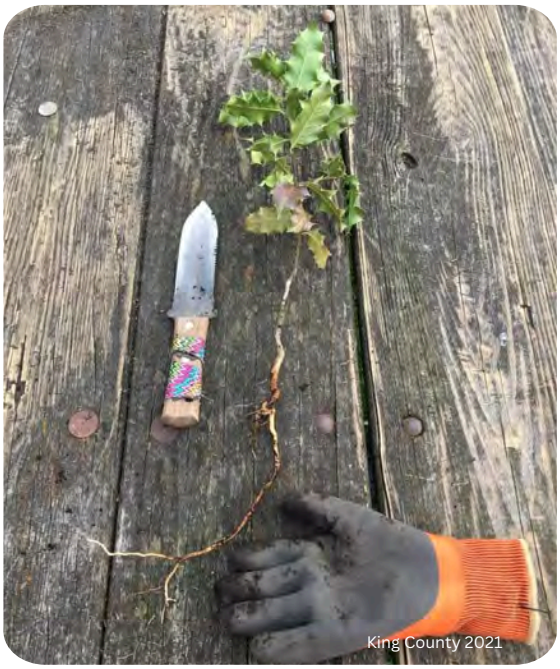
Chemical
Chemical control can be effective in treating English holly, especially used in combination with manual or mechanical treatments. However, chemical treatment is not the preferred method for treating holly due to its tendency to grow near waterbodies, wetlands, and wetter areas.[1]

Biological
No biological control agents are currently available for distribution in treating English holly in BC.[1]

TIMING

English holly can be removed at any time of year, however, it is recommended that manual control methods be conducted prior to berry maturation.[1]

Winter treatment of holly is common in BC since most deciduous plants will have dropped their leaves, making holly easy to spot. Other higher priority invasive species are generally targeted in the spring and summer, which leaves holly available for management in winter.[4]


King County 2021

1 Invasive Species Council of BC. 2021. Best Management Practices for English Holly in the Metro Vancouver Region. https://metrovancouver.org
2 King County Noxious Weed Control Program. 2018. King County Noxious Weed Alert: English holly.
3 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
4 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146

Prepared by:
McTavish July 2024

ENGLISH IVY

Hedera helix

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

KEY CHARACTERISTICS[2]

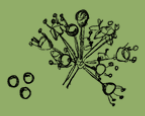
Stems

Woody stems are purple-green when freshly sprouted and turn brown as they mature. Stems can grow over 30 m.

Leaves

Juvenile leaves are 3-5 lobed, a glossy dark green, and veined.
Mature leaves are unlobed, with less distinct veins.

Flowers



Flowers are only produced in mature plants and are greenish-white, appearing in 3-6 clusters per terminal stem, each cluster containing around 8-20 flowers. Berries are dark and mature in winter or early spring.

OVERVIEW

The Regional District of Nanaimo (RDN) has listed English ivy as a priority invasive species. English ivy has been identified over a total area of 14 ha within the RDN.[1]

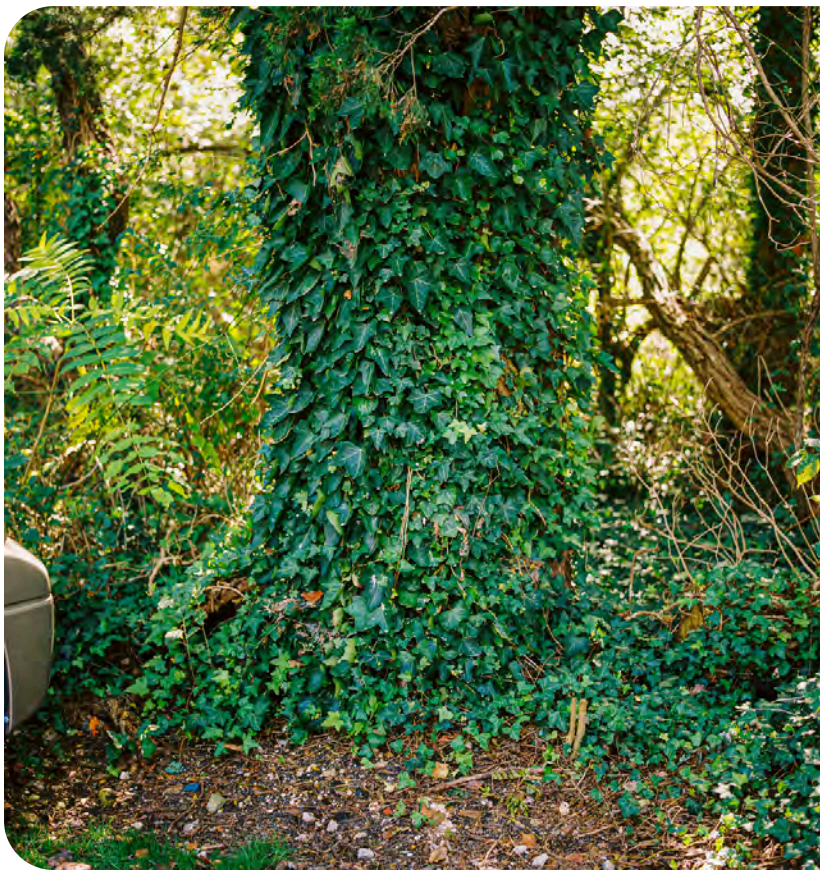
English ivy was introduced deliberately into North America to be used as cover for walls, and ground cover for landscaping. It originates from Europe and western Asia.[2]

English ivy is a woody, evergreen perennial plant that has two distinct growth phases 1) shade tolerant juvenile phase consisting of ground cover, lasting about 10 years and 2) adult phase where the ivy can grow vertically up a tree as light becomes available.[2]

HABITAT & DISTRIBUTION

English ivy is most commonly found in urban forested areas, but it can also grow on rocks/cliffs and residential areas, including structures such as fences or walls.[2]

English ivy is common throughout the south coast region of BC, including the Gulf Islands and Haida Gwaii. They can tolerate a wide range of light and soil conditions.[2]



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McTavish July 2024

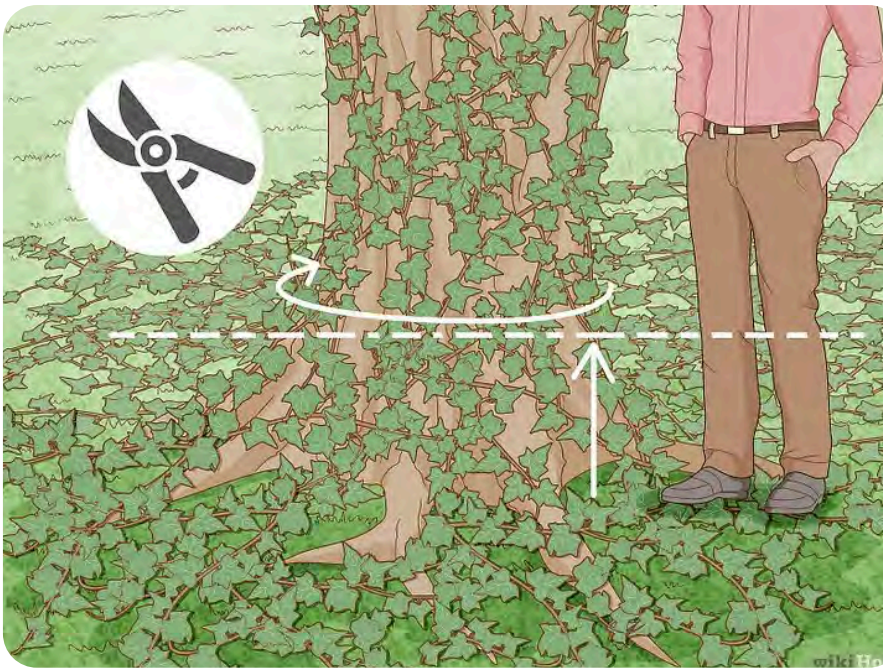
ENGLISH IVY

THREATS TO BIODIVERSITY

Competing with native vegetation:
English ivy smothers pre-existing native vegetation with its ability to grow adventitious roots as it competes for sunlight.[2]

Reduce species diversity:
English ivy forms dense monocultures that smothers the forest floor and prohibits native species from establishing. Ivy creates unsuitable habitat for wildlife species, reducing foraging availability. Ivy is toxic to many species if ingested, including birds that have not adapted to the plant.[2]

Impact forest health:
English ivy carries a disease called Bacterial Leaf Scorch that targets tree species such as maples, oaks, and elms. The weight on mature ivy on trees also makes the tree more susceptible to diseases or wind blowdown.[2]



TREATMENT METHODS

Manual
Manual control is the recommended method for removing English ivy. Cutting or pulling out small plants has been shown to be an effective method of removing ivy on the ground or growing up trees. Ivy has shallow roots that can also be pulled out from the ground. Large ivy groundcover areas can be rolled into a continuous mat. Other manual methods include mulch and mowing.[2]

Chemical
Chemical control is generally not effective on English ivy due to the waxy leaves of English ivy. However, it can help reduce the overall seed bank in large, ivy-infested areas.[2]

Biological
No biological control agents are currently available for distribution in treating English ivy in BC.

