



DISTRICT OF METCHOSIN

AGENDA

ENVIRONMENTAL ADVISORY SELECT COMMITTEE MEETING

January 28, 2025 at 7:00 p.m.

Council Chambers

Metchosin Municipal Hall

1. **Agenda, Additions, Approval**
2. **Presentations**
3. **Public Participation**
4. **Adoption of Minutes**
 - a) [Environmental Advisory Select Committee, December 18, 2024](#)..... 1
5. **Receipt of Minutes**
6. **Business Arising from the Minutes**
 - a) Spongy Moth Spraying Program
 - b) Invasive Himalayn Blackberry (HBB) Regional Management 3
 - Capital Region Invasives Species Partnership (CRISP) Regional Recommendations, anuary 2025
 - Invasives Management Curve
 - [Status List for Priority Invasive Plants in the Capital Region](#)
 - [Best Management Practices for Himalayan Blackberry in the Metro Vancouver Region](#)
 - [Garry Oak Ecosystems Recovery Team Best Practices for HBB](#)
 - [Pesticides and Pest Management, Province of BC](#)
7. **Reports**
 - a) Chair's Verbal Report
 - b) Council Liaison Verbal Report
8. **Correspondence**
9. **Other Business**
 - a) District of Metchosin Council – 2025 Priorities 5
 - Local Government Riparian Area Regulation
 - [Riparian Areas Regulation Guidebook for Local Governments, Ministry of Forests, Lands and Natural Resource Operations](#)
 - Proposed Biodiversity and Natural Assets Plan
 - [EDPA Framework 2017 Comox Valley](#)
 - [Resilient Saanich FACTSHEET 2, Biodiversity Conservation Strategy Examples](#)
10. **Adjournment and Next Meeting**

District of Metchosin

Minutes

Environmental Advisory Select Committee Meeting

December 18, 2024 at 7:00 p.m.

Council Chamber

Metchosin Municipal Hall

Present: Garry Fletcher (Chair), Councillor Steve Gray (Council Liaison), Bill Cave, Anna Hall, Andy MacKinnon (Recorder)

Regrets: Merrilee Hoen, Ric Perron, Erin Van de Water

The meeting was called to order at 7:01 p.m.

1. Agenda, Additions and Approval

Moved and Seconded by Andy and Anna that the Committee approve the agenda.

Carried

2. Presentations:

None.

3. Public Participation

None.

4. Adoption of Minutes

Moved and Seconded by Garry and Bill that the Committee adopt the minutes of the Environmental Advisory Select Committee meeting held November 26, 2024.

Carried

5. Receipt of Minutes

None.

6. Business Arising from the Minutes

- a) Sensitive Environments in Metchosin – Fulfilling the Requirements of Section 2.3.9 of the *Metchosin Official Community Plan Bylaw, No. 258, 1995*
[*State of Biodiversity Report - FINAL District of Saanich.pdf*](#)

Garry has been making a spreadsheet with our map data (including UTM's) in it. There are approximately 120 records in the database. Garry will share the partially-completed spreadsheet with Andy, and Andy will check with the Conservation Data Centre that these are the data they require. Once that is all confirmed, Garry will share the spreadsheet with MEASC members, with a request that they complete data entry for incomplete records.

It was also considered important that we develop a mechanism to ‘peel off data’ from QEP reports from environmental assessments in Metchosin’s records.

7. Reports

a) Chair’s Verbal Report

Our Chair has received an invitation to meet with the Mayor, but there’s been no explanation about the reason for the meeting. It is believed that it may include a discussion about the Terms of Reference for MEASC. Garry will report back at our next MEASC meeting.

b) Council Liaison Verbal Report

Apparently MEASC has made 22 recommendations to Council in the last two years, and Council has adopted 18 of them. This is considered to be fairly productive for an Advisory Committee.

8. Correspondence

None.

9. Other Business

None.

10. Adjournment and Next Meeting

Moved and Seconded by Steve and Andy that the Committee adjourn the meeting at 7:50 p.m.

Carried

The next meeting will be held on Tuesday, January 28, 2025 at 7:00 p.m.

Invasive Himalayan Blackberry (HBB) - Capital Region Invasive Species Partnership

January 2025

Advice and the recommended approaches in use to manage this plant in the region.

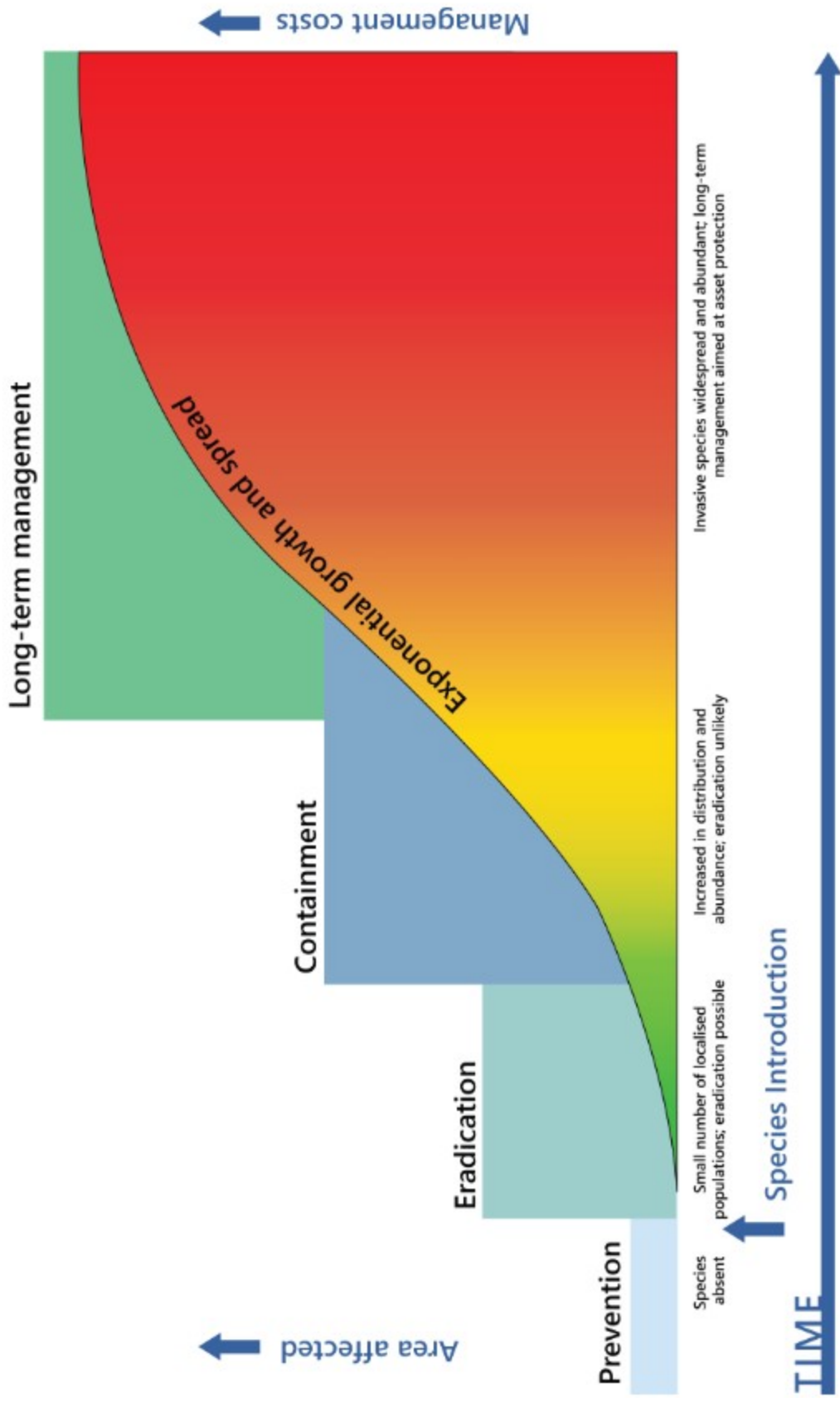
Invasive Curve: As with all invasives, the goal is to reduce harmful impacts based on capacity and on the stage of invasion the plant is in, in the area. See the invasion curve (attached) from the Invasive Species Council of Australia. invasives.org.au. HBB has long been established in our area and would be in the red area below. Management costs and efforts would be much higher for these species and chance of success much more limited, as the plants are wide spread across the whole region.

CRD Regional Priority List: The CRD maintains a regional priority invasive species list here: [2019-03-27 - SR - PEC - Invasive Species Program Update - Appendix D](#). HBB is in the control category, meaning that there are established infestations common and widespread throughout the capital region. With this comes the recommendation to focus on control in high value conservation areas such as parks, and ecosystems at risk. For control species such as HBB, we encourage partners to work with stewardship groups to help keep them in check.

Best Management Practices: There are two best management practices (BMP) for this species. One is from the Garry Oak Ecosystem Recovery Team (GOERT). I've included that here: [Microsoft Word - Best Practices for Blackberry revised.doc](#) You will see that herbicide use is only with extreme caution. There are many other methods that can work well. Metro Vancouver Regional District also has a BMP [himalayan-blackberry-best-practices-management.pdf](#)

The general rule in invasive species management is to contain the invasive species first and then reduce the amount. With HBB, it is extremely widespread and (like holly), birds will continue to move seeds about, so eradication is not the goal, rather minimizing harm in priority areas is.

Herbicides are always the last resort for invasive species management. Health Canada and the BC Integrated Pest Management Act govern their use [Pesticides and pest management - Province of British Columbia](#)





Status List for Priority Invasive Plants in the Capital Region

This priority invasive plant status list for the Capital Region (Vancouver Island) helps guide priorities in the region including reporting, education, invasive management and planning. Local jurisdictions of the Capital Region may have their own species status (within their jurisdiction), priorities and special concerns.




Prevent Species:



Scientific Name	Common Name	Special Concern
<i>Aegilops cylindrica</i>	Jointed Goatgrass	BC
<i>Ammophila breviligulata</i>	American beachgrass	
<i>Berteroa incana</i>	Hoary alyssum	
<i>Brachypodium sylvaticum</i>	Slender False Brome	
<i>Butomus umbellatus</i>	Flowering Rush	BC
<i>Centaurea militensis</i>	Maltese Starthistle	
<i>Centaurea solstitialis</i>	Yellow Starthistle	BC
<i>Euphorbia esula</i>	Leafy Spurge	
<i>Hydrilla verticillata</i>	Hydrilla	BC
<i>Lepidium draba</i>	Hoary Cress	
<i>Myriophyllum heterophyllum</i>	Two-Leaf Watermilfoil	
<i>Pastinaca sativa</i>	Wild Parsnip	
<i>Peuraria montana</i>	Kudzu	BC
<i>Potentilla recta</i>	Sulphur Cinquefoil	
<i>Rhaponiticum repens</i>	Russian Knapweed	
<i>Spartina densiflora</i>	Dense-flowered Cordgrass	BC
<i>Spartina patens</i>	Salt Meadowgrass	BC
<i>Spartina anglica</i>	English Cordgrass	BC
<i>Spartina alterniflora</i>	Smooth Cordgrass	BC

Group	Description	Name
P	Species not known to occur in the region, but likely to establish if introduced. Eradicate if found.	Prevent
E	Priority species known to occur in limited distribution and low density. Eradicate if found.	Eradicate
CN	Established infestations found in portions of the region. Contain existing infestations and prevent spread to un-infested areas.	Contain
CL	Established infestations common and widespread throughout the Capital Region. Focus control in high value conservation areas.	Control
	Human health hazard	Toxic
	Animal health hazard	Toxic




***BC**: species on the BC Prohibited List. All reports (and management) to be forwarded to the Province. BC Prohibited List: <https://www.for.gov.bc.ca/hra/invasive-species/prohibited.htm>



Eradicate Species:

Scientific Name	Common Name	Special Concern
<i>Alliaria petiolata</i>	Garlic Mustard	
<i>Anthriscus sylvestris</i>	Wild Chervil	
<i>Arundo donax</i>	Giant Reed	BC
<i>Centaurea diffusa</i>	Diffuse Knapweed	
<i>Centaurea nigra</i>	Black Knapweed	
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	Spotted Knapweed	
<i>Cytisus multifloris</i>	White-flowered broom	
<i>Echium vulgare</i>	Blueweed	
<i>Euphorbia cyparissias</i>	Cypress Spurge	
<i>Fallopia x bohemica</i>	Bohemian Knotweed	
<i>Fallopia japonica</i>	Japanese Knotweed	
<i>Fallopia sachalinensis</i>	Giant Knotweed	BC
<i>Geranium lucidum</i>	Shiny Geranium	
<i>Glyceria maxima</i>	Giant Mannagrass	
<i>Heracleum mantegazzianum</i>	Giant Hogweed	
<i>Hieracium aurantiacum</i>	Orange Hawkweed	
<i>Hieracium pilosella</i>	Mouse-ear Hawkweed	
<i>Impatiens glandulifera</i>	Policeman's Helmet	
<i>Linaria genistifolia</i> ssp. <i>dalmatica</i>	Dalmatian Toadflax	
<i>Linaria vulgaris</i>	Yellow Toadflax	
<i>Onopordum acanthium</i>	Scotch Thistle	
<i>Persicaria wallichii</i>	Himalayan Knotweed	
<i>Phragmites australis</i> ssp. <i>Australis</i>	Common Reed	
<i>Silybum marianum</i>	(Blessed) Milk Thistle	
<i>Spartium junceum</i>	Spanish Broom	







Group	Description	Name
P	Species not known to occur in the region, but likely to establish if introduced. Eradicate if found.	Prevent
E	Priority species known to occur in limited distribution and low density. Eradicate if found.	Eradicate
CN	Established infestations found in portions of the region. Contain existing infestations and prevent spread to un-infested areas.	Contain
CL	Established infestations common and widespread throughout the Capital Region. Focus control in high value conservation areas.	Control
	Human health hazard	Toxic
	Animal health hazard	Toxic



Contain Species:


Scientific Name	Common Name	Special Concern
<i>Ailanthus altissima</i>	Tree of Heaven	
<i>Ammophila arenaria</i>	European Beachgrass	
<i>Buddleja davidii</i>	Butterfly Bush	
<i>Iris pseudacorus</i>	Yellow Flag Iris	
<i>Lysimachia vulgaris</i>	Garden Yellow Loosestrife	
<i>Lythrum salicaria</i>	Purple Loosestrife	
<i>Myriophyllum aquaticum</i>	Parrotfeather	
<i>Myriophyllum spicatum</i>	Eurasian Watermilfoil	
<i>Ranunculus ficaria</i>	Lesser Celandine	 
<i>Salix alba 'Vitellina'</i>	Golden Willow	
<i>Tragopogon dubius</i>	Yellow Salsify	
<i>Ulex europaeus</i>	Gorse	

Group	Description	Name
P	Species not known to occur in the region, but likely to establish if introduced. Eradicate if found.	Prevent
E	Priority species known to occur in limited distribution and low density. Eradicate if found.	Eradicate
CN	Established infestations found in portions of the region. Contain existing infestations and prevent spread to un-infested areas.	Contain
CL	Established infestations common and widespread throughout the Capital Region. Focus control in high value conservation areas.	Control
	Human health hazard	Toxic
	Animal health hazard	Toxic

Control Species:

Scientific Name	Common Name	Special Concern
<i>Aegopodium podagraria</i>	Goutweed	
<i>Allium vineale</i>	Field Garlic	
<i>Anthriscus caucalis</i>	Burr Chervil	
<i>Centaurea cyanus</i>	Bachelors Buttons	
<i>Cirsium arvense</i>	Canada Thistle	
<i>Cirsium vulgare</i>	Bull Thistle	
<i>Clematis vitalba</i>	Traveler's Joy	
<i>Conium maculatum</i>	Poison Hemlock	 High Priority
<i>Cotoneaster</i> sp.	Cotoneaster	
<i>Crataegus monogyna</i>	Common Hawthorn	
<i>Cyclamen hederifolium</i>	Cyclamen	
<i>Cytisus scoparius</i>	Scotch Broom	
<i>Dactylis glomerata</i>	Orchard Grass	
<i>Daphne laureola</i>	Spurge Laurel	
<i>Dipsacus fullonum</i> ssp.	Fuller's Teasel	
<i>Foeniculum vulgare</i>	Sweet Fennel	
<i>Hedera helix</i>	English Ivy	 mild
<i>Hyacinthoides hispanica</i>	Spanish Bluebell	
<i>Hyacinthoides non-scripta</i>	English Bluebell	
<i>Hypericum calycinum</i>	St. John's Wort	
<i>Hypericum perforatum</i>	Common St. John's Wort	
<i>Ilex aquifolium</i>	English Holly	
<i>Lamium galeobdolon</i>	Yellow Archangel	
<i>Leucanthemum vulgare</i>	Oxeye Daisy	
<i>Ligustrum vulgare</i>	European Privet	
<i>Tripleurospermum inodorum</i>	Scentless Mayweed	
<i>Phalaris arundinacea</i>	Reed Canary Grass	
<i>Prunus laurocerasus</i>	Cherry-Laurel	 mild
<i>Prunus lusitanica</i>	Portugal Laurel	

Group	Description	Name
P	Species not known to occur in the region, but likely to establish if introduced. Eradicate if found.	P revent
E	Priority species known to occur in limited distribution and low density. Eradicate if found.	E radicate
CN	Established infestations found in portions of the region. Contain existing infestations and prevent spread to un-infested areas.	C ontain
CL	Established infestations common and widespread throughout the Capital Region. Focus control in high value conservation areas.	C ontrol
	Human health hazard	Toxic
	Animal health hazard	Toxic

<i>Rubus armeniacus</i>	Himalayan Blackberry	
<i>Rubus laciniatus</i>	Cutleaf Evergreen Blackberry	
<i>Senecio jacobaea</i>	Tansy Ragwort	
<i>Soliva sessilis</i>	Carpet Burweed	
<i>Tanacetum vulgare</i>	Common Tansy	
<i>Typha angustifolia</i>	Lesser Cattail	
<i>Typha angustifolia x glauca</i>	Cattail hybrid	
<i>Tragopogon porrifolius</i>	Purple Salsify	
<i>Ulmus glabra</i>	Wych or Scots Elm	
<i>Ulmus parvifolia</i>	Chinese Elm	
<i>Vinca major</i>	Large Periwinkle	
<i>Vinca minor</i>	Common Periwinkle	



Rubus bifrons

BEST MANAGEMENT PRACTICES FOR
Himalayan Blackberry
in the Metro Vancouver Region



metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION



Disclaimer

This publication is not intended to endorse or recommend any particular product material or service provider, nor is it intended as a substitute for engineering, legal, or other professional advice. Such advice should be sought from qualified professionals.

While the information in this publication is believed to be accurate, this publication and all of the information contained in it are provided “as is” without warranty of any kind, whether express or implied. All implied warranties, including, without limitation, implied warranties of merchantability and fitness for a particular purpose, are expressly disclaimed by Metro Vancouver. The material provided in this publication is intended for educational and informational purposes only.

Copyright to this publication is owned by the Metro Vancouver Regional District (“Metro Vancouver”).

Permission to reproduce this publication, or any substantial part of it, is granted only for personal, non-commercial, educational and informational purposes, provided that the publication is not modified or altered and provided that this copyright notice and disclaimer is included in any such production or reproduction.

Otherwise, no part of this publication may be reproduced except in accordance with the provisions of the *Copyright Act*, as amended or replaced from time to time.

Created by: Metro Vancouver and the Invasive Species Council of Metro Vancouver

In partnership with: The Invasive Species Council of British Columbia
Diamond Head Consulting



Requested by: Metro Vancouver’s Regional Planning Advisory Committee –
Invasive Species Subcommittee

4730 Kingsway, Burnaby, BC, V5H 0C6

metrovancover.org

August 2021

Contents

Introduction	4
REGULATORY STATUS	4
IMPACTS	5
REPRODUCTION AND SPREAD	5
HABITAT AND DISTRIBUTION	6
CLIMATE ADAPTATION	6
Identification	7
SIMILAR SPECIES	8
Tracking	9
Reporting	9
Prevention and Control Strategies	10
PREVENTION: IMPERATIVE	10
MANUAL/MECHANICAL: RECOMMENDED	10
CHEMICAL: RECOMMENDED	12
CULTURAL: PARTIALLY RECOMMENDED	16
BIOLOGICAL: NOT AVAILABLE	17
CONTROL SUMMARY	18
Disposal	19
OFF SITE DISPOSAL	19
ON SITE DISPOSAL	19
CLEANING AND DISINFECTION	20
Follow-up Monitoring	20
Restoration	21
References	22
Additional Resources	24
Acknowledgments	24



Introduction

The impacts of invasive species on ecological, human, and economic health are of concern in the Metro Vancouver region. Successful control of invasive species requires concerted and targeted efforts by many players. This document - **“Best Management Practices for Himalayan Blackberry in the Metro Vancouver Region”** - is one of a series of species-specific guides developed for use by practitioners (e.g., local government staff, crews, project managers, contractors, consultants, developers, stewardship groups, and others who have a role in invasive species management) in the region. Together, these best practices provide a compendium of guidance that has been tested locally by many researchers and operational experts.

Himalayan blackberry¹ was first introduced in British Columbia in the nineteenth century as a berry crop, but has more recently been recognized as an invasive species. Academic institutions, government, and non-government organizations continue to study this species in British

Columbia. As researchers and practitioners learn more about the biology and control of Himalayan blackberry, it is anticipated that the recommended best management practices will change over time and this document will be updated. Please check metrovancover.org often to ensure you have the most recent version of these best management practices.

REGULATORY STATUS

Section 2 (1) (b) (iii) of the [Community Charter, Spheres of Concurrent Jurisdiction – Environment and Wildlife Regulation](#), states that “municipalities may regulate, prohibit and impose requirements in relation to control and eradication of alien invasive species”, which includes Himalayan blackberry.

