



SELECTING PLANTS FOR POLLINATORS



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



LOWER MAINLAND

INCLUDING THE
GREATER VANCOUVER AREA,
ABBOTSFORD, CHILLIWACK,
POWELL RIVER, HARRISON LAKE,
AND PARTS OF
SIMILKAMEEN VALLEY



**POLLINATOR
PARTNERSHIP**
CANADA

and
NAPPC

TABLE OF CONTENTS

WHY SUPPORT POLLINATORS?	4
GETTING STARTED	5
LOWER MAINLAND	6
MEET THE POLLINATORS	8
PLANT TRAITS	10
DEVELOPING PLANTINGS	12
FARMS	13
PUBLIC LANDS	14
HOME LANDSCAPES	15
PLANTS THAT ATTRACT POLLINATORS	16
HABITAT HINTS	21
HABITAT AND NESTING REQUIREMENTS	22
CHECKLIST AND RESOURCES	23
FEEDBACK	24

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

Cover bee photo by Julie Baker

SELECTING PLANTS FOR POLLINATORS

A REGIONAL GUIDE FOR FARMERS, LAND MANAGERS, AND GARDENERS

IN THE
ECOLOGICAL REGION OF THE

LOWER MAINLAND

INCLUDING THE
GREATER VANCOUVER AREA,
ABBOTSFORD, CHILLIWACK,
POWELL RIVER, HARRISON LAKE,
AND PARTS OF
SIMILKAMEEN VALLEY

A NAPPC AND POLLINATOR PARTNERSHIP™ PUBLICATION

This guide was funded by The Stanley Smith Horticultural Trust with oversight by the Pollinator Partnership Canada (www.pollinator.org), in support of the North American Pollinator Protection Campaign (NAPPC—www.napcc.org).



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.

Pumpkins, broccoli, squash, and cabbage are some of the crops raised in the Lower Mainland that rely on honey bees and native bees for pollination. Domestic honey bees pollinate more than \$1 billion worth of crops in Canada each year.

Unfortunately, the numbers of both native pollinators and domesticated bee populations are declining. They are threatened by habitat loss, disease, and the excessive and inappropriate use of pesticides. The loss of commercial bees during the winter has highlighted how severe the issues of proper hive management are to reduce stresses caused by disease, pesticide use, insufficient nutrition, and transportation practices. Currently, the pollination services that the commercial beekeeping industry provides are receiving much needed research and conservation resources. 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.

Laurie Davies Adams
Executive Director
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 information on how individuals can influence pollinator populations through choices they make when they farm a plot of ground, manage large tracts of public land, or plant a garden. 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 to identify the geographic focus of this guide 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 Lower Mainland.

The Lower Mainland ecoregion is part of the larger Pacific Maritime Ecozone, which spans 195,000 km² along the Canadian Pacific Coast. The Lower Mainland ecoregion is contained entirely in British Columbia and is approximately 5,000 km² from the foothills of the Cascade Mountains to the Fraser River.

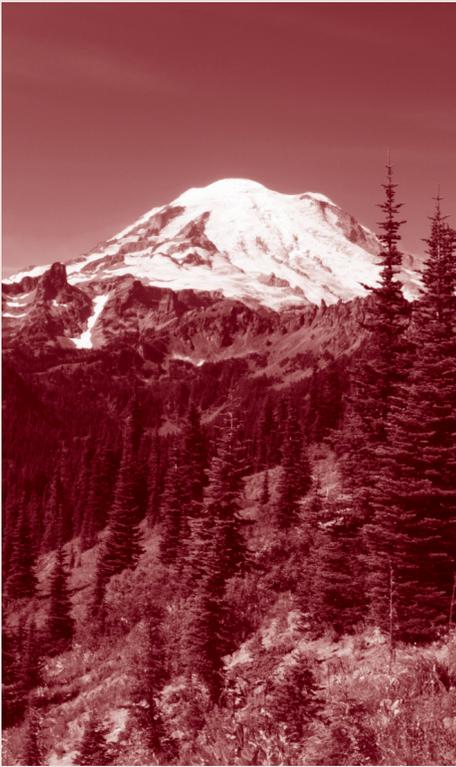
The summer mean temperature is 15°C and the winter mean temperature is 3.5°C. This ecoregion's precipitation peaks in

winter months and reanges from 850mm to 2000mm annually.