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TIMING

English ivy can be removed at any time of year but is best treated in the fall or spring when the ground is wet and the ivy vines are more flexible.[2]

Winter treatment of ivy is common in BC since most deciduous plants will have dropped their leaves, making ivy easy to spot. Other higher priority invasive species are generally targeted in the spring and summer, which leaves ivy available for management in winter.[2]

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Invasive Species Council of BC. 2021. Best Management Practices for English Ivy in the Metro Vancouver Region. https://metrovancouver.org

Prepared by:
McTavish July 2024

GIANT HOGWEED

Heracleum mantegazzianum

Warning: Highly Toxic

Provincial Designation:
Schedule A - Part 1 of Noxious Weeds under the *Weed Control Act*

KEY CHARACTERISTICS[3]

Stems

Stems are hollow, ribbed, have distinct purple blotches, and coarse bristly hairs. The plant ranges from 2.5-5 m tall.

Leaves

Leaves are compound with 3 large, deeply cut leaflets. Each leaflet has spiked edges.

Flowers

Flowers are white, arranged in large umbels (umbrellas-shaped clusters). Each umbel is composed of many smaller umbels.

OVERVIEW

Giant hogweed is listed as a provincial noxious weed under the *Weed Control Act*. The Regional District of Nanaimo (RDN) has listed giant hogweed as a priority invasive species under the Eradicate category. Giant hogweed has been identified over a total area of 28 ha within the RDN.[1]

Giant hogweed was introduced from Asia and Eastern Europe. The sap can cause severe burning and blistering once exposed to UV/sunlight if it comes into contact with human skin.[2]

Giant hogweed is a perennial plant that reproduces from seed but may also reproduce vegetatively. Seeds are dispersed by wind.[2]

HABITAT & DISTRIBUTION

Giant hogweed grows in ditches, along streams, open forests, disturbed and roadside areas. They are associated with full sun and moist soils but can tolerate a range of conditions.[3]

Giant hogweed is mostly restricted to central/southern Vancouver Island and the south coast of BC. A few small isolated pockets occur in the Kootenay region.[4]

Prepared by:
McTavish July 2024

GIANT HOGWEED

THREATS TO BIODIVERSITY

Reduced species diversity and richness:
Large monocultures of giant hogweed have been correlated with a reduction in species diversity and richness of up to 50-60%.[4]

Competing with native vegetation:
Giant hogweed has an earlier germination than most native plants in BC, which allows it to easily compete with/outgrow most plants. It also shades out any plants growing underneath it due to its large leaves and height. The dieback in winter contributes to excessive biomass and litter production that can smother the growth of other native plants in the future.[4]

Increased soil erosion and bank destabilization:
Giant hogweed dies back completely in the winter, and in areas where there are larger infestations, this causes the soil to become exposed, making it susceptible to erosion or for streamside banks to destabilize.[4]

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TREATMENT METHODS

*PPE SHOULD ALWAYS BE WORN WHEN TREATING GIANT HOGWEED.

Manual
Digging and cutting the taproot is an effective treatment method for smaller populations (<100) and plants in their 1st or 2nd year. Flower (umbel) removal can also be effective as long as the timing is right (May-August).[6]

Mechanical control using power equipment is not recommended because it can cause sap to splash out of plants and onto the face or exposed skin.[6]

Chemical
Chemical control is an effective treatment in BC and consists of both foliar spray and stem injection. Chemical treatment efficacy is dependent on growth stage. There are a few 'selective' herbicide brands.[4]

Biological
There are no biocontrol agents available for giant hogweed in British Columbia.[4]

TIMING

Hand-pulling young, small plants should occur in the spring (early May). Make sure the entire root/taproot is removed. Cutting the umbels is most effective if done when terminal umbels just start to flower.[4]

Chemical treatment should be applied after leaves are fully expanded (spring or early summer) and follow up treatments in late summer for missed plants or those that may have regrown.[4]

Kelly Mulherin CBD

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Nature Conservancy of Canada. 2024. Giant hogweed. https://www.natureconservancy.ca
3 Invasive Species Council of BC. 2017. Giant Hogweed Factsheet. https://www2.gov.bc.ca
4 Metro Vancouver. 2021. Best Management Practices for Giant Hogweed in the Metro Vancouver Region. https://metrovancouver.org
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146
6 Francine MacDonald and Hayley Anderson. 2012. Giant Hogweed (Heracleum mantegazzianum): Best Management Practices in Ontario. Ontario Invasive Plant Council, Peterborough, ON.

Prepared by:
McTavish July 2024

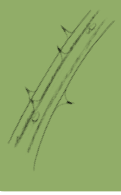
HIMALAYAN BLACKBERRY

Rubus armeniacus

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

KEY CHARACTERISTICS[3]

Stems



Himalayan blackberry stems, also called canes, can reach up to 12 m long and are thorned. The canes are purple-green in colour.

Leaves

Toothed leaves are grouped in 5's on first-year canes, but generally grouped in 3's on second-year canes.

Flowers

Flowers are 5-petaled, small and can range in colour from pink to white. Berries are black and hairless.

OVERVIEW

The Regional District of Nanaimo (RDN) has listed Himalayan blackberry as a priority invasive species. Himalayan blackberry has been identified over a total area of 177 ha within the RDN.[1]

Himalayan blackberry was introduced from Armenia and Northern Iran for its berries, which are a highly valued food resource for both humans and wildlife.[2]

As a popular food resource, blackberry is dispersed by birds and other mammals (black bears, coyotes, foxes), but it also spreads through root and stem fragments, which makes eradicating blackberry very difficult.[2]

HABITAT & DISTRIBUTION

Himalayan blackberry can be found in almost any type of habitat. It especially prefers wetter sites, such as streamside banks, freshwater wetlands, ravines, and riparian edges. Full sun and well-drained soils are the ideal environmental conditions for blackberry.[3]

Himalayan blackberry is concentrated on the southwest coast of BC and central-southern Vancouver Island, including the Gulf Islands.[3]

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McTavish July 2024

HIMALAYAN BLACKBERRY

THREATS TO BIODIVERSITY

Reduced wildlife habitat value:
Himalayan blackberry may provide a valuable food resource for wildlife, but its overall functionality in riparian and stream ecosystems is much lower than native vegetation. Shade and Large Woody Debris input is significantly reduced when blackberry dominates a stream ecosystem. In addition, the low functionality habitat has been correlated with reduced bird species richness and evenness.[5]

Limiting wildlife dispersal and corridors:
Himalayan blackberry grows in wildlife corridors and can limit medium-large mammal movement with its thorned, dense thickets, especially within urban areas.[4]

Increased erosion and flooding:
The shallower root system of Himalayan blackberry along the streamside leads to unstable banks, which causes an increase in flooding and erosion potential.[4]

Outcompeting native vegetation:
The dense, impenetrable thickets of blackberry prohibit shade-intolerant native trees and shrubs from growing.[4]

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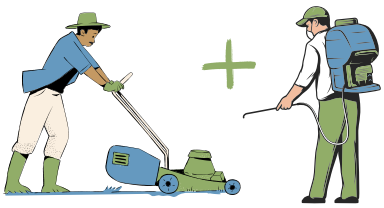
TREATMENT METHODS

Himalayan blackberry is most effectively managed by using a combination of manual/mechanical and chemical treatment methods.

Manual
Manual/mechanical control is only effective if all parts of the plant are removed (crown root, roots, and canes). The most commonly used methods of removing blackberry manually includes hand pulling, digging, and vegetation release. Other manual/mechanical methods that can be effective but require multi-year effort includes mowing, tilling, and cutting.[4]

Chemical
Chemical control is often the most effective treatment method but is not always feasible since Himalayan blackberry is often found near bodies of water. The most successful chemical applications include foliar spray, basal bark spray, and cut stump methods. Caution should be used to ensure the herbicide is not applied in an area where blackberry picking is common.[4]

Biological
No biological control agents are currently available for distribution in treating Himalayan blackberry in BC due to the risk that these insects may target other culturally important plants that also belong to the *Rubus* genus.[4]



TIMING

Removal of blackberry should take place between September-March, outside of the breeding bird window, since many birds use the shrub as their nesting site.[4]

Chemical treatment application depends on the type of herbicide being used and the method of herbicide application, but varies between September/October and the growing season. Basal bark spray can be applied at any time of year.[4]


Focal Point Landscape Solutions

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Invasive Species Council of BC. 2023. Invasive Plant: Himalayan Blackberry. https://bcinvasives.ca/invasives/himalayan-blackberry/
3 Invasive Species Council of BC. 2019. Himalayan Blackberry Factsheet. https://bcinvasives.ca/invasives/himalayan-blackberry/
4 Invasive Species Council of BC. 2021. Best Management Practices for Himalayan blackberry in the Metro Vancouver Region. https://metrovancouver.org
5 Astley, Caroline. 2010. How Does Himalayan Blackberry (Rubus Armenicaus) Impact Breeding Bird Diversity? A Case Study of the Lower Mainland of British Columbia. MSc Thesis, Royal Roads University

Prepared by:
McTavish July 2024

JAPANESE KNOTWEED

Reynoutria japonica

Provincial Designation:
Noxious weed (Schedule A - Part 1 of Weed Control Regulation)

KEY CHARACTERISTICS[1]

Stems

Hollow, smooth, purple to green coloured and up to 2.5 cm in diameter.
Jointed stems have reddish-brown nodes surrounded by paper sheaths.
Stems die back in fall and remain standing in winter.

