INFORMATION BULLETIN
Restoration and Enhancement Guidelines

November 2026

When development is proposed within a Streamside Protection and Enhancement Area, a Restoration and Enhancement Plan may be required to offset habitat losses as per the Natural Environment Development Permit Guidelines. Restoration and Enhancement Plans must be prepared and supervised by an appropriately qualified professional (e.g. a registrant of the College of Applied Biologists). The Restoration and Enhancement Plan should be sufficiently detailed to allow for monitoring for conformity of the plan as well as plant survival rates.

Wherever a development site will result in land clearing activities, the opportunity exists to salvage and translocate structural materials (i.e. downed wood, stumps, mossy rocks, vascular plants, non-vascular plants) into the remaining environmentally sensitive areas and/or restoration and enhancement areas. Use caution for materials brought from elsewhere, especially other jurisdictions or habitats as invasive insects or plants can negatively impact natural areas as well as adjacent developments: *if materials are being brought in from another site/location, the QEP must assess the other site and approve the materials.*

Consider the ability to complete work within natural areas following construction of retaining walls and buildings: some materials may need to be delivered/ stored ahead of restoration or restoration may be best started immediately and not following building construction (Note: initial securities are available to be released once the restoration and enhancement plan is fulfilled). Additionally, consider if the long-term restoration and enhancement works will conflict with future constructed features (i.e. routine maintenance of structures).



Habitat Complexing

These key habitat features provide a diversity of habitats for both invertebrates and vertebrate species and should be considered for all restoration and enhancement areas:

- **Coarse woody debris**, like tree logs, piles of large limbs or sticks, and stumps and **rock mounds** provide structural habitat features for insects, small wildlife, and amphibians.
- **Mossy rocks and herbs** salvaged from the development site can help 'seed' the restored area with native groundcover species.
- Integrating **microtopography** such as small depressions, hummocks, and hollows (vs. flat, homogeneous landscapes) helps landscapes adapt to erratic climate shifts by moderating temperature, preserving moisture, and boosting vegetation succession while providing microhabitats for wildlife and species at risk.
- Creation and/or translocation of **wildlife trees** (min. 2-3 m in height) within the restoration area can provide places for insects, birds, and other wildlife who might use it to feed, rest, live and raise their young.
- Where sites lack mature trees, installation of **bird nesting boxes** or **nesting platforms** can attract songbirds and/or waterfowl and **bat boxes** can attract bats, all of whom aid in seed dispersal, provide natural pest control, pollinate plants, and assist QEPs in tracking ecosystem performance.
- Including **native wildflowers** into seeding mixtures support **pollinators** and healthy insect populations. Where natural habitat is limited, such as dead wood or varied ground cover, **insect hotels** provide refuge for pollinators and pest-control species, helping native plants establish and supplying food for wildlife.
- For instream improvements, consider incorporating **large woody debris** such as root wads and large logs and/or boulders to create natural pools, habitat complexity, cover, and rest areas for fish. These structures can also serve to create **basking areas** for reptiles and promote natural erosion, contributing **spawning substrate** to the channel. **Fish baffles and ramps** may be installed in existing culverts to support fish passage. (Note: Federal and provincial approval is required for any instream improvements).