The Lower Mainland is characterized primarily by forests including western red cedar, western hemlock,

Long before there were homes and farms in this area, natural vegetation provided essential feeding opportunities for wildlife, including pollinators. 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 can make a difference by understanding the vegetation patterns on the farm, forest, or neighbour's yard adjacent to yours and by making planting choices that support the pollinators' need for food and shelter as they move through the landscape.

UNDERSTANDING THE LOWER MAINLAND



- ✿ This region is designated **number 196** Lower Mainland. To see a map of the other ecoregions go to:
<http://www.ecozones.ca/english/region/196.html>
- ✿ Not sure about which bioregion you live or work in? Go to www.pollinator.org and click on **Ecoregion Locator** for help.
- ✿ 5,067 km² within British Columbia.
- ✿ Elevations ranging from sea level to 310 metres.
- ✿ Summer mean temperature of 15°C and winter mean temperature of 3.5°C
- ✿ Average year-round precipitation between 850 to 2,000mm.
- ✿ Diverse soil types including glacial till, silty alluvium and marine sediments.

CHARACTERISTICS

- ✿ Dominated by dense coniferous forests including Douglas fir, Western red hemlock and dogwood.
- ✿ Deciduous trees including oak and large leaf maple.
- ✿ Understories are characterized by moss, Oregon grape and salal.
- ✿ Wetter areas are comprised of Douglas fir, Western red cedar and Western hemlock.
- ✿ Wildlife include marine birds, black tail deer, racoon, sea otters and coyote.



The Lower Mainland includes:
The Greater Vancouver Area
Abbotsford
Chilliwack
Powell River
Harrison Lake
and parts of
Similkameen Valley

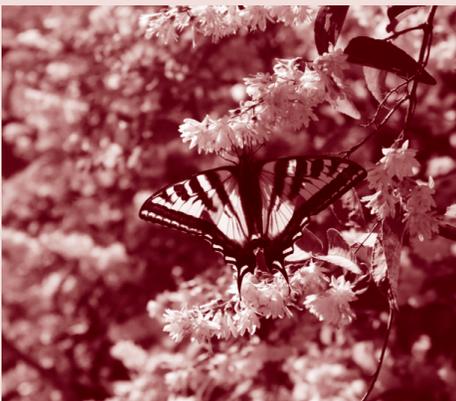


MEET THE POLLINATORS



Flower flies, also known as hoverflies, mimic the appearance of bees or wasps and feed on nectar and pollen like bees, but are classified as flies.

Western Tiger Swallowtail



WHO ARE THE POLLINATORS?

BEES

Bees are well documented pollinators in the natural and agricultural systems of the Lower Mainland. A wide range of crops including pumpkins, squash, broccoli, and cabbage are just a few plants that benefit from bee pollinators.

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.

There are over 800 species of native ground and twig nesting bees in Canada. Most bee species live a solitary life while a minority of species are social and form colonies. Native bees currently pollinate many crops and 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 have tongues of varying lengths that help determine which flowers they can obtain nectar and pollen from.

The bumble bee (*Bombus* spp.) forms small colonies, usually underground. They are generalists, feeding on a wide range of plant material from April to October and are important pollinators of tomatoes. The sweat bee (family Halictidae) nests

underground. Various species are solitary while others form loose colonies.

Solitary bees include carpenter bees (*Xylocopa* spp.), which nest in wood; digger, (*Apidae*), which nest underground; leafcutting bees (*Megachile* spp.), which prefer dead trees or branches for their nest sites; and mason bees (*Osmia* spp.), which utilize cavities that they find in stems and dead wood. Sunflower bees (*Diadasia* spp.) are also solitary ground nesters.

