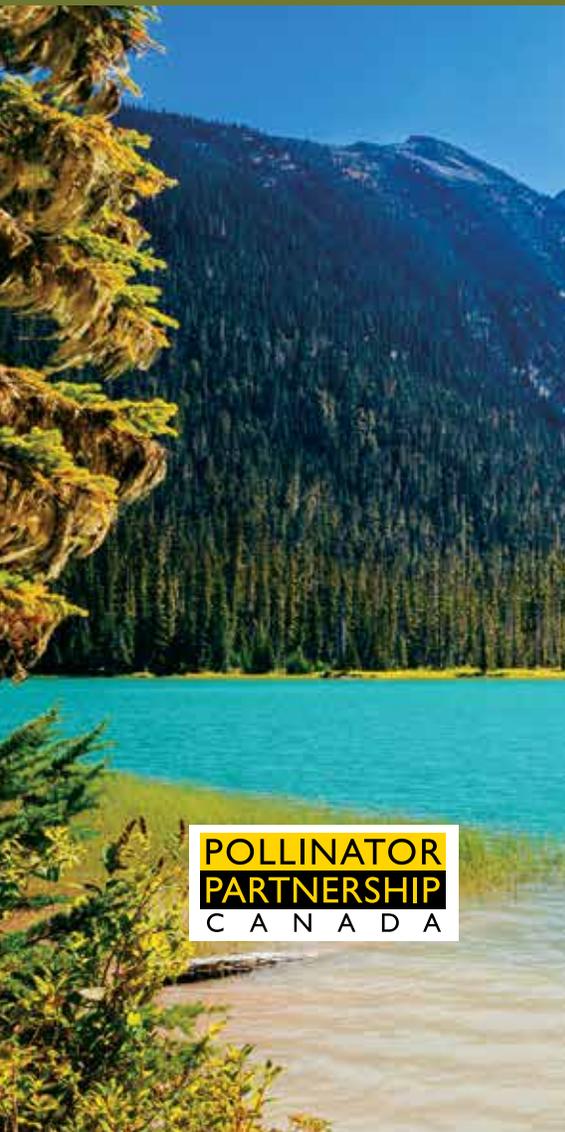




SELECTING PLANTS FOR POLLINATORS



A GUIDE FOR GARDENERS, FARMERS, AND LAND MANAGERS IN THE



PACIFIC RANGES ECOREGION

BRITISH COLUMBIA COAST
MOUNTAINS FROM THE BRITISH
COLUMBIA-WASHINGTON BORDER

NORTH TO BURKE CHANNEL
AND BELLA COOLA INCLUDING
SQUAMISH, WHISTLER
HOPE, AND PEMBERTON



**POLLINATOR
PARTNERSHIP**
C A N A D A

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This is one of several guides for different regions of North America. We welcome your feedback to assist us in making the future guides useful. Please contact us at feedback@pollinator.org

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GARDENERS, FARMERS,
AND LAND MANAGERS**

IN THE
PACIFIC RANGES
ECOREGION

BRITISH COLUMBIA COAST MOUNTAINS

FROM THE

BRITISH COLUMBIA-WASHINGTON BORDER

NORTH TO BURKE CHANNEL AND

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WHISTLER, HOPE, AND PEMBERTON



A NAPPC AND POLLINATOR PARTNERSHIP CANADA™ PUBLICATION



WHY SUPPORT POLLINATORS?

IN THEIR 1996 BOOK, *THE FORGOTTEN POLLINATORS*, Buchmann and Nabhan estimated that animal pollinators are needed for the reproduction of 90% of flowering plants and one third of human food crops. Each of us depends on these industrious pollinators in a practical way to provide us with the wide range of foods we eat. In addition, pollinators are part of the intricate web that supports the biological diversity in natural ecosystems that helps sustain our quality of life.

Abundant and healthy populations of pollinators can improve fruit set and quality, and increase fruit size. In farming situations this increases production per hectare. In the wild, biodiversity increases and wildlife food sources increase. The Pacific Ranges are mostly mountainous and coastal, with a large diversity of native flowers, shrubs, and trees that rely on native pollinators such as bumble bees for seed and fruit production. The Pemberton Valley is the most productive agricultural area within the Pacific Ranges ecoregion, producing a diversity of crops, such as nuts, vegetables, and berries, many of which rely or benefit from managed honey bees, native bees, and other pollinators. Honey bees pollinate more than \$4 billion worth of crops in Canada each year.

Unfortunately, the numbers of many native pollinators are declining. They are threatened by habitat loss, disease, climate change, and the excessive and inappropriate use of pesticides. As a result research and conservation actions supporting native pollinators are increasingly active. Honey bee colony losses have significantly impacted beekeepers. Parasites, disease, pesticide use, insufficient nutrition, and transportation practices all impact honey bee health, and this in turn can impact the commercial pollination services honey bees provide. The efforts to understand the threats to commercial bees should help us understand other pollinators and their roles in the environment as well.

It is imperative that we take immediate steps to help pollinator populations thrive. The beauty of the situation is that by supporting pollinators' need for habitat, we support our own needs for food and support diversity in the natural world.

Thank you for taking time to consult this guide. By adding plants to your landscape that provide food and shelter for pollinators throughout their active seasons and by adopting pollinator friendly landscape practices, you can make a difference to both the pollinators and the people that rely on them.



Val Dolcini
President & CEO, Pollinator Partnership

“**FLOWERING PLANTS
ACROSS WILD,
FARMED AND EVEN
URBAN LANDSCAPES
ACTUALLY FEED THE
TERRESTRIAL WORLD,
AND POLLINATORS
ARE THE GREAT
CONNECTORS WHO
ENABLE THIS GIANT
FOOD SYSTEM TO
WORK FOR ALL WHO
EAT... INCLUDING US.**”

— ROGER LANG, CHAIRMAN,
POLLINATOR PARTNERSHIP



THIS REGIONAL GUIDE IS JUST ONE in a series of plant selection tools designed to provide you with information on how to plant local native plants for pollinators. Each of us can have a positive impact by providing the essential habitat requirements for pollinators including food, water, shelter, and enough space to raise their young.

Pollinators travel through the landscape without regard to property ownership or provincial boundaries. We've chosen to use the ecoregional classification system and to underscore the connections between climate and vegetation types that affect the diversity of pollinators in the environment.

The Canadian ecoregions are based on the National Ecological Framework Report. The National Ecological Framework for Canada

is a system created as a management tool and is used to predict responses to land management practices throughout large areas. This guide addresses pollinator-friendly land management practices in what is known as the Pacific Ranges ecoregion. This ecoregion contains some of the most productive forest lands in Canada and land uses include forestry, production of hydroelectric power, water-oriented recreation, tourism, and agriculture in the Pemberton Valley.