1 Nomenclature of this species is complicated and genetic analysis of Canadian samples is likely required for taxonomists to agree on a scientific name (Gaire et al 2015). The scientific name *Rubus bifrons* is supported by Flora North America and other sources; this species is also known as *R. armeniicus* and was previously known as *R. discolor*, *R. fruticosus* and *R. procerus* (Gaire et al 2015).

IMPACTS

Himalayan blackberry forms thick, impenetrable thickets of live and dead canes, which degrade the quality of riparian habitats as well as forest edges, transportation and utility corridors, and fence lines. It can obstruct roads, walkways and signage, making it difficult to access or inspect structures or other assets. Dense blackberry patches can prevent the establishment of native vegetation, limit the movement of people and large animals, and obstruct sight lines (ISCBC 2014). Contact with Himalayan blackberry thorns can also cause skin irritation, scratches and small wounds.

Although blackberry shrubs offer limited food, nesting sites, and wildlife cover, it is poorer quality habitat than native shrub species and results in decreased biodiversity (Bennett 2007). When Himalayan blackberry is the dominant understorey shrub in a forested setting in Metro Vancouver, it is often associated with a statistically significant reduction in bird species richness and evenness (Astley 2010). Typically, more bird species are noted in habitats with greater diversity of native vegetation (Astley 2010).

Though Himalayan blackberry provides nectar and pollen for bees, the bloom period does not overlap with the foraging periods of all pollinators. Restored areas in Metro Vancouver Regional Parks had 26% more pollinator species, and pollinators were 30% more abundant, compared to non-restored areas mostly dominated by Himalayan blackberry (Wray 2015).

When Himalayan blackberry out competes native vegetation in riparian areas, flooding and erosion potential often increases because of the lack of deep-rooted native shrubs. Himalayan blackberry cannot provide the necessary shade for stream water, or contribute large woody debris compared to stream sides with diverse native vegetation (Bennett 2007).

All levels of government, non-profit organizations and private property owners spend significant resources managing Himalayan blackberry in the Metro Vancouver region every year. In 2016, local/provincial governments and several right-of-way partners on Metro Vancouver's Regional Planning

Advisory Committee - Invasive Species Subcommittee spent nearly \$350,000 on Himalayan blackberry control efforts. This figure does not include control costs for private landowners across the region, volunteer 'weed pull' hours, or costs associated with education and awareness activities.

REPRODUCTION AND SPREAD

Himalayan blackberry is primarily a biennial plant that reproduces both vegetatively and sexually. It propagates via root pieces and forms daughter plants where the tips of first year canes touch the ground. Shoots can arise from underground runners that persist up to a meter deep and over 10 meters long (Soll 2004). Blackberry flowers are pollinated primarily by bumblebees and honey bees. The flowers can be self-pollinated, but cross pollination increases fruit set (LEPS, Graham and Clements n.d.). Typical thickets of blackberries can produce 7,000 to 13,000 seeds/m² that remain viable in the soil for several years (ISCBC 2014). Fruiting stems generally die back at the end of the season, but non-fruited stems may persist for several years before producing fruit (ISCBC 2014).

Although Himalayan blackberry allocates more resources directly to flowers and fruit than the native trailing blackberry (*Rubus ursinus*), the invasive blackberry has significantly lower reproductive effort (i.e., fewer resources diverted from vegetative activity to reproduction) (McDowell and Turner 2002). This likely contributes to its success in the Pacific Northwest, as it minimizes the trade-offs often inherent in reproduction (McDowell and Turner 2002).

Since blackberry reproduction can happen both vegetatively and sexually, dispersal also can take place through both methods. It reproduces primarily through the movement of stem and root fragments and berries, which are consumed by birds and omnivorous mammals, such as foxes, bears, and coyotes, thereby moving seeds (ISCBC 2014). Humans also contribute to the spread by purposefully planting or maintaining canes for their fruit (ISCBC 2014), and unintentionally moving seed or infested substrates during roadside mowing, landscaping or other activities.

HABITAT AND DISTRIBUTION

Himalayan blackberry can grow on a variety of barren, infertile soil types, and a range of soil pH and textures, but prefers rich, well-drained soils (ISCBC 2014) with higher concentrations of sand, and less silt and clay (Caplan and Yeakley 2006). It is tolerant of periodic flooding by brackish or fresh water (ISCBC 2014), and is able to withstand soils with low water content and low nutrient availability with only a small reduction in growth (Caplan and Yeakley 2006).

Himalayan blackberry stand height is correlated to canopy cover; the higher the concentration of light, the higher the concentration of blackberry plants (Caplan and Yeakley 2006). It can, however, survive in varied light conditions (ISCBC 2014). Shade has been found to be the primary environmental deterrent of blackberry occurrence and growth (Caplan and Yeakley 2006). As such, it is widely naturalized, often found on disturbed sites and streamside areas (Pojar and MacKinnon 2004) at low elevations under 700 metres (UBC 2017) with lots of sun exposure. This includes areas such as: transportation and utility corridors, parks, trail sides, backyards, abandoned properties, pastures, riparian areas, freshwater wetlands, forest edges, and wooden ravines (ISCBC 2014).

Within British Columbia, Himalayan blackberry is currently found in the Lower Mainland, Sunshine Coast, Fraser Valley, Gulf Islands, central to southern Vancouver Island, Queen Charlotte Islands, the Okanagan, and the West Kootenay areas (ISCBC 2014). It is one of the most widespread invasive plants in Metro Vancouver and is common in many habitats throughout the region.

CLIMATE ADAPTATION

Climate modellers predict that the Metro Vancouver region will experience warmer temperatures; a decrease in snowpack; longer dry spells in summer months; more precipitation in autumn, winter and spring; more intense extreme events; and an extended growing season. In the past, our region had an average of 252 days in the growing season. In lower elevations 45 days will be added to the growing season by the 2050s, and 56 days by the 2080s, resulting in nearly a year-round growing season of 357 days on average. In higher elevation ecosystems the growing season length will increase by 50% to 325 days by the 2080s (Metro Vancouver 2016). These changes will stress many sensitive ecosystems, increasing their vulnerability to invasive species.

Himalayan blackberry may be able to adapt to our future climate in several ways:

- **Warmer temperatures:** An increase in carbon dioxide associated with higher temperatures may favor Himalayan blackberry regeneration and spread over native plants which are less efficient in acquiring carbon and other nutrients (USDA 2020).
- **Longer summer drought periods:** Himalayan blackberry growth is highly correlated with sun exposure (Caplan and Yeakley 2006) and presumably more access to sun, for longer periods, may encourage its growth.
- **Increased precipitation and flooding:** Himalayan blackberry is tolerant to flooding (ISCBC 2014).

Based on climate change models, the Center for Invasive Species and Ecosystem Health predicts that Himalayan blackberry will expand in the United States (USDA, 2020). Himalayan blackberry can thrive in a variety of habitats and is already very widespread in the region. With these kinds of competitive advantages, this species is more adaptable than native species in a variety of ecosystems and suggest that it will be able to withstand, and possibly thrive, with changing climate conditions.

Identification

The following identification information was collated from the Invasive Species Council of BC (2014), Plants of Coastal British Columbia (2004) and [E-Flora](#) (2017).

Life cycle: Perennial, thicket-forming shrub, erect to trailing along the ground.

Stems: Stems range from erect to sprawling. Stout stems are erect, then arch and trail along the ground up to 10-12 m long, and up to 3 m high (even higher if aided by trees or other structures). It has robust, stiff, 4 to 5 angled stems (canes) that support large, flattened, and hooked or straight prickles. These prickles or barbs will point back to the root end, helping to distinguish the root from the tip. First year canes produce leaves only and can root at the tips, producing daughter plants.

Second year canes grow from the axils of first year canes and produce flowers and fruits. Canes have been known to grow up to 7 m in a single season (LEPS, Graham and Clements n.d.). Stems vary from pale green (young) to red to brown (old).

Leaves: Leaves are alternate, and mostly evergreen, 12-25 cm wide. They have predominantly large, oval or oblong, toothed leaflets that radiate from the end of the leaf stem that are a smooth green on top, with white hairs below. Leaflets are generally grouped in fives on first-year canes and threes on flowering (second-year) canes.

Flowers: Small (2-3 cm diameter), white to light pink, stalked, 5-petalled, arranged in clusters of 5-20, blooms from April to August, flower stalks are woolly and prickly, many stamens.

Fruits: Fruits (drupelets) are usually 1-1.5 cm long, and up to 2 cm in diameter. The blackberries are oblong to spherical, black and shiny, hairless, and edible. They form on second year canes and ripen from mid-summer to fall.

Each berry produces numerous seeds that have a hard, impermeable coat. Seeds remain viable for a period of several years; however the specific length of viability has not been documented.

The following photos show blackberry plant parts.



Leaf (with 5 leaflets), stem and thorns
CREDIT: ISCMV



Flowers
CREDIT: ISCMV



Fruit
CREDIT: D. HANNA

SIMILAR SPECIES

Several similar berry species can grow in similar habitats as Himalayan blackberry and it is not uncommon to see more than one blackberry species growing at sites in British Columbia. However, Himalayan blackberry is typically the most dominant species, especially in disturbed areas.

Species present in British Columbia that could be confused with Himalayan blackberry include:

NATIVE SPECIES

- Trailing blackberry (*Rubus ursinus*) is a smaller and far less robust plant than Himalayan blackberry with deciduous leaves in groups of three (not five) and smaller stems (0.5 cm diameter) with a white waxy stem coating (sometimes appearing bluish) that tend to hug the ground. Blooming April to August, it has large white flowers in flat-topped clusters that stand more upright than the vines.
- Black raspberry (*Rubus leucodermis*) has smaller stems and small, black or purple-colored hairy berries that are hollow in the center like raspberries, while blackberries are shiny and the berry's core detaches when picked.
- Salmonberry (*Rubus spectabilis*) has smaller, upright, zigzagged stems, smaller prickles, red-pink flowers (not white), and dark reddish to yellowish (not black) edible berries.



Trailing blackberry

CREDIT: ISCMV



Black raspberry



Salmonberry

CREDIT: ISCMV

NON-NATIVE SPECIES

- Cut-leaf or evergreen blackberry (*Rubus laciniatus*) is primarily differentiated from Himalayan blackberry by leaf characteristics. Evergreen blackberry has more deeply incised and jaggedly toothed leaflets, and is greenish on the under surface (rather than whitish). *R. laciniatus* canes are usually thinner and less robust than *R. armeniacus*. In Metro Vancouver, *R. laciniatus* is far less common than *R. armeniacus*. However, it is also considered invasive with similar impacts, and can be controlled using the same methods.



Cut-leaf blackberry

CREDIT: ISCMV

Tracking

The provincial government maintains the [Invasive Alien Plant Program \(IAPP\) application](#) (BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development 2017), which houses information pertaining to invasive plant surveys, treatments, and monitoring. Many agencies, including local governments, have their own internal invasive species inventory and mapping protocols that are used by staff, contractors and, in some cases, the public. For example, the City of North Vancouver has its own system called AlienMap. Agencies in British Columbia that do not enter data into IAPP are encouraged to check it regularly because it contains public reports and data from other agencies and it is important to consider as much data as

possible when making management decisions. The Map Display module of IAPP is publicly accessible.

When conducting a Himalayan blackberry inventory, the following information should be recorded as it will later help inform treatment plans:

- Size and density of infestation;
- Location in relation to the high water mark of water courses; and
- Location in relation to other water sources, such as wells.

Reporting

Since Himalayan blackberry is widespread throughout the Metro Vancouver region and does not pose an imminent health or safety risk, there is generally little value in reporting individual occurrences.

Prevention and Control Strategies

Effective invasive plant management may include a variety of control techniques ranging from prevention, chemical, manual, mechanical, biological and/or cultural methods. Each method is described below in order of effectiveness.

Himalayan blackberry can be effectively controlled through both manual/mechanical and chemical treatment techniques. The technique used is dependent on the age and size of the infestation, and site characteristics. Chemical treatment is most effective and efficient; however it is not necessarily suited to all sites. Manual/mechanical treatment can also be effective, but will generally be more time consuming and may promote seedling germination through soil disturbance. Follow-up monitoring and treatment will be required for several years regardless of the treatment technique.

Wear gloves, eye protection, long pants, long sleeves and sturdy footwear to avoid injuries from thorns when working around Himalayan blackberry.

STRATEGY COLOUR LEGEND
GREEN: RECOMMENDED
ORANGE: CAUTION
RED: NOT RECOMMENDED OR NOT AVAILABLE

PREVENTION: IMPERATIVE

Prevention is the most economical and effective way to reduce the spread of Himalayan blackberry over the long term.

When working in or adjacent to Himalayan blackberry, inspect and remove plants, plant parts, and seeds from personal gear, clothing, pets, vehicles, and equipment and ensure soil, gravel, and other fill materials are not contaminated with blackberry plant parts before leaving the infested area.

Do not purchase, trade, or grow Himalayan blackberry. Instead, grow regional native plants that are naturally adapted to the local environment and non-invasive. Consult the Invasive Species Council of BC's [Grow Me Instead Program](#) or [Metro Vancouver's Grow Green website](#) for non-invasive and drought-tolerant plants, and garden design ideas. It is also important to maintain or establish healthy plant communities that are resistant to invasion by invasive plants.

MANUAL/MECHANICAL: RECOMMENDED

The success of manual/mechanical methods is contingent on removal of all plant parts: canes, roots and root crowns to prevent re-sprouting (DiTomaso et al. 2013). The following manual/mechanical methods can be used to control Himalayan blackberry:

- **Hand Pulling:** Small seedlings or young plants can be hand pulled to uproot the root crown. This method works best after rain or when soils are soft, and with shade suppressed canes in forest understories. Pulling should be done as soon as canes are large enough to grasp but have not produced seed (Soll 2004).
- **Digging/Grubbing:** Dig up root crowns and lateral roots. Work must be as thorough as possible because any remaining root fragments may sprout a new plant (Soll 2004). Claw mattocks or pulaskis are effective (King County 2014).
- **Cutting*:** Manually cutting the above ground growth using any number of hand tools (e.g., brush cutter, loppers, machete, etc.) is not an effective control method on its own unless it is repeated multiple times over multiple years to exhaust the plants stored reserves. However, cutting prior to digging/grubbing is critical in thickets to enable access to the roots and root crowns. If roots are being removed after cutting, cut the canes at 30 cm in height so roots can be easily located.

- **Mowing*:** Mowing can be very effective, but can also harm desirable species (ISCBC 2014). If roots are not manually removed, mowing several times per year, particularly during the flowering period, over several years is necessary to exhaust root reserves (DiTomaso et al. 2013). Do not mow where soil is highly susceptible to compaction or erosion, where soil is very wet or on steep slopes (Soll 2004). If follow-up treatment is not undertaken, plants will regrow in greater density (Soll 2004). If roots are being removed after mowing, allow stems to regrow to 30 cm in height so roots can be easily located.
- **Tilling*:** Repeated tillage (cultivation) in combination with mowing will stimulate regrowth. However, this strategy can be very effective when followed-up with spot application of herbicide or hand-digging to remove roots (ISCBC 2014). Tilling causes significant soil disturbance and is therefore unsuitable in riparian areas (DiTomaso et al. 2013). During tillage care should be taken to ensure that root pieces/crowns are not spread or dragged beyond the infested area as they could re-sprout. These parts should be collected by hand for disposal.
- **Vegetation Release:** Natural regeneration of other desirable plants can often be encouraged through persistent control of blackberry. Cutting back blackberry two or more times per year can encourage growth of existing native plants, create layering and sprouting of species such as willow and black cottonwood, and stimulate germination or rapid early growth of native species from seed (Bennett 2007). This method works best where there is already scattered existing native vegetation, not where blackberry is a monoculture.

* Methods that rely solely on repeated cutting or mowing may reduce blackberry cover in the long run; however this result is difficult to achieve in most cases. Less intensive treatments of one or two mowings or cuttings a year are likely to fail (Bennett 2007).

If volunteers will be removing large berms of blackberry plants, it is recommended to pre-cut stems (or flail mow berm and let regrow to 30 cm). Volunteers can then dig out the root crowns more easily.

Note that manual/mechanical application methods can also be used in combination with the chemical control methods outlined below.

MANUAL/MECHANICAL CONTROL TIMING

It is best to delay removal if the blackberry patch is used as a nesting site for native passerine birds; removal should take place after the nesting season, from September to mid-March (Garry Oak Ecosystem Recovery Team 2002). Thickets can be flail mowed during the winter or early spring, allowed to regrow to 30 cm and then the root crowns can be removed. If canes can only be removed once in a season, the best time for manual or mechanical control is when the plant starts to flower, since much of the root reserves have gone into flowering (Whatcom County Noxious Weed Control Board n.d.).

Although invasive species can be problematic, removal efforts should consider the availability of all floral resources in an area (Elle 2012). If there is little other vegetation nearby for the birds and other pollinators, consider removing only one quarter of the blackberry infestation each year (King County 2014) and establishing a pollinator-friendly native plant community. Slow removal of invasive species and establishing plants that bloom throughout the growing season, may be essential to ensure pollinators have a food supply throughout their life cycle.

APPLYING MANUAL/MECHANICAL CONTROL METHODS IN RIPARIAN AREAS

Himalayan blackberry often grows along water courses. Consider the impact of control techniques and the resulting bare soil on the adjacent aquatic environment. Schedule removal works during a period of least risk to fish species, outside of the [fish window](#). Adhere to Provincial and Federal riparian regulations. It is recommended to consult with a qualified environmental professional when working around water bodies.

CHEMICAL: RECOMMENDED

When alternative methods to prevent or control invasive plants are unsuccessful, professionals often turn to herbicides. With the exception of substances listed on Schedule 2 of the [BC Integrated Pest Management Regulation](#), the use of herbicides is highly regulated in British Columbia. Site characteristics must be considered with herbicide prescribed, based on site goals and objectives and in accordance with legal requirements. [This summary of BC's Integrated Pest Management Act](#) provides an overview of the provincial legislation.

Chemical control can be an effective and relatively inexpensive method to treat blackberry; however, this method should be used with caution for three reasons (Soll 2004):

1. Blackberry often grows in riparian areas where pesticide use is restricted
2. Some herbicides promote vegetative growth from lateral roots
3. When used incorrectly, herbicide will only top-kill blackberry

PESTICIDE LICENCE AND CERTIFICATION

A valid pesticide licence is required to:

- offer a service to apply most pesticides;
- apply most pesticides on public land including local government lands²; and
- apply pesticides to landscaped areas on private land, including outside office buildings and other facilities.

Pesticides (e.g., herbicides, insecticides, fungicides) are regulated by the federal and provincial government, and municipal governments often have pesticide bylaws.

- Health Canada evaluates and approves chemical pest control products as per the [Pest Control Products Act](#).
- The [BC Integrated Pest Management Act](#) sets out the requirements for the use and sale of pesticides in British Columbia. This Act is administered by the Ministry of Environment and Climate Change Strategy.
- Several municipalities have adopted bylaws which prohibit the use of certain pesticides.

Everyone who uses pesticides must be familiar with all relevant laws.

² on up to 50 ha/year by a single organization. Organizations looking to treat over 50 hectares of land per year are also required to submit a Pest Management Plan and obtain a Pesticide Use Notice confirmation.

ONLY companies or practitioners with a valid Pesticide Licence and staff who are certified applicators (or trained assistant applicators working under a certified applicator) may apply herbicide on invasive plants located on public lands in British Columbia. Applicators must be either the land manager/owner or have permission from the land manager/owner prior to herbicide application.

On private property the owner may obtain a Residential Applicators Certificate (for Domestic class products only) or use a qualified company. Residents do not require a Residential Applicator Certificate for certain uses of domestic class glyphosate including treatment of plants that are poisonous for people to touch, invasive plants and noxious weeds listed in legislation, and weeds growing through cracks in hard surfaces such as asphalt or concrete. Refer to the 'Pesticides & Pest Management' and 'Home Pesticide Use' webpages listed in the Additional Resources Section for more information.

Questions? Contact the BC Integrated Pest Management Program:

Telephone: (250) 387-9537

Email: bc.ipm@gov.bc.ca

Pesticide applicator certificates can be obtained under the category 'Industrial Vegetation Management' to manage weeds on industrial land, roads, power lines, railways, and pipeline rights-of-way for control of noxious weeds on private or public land. Assistant applicator training is also available and the [online course and exam](#) are free.

It is best practice for personnel supervising or monitoring pesticide contracts to also maintain a pesticide applicator licence so they are familiar with certification requirements.

For more information on how to obtain a licence and the requirements when working under the provincial [Integrated Pest Management Act and Regulation](#), please review the Noxious Weed & Vegetation Management section on this webpage: gov.bc.ca/PestManagement.

HERBICIDE LABELS

Individual herbicide labels must always be reviewed thoroughly prior to use to ensure precautions, application rates, and all use directions, specific site and application directions are strictly followed. Under the federal *Pest Control Products Act* and the BC Integrated Pest Management Regulation, **persons are legally required to use pesticides (including herbicides) only for the use described on the label and in accordance with the instructions on that label.** Failure to follow label directions could cause damage to the environment, poor control results, or danger to health. Contravention of laws and regulations may lead to cancellation or suspension of a licence or certification, requirement to obtain a qualified monitor to assess work, additional reporting requirements, a stop work order, or prohibition from acquiring authorization in the future. A conviction of an offence under legislation may also carry a fine or imprisonment.