BUTTERFLIES

Gardeners have been attracting butterflies to their gardens for some time. These insects tend to be eye-catching, as are the flowers that attract them. Position flowering plants where they have full sun and are protected from the wind. Also, you will need to provide open areas (e.g., bare earth, large stones) where butterflies may bask, and moist soil from which they may get needed minerals. By providing a safe place to eat and nest, gardeners can also support the pollination role that butterflies play in the landscape. It might mean accepting slight damage to the plants, known as host plants, that provide food for the larval stage of the butterfly.

A diverse group of butterflies are present in garden areas and woodland edges that provide bright flowers, water sources, and specific host plants. Numerous trees, shrubs, and herbaceous plants support



butterfly populations.

Butterflies are in the Order Lepidoptera. Some of the types in the Lower Mainland are Brush-footed, Swallowtail, Copper, Skipper, and Hairstreak butterflies. They usually look for flowers that provide a good landing platform.

Wet mud areas provide butterflies with both the moisture and minerals they need to stay healthy. Butterflies eat rotten fruit and even dung, so don't clean up all the messes in your garden!

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. In addition, butterflies typically are active during the day; moths at night. Butterfly bodies are not very hairy, while moth bodies are quite hairy and more stout.

Moths, generally less colourful than butterflies, also play a role in pollination. They are attracted to flowers that are strongly sweet smelling, open in late afternoon or night, and are typically white or pale coloured.

BEETLES

More than 9000 species of beetles are found in Canada and many of them can be found on 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 that they eat. Beetles are not as efficient as some pollinators. They wander between different species, often dropping pollen as they go.

Beetle pollinated plants tend to be large, strong scented flowers with their sexual organs exposed. They are known to pollinate magnolia, stiff goldenrod, paw paws, and yellow pond lilies.

FLIES

It may be hard to imagine why one would want to attract flies to the garden. However, like beetles, the number of fly species and the fact that flies are generalist pollinators (visit many species of plants), should encourage us all to leave those flies alone and let them do their job as pollinators.

Recent research indicates that flies primarily pollinate small flowers that bloom under shade and in seasonally moist habitats. The National Research Council's *Status of Pollinators in North America* study states that flies are economically important as pollinators for a range of annual and bulbous ornamental flowers.

Plants pollinated by the fly include the American pawpaw (*Asimina triloba*), skunk cabbage

(*Symplocarpus foetidus*), goldenrod (*Solidago* spp.), and members of the carrot family like Queen Anne's lace (*Daucus carota*).

BIRDS

Hummingbirds are the primary birds which play a role in pollination in North America. Their long beaks and tongues draw nectar from tubular flowers. Pollen is carried on both the beaks and feathers of different hummingbirds. The regions closer to the tropics, with warmer climates, boast the largest number of hummingbird species and the greatest number of native plants to support the bird's need for food. White-winged doves (*Zenaidura asiatica*) are also pollinators of the saguaro cactus (*Carnegiea gigantea*) in the south central United States.

Bright coloured tubular flowers attract hummingbirds to gardens. Hummingbirds can see the colour red; bees cannot. Many tropical flowers, grown as annuals in the Lower Mainland, along with native woodland edge plants, attract hummingbirds.

BATS

Though bats in the Lower Mainland are not pollinators, bats play an important role in pollination in the southwest where they feed on agave and cactus. The long-nosed bats' head shape and long tongue allows it to delve into flower blossoms and extract both pollen and nectar.



PLANT TRAITS

WHICH FLOWERS DO THE POLLINATORS PREFER?