The seasonal cycle of sun and shade within the forests has created a changing pattern of bloom time for food plants and shelter needs for foraging, nesting, and migrating pollinators. Farms and residential areas provide a diverse range of soil types in both sunny and shady areas. With this diversity of locations many different species of plants may be

used to improve pollinator habitats where they are lacking.

Long before there were homes and farms in the Pacific Ranges ecoregion, natural vegetation provided essential opportunities for wildlife, including pollinators. Farmers, land managers, and gardeners in this region have a wide palette of plants to use in the landscape. In choosing plants, aim to create habitat for pollinators that allow adequate food, shelter, and water sources. Most pollinators have very small home ranges. You will make a difference by understanding the vegetation patterns on the farm, forest, or neighbour's yard adjacent to your property. With this information in hand, your planting choices will better support the pollinators' need for food and shelter as they move through the landscape.

UNDERSTANDING THE PACIFIC RANGES



- ✿ The Pacific Ranges ecoregion is part of the larger Pacific Maritime Ecozone, which spans 195,000 km along the Canadian Pacific Coast. The ecoregion is entirely contained in British Columbia, and encompasses the southern part of the Coast Mountains, extending from the British Columbia-Washington border north to Bella Coola. This ecoregion contains some of the most productive forest lands in Canada and land uses include forestry, production of hydroelectric power, water-oriented recreation, tourism, and agriculture in the Pemberton Valley.
- ✿ Not sure about which region you live or work in? Go to www.pollinator.org/guides and click on **Ecoregion Locator** for help.
- ✿ Southern-most mountain range of the Coast Mountains, from Burke Channel in the north to the Fraser River Lowland in the south.
- ✿ Contains one of the most extensive mountain-fjord complexes in the world.
- ✿ Elevations ranging from sea level to 4,000 meters.
- ✿ In the valleys, the summer mean temperature is 13.5°C and the winter mean temperature is -1°C. Temperatures are cooler in the higher elevations.
- ✿ Average year-round precipitation is 1,500 mm in the lower elevations, and up to 3,400 mm in the higher elevations.
- ✿ The mountains are made up of coastal granite and are high, irregular, and steeply-sloping.

CHARACTERISTICS

- ✿ Vegetative cover ranges from western hemlock, western red cedar, and Pacific silver fir on the low-elevation slopes, to western hemlock and Douglas fir in drier areas, and mountain hemlock and Pacific silver fir in the subalpine zone.
- ✿ An unusual white color form of the black bear (Kermode or Spirit bear) is found in this ecoregion.
- ✿ In the valleys and old-growth coastal rainforest, more than 50% of the region has been fragmented by logging activities and logging roads, a concern for species that need habitat connectivity.

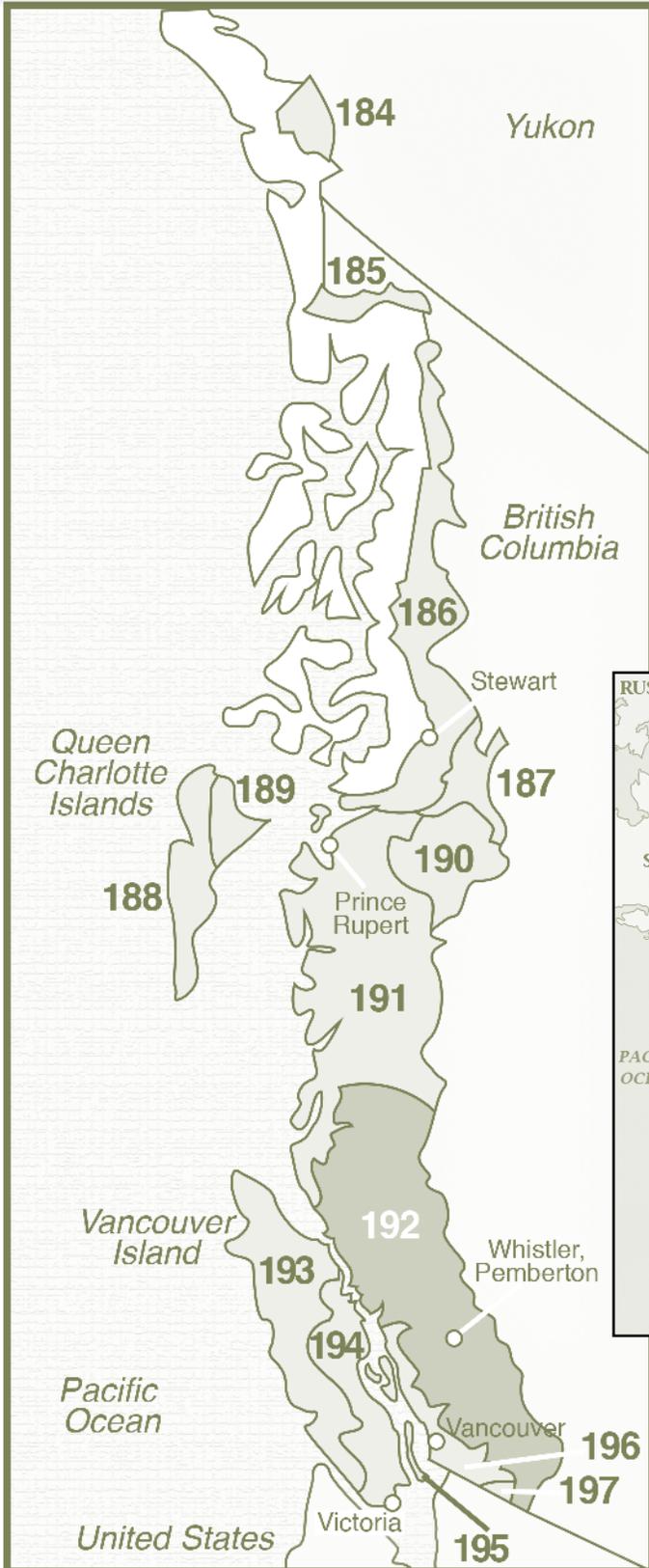


Pacific Maritime Ecoregions

- 184 Mount Logan
- 185 N. Coastal Mountains
- 186 N. Coastal Mountains
- 187 Nass Basin
- 188 Queen Charlotte Ranges
- 189 Queen Charlotte Lowland
- 190 Nass Ranges
- 191 Coastal Gap

192 Pacific Ranges

- 193 Western Vancouver Island
- 194 Eastern Vancouver Island
- 195 Georgia-Puget Basin
- 196 Lower Mainland
- 197 Cascade Ranges



Pacific Ranges includes:

Squamish, Whistler, Hope, and Pemberton

MEET THE POLLINATORS



Anna's Hummingbird, a year-round species in the Pacific Ranges ecoregion.

Western Tiger Swallowtail.



Photo courtesy Kim Davis & Mike Stangeland

WHO ARE THE POLLINATORS?

BEES

Bees are the main pollinators of many wild flowers and agricultural crops across Canada.