Leaves

Leaves have an alternate pattern in a distinct zig-zag pattern.
The leaves are oval with a pointed tip, and a petiole arising from the stalk.

Flowers

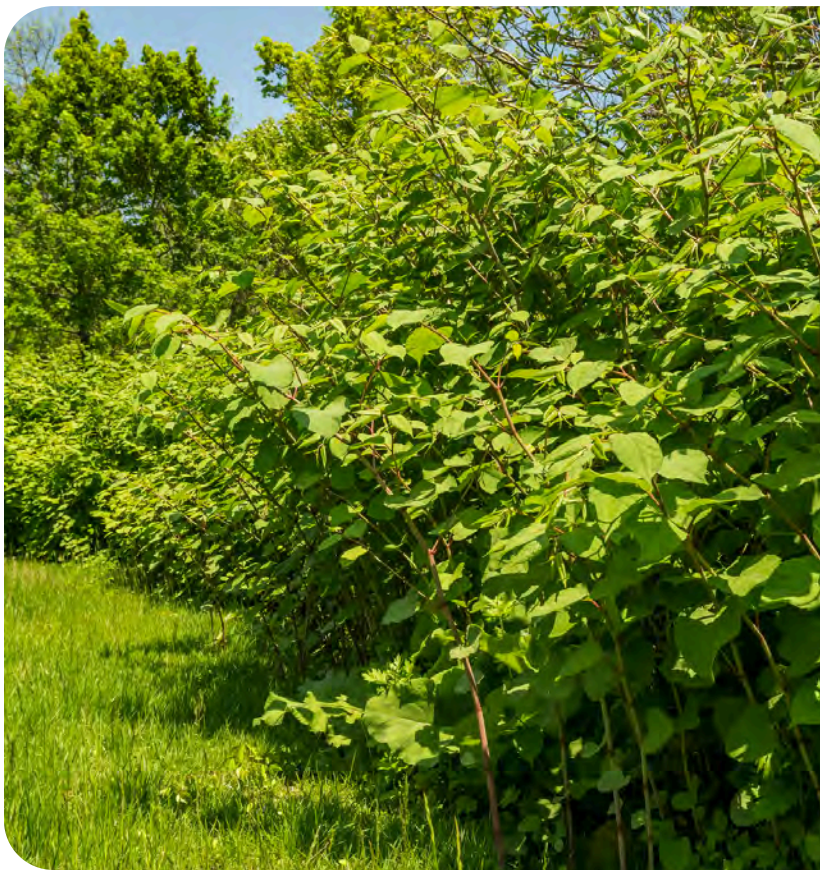
Flowers bloom in late July or August and are produced in clusters of small white-green flowers. Seeds are tiny, triangular, and winged, which helps with wind and water dispersal.

OVERVIEW

The Regional District of Nanaimo (RDN) has listed Japanese knotweed as a priority invasive species in managing RDN parks and trails.[2]

Japanese knotweed has various impacts including economic, ecological, and social impacts. Japanese knotweed grows rapidly and forms monocultures that limit resources for native plants, thus reducing biodiversity.

Management of knotweed can be difficult based on Japanese knotweed's ability to reproduce vegetatively through root and stem tissues, as such, management options must be carefully evaluated on a case-by-case basis to avoid further spread and complications. Eradication of Japanese knotweed typically requires a dedicated, multi-year, planned approach.



HABITAT & DISTRIBUTION

Japanese knotweed is native to Asia and was introduced in British Columbia (BC) as an ornamental plant. Japanese knotweed is found in several regions of BC, including Vancouver Island and the Lower Mainland.[3]

Japanese knotweed is usually found in riparian areas, where it is associated with moist soils and full or partial sun. However, it can be found in a variety of areas, including disturbed lands or right-of-way corridors.[3]

Prepared by:
McTavish July 2024

JAPANESE KNOTWEED

THREATS TO BIODIVERSITY

Reduced species diversity
Japanese knotweed significantly degrades the quality of wetland and riparian habitats through the establishment of dense monoculture stands that do not support the same levels of diverse wildlife populations as native vegetation.[3]

Competing with native vegetation
Japanese knotweed is suspected to contain allelopathic properties, which reduces the ability of native plants to establish in a Japanese knotweed infested area. In addition, Japanese knotweed can alter soil chemistry and outcompete native vegetation for vital light and food resources.[4]

Destabilize stream habitats
The rooting structure of Japanese knotweed compromises the stream bank's ability to hold water during flood or high rain events. Through their large rhizome system, soil availability along stream banks is significantly reduced and prone to eroding. Stable stream systems are vital during extreme weather events that are becoming more common due to climate change.[3]

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TREATMENT METHODS

Manual
Mechanical control of Japanese knotweed on its own is typically not an effective management tool. Mechanical control should be carried out with extreme caution due to the likelihood of spread through root and stem fragments. Mechanical control is time consuming and requires frequent removal over numerous years. All removed plant material should be disposed of at approved waste facilities.[5]

Chemical
Chemical control with a systemic herbicide is the recommended treatment strategy for Japanese knotweed due to its unreliability in being treated by manual pulling or cuttings. A variety of chemical treatments can be used, which may vary depending on the objective of the site.[5]

Biological
Research is ongoing in Canada on the feasibility of using a sap-sucking insect or a fungal disease (two natural Japanese knotweed predators) for biological control of Japanese knotweed.[1]

TIMING

For manual control such as mowing, digging, or excavation, treatment must coincide with the growing season.[1]

For chemical control, herbicide should be applied in late May, followed by additional applications in the summer (June, July). A combination of mechanical and chemical treatment is most effective for established populations.[1]

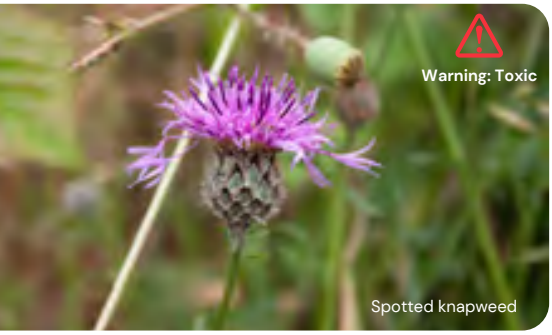
1 Anderson, Hayley. 2012. Invasive Japanese Knotweed (Fallopia japonica (Houtt.)) Best Management Practices in Ontario. Ontario Invasive Plant Council, Peterborough, ON
2 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146
3 Invasive Species Centre. 2024. Japanese Knotweed. https://www.invasivespeciescentre.ca/invasive-species/meet-the-species/invasive-plants/japanese-knotweed/#fact-sheets
4 Vancouver Board of Parks and Recreation. 2016. Biodiversity Strategy. Vancouver, BC. 53 pp.
5 Metro Vancouver. 2021. Best Management Practices for Knotweed Species in the Metro Vancouver Region. Vancouver, BC. 30 pp.

Prepared by:
McTavish July 2024

KNAPWEEDS

Russian (Acroptilon repens) and spotted (Centaurea maculosa)

Russian knapweed - Stan Shebs



Spotted knapweed

Provincial Designation: Schedule A Part 2 of Regional Noxious Weeds under the *Weed Control Act*.

Provincial Designation: Schedule A Part 1 of Provincial Noxious Weeds under the *Weed Control Act*.

KEY CHARACTERISTICS[4]

Stems

Spotted: Rosettes appear in 1st year plants, mature plants have slender stems with many branches.

Russian: Stems are stiff, erect, and covered in soft, short hairs.

Leaves

Leaves are grey-green, deeply lobed, and arranged in an alternate pattern.

Flowers

Spotted: Purple-white, grow in solitary heads at the ends of branches. Black-tipped flower head bracts give a spotted appearance.
Russian: Pink-purple, contain papery bracts, and grow in solitary heads at the ends of branches.