NOT ALL POLLINATORS ARE found in each North American 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	Bats	Bees	Beetles
Colour	Dull white, green or purple	Bright white, yellow, blue, or UV	Dull white or green
Nectar guides	Absent	Present	Absent
Odour	Strong musty; emitted at night	Fresh, mild, pleasant	None to strongly fruity or fetid
Nectar	Abundant; somewhat hidden	Usually present	Sometimes present; not hidden
Pollen	Ample	Limited; often sticky and scented	Ample
Flower Shape	Regular; bowl shaped – closed during day	Shallow; have landing platform; tubular	Large bowl-like, Magnolia

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



AND THE POLLINATORS THEY ATTRACT

Pollinator

Birds	Butterflies	Flies	Moths	Wind
Scarlet, orange, red or white	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
Absent	Present	Absent	Absent	Absent
None	Faint but fresh	Putrid	Strong sweet; emitted at night	None
Ample; deeply hidden	Ample; deeply hidden	Usually absent	Ample; deeply hidden	None
Modest	Limited	Modest in amount	Limited	Abundant; small, smooth, and not sticky
Large funnel like; cups, strong perch support	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.16-20)
- Plant a diversity of plants to support a variety of pollinators. Flowers of different color, 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.

- Recognize weeds that might be a good source of food. For example, dandelions provide nectar in the early spring before other flowers open. Milkweeds are 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.
- 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.
- Avoid applying thick layers of mulch that are hard to dig through.
- 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 pesticides are largely toxic to pollinators. Extreme caution is warranted if you choose to use any pesticide. Strategically apply pesticides only for problematic target species.



FARMS

Broccoli, cabbage, pumpkins, and squash are a few of the food crops in the Lower Mainland that 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 pesticides to reduce the impact on native pollinators. Spray when bees aren't active (just before dawn) and choose targeted ingredients.
- Be conscientious of the fact that

different bees forage at different times of day. *Peponapis pruinosa*, the squash bee, is active from dawn until noon. In the case of squash production, the best time to spray is in the evening rather than the early morning.

- Carefully consider the use of herbicides. Perhaps the targeted 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 your regional conservation authority office to see what technical and financial 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 the Lower Mainland, forests have been cut to allow for roads, buildings, open lawn areas, boat ramps, and vistas. 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 pesticides 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 and encroaching shrubs and trees.



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 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.
- Strive to eliminate the use of all pesticides.
- Find local resources to help you in your efforts. Contact your regional conservation authority agent or garden club. 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 LOWER MAINLAND