Most of us are familiar with the colonies of honey bees that have been the workhorses of agricultural pollination for years in Canada. They were imported from Europe almost 400 years ago and continue to be managed for honey production and pollination services. There are over 800 species of native ground and twig nesting bees in Canada. Most of these bee species live a solitary life; a minority are social and form colonies or nest in aggregations.

Native bees visit and pollinate many crops; in many cases they are better at transferring pollen than honey bees. Our native bees can be encouraged to do more to support agricultural endeavours if their needs for nesting habitat are met and if suitable sources of nectar, pollen, and water are provided. Bees come in a variety of body shapes and sizes, and even have tongues of different lengths. Native bees visit the widest range of flowers and crops of any pollinator group.

Bumble bees (*Bombus* spp.) form small colonies, usually underground making use of old rodent burrows or dense thatches. They are generalists, feeding on a wide range of plant types from May to September and are important pollinators of

tomatoes and blueberries. Sweat bees (family Halictidae) are medium to small-sized, slender bees

that commonly nest underground. Various species are solitary while others form loose colonies, nesting side-by-side. Other common solitary bees include mining bees (*Andrena* spp.), which nest underground and are common in the spring; leaf-cutter bees (*Megachile* spp.), which prefer dead trees or branches for their nest sites; and mason bees (*Osmia* spp.), which utilize cavities they find in stems and dead wood that they fill with mud.

BUTTERFLIES

Butterflies prefer open and sunny areas such as meadows and along woodland edges that provide bright flowers, water sources, and specific host plants for their caterpillars. Gardeners have been attracting butterflies to their gardens for some time. To encourage butterflies place flowering plants where they have full sun and are protected from the wind. They usually look for flowers that provide a good landing platform. Butterflies need open areas (e.g., bare earth, large stones) where they can bask, and moist soil from which they wick needed minerals. Butterflies eat rotten fruit and even dung, so don't clean up all the messes in your garden! By providing a safe place to eat and nest, gardeners can also support the pollination role that butterflies play in the landscape. British Columbia has the largest diversity of butterflies in Canada, with 187 known species. Some of the butterflies that have been found in the Pacific Ranges ecoregion include the Western Tiger Swallowtail (*Papilio rutulus*), the Western Spring Azure (*Celastrina echo*), the Western Sulphur (*Colias occidentalis*), and the Green Comma (*Polygonia faunus*).



MOTHS

Moths are most easily distinguished from butterflies by their antennae. Butterfly antennae are simple with a swelling at the end. Moth antennae differ from simple to featherlike, but never have a swelling at the tip. Butterfly bodies are not very hairy, while moth bodies are quite hairy and much more stout. In addition, butterflies typically are active during the day; moths at night. They are attracted to flowers that are strongly sweet smelling, open in late afternoon or night, and are typically white or pale coloured.

BEETLES

There are more than 9000 species of beetles in Canada and many of them can be found easily by looking inside flower heads. Gardeners have yet to intentionally draw beetles to their gardens, possibly because beetle watching isn't as inspiring as butterfly or bird watching. Yet beetles do play a role in pollination. Some have a bad reputation because they can leave a mess behind, damaging plant parts as they eat pollen. Beetle pollinated plants tend to be large, strong scented flowers and have the anthers and stigma exposed. Beetles are known to pollinate magnolia, paw paws, and yellow pond lilies.

FLIES

It may be hard to imagine why one would want to attract flies to the garden. However, flies are one of the most diverse group of pollinators. They include colourful flower flies and hover flies (*Syrphidae*), active bee flies (*Bombyliidae*), and tiny midges

that visit many plant species. Like bees, flies are hairy and can easily transport pollen from flower to flower. Flies primarily pollinate small flowers that bloom under shade and in seasonally moist habitats, but are also economically important as pollinators for a range of annual and bulbous ornamental flowers. Plants pollinated by flies include the American pawpaw (*Asimina triloba*), skunk cabbage (*Symplocarpus foetidus*), goldenrod (*Solidago* spp.), and members of the carrot family.

BIRDS

Hummingbirds are the primary birds that play a role in pollination in North America. Their long beaks and tongues draw nectar from tubular flowers. Pollen is carried on both their beaks and feathers. Regions closer to the tropics, with warmer climates, boast the largest number of hummingbird species and the greatest number of native plants to support their need for food. A number of hummingbirds spend the summer in British Columbia. Anna's Hummingbirds (*Calypte anna*) have the northern most year round range and are a common site in the winter in coastal BC. Hummingbirds can see the colour red; bees cannot. Many tropical flowers, grown as annuals, along with native woodland edge plants, attract hummingbirds.

BATS

Though bat species in Canada are not pollinators, bats in the south western United States and Mexico are important pollinators of agave and cactus. The head shape and

long tongues of nectar bats allows them to delve into flower blossoms and extract both pollen and nectar; pollen covers their hairy bodies and is transfer as they move from plant to plant.

SPECIES AT RISK

Species at Risk include endangered species, as well as threatened and special concern species. Some pollinator species such as the Karner Blue butterfly have already been extirpated from some regions in Canada. Other species that were once common have become rare, such as the Western Bumble Bee (*Bombus occidentalis*). Because habitat loss is one of the largest threats facing many pollinators, the very best thing you can do is plant for them.

Western Bumble Bee

- The Western Bumble Bee (*Bombus occidentalis*) used to be one of the most common bumble bees in the Pacific Northwest.
- It has become rare since the 1990s, possibly due to pathogens that transferred from managed bumble bees to wild populations, and habitat loss.
- It was designated as 'Threatened' in 2014 but currently has no status under the Species at Risk Act.
- Recently, there are signs that some populations of the Western Bumble bee may be recovering in the US.

PLANT TRAITS

WHICH FLOWERS DO THE POLLINATORS PREFER?

NOT ALL POLLINATORS ARE found in each province, and some are more important in different parts of Canada. Use this page as a resource to understand the plants and pollinators where you live.

Plants can be grouped together based on the similar characteristics of their flowers. These floral characteristics can be useful to predict the type of pollination method or animal that is most effective for that group of plants. This association between floral characteristics and pollination method is called a pollination syndrome.

The interactions of animal pollinators and plants have influenced the evolution of both groups of organisms. A mutualistic relationship between the pollinator and the plant species helps the pollinator find necessary pollen and nectar sources and helps the plant reproduce by ensuring that pollen is carried from one flower to another.