Herbicide labels include information on both the front and back. The front typically includes trade or product name, formulation, class, purpose, registration number, and precautionary symbols. Instructions on how to use the pesticide and what to do in order to protect the health and safety of both the applicator and public are provided on the back (BC Ministry of Environment 2011).

Labels are also available from the Pest Management Regulatory Agency's [online pesticide label search](#) or [mobile application](#) as a separate document. These label documents may include booklets or material safety data sheets (MSDS) that provide additional information about a pesticide product. Restrictions on site conditions, soil types, and proximity to water may be listed. If the herbicide label is more restrictive than provincial legislation, the label must be followed.

HERBICIDE OPTIONS

The following herbicides can be used on Himalayan blackberry:

ACTIVE INGREDIENT (EXAMPLE BRAND NAMES) ⁺	APPLICATION	PERSISTENCE	GROWTH STAGE	TYPE ++	COMMENT
Glyphosate (many products)	foliar application	non-residual	September to October; ineffective when applied earlier	non-selective	can impact trees with roots within or adjacent to the treatment area; sometimes combined with triclopyr for improved efficacy
Imazapyr (e.g. Arsenal™)	foliar application	residual	post-emergence, actively growing**	non-selective	
Triclopyr (e.g. Garlon™)	foliar application or basal bark spray	residual	foliar application: mid- summer and early fall after flowering and start of fruit set; basal bark spray: applied any time of year	selective, no effect on grasses	
2,4-D mixed with triclopyr*	foliar application	residual	actively growing	selective, no effect on most grasses	2,4-D products not currently permitted on BC Ministry of Transportation and Infrastructure jurisdiction
Metsulfuron (e.g. Escort™*)	foliar application	residual	fully leaved- out; before fall discoloration	selective, no effect on grasses	may affect shrub species

* Blackberry is not specifically listed on the 2,4-D or Escort™ labels; however they can be used under the general application provision for woody species.

** Active growth occurs in the spring and fall (i.e., not during cold months and not during summer bloom/fruitletting periods).

+ The mention of a specific product or brand name of pesticide in this document is not, and should not be construed as an endorsement or recommendation for the use of that product.

++ Herbicides that control all vegetation are non-selective, while those that control certain types of vegetation (e.g. only grasses or only broadleaf plants) are termed selective.

Picloram is sometimes used to treat blackberry, but it is not recommended for use in coastal areas or the Lower Fraser Valley west of Hope because it is very persistent (4 to 7 years) and mobile in high water tables or regions with high rainfall.

Note that keeping the herbicide application rate low for control of deep-rooted perennials is generally better so the above ground plant tissue does not die before herbicide is translocated into the roots (Soll 2004).

APPLYING PESTICIDE IN RIPARIAN AREAS

Provincial legislation prohibits the use of herbicides within 10 metres of natural water courses and 30 metres of domestic or agricultural water sources on public lands. On private lands herbicide labels must be followed (which means for glyphosate products treatment can happen up to the water's edge), and additional restrictions may apply for some private lands (e.g., industrial sites, forestry sites, golf courses, etc.). On public lands, glyphosate is the only active ingredient that can be applied within the 10 metre Pesticide-Free Zone (PFZ)² in British Columbia in accordance with the BC *Integrated Pest Management Act* and Regulation and all public land Pesticide Management Plans (PMPs). A plant must be either a listed Noxious Weed (under the BC [Weed Control Act](#)) or appear in the *Forest and Range Practices Act Invasive Plants Regulation* to be treated within the 10 metre PFZ. **Himalayan blackberry is not listed and therefore glyphosate and other herbicides can only be applied on blackberry up to 10 metres away from the high water mark (HWM)³.** The 30 metre no-treatment zone around a water supply intake or well used for domestic or agricultural purposes may be reduced if the licensee or PMP holder is "reasonably satisfied" that a smaller no-treatment zone is sufficient to ensure that pesticide from the use will not enter the intake or well.

When managing Himalayan blackberry with herbicide in riparian areas:

- Observe and mark all PFZs while on site.
- The HWM should be determined by careful evaluation by the applicator.
- Distances in PFZs should be measured as horizontal distance.
- Herbicides restricted in a PFZ must not enter these zones by leaching (lateral mobility) through soil or by drift of spray mist or droplets.
- Treatments should be conducted when water levels are low (e.g. summer months) to reduce risk.
- Note that efficacy may be dependent on site conditions, including moisture in the soil.

3 The Pesticide-Free Zone (PFZ) is an area of land that must not be treated with pesticide and must be protected from pesticide moving into it, under the *Integrated Pest Management Act* and Regulation.

4 The High Water Mark (HWM) is defined as the visible high water mark of any lake, stream, wetland or other body of water where the presence and action of the water are so common and usual and so long continued in all ordinary years as to mark upon the soil of the bed of the lake, river stream, or other body of water a character distinct from that of the banks, both in vegetation and in the nature of the soil itself. Typical features may include, a natural line or "mark" impressed on the bank or shore, indicated by erosion, shelving, changes in soil characteristics, destruction of terrestrial vegetation, or other distinctive physical characteristics. The area below the high water mark includes the active floodplain (BC Ministry of Environment and Climate Change Strategy 2018).

APPLICATION METHODS

The preferred application methods to minimize non-target damage and applicator exposure are as follows:

- **Foliar application** uses a backpack or handheld sprayer to completely cover the actively growing plant parts with herbicide, including suckers growing away from the main bush (Soll 2004).
- **Basal bark spray** involves high concentrations of herbicide in oil, applied to the basal portion of stem using backpack sprayers. This method effectively kills roots, particularly in the fall (Soll 2004).
- **Cut stump** involves cutting the stems near the ground followed by painting the cut portion of the stem with herbicide (Soll 2004). Painting must occur within 10 minutes of the cut to ensure effectiveness (San Juan County Noxious Weed Control Program 2014). This method is likely best applied in the late summer or fall, although more research is needed to confirm optimal timing.

Note these application methods can also be used in combination with manual/mechanical methods outlined above. For example, regrowth of patches that were cut/mowed can be spot sprayed. One challenge with only using herbicide treatment of blackberry is that the roots are still present in the soil. If restoration activities are planned for the site, the dead canes and root crowns may require manual removal prior to planting.

TREATMENT TIMING

Generally, herbicides should be applied when blackberry is in full leaf; results are poor when plants are sprayed prior to this stage (Soll 2004). Blackberry is best sprayed in late summer or fall, particularly if glyphosate is used. Drought or dry conditions will significantly reduce efficacy (Soll 2004). In areas where people pick berries, timing should be carefully considered to avoid contamination of the fruit. If treatment is necessary between March and September, nesting activity searches should also be conducted and mitigation measures should be implemented.

CULTURAL: PARTIALLY RECOMMENDED

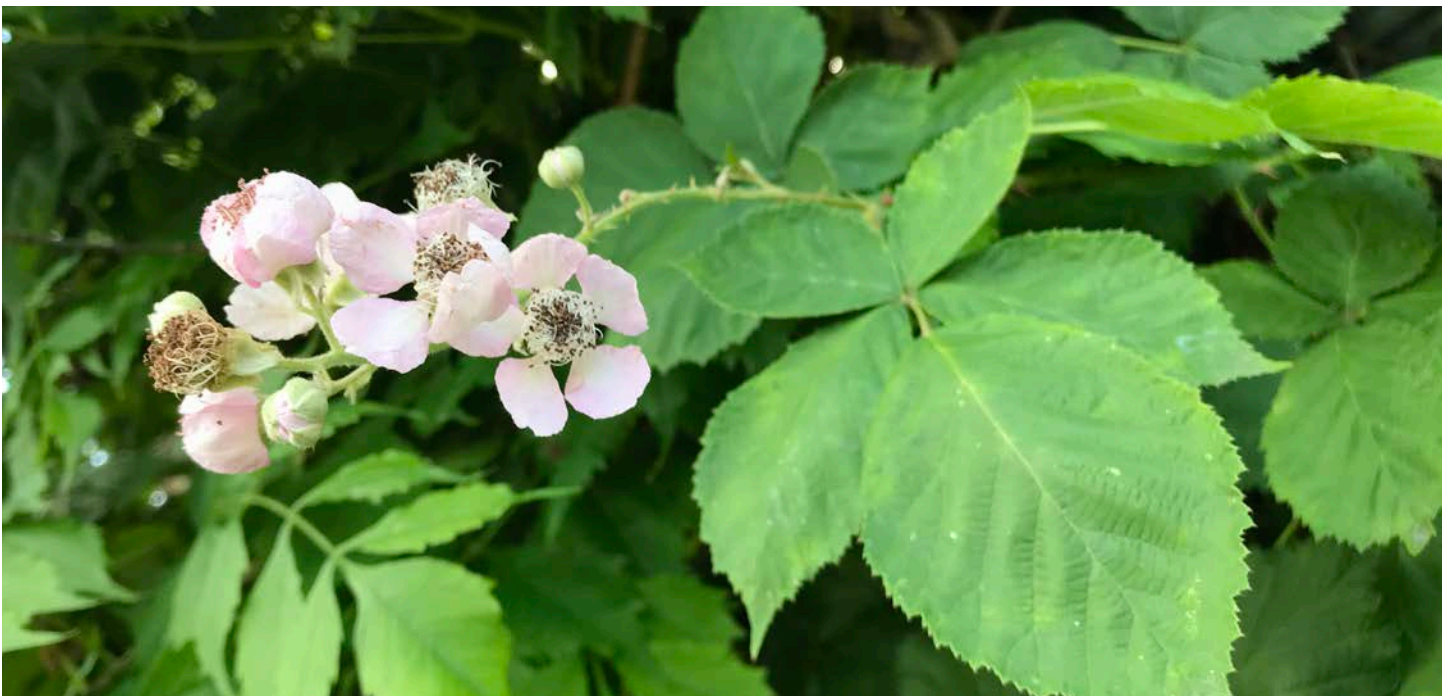
- Growing a **closed canopy with deep shade** can be used to suppress Himalayan blackberry. The plants will need to be continually removed or cut back around seedlings or planted trees until they grow to a height well above the blackberry. The utility of this method is restricted to sites where a tree canopy is desired and/or appropriate. In practice, many blackberry patches in Metro Vancouver grow along narrow natural area corridors where the edges will always receive adequate light no matter how closed the tree canopy may be.
- **Targeted grazing** will not be effective on its own, but may be used as a complementary method as part of a larger integrated pest management plan to suppress blackberry spread and/or regrowth (Miller, Tarasoff & Salmon, 2021). Goats and pigs prefer young canes (1-4 years old); on mature stands they tend to only eat the leaves (King County 2014). Grazing by horses, cattle and sheep dramatically reduces the number of daughter plants (i.e., new plants produced by tip rooting) (Soll 2004). Grazing must be continuous for 3-5 years to prevent re-growth, and complete eradication is unlikely (Miller, Tarasoff & Salmon, 2021).

Grazing opportunities are limited in urban areas due to municipal bylaws regulating animals, the need for specially trained herds, and damage animals may cause in sensitive ecosystems (e.g. off-target grazing, erosion). Grazing will be indiscriminate and therefore may result in the loss of desirable species (DiTomaso et al. 2013). This method is best suited for large, continuous patches with little other desired vegetation, not sensitive or riparian sites. Many Himalayan blackberry sites in the Metro Vancouver region would not be good candidates for targeted grazing.

BIOLOGICAL: NOT AVAILABLE

No biological control agents have been approved for use in British Columbia on Himalayan blackberry (ISCBC 2014).

A non-native species of rust fungus (*Phragmidium violaceum*) was found on Himalayan blackberry in Oregon in 2005 that is believed to have been accidentally introduced (Peters 2012). It partially to fully defoliates both Himalayan and evergreen blackberries (*Rubus laciniatus*) and reduces tip rooting (DiTomaso et al. 2013). This fungus has been successfully used in Chile, Australia, and New Zealand (Peters 2012) and testing in Oregon indicated that the rust had minimal to no impact on native blackberry populations, but impacted one commercial variety.



Himalayan blackberry in bloom

CREDIT: ISCMV

CONTROL SUMMARY

The following table provides a summary and comparison of control methods for Himalayan blackberry.

CONTROL STRATEGY	TECHNIQUES	APPLICABLE SITE TYPE	PROS	CONS
Manual	Hand pulling	Young individual plants that are large enough to grip	Selective, non-chemical, can be done by volunteers, inexpensive	Labour intensive
	Digging, grubbing	Individual plants, sites of all sizes	Selective, non-chemical, can be done by volunteers, inexpensive	Labour intensive, creates disturbance
	Cutting 30 centimetres above the ground	Use before pulling or digging to provide easy access to roots	Selective, non-chemical, can be done by volunteers, causes minimal harm to surrounding plants	Repeated cutting required, not an effective method on its own
	Vegetation release	Sites with existing native vegetation	Encourages growth of native plants	Long-term commitment
Mechanical	Mowing, tilling to remove exposed roots	Areas accessible by a machine	Less labour intensive, non-chemical	Requires trained staff, speciality equipment, creates disturbance, must be repeated multiple times each year
Chemical	Foliar application, basal bark spray, cut stump	High density sites, sites with minimal integration of native trees and shrubs, non-aquatic environments	Treatment method for plants that cannot be managed other ways, less labour intensive, treat large areas	Unintended environmental/health impacts, high public concern, requires trained staff, weather dependent
Cultural	Growing a closed tree canopy	Where appropriate to install trees	Natural, can be used with other methods	Long-term commitment, labour intensive, not suitable for sites where tree canopy is not desired, blackberry will always persist on perimeters of shaded areas
	Targeted grazing	Large, continuous patches with little other desired vegetation, sites that meet infrastructure and logistical requirements of a grazing herd	Livestock can provide treatment on slopes and terrain inaccessible to humans or machinery	Complete eradication unlikely, environmental damage, long-term commitment
Biological	No bioagents are currently available for distribution in British Columbia			

CONTROL SUMMARY COLOUR LEGEND

GREEN: RECOMMENDED

ORANGE: CAUTION

RED: NOT RECOMMENDED OR NOT AVAILABLE

Disposal

Control methods for blackberry tend to generate a large volume of green waste. In most cases, it is desirable to dispose of blackberry off site to facilitate access for future monitoring, follow-up treatment and restoration planting.

OFF SITE DISPOSAL

When disposed off site, transport plant parts on tarps or in thick plastic bags to an appropriate disposal or compost facility (see below). Care should be taken to ensure that plant parts are not spread during transport (ISCBC 2014).

In the Metro Vancouver region, several facilities accept Himalayan blackberry plants and/or infested soil. [This list](#) provides addresses and website links for the disposal facilities. This list is updated periodically.

PLEASE CONTACT ALL FACILITIES BEFOREHAND TO CONFIRM THEY CAN PROPERLY HANDLE THE MATERIAL.

ON SITE DISPOSAL

When off site disposal is not practical, chipping the plant into small pieces and leaving the green waste on site as mulch is a viable option, provided the root crowns are removed from the site. Although blackberry can re-sprout from roots and root crowns, if all plant parts are fully removed from the soil they tend to dry out and die very quickly and are rarely observed re-sprouting in Metro Vancouver (MacKenzie 2017). Roots can also be suspended in the air on nearby trees to ensure they dry out and don't re-sprout (Pocock 2017).

Composting Himalayan blackberry foliage and berries at home or at municipal works yards is **not recommended** as the temperature will not reach high enough to kill the roots or seeds.

CLEANING AND DISINFECTION⁵

Before leaving a site, remove all visible plant parts and soil from vehicles, equipment, and gear, and if possible, rinse these items. When back at a works yard or wash station, vehicles should be cleaned and disinfected using the following steps:

- Wash with 180 °F water at 6 gpm, 2000 psi*, with a contact time of ≥ 10 seconds on all surfaces to remove dirt and organic matter such as vegetation parts or seeds. Pay special attention to undercarriages, chassis, wheel-wells, radiators, grills, tracks, buckets, chip-boxes, blades, and flail-mowing chains.
- Use compressed air to remove vegetation from grills and radiators.
- Sweep/vacuum interior of vehicles paying special attention to floor mats, pedals, and seats.
- Steam clean poor access areas (e.g., inside trailer tubes) – 200 psi @ 300 °F.
- Fully rinse detergent residue from equipment prior to leaving facility.

* Appropriate self-serve and mobile hot power-wash companies in the Metro Vancouver area include: Zolliker Fleet Cleaning, Omega Power Washing, Eco Klean Truck Wash, RG Truck Wash, Ravens Mobile Pressure Washing, Hydrotech Powerwashing, Platinum Pressure Washing Inc, and Alblaster Pressure Washing. Wash stations should be monitored regularly for Himalayan blackberry growth.

Follow-up Monitoring

Whatever control method is used, follow-up monitoring and maintenance treatments are important components of an integrated management plan or approach. Initial treatments are rarely successful in removing or killing all roots and root crowns. Resprouting and new germination from the seed bank are very likely. In addition, it is quite common for an effectively controlled blackberry patch to be re-invaded by surrounding patches (Bennett 2007), so it is critical to monitor for invasion from adjacent areas.

- Annual follow-up monitoring should take place following initial treatment for both chemically and manually treated sites. The number of years of monitoring required will vary depending on the control method(s) and site characteristics. In Metro Vancouver, sites controlled through manual digging and restored with native vegetation need a minimum of three years of follow-up treatments on average (MacKenzie 2017).
- When controlling blackberry through vegetation release (see MANUAL/MECHANICAL control section), control should be ongoing until native trees reach a height of 5 m (Soll 2004).

In the long-term, taking steps to encourage and support the growth of a coniferous tree canopy in riparian and forest areas will help keep blackberry levels low (Bennett 2007).

⁵ Adapted from Metro Vancouver 2018 Water Services Equipment Cleaning Procedures and Inspection Protocols.

Restoration

Restoration is recommended to create competition, control Himalayan blackberry regrowth, and replace lost food supply for pollinators. If only herbicide was used, manual/mechanical removal of the dead canes and root crowns may be necessary prior to planting.

Mulch can be used to avoid leaving bare soil and reduce colonization by other invasive plant species. The International Society of Arboriculture and relevant municipal parks or arboriculture departments offer guidelines for mulch application. Specific mulch depths can be used to control invasive weeds and encourage plant growth (International Society of Arboriculture 2011). If restoration and/or mulch application is not feasible at the time, installation of erosion and sediment control measures and/or a planting quick establishing native grass mix are recommended to avoid leaving bare soil exposed until restoration is feasible.

Replacement species should be chosen based on the ecology of the site by a qualified environmental professional. Local biologists, environmental professionals, agronomists, agrologists, native and domestic forage specialists, seed companies, and plant nurseries are all good sources for localized recommendations for regional native species and regionally adapted domestic species, based on site usage. Native grass seed mixes are also available. Several science-based resources are available to guide restoration efforts, such as the South Coast Conservation Program’s [Diversity by Design](#) restoration planning toolkit.

Examples of common competitive native species prescribed for Metro Vancouver sites are summarized in the table below based on site moisture.

WET SITES	MOIST SITES	DRY SITES
SHRUBS		
Salmonberry	Salmonberry	Thimbleberry
Hardhack	Willow	Nootka rose
Willow	Red osier dogwood	Red flowering currant
Red osier dogwood	Red elderberry	Snowberry
Pacific ninebark	Vine maple	Tall Oregon grape
Black hawthorn	Indian plum	Oceanspray
TREES		
Western red cedar	Western red cedar	Douglas-fir
Red alder	Red alder	Red alder

Revegetation of the site to a domestic or cultured non-native plant species composition may be considered in some circumstances. Often domestic species establish faster and grow more prolifically, which aids in resisting invasive blackberry re-invasion.

Himalayan blackberry sites are often found in areas with existing, or potential, wildlife populations (e.g. deer, beaver, muskrat, vole, etc.) that can damage restoration plantings. Therefore, any revegetation plan must consider impacts from wildlife and utilize appropriate mitigation measures to protect the restoration and existing native plantings (tree wrapping, exclusion caging/fencing, vole guards, etc.).

References

- 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.
- BC Ministry of Environment and Climate Change Strategy. 2018. *Instream Works Glossary*. Accessed July 2018. <https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/procedures/procedure08.pdf>
- BC Ministry of Environment. 2011. "Canadian Pesticide Education Program: Applicator Core Manual. Federal, Provincial, Territorial Working Group on Pesticide Education, Training and Certification."
- BC, British Columbia. 2008. *Community Charter - Environment and Wildlife Regulation*. 08 07. Accessed 08 09, 2017. [http://www.bclaws.ca/civix/document/id/complete/statreg/144_2004/search/CIVIX_DOCUMENT_ROOT_STEM:\(blackberry\)%20AND%20CIVIX_DOCUMENT_ANCESTORS:statreg?1#hit1](http://www.bclaws.ca/civix/document/id/complete/statreg/144_2004/search/CIVIX_DOCUMENT_ROOT_STEM:(blackberry)%20AND%20CIVIX_DOCUMENT_ANCESTORS:statreg?1#hit1).
- Bennett, Max. 2007. *Managing Himalayan Blackberry*. Jackson County, Oregon State University Extension Service. Accessed September 2017. <https://ir.library.oregonstate.edu/downloads/pg15bf146>
- Caplan, Joshua, and Alan Yeakley. 2006. "Rubus armeniacus (Himalayan blackberry) Occurrence and Growth in Relation to Soil and Light Conditions in Western Oregon." *Northwest Science* 80 (1): 9-17. Accessed August 2017. https://www.researchgate.net/publication/228344920_Rubus_armeniacus_Himalayan_blackberry_occurrence_and_growth_in_relation_to_soil_and_light_conditions_in_Western_Oregon.
- DiTomaso et al. 2013. In *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Centre, University of California. Accessed September 2017. http://wric.ucdavis.edu/information/natural%20areas/wr_R/Rubus.pdf.
- E-Flora. 2017. "Scotch broom." *E-Flora BC: Electronic Atlas of the Flora of British Columbia*. Edited by B. Klinkenberg. Department of Geography. August. Accessed August 2017. <http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Cytisus%20scoparius>.
- Elle, E.J., Elwell, S.L., Gielens, G.A. 2012. "The use of pollination networks in conservation." *Botany* 525-534.
- Gaire, R., C. Astley, M. K. Upadhyaya, D. R. Clements, M. Bargaen. 2015. *The Biology of Canadian Weeds*. 154. *Himalayan blackberry*. July 2021. https://www.researchgate.net/publication/273904874_The_Biology_of_Canadian>Weeds_XXX_Himalayan_blackberry
- Garry Oak Ecosystem Recovery Team. 2002. *Best Practices for Invasive Species Management in Garry Oak and Associated Ecosystems: Evergreen Blackberry (Rubus laciniatus) and Himalayan Blackberry (Rubus armeniacus/discolor/procerus)*. Accessed August 2017. <https://goert.ca/wp/wp-content/uploads/IS-Best-Practices-Blackberry-2002.pdf>.
- International Society of Arboriculture. 2011. *Proper Mulching Techniques*. <https://www.treesaregood.org/portals/0/docs/treecare/ProperMulching.pdf>.
- ISCBC, Invasive Species Council of British Columbia. 2019. "Himalayan Blackberry Factsheet." *BC Invasives*. Accessed July 2021. https://bcinvasives.ca/wp-content/uploads/2021/01/Himalayan_Blackberry_Factsheet_20190220.pdf
- King County. 2014. "Best Management Practices for Himalayan blackberry." *King County Noxious Weed Control Program*. Accessed September 2017. <http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/BMPs/blackberry-control.pdf>.