OVERVIEW

The Regional District of Nanaimo (RDN) has identified knapweed as a priority invasive species. Russian knapweed is listed under the Prevent category and spotted knapweed is listed under the Control category. Both knotweeds are also listed on the *Weed Control Act* under Schedule A, with Russian knapweed listed as regionally noxious in the Northern Okanagan area. Spotted knapweed has been identified over a total area of 8 ha, but Russian knapweed has not been reported in the RDN yet.[1]

Knapweeds originate from Europe and Asia but were unintentionally introduced into North America.[1]

Knapweed reproduces via seed, but Russian knapweed can also reproduce from rhizomes.[2] Spotted knapweed can contain around 140,000 seeds per square meter. Both knapweeds disperse through wind, vehicles, birds, wildlife, and agricultural transport.[3]

HABITAT & DISTRIBUTION

Both knapweeds prefer open areas and well-drained soils, dominating grasslands, open forests, ditches, and roadsides.[1]

Spotted knapweed is currently distributed throughout Southern BC and is heavily concentrated in the Omineca, Peace River, Kootenay, Okanagan, Thompson, and Cariboo regions.[3] Russian knapweed can be found east of the Coast-Cascade Mountains.[3]

Eric Coombs, Oregon Department of Agriculture

Prepared by:
McTavish July 2024

KNAPWEEDS

THREATS TO BIODIVERSITY

Increased erosion and sedimentation:
Monocultures of knapweed were shown to increase surface water run-off and erosion, since areas where knapweed grow contain more bare ground and less litter than a native bunchgrass community.[7]

Competing with native vegetation:
Both knapweeds are allelopathic, spreading toxins into the soil surrounding them and preventing other plants from growing or establishing. This results in monocultures of knapweed, reducing species diversity and lowering the overall wildlife habitat value, especially in grassland ecosystems of BC which support many at-risk species.[4]

Reduced wildlife habitat value:
Knapweed is not a value food resource for wildlife. Russian knapweed also causes a neurological disorder in horses that is fatal once symptoms show.[6]

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TREATMENT METHODS

Manual
Timing is critical if using manual or mechanical treatment methods, but it can provide successful results, especially for smaller infestations. Hand pulling is not effective for established Russian knapweed patches because it can rapidly resprout from rhizomes. For spotted knapweed, mowing in the flowering or seed producing stage for 3 consecutive years reduced adult plant density by about 85%. Mowing should be prevented in areas where there are established biocontrol agents.[6]

Chemical
Chemical control is another effective treatment method. Picloram is considered the most effective for treating knapweed, but it does contain residual effects.[6]

Biological
In BC, 12 knapweed biocontrol agents have been released. A combination of several different types of biocontrol agents are believed to be the most effective treatment in reducing knapweed infestations within the Southern Interior (e.g., root-feeding weevil/moth and seed-eating fly/moth). In some states, the root weevil in combination with the seed head insects has reduced seed production by 94%.[6]

TIMING

Manual treatments should be conducted before the plant goes to seed, which is typically in the spring. Wetter soils can also aid in pilling out the plant. Mowing is most effective when conducted in the fall (flowering or seed producing stage).[6]

Chemical treatments are most effective when applied after the first killing frost, then again the following spring. Follow-up treatments are likely required.[6]


Norman E. Rees, USDA Agricultural Research Service

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Fraser Valley Invasive Species Society. 2024. Invasive Plant - Russian knapweed. https://fviss.ca/invasive-plant/russian-knapweed
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4 Sherman, Kellie and Powell, Kate. 2017. Spotted Knapweed (Centaurea stoebe) Best Management Practices in Ontario. Ontario Invasive Plant Council, Peterborough, ON.
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146
6 Montana State University. Biology, ecology and management of Montana knapweeds. https://www.montana.edu
7 Lacey, J.R., C.B. Marlow and J.R. Lane. 1989. Influence of spotted knapweed on runoff and sediment yield. Weed Technology. 3: 627-631.

Prepared by:
McTavish July 2024

KNOTWEEDS

Japanese, Himalayan, giant, and bohemian knotweeds


Japanese knotweed


Himalayan knotweed – N. Page

Provincial Designation:
Schedule A Part 1 of Noxious Weeds under the *Weed Control Act*.


Giant knotweed – Jennifer Andreas


Bohemian knotweed – Robrt Videki, Bugwood.org

OVERVIEW

The Regional District of Nanaimo (RDN) has identified knotweeds as priority invasive species under the Contain management category. Four knotweeds can be found in the RDN; Japanese knotweed (*Fallopia japonica*), Himalayan knotweed (*Polygonum polystachum*), giant knotweed (*Fallopia sachalinensis*), and bohemian knotweed (*Fallopia x bohemica*). All knotweeds are listed on the *Weed Control Act* under Schedule A, Part 1. In total, knotweeds make up approximately 67 ha within the RDN.[1]

Knotweeds were introduced from Asia as an ornamental plant. Knotweeds grow aggressively and are very hard to get rid of based on knotweed's ability to reproduce vegetatively through root and stem tissues. As such, management options must be carefully evaluated on a case-by-case basis to avoid further spread and complications. Eradication of Japanese knotweed typically requires a dedicated, multi-year, planned approach.[4]

HABITAT & DISTRIBUTION

Knotweed is usually found in riparian areas, where it is associated with moist soils and full or partial sun. However, it can be grow in a variety of habitats, including disturbed lands or right-of-way corridors.[3]

Knotweeds are concentrated in southwest BC and Vancouver Island, but can also be found in the Thompson-Nicola, Okanagan, Nechako, and Cariboo regions.[3]

KEY CHARACTERISTICS[4]

Stems

Stems are bamboo/cane-like, stout, and green with reddish-brown speckles.

Leaves

Leaves are heart shaped or triangular shaped, except for Himalayan which is more lance-shaped.

Flowers

Flowers are typically white, showy, plume-like, and branched clusters along the stem and leaf axils.

Prepared by:
McTavish July 2024

KNOTWEEDS

THREATS TO BIODIVERSITY

Reduced species diversity:
Knotweed significantly degrades the quality of wetland and riparian habitats through the establishment of dense monoculture stands that do not support the same levels of diverse wildlife populations as native vegetation.[4]

Competing with native vegetation:
Some knotweeds, such as Japanese knotweed, is suspected to contain allelopathic properties, which reduces the ability of native plants to establish in a Japanese knotweed infested area. In addition, Japanese knotweed can alter soil chemistry and outcompete native vegetation for vital light and food resources.[4]

Destabilize stream habitats:
The rooting structure of knotweed compromises the stream bank's ability to hold water during flood or high rain events. Through their large rhizome systems, soil availability along stream banks is significantly reduced and prone to eroding. Stable stream systems are vital during extreme weather events that are becoming more common due to climate change.[3]

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TREATMENT METHODS

A combination of mechanical and chemical treatment is most effective for established populations.

Manual
Mechanical control of knotweed on its own is typically not an effective management tool. Mechanical control should be carried out with extreme caution due to the likelihood of spread through root and stem fragments. Mechanical control is time consuming and requires frequent removal over numerous years. All removed plant material should be disposed of at approved waste facilities.[4]

Chemical
Chemical control with a systemic herbicide is the recommended treatment strategy for knotweeds due to its unreliability in being treated by manual pulling or cuttings. A variety of chemical treatments can be used, which may vary depending on the objective of the site.[4]

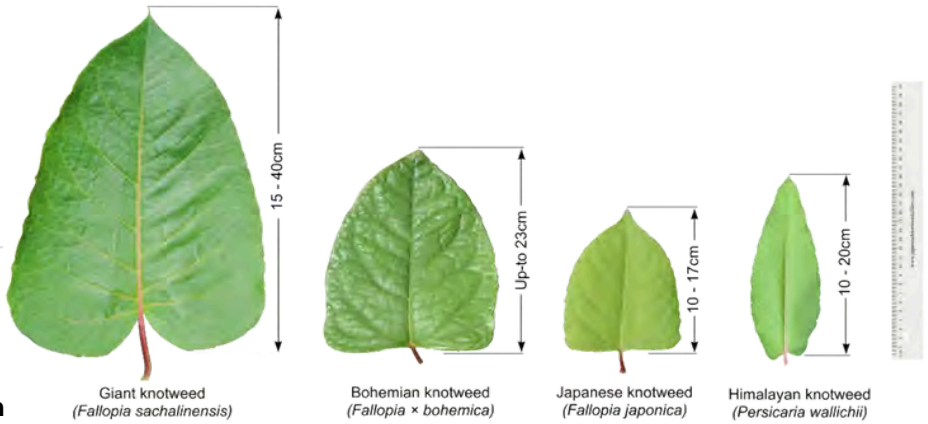
Biological
Research is ongoing in Canada on the feasibility of using a sap sucker psyllid (*Aphalara itadori*). Agriculture and Agri-Food Canada and the BC Ministry of Forests have released the psyllid in BC, but the insect has not established.[4]

TIMING

For manual control such as mowing, digging, or excavation, treatment must coincide with the growing season.[4]

For chemical control, herbicide should be applied in late May, followed by additional applications in the summer (June, July).[4]

KNOTWEED LEAF COMPARISON GUIDE



japaneseknotweedkillers.com

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146
3 Invasive Species Council of BC. 2019. Knapweed Factsheet.https://bcinvasives.ca/wp-content/uploads/2021/01/Knapweeds_Factsheet_20_02_2019.pdf
4 Metro Vancouver. 2021. Best Management Practices for Knotweed Species in the Metro Vancouver Region. Vancouver, BC. 30 pp.