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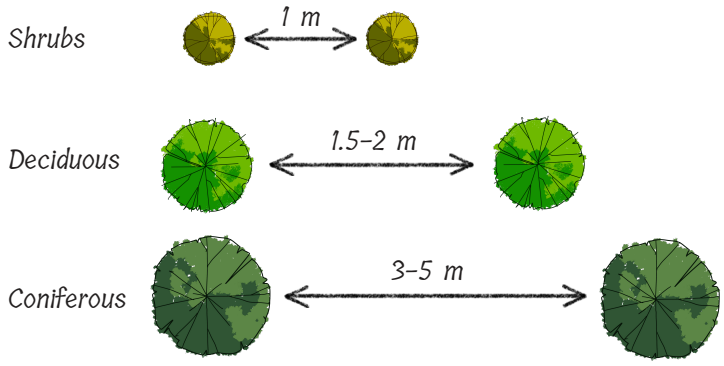
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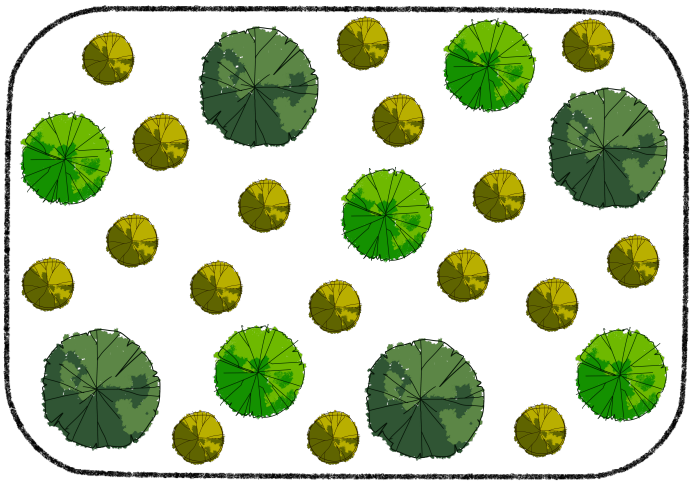
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General Planting

- **Site preparation** should include treating existing soils, managing competing weeds, eradicating noxious weeds, and improving soil moisture and aeration to ensure planting success.
- **Soil amendments** such as organic composts and mulch may be required to improve degraded, compacted or nutrient-poor soils. In addition, biological inoculates such as mycorrhizal fungi may boost root expansion, nutrient uptake and drought survival.
- All tree/shrub species should be of **guaranteed nursery stock**.
- The botanical name should be used when ordering stock to ensure that the desired native species is being purchased. Each specimen should be tagged with the botanical name and the tag should be left attached (and loose for plants expected to grow rapidly) after planting.
- Tags must be removed from plantings following 1 growing season and the City has completed their inspection.
- **Stock planted during the fall (Sept. – Oct.) has the greatest likelihood of surviving.** Plantings in spring (March – April) must have a dedicated watering system (approval from Senior Water Engineer is required for irrigation during watering restriction times).
- **Regular watering** may be required until the plants are established. Additional advice on proper planting procedures should be obtained from the nursery supplying the stock.
- Tree stock should be a minimum of 1.2 m (4 ft) in height when purchased.
- **Shrubs** should be planted **1 m** apart and a minimum 1- or 2-gallon pot size.
- **Deciduous trees** should be planted **1.5 to 2 m** apart from other deciduous trees and other shrubs.
- **Coniferous trees** should be planted **3-5 m** apart from other trees and 2-3 from other shrubs.
- Trees should be planted a minimum of 3 m from retaining walls, fences, or other permanent structures, taking into account mature canopy spread.
- Every year **100% of the trees** must survive and at least **80% of the shrubs**. If the survival rates are not met in any given year, replanting is required.
- Prior removal of invasive plant species (e.g. Himalayan blackberry, reed canarygrass) may be required to enhance the survival of transplants. All noxious weeds under the *Weed Control Regulation* (e.g. Japanese knotweed, scotch broom, tansy ragwort) must be removed prior to the conclusion of the monitoring period.
- **Ongoing removal of invasive plants** is required after planting until the native plants reach 'free-to-grow' status (i.e. they are large enough to out-compete invasive plants). Invasive plant removal should occur every month during the growing season in the first two years, with diminishing frequency once the invasive plants are becoming less prevalent.
- Additional fertilizing, **dedicated watering** and/or replanting may be required to establish vigorous vegetative cover throughout the first few years of growth.