LEPS, Langley Environmental Partners Society, Paul Graham, and David Clements. n.d. *Evergreen Blackberry & Himalayan Blackberry*. Accessed August 2017. http://www.cmnmaps.ca/shim/atlas/invasivespecies/_private/blackberry.htm

MacKenzie, Keith, interview by F. Steele. 2017. *Field Operations Manager, Diamond Head Consulting* (September).

McDowell, Susan, and David Turner. 2002. "Reproductive effort in invasive and non-invasive *Rubus*." *Oecologia* 133 (2): 102-111. Accessed August 2017. <https://link.springer.com/article/10.1007/s00442-002-1006-5>

Metro Vancouver. 2016. *Climate Projections for Metro Vancouver*. Burnaby, BC. Retrieved from <http://www.metrovancouver.org/services/air-quality/AirQualityPublications/ClimateProjectionsForMetroVancouver.pdf>

Miller, Amanda J., Catherine Tarasoff, Tammy Salmon. 2021. *Feasibility of Targeted Invasive Plant Grazing in Metro Vancouver*. Accessed June 2021. <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/FeasibilityTargetedInvasivePlantGrazingMV.pdf>

Peters, Amy. 2012. *Blackberry Rust Fungus: Possible New Biological Control*. Oregon: Oregon State University. Accessed August 2021. <https://www.cambridge.org/core/journals/invasive-plant-science-and-management/article/invasive-blackberry-species-in-oregon-their-identity-and-susceptibility-to-rust-disease-and-the-implications-for-biological-control/3557705EAAB69DA1E3B121B90953CA2F>.

Pocock, Kari, interview by T. Murray. 2017. *Stewardship Coordinator, Stanley Park Ecology Society* (August).

Pojar, Jim, and Andy MacKinnon. 2004. *Plants of Coastal British Columbia - Revised*. British Columbia: Lone Pine.

San Juan County Noxious Weed Control Program. 2014. *Himalayan and Evergreen Blackberries*. Accessed 2018. <https://s3.wp.wsu.edu/uploads/sites/2054/2014/04/Himalayan-Evergreen-Blackberries-2014.pdf>.

Soll, J. 2004. *Controlling Himalayan blackberry in the Pacific Northwest*. Edited by B. Lipinski. The Nature Conservancy. Accessed August 2017. <https://www.invasive.org/gist/moredocs/rubarm01.pdf>.

UBC, Department of Geography. 2017. *E-Flora BC: Electronic Atlas of the Flora of British Columbia: Himalayan Blackberry*. Accessed August 2017. <http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Rubus%20armeniacus>.

United States Department of Agriculture, USDA. 2020. Fire Effects Information System Database: *Rubus armeniacus*, *R. bifrons*. Accessed July 2021. <https://www.fs.fed.us/database/feis/plants/shrub/rubspp/all.pdf>

Whatcom County Noxious Weed Control Board. n.d. "Whatcom Weeds: Blackberries." Information Sheet, Bellingham. Accessed August 2017. <http://www.whatcomcounty.us/documentcenter/view/27139>.

Wray, J. and Elle, E.J. 2015. "Wild and Managed Pollinators: Current Status and Strategies to Increase Diversity." Metro Vancouver Climate Action Committee Report. <https://www.scribd.com/document/261264327/Wild-and-Managed-Pollinators-Report>.

Additional Resources

For more information please refer to the following resources.

Invasive Species Council of British Columbia Himalayan blackberry Fact Sheet. https://bcinvasives.ca/wp-content/uploads/2021/01/Himalayan_Blackberry_Factsheet_20190220.pdf

British Columbia Ministry of Forests, Lands, Natural Resources Operations and Rural Development, Invasive Alien Plant Program (IAPP). <http://www.gov.bc.ca/invasive-species>

The Biology of Canadian Weeds. 154. Himalayan blackberry. Gaire, R., C. Astley, M. K. Upadhyaya, D. R. Clements, M. Bargaen. 2015. https://www.researchgate.net/publication/273904874_The_Biology_of_Canadian_Weeds_XXX_Himalayan_blackberry

King County Noxious Weed Control Program: *Best Management Practices for Himalayan Blackberry.* King County, Washington <http://your.kingcounty.gov/dnrp/library/water-and-land/weeds/BMPs/blackberry-control.pdf>

Controlling Himalayan blackberry in the Pacific Northwest. Soll, Jonathan. Edited by B. Lipinski. The Nature Conservancy. 2004. <https://www.invasive.org/gist/moredocs/rubarm01.pdf>

Bennett, Max. (2007). *Managing Himalayan Blackberry.* Jackson County, Oregon State University Extension Service. <https://ir.library.oregonstate.edu/downloads/pg15bf146>

E-Flora BC, an Electronic Atlas of the Plants of BC. <http://www.eflora.bc.ca/>

Grow Me Instead. <https://bcinvasives.ca/play-your-part/plantwise/>

Pesticides and Pest Management, Province of British Columbia <https://www2.gov.bc.ca/gov/content/environment/pesticides-pest-management>

Acknowledgments

The project team would like to thank the following groups for their contributions related to the development and review of this document:

Green Teams of Canada

Langley Environmental Partners Society

Stanley Park Ecology Society

Metro Vancouver's Regional Planning Advisory Committee (RPAC) - Invasive Species Subcommittee

To submit edits or additions to this report, contact Laurie Bates-Frymel, Senior Regional Planner at laurie.bates-frymel@metrovancover.org.





Best Practices for Invasive Species Management in Garry Oak and Associated Ecosystems:

Evergreen Blackberry (*Rubus laciniatus*) and Himalayan Blackberry (*Rubus armeniacus/dicolor/procerus*)

Assess the site characteristics and your available resources to help you decide where to take management action, what action to take, and when. These decisions should be made within the context of the overall restoration objectives (and restoration plan, if one exists).

Before proceeding, be aware that it is very important to not confuse Evergreen blackberry (*R. laciniatus*) with the native *Rubus ursinus*. Evergreen blackberry is often found in association with Himalayan blackberry. If Evergreen blackberry is found alone and you are uncertain you have identified it correctly, leave it alone. Also leave it alone if it is in trailing form (rather than upright); you may damage understory vegetation by trying to remove it.

a) Deciding where to take action

Factor 1: Blackberry density

Survey the areas in the GOE where blackberry occurs. Sketch-out and label these areas "zone 1", "zone 2" or "zone 3" on your sketch map. Use the following descriptions:

- Zone 1 satellite patches (from a few canes, to a 5 foot by 5 foot patch)
- Zone 2 edges around larger patches
- Zone 3 larger patches (larger than 5' by 5')

Where to focus your effort? Follow the **Priority Principle: contain the invasive species first, then reduce its amount!** The highest priority is to prevent further spread of blackberry. Only take action to reduce the "footprint" of the blackberry invasion after it is contained. Therefore Zones 1 and 2 should be your first priority, and you should only move into Zones 3 areas when blackberry has been successfully removed from Zones 1 and 2. (Sometimes concerns about species at risk should override this. For example if a population of a species at risk is directly and imminently threatened by blackberry this should be a top priority. Such decisions should be made in consultation with species at risk experts.)

Factor 2: Ecological quality

To help you prioritize areas *within* Zones, consider GOE quality, presence of species of concern, and blackberry vulnerability. First priority areas should be those of highest ecosystem quality, where species at risk are threatened by a blackberry invasion. Within such areas, start in the more open, vigorous fruitley blackberry patches, which are likely to be in dry areas where the plants are stressed and often not the most robust.

Factor 3: Accessibility

Blackberry management will require repeated efforts. Focus first in areas that can be accessed more easily for repeat treatments before moving into hard-to-access spots. On some areas where further spread is unlikely, you may actually wish to leave blackberry as an access barrier, if that fits the overall management objectives for the GOE.

b) Deciding what action to take, and when

Circumstances	Method	When	Caveats
Any size of patch	Manual control: loppers (can also be used as tongs to pull the cut cane out), hand clippers, brush saw	August - October before roots form from draping shoots	<ul style="list-style-type: none"> If patch is used as a nesting site for native passerine birds, remove the patch gradually and avoid nesting season Also remove the root crowns or burls, as they can remain viable for a long time (use pick axe, mattock or Pulaski)
Large, thick, patch of just blackberry, with no native species	Back hoe to remove biomass, and scrape down to the soil surface	When risk of damage to GOE (e.g. soil compaction, physical site damage) from machine access is lowest	<ul style="list-style-type: none"> Should only be used on extreme invasions where manual control seems hopeless Be sure hoe will not destroy sensitive areas on its way to the blackberry patch it is targeting
Areas too expansive for manual control AND not concerned about species at risk	Mowing	In the winter, when most native plant species are dormant	<ul style="list-style-type: none"> Is more of a maintenance regime for control rather than eradication, though mowing may sometimes also encourage native species growth Will only work on relatively flat areas where mowers can be operated
Draping tips starting to root	Hand extraction: paring knife	As soon as tips form roots (late October - November)	<ul style="list-style-type: none"> This is a mitigation, not a recommended control method; try to get to the canes before the drooping tips form roots Don't just pull! You'll leave the roots, and have lots of new shoots to deal with later
New growth from root fragments or root crown	Manual control: loppers, hand clippers	2-3 times per year, for 2-3 years following initial control	<ul style="list-style-type: none"> May take 5 years to fully eradicate it
New growth from root fragments or root crown	Herbicide	As soon as new growth appears	<ul style="list-style-type: none"> Only with extreme caution, and by (or advised by) experts May be restricted (legally) in some jurisdictions Only use herbicides such as Glyphosate that do not remain active in the soil 2 treatments will likely be necessary for root fragments on the soil surface 3 treatments will likely be necessary for root crowns or root fragments underground

If unsure which end of a vine is the tip (can be tricky if the tip has drooped and rooted), look at the barbs - they point back to the original root end.

In deciding which method(s) to choose, also consider:

- Your budget to acquire the necessary tools and equipment for the methods chosen (e.g. pick axes, pitch forks, loppers, hand clippers, brush cutters, back hoe and operator),

- Your budget to acquire the necessary protective clothing and equipment (e.g. gloves, hats, thick- and hard-soled boots),
- The need to comply with Workers Compensation Board regulations, and
- The number and skill level of the people that will be assisting you.

Consider following up on any of these control methods with a planting or seeding treatment in order to speed up re-establishment of native species. The need for this will depend on what bulbs and seeds already exist in the soil, vegetation immediately adjacent to the area, light conditions, and how well seeds or bulbs germinate and sprout when the blackberry is removed. You may wish to first monitor the site after the control methods have been implemented, and then plant or seed later if the desired native plants do not appear or are sparse. If you are going to plant native species, consult with someone knowledgeable about this first, ensure that your plant and seed stock originate from sources that follow ethical guidelines, and take genetic issues into consideration.

c) Deciding how to dispose of dead plant material

If you choose any mechanical removal method, you must think about what to do with the plant material that you have cut or pulled. Consider the following options, based on the amount of dead blackberry you expect to remove from the areas you plan to target:

Material	Removal from site	Disposal
Large amount of dead blackberry	Necessary only if being chipped or burned off site; cut canes to manageable length and move on tarps or makeshift "stretchers" Pitch forks can be useful for moving quantities of blackberry on site	<ul style="list-style-type: none"> • Pile on site in area where smothering native vegetation underneath is not a concern OR chip and mulch on site OR burn safely, either at the time of removal or the following spring (Consult BC government's <i>Open Burning Smoke Control Regulation</i>) • Do <i>not</i> pile on blackberry root crowns; you will want access to these for re-treatment • If piling on site, revisit the piles and re-flatten as they break down; do not flatten right away as cut material may root if pressed into soil
Small amount of dead blackberry shoots	Not necessary	<ul style="list-style-type: none"> • Leave on site in small piles; can be used to block "bandit trails"
Blackberry root crowns	Necessary only if being burned off site; no special techniques required	<ul style="list-style-type: none"> • Leave them on a rock or paved surface to dry out OR burn safely (Consult BC government's <i>Open Burning Smoke Control Regulation</i>)

d) Recognizing uncertainty

In making these decisions, there will be things you are unsure about. This is normal, and should not cause undue concern. The important thing is to be *aware* of the things you are most uncertain about, document them, and plan your actions in a manner that will help you learn and reduce this uncertainty.

Acknowledgements: developed with the assistance of Louise Blight, Ron Carter, Adolf Ceska, Patrick Dunn, Tim Ennis, Marilyn Fuchs, Richard Hebda, Laura Hooper, Andrew MacDougall, Willie MacGillivray, Carrina Maslovat, Edo Nyland, Eileen Palmer, Briony Penn, Raj Prasad, Hans Roemer, Andrea Schiller, and Joel Ussery.

Pesticides and pest management

Monitor your home and property or any other area where pests are a concern. Be prepared to take appropriate action when pests cause damage or health issues. Learn about using less harmful pesticides and integrated pest management techniques to help protect natural environments.

Services and information topics

[Managing pests](#)

The key to effective pest management is to prevent pests from becoming a problem in the first place. If you do have a pest problem, it's important to know how to identify, monitor and control pests using safe treatment methods.

[Pesticide use](#)

Sometimes pesticides are needed to control pests. Pesticides must be used safely and according to legal requirements.

[Business and industry](#)

If you're a pest management professional or a business that sells or uses pesticides:

- Review when authorizations are required, and
- Access information and tools made for your work



Certification and training

Only a trained and certified person may sell or use most pesticides.

Learn about the different types of certificates and find out how to:

- Get study materials
- Access training courses
- Take an exam
- Get continuing education credits

Reports, publications and guides

Find reference materials designed to help pest control managers understand and navigate legislated requirements.

Compliance and enforcement

Learn how the province enforces pesticide requirements under the Integrated Pest Management Act and Regulation.

Find out how to report a pesticide related concern.

Legislation and consultation

Review the laws that regulate the storage, sale, transportation and use of pesticides. Changes are occasionally made to the IPM legislation to improve the protection of human health and the environment from pesticides. Participate in related public consultations and find out how these changes may affect you.

IPM news

Subscribe to this page to receive information related to:

- Integrated pest management (IPM)
- The regulation of pesticides

Rodenticide use

Get information on how rodenticide sale and use in B.C. has changed. Visit [Rodent IPM](#).

Pesticide use at home

Get information on applying pesticides to your residential landscape including obtaining a Residential Applicator Certificate. Visit the [Home Pesticide Use](#) page.

Cannabis and pests

Whether growing cannabis at home or commercially, find guidance on pest management and what regulations apply.

- [Growing cannabis at home](#)
- [Growing cannabis commercially](#)

Regulations and consultations

Find out about the laws and acts that regulate the sales and use of pesticides or participate in public consultations related to modifying some regulations.

- [Check out all regulations and consultations](#)
- [Integrated Pest Management Regulation](#)
- [Integrated Pest Management Act](#)

The B.C. Public Service acknowledges the territories of First Nations around B.C. and is grateful to carry out our work on these lands. We acknowledge the rights, interests, priorities, and concerns of all Indigenous Peoples - First Nations, Métis, and Inuit - respecting and acknowledging their distinct cultures, histories, rights, laws, and governments.



We can help in over 220 languages and through other accessible options. [Call, email or text us](#), or [find a service centre](#)

MORE INFO

[Home](#)

[Accessibility](#)

[About gov.bc.ca](#)

[Copyright](#)

[Disclaimer](#)

[Contact us](#)

[Privacy](#)

© 2025 Government of British Columbia



District of Metchosin Council – 2025 Priorities

January 13, 2025

Metchosin's Mayor and Council have set the following as priorities for its work in 2025. Council looks forward to working with District staff, volunteers and community members in achieving these goals.

Support District staff in maintaining day to day operations in Metchosin.

- Ensure the general workload originating from Council is manageable and staffing levels are appropriate.
- Set realistic expectations with residents, volunteers and community groups around service and responsiveness levels.

Develop a responsible operations and capital budget for 2025.

- Work to balance service needs and priorities against any associated tax increases, recognizing that significant costs are being downloaded by the provincial government without accompanying financial support.
- Assess options for the 2.4 million BC Community Building Fund grant.

Support the continuing development of Metchosin School as a thriving, community-focused multi-use facility.

- Confirm the overall vision on the School's role and purpose.
- Complete a financial and management plan in early 2025.

Continue exploring the future of Metchosin's Fire Hall.

- Assess options as presented in the forthcoming Fire Hall Feasibility Study.
- Ensure community engagement is undertaken around the options under consideration.
- Continue to explore grants and other financial support.

Address provincial housing requirements.

- As required by provincial legislation, amend Metchosin's *Official Community Plan (OCP)* and *Land Use Bylaw (LUB)* before the end of 2025.
- To the greatest extent possible, amendments to the OCP and LUB are to be made in a manner that suits Metchosin's rural character and values, and which account for the development constraints faced by Metchosin (limited distribution of municipal water and no municipal sewage service; reliance on wells and Aquifer 606; potential impacts to ALR lands; regional growth strategy commitments; limited transit and family amenities) and Metchosin's regional role in climate mitigation and biodiversity protection.

Update bylaws/policies that support environmental protection, a peaceful / livable community, housing requirements, and good governance.

- Priorities bylaws are as follows:
 - *Good Neighbour Bylaw; Land Use Bylaw; Soil Removal and Deposit Bylaw; Bylaw Notice Enforcement Regulation; Subdivision Servicing Bylaw; Advisory Select Committee Bylaw; Council Procedure Bylaw; Tree Preservation Bylaw; Alcohol Consumption Policy.*
- Pending completion of the priorities other bylaws may be reviewed, including
 - *Business Licence Bylaw; Fire Regulation Bylaw; Rainwater Bylaw; Development Procedure Bylaw*

Address public safety matters.

- Adopt a Roads Management Plan.
- Address pedestrian / traffic safety issues, assessing opportunities identified through the Active Transportation process or through previous community engagement.
- Address safety issues posed by the aging trees on Lombard Drive.
- Complete climate change adaptation assessments currently underway, including heat mapping and the climate hazard assessment.
- Complete the disaster risk climate adaptation assessment currently underway.
- Continue to support fire prevention and emergency response public education initiatives and programs.
- Review and update the shoreline spill response plan.
- Initiate the District's Accessibility Plan.

Continue working to protect our environment, supporting initiatives focused on land conservation, biodiversity enhancement, and water / watershed protection.

- Assess a new conservation-oriented zone for the Buffer Land. As appropriate, take action to adopt the new zone and develop a management plan.
- Develop more information on strengthening riparian areas protection through education and regulation.
- Engage the owners of tax-exempt properties on land protection strategies.
- Review previous work on environmental initiatives for current relevance and applicability: Climate Action Plan, Blue Green Strategy, Sustainability Strategy, Uplands Planning report towards the development of a Biodiversity and Natural Assets Plan.

Support and be involved in opportunities to enhance agricultural, recreational, cultural, and community building activities.

- Complete the Active Transportation Plan.
- Support the implementation of Metchosin's Agriculture Plan, with a focus on:
 - Agricultural Land Reserve regulation for residential home plate.
 - Soil deposits on agricultural land.
 - Response to geese impacts on agriculture.
 - Support continuing development of farmers network
- Update the District's Parks and Trails Master Plan.

Continue community engagement

- Develop opportunities to share information and receive community input on key issues, including the School, housing, active transportation / traffic safety, Buffer Land.
- Develop a community information sharing session for Spring 2025, with a focus on active transportation and traffic safety.

Continue evolving and updating Council governance processes.

- Move to a Committee of the Whole approach for the Council Standing Committees. Evaluate effectiveness by mid-2025.
- Update Advisory Committee Terms of Reference.
- Update governance-related bylaws and/or policies, including the *Council Procedure Bylaw* and *Advisory Select Committee Bylaw*.