Plant Trait	Pollinator		
	Bees	Beetles	Birds
Colour	Bright white, yellow, blue, or UV	Dull white or green	Scarlet, orange, red or white
Nectar Guides	Present	Absent	Absent
Odour	Fresh, mild, pleasant	None to strongly fruity or fetid	None
Nectar	Usually present	Sometimes present; not hidden	Ample; deeply hidden
Pollen	Limited; often sticky and scented	Ample	Modest
Flower Shape	Shallow; have landing platform; tubular	Large bowl-like, Magnolia	Large funnel like; cups, strong perch support

This chart and more information on pollinator syndromes can be found at:



AND THE POLLINATORS THEY ATTRACT

Pollinator

	Butterflies	Flies	Moths	Wind
	Bright, including red and purple	Pale and dull to dark brown or purple; flecked with translucent patches	Pale and dull red, purple, pink or white	Dull green, brown, or colourless; petals absent or reduced
	Present	Absent	Absent	Absent
	Faint but fresh	Putrid	Strong sweet; emitted at night	None
	Ample; deeply hidden	Usually absent	Ample; deeply hidden	None
	Limited	Modest in amount	Limited	Abundant; small, smooth, and not sticky
	Narrow tube with spur; wide landing pad	Shallow; funnel like or complex and trap-like	Regular; tubular without a lip	Regular; small and stigmas exerted

<http://www.fs.fed.us/wildflowers/pollinators/syndromes.shtml>



DEVELOPING LANDSCAPE PLANTINGS THAT PROVIDE POLLINATOR HABITAT

WHETHER YOU ARE A FARMER of many hectares, land manager of a large tract of land, or a gardener with a small lot, you can increase the number of pollinators in your area by making conscious choices to include plants that provide essential habitat for bees, butterflies, moths, beetles, hummingbirds, and other pollinators.

FOOD:

Flowers provide nectar (high in sugar and necessary amino acids) and pollen (high in protein) to pollinators.

Fermenting fallen fruits also provide food for bees, beetles, and butterflies.

Specific plants, known as host plants, are eaten by the larvae of pollinators such as butterflies.

- Plant in groups to increase pollination efficiency. If a pollinator can visit the same type of flower over and over, it doesn't have to relearn how to enter the flower and can transfer pollen to the same species, instead of squandering the pollen on unreceptive flowers.
- Plant with bloom season in mind, providing food from early spring to late fall. (see Bloom Periods pp.16-19)
- Plant a diversity of plants to support a variety of pollinators. Flowers of different colour, fragrance, and season of bloom on plants of different heights will attract different pollinator species and provide pollen and nectar throughout the seasons.
- Many herbs and annuals, although not native, are very good for pollinators. Mint, oregano, garlic,

chives, parsley and lavender are just a few herbs that can be planted. Old fashioned zinnias, cosmos, and single sunflowers support bees and butterflies. Non-native crops, herbs, and ornamental flowers should only be planted in gardens.

- Recognize weeds that might be a good source of food. For example, dandelions provide nectar in the early spring before other flowers open. Milkweed is a host for the Monarch butterfly.
- Learn and utilize Integrated Pest Management (IPM) practices to address pest concerns. Minimize or eliminate the use of pesticides.

SHELTER:

Pollinators need protection from severe weather and from predators as well as sites for nesting and roosting.

- Incorporate different canopy layers in the landscape by planting trees, shrubs, and different-sized perennial plants.
- Leave dead snags for nesting sites of bees, and other dead plants and leaf litter for shelter.
- Avoid applying thick layers of mulch that are hard to dig through.
- Build bee boxes to encourage solitary, non-aggressive bees to nest on your property.
- Ground nesting bees are also attracted to lawns and short grass areas, especially if there is a south facing slope.
- Leave some areas of soil uncovered to provide ground nesting insects easy access to underground tunnels.
- Group plantings so that pollinators

can move safely through the landscape protected from predators.

- Include plants that are needed by butterflies during their larval development.

WATER:

A clean, reliable source of water is essential to pollinators.

- Natural and human-made water features such as running water, pools, ponds, and small containers of water provide drinking and bathing opportunities for pollinators.
- Ensure the water sources have a shallow or sloping side so the pollinators can easily approach the water without drowning.

Your current landscape probably includes many of these elements.

Observe wildlife activity in your farm fields, woodlands, and gardens to determine what actions you can take to encourage other pollinators to feed and nest. Evaluate the placement of individual plants and water sources and use your knowledge of specific pollinator needs to guide your choice and placement of additional plants and other habitat elements. Minor changes by many individuals can positively impact the pollinator populations in your area. Watch for - and enjoy - the changes in your landscape!

- **CAUTION LAND MANAGERS:** Remember that insecticides are toxic to pollinators. Extreme caution is warranted if you choose to use any insecticide. Strategically apply insecticides only for problematic target species.



FARMS

Many tree fruit, berry, and vegetable crops are grown in British Columbia, and they will benefit from strong native bee populations that boost pollination efficiency. Incorporate different plants throughout the farm that provide food for native populations when targeted crops are not in flower.

Farmers have many opportunities to incorporate pollinator-friendly land management practices on their land which will benefit the farmer in achieving his or her production goals:

- Minimize the use of insecticides to reduce the impact on native pollinators. Spray when bees

aren't active (after dark or just before dawn) and choose targeted ingredients.

- Consider using Integrated Pest Management (IPM) strategies to control pests. Use insecticides that cause the least harm to non-target organisms and only use when pests reach economic thresholds.
- Carefully consider the use of herbicides. Some weeds can provide needed food for pollinators.
- Minimize tillage to protect ground nesting pollinators.
- Consider creating designated permanently untilled areas for ground nesting bees along internal farm laneways.
- Ensure water sources are scattered

throughout the landscape.

- Choose a variety of native plants to act as windbreaks, riparian buffers, and field borders throughout the farm.
- Plant unused areas of the farm with temporary cover crops that can provide food or with a variety of trees, shrubs, and flowers that provide both food and shelter for pollinators.
- Check with local not-for-profit organizations or government agencies to see what technical support might be available to assist you in your effort to provide nectar, pollen, and larval food sources for pollinators on your farm.



Illustrations by Carolyn Vibbert



Public lands are maintained for specific reasons ranging from high impact recreation to conservation. In British Columbia, forests have been cut to allow for roads, energy infrastructure, buildings, open lawn areas, boat ramps, and vistas. These other lands can provide benefits to pollinator when managed correctly. Pollinators are encouraged by timed mowing, opening tree canopies, and planting of native flowers. Less disturbed natural areas can be augmented with plantings of native plant species. Existing plantings around buildings and parking areas should be evaluated to determine if pollinator-friendly plants can be substituted or added to attract and support pollinators. Public land managers have a unique opportunity to use their plantings as an education tool to help others understand the importance of

pollinators in the environment through signs, brochures, and public programs.

In an effort to increase populations of pollinators the land manager can:

- Inventory and become knowledgeable of local pollinators.
- Provide connectivity between vegetation areas by creating corridors of perennials, shrubs, and trees that provide pollinators shelter and food as they move through the landscape.
- Maintain a minimum of lawn areas that support recreational needs.
- Restrict the use of insecticides and herbicides.
- Provide water sources in large open areas.
- Maintain natural meadows and openings that provide habitats for sun-loving wildflowers and grasses.
- Remove invasive species.