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General Riparian Planting

- All riparian plantings should be based on 1 tree or shrub per 1 square metre density, taking into account any existing native plants.
- 20% of the plants should be trees and 80% shrubs.
- A minimum of 50% of trees and shrubs planted should be fruit-bearing species to promote recolonization by seed and provide wildlife food sources. However, use caution if the proposed restoration is adjacent to an agricultural area, and chose species that will not promote conflict with growing crops (disease, wildlife, shading, etc.).
- Coniferous trees should comprise not less than 10% nor more than 25% of the tree stock planted.

Additional Resources

The following are some links to additional guidance on planting riparian areas with native plants, some information on the moisture preferences of the various species.

- Fraser Valley Conservancy's guide Gardening with Native Plants in the Lower Mainland and Fraser Valley
- Ministry of Forests Riparian Restoration Guidelines
- Ministry of Forests RAR Revegetation Guidelines for Brownfield Sites
- Ministry of Agriculture Selecting Plants for Agricultural Riparian Plantings
- Fisheries and Oceans Canada Riparian Revegetation
- Stewardship Centre for BC's Guidance for Restoration Activities in Riparian Areas
- FireSmartBC's Landscaping Guide

While many plant nurseries sell native plants, the following is a list of a few nurseries that specialize in native plant propagation and will have better selection and availability. Note that not all of them will sell to the public unless you are placing a minimum order.

- BC Wild Heritage Plants
- Birchgrove Nursery
- Can-Am Nurseries
- Green Flow Nurseries
- Linnaea Nurseries
- NATS Nursery
- Peels Nursery



Tips

- The most successful restoration plans are those that mimic natural conditions and plant assemblages. Native plants that are growing within the site/nearby are most likely to have high, long-term survivorship. If a species is not naturally occurring onsite, there is probably an underlying reason.
- The first year after planting is the most important. Invasive species management and sufficient watering practices will greatly boost survivorship.
- If trespass or encroachment into the restoration area are a concern, consider selecting species that will naturally discourage access, such as those with thorns (*Rosa* spp.) or tendency to grow in dense thickets (*Spirea* spp.).
- Utilize existing vegetation where possible to avoid replanting established plantings.
- Application of a native reclamation seed or mulch between plantings will aid in invasive species suppression and support nutrient availability and uptake by the intended stock.
- Abiotic components are equally valuable as biotic components. If biotic features are maximized, consider incorporating abiotic features for added value and use of the restoration area by wildlife.
- Consider the impact and purpose of the restoration; will the restoration and enhancement plan work against natural processes, or contribute to it?

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Recommended fire-resistant native vegetation species suitable for restoration and enhancement *(sorted by scientific name)*