RIPARIAN AREAS REGULATION **GUIDEBOOK**

For Local Governments

August 1, 2016 - Revised - Version 3.0



Ministry of
Forests, Lands and
Natural Resource Operations

TABLE OF CONTENTS

Protecting Fish Habitat Matters	4
introduction	4
What are local governments required to do to meet the Riparian Areas Regulation?	5
Implementation Options for local governments.....	5
Implementation Tools for Local Government.....	5
Basic requirements	7
Legislative tools	7
Official Community Plans (OCPs)	8
Development permit areas (DPAs)	9
Zoning bylaws	10
Subdivision.....	13
Development approval procedures and information requirements.....	14
Other local government act Part 14 powers	15
<i>Landscaping</i>	15
<i>Surface runoff</i>	15
<i>Security</i>	15
<i>Restrictive covenants</i>	16
Other powers under the Local Government Act and Community Charter	16
Long-term protection of the SPEA	17
<i>Covenants</i>	17
Approaches to implementing the Riparian Areas Regulation.....	19

Approach 1: Adopt riparian assessment areas <i>only</i>	21
Approach 2: Adopt riparian assessment areas and SPEAs <i>generally</i>	22
Approach 3: Adopt and designate (pre-determine) SPEAs.....	23
COMMONLY ENCOUNTERED ISSUES WITH RAR POLICIES AND BYLAWS	25
Watercourse Mapping and/or Pre-designated SPEAs that exclude RAR streams	25
Applicable Development exempted from permit requirements in bylaws	26
Ensuring Submission of RAR Assessment Reports.....	26
Ditches and Channelized Watercourses omitted from RAR requirements	27
Applicability of RAR to Agricultural Lands	27
Local government enforcement tools	27
Other environmental concerns with fish and fish habitat during development.....	29
Large woody debris (LWD)	30
Watershed planning	31
Stormwater management.....	31
Wetlands	32
Hazards	32
Requirements for developing monitoring, enforcement and education strategies	32

Protecting Fish Habitat Matters

INTRODUCTION

Federal, provincial and local governments recognize the importance of conservation of fisheries resources and protection of fish habitat to the economic and social well-being of British Columbia communities. In response to the increasing pace of development in BC, the Riparian Areas Regulation (RAR) was enacted to provide support to local governments in the creation of practical tools for fish habitat protection. The RAR is designed to provide local governments with adequate support, direction and assurance that, with the exercise of due diligence, protection of riparian fish habitat will be achieved.

The RAR, administered by the Ministry of Forests, Lands and Natural Resource Operations, applies to riparian habitat affected by new residential, commercial and industrial development on land under local government jurisdiction (private land and the private use of Crown land). This guide outlines various implementation tools that local governments may use to apply the RAR.

Compliance with the RAR does not exempt anyone from complying with other applicable federal or provincial laws, local government bylaws or related environmental legislation.

Note: Terms used in this guidebook in *italics* are those defined in the *Riparian Areas Regulation (2004)* and as amended.

What are local governments required to do to meet the Riparian Areas Regulation?

The RAR directs local governments to protect riparian areas during residential, commercial and industrial development, through the use of their authority outlined in Part 14 of the *Local Government Act*. The RAR establishes a science-based process that local governments can apply to achieve riparian area conservation. The RAR does not supersede the requirements of any other relevant legislation. When planning a development, a proponent should be aware that requirements in addition to local government regulations may apply.

Local governments have responsibility for land use decisions which relate to the protection, conservation and enhancement of the environment within their jurisdictions. As such, local governments have the primary responsibility for implementing riparian fish habitat protection on private land. Although RAR focusses on riparian fish habitat, local governments remain free to use their powers under the *Local Government Act* to protect other values.

Implementation Options for Local Governments

There are three basic options available to local governments in implementing the RAR. These options involve:

- utilizing the transitional clause in Section 8 of the RAR;
- following the direction in Section 4 of the RAR or;
- establishing a regime that provides a level of protection that meets or exceeds that of the RAR.

Implementation Tools for Local Government

Section 12 of the *Riparian Areas Protection Act* directs local governments to use their zoning or other land use management bylaws and permits under the *Local Government Act* to implement riparian area protection provisions. The following

table summarizes legislative tools that local governments can use to support RAR implementation.

TABLE 1: *Local government legislative tools for RAR implementation*

TOOL	LEGISLATIVE BASIS
Official Community Plan	<i>Local Government Act, Part 14</i>
Development Permit Areas	<i>Local Government Act, Part 14</i>
Zoning Bylaws	<i>Local Government Act, Part 14</i>
Subdivision bylaws	<i>Local Government Act, Part 14 and Land Title Act, Part 7</i>
Development Approval and Information Bylaws	<i>Local Government Act, Part 14</i>
Covenants	<i>Land Title Act</i>
Other Regulatory Bylaws Affecting Land Use	<i>Local Government Act, Part 9, and Community Charter</i>

Other non-legislative tools for the protection and conservation of riparian areas include information and education about stream stewardship, watershed or stormwater management plans, parkland acquisition, tax incentives and landowner agreements. Some of these tools are discussed in the last section of this guide.

BASIC REQUIREMENTS

Whatever tools a local government chooses to use to implement the RAR, there are three basic elements that the applicable regulatory process needs to provide:


- definitions of *streams* and *riparian areas* that are consistent with the RAR;
- a means of triggering a regulatory action if a development activity is proposed to occur in a *riparian assessment area*; and
- a means of requiring a QEP *assessment report* that complies with the RAR and its *assessment methods*.

Local government bylaws and policies do not have to use the same terms that are in the RAR. For example, a bylaw may use “waterway” or “watercourse” instead of *stream*; or “leave strip” / “watercourse protection area” instead of *riparian area* or *streamside protection and enhancement area* (SPEA). If terms are used that differ from the RAR, the definitions must still be congruent with RAR definitions and their applicability should be clear. Watercourses may be defined by a local government to include a broad range of aquatic and terrestrial components beyond fish habitat. This is entirely valid, provided these include all *streams* as defined in the RAR. In other words, local governments may provide more protection for riparian habitat than is prescribed by the RAR, but it cannot provide less.

The RAR has the expectation that the local government’s development approval mechanism, using such tools as rezoning or subdivision approvals, development permits, building/variance permits and others will be subject to the conditions outlined in the RAR *assessment report*, including the delineation and protection of the SPEA and incorporation of all applicable measures in the report.

LEGISLATIVE TOOLS

Implementation of the RAR has shown that new and/or separate bylaws, policies or procedures are not necessarily required to meet the standard expected in the



RAR. Many local governments have integrated progressive riparian protection measures into their existing frameworks and several local governments that are not subject to the RAR have put standards in place voluntarily. Now that the RAR has been in place for some time, ensuring compliance with the RAR is largely a matter of reviewing and where necessary, revising existing provisions.

Local governments can also use tools available under other parts of the *Local Government Act* to support implementation of the RAR. Many of the tools are complementary, and local governments may choose to use more than one method to achieve riparian protection. For example, a municipality may adopt objectives to protect riparian areas in its OCP; pre-designate SPEAs through Development Permit Areas or zoning bylaw setbacks, or use watershed level plans to define specific SPEAs on a stream system.

For more information about the use of these tools, see publications such as “Stream Stewardship: A Guide for Planners and Developers” and “Green Bylaws Toolkit” available from the Stewardship Centre for British Columbia.

OFFICIAL COMMUNITY PLANS (OCPs)

Official Community Plans provide the basic direction for land use decisions in a community. Among other things, OCPs can establish policies for “the preservation, protection, restoration and enhancement of the natural environment, its ecosystems and biological diversity” (*Local Government Act*, Part 14, Division 4).

An OCP can reference *streams* and *riparian areas* as defined in the RAR and establish policies for their protection in future planning or development approvals. OCP policies can set forth the objective of meeting the RAR, and define the

mechanisms or processes for doing so. These OCP policies then guide land use decisions made under local area plans and other land use bylaws.

DEVELOPMENT PERMIT AREAS (DPAS)

Development Permit Areas (DPAs) can be designated under OCPs for the “protection of the natural environment, its ecosystems and biological diversity” (*Local Government Act*, section 488(1)(a)). A DPA may specify that land may not be altered or construction started without a development permit first being obtained (*Local Government Act*, section 489(c)). A DPA must be accompanied by guidelines, set out in either the OCP or a zoning bylaw, that address how the objectives of the DPA will be addressed.

Development permit areas are the most common tool used by local governments for implementing the RAR and protecting riparian areas more generally. They allow a local government to regulate a wide range of development activities that involve various forms of site alteration beyond construction, such as the removal of vegetation and the disturbance of soils. A development permit can supplement requirements under zoning or subdivision bylaws, as long as it does not vary the zoned use or density.

A drawback of the DPA option is its limited enforcement measures. Violations of the terms of a development permit, or activities conducted in a DPA without a permit can be addressed only through a court injunction, which can be a time-consuming process. Where a proponent fails to secure a permit as required by a DPA and conducts works that impact the riparian area, the RAR does not provide a mechanism for “enforcement” action on the part of the province. As a consequence, gaining compliance with the objectives of a DPA is usually done more through education and incentives. The requirements in a DPA can also complement the use of other regulatory tools such as the *Fisheries Act* or *Water Sustainability Act*. In the most robust applications of RAR, a DPA is supported by enforcement bylaws and/or performance bonding to ensure riparian protection objectives are met.

ZONING BYLAWS

Zoning is a primary tool used by local governments to regulate land use, density, lot sizes and the location of buildings and structures. A zoning bylaw can establish riparian protection in the form of setbacks in which development is restricted or precluded. Setbacks are a common requirement of zoning bylaws that define the distance that structures should be from property lines, other structures, special features, between different land uses, and so on.

When used to implement the RAR, setbacks can reflect the *riparian assessment area* or RAR standards either by citing them generally, or by applying RAR compliant SPEA widths and measures on a stream-by-stream basis. The latter option requires a local government to undertake mapping of streams using the methodology outlined in the *RAR assessment methods*.

Zoning bylaws can also set guidelines on lot dimensions and layout to protect riparian areas. Some local governments have included a provision whereby the minimum lot size in particular zones must be defined exclusive of the riparian “setback.”

Zoning bylaw requirements are applied in several contexts:

- At time of rezoning, they can be used to achieve riparian protection over an entire parcel.
- At time of subdivision, in directing the size, shape and location of lots to protect riparian areas.
- At time of lot development, in regulating the siting of a building or other structure to avoid a riparian area.

Adjustments from the requirements within a given zone can be considered under a Development Variance Permit, which generally requires Council or Regional Board approval. Minor adjustments to zoning bylaw requirements can be handled by a Board of Variance, whose primary criterion is the determination of “hardship.” Proposed adjustments from compliant pre-designated SPEAs would trigger the need for an *assessment report*.

The adjustment process for zoning requirements is significant to the RAR in that it will ideally provide an avenue for adjustments to associated lot requirements; for example lot/yard setbacks or parking area requirements – that can help to accommodate the SPEA and associated measures.

The sample scenario in Figure 1 shows how the RAR requirements could be implemented for someone applying to create a new lot.

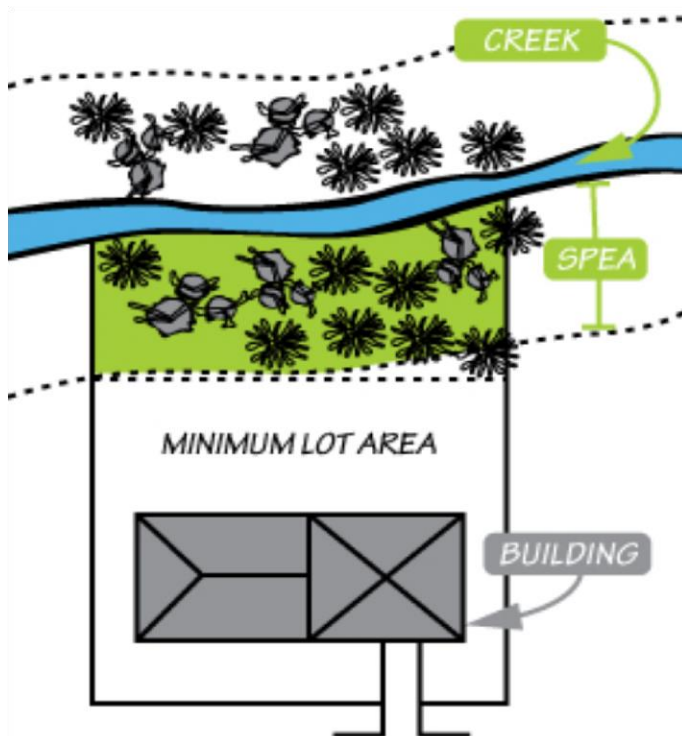



FIGURE 1. Sample scenario showing the Riparian Areas Regulation applied to an application to create a new lot.



A zoning bylaw can require that the creation of new lots must exclude the SPEA in meeting minimum lot area requirements. For example, if the minimum area for a single-family lot under a residential zone is 600 m², the area must be entirely outside the SPEA. The figure illustrates how this might work. Note that in this case, the SPEA would become part of the new lot but would be subject to special protective measures (e.g., part of a development permit area, subject to a restrictive covenant).

SUBDIVISION

Under Part 14 (Division 11) of the *Local Government Act*, local governments have the authority to adopt bylaws regarding the provision of works and services as part of subdivision. This authority is the basis for engineering standards that typically apply to the design and construction of roads and utilities. In support of the RAR, engineering standards can also be used to set requirements for protecting existing vegetation, replanting standards, and erosion and sediment control design standards. All of these measures can support stream and riparian protection.

The RAR applies to subdivision as the RAR has the goal of ensuring that development conforms to RAR requirements. This is especially important for subdivisions to ensure that subsequent development proposals for subdivided lots do not require variances from RAR standards.

The *Land Titles Act* addresses the process of subdivision, including the powers and responsibilities of subdivision approving officers.¹ Subdivision approving officers are obliged to consider local government regulations and policies in reviewing subdivision applications, which would include any riparian area protection provisions.

The Land Titles Act also authorizes subdivision approving officers to consider matters of public interest, including environmental issues, in approving subdivisions. For instance, they can require covenants on environmentally sensitive areas. Subdivision approving officers can also require dedication and improvement of “highways,” which are defined as “any way open for public use.”

¹ In municipalities, the subdivision approving officer is a staff member; outside municipal boundaries, the function of the approving officer is typically held by the Ministry of Transportation, though this is changing as regional districts negotiate the acquisition of subdivision approval authority.

This can be used to acquire trail rights-of-way to supplement riparian protection, where passive access along the outer portion of a riparian area is envisioned.

The Act also requires up to 5% of land to be subdivided to be dedicated as a public park. This can be a means by which a local government can acquire and protect riparian areas.

DEVELOPMENT APPROVAL PROCEDURES AND INFORMATION REQUIREMENTS

Part 14, section 460 of the *Local Government Act* states that a local government that has adopted an OCP bylaw or zoning bylaw must also define procedures under which a landowner may apply for a permit or amendment under that bylaw. Development application procedures bylaws typically set out such things as the application form, basic information requirements, timing and means of notification of the application. Such bylaws can be used to require applicants to indicate whether they propose to undertake activities in a riparian assessment area, and if so, require a RAR *assessment report* as part of the application.

Another means of acquiring this information is provided under section 484(e) of the *Local Government Act*, whereby local governments may require “development approval information” of development applicants, which can include natural environment information. Under this section local governments can also specify policies and procedures for providing that information. Again, this can be used to determine whether development will occur in a *riparian assessment area* and whether an *assessment report* is required.

OTHER LOCAL GOVERNMENT ACT PART 14 POWERS

LANDSCAPING

Section 527(b) of the *Local Government Act* provides the authority to require and set standards for landscaping for the purpose (among others) of “preserving, protecting and enhancing the natural environment.” Some local governments have separate landscaping bylaws while others have incorporated landscaping requirements into their zoning bylaws. This can be a method of regulating the preservation and enhancement of riparian vegetation.

SURFACE RUNOFF

Section 523 of the Act allows local governments to set requirements regarding the management of surface runoff, and establish maximum percentages of land area that can be covered by impervious surfaces (roofs, roads, parking lots, driveways, playing courts, etc.). These powers can assist the protection of streams / riparian areas by supporting the stormwater management measures required in RAR *assessment reports*.

SECURITY

Section 502 of the Act authorizes a local government to take security deposits, or bonds, as part of a development permit, development variance permit or temporary use permit. Security deposits can be used for satisfying landscaping conditions that have not been met, correcting an unsafe condition, and correcting damage to the environment resulting from a violation of permit conditions.

Security deposits can help to ensure that riparian protection and enhancement measures specified in a RAR *assessment report* are met, as a condition of any of these permits. These should be of a sufficient amount to act as an incentive to fully complete the activity specified and to cover a local government’s costs if they must take corrective action. The security can be valued on the basis of an estimated cost (e.g., 125% of estimated landscaping costs to restore riparian

vegetation), and can be held and/or released over several years (e.g., to ensure long-term survival of planted areas).

RESTRICTIVE COVENANTS

There are two types of covenants that can be used to protect riparian areas and other environmental features: restrictive and conservation covenants. These are discussed under “Long term protection of the SPEA,” below.

OTHER POWERS UNDER THE LOCAL GOVERNMENT ACT AND COMMUNITY CHARTER

Powers under other parts of the *Local Government Act* or the *Community Charter* are not referred to in the *Riparian Areas Protection Act* as a means of implementing riparian directives. However, in association with an OCP policy to protect riparian areas, some key regulatory powers from these other sources could be used to meet or exceed the RAR, or act as effective supplements to Part 14 powers. The following table summarizes these tools:

TABLE 2: *Additional local government tools supporting RAR*

AUTHORITY	LEGISLATIVE BASIS *
Soil deposit and removal	CC, sec.8(3)(m) (municipalities) LGA, sec.327 (regional districts)
Tree protection and management	CC, sec.8(3)(c) (municipalities) LGA, sec.500 (regional districts regarding tree cutting in hazardous areas)
Protection of the natural environment	CC, sec.8(3)(j) (municipalities)

Under any of these authorities, a local government could recognize riparian assessment areas, establish SPEAs and/or require Assessment Reports to evaluate SPEAs and their protective measures. Using these powers allows enforcement by ticketing and fines, which is an advantage in the eyes of some local governments who prefer this more immediate enforcement tool to court proceedings.

LONG-TERM PROTECTION OF THE SPEA

The RAR *assessment report* establishes SPEAs and associated measures which must be adhered to during development. Long-term riparian protection requires a form of legal protection of setback areas that resides with the land through successive owners of the property. Local governments are encouraged to use their authorities and tools to achieve long-term protection of SPEAs. Legal protection can take several forms: dedication of riparian areas as park or greenspace, conservation covenants, restrictive covenants and dedication to a land conservancy organization.

COVENANTS

There are two types of covenants that can be used to protect riparian areas and other environmental features: restrictive and conservation covenants. Restrictive covenants can be imposed by local governments. Conservation covenants are voluntary agreements.

Restrictive Covenants

Restrictive covenants are meant to prevent defined activities from occurring on a designated area of a property. They are provided for under Section 219 of the *Land Title Act* and have been used to protect environmentally sensitive lands, in particular stream and riparian areas. Registered on land title such that they remain associated with a property through changes in ownership, covenants can

be applied as a condition of rezoning, subdivision or development permit approval to inform landowners and developers of environmental values.

Restrictive covenants are variable in their effectiveness as they require monitoring by the government agency holding the covenant, usually the ministry or the local government. This is often challenging due to resource limitations. On re-sale of a covenanted property, a new property owner may not always be aware of or understand the implications of a restrictive covenant. It is often only when a complaint is lodged, usually by another landowner or resident that covenant violations come to light.

Conservation Covenants

Conservation covenants are legally binding agreements registered on title of a property to conserve land or features on that property. These have been developed as a means of protecting ecologically sensitive lands of all types, including riparian areas. Unlike restrictive covenants, conservation covenants are entered into voluntarily and allow landowners to permanently preserve natural features of their property while still retaining ownership and use. Also unlike restrictive covenants, conservation covenants can be held by designated conservation organizations or land trusts as well as local governments.

Conservation covenants can trigger some property tax reductions for landowners in jurisdictions that offer this as an incentive (see below). However, conservation covenants can have significant initial costs for both the organization that will be holding the covenant and the landowner, for the legal and administrative assistance in setting them up. Therefore, for a variety of reasons, both conservation organizations and landowners are selective in determining whether a conservation covenant is desirable on a given property.

Property Tax Exemptions

Property tax exemptions can be used as an incentive for riparian area protection. One example is the Natural Area Protection Tax Exemption Program (NAPTEP) administered by the Islands Trust in their jurisdiction. The Sunshine Coast and Capital Regional Districts are also participating in the program.

Approaches to implementing the Riparian Areas Regulation

The tools that a local government chooses to use to implement the RAR will depend on their individual legislative framework for stream and riparian protection, and the level of information it has at hand regarding streams in its jurisdiction.

Given these factors, this section outlines three general approaches to implementing the RAR and details some of the tools that can be used to apply that approach. The approaches offer increasing levels of pre-determination of SPEAs depending on the level of stream-related information and mapping that is available. The suggested approaches are discussed below and summarized in Table 3.