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</i> spp.	maples	12-20m+	red, greenish, yellow	March - April	sun to partial shade	dry to wet	bees	X
<i>Actaea rubra</i>	red baneberry	1m	white	April - June	sun to shade	moist	bees, flies	
<i>Amelanchier alnifolia</i>	Saskatoon serviceberry	1-5m	white	April - July	sun to partial shade	moist to dry	bees, flies	X
<i>Arbutus menziesii</i>	Pacific madrone	6-30m	white	April - May	sun to partial shade	dry	beetles, flies, bees	
<i>Arctostaphylos columbiana</i>	Hairy manzanita	0.1-3m	white	April - July	sun to partial shade	dry, well drained	beetles, flies, bees	
<i>Arctostaphylos rubra</i>	red fruit bearberry	less than 1m	white	May - June	sun to partial shade	wet	beetles, flies, bees	
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	less than 1m	pink	April - June	sun to shade	dry to moist	bees, beetles	
<i>Ceanothus sanguineus</i>	redstem ceanothus	1-3m	white	May - July	sun to shade	dry to moist	bees, flies, moths, butterflies	
<i>Ceanothus velutinus</i>	snowbrush ceanothus	1-1.5m	white	April - August	sun to shade	dry to well drained	bees, flies, moths, butterflies	
<i>Cornus nuttallii</i>	Pacific dogwood	4-12m	white	April - June	shade	moist to well drained	bees, beetles, flies, butterflies	X
<i>Cornus unalaschkensis</i>	western cordilleran bunchberry	less than 1 m	white	June - August	partial shade	moist to well drained	bees, flies, beetles	X
<i>Holodiscus discolor</i>	oceanspray	1-2m	white	June - August	sun to partial shade	moist	bees, butterflies, flies	X
<i>Loiseleuria procumbens</i>	alpine azalea	1m	pink	June - August	partial shade	moist	bees	
<i>Lonicera ciliosa</i>	orange honeysuckle	climbing	orange	May - July	sun, partial shade to shade	well drained	bees, hummingbirds	
<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>	twinberry honeysuckle	1-3m	yellow to red	April - August	sun, partial shade to shade	moist	bees, hummingbirds	
<i>Lonicera utahensis</i>	Utah honeysuckle	1-2m	white, yellow	May - June	shade	well drained	bees, moths	
<i>Mahonia aquifolium</i>	hollyleaved barberry	1-2m	yellow	March - May	partial shade to shade	dry	bees	
<i>Mahonia nervosa</i>	Cascade barberry	less than 1m	yellow	March - June	sun to shade	dry to moist	bees	
<i>Mahonia repens</i>	creeping barberry	less than 1m	yellow	April - June	partial 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, flies, moths	X
<i>Menziesia ferruginea</i>	rusty menziesia	0.5-1.5m	pink to red	May - August	shade	well drained	bees	
<i>Physocarpus capitatus</i>	Pacific ninebark	1-2.5m	white	May - June	sun to partial shade	moist to wet	bees, flies	
<i>Prunus emarginata</i>	bitter cherry	1-15m	white	April - June	sun to partial shade	well drained	bees	X
<i>Prunus pensylvanica</i>	pin cherry	10-15m	white	April - May	sun	dry, well drained	bees	X
<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, flies	
<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</i> spp.	currants and gooseberrys	various	green to white to pink	March - June	sun to shade	dry, well drained, moist	bees, hummingbirds	X
<i>Ribes acerifolium</i>	mapleleaf currant	1m	pink	June - July	sun to partial shade	well drained to moist	bees	
<i>Ribes bracteosum</i>	stink currant	1-3m	white-yellow	May - June	partial shade to shade	moist to wet	bees	
<i>Ribes cereum</i>	wax currant	1-1.5m	white to pink	April - July	sun to partial shade	dry 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>	redflower currant	1-3m	red	April - June	sun, partial shade to shade	dry to moist	bees, hummingbirds, butterflies	X
<i>Rosa acicularis</i>	prickly rose	1+m	pink	June - July	sun to partial shade	dry to wet	bees, flies, beetles	
<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>Rosa woodsii</i>	Woods' rose	up to 1.5m	pink	May - July	sun, partial shade to shade	dry to moist	bees	
<i>Rubus chamaemorus</i>	cloudberry	less than 1m	white	May - June	sun	dry	bees, beetles, butterflies	
<i>Rubus idaeus</i>	wild red raspberry	1.5-2.5m	white	June - July	sun, partial shade to shade	dry to moist	bees, beetles, butterflies	
<i>Rubus leucodermis</i>	whitebark raspberry	0.5-2 m	white	April - July	sun, partial shade to shade	dry	bees, beetles, butterflies	
<i>Rubus pedatus</i>	strawberryleaf raspberry	less than 1m	white	June	partial shade to shade	well drained	bees, beetles, butterflies	
<i>Rubus ursinus</i>	western blackberry	0.5-1.5m	white	April - August	sun, partial shade to shade	moist	bees	