Prepared by:
McTavish July 2024

LAMIUM SP.

Yellow archangel, purple deadnettle

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

Not currently listed under any provincial/regional designation

KEY CHARACTERISTICS[3]

Stems

Stems are squared (4-sided), can grow from 30-60 cm tall, and produce stolons that can grow horizontally.

Leaves

Leaves are toothed, oval-heart shaped, and covered in tiny hairs. Leaves are typically dark green but some variegated colour variations exist.

Flowers

Flowers range in colour within the Lamium species but are small, 2-lipped, and are axillary flowers (bloom in the crease where leaves meet the stem).

OVERVIEW

The Regional District of Nanaimo (RDN) has identified the species yellow archangel (*Lamium galeobdolon*) as a priority invasive species under the Control management category. Yellow archangel has been identified over a total area of 0.05 ha. Purple deadnettle is another species belonging to the *Lamium* genus, and has been identified over a total area of 0.0004 ha (2 sites).[1]

The genus *Lamium* originates from Europe, Asia, and Northern Africa and is an herbaceous, escaped garden plant in North America.[2]

Both *Lamium* species found in the RDN can reproduce via seed and vegetative fragments. Dispersal occurs primarily through animals and humans tracking through the groundcover, and seeds are a secondary form of dispersal.[2]

HABITAT & DISTRIBUTION

Lamium is a highly-adaptable genus that can grow in a variety of habitats and soil conditions. Yellow archangel is known to invade woodland habitats and full, shaded areas, and purple deadnettle prefers more open habitats.[2]

Both *Lamium* species are heavily distributed within the Lower Mainland/Fraser Valley in BC, with isolated pockets scattered along the central east coast of Vancouver Island.[3]

Yellow archangel

Prepared by:
McTavish July 2024

LAMIUM SP.

THREATS TO BIODIVERSITY

Reduced species diversity and richness: The two species found in the RDN do no contribute to a functioning riparian ecosystem, where it can be found overtaking the native groundcover. They reduce wildlife habitat value, and are not a highly valued food resource for most wildlife.[3]

Competing with native vegetation: Most members of the *Lamium* genus are evergreen depending on the location they are growing. They easily outgrow and displace local native groundcovers such as sword fern, trillium, and false-lily-of-the-valley, which are all important components of a healthy woodland ecosystem.[4]

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TREATMENT METHODS

Manual
Manual treatments are an effective method for removing both *Lamium* species. Hand pulling and cutting is effective and vines can be easily pulled, but roots need to be fully removed for this to be effective. Effort will depend on the size and density of the infestation. Mulching can also be effective but must ensure there are no portions of the plants that can reach sunlight. Mechanical treatments are often not the most cost-effective as it can take several years for successful results.[3]

Chemical
Chemical control is another effective treatment method but is not always feasible depending on the location the plant is growing (i.e., riparian areas, near water, etc.).[3]

Biological
There are currently no biological control agents available for distribution in BC.[3]

TIMING

Manual treatments should be conducted before the plant goes to seed, which is typically in the fall or early spring.[4]

Chemical treatments are most effective when applied in the fall or early spring, which is when the plant is most actively growing or using their energy reserves. Applying herbicide before the flower blooms can also avoid harm to pollinators.[4]

Purple deadnettle

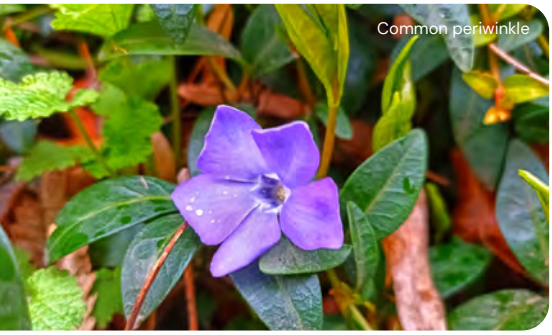
1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Fraser Valley Invasive Species Society. 2024. Invasive Plants https://fviss.ca/invasive-plants
3 Invasive Species Council of BC. 2017. Yellow Archangel Factsheet. https://bcinvasives.ca/wp-content/uploads/2021/01/Yellow-Archangel.pdf
4 Invasive Plants of Southwestern BC website. 2005. Yellow archangel. https://www.cmnmaps.ca/
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146

Prepared by:
McTavish July 2024

PERIWINKLE

Vinca spp.


Bigleaf periwinkle


Common periwinkle

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

KEY CHARACTERISTICS[3]

Stems

Stems are trailing, evergreen, and slender.

Leaves

Leaves are dark green and glossy, oval-egg shaped, and are arranged in opposite patterns.

Flowers

Flowers are purple-blue, 5-petalled and one flower is produced per stem. Flowers can sometimes be white.

OVERVIEW

The Regional District of Nanaimo (RDN) has identified periwinkle species as a priority invasive species under the Control management category. There are two types of periwinkle identified within the RDN (*V. minor* and *V. major*), and both make up a total of 2 ha within the district.[1]

Periwinkle originates from Europe and Asia, and is an escaped ornamental groundcover plant that is also used for medicinal purposes.[1]

Periwinkle can reproduce via seed and vegetative fragments. In addition to dispersing naturally, periwinkle is also still sold throughout BC and is considered one of the top 6 invasive plants still being actively distributed throughout the province despite its negative impacts.[2]

HABITAT & DISTRIBUTION

Periwinkle can grow in a variety of habitats and soil conditions. Periwinkle appears to thrive in shady, moist forests and are also commonly found in roadside and urban areas.[1]

Periwinkle is distributed within the Lower Mainland/Fraser Valley in BC, and is also widespread along the central and southern coast of Vancouver Island.[3]


ISCMV 2024

Prepared by:
McTavish July 2024

PERIWINKLE

THREATS TO BIODIVERSITY

Reduced species diversity and richness:
Dense mats of periwinkle prevent the native understory of coniferous forests from establishing and in doing so reduce overall wildlife habitat value. Periwinkle is not a highly valued food resource and it is unpalatable to livestock.[3]

Competing with native vegetation:
Periwinkle is an evergreen perennial vine that easily outgrow and displace local native groundcovers, which are all important components of a healthy woodland ecosystem.[3]

Preventing the growth of native trees:
In addition to competing with native groundcover species, dense periwinkle mats also prevent the establishment of tree seedlings.[4]

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TREATMENT METHODS

Manual
Manual treatments are an effective method for removing periwinkle. Hand pulling and cutting is effective and vines can be easily pulled, but roots need to be fully removed for this to be effective. Effort will depend on the size and density of the infestation. Mulching can also be effective but must ensure there are no portions of the plants that can reach sunlight. Mechanical treatments are often not the most cost-effective as it can take several years for successful results.[3]

Chemical
Chemical control is another effective treatment method but is not always feasible depending on the location the plant is growing (i.e., riparian areas, near water, etc.).[3]

Biological
There are currently no biological control agents available for distribution in BC.[3]

TIMING

Manual treatments should be conducted before the plant goes to seed, which is typically in the fall or early spring.[3]

Chemical treatments are most effective when applied in the fall or early spring, which is when the plant is most actively growing or using their energy reserves. Applying herbicide before the flower blooms can also avoid harm to pollinators.[3]

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Invasive Species Council of BC. 2023. Invasive Plant - Common periwinkle. https://bcinvasives.ca/invasives/common-periwinkle/.
3 Invasive Species Council of BC. 2017. Common Periwinkle Factsheet. https://bcinvasives.ca/wp-content/uploads/2021/01/Periwinkle.pdf
4 Tree Canada. n.d. Tree Killers: Periwinkle. https://treecanada.ca/resources/tree-killers/periwinkle/
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146

Prepared by:
McTavish July 2024

ST. JOHN'S-WORT

Hypericum perforatum

Regional Designation:
Priority Invasive Plant under 'Control' Management Category (Coastal ISC)

KEY CHARACTERISTICS[3]

Stems

Stems are erect and can range from 0.1-1.0 m tall, 2-sided, and rust-coloured, forming numerous branches.

Leaves

Leaves are arranged opposite, oval, and are dark green covered in transparent dots.

Flowers

Flowers are yellow, 5-petaled, and grow in clusters at the top of branches.