TABLE 3. Summary of approaches and bylaw options for implementing the Riparian Areas Regulation

APPROACH	EXPLANATION	ROLE OF APPLICANT/QEP	IMPLEMENTATION TOOL OPTIONS
1. Adopt the riparian assessment area only	Establish an area that is 30 m from the <i>top of bank</i> or 10 m from the <i>top of ravine bank</i> on all watercourses, within which a SPEA will be defined according to the RAR assessment methods.	1. BC Land Survey identifies top of bank (and/or top of ravine bank) 2. a) QEP determines SPEA according to simple assessment. OR b) QEP determines SPEA according to detailed assessment.	<ul style="list-style-type: none"> • Official Community Plan • Zoning bylaw • Development permit area • Environment/stream protection bylaw
2. Adopt the riparian assessment area and SPEAs generally	Adopt Table 2-4 from the RAR simple assessment methods, along with applicable definitions.	1. QEP determines which SPEA applies on site specific basis – i.e., conducts a simple assessment or 2. If applicant wishes to vary from applicable SPEA determined by simple assessment, QEP determines SPEA according to detailed assessment.	<ul style="list-style-type: none"> • Official Community Plan • Zoning bylaw • Development permit area • Environment/stream protection bylaw
3. Adopt and designate (pre-determine) SPEAs	Establish/designate SPEAs on streams according to Table 2-4 from the RAR simple assessment methods and adopt applicable definitions.	1. BC Land Survey identifies top of bank (and/or top of ravine bank) as RAA boundary; or 2. If applicant wishes to vary from designated SPEA, QEP determines SPEA according to detailed assessment.	<ul style="list-style-type: none"> • Local Area Plans, Watershed Plans • Zoning bylaw • Development permit area (requires a map) • Environment/stream protection bylaw

APPROACH 1: ADOPT RIPARIAN ASSESSMENT AREAS ONLY

A local government can establish an area around its *streams* that reflects the *riparian assessment area* as defined in the RAR; 30 m from the top of the bank on all *streams* and ravines less than 60 m in width, or 10 m from the top of the ravine bank for ravines larger than 60 m in width.

Any development proposed in this area would trigger the requirement for an applicant to have the SPEA defined by a QEP according to the *assessment methods*. The QEP, in consultation with the applicant can choose whether to use the simple or detailed assessment to define the SPEA. The QEP is responsible for completing and submitting an *assessment report*.

The *riparian assessment area*, and the need to define SPEAs at time of development application, can be established in several ways:

- As a policy in an OCP, provided it is supported by development permit conditions (see below).
- As a Development Permit Area under an OCP. The DPA guidelines would delineate the area subject to the permit requirement, which must be equal to or greater than the RAR *riparian assessment area* and refer to the RAR *assessment methods*. In some cases, a DPA may be supported by watercourse mapping, but a fully compliant DPA must contain language that allows all *streams* under the RAR to be captured in the permit area.
- Under a zoning bylaw setback provision.
- In an environmental protection bylaw. The bylaw can refer to the RAR *assessment methods* in its permit application requirements.

APPROACH 2: ADOPT RIPARIAN ASSESSMENT AREAS AND SPEAS GENERALLY

A local government can pre-establish *riparian assessment areas* as well as indicate how SPEAs are to be defined in these areas by adopting the equivalent of Table 2-4 under the simple assessment in the RAR *assessment methods*. This table sets out SPEA widths and measures based on certain stream characteristics: fish-bearing, stream flows and the nature of riparian vegetation.

Applicants proposing development within a *riparian assessment area* would commission a QEP to determine what pre-established SPEA would apply to their property. If the proposed development occurs outside the applicable SPEA width, then further assessment is not necessary and the QEP can submit the applicable *assessment report*. If the proposed development encroaches into the defined SPEA, the applicant may choose to:

- a) have a detailed assessment carried out to determine if this results in an alternative SPEA;
- b) modify the development plan to avoid the SPEA; or
- c) apply for authorization under the federal *Fisheries Act* (as defined in section 4(3) of the RAR) if adequate modification is not possible.

The *riparian assessment area* and pre-defined SPEA widths and measures could be established in the same ways:

- As a policy in an OCP, provided it is supported by development permit conditions (see below).
- As a Development Permit Area under an OCP. The DPA guidelines would refer to the RAR *assessment methods* in its application requirements and

outline the use of table 2-4 of these methods. In some cases, a DPA may be supported by watercourse mapping, but a fully compliant DPA must contain language that allows all *streams* under the RAR to be captured in the permit area.

- Under a zoning bylaw setback provision. Proposed adjustments to a defined SPEA setback (requiring a detailed assessment or DFO authorization) would be handled under a Development Variance Permit process.
- In an environmental protection bylaw. The bylaw would refer to the RAR assessment methods in its permit application requirements.

APPROACH 3: ADOPT AND DESIGNATE (PRE-DETERMINE) SPEAS

This approach can be considered by local governments who have mapped and classified the *streams* in their jurisdiction using methods that reflect the former Streamside Protection Regulation or the simple assessment in the assessment methods of the RAR. A local government could designate SPEA widths and measures, based on Table 2-4 in the RAR assessment methods, on identified *streams* for which they have sufficient information to conduct a simple assessment.

For those *streams* with predetermined SPEA widths and measures, a development applicant would not need to hire a QEP to define the applicable SPEA. They would be required to locate and survey the top of the bank (and/or top of the ravine bank, as applicable) to show where the predetermined SPEA is relative to the proposed development. If the proposed development encroaches into the predetermined SPEA, the applicant may choose to:

- a) have a detailed assessment carried out to determine if this results in an alternative SPEA;
- b) modify the development plan to avoid the SPEA; or

- c) apply for authorization under the federal *Fisheries Act* (as defined in section 4(3) of the RAR) if adequate modification is not possible.

If sufficient information is not available for all *streams*, a local government can combine the approaches – for example, using approach 3 on *streams* that are well documented and approaches 1 or 2 on all other *streams*.

This combined strategy lends itself to being implemented through more detailed Local Area (or Sector) Plans. These plans are adopted under OCPs and guide rezoning, subdivision and other permitting decisions. Other methods for implementing this approach are similar to those for approach 2:

- *As a development permit area* – In this case, if a DPA is established based on the predetermined SPEA width, any activity proposed within the DPA would require a detailed assessment to justify an alternative SPEA. The DPA guidelines would refer to the RAR *assessment methods* in its application requirements.
- *Under a zoning bylaw setback provision* – Proposed adjustments to a defined SPEA setback (requiring a detailed assessment or HADD authorization) would be handled under a Development Variance Permit process.
- *In an environmental protection bylaw* – The bylaw would refer to the RAR assessment methods in its application requirements.

Several local governments have adopted stream maps and classifications regarding fish habitat sensitivity, which they then use to establish riparian protection measures as part of land use decisions. Stream classification maps can be useful tools to support the implementation of the RAR, however while these maps may reflect RAR SPEA standards regarding fish-bearing potential

and/or stream permanence they may not specifically address riparian vegetation conditions. Local governments who have stream classification maps, or have other pre-designated riparian protection classes need to review their classifications regularly and also consider their validity when applied to a specific site. This helps ensure that all the stream characteristics used in the RAR are taken into account and that the requirement for an *assessment report* is applied wherever a *stream* as defined in the RAR is involved.

COMMONLY ENCOUNTERED ISSUES WITH RAR POLICIES AND BYLAWS

In the process of RAR implementation and dialogue between the ministry and local governments, some recurrent issues with delivery have been identified. These commonly encountered issues are included in this guidebook so that local governments can ensure their policies and bylaws take them into account.

WATERCOURSE MAPPING AND/OR PRE-DESIGNATED SPEAS THAT EXCLUDE RAR STREAMS

Several local governments have developed watercourse classification systems and associated maps for a range of purposes relating to environmental protection. In some cases, these maps have informed the designation of watercourses subject to RAR conditions and/or the pre-designation of SPEA boundaries. Watercourse mapping provides a valuable resource to meet the objectives of the RAR, but local governments must ensure that all *streams* as defined in the RAR are captured in their process. For example, as described below modified watercourses such as ditches are sometimes subject to different standards in bylaw language, although modified watercourses are typically considered *streams* under the RAR. An appropriate response might entail the inclusion of language that provides that RAR standards apply to all watercourses on the map and also those that are unmapped, with their RAR status determined by a QEP. The goal should be to ensure that the creation of a watercourse map

does create a misunderstanding on the part of proponents that RAR standards do not apply to any RAR *streams* omitted from the map.

APPLICABLE DEVELOPMENT EXEMPTED FROM PERMIT REQUIREMENTS IN BYLAWS

Development Permit Areas are the most common method used by local governments to implement the RAR. In most cases, DPAs include a list of exemptions to define which activities do not require a permit. The definition of *development* in the RAR is broad and includes such activities as the removal of vegetation, disturbance of soil and the creation of nonstructural surfaces that may typically be exempted from development permit requirements. To be fully compliant with the RAR, it is important that local governments do not inadvertently exempt activities in their DPA that are included in the definition of *development* as described in section 1 of the RAR.

ENSURING SUBMISSION OF RAR ASSESSMENT REPORTS

The RAR requires that local governments be in receipt of notification that an *assessment report* has been submitted to the province before approving development. The RAR assessment methods specify that a QEP must use the online RAR Notification Service (RARNS) for this purpose. In some cases, local governments specify that RAR related material including *assessment reports* be sent to the local government for review in advance of permit approval. This advance review procedure is permissible under the RAR; however a process where a RAR assessment report is submitted directly to the local government without using the RARNS is not compliant with the RAR as no notification will be issued. Use of the RARNS is important beyond the issuance of a notification as

the information submitted is used as a basis of ongoing RAR project auditing, compliance review, and effectiveness monitoring.

DITCHES AND CHANNELIZED WATERCOURSES OMITTED FROM RAR REQUIREMENTS


The definition of *stream* in the RAR is intentionally broad and captures many waterbodies that may not be commonly considered as riparian habitat. This includes both natural and man-made watercourses, whether they contain fish or not. The misinterpretation that the RAR only applies to watercourses containing fish, combined with a lack of awareness of the habitat value of modified watercourses, has led to some jurisdictions omitting these from RAR bylaw standards. Even in cases where a watercourse is assessed as a *ditch* as defined in the RAR, a SPEA will apply. Similarly, RAR standards apply to ditches and channelized watercourses in agricultural land (see below).

APPLICABILITY OF RAR TO AGRICULTURAL LANDS

The RAR does not apply to *farm practices* as defined in the *Farm Practices Protection Act*. In some cases, this can lead to the misinterpretation that the RAR does not apply to lands zoned for agriculture, or in the Agricultural Land Reserve (ALR). The RAR does apply to these lands for activities that are not *farm practices*, for example residential construction. It is important to note that local governments have the ability to establish bylaws that apply to agricultural lands, and some have implemented setbacks for agricultural buildings that complement the setbacks designated under RAR.

Local government enforcement tools

The RAR does not contain enforcement provisions because it is a provincial directive to local governments. It establishes a due diligence requirement and proactive complement to existing regulatory tools, notably the federal *Fisheries Act* and the provincial *Water Sustainability Act*. It relies on other Acts and powers such as those in local government, provincial and federal jurisdictions. These



include the federal *Fisheries Act*, which prohibits serious harm to fish; the provincial *Water Sustainability Regulation*, which regulates changes in or about a stream; and some local government bylaws (e.g., tree protection, soil preservation and watercourse protection) that have various powers and applicability depending on their wording.

The preferred course in addressing non-compliance will be to first seek voluntary compliance by the proponent.

If this is unsuccessful, enforcement actions by the local government may be required using the tools at its disposal and based on the bylaws and policies by which it implements RAR. Some of these methods have been mentioned in the previous sections, and include tickets and fines, stop work orders, court actions, withholding approval, security deposits or bonds, and restrictive covenants. They are summarized in Table 4.

TABLE 4. Enforcement tools available to local governments

TOOL	SOURCE AND WHEN TO USE	COMMENTS
Ticket/fine	Can be applied under a regulatory bylaw established under the <i>Community Charter</i> or Part 14 of the <i>Local Government Act</i> (e.g., tree protection, soil deposit and removal, runoff management, environmental protection)	Can be used as a preventative tool instead of, or in addition to, a disciplinary measure. Typically enforced by bylaw enforcement staff; may require training on what constitutes riparian infractions. No avenue for requiring remediation unless tickets are used as a means of negotiating a remedy.
Stop work order	Building permits; may be applicable to permits issued under regulatory bylaws (see above)	Allows inspectors or local government staff to stop development activity on a site until infraction rectified. Applicable only while development is under way.
Withhold approval	For rezoning, under the <i>Local Government Act</i> ; for subdivision, approving authority under <i>Land Title Act</i> .	Can withhold approval of preliminary plan or design stage until riparian issues are addressed satisfactorily. For subdivision, the approving officer must be able to justify based on bylaw requirements or “public interest.”
Court order or injunction	Development permits	Stops work until infraction is rectified.
Security deposits/bonds	Can be required with most forms of permits	Should be of sufficient amount to act as incentive to complete the activity required or to cover a local government’s costs if it must take corrective action.
Restrictive covenants	Rezoning approval, subdivision approval, development permits	Monitored by the government agency holding the covenant. New landowners need to determine if any covenants exist on land that they purchase.

Other environmental concerns with fish and fish habitat during development

The RAR deals with riparian fish habitat, and only in association with residential, commercial and industrial development on land under local government jurisdiction (this includes private land and the private use of provincial Crown land). Other uses are subject to other planning and management approaches.

Although beyond the scope of section 12 of the *Riparian Areas Protection Act*, local governments can also consider the following impacts that can be positively influenced by the application of bylaw provisions:

- hydrological impacts on fish habitat resulting from land use and development and the associated creation of impervious surfaces;
- water quality impacts on fish from point and non-point source pollution; and
- the role and importance of riparian ecosystems to terrestrial species.

Many local governments have chosen to address these matters through integrated, watershed-based stormwater / riparian planning and management.

LARGE WOODY DEBRIS (LWD)

Large woody debris can be problematic in urban areas and local governments regularly remove it because it poses a flood hazard to instream structures, primarily culverts.

The abundance of LWD in urban streams is considerably lower than that for forested streams. Areas with more urbanization tend to have more LWD removed from the channel and lower recruitment due to the removal of danger trees. Emphasis needs to be placed on finding opportunities to satisfactorily address both the fish habitat needs and municipal hazard concerns to enable the recovery of urban streams. Past practices of LWD removal should be re-evaluated in light of the importance of LWD to stream environments. It is recommended that local governments work collaboratively with DFO and the Ministry on developing best management practices for managing LWD in urban streams.

The RAR has designed the SPEA to support the supply of LWD (downed trees and large pieces of wood) to streams. Research confirms the role of LWD as an essential component of healthy fish habitat, contributing to the complexity and stability of stream channels as well as providing cover for fish and aiding in the cycling of nutrients.

WATERSHED PLANNING

Local governments are encouraged to undertake watershed planning because it leads to more informed environmental decisions. Watershed plans consider environmental, cultural and socio-economic values and identify clear and realistic goals, objectives and timelines. They enable the use of best available information, can resolve land and water use conflicts and build partnerships which lead to improved cooperation. Watershed plans reconcile short term actions and future plans for the watershed.

A component of any watershed plan should be riparian protection. The RAR can be used to provide the riparian fish habitat component of a watershed plan. Recommendations from watershed plans, because they are more comprehensive, may develop setbacks that incorporate a number of interests and values, and may exceed those established solely by following the direction in the RAR.

STORMWATER MANAGEMENT

Stormwater management is critical to the protection of urban and rural streams. Integrated stormwater management plans (ISMPs) are another tool that many local governments are using to address stormwater management in an environmental and drainage management context. Local governments are strongly encouraged to familiarize themselves with provincial stormwater guidance materials, including Stormwater Planning: A Guidebook for British Columbia.

WETLANDS

Wetlands are very sensitive to hydrological changes and water quality degradation. Although the RAR provides a SPEA for wetlands, if significant soil movement is part of the development plan a hydrological expert should also be retained. The hydrological expert will evaluate if soil movement will impact the water regime of the wetland and the riparian vegetation. Stormwater should be treated before being discharged into a natural wetland and a follow-up evaluation undertaken, to ensure that input of additional water over more frequent periods will not harm the functioning of the wetland.

HAZARDS

Some development properties will require assessment and confirmation that the land may be used safely for the purpose intended without undue risk of hazards. Hazards may include flooding, groundwater flows, mud flows, erosion, subsidence, land slip, earthquake or avalanche. With respect to watercourses, steep slopes found in ravines are often of special concern and require assessment by a professional. Development on areas with thick peaty soils may also cause heaving of soils that may impact the integrity of a SPEA.

Requirements for developing monitoring, enforcement and education strategies

The RAR also requires local governments to work with DFO and the ministry to develop strategies for:

- obtaining certificates from QEPs that projects have been carried out as defined in the Assessment report;

- monitoring and reporting, to ensure QEPs have prepared Assessment Reports according to the prescribed assessment methods and that the development has proceeded consistent with the Assessment Report; and
- educating the public on the protection of riparian areas.

This section of the RAR recognizes that it will take the efforts of all groups involved to plan new development or redevelopment projects so that riparian areas are effectively protected. Informing and educating people about riparian area protection and the requirements of the RAR are important parts of the compliance continuum.

Public awareness and understanding promotes compliance and ensures long-term recognition of the importance of SPEAs, both pre and post development. By being well informed about both the requirements of the RAR and the local government's regulatory approach, the public can be involved in reporting inappropriate or non-compliant activities.

The RAR contemplates a role for all levels of government to work together in developing strategies and tools for education purposes.

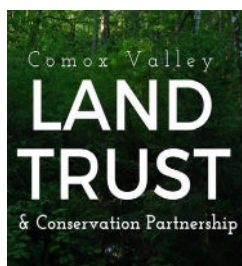
FINDING BALANCE

COMOX VALLEY LAND TRUST



A Framework for Establishing Environmental Development Permit Area (EDPA) Regulations for the Protection and Restoration of Environmentally Sensitive Areas (ESAs)

Prepared by the Comox Valley Conservation Partnership with support from:



Acknowledgement

This document was prepared by Comox Valley Conservation Partnership (CVCP) a collaborative initiative involving over 20 Comox Valley stewardship, environmental and ratepayer groups organized and administered by the Comox Valley Land Trust. The CVCP Steering Committee is made up of contract staff and volunteers from partner groups. The CVCP program manager, David Stapley, led the research and writing of the document with the help of members of the CVCP Steering Committee including: Tim Ennis, Piet Rutgers, Murray Little, Bill Heidrick, Kathryn Clouston, Linda Safford, Robert Deane, Steve Williams, Kate Panayotof, Jack Minard and Sandra Borton.

The Comox Valley Land Trust would like to acknowledge the assistance and advice provided by [Deborah Curran](#) from the University of Victoria's [Environmental Law Centre](#) in the research and publishing of this document.

A Framework for Establishing Environmental Development Permit Area (EDPA) Regulations for the Protection and Restoration of *Environmentally Sensitive Areas (ESA's)* and Corridors

(Note: All terms found in the definitions section (pages 10-14) are in italics)

1) Objective

The objective of this framework is to balance the need to accommodate growth and development while protecting natural values that are important to the community as a whole. This framework is intended to provide guidance for the development of Environmental Development Permit Area (EDPA) regulations that direct development away from environmentally sensitive areas (ESAs) to protect *ecosystems* and restore and connect them over time.

2) Background

The Comox Valley was once a large and pristine region of intact ecosystems. Recent analysis of the 2014 *Sensitive Ecosystem Inventory* (SEI) completed for the Comox Valley Land Trust in partnership with the Comox Valley Regional District (CVRD) shows less than 5% of those ecosystems remain intact. The SEI provides an important evidence-based indicator of the impacts of industry and development on ESAs. Protection of the remaining intact ecosystems and restoration of damaged environmentally sensitive areas is the primary goal for strengthening Environmental Development Permit Area (EDPA) regulations and the quality of the land designated within them.

The Comox Valley Conservation Strategy (CVCS), endorsed by all local governments in the Comox Valley in 2008, provides a land use planning framework to protect and restore a healthy environment. The goal of the CVCS is to protect and restore natural landscapes, creeks, wetlands, forests and shorelines that make up the environmentally sensitive areas of the Comox Valley. The economy and the key to livable communities rely on a healthy natural environment. Protecting and restoring environmentally sensitive areas is the goal of robust Environmental Development Permit Area (EDPA) regulations. EDPA regulations are an important way to implement the Comox Valley Conservation Strategy.

3) Benefits & Costs

EDPA regulations that direct development away from ESAs and encourage restoration of damaged areas will ensure communities benefit from free ecosystem services that healthy ecosystems provide. Benefits that accrue to the environment, local government, landowners and citizens' quality of life from ecosystem services include:

Environment	Local Government	Land Owners	Quality of Life
<ul style="list-style-type: none"> Wildlife & plant habitat Healthy watersheds Water quality Fish & aquatic habitat Pollination Biodiversity Intact ecological processes Climate change resilience 	<ul style="list-style-type: none"> Improved water quality Natural rainwater (storm water) management Reduced infrastructure maintenance and costs 	<ul style="list-style-type: none"> Increased property values Reduced risk of flooding Reduced infrastructure costs & lower property taxes 	<ul style="list-style-type: none"> Clean water Improved air quality Reduced demands on health care system Access to green space, outdoor recreation, active living, nature education

One of the outcomes of effective EDPA regulations is to ensure the environmental, economic and social costs are mitigated when landowners exercise their development rights. In some instances, the potential economic value gained from development may be reduced when regulations limit the location and type of development. The potential economic loss to individual landowners must be balanced with community costs and benefits. Community costs from development in environmentally sensitive areas can lead to higher infrastructure costs, flooding downstream and loss of quality of life benefits. Landowners benefit from ESAs on or adjacent to their properties as evidence shows that proximity to natural amenities raises property values.

Local governments have tools, such as zoning, *density bonuses* and variances that can help mitigate the impacts that EDPAs might have on some landowners.