Common name	Scientific name	Soil moisture regime	Mature height (m)	Shade tolerance	Use notes
Trees					
Vine maple*	*Acer circinatum*	Moist; forests, forest edges, ravines, and streambanks; tolerates seasonally wet sites but not prolonged saturation	3–10	Medium to high	understory/small tree for shaded riparian buffers and forest-edge restoration; good for slope stability; provides wildlife food from seeds
Douglas maple*	*Acer glabrum*	Dry to moist; well-drained open woods, rocky slopes, and upper riparian terraces	3-10	Medium	small tree; more drought and sun tolerant alternative to the *A. circinatum*; provides wildlife food from seeds
Bigleaf maple	*Acer macrophyllum*	Dry to moist; floodplains	20–35	Low to medium	fast-growing; shallow-rooted & short-lived; suitable where space allows; does well on disturbed sites & flooded lands; provides wildlife food from seeds and branches
Red alder	*Alnus rubra*	Wet; streambanks, active floodplains, and disturbed sites	20–40	Low	nitrogen-fixing, fast-growing, and useful for disturbed riparian sites; provides wildlife food from seeds and branches
Black hawthorn*	*Crataegus douglasii*	Moist; streamside, lakeshores, open areas, forest edges, and open deciduous forest	3–10	Low	small tree; wet to moist riparian edges and wildlife habitat; thorny growth may affect maintenance/access; provides wildlife food from fruits; thickets provide nesting and denning opportunities
Pacific crabapple	*Malus fusca*	Moist to wet; edges of standing and flowing water	6–12	Medium	small tree for moist/wet riparian and wetland-edge restoration areas; provides wildlife food from fruits
Black cottonwood	*Populus balsamifera ssp. trichocarpa*	Moist to very moist; floodplains, streambanks, lakeshores, and seepage sites	30–50	Low	fast-growing; floodplains and larger streamside sites; use where mature size and roots can be accommodated.
Trembling aspen	*Populus tremuloides*	Very dry to moist; disturbed and open areas with full sunlight	9-20	Low	small tree; fast-growing; deep, extensive root system, aggressive pioneer species; often in moist but not wet sandy, gravelly, or loamy soils; provides wildlife food and habitat
Bitter cherry	*Prunus emarginata*	Slightly dry to moist; along streams and logged areas	6–15	Medium	drier riparian edges, slopes, disturbed areas, and upland transitions; loamy, sandy or gravelly soils; provides wildlife food from fruits
Cascara	*Rhamnus purshiana*	Moist; well-drained forests, forest edges, floodplain terraces, and riparian margins	6–12	Medium to high	small tree; good for soil-binding; often associated with red alder and vine maple; provides wildlife food in fruits
Pacific willow*	*Salix lasiandra*	Moist to wet; streambanks, lakeshores, floodplains, and alluvial sites	9-12	Low	fast-growing, tolerant of flooding; riparian stabilization; provides wildlife food from seeds and pollen for insects
Scouler's willow*	Salix scouleriana	Dry to moist; open forests, disturbed slopes, upper banks, and well-drained alluvial sites	2-12	Low to medium	fast-growing, tolerant of flooding; riparian stabilization; provides wildlife food from seeds and pollen for insects

Common name	Scientific name	Soil moisture regime	Mature height (m)	Shade tolerance	Use notes
Shrubs					
Mountain alder*	*Alnus tenuifolia*	Moist to wet; streambanks and wetland areas	6-8	Medium	Nitrogen-fixing shrub for moist banks, floodplain edges, and seepage areas; dense roots support bank stabilization; intolerant of prolonged drought; provides wildlife food from seeds
Saskatoon*	*Amelanchier alnifolia*	Dry to moist; best on well-drained slopes, open woods, thickets, and riparian terraces	2-4	Medium	deep-rooted, drought-tolerant shrub; open slopes and upland transitions; suckering habit provides useful soil binding; provides wildlife food from fruits and branches
Kinnikinnick*	*Arctostaphylos uva-ursi*	Dry to well-drained; sandy to rocky soils	<0.25	Low	highly drought-tolerant once established; good for slope stability; provides wildlife food from fruits
Red-osier dogwood*	*Cornus stolonifera / Cornus sericea*	Moist to wet; streamside, open forest, and disturbed sites	2–6	Medium	riparian shrub for moist soils, bank stabilization, and environmental plantings; provides wildlife food from fruits and branches
Beaked hazelnut*	*Corylus cornuta*	Dry to moist; well-drained forests, forest edges, and open slopes	2–7	Medium	understory shrub; provides wildlife food (nuts) and cover; good for slope stability
Salal*	*Gaultheria shallon*	Dry to wet; coniferous forests and shoreline	0.3–1.5	High	coastal understory and shoreline plantings; forms thickets and is highly adaptable; good for slope stability; provides wildlife food from fruits and branches
Oceanspray*	*Holodiscus discolor*	Dry to moist; open areas and ravine edges	1.5–4	Medium	drier Lower Mainland riparian margins, gravelly slopes, and pollinator-support plantings; good for slope stability
Black twinberry*	*Lonicera involucrata*	Moist to wet; streambanks, seepage areas, wet thickets, and forest edges	1–3	Medium to high	fast-growing; moist/wet Lower Mainland riparian buffers and wetland-edge restoration; flowers provide nectar for hummingbirds
Low Oregon-grape*	*Mahonia nervosa*	Dry to moist	0.2–0.6	High	evergreen ground-layer shrub for shaded Lower Mainland restoration areas; good for slope stability
Tall Oregon grape*	*Mahonia aquifolium*	Dry to moist; well-drained open woods, forest edges, and rocky slopes	1.5-2 m	Medium	Evergreen shrub for well-drained edges and slopes; spreads by rhizomes and is useful for soil binding, but avoid persistently wet sites; provides wildlife food from branches
Osoberry*	*Oemleria cerasiformis*	Dry to moist; streamside, open forest, and disturbed sites	1.5 – 5	Medium to high	pioneer seral species on moist sites with rapid growth rate; good for slope stability; provides wildlife food from fruits
Mock orange*	*Philadelphus lewisii*	Moist rich sites to dry rocky soils; open forest and forest edges	1–3	Medium	dry-to-moist edges and disturbed restoration areas where well-drained soils are present; good for slope stability