OVERVIEW

The Regional District of Nanaimo (RDN) has listed St. John's-wort as a priority invasive species. St. John's-wort has been identified over a total area of 112 ha within the RDN.[1]

St. John's-wort was introduced for its medicinal properties from Europe, Asia, and North Africa. The plant is toxic to grazing animals that are lighter-skinned.[2]

St. John's-wort is a perennial herbaceous plant that reproduces by seed and roots, each plant producing up to 100,000 seeds per year. The plant has rhizomatous roots that spread laterally and can form independent buds from these roots.[2]

HABITAT & DISTRIBUTION

St. John's-wort is found in pastures, rangelands, meadows and roadside areas. Dry, gravelly, or sandy soils appear to be the best growing mediums for St. John's-wort.[3]

St. John's-wort is found in the Kootenays, Okanagan, Boundary, North Thompson, Cariboo, Skeena, Fraser Valley, and Vancouver Island regions, however they are distributed in isolated pockets.[3]

Prepared by:
McTavish July 2024

ST. JOHN'S-WORT

THREATS TO BIODIVERSITY

Reducing soil moisture availability:
The rhizomatous root structure of St. John's-wort has been shown to deplete overall soil moisture availability for surrounding native plants. The deep root structure also allows St. John's-wort to continue growing even during drier seasons.[2]

Reduced wildlife forage:
St. John's-wort is not a highly valued food resource for wildlife. In addition to wildlife, it becomes unpalatable to livestock as the plant matures.[4]

Increased wildlife hazard:
The dead stalks of St. John's-wort contribute to high fuel loads, especially in grassland areas.[2]

Competing with native vegetation:
St. John's-wort displaces native vegetation and delays the establishment of native species in disturbed areas.[2]

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TREATMENT METHODS

Manual
Since St. John's-wort reproduces vegetatively, many manual/mechanical methods of control are not effective. Tillage appears to be the only effective treatment method for managing St. John's-wort in agricultural fields. Also, hand pulling or digging before the flowers go to seed can reduce the spread of this plant, but the root system needs to be entirely removed for this to be effective.[6]

Chemical
Chemical control has proven to be an effective treatment method in the USA, but the waxy leaves can sometimes prohibit herbicide uptake by the plant.[2]

Biological
Several biological control agents are being used in BC that target St. John's-wort. Two species of leaf-eating beetles are reproducing successfully in BC, but the beetle needs to be moved to new populations periodically. There are an additional three insects that have been released and are being closely monitored in the province.[3]

TIMING

Hand-pulling young, small plants should occur in the spring, when the plant starts putting its energy reserves into growing rapidly.

Chemical treatments used on St. John's-wort are most effective[6] during post-emergence when the plant begins to rapidly grow, but if this is not possible, applying the treatment prior to bloom can also work.[6]

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Klein, H. 2011. Common St. Johnswort (PDF | 128 KB) University of Alaska Anchorage, Alaska Exotic Plants Information Clearinghouse.
3 Province of BC. 2002. A Guide to Weeds in BC: St. John's-wort . https://www2.gov.bc.ca
4 Invasive Species Council of BC. 2023. Common St. John's wort. https://bcinvasives.ca/invasives/st-johns-wort/
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146
6 DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States.* Weed Research and Information Center, University of California. 544 pp.

Prepared by:
McTavish July 2024

TANSY RAGWORT

Senecio jacobeae

Provincial Designation:
Schedule A - Part 1 of Noxious Weeds under the *Weed Control Act*

OVERVIEW

The Regional District of Nanaimo (RDN) has listed Tansy ragwort as a priority invasive species. Tansy ragwort has been identified over a total area of 63 ha within the RDN.[1]

Tansy ragwort was introduced as a medicinal herb from Europe, Asia, and Siberia. It has further spread through hay and contaminated ballast water.[2]

Tansy ragwort is a biannual and perennial herbaceous plant that reproduces from seed but can also germinate from crown buds, roots, and root fragments. Seeds are dispersed by wind, animals, soils, and human activity.[2]

HABITAT & DISTRIBUTION

Tansy ragwort is found in pastures, clear-cuts, and roadside areas. They are associated with full sun or partial shade and well-drained soils.[2]

Tansy ragwort is mostly confined to the southwest coast of BC, concentrated in the Nanaimo region and the Fraser Valley. Isolated pockets occur in the interior, on the eastern side of the Okanagan Valley.[2]

KEY CHARACTERISTICS[3]

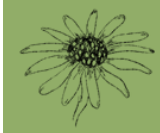
Stems

The first year appears as a rosette and subsequent years is an erect stem reaching up to 1.2 m tall.

Leaves

Leaves are dark green and deeply cut into irregular segments, giving it a ragged appearance.

Flowers



Flowers are yellow, containing 10-15 ray petals around 1 disk flower. The flowers are arranged in a flat-top cluster.


Zoya Akulova

Prepared by:
McTavish July 2024

TANSY RAGWORT

THREATS TO BIODIVERSITY

Reduced wildlife forage:
Tansy ragwort is not a highly valued food resource for wildlife. The plant produces alkaloids that are toxic to most livestock animals, except for sheep. It can also affect the taste and colour of honey for bees that pollinate using tansy ragwort.[3]

Competing with native vegetation:
Tansy ragwort is a highly competitive species. Disturbing the soil can germinate dormant seeds, it has a deep taproot system, and the roots are rhizomatous. Tansy ragwort displaces native vegetation and delays the establishment of native species in disturbed areas.[4]

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TREATMENT METHODS

Manual
Since tansy ragwort reproduces vegetatively, many manual/mechanical methods of control are not effective. Repeated mowing and prescribed burning have produced somewhat successful results where enough seedlings can be removed. Hand pulling or digging before flowering can reduce the spread of this plant, but the root system needs to be entirely removed and done 2-3 times per year for this to be effective.[4]

Chemical
Chemical control has proven to be a successful treatment method in the USA, with results of over 95% removal using several herbicide brands.[4]

Biological
Several biological control agents are being used in BC that target tansy ragwort and are producing successful results. One is a defoliating moth called the cinnabar moth (*Tyria jacobaeae*), which targets seed heads, roots, and leaves. There are an additional four insects being used that target tansy ragwort, including flies and beetles.[3]


Tyria jacobaeae

TIMING

Hand-pulling young, small plants should occur in the spring, when the plant starts putting its energy reserves into growing rapidly.[4]

Chemical treatment timing is dependent on the brand being used, but is mostly related to the growth stage of the plant rather than the time of year.[4]

1 Coastal Invasive Species Committee. 2022. Regional District of Nanaimo Invasive Species Survey. https://www.coastalisc.com/regional-district-of-nanaimo/
2 Invasive Species Council of BC. 2023. Tansy ragwort. https://bcinvasives.ca/invasives
3 Invasive Species Council of BC. 2019. Tansy ragwort Factsheet. https://www2.gov.bc.ca
4 DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States.* Weed Research and Information Center, University of California. 544 pp.
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146

Prepared by:
McTavish July 2024

WILD & BUR CHERVIL

Anthriscus sylvestris & Anthriscus caucalis

Southwest Desert Flora

Provincial Designation:
Schedule A - Part 2 of Regional Noxious Weeds under the *Weed Control Act*

Provincial Designation:
Schedule A - Part 1 of Noxious Weeds under the *Weed Control Act*

KEY CHARACTERISTICS[3]

Stems

Stems are hollow, ribbed, green, and covered in tiny hairs near the bottom of the plant.

Leaves

Leaves are triangular, alternating, and finely divided, resembling ferns.

Flowers

White flowers are arranged in umbels and 5-petaled. Seeds are smooth, shiny, brown, arranged in twos, and taper at the end.

OVERVIEW

Bur chervil is provincially listed as a noxious species under the *Weed Control Act* and as a priority invasive species under the Control category for the Regional District of Nanaimo (RDN). Wild chervil is regionally listed as a noxious species in the Fraser Valley under the *Weed Control Act* and as a priority invasive species under the Eradicate category for the RDN. Bur chervil has been identified over a total area of 1.5 ha and wild chervil has been identified over a total area of 7 ha within the RDN.[1]

Both chervil species were introduced from Europe and Asia. Bur chervil is a biannual herbaceous plant that reproduces from seed only. Seeds are dispersed by animals and people as they contain tiny burs that cling onto fur, clothing, and vehicles. Wild chervil reproduces by seed but also through root buds. Seeds are typically dispersed by wind.[2]