Gardeners have a wide array of plants to use in their gardens. Native plants, plants introduced from years of plant exploration from around the world, and plants developed by professional and amateur breeders can be found in garden centres, in catalogs, and on web-sites. Use your knowledge of pollinator needs and the plant list in this document to guide your choices.

- Choose a variety of plants that will provide nectar and pollen throughout the growing season.
- Resist the urge to have a totally manicured lawn and garden. Leave bare ground for ground nesting bees. Leave areas of dead wood and leaf litter for other insects.
- Find local resources to help you in your efforts. Contact your local garden club or conservation groups. Visit your regional botanic gardens and arboreta.

The scale of your plantings will vary but it is important to remember that you are trying to provide connectivity to the landscape adjacent to your property. Don't just look within your property boundaries. If your neighbour's property provides an essential element, such as water, which can be utilized by pollinators visiting your land, you may be able to devote more space to habitat elements that are missing nearby. It is best to use native plants which have evolved to support the needs of specific native pollinators. Some pollinators, however, are generalists and visit many different plants, both native and non-native. Be sure that any non-native plants you choose to use are not invasive. Remember that specialized cultivars sometimes aren't used by pollinators. Flowers that have been drastically altered, such as cultivars with double petals or completely different colour than the wild species, often prevent pollinators from finding and feeding on the flowers. In addition, some cultivars don't contain the same nectar and pollen resources that attract pollinators to the wild types.

- **CAUTION:** Take time to evaluate the source of your plant material. You want to ensure you get plants that are healthy and correctly identified. Your local garden club can help you make informed decisions when searching for plants.



PLANTS THAT ATTRACT POLLINATORS IN THE PACIFIC RANGES

The following chart lists plants that attract pollinators. It is not exhaustive, but provides guidance on where to start. Annuals, herbs, weeds, and cover crops provide food and shelter for pollinators, too.

Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
Trees and Shrubs								
<i>Acer glabrum</i>	Douglas maple	1-10m	yellow, greenish	April - May	sun to partial shade	dry to moist	bees	
<i>Acer macrophyllum</i>	bigleaf maple	12-20m+	red, greenish, yellow	March - April	sun to partial shade	dry to wet	bees, flies, beetles	X
<i>Amelanchier alnifolia</i>	Saskatoon berry	1-5m	white	April - July	sun to partial shade	moist to dry	bees, flies	X
<i>Arbutus menziesii</i>	arbutus	6-30m	white	April - May	sun to partial shade	dry	bees	
<i>Arctostaphylos columbiana</i>	hairy manzanita	0.1-3m	white	April - July	sun to partial shade	dry, well drained	hummingbirds	
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	less than 1m	pink	April - June	sun to shade	dry to moist	bees	
<i>Cassiope mertensiana</i>	western bell heather	up to 1m	white	July - August	sun	moist	butterflies	X
<i>Ceanothus sanguineus</i>	redstem ceanothus	1-3m	white	May - July	sun to shade	dry to moist	bees	
<i>Ceanothus velutinus</i>	snowbrush ceanothus	1-1.5m	white	April - August	sun to shade	dry to well drained	bees	
<i>Cornus nuttallii</i>	Pacific dogwood	4-12m	white	April - June	shade	moist to well drained	bees, beetles, flies, butterflies	
<i>Cornus stolonifera</i>	red-osier dogwood	2-4m	white to cream	May - June	partial shade	moist	butterflies	X
<i>Crataegus douglasii</i>	black hawthorn	0-10m	white to cream	May - June	sun to partial shade	normal to wet	butterflies	X
<i>Gaultheria shallon</i>	salal	0.4-3m	white to cream, pink	May - June	sun to partial shade	dry to wet	bees, butterflies, hummingbirds	
<i>Holodiscus discolor</i>	oceanspray	1-2m	white	June - August	sun to partial shade	moist	bees, butterflies	X
<i>Loiseleuria procumbens</i>	alpine azalea	1m	pink	June - August	partial shade	moist	bees	
<i>Lonicera dioica</i>	limber honeysuckle	1-3m	yellow, orange	May - June	sun, partial shade to shade	dry to moist	bees, hummingbirds	
<i>Lonicera involucrata</i>	black twinberry	1-3m	yellow to red	April - August	sun, partial shade to shade	moist	bees, hummingbirds	
<i>Mahonia aquifolium</i>	tall Oregon-grape	1-2m	yellow	March - May	partial shade to shade	dry	bees	
<i>Mahonia nervosa</i>	dull Oregon-grape	less than 1m	yellow	March - June	sun to shade	dry to moist	bees	



Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Malus fusca</i>	Pacific crabapple	6-10m	white to pink	April - June	sun	moist to wet	bees	
<i>Menziesia ferruginea</i>	rusty menziesia	0.5-1.5m	pink to red	May - August	shade	well drained	bees	
<i>Philadelphus lewisii</i>	mock orange	1-3m	white to cream	June	sun	dry to moist	bees, butterflies	
<i>Phyllodoce empetriformis</i>	pink mountain heather	up to 1m	pink, purple	June - August	partial shade	moist	bees	
<i>Physocarpus capitatus</i>	Pacific ninebark	1-2.5m	white	May - June	sun to partial shade	moist to wet	bees	
<i>Prunus emarginata</i>	bitter cherry	1-15m	white	April - June	sun to partial shade	well drained	bees	
<i>Prunus virginiana</i>	chokecherry	6-10m	white	May - July	sun to shade	dry to moist	bees, butterflies, moths	X
<i>Rhododendron albiflorum</i>	Cascade azalea	1-2m	white	June - August	sun, partial shade to shade	dry, well drained, moist to wet	bees	
<i>Rhododendron macrophyllum</i>	Pacific rhododendron	1.5-7.5m	pink to purple	May - July	partial shade to shade	dry to moist	bees	
<i>Ribes acerifolium</i>	mapleleaf currant	1m	pink	June - July	sun to partial shade	well drained to moist	bees	
<i>Ribes divaricatum</i>	spreading gooseberry	3m	white to red	April - May	sun, partial shade to shade	well drained	bees	
<i>Ribes sanguineum</i>	red-flowering currant	1-3m	red	April - June	sun, partial shade to shade	dry to moist	bees, butterflies, hummingbirds	
<i>Rosa gymnocarpa</i>	dwarf rose	2m	pink	May - August	sun, partial shade to shade	dry to moist	bees	
<i>Rosa nutkana</i>	Nootka rose	1-3m	pink	May - July	sun, partial shade to shade	dry to moist	bees, butterflies	X
<i>Rubus leucodermis</i>	blackcap raspberry	0.5-2 m	white	April - July	sun, partial shade to shade	dry	bees, butterflies	
<i>Rubus parviflorus</i>	thimbleberry	1-2m	white to cream	May - July	sun to partial shade	normal to moist	butterflies	
<i>Rubus pedatus</i>	strawberryleaf raspberry	less than 1m	white	June	partial shade to shade	well drained	bees, butterflies	
<i>Rubus ursinus</i>	trailing blackberry	0.5-1.5m	white	April - August	sun, partial shade to shade	moist	bees	
<i>Rubus spectabilis</i>	salmonberry	1-3m	pink	March - June	sun, partial shade to shade	moist	bees	