Common name	Scientific name	Soil moisture regime	Mature height (m)	Shade tolerance	Use notes
Shrubs					
Pacific ninebark*	*Physocarpus capitatus*	Moist to wet; streamside and forest edges	1.5–4	Medium	moist riparian buffers and dense native shrub cover; spreading roots and layered stems provide useful bank and slope soil binding; provides wildlife food from branches
Choke cherry	*Prunus virginiana*	Moist to wet; damp areas but not saturated or poorly drained soils	5-9	Low	high drought & cold tolerance once established as roots are deep
Pin cherry	*Prunus pensylvanica*	Slightly dry to moist; well-drained open woods, burns, clearings, and disturbed sites	3–10	Low	fast-growing, short-lived pioneer for open disturbed sites; useful for rapid cover and wildlife habitat, but not for saturated soils; provides wildlife food from fruits
Black gooseberry	*Ribes lacustre*	Moist to wet; streambanks, seepage areas, wet forests, and cool shaded thickets	0.5–2	Medium	shaded riparian and forest restoration areas; confirm placement where thorny stems may affect access
Red-flowering currant	*Ribes sanguineum*	Dry to moist; well-drained soils	1-3	Low to medium	dry rocky areas with shade to full sun; drought-tolerant once established; flowers provide nectar for hummingbirds
Nootka Rose*	*Rosa nutkana spp. nutkana*	Dry to moist; streamside, open habitats, and seepage areas	1–3	Medium	edge and shrub-buffer plantings; good for slope stability (NOTE: other rose species not good for erosion control)
Red raspberry*	*Rubus idaeus*	Slightly dry to moist; open forests, clearings, disturbed sites, and well-drained riparian terraces	1-2	Low	Rapidly colonizes disturbed ground by rhizomes; dense canes provide short-term erosion control and wildlife cover, but allow room for spreading and maintain access
Black raspberry*	*Rubus leucodermis*	Dry to moist; open woods, forest edges, thickets, and disturbed well-drained sites	0.5-2	Low	arching, thorny canes provide cover and surface erosion control on disturbed slopes; use away from access routes and allow room for spread; provides wildlife food from fruits and branches
Thimbleberry*	*Rubus parviflorus*	Moist, well-drained soils	0.5-3	Medium	prefers shade but can tolerate edges and clearings; good for slope stability; provides wildlife food from fruits
Salmonberry*	*Rubus spectabilis*	Moist to wet; streambanks, seepage areas, wet thickets, and forest edges	1–4	Medium to high	rapidly forms dense rhizomatous thickets on moist banks; useful for erosion control and wildlife cover, but allow room for spread; provides wildlife food from fruits and branches
Sitka willow*	*Salix sitchensis*	Wet to dry; streamside, lakeshore, alluvial areas, and open forests	1-8	Medium	fast-growing, tolerant of flooding; riparian stabilization; provides wildlife food from branches and pollen for insects
Blue elderberry*	*Sambucus cerulea*	Slightly dry to moist; well-drained open slopes, forest edges, and riparian terraces	2–6	Medium	needs good drainage; fast-growing shrub for sunny disturbed sites and upper-bank or upland transitions; provides wildlife value but is not suited to saturated soils; provides wildlife food from fruits and nectar for hummingbirds