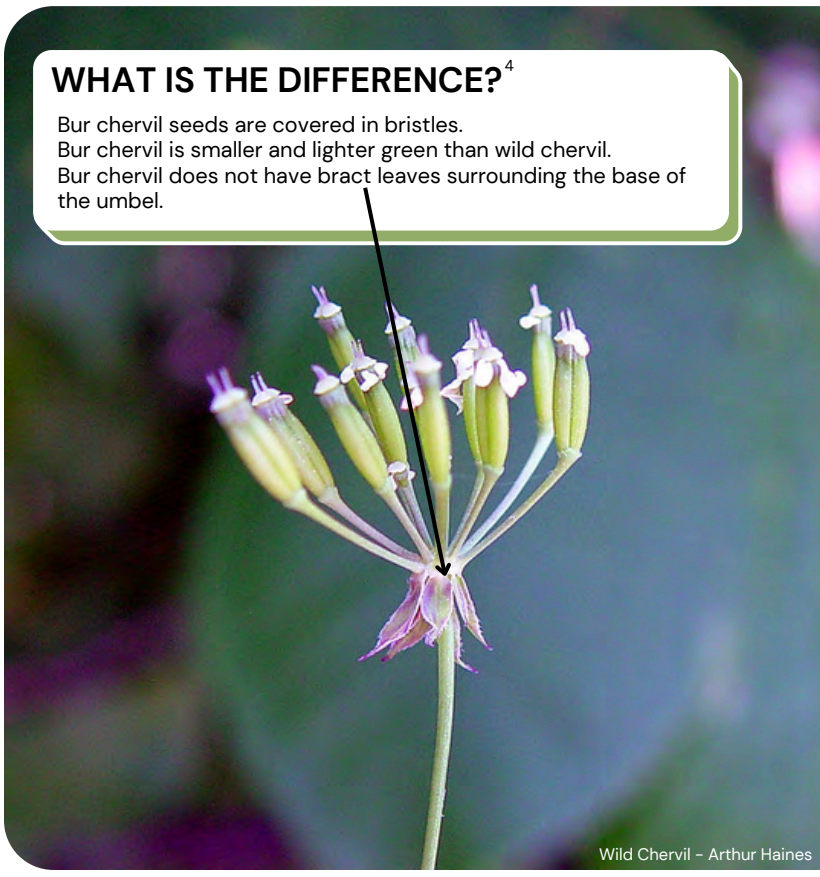
HABITAT & DISTRIBUTION

Both bur and wild chervil habitats overlap, but wild chervil is often associated with wetter communities than bur chervil. They can be found in meadows, streambanks, and roadside/disturbed areas.[2]

Both chervils have limited distribution in BC. Wild chervil is found in the Fraser Valley and southwest coast of Vancouver Island (VI). Bur chervil is found along the southwest coast of VI.[3]

WHAT IS THE DIFFERENCE?[4]

Bur chervil seeds are covered in bristles.
Bur chervil is smaller and lighter green than wild chervil.
Bur chervil does not have bract leaves surrounding the base of the umbel.



Wild Chervil - Arthur Haines

Prepared by:
McTavish July 2024

WILD & BUR CHERVIL

THREATS TO BIODIVERSITY

Reduced wildlife forage:
Bur and wild chervil do not contribute to a functioning riparian ecosystem. They reduce wildlife habitat value, and are not a highly valued food resource for most wildlife. Its aromatic qualities also make it unfavorable for livestock.[2]

Competing with native vegetation:
Both chervils are highly competitive species. They have a deep taproot system that can uptake nutrients and resources aggressively from the surrounding habitat. The height and leaves of the plant also shade out native shrubs, herbs or seedlings.[3]

TREATMENT METHODS

Manual
Manual and mechanical control treatments are most effective at managing both chervil species. Hand pulling and digging is suitable for small, isolated sites, but typically requires repeated treatments and taproots may re-sprout if not entirely removed. Tilling is another option but the success rate is low unless combined with other methods, such as seeding with competitive species and/or herbicide.[6]

Chemical
Chemical control is not always effective due to the deep taproot system of both plants. Most chemical treatment options for chervil are also non-selective, which may damage surrounding native vegetation.[2]

Biological
There are currently no biological control agents available for distribution in BC.[2]

TIMING

Since both bur and wild chervil reproduce by seed, treatment methods should occur before May, which is when seed sets.[6]

Bur chervil seed
Credit: D. Walters and C. Southwick


Wild chervil seed
Credit: Kristine Lofgren

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Bur chervil

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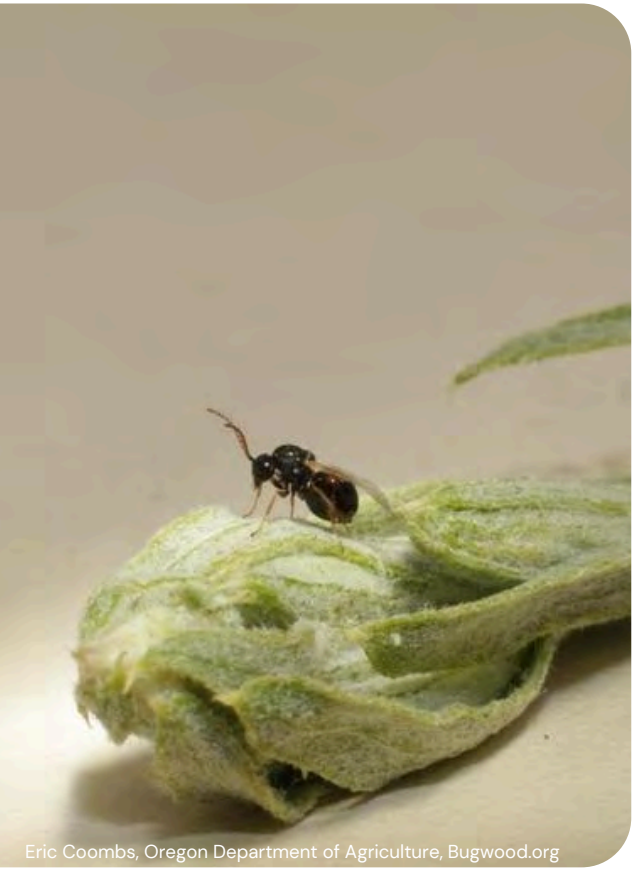
2 DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States.* Weed Research and Information Center, University of California. 544 pp.
3 Fraser Valley Invasive Species Society. 2024. Invasive Plants. https://fviss.ca/invasive-plants
4 King County. 2024 Wild chervil identification and control. https://kingcounty.gov
5 Regional District of Nanaimo. 2024. Invasive Species Gallery.https://www.getinvolved.rdn.ca/invasivespecies/widgets/138473/photos/32146
6 Metro Vancouver. n.d. Wild Chervil Factsheet: Tackling Wild Chervil (Anthriscus sylvestris). https://metrovancouver.org

Prepared by:
McTavish July 2024

MANAGEMENT CONTROL STRATEGIES:

BIOLOGICAL CONTROL



Eric Coombs, Oregon Department of Agriculture, Bugwood.org

BENEFITS[1]

- Encourages long-term management of invasive plants
- Can be used in environmentally sensitive sites
- Can include the use of native plants
- Minimal/no impact on fish habitat

TYPES OF BIOLOGICAL CONTROL[4]

CLASSICAL

Classical methods of biocontrol uses natural predators of the invasive plant that originally come from the plant's place of origin. The original relationship between the two would achieve a long-term balance that keeps both populations in check. St.Jonh's-wort is a good example of a plant under effective biocontrol with a cyclical population reminiscent of its origin.

In classical biocontrol, which is more often used than inundative biological control, the plant will never be fully eradicated since the biocontrol agent's population will decline after the invasive plant population has been reduced. The success or availability of one is highly dependent on the other.

Invasive plants may be killed directly or indirectly by decreasing reproductive success, competitive ability, or overall plant vigour. The aim of these is to give native plants a chance to re-establish.

INUNDATIVE

Inundative biocontrol typically uses pathogens, such as rusts, fungus, or nematodes. These biocontrol agents are applied similarly to how herbicide would be applied. that are applied to the target weed at high rates in a manner similar to herbicide application.

However, this method may not affect the seed bank or prevent the plant from re-establishing as it would with a chemical treatment, but it can wipe out an entire population, leaving the space open for native plants to establish either on their own or through planting.

Seedhead eating weevil

Seedhead eating moth

Seedhead gall-producing fly

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McTavish July 2024

MANAGEMENT CONTROL STRATEGIES:
BIOLOGICAL CONTROL

LIMITATIONS[1]

- The environmental setting may prevent insect populations from thriving if the site or soil conditions are unfavourable.
- Biological control agents are not available for many persistent/established invasive plant species.
- Noticeable results can take up to 20 years
- Biocontrol does not usually result in complete eradication, but rather control of a species.
- The screening process for release of biocontrol agents can take time/be costly to ensure it will not harm native plants.

ADVENTIVE V.S. RELEASED BIOCONTROL AGENTS

Adventive biocontrol agents are those that arrived in BC by their own means either by 1) accidently (from overseas), 2) migrated from a screened process in the USA, or 3) migrated from a screened process in another part of Canada.[3]

ALTERNATIVES TO BIOLOGICAL CONTROL

Biological control often works best on large infestations, or infestations near water. It is a long-term approach that can take many years for insect populations to establish and show significant results.

Alternatives to biological controls are needed when the plant infestation poses an immediate threat to human infrastructure, human safety, or agricultural economic impacts. Mechanical/manual or chemical treatments must be considered in these cases.