4) EDPA Framework

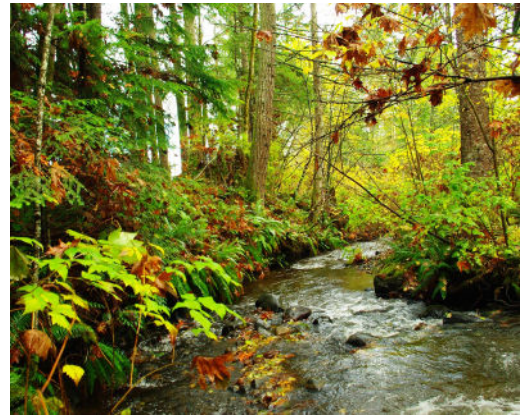
This Framework proposes an approach to EDPAs that can be referenced by all municipal, regional or First Nation's governments in the development of Official Community Plan (OCP) and/or Local Area Plan (LAP) Bylaws. This Framework provides examples from the best practices and approaches to date in British Columbia.

4.1) Purposes

The primary function of an EDPA is to ensure that ESAs are protected, connectivity restored and maintained, and development impacts mitigated. This includes allowing decision makers to have the ability to place conditions on development.¹ ESAs include the following:

¹See Appendix A: Local Government Act Legislation establishing EDPA regulations, pages 15-17.

- All areas identified by the most up to date Sensitive Ecosystem Inventory (SEI)
- All sensitive areas, known and that are discovered during the assessment phase preceding development
- Critical habitats of rare and endangered species
- Fish, all waters they inhabit and the waters that support hydrological function
- All *riparian/littoral areas*
- Critical bird breeding, nesting and rearing areas
- Contiguous natural corridors (biodiversity corridors) of natural vegetation
- Natural features that are critical in maintaining hydrological function
- Ecological communities at risk



4.2) Natural Stormwater (Rainwater) Management

Protect and restore ESAs that provide natural systems for managing rainwater in accordance with the Water Balance Model and the most recent *integrated watershed management plan, integrated stormwater (rainwater) management plan* and Water Sustainability Plans under the BC Water Sustainability Act. This includes managing rainwater on site, maintaining pre-development drainage flows and integrating drainage with natural systems in ways that reduce rapid runoff and contribute to landscape level infiltration.

4.3) Connectivity

Maintain biodiversity by ensuring sensitive ecosystems and habitat areas are connected by a network of *natural areas*. This is becoming increasingly important as some species will migrate north or to higher elevations to adapt to climate change. Figure 1 and Table 2 show examples of land use components that make up a natural areas network.

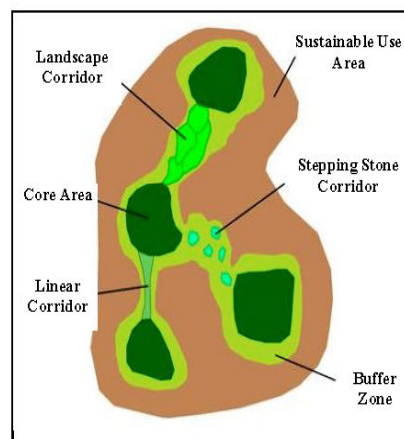


Figure 1: Components of a natural areas network: a mosaic of land uses that can support biodiversity

Natural Area Network Components	Land Use
Core Areas	Parks, reserves and protected areas - such as sensitive ecosystems, critical habitats, areas of unfragmented natural habitat and large forested areas.
Buffer Areas	Areas of transition that protect core areas from adjacent uses.
Corridors	Land and water corridors that link core areas; they can include intact and restored areas, and some areas under compatible human use, such as forestry and agriculture.
Sustainable Use Areas	Lands designated for human settlement and use

Table 2: Land Use descriptions for areas within a Natural Area Network

EDPA provisions that maintain and protect the components of a network of natural areas that connect ecosystems are essential for maintaining biological diversity and ecosystem functioning.

4.4) Quality of Life

Provide for enhanced access to natural areas for quality of life and personal health.



5) Key Elements of Robust EDPA regulations

5.1) Designation of areas covered by EDPA regulations

When comprehensive mapping has not occurred then EDPA designations will need to be applied extensively throughout the jurisdiction. This will allow the jurisdiction to set site assessment criteria to identify important environmental features such as sensitive ecosystems or habitat for *species at risk* (SAR) when development is proposed within these areas.

For example Saanich has mapped discrete EDPA polygons where they occur throughout the municipality. By contrast the village of Cumberland has designated large areas that contain mapped and unmapped ESAs in lands zoned for future development.

For examples of an EDPA that designates the physical coordinates of ESAs through investment in scoping and mapping see [Saanich's EDPA](#), p 115, p 122; and the City of Kelowna that has mapped watersheds and watercourses as well as terrestrial ESAs to determine areas covered by EDPA regulations. See Kelowna's [EDPA map](#).

5.2) Establishment of “no touch” areas for Environmentally Sensitive Areas (ESAs)

ESAs would be specified as “no touch” areas. In “no touch” areas development is not permitted. Where riparian areas have been impacted by development or logging a no touch area of 15 meters minimum in sites already developed and 30 meter minimum in undeveloped green field sites would apply.

Alternatively, no touch areas could be established through mapping based on site assessment by local governments to predetermine no touch areas of special concern.

5.3) Establishment of *buffer zones* around all ESAs

Buffer zones would be required around all environmentally sensitive areas. A 5 meter no disturbance minimum would apply. *Low impact development (LID)* would be allowed in the buffer zone beyond the 5 meter minimum such as non-motorized trails, gazebos and benches and rainwater management infrastructure. Only development that does not affect the integrity of the buffer area to protect the ESA would be allowed.

The size of the buffer zone and type of development allowed within the zone would be defined in development permit guidelines and require assessment by a *Qualified Environmental Professional (QEP)*.

For examples of buffer zones in an EDPA refer to the City of Courtenay's Arden Corridor Environmental Development Permit Area, [Arden Area LAP](#), section 9 p 21-22; [Village of Cumberland OCP](#), EDPA, section 10.5. 1-4, p 90-92; [Saanich's EDPA](#), p 115.

5.4) Bio-inventory Assessment of all Sites

Before any land clearing takes place, and before development design begins, an application for a development permit will require a biological site inventory (bio-inventory) according to the procedures described in the most current “Develop with Care” Guidelines for Urban and Rural Land Development in British Columbia.



For examples of a Bio-inventory assessment refer to the City of Courtenay's [Arden Corridor LAP](#), p 17-23; [Village of Cumberland OCP](#), EDPA, 10.1.5 sections 1-4, p 90-9; [Environmental Development Permit Areas: In Practice and in Caselaw](#), Regional District of Central Okanagan Regime, section 2.4.7 p 18.

5.5) Qualified Environmental Professional (QEP)

Only a QEP with the qualifications appropriate for the type of assessment required and who has worked in the ecosystems of the Comox Valley should undertake the assessment. Should there be cause to believe that the original assessment is erroneous or insufficient to confirm the bio-inventory assessment a 3rd party QEP may be retained by the jurisdiction and paid for by the applicant. In riparian areas local governments would have to establish EDPAs that exceed Riparian Area Regulations (RAR) to allow for 3rd party assessment.

For an example of 3rd party assessment see [Arden Corridor LAP](#); Section 18, p 23; for example of appropriate qualifications for type of ESA see [Nanaimo OCP, DPA2](#), p 165.

5.6) Biodiversity Corridors

Biodiversity Corridors on all sites will require protection and/or restoration over time. Bio-inventory assessments would include documenting and mapping (GPS) the presence of existing and potential biodiversity corridors. Planning for development should include identifying and protecting corridors so that contiguous corridors are established over time.



For examples of biodiversity protection see: [Village of Cumberland OCP, EDPA 1](#), p 85-88; [Arden Corridor LAP](#), section 5.i p 21; [Environmental Development Permit Areas: In Practice and in Caselaw](#), Regional District of Central Okanagan Regime, section 2.4.7 p 18.

5.7) Require that Province of BC “Develop With Care” Guidelines be followed

Site planning, design and construction activities will follow the most current Province of BC “Develop With Care” Guidelines.

5.8) Monitoring and Security

Monitoring should be required to ensure that the conditions of the development permit have been met. The length of monitoring should be based upon the nature of the site disturbance, proposed mitigation and maintenance required.

For an example of comprehensive monitoring requirements see [Nanaimo OCP, DPA2](#), p 166.

Monitoring should be undertaken by a QEP with the appropriate professional designation to assess the environmental values on the site and the complexity of the development.

Security should be required and set at a level to ensure that all requirements of the conditions, mitigation and maintenance have been met.

For an example of an effective performance bond to safeguard against non-compliance, see City of Kelowna [Natural Environment DP](#), chapter 12, p 11, Performance Bonding.

5.9) Existing development

Redevelopment of sites within an EDPA where development existed before the EDPA came into effect will only be allowed on the existing footprint. Development outside the existing footprint will be subject to EDPA regulations and will require measures for restoration of damaged or lost environmentally sensitive areas. Wherever possible a redevelopment will bring the footprint into compliance with *Riparian Area Regulation (RAR)* and EDPA regulation. Where restricted by lot size and gaining buffers is not possible, the applicant would work with the local authority to gain optimum protection/restoration which could include paying for mitigation elsewhere (Development Variance Permit maybe required).

6) Incentives and Variances

In order to support the EDPA goal of the restoration and protection of environmentally sensitive areas, OCP policies will allow the jurisdiction to use zoning tools such as *conservation zoning setbacks*, *amenity density bonus* (municipality) and *clustering*. Local Government can also make adjustments to *Development Cost Charges* and taxation to support and encourage restoration and protection measures.

For an example of the use of a zoning variance see section [Arden Corridor LAP](#), #4.8, p 21.

Local Governments should support initiatives such as the *Conservation Tax Incentive Program (CTIP)* as an incentive to landowners who place their land or a portion of their land into a Conservation Covenant in perpetuity.

7) Assumptions

This EDPA Framework assumes the following:

- An acceptance of the Provincial Sensitive Ecosystem Inventory as a fundamental starting point and includes all environmentally sensitive areas (ESAs) discovered and added over time. It is important that map data is continually added to the region's mapping database (Sensitive Habitat Atlas). This would include data provided by Qualified Environmental Professionals (QEP's) who discover/encounter *Streamside Protection and Enhancement Areas (SPEAs)* under the Riparian Area Regulations (RAR) and any mapping undertaken under local policy requirements or by Watershed Stewards.
- Modern Integrated Stormwater (and Rainwater) Management Planning (ISMP) would be in alignment with this Framework and would inform this Framework as plans are developed.

- Urban or Regional tree strategies/bylaws, soil removal and deposit bylaws, and watercourse protection bylaws would be in place and in alignment with this framework and would inform this document as required.
- The security required in the EDPA is adequate to ensure EDPA guidelines are met.
- Environment Canada’s Species at Risk Act (SARA) Registry and the BC Conservation Data Centre would also inform this framework through definitions of species habitats cross-referenced with Development Assessment Reports.

8) Watershed Health and EDPAs

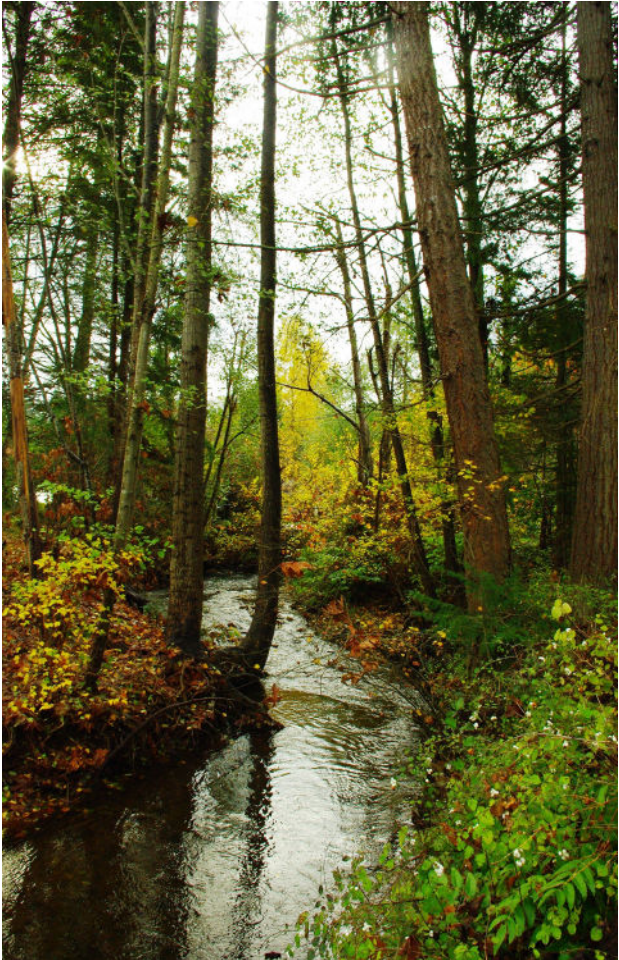
Watershed health is described by the development of an *Integrated Watershed Health Index* that can be utilized for site or project screening levels. The index would utilize GIS right through to statistical and geospatial modeling of ecological and hydrological attributes and their contribution to the overall health of the watershed. Such an index should include:

- Habitat
- Soils
- Landscape condition
- Hydrology
- Geomorphology
- Water quality
- Water quantity
- Biological condition and vulnerability

For information on how to assess watershed health and integrate multiple indicators see examples of regional and local [Integrated Watershed Assessments](#)

Once data has been gathered an Integrated Watershed Health Index can be created and used to develop an Integrated Watershed Management Plan.

Local Governments should:
 Consult with local stewardship groups and support collaborative monitoring and data collection activities for development of an Integrated Watershed Health Index. Monitoring data collected over time should be used to inform watershed plans.



For an example of collaborative water monitoring program see [Regional District of Nanaimo Community Water Monitoring Project](#). For example of watershed management plans see [Tsolum River Recovery Plan](#) and the [Bowker Creek Watershed Management Plan](#).

9) Strategies to Employ as Guidance

- Follow the Province of [British Columbia's Develop With Care Guidelines](#)
- Utilize the Federal ACT ([Development Standards: A Guide for Practitioners](#)) initiative.
- Modern Integrated Stormwater Management Planning provides a significant opportunity to integrate environmental protection and restoration on a watershed scale. These plans should form a part of a sustainable service delivery process that safely and effectively integrates natural systems with human-made green and piped infrastructure as parts of a holistic approach to overall rainwater management across the landscape.
- Use the *Precautionary Principle* to decide if the environmental impact of a given development is acceptable (environmentally sensitive development is the key objective of this Framework)
- Use Low Impact Development (LID) site layout, patterning and building form to guide and evaluate development adjacent to sensitive areas. This principle recognizes that the building and development should aim to understand the interrelationships between drainage, landforms, soils, habitat and land use and that there is an explicit desire to depart from the 'conventional' approach of stormwater servicing, road widths and layouts including single family housing developments.
- Engage in public consultation and involve organizations that seek to improve watershed health and have been doing so over time (Watershed Stewardship Groups).
- Assess environmental impacts of activities on public lands and protect ESAs by directing development away from ESAs, limiting tree and native species removal and installation of hard infrastructure. When development needs to occur, utilize LID techniques, green infrastructure and undertake restoration of damaged ecosystems.
- Limit stream crossings. When required, clear span bridge crossings are encouraged.
- Consider adopting a Regional Conservation Strategy and embedding it into the RGS.
"A Regional Conservation Strategy is a big picture, landscape view of the region as a whole and provides a framework for considering conservation options for entire watersheds and ecosystems. This larger, regional view encourages thinking beyond municipal boundaries and presents opportunities for collaboration among municipalities on conservation efforts often with cost-saving benefits."

-Excerpt from the [Green Bylaws Toolkit](#), 2016, p 55.

This work has already been completed in the Comox Valley by the Comox Valley Land Trust and is presented in the documents [Nature Without Borders: A Regional Conservation Strategy](#) and [Nature Without Borders, 2nd Edition: The Comox Valley Land Trust Regional Conservation Strategy](#).

10) Definitions

Amenity Zoning (Density Bonus): Amenity zoning is the general term for often unique zoning that provides an incentive to developers to provide an amenity such as parkland, clustering, waterfront access, daycare facilities, or affordable housing as part of a rezoning package. Amenity zoning and density bonus provisions are often used interchangeably because in exchange for increased density the developer provides the amenity.²

Aquatic Habitat Corridors: *Biodiversity corridors* designated to protect watercourses, and the wetlands and fisheries sensitive zones surrounding them.³

Biodiversity Corridor: The land and water pathways that link core parks and protected areas. They incorporate intact and restored ecosystems, areas that have the potential for restoration and are key to connectivity and areas under human use, such as forestry and agriculture. These habitat connections are critical to maintaining health and biodiversity in plant and animal populations. They provide fish, birds and other species with the opportunity to move across the landscape, to find food, birthing and rearing spaces, and protection from predators. They include areas of public and private ownership. The two types of biodiversity corridors are: *Aquatic Habitat Corridors* and *Upland Habitat Corridors*.⁴

Buffer zones: A Natural Area surrounding an *Environmentally Sensitive Area* (ESA) that acts to buffer the impact of land use that might otherwise compromise the natural functioning of the ESA. Buffer zones create a transition from ESAs to other land uses.⁵

Clustering: Clustering of development refers to the rezoning and subdivision of a larger parcel so that new lots can “cluster” on a portion of the new properties (or property if it is a comprehensive development zone) away from sensitive *ecosystems* and greenways.⁶

Conservation Zoning Setbacks: Once mapping has identified the location of *Environmentally Sensitive Areas* (ESAs), zoning can create setbacks between development and ESAs to maintain undeveloped landscape-level corridors.⁷

Conservation Tax Incentive Programs: Voluntary programs designed to recognize, encourage and support the long term sound stewardship of environmentally valuable lands. It offers **property** tax exemption to those **private** landowners who agree to protect the natural heritage values of their property. Under the program, landowners agree not to undertake activities that will degrade, damage or result in the loss of features for which it was identified. For an example see [Ontario’s Conservation Land Tax Incentive Program](#).

²Definition derived from, [Green Bylaws Toolkit: For Conserving Sensitive Ecosystems and Green Infrastructure](#), Environmental Law Clinic, University of Victoria Faculty of Law, and Deborah Curran & Company, pages 79-80.

³Definition for Aquatic Habitat Greenways derived from the Comox-Strathcona Regional District Bylaw No. 2152 (1999) Electoral Area Plan and Greenways Plan for Area ‘B’. Aquatic Habitat Greenways located within the Agricultural Land Reserve are defined as ‘Working Landscape Fisheries Sensitive Zones.’

⁴Nature Without Borders, second edition, 2013, Glossary Terms, page 50.

⁵Definition derived from the Village of Cumberland OCP No. 990, Section D Implementation, 10.1.5 b), page 88.

⁶Definition derived from, [Green Bylaws Toolkit: For Conserving Sensitive Ecosystems and Green Infrastructure](#), Environmental Law Clinic, University of Victoria Faculty of Law, and Deborah Curran & Company, page 75.

⁷Definition derived from, [Green Bylaws Toolkit: For Conserving Sensitive Ecosystems and Green Infrastructure](#), Environmental Law Clinic, University of Victoria Faculty of Law, and Deborah Curran & Company, page 74.

Density Bonus: See *Amenity Zoning* above.

Development Cost Charges: Development cost charges (DCC's) are monies that municipalities and regional districts collect from land developers for the incremental cost to existing road, park, water, and sewer services. The intent is for the new development to offset the additional cost it brings to these existing infrastructure systems as a direct result of this new development.⁸

Ecosystems: A complete system of living organisms interacting with the soil, land, water, and nutrients that makes up their environment. An ecosystem is not complete without three elements: composition, structure, and function. The composition includes the pieces that make up the ecosystem (e.g., species); structure refers to the physical and spatial aspects of an ecosystem; and function is about natural processes such as fire, floods, insect outbreaks and wind throw that shape it. An ecosystem can be any size—a log, pond, field, forest, or the earth's biosphere—but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation—for example, old-growth forest or grassland ecosystem.⁹

Environmentally Sensitive Areas (ESAs): ESAs are areas having high ecological value, such as sensitive ecosystems, requiring protection from development. For a full list of ESAs see section 3.1a on page 2.

Integrated Stormwater (and Rainwater) Management Planning (ISMP): Is a process for integrating stormwater management and land use planning that protects and or enhances ecological values of stream health including riparian areas and water quality. The planning process is intended to take an infiltration-based Low Impact Development approach to rainwater to prevent drainage-related problems like flooding and erosion while facilitating land development or redevelopment.¹⁰

Integrated Watershed Health Index: Is a tool for measuring the health of a watershed based on an assessment of key indicators of the watersheds ecological health such as water quality, landscape condition, hydrology and biological assessments.¹¹

Integrated Watershed Management: Is a process of decision making about the conservation and use of land and natural resources within a watershed to balance diverse goals and uses for environmental resources, and to consider how cumulative actions may affect the long-term sustainability of these resources.¹²

⁸ http://www.cscd.gov.bc.ca/lgd/finance/development_cost_charges.htm

⁹ Village of Cumberland OCP Bylaw No. 990, 2014, Part D Implementation, Appendix A Glossary, page 171.

¹⁰ Definition derived from BC Ministry of the Environment, [Stormwater Planning: A Guidebook for British Columbia, Part C](#), Section 9.1, page 9-1.

¹¹ Definition derived from US Environmental Protection Agency website: [Healthy Watersheds: Developing a Watershed Health Index](#)

¹² Definition derived from [Green Bylaws Toolkit](#): For Conserving Sensitive Ecosystems and Green Infrastructure, Environmental Law Clinic, University of Victoria Faculty of Law, and Deborah Curran & Company, page 257.