Common name	Scientific name	Soil moisture regime	Mature height (m)	Shade tolerance	Use notes
Shrubs					
Red elderberry*	*Sambucus racemosa*	Moist; streamside forests, moist clearings, and forest edges; tolerates seasonal wetness but prefers aerated soils	2–6	Medium to high	moist Lower Mainland riparian and shaded forest-edge restoration areas; good for slope stability; provides wildlife food from fruits and nectar for hummingbirds
Sitka mountain-ash	*Sorbus sitchensis*	Slightly dry to moist; along streams, open forests, and forest edges	1-4	Medium	small tree; best in cool, moist forest edges and upper riparian slopes; fibrous roots contribute soil binding; provides wildlife food from fruits
Hardhack*	*Spiraea douglasii*	Moist to wet; streambanks, lake margins, and wet open forests	1–2	Low to medium	wet riparian and lake-margin restoration; rhizomatous thickets provide surface erosion control and bank soil binding; can spread aggressively in wet areas; flowers provide pollen for insects
Snowberry*	*Symphoricarpos albus*	Dry to moist; ravines and open forests	0.5–2	Medium	drier riparian margins, ravines, and upland transition zones; good for slope stability; provides wildlife food from fruits
Vaccinium species	*Vaccinium spp.*	Moist; under coniferous trees	0.2–2	Medium to high	understory option where acidic, organic soils and conifer-associated conditions are present; provides wildlife food from fruits and branches
Highbush cranberry	*Viburnum edule*	Wet to moist; streambanks, seepage areas, and wet forests	1–3	Medium to high	Suitable for moist/wet Lower Mainland riparian restoration and seepage areas; provides wildlife food from fruits
Ferns & Graminoids					
Lady fern	*Athyrium filix-femina*	Moist to wet forests; riparian and streambanks	0.4–1.5	High	shaded, wet forest and riparian areas; not ideal for open, exposed space
Deer fern	*Blechnum spicant*	Moist to wet; moist/wet forests and streambanks	0.2–0.8	High	shaded moist Lower Mainland streambanks and forest floors; provides wildlife food
Sedges*	*Carex* spp.	Moist to wet, saturated soils; common wetland hydrophtye	0.5–2	Low	useful for wetland restoration or near stream boundaries; tolerant of water table fluctuations; rhizomatous growth
Western Oak fern	*Gymnocarpium dryopteris*	Slightly dry to moist; forest and streambanks	0.1–0.4	High	small fern; useful for filling interstitial spaces; tolerant of dense planting
Sword fern	*Polystichum munitum*	Moist to very moist; moist forest	0.5–1.5	High	shaded Lower Mainland riparian and forest understory restoration.
Bulrushes*	*Scirpus* spp.	Moist to wet, saturated soils; common wetland hydrophtye	0.5–2	Low	useful for wetland restoration or near stream boundaries; tolerant of water table fluctuations; rhizomatous growth

*** erosion-control or bank-stabilization value**

Other species not on this list may be suitable for restoration and enhancement, including native species that are not included in the FireSmart BC Landscape Guide. These include coniferous tree species, such as western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), and coast Douglas fir (*Pseudotsuga menziesii var. menziesii*). Ultimately, species chosen for restoration and enhancement areas must be confirmed by the QEP against project-specific site conditions, and nursery availability and size specifications.