INVASIVE SPECIES THAT RESPOND WELL TO BIOLOGICAL CONTROL METHODS:

SPOTTED KNAPWEED
Impatiens glandulifera

There are 14 known biocontrol agents that target spotted knapweed in BC, including fungus, root feeding weevils, and seed eating flies.[2]

DALMATION TOADFLAX
Linaria dalmatica

There are seven documented biocontrol agents that target dalmation toadflax, including root/seed feeding weevils, stem mining weevils, and root feeding moths.[2]

CANADA THISTLE
Cirsium arvense

There are nine documented biocontrol agents in BC that target Canada thistle, including stem and seed feeding weevils, a fungus, and a foliar feeding beetle.[2]

1 Coastal Invasive Species Committee. 2024. Control Invasive Plants. https://www.coastalisc.com/how-to-control-invasive-plants/
2 Government of BC. 2017. Biological control agents and host plants. https://www2.gov.bc.ca
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MANAGEMENT CONTROL STRATEGIES:

CHEMICAL TREATMENTS

BENEFITS[1]

- Effective for new and small infestations of invasive plants
- Will kill target plants (selective herbicide options)
- Long-term benefits of residual control of seed-bank
- Less labour intensive than alternative mechanical and cultural methods.
- Minimal to no impact on soil disturbance, which reduces CO2 emissions

TYPES OF CHEMICAL TREATMENTS[2]

FOLIAR SPRAY

Herbicide is diluted with water to a specific ratio and sprayed over the foliage. Foliar sprays are quick and economic options for herbicide treatments. Some examples of foliar sprays can include pressurized backpack sprayers, vehicle boom spray, hose and handgun, or splatter guns.

BASAL BARKING

Basal barking consists or mixing an oil-soluble herbicide in diesel or other recommended product and spraying the trunk or stem of the plant.

STEM INJECTION

Stem injections are drilling or cutting straight into the stem or sapwood tissue of woody plants to transport the herbicide throughout the plant. The injections must be immediately after cutting to ensure there is active uptake of the herbicide moving through the plant's tissue.

CUT AND SWAB

Invasive plant stems are cut through completely, close to the ground, and herbicide is applied immediately to the cut surface using spray or brush application.

STEM SCRAPER

Stem scraping is used for invasive plants with aerial tubers. A knife is used to scrape a very thin layer of bark from a 10 cm section of stem, and the herbicide is applied immediately to the exposed tissue.

WICK APPLICATOR

Wick applicators are wicks or ropes soaked in herbicide from a reservoir attached to a handle. The wetted wick is used to wipe or brush over the plant.

Wick applicator attached on a tractor

Foliar spray using pressurized backpack/pump sprayer

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MANAGEMENT CONTROL STRATEGIES:

CHEMICAL TREATMENTS

LIMITATIONS[1]

- Some herbicides are non-selective, meaning they will impact surrounding vegetation, even if it is a non-target species. Precautions need to be taken to limit the effects on surrounding non-target plants.
- The environmental setting, such as steep slopes, waterbodies, culturally significant sites, may limit herbicide use in an area.
- The site conditions, such as soil or climate, may limit the effectiveness of herbicide applications.
- Community groups or Indigenous groups may have concerns about the use of herbicides if it is suspected to impact human health or foraging ability.

A Pesticide Use Permit (PUP) is an authorization by the province of BC to sell pesticides, apply pesticides to public or private land, to apply pesticides as a service, or for specified industrial uses on water. Examples of some areas that have a PUP is knotweed near the shoreline of the Nimpkish River or Victoria Lake.[6]

ALTERNATIVES TO CHEMICAL CONTROL

Chemical methods are not always feasible depending on limitations. In addition, they require the user to be a certified pesticide applicator. If chemical treatments are unavailable, there are many other manual, mechanical, biological, or cultural treatments.

Chemical treatments may also be feasible for a site, but the invasive plant has characteristics for it such as waxy, hairy, or oily, leaves that do not uptake herbicide. Other factors that may decrease herbicide effectiveness includes the climate, soil conditions, or growth stage of the plant is.[5]

INVASIVE SPECIES THAT RESPOND WELL TO CHEMICAL CONTROL METHODS:

JAPANESE KNOTWEED

Fallopia japonica

Just after flowering (early to mid September) an herbicide application using a 5% solution of a glyphosate based product, such as Roundup, should be applied as a foliar spray using a pump, backpack sprayer or mist blower.[3]

BUTTERFLY BUSH

Buddleja davidii

The most effective method for butterfly bush is the cut stump method. The trunk of the bush should be cut off at the base and concentrated glyphosate or triclopyr should be applied to the freshly cut surface.[4]

RUSSIAN KNAPWEED

Rhaponticum repens

Many different invasive species councils suggest that Picloram is the most effective herbicide for this species.[5]

1 Coastal Invasive Species Committee. 2024. Control Invasive Plants. https://www.coastalisc.com/how-to-control-invasive-plants/
2 Queensland Government. 2021. Herbicide application methods for invasive plants. qld.gov.au
3 New Hampshire Department of Agriculture. n.d. Control Methods for Japanese Knotweed. https://www.agriculture.nh.gov/publications-forms/documents/japanese-knotweed-control.pdf
4 Peachey, E., editor. 2022. Pacific Northwest Weed Management Handbook [online].
5 Fraser Valley Invasive Species Society. 2024. Russian knapweed. https://fviss.ca/
6 Province of BC. 2024. Invasive Plant Pest Management Plans and Pesticide Use Permits. https://www2.gov.bc.ca

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MANAGEMENT CONTROL STRATEGIES:

MANUAL & MECHANICAL REMOVAL


Nature Trust of BC 2023

BENEFITS[1]

- Use of readily available equipment and tools
- Environmentally safe if correctly timed and precautions taken to minimize soil disturbance and native vegetation loss in treatment area
- Alternative to when herbicide cannot be used
- Effective at reducing plant density and spread to other sites
- Minimal/no impact on fish habitat if erosion and sedimentation is controlled

TYPES OF MANUAL CONTROL[2]

HAND PULLING:

The key to effective hand pulling is to remove as much of the root as possible while minimizing soil disturbance. For many species, root fragments left behind have the potential to re-sprout, and pulling is not effective on plants with deep and/or easily broken roots. Hand pulling is often the best way to control small infestations.

MOWING, BRUSH-CUTTING, WEED-EATING:

Mowing and cutting can reduce seed production and restrict weed growth, especially in annuals that are cut before they flower and set seed. Mowing and cutting are often used as primary treatments to reduce aboveground biomass. It is important to collect cut fragments that are capable of re-sprouting and remove/dispose of them off-site at an approved waste disposal facility.

SMOTHERING:

Smothering is often a technique using black or clear plastic installed over the infestation/soil surface to trap solar radiation and cause an increase in soil temperatures to levels that kill plants, seeds, plant pathogens, and insects. If black plastic or other opaque materials are used, sunlight is blocked which can kill existing plants.

MECHANICAL (E.G., HEAVY EQUIPMENT):

For large populations, heavy equipment is an effective method using full-scale excavation. Usually, excavation is done by digging deep pits (2-5 m or greater) and disposing of vegetative debris at a soil treatment facility or landfill.

Manual and mechanical techniques are generally favoured against small infestations and/or where a large pool of volunteer labour is available. Manual control methods are more practical for use on small sites or portions of sites due to the high cost and effort.

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MANAGEMENT CONTROL STRATEGIES:

MANUAL & MECHANICAL REMOVAL

LIMITATIONS[1]

- Mowing is less effective on low-growing plants or plants that can re-sprout quickly after disturbance. Mowing may exacerbate the growth of some invasive plant species, especially those that reproduce by rhizomes.
- Cutting effectiveness is largely dependent on plant species, timing of cut, and age of the plant. Cutting is not an appropriate control measure for plants that reproduce by stem or root fragments.
- Excavating can be costly and labour intensive. Digging, excavating, and hand-pulling are not suitable treatments for species with adventitious root buds and rhizomes.
- Soil disturbance created by mechanical and manual treatments may facilitate the re-establishment of invasive plants.
- Repeated follow-up treatments are often required between 3 - 5 years following the initial treatment.

ALTERNATIVES TO MANUAL CONTROL

Chemical methods (i.e., herbicide) are used when the treatment must be highly localized in order to protect native vegetation, or if the target species is highly persistent.

Typically, more than one type of method is used to control an invasive plant infestation, and consideration of environmentally sensitive areas, steep slopes, vicinity to water, or traditional First Nations lands are required prior to treatment application.[5]

INVASIVE SPECIES THAT RESPOND WELL TO MANUAL CONTROL METHODS:

POLICEMAN'S HELMET

Impatiens glandulifera

Hand-pull from the base of the plant prior to seed set. Plants may be composted as long as no seeds are present.[3]

SCOTCH BROOM

Cytisus scoparius

Small plants should be gently pulled from moist soil. Ensure all roots are removed.[3]

HIMALAYAN BLACKBERRY

Rubus armeniacus

Mowing can be very effective, but if roots are not manually removed, mowing several times per year for several years is required to exhaust root reserves.[4]

1 Province of BC. 2024. Invasive Plant Pest Management Plan for Provincial Public Lands in Southern and Coastal British Columbia. https://www2.gov.bc.ca/
2 The Nature Conservancy. 2001. Weed Control Methods Handbook. https://www.invasive.org/gist/products/handbook/03.ManualMechanical.pdf
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5 Coastal Invasive Species Committee. 2024. Control Invasive Plants. https://www.coastalisc.com/how-to-control-invasive-plants/

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