Low Impact Development (LID): Low Impact Development (LID): Refers to the practice of mitigating stormwater runoff by utilizing the natural drainage patterns of the land. This practice also seeks to reduce conventional stormwater conveyance infrastructure and treatment to minimize costs and maximize natural processes such as retention ponds, wetlands, bioswales, landscape buffers and vegetative roof systems on buildings. Design using LID principles follows four simple steps:

- a. Determine pre-developed conditions and identify the hydrologic goal.
- b. Assess treatment goals, which depend on site use and local keystone pollutants.
- c. Identify a process that addresses the specific needs of the site.
- d. Implement a practice that utilizes the chosen process and that fits within the site's constraints.¹³

Natural Areas: Open space containing unusual or representative biological, physical or historical components. It either retains or has had re-established a natural character, although it often is not in a natural or undisturbed state.¹⁴

No touch areas: Refers to Environmentally Sensitive Areas protected from encroachment by development through Environmental Development Permit Area regulations.¹⁵

Precautionary Principle: Where there are threats of serious or irreversible damage to the environment or human health, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent the environmental degradation from occurring.¹⁶

Qualified Environmental Professionals (QEP's): means an applied scientist or technologist, acting alone or together with another qualified environmental professional, if

- a. the individual is registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association,
- b. the individual's area of expertise is recognized in the assessment methods as one that is acceptable for the purpose of providing all or part of an assessment report in respect of that development proposal, and
- c. the individual is acting within that individual's area of expertise.¹⁷

¹³ Village of Cumberland OCP Bylaw No. 990, 2014, Part D Implementation, [Appendix A Glossary](#), page 173.

¹⁴ Village of Cumberland OCP Bylaw No. 990, 2014, Part D Implementation, [Appendix A Glossary](#), page 173.

¹⁵ See also, restricted development zones, as defined in the Village of Cumberland OCP Bylaw No. 990, 2014, Part D Implementation, Section 10.1.5a, page 88.

¹⁶ United Nations Environment Programme (UNEP). Rio Declaration on Environment and Development. (United Nations Environment Programme, <http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=78&ArticleID=1163>) Accessed: May 2011.

¹⁷ Definition derived from, [Green Bylaws Toolkit](#): For Conserving Sensitive Ecosystems and Green Infrastructure, Environmental Law Clinic, University of Victoria Faculty of Law, and Deborah Curran & Company, page 259.

Riparian Areas: The area adjacent to a stream which may be subject to temporary, frequent, or seasonal inundation. The area supports plant species that are typical of an area of inundated or saturated soil conditions and that are distinct from plant species on freely drained adjacent upland sites. The riparian ecosystem is influenced by, and exerts an influence on, the associated aquatic ecosystem.¹⁸

Riparian Area Regulations (RAR): Is a set of regulations created by the BC Ministry of Environment which is used throughout B.C. to evaluate land development in riparian areas. This regulation involves a consistent process whereby the BC Ministry of Environment (MoE), Fisheries and Oceans Canada (DFO) and local governments can work together to consider projects. Decisions and recommendations about developments and land use changes are made by these groups based on their respective policies. The RAR involves a Riparian Assessment Area of 30 metres measured from the High Water Mark. It also outlines the requirements and methods for determining specific regulatory setbacks within these Assessment Areas, called Streamside Protection and Enhancement Area (SPEA) setbacks.¹⁹

Sensitive Ecosystem Inventory (SEI): Rare and/or fragile ecosystems that have been identified through a Sensitive Ecosystems Inventory. In the early 1990s, an inventory of nine rare and/or fragile and threatened land based ecosystems was conducted in the lowland Comox Valley area using information from 1984-1993 air photos. The Sensitive Ecosystem Inventory (SEI) for the lowland Comox Valley has been reassessed two times since the original inventory, using 2002 and 2012 air photos. The nine sensitive ecosystems inventoried are: Wetland, Riparian, Older Forest, Woodland, Terrestrial Herbaceous (rocky outcrops), Coastal Bluff, Sparsely Vegetated (dunes, spits and cliffs), Seasonally Flooded Agricultural Fields and Older Second Growth Forests.

Species At Risk (SAR): A species that has been defined as at risk (of extirpation) by either the federal or provincial government due to its vulnerable, threatened or endangered status.²⁰

Streamside Protection and Enhancement Areas (SPEA): The area adjacent to a stream that links aquatic to terrestrial ecosystems and includes both the riparian area and the adjacent upland area that exerts an influence on the stream, the width of which is determined in accordance with the RAR. SPEA setbacks must be determined by Qualified Professionals.²¹

¹⁸ Village of Cumberland OCP Bylaw No. 990, 2014, Part D Implementation, [Appendix A Glossary](#), page 174.

¹⁹ Definition derived from City of Courtenay Official Community Plan, Development Permit Areas, Section 8.7, page 120.

²⁰ Definition derived from City of Courtenay Official Community Plan, Development Permit Areas, Section 8.7, page 121.

²¹ Definition derived from City of Courtenay Official Community Plan, Development Permit Areas, Section 8.7, page 121.

Upland Habitat Corridors: *Biodiversity corridors* that provide connectivity between terrestrial ecosystems. Upland Habitat Corridors are mapped to recognize the existing or potential connections between habitat refuges and reservoirs including core protected areas such as nature parks and conservation lands.²²

²² Definition derived from Comox-Strathcona Regional District Bylaw No. 2152 (1999) Electoral Area Plan and Greenways Plan for Area 'B'. The CSRD separately defined Upland Habitat Greenways within the Agricultural Land Reserve for policy purposes.

Appendix A: Local Government Act Legislation establishing EDPAs

Local Government Act: [Section 7, 488-491](#)

Designation of development permit areas

488 (1) An official community plan may designate development permit areas for one or more of the following purposes:

- (a) protection of the natural environment, its ecosystems and biological diversity;
 - (b) protection of development from hazardous conditions;
 - (c) protection of farming;
 - (d) revitalization of an area in which a commercial use is permitted;
 - (e) establishment of objectives for the form and character of intensive residential development;
 - (f) establishment of objectives for the form and character of commercial, industrial or multi-family residential development;
 - (g) in relation to an area in a resort region, establishment of objectives for the form and character of development in the resort region;
 - (h) establishment of objectives to promote energy conservation;
 - (i) establishment of objectives to promote water conservation;
 - (j) establishment of objectives to promote the reduction of greenhouse gas emissions.
- (2) With respect to areas designated under subsection (1), the official community plan must
- (a) describe the special conditions or objectives that justify the designation, and
 - (b) specify guidelines respecting the manner by which the special conditions or objectives will be addressed.
- (3) As an exception to subsection (2) (b), the guidelines referred to in that subsection may be specified by zoning bylaw but, in this case, the designation is not effective until the zoning bylaw has been adopted.
- (4) If an official community plan designates areas under subsection (1), the plan or a zoning bylaw may, with respect to those areas, specify conditions under which a development permit under section 489 would not be required.

Activities that require a development permit

489 If an official community plan designates areas under section 488 (1), the following prohibitions apply unless an exemption under section 488 (4) applies or the owner first obtains a development permit under this Division:

- (a) land within the area must not be subdivided;
- (b) construction of, addition to or alteration of a building or other structure must not be started;
- (c) land within an area designated under section 488 (1) (a) or (b) [natural environment, hazardous conditions] must not be altered;
- (d) land within an area designated under section 488 (1) (d), (h), (i) or (j) [revitalization, energy conservation, water conservation, greenhouse gas reduction], or a building or other structure on that land, must not be altered.

Development permits: general authority

490 (1) Subject to this section, a local government may, by resolution, issue a development permit that does one or more of the following:

- (a) varies or supplements a land use regulation bylaw or a bylaw under Division 11 [Subdivision and Development: Requirements and Related Matters];
- (b) includes requirements and conditions or sets standards under section 491 [development permits: specific authorities];
- (c) imposes conditions respecting the sequence and timing of construction.

(2) The authority under subsection (1) must be exercised only in accordance with the applicable guidelines specified under section 488 in an official community plan or zoning bylaw.

(3) A development permit must not vary the use or density of the land from that permitted in the bylaw except as authorized by section 491 (3) [protection from hazardous conditions].

(4) A development permit must not vary a flood plain specification under section 524 (3).

(5) If a local government delegates the power to issue a development permit under this section, the owner of land that is subject to the decision of the delegate is entitled to have the local government reconsider the matter.

Development permits: specific authorities

491 (1) For land within a development permit area designated under section 488 (1) (a) [protection of natural environment], a development permit may do one or more of the following:

(a) specify areas of land that must remain free of development, except in accordance with any conditions contained in the permit;

(b) require specified natural features or areas to be preserved, protected, restored or enhanced in accordance with the permit;

(c) require natural water courses to be dedicated;

(d) require works to be constructed to preserve, protect, restore or enhance natural water courses or other specified natural features of the environment;

(e) require protection measures, including that vegetation or trees be planted or retained in order to

(i) preserve, protect, restore or enhance fish habitat or riparian areas,

(ii) control drainage, or

(iii) control erosion or protect banks.

- (3) Conditions and requirements under subsection (2) may vary the use or density of land, but only as they relate to health, safety or protection of property from damage.
- (4) Before issuing a development permit for land within a development permit area designated under section 488 (1) (b), a local government may require the applicant to provide a report to assist the local government in determining what conditions or requirements it will impose under subsection (2) of this section.
- (5) A report required under subsection (4) must
- (a) be provided by the applicant at the applicant's expense, and
 - (b) be certified by a professional engineer with experience relevant to the applicable matter.
- (6) For land within a development permit area designated under section 488 (1) (c) [protection of farming], a development permit may include requirements for screening, landscaping, fencing and siting of buildings or other structures, in order to provide for the buffering or separation of development from farming on adjoining or reasonably adjacent land.
- (7) For land within a development permit area designated under any of the following, a development permit may include requirements respecting the character of the development, including landscaping, and the siting, form, exterior design and finish of buildings and other structures:
- (a) section 488 (1) (d) [revitalization of commercial use area];
 - (b) section 488 (1) (e) [intensive residential development];
 - (c) section 488 (1) (f) [commercial, industrial or multi-family residential development];
 - (d) section 488 (1) (g) [resort region development].
- (8) For land within a development permit area designated under section 488 (1) (f), a development permit may include requirements respecting the character of the development, as referred to in subsection (7) of this section, but only in relation to the general character of the development and not to particulars of the landscaping or of the exterior design and finish of buildings and other structures.
- (9) For land within a development permit area designated under section 488 (1) (h), (i) or (j) [energy conservation, water conservation, greenhouse gas reduction], a development permit may include requirements respecting the following in order to provide for energy and water conservation and the reduction of greenhouse gas emissions:
- (a) landscaping;
 - (b) siting of buildings and other structures;
 - (c) form and exterior design of buildings and other structures;
 - (d) specific features in the development;
 - (e) machinery, equipment and systems external to buildings and other structures.
- (10) For land within a development permit area designated under section 488 (1) (h), (i) or (j), a development permit may establish restrictions on the type and placement of trees and other vegetation in proximity to the buildings and other structures in order to provide for energy and water conservation and the reduction of greenhouse gas emissions.



Resilient Saanich FACTSHEET #2

Biodiversity Conservation Strategy Examples



Saanich is currently developing a Biodiversity Conservation Strategy. Strategies by other local governments in BC may provide valuable insights and methodologies as Saanich develops its own strategy. The following is provided for residents interested in being informed participants in the strategy development.

What is Biodiversity?

“Biodiversity encompasses all living species on Earth and their relationships to each other. This includes the differences in genes, species and ecosystems.” - Government of Canada

What is a Biodiversity Conservation Strategy?

A ‘biodiversity conservation strategy’ is a plan to enhance and protect the variety of native species and ecosystems in a given geographical area. There have been many biodiversity conservation strategies produced in British Columbia, both at the municipal and regional level. Below is a summary of nine local and regional biodiversity conservation strategies.

1. Nature Without Borders – The Comox Valley Land Trust Regional Conservation Strategy (2008 and 2013)

Two regional conservation strategies have been prepared for the Comox Valley – Phase 1 in 2008 and Phase 2 in 2013. The strategies cover the 1725 sq.km. area of the Comox Valley with a population of 66,527 (2016 data). The strategies are meant for all the stakeholders of the Comox Valley, and address many inter-jurisdictional issues in conservation planning: identification of priority areas for conservation; clarification of conservation terms; establishing common methods and criteria for determining priority areas, and regionally consistent mechanisms for protecting environmentally sensitive areas. A critical network of conservation areas is identified that includes wildlife and plant habitat and biodiversity values. Conservation priorities identify both ecological and recreation areas. Important map layers and a database accompany the report. Finally, recommendations for stakeholders are provided to guide report implementation.

Applicability to Saanich: This report is Island-based and covers an urban-rural landscape similar to Saanich, with Garry Oak ecosystem characteristics. However, it was prepared by non-

governmental organizations for an entire region. It was developed based on broad consultation with many stakeholders in the Comox Valley.

<https://cumberland.ca/wp-content/uploads/2012/09/Land-Trust-Nature-Without-Borders-July-2008.pdf>

<http://www.sccp.ca/sites/default/files/species-habitat/documents/nature%20without%20borders%20comox%20valley%20land%20trust.pdf>

2. A Biodiversity Conservation Analysis for the North and Central Okanagan Region (2013)

Keeping Nature in Our Future – A Biodiversity Conservation Strategy for the Okanagan Region (2014)

Two regional conservation strategies have been prepared for the Okanagan Valley, divided into sub-regional reports. The North and Central Okanagan Region report covers an area of 10,417 sq.km and has population of 279,326 (2016 data). The South Okanagan Similkameen Region report covers an area of 10,413 sq.km. with a population of 83,022 (2016 data). Both reports were produced by conservation partnerships in the Okanagan.



Resilient Saanich FACTSHEET #2

Biodiversity Conservation Strategy Examples



The Okanagan Valley is a unique region of Canada, recognized provincially and nationally as a biodiversity hotspot for richness and rarity of species and habitats. The first report integrates a wide variety of regional-scale environmental and land tenure data with associated attributes to produce a series of maps that depict habitat connectivity and “biodiversity hotspots” across the region. This second report goes beyond the technical and mapping analysis of the previous report to discuss **why** we should conserve and protect natural areas, **which** natural areas should be protected and restored, **who** can contribute to this process, **how** and **when** conservation and restoration can be achieved, and the **role** of natural areas in protecting regional biodiversity.

Applicability to Saanich: Like the capital region, the area is a hotspot for rare ecosystems and species and the ‘biodiversity hot spot’ approach may be applicable. However, neither report was a government initiative and the landscape area is much larger than Saanich. The second report outlines useful tools for local governments to integrate biodiversity protection into the development approval process, policies, plans, and regulations.

https://a100.gov.bc.ca/pub/acat/documents/r42389/Part2_1416247567273_6247203863.pdf

https://a100.gov.bc.ca/pub/acat/documents/r42389/BiodiversityStr_1409784064471_9783578053.pdf

3. Biodiversity Conservation Strategy for City of Surrey (2014)

The City of Surrey strategy recognizes Surrey’s biodiversity as a key foundation for a healthy, livable and sustainable community. The report covers an area of 316 sq.km. which holds one of the fastest growing populations in the province – 517,887 people (2016 data). The report identifies threats to biodiversity protection and the limitations of local government in addressing these threats. A Green Infrastructure

Network (GIN) mapping was developed – an interconnected network of open spaces and natural areas needed to conserve ecosystem functions and provide benefits to wildlife and people. Outside of the GIN areas, Development Permit Areas (DPA’s) are recommended to guide development in a sustainable manner, which protects the core network of protected natural areas. A Biodiversity Checklist has been developed to integrate into their Sustainability Checklist, guiding development outside the GIN. In addition, the strategy includes designation of key management areas with unique ecological conditions, and policy and management recommendations for local government.

Applicability to Saanich: The concept of a Green Infrastructure Network (GIN) is an effective approach, combining open spaces and natural areas into a system of connected habitat features.

https://www.surrey.ca/files/Surrey_BCS_Report.pdf

4. Biodiversity Strategy - Vancouver Board of Parks and Recreation (2016)

This report covers the City of Vancouver, an area of 115 sq.km. with a population of 631,486 (2016 data). This report is the most generalized and stylized of all the strategies reviewed, with many graphics for easy public consumption. The report outlines urban threats to biodiversity, maps priority habitats and biodiversity hotspots at a broad scale, includes the status of key priority species, and notes general goals and strategies needed to restore habitats and species. It is not evident what analysis (other than internal) was done to produce the results and conclusions.

Applicability to Saanich: This document does not contain any detailed analysis or strategies for local governments to undertake. However, its format would be very useful as a public education tool about biodiversity.

<https://vancouver.ca/files/cov/biodiversity-strategy.pdf>



Resilient Saanich FACTSHEET #2

Biodiversity Conservation Strategy Examples



5. Strategic Directions for Biodiversity Conservation in MetroVancouver Region (2008)

An earlier report for the MetroVancouver region covers an area of 2700 sq.km. with a population of 2,463,400 (2018 data). Produced by the Biodiversity Conservation Strategy Partnership of government and non-governmental partners in the Georgia Basin, this report describes the importance of biodiversity and threats to its protection. Roles and responsibilities for protecting biodiversity are addressed in general terms for different levels of government. Details are provided regarding guiding principles and goals, strategic directions and opportunities, and actions needed to move forward. Maps are included showing regional habitat types, habitat connectivity corridors and classification of sites of different levels of biodiversity. The scale of the mapping is broad and regional, leaving a lot of ground-level detail unknown.

Applicability to Saanich: The regional scale and generalized nature of the goals, strategies and conclusions for MetroVancouver's report do not translate well to a much smaller area (and single municipality) like Saanich. The guiding principles from the report however could provide guidance to Saanich.

<http://www.metrovancouver.org/services/regional-planning/PlanningPublications/StrategicDirectionsBiodiversityConservation.pdf>

6. Richmond's Ecological Network Management Strategy - Phase 1 (2014)

Richmond covers a 129 sq.km. area with a population of 218,300 (2018 data). This report takes an approach similar to Surrey, identifying an interconnected system of natural areas and green infrastructure (built environment) into the Ecological Network (EN). Both of these components provide the essential ecosystem services on which the City depends for drainage, erosion protection, flood mitigation and water filtration, as well as cultural, recreational and

aesthetic values. The EN is composed of five main components: hubs (>10ha.), sites, corridors and connectivity zones, shorelines and riparian areas, and parks and greenways. This management strategy uses the EN as a guide for on-the-ground planning and development decisions, land use decisions and area-specific projects.

Applicability to Saanich: The integrated mapping of natural ecosystems and green infrastructure into a common network of ecosystem services is similar to the City of Surrey's approach in identifying a Green Infrastructure Network.

https://www.richmond.ca/_shared/assets/ecologicalnetworkmanagementstrategy39324.pdf

7. Sunshine Coast Biodiversity Conservation Strategy (2013)

Prepared by the Ruby Lake Lagoon Society, this report covers an area of 3,827 sq.km. with a population of 29,970 residents (2016 data). The report provides a very broad overview, mainly qualitative, of Sunshine Coast biodiversity. It contains Guiding Principles/Vision/Goals/Objectives/Strategies, and an action plan to implement strategies. Next steps to be developed include timelines, targets and lead organizations. The report represents the collective efforts of local residents and attests to the value of protecting biodiversity on the Sunshine Coast.

Application to Saanich: This report covers an area larger than Saanich and was prepared by a local conservation organization. It is mainly qualitative in nature, and awaits the preparation of a 'next steps' companion report.

<https://lagoonsociety.com/files/9914/3699/5088/SC-Biodiversity-Strategy-web-version-for-circulation.pdf>



Resilient Saanich FACTSHEET #2

Biodiversity Conservation Strategy Examples



8. Islands Trust Regional Conservation Plan 2018-2027

The Islands Trust Conservancy Regional Conservation Plan covers an area of 790 sq. km. with a population of 26,200 people (2016 data). It describes the Islands Trust Area, placing it in the context of the region ecologically and culturally. The plan provides detail on land status and land use, current ecosystems, protected areas and changes to the landscape over the last ten years. Goals and areas of focus are set out for the Islands Trust Conservancy over the next ten years. The approach uses a decision-making matrix to evaluate conservation priorities for each local trust area/island municipality within the Islands Trust Area. The Islands Trust has set a strong goal to build relationships and work in collaboration with the local First Nations of the area. Limited resources will be focused on protecting areas with the highest biodiversity values and greatest need for conservation.

Application to Saanich: This is an evaluation process that could be duplicated in Saanich as the ecosystems are similar within the Coastal Douglas-fir zone. Both Saanich and the Islands Trust areas are dealing with development pressures on rare and disappearing ecosystems and species. (Note: the Island Trust has different enabling legislation than Saanich.)

http://www.islandstrustconservancy.ca/media/84821/itc_2018-11_rcp-2018-2027-web_final.pdf

9. Wildlife Conservation Strategy for Township of Langley (2008)

The Township of Langley comprises 316 sq. km. and holds 143,225 people (2017 data). Jointly prepared by the Township of Langley and the Langley Environmental Partners Society, this report is a framework for long term planning and management of wildlife habitat in the Township of Langley. The objectives of the strategy are to protect wildlife habitat patches and connectivity along riparian and upland corridors within a local legal framework. The framework helps set clear expectations for the public and developers, and to integrate wildlife protection measures into Township instruments (bylaws, policies and programs). The Township of Langley's Official Community Plan, and community and neighbourhood planning processes were used as tools to guide public involvement in the development of the strategy. A case study is included in the report to demonstrate how the strategy can be implemented on the ground.

Application to Saanich: The simple approach of using protection of wildlife habitat as the impetus for creating a series of connected protected areas is an approach that could guide Saanich in the initial stages of protecting its biodiversity.

http://www.leps.bc.ca/wp-content/uploads/2015/06/Wildlife_Habitat_Conserv_Strat.pdf

There are examples of other local government strategies beyond BC. If you find a strategy you think will be useful to Saanich for review, please send to Thomas Munson: Thomas.Munson@saanich.ca.