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PLANTS THAT ATTRACT POLLINATORS IN THE PACIFIC RANGES

Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Salix lucida</i>	shining willow	3.5-6m	white to yellow	March - May	sun, partial shade to shade	moist to wet	bees	
<i>Salix scouleriana</i>	Scouler's willow	4-12m	yellow	March - April	sun to partial shade	dry to moist	bees	
<i>Salix sitchensis</i>	sitka willow	3-9m	white to cream	March - April	sun to partial shade	moist to wet	bees	
<i>Sambucus cerulea</i>	blue elderberry	2-8m	white	May - July	sun to partial shade	moist	bees	
<i>Spiraea douglasii</i>	hardhack	1-3m	pink, purple	June - August	sun to partial shade	moist	bees	
<i>Spiraea splendens</i>	rose meadowsweet	1m	pink	June - August	sun to partial shade	moist	bees	
<i>Symphoricarpos albus</i>	common snowberry	0.5-1.5m	white to pink	May - August	sun to partial shade	dry	bees	
<i>Vaccinium caespitosum</i>	dwarf blueberry	less than 1m	white to pink	May - July	sun	well drained	bees, butterflies	X
<i>Vaccinium membranaceum</i>	thinleaf huckleberry	up to 2m	white to pink	May - June	sun, partial shade to shade	dry, moist, wet	bees	
<i>Vaccinium ovalifolium</i>	oval-leaf blueberry	1m	white to pink	May - July	sun to shade	moist to wet	bees	
<i>Vaccinium parvifolium</i>	red huckleberry	up to 6m	white to pink to green	April - June	sun, partial shade to shade	moist	bees	
<i>Vaccinium uliginosum</i>	bog blueberry	less than 1m	white to pink	May - June	sun, partial shade to shade	moist to wet	bees, butterflies	X
<i>Viburnum edule</i>	highbush cranberry	0.5-2+m	white	May - June	sun to shade	moist	bees, butterflies	
Forbs								
<i>Achillea millefolium</i>	common yarrow	less than 1m	white to pink	June - November	sun to partial shade	dry to moist	bees	X
<i>Allium acuminatum</i>	Hooker's onion	less than 1m	purple, pink	May - June	sun to partial shade	dry to normal	bees, butterflies	
<i>Allium cernuum</i>	nooding onion	less than 1m	white to cream, pink	July - August	sun	dry to moist	bees, butterflies, hummingbirds	X
<i>Anaphalis margaritacea</i>	pearly everlasting	less than 1m	white to cream	July - September	sun	dry to moist	bees, butterflies	X
<i>Anemone occidentalis</i>	western pasqueflower	less than 1m	white, pink	May - August	sun	moist, well drained	flies	
<i>Apocynum androsaemifolium</i>	spreading dogbane	0.3-2m	white to cream, pink	June - August	sun to partial shade	dry to normal	butterflies	X
<i>Aquilegia formosa</i>	red columbine	less than 1m	red	May - August	sun to partial shade	normal to moist	bees, hummingbirds	



Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Arnica latifolia</i>	Mountain arnica	less than 1m	yellow	June - July	sun	wet	flies	
<i>Asclepias speciosa</i>	showy milkweed	1m	white to pink	June - August	sun	moist	bees, butterflies	X
<i>Castilleja hispida</i>	harsh Indian Paintbrush	up to 1m	red, orange, yellow, green	April - August	partial shade	dry	bees, hummingbirds	
<i>Castilleja miniata</i>	scarlet paintbrush	up to 1m	red, pink, orange	May - September	sun	moist to wet, well drained	bees, hummingbirds	
<i>Castilleja parviflora</i>	small-flowered paintbrush	less than 1m	pink	June - September	sun	well drained	bees, hummingbirds	
<i>Castilleja rhexiifolia</i>	alpine paintbrush	up to 1m	pink	June - August	partial shade	dry	bees, hummingbirds	
<i>Cerastium arvense</i>	field chickweed	less than 1m	white to cream	May - September	sun	dry	bees, flies	
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary	up to 1m	blue, purple	April - June	partial shade	moist	bees	
<i>Cornus canadensis</i>	bunchberry	less than 1m	white to cream	May - September	sun to partial shade	normal to moist	bees, flies	
<i>Cornus unalaschkensis</i>	Alaskan bunchberry	less than 1m	white	June - August	partial shade	moist to well drained	bees, flies	
<i>Delphinium menziesii</i>	Menzies' Larkspur	less than 1m	yellow, blue, purple	April - July	sun	moist, well drained	bees, hummingbirds	
<i>Dicentra formosa</i>	pacific bleeding heart	less than 1m	purple, pink	May - June	sun to shade	moist	hummingbirds	
<i>Dodecatheon pulchellum</i>	few-flowered shootingstar	less than 1m	pink	April - August	partial shade	normal	bees	
<i>Epilobium anagallidifolium</i>	alpine willowherb	less than 1m	pink	June - September	sun	well drained	bees	
<i>Epilobium angustifolium</i>	fireweed	1-1.5m	pink	June - September	sun	moist	bees, hummingbirds	
<i>Epilobium latifolium</i>	broad-leaved willowherb	less than 1m	pink to purple	June - August	sun	moist	bees	
<i>Erigeron compositus</i>	cutleaf daisy	less than 1m	white to pink	May - August	partial shade	well drained	bees, butterflies	
<i>Erigeron divergens</i>	spreading fleabane	less than 1m	white to pink	April - October	partial shade	moist	bees, butterflies	
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	less than 1m	white to pink	April - June	partial shade	well drained to moist	bees, butterflies	
<i>Eriogonum umbellatum</i>	sulphur-flower buckwheat	less than 1m	yellow to red	June - August	sun to partial shade	dry	bees, butterflies	
<i>Eriophyllum lanatum</i>	woolly sunflower	less than 1m	yellow	May - August	sun	dry	bees, butterflies	

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PLANTS THAT ATTRACT POLLINATORS IN THE PACIFIC RANGES

Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Erythronium grandiflorum</i>	yellow avalanche lily	less than 1m	yellow	May - June	partial shade	normal to moist	bees, butterflies	
<i>Euthamia graminifolia</i>	flat-top goldentop	1m	yellow	July - September	sun	moist	bees, butterflies	
<i>Fragaria chiloensis</i>	wild strawberry	less than 1m	white to cream	July	sun to partial shade	dry to normal	bees	
<i>Fragaria vesca</i>	wood strawberry	less than 1m	white to cream	May - August	partial shade	normal to wet	bees	
<i>Fragaria virginiana</i>	Virginia strawberry	less than 1m	white	May - August	sun to partial shade	dry	bees, butterflies	X
<i>Geranium erianthum</i>	woolly geranium	1m	white-purple	May - July	partial shade	moist	bees	
<i>Grindelia stricta</i>	entire-leaved gumweed	1-2m	yellow	July - October	sun to partial shade	normal to moist	bees	
<i>Linnaea borealis</i>	twinflower	less than 1m	white to cream, pink	May - July	sun to partial shade	moist to wet	bees, flies, moths	
<i>Lobelia kalmii</i>	Ontario lobelia	less than 1m	white to blue	July - August	sun	well drained to moist	bees	
<i>Lysichiton americanus</i>	skunk cabbage	less than 1m	yellow, white to cream	March - June	partial shade	moist to wet	flies, beetles	
<i>Maianthemum dilatatum</i>	false lily-of-the-valley	less than 1m	white to cream	May - June	shade	moist to wet	bees, butterflies	
<i>Maianthemum racemosum</i>	false Solomon's seal	less than 1m	white to cream	May - July	partial shade to shade	normal to moist	bees	
<i>Monarda fistulosa</i>	wild bergamot	less than 2m	pink-purple	May - August	sun to partial shade	dry to moist	bees, butterflies, hummingbirds	
<i>Penstemon davidsonii</i>	Davidson's penstemon	less than 1m	pink to purple	July-August	sun	well drained	bees, hummingbirds	
<i>Penstemon serrulatus</i>	serrulate penstemon	less than 1m	blue to purple	June - August	partial shade	moist to wet	bees	
<i>Phacelia sericea</i>	silky phacelia	less than 1m	white to purple	June - July	partial shade	well drained	bees	
<i>Plectritis congesta</i>	sea blush	less than 1m	white, pink	March - June	sun to partial shade	moist	bees, butterflies	
<i>Polemonium viscosum</i>	sticky polemonium	less than 1m	purple	July - August	sun	well drained	bees	
<i>Prunella vulgaris ssp. lanceolata</i>	self-heal	less than 1m	purple	May - September	sun to partial shade	moist	bees, butterflies	
<i>Ranunculus occidentalis</i>	western buttercup	up to 1m	yellow	April - June	partial shade	moist, well drained	bees	



Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Solidago lepida</i>	Canada goldenrod	up to 1.5m	yellow	August-September	sun	dry to moist	bees	
<i>Solidago multiradiata</i>	northern goldenrod	less than 1m	yellow	July - September	partial shade	dry	bees, butterflies	X
<i>Solidago simplex</i>	spikelike goldenrod	less than 1m	yellow	July - September	sun to partial shade	moist	bees	
<i>Symphyotrichum laeve</i>	smooth blue aster	1m	purple	August - September	sun to partial shade	well drained to moist	bees	
<i>Symphyotrichum subspicatum</i>	Douglas' aster	less than 1m	yellow, purple	July - September	sun to partial shade	normal to wet	bees, butterflies	
<i>Tellima grandiflora</i>	fringecup	less than 1m	white to cream	April - May	sun to partial shade	normal to moist	hummingbirds	
<i>Trifolium wormskioldii</i>	springbank clover	1m+	white to purple	May - August	sun to partial shade	moist to wet	bees, butterflies	
<i>Trillium ovatum</i>	western trillium	less than 1m	white to cream	April - May	partial shade to shade	moist to wet	bees, butterflies	
<i>Viola adunca</i>	hookedspur violet	less than 1m	blue, purple	April - July	partial shade to shade	dry to moist	bees, butterflies	X
<i>Viola glabella</i>	stream violet	less than 1m	yellow	April - May	partial shade to shade	moist to wet	bees, butterflies	
<i>Viola sempervirens</i>	trailing yellow violet	less than 1m	yellow	March - June	shade	moist	bees, butterflies	
Vines								
<i>Lonicera ciliosa</i>	orange honeysuckle	climbing	orange	May - July	partial shade	well drained	bees, hummingbirds	
Shelter Plants								
<i>Bouteloua curtipendula</i>	sideoats grama	up to 1m			sun to partial shade	dry to moist		X
<i>Bromus carinatus</i>	California Brome	up to 1m			partial shade	dry		
<i>Deschampsia cespitosa</i>	tufted hairgrass	up to 1m			sun	dry to wet		X
<i>Elymus glaucus</i>	blue wildrye	1-2m			partial shade	dry to moist, well drained		
<i>Koeleria macrantha</i>	junegrass	less than 1m			sun to partial shade	dry to normal		
<i>Polystichum munitum</i>	sword fern	1-1.5m			partial shade to shade	moist		

NOTES



NOTES



HABITAT HINTS

FOR THE PACIFIC RANGES

BEE-POLLINATED GARDEN FLOWERS AND CROPS

	Bumble	Digger	Lg Carpenter	Sm Carpenter	Squash/ Gourd	Leafcutter	Mason	Sweat	Plasterer	Yellow- faced	Andrenid
FLOWERS											
Catalpa			x								
Catnip	x	x					x				
Clover		x									x
Columbine	x										
Cow parsley										x	
Goldenrod	x	x				x		x			
Impatiens	x										
Irises	x		x								
Lavender	x	x	x			x					
Milkwort								x			
Morning glory				x							
Penstemon	x	x					x				
Phacelia	x	x		x		x	x	x	x		x
Potentilla										x	
Rose	x		x				x	x		x	
Salvia	x	x	x			x	x				
Saxifrages								x		x	
Sorrel				x							
Sunflowers	x	x	x	x		x		x	x		x
Violet								x			x
Wild Mustard		x							x		
Willow catkins									x		x
CROPS											
Apple							x				
Blueberry	x	x									x
Cherry							x				x
Gooseberry	x										x
Legumes	x	x				x		x			
Water melon	x							x			
Squash/ Pumpkins/ Gourds			x		x						
Tomatoes	x	x	x					x			
Thyme	x	x					x	x		x	



HABITAT AND NESTING REQUIREMENTS:

Honey Bees:

Honey bees are colonial cavity nesters. Occasionally in the spring and summer you might encounter a swarm of honey bees on the move to a new home. In Canada, the majority of honey bees are managed by beekeepers in hives. Beekeepers with commercial operations can have bee yards with tens to hundreds of hives commonly in agricultural, rural and some natural habitats. In urban and garden settings, it is common to see a single or a handful of honey bee hives – usually wooden boxes painted white or other light colours. Give honey bees space and don't approach their hive. Even beekeepers minimize the amount of time they spend working bees. Honey bees have different feeding needs than native bees. Their colony can last multiple years and they feed on flowers from the beginning of spring bloom to the fall. Honey bees visit crops when they are in bloom and forage on a diversity of wildflowers as well. Honey bees also need plants that produce a large amount of nectar to make honey. Clovers, lavenders, mints, and sages are great nectar sources. Honey bees also like to feed off of the pollen of trees and shrubs such as maples, willows, and roses. Fields of goldenrod are an excellent pollen source.

Bumble Bees:

Bumble bees nest in cavities such as abandoned mouse nests, other rodent burrows, upside down flower pots, under boards, and other human-made cavities. Colonies are founded by a queen in the spring. The number of workers in a colony can grow to upward of 400 at the peak of summer bloom. Bumble bee colonies die out in the fall after producing new queens. New queens mate and then overwinter, hiding underground, in cracks, or small crevices. Bumble bees are usually active during the morning hours and forage at colder temperatures than honey bees, even flying in light rain.

Large carpenter bees:

Large carpenter bees chew nests into dead wood, poplar, cottonwood or willow trunks and limbs. They also make nests in structural timbers including redwood and cedar. Depending on the species, there may be one or two brood cycles per year. These bees can be active all day even in the hottest and coolest weather.

Digger bees:

Digger bees can be found nesting in sandy, compacted soils, and along stream banksides. These bees are usually active in the morning hours, but can be seen at other times of the day as well. To attract these bees have some areas of exposed soil in your garden and avoid applying thick layers of mulch that are hard to dig through.

Small carpenter bees:

Small carpenter bees chew into pithy stems, including roses and blackberry canes, where they make their nests. These bees are more active in the morning but can be found at other times.

Squash and Gourd bees:

Squash and gourd bees prefer to nest in sandy soil but also may nest in gardens (where pumpkins, squash and gourds are grown). These bees are early risers and can be found in pumpkin patches before dawn. Males often sleep in wilted squash flowers.

Leaf-cutting bees:

Leaf-cutting bees nest in pre-existing circular tunnels of various diameters in dead wood created by emerging beetles. Some also nest in the ground. Leafcutter bees line and cap their nests with leaves or flower petals. These bees can be seen foraging throughout the day even in very hot weather.

Mason bees:

Mason bees use pre-existing tunnels of various diameters in dead wood made by emerging beetles, or human-made nesting substrates such as drilled wood blocks or cardboard tubes. These bees get their name from the fact that they cap their nests with mud. Mason bees are generally more active in the morning hours.

Sweat bees:

Sweat bees need bare ground in sunny areas not covered by vegetation for nesting. Some will nest in small pre-existing holes, much like leaf-cutting or mason bees. Like most bees, sweat bees forage for pollen earlier in the morning and then for nectar later in the day. To help these bees nest, keep some parts of your garden exposed and avoid applying thick layers of mulch that are hard to dig through.

Plasterer or cellophane bees:

Plasterer or cellophane bees get their name from the unique, clear waterproof lining they make around their nest. Similar to sweat bees they prefer bare ground, stream banks or slopes. These bees can be active in the morning or later in the day.

Yellow-faced bees:

Yellow-faced bees are tiny, hairless bees that make their nesting by chewing into small dead stems. These bees are more active during morning hours.

Mining bees:

Mining bees prefer sunny, bare ground, and sand soil. They are also known to nest under leaf litter or in the soil along banksides and cliffs. Mining bees are active in the spring and most commonly seen on flowers during the morning when pollen and nectar resources are abundant.

S.H.A.R.E. - SIMPLY HAVE AREAS RESERVED FOR THE ENVIRONMENT.

- ✿ Planting for pollinators is the first step. Put your pollinator habitat on the S.H.A.R.E. map and connect to pollinator conservation efforts across North America. Visit pollinator.org/SHARE
- ✿ Farmers can also certify their habitat with Bee-Friendly Farming. Visit pollinator.org/bff

BECOME FAMILIAR WITH POLLINATORS IN YOUR LANDSCAPE.

- ✿ Watch for activity throughout the day and the seasons.
- ✿ Keep a simple notebook of when and what comes to your garden.
- ✿ Take part in citizen science monitoring and get involved in local programs.
- ✿ Consult a local field guide or web site when you are ready to learn more details.

ADD NATIVE PLANTS TO ATTRACT MORE NATIVE POLLINATORS.

- ✿ List the plants you currently have in your landscape.
- ✿ Determine when you need additional flowers to provide nectar and pollen throughout the growing season.
- ✿ Add plants that provide additional seasons of bloom, create variable heights for shelter, and attract the types of pollinators you want.
- ✿ Don't forget to include host plants that provide food and shelter for larval development.
- ✿ Contact your local native plant society or extension agent for more help.

USE POLLINATOR FRIENDLY LANDSCAPE PRACTICES TO SUPPORT THE POLLINATORS YOU ATTRACT.

- ✿ Use Integrated Pest Management (IPM) practices to address pest concerns.
- ✿ Tolerate a little mess – leave dead snags and leaf litter, keep areas bare for ground nesting insects, and leave some weeds that provide food for pollinators.
- ✿ Provide safe access to clean water.

NOTICE THE CHANGES THAT YOU HAVE HELPED TO CREATE!



RESOURCES

Many books, websites, and people were consulted to gather information for this guide. Use this list as a starting point to learn more about pollinators and plants in your area.

ECOREGION PROFILE

Environment Canada Ecozones Program—Pacific Ranges

<http://www.ecozones.ca/english/region/192.html>

World wildlife Fund

<https://www.worldwildlife.org/ecoregions/na0506>

Nature Conservancy of Canada

http://support.natureconservancy.ca/pdf/blueprints/North_Cascades_ERA.pdf

POLLINATION/POLLINATORS

Pollinator Partnership

www.pollinator.org

North American Pollinator Protection Campaign

www.nappc.org

Pollination Canada

www.pollinationcanada.ca

Seeds of Diversity

www.seeds.ca

Canadian Biodiversity Information Facility: Butterflies of Canada

www.cbif.gc.ca/eng/species-bank/butterflies-of-canada/?id=1370403265518

North American Butterfly Association

www.naba.org

Canadian Honey Council

www.honeycouncil.ca

Buchmann, S.L. and G.P. Nabhan. 1997. *The Forgotten Pollinators*

Island Press: Washington, DC.

Committee on the Status of Pollinators in North America. 2007. *Status of Pollinators in North America* The National Academies Press: Washington, DC.

NATIVE PLANTS

Native Plant Society of British Columbia

www.npsbc.ca

E Flora BC www.eflora.bc.ca/

Royal BC Museum

Native Plant Garden

www.royalbcmuseum.bc.ca

Ministry of Environment

British Columbia

www.env.gov.bc.ca/

FEEDBACK

We need your help to create better guides for other parts of North America. Please e-mail your input to feedback@pollinator.org.

- ✿ How will you use this guide?
- ✿ Do you find the directions clear? If not, please tell us what is unclear.
- ✿ Is there any information you feel is missing from the guide?
- ✿ Any other comments?

**THANK YOU
FOR TAKING
THE TIME TO HELP!**



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The Pollinator Partnership™/North American Pollinator Protection Campaign

www.pollinatorpartnership.ca  www.nappc.org