CONTINUED ON PAGE 18

PLANTS THAT ATTRACT POLLINATORS IN THE LOWER MAINLAND

Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Rubus spectabilis</i>	salmonberry	1-3m	pink	March - June	sun, partial shade to shade	moist	bees, butterflies	
<i>Salix lucida</i>	shining willow	3.5-6m	white to yellow	March - May	sun, partial shade to shade	moist to wet	bees	
<i>Sambucus nigra</i> ssp. <i>caerulea</i>	blue elderberry	2-8m	white	May - July	sun to partial shade	moist	bees, beetles, moths, butterflies, flies	
<i>Sambucus racemosa</i>	red elderberry	2.5-6m	white	March - June	sun, partial shade to shade	moist to wet	bees, beetles, moths, butterflies, flies	
<i>Spiraea douglasii</i>	rose spirea	1-3m	pink, purple	June - August	sun to partial shade	moist	bees, flies, butterflies	
<i>Spiraea splendens</i>	rose meadowsweet	1m	pink	June - August	sun to partial shade	moist	bees, flies, butterflies	
<i>Symphoricarpos albus</i>	common snowberry	0.5-1.5m	white to pink	May - August	sun to partial shade	dry	bees	
<i>Symphoricarpos occidentalis</i>	western snowberry	1+m	white to pink	June - August	sun	dry to well drained	bees	
<i>Vaccinium caespitosum</i>	dwarf bilberry	less than 1m	white to pink	May - July	sun	well drained	bees, butterflies	X
<i>Vaccinium corymbosum</i>	highbush blueberry	2-3m	white to pink	May - June	sun, partial shade to shade	dry to wet	bees	
<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 myrtilloides</i>	velvetleaf huckleberry	less than 1m	white to pink	May - June	sun, partial shade to shade	moist	bees	X
<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, butterflies	
<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>	squashberry	0.5-2+m	white	May - June	sun to shade	moist	bees, butterflies	X
<i>Viburnum opulus</i> var. <i>americanum</i>	American cranberry bush	2-4m	white	May - July	partial shade	well drained to wet	bees, butterflies	X
Forbs								
<i>Achillea millefolium</i> var. <i>occidentalis</i>	western yarrow	less than 1m	white to pink	April - October	sun to partial shade	dry	bees, flies, moths	X
<i>Aquilegia formosa</i>	Cascade columbine	less than 1m	red	May - August	partial shade to shade	moist	hummingbirds, bees, moths	
<i>Asclepias speciosa</i>	showy milkweed	1m	white to pink	June - August	sun	moist	bees, butterflies	X
<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot	1m	yellow	May - July	sun	moist	bees, butterflies, flies	

Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Delphinium bicolor</i>	little larkspur	less than 1m	blue to purple	May - July	sun	dry	bees	
<i>Delphinium glaucum</i>	Sierra larkspur	1-2m	purple	July - August	partial shade	moist to wet	bees, butterflies, moths, hummingbirds	
<i>Delphinium nuttallianum</i>	twolobe larkspur	less than 1m	blue to purple	March - July	sun	dry to well drained	bees, moths, hummingbirds	
<i>Epilobium anagallidifolium</i>	pimpernel willowherb	less than 1m	pink	June - September	sun	well drained	bees, moth	
<i>Chamerion angustifolium</i> ssp. <i>Angustifolium</i>	fireweed	1-1.5m	pink	June - September	sun	moist	bees, butterflies, moths	
<i>Chamerion latifolium</i>	dwarf fireweed	less than 1m	pink to purple	June - August	sun	moist	bees, moth	
<i>Erigeron annuus</i>	eastern daisy fleabane	1m	white	June - October	sun	dry to well drained	bees, butterflies, flies	
<i>Erigeron compositus</i>	cutleaf daisy	less than 1m	white to pink	May - August	partial shade	well drained	bees, butterflies, flies	
<i>Erigeron divergens</i>	spreading fleabane	less than 1m	white to pink	April - October	partial shade	moist	bees, butterflies, flies	
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	less than 1m	white to pink	April - June	partial shade	well drained to moist	bees, butterflies, flies	
<i>Erigeron strigosus</i>	prairie fleabane	less than 1m	white to pink	April - May	sun	well drained	bees, butterflies, flies	
<i>Eriogonum umbellatum</i>	sulphur-flower buckwheat	less than 1m	yellow to red	June - August	sun to partial shade	dry	bees, butterflies, flies	
<i>Eriophyllum lanatum</i>	common woolly sunflower	less than 1m	yellow	May - August	sun	dry	bees, butterflies, flies	
<i>Euthamia graminifolia</i>	flat-top goldentop	1m	yellow	July - September	sun	moist	bees, beetles	
<i>Fragaria virginiana</i>	Virginia strawberry	less than 1m	white	May - August	sun to partial shade	dry	bees, flies, butterflies	X
<i>Geranium erianthum</i>	woolly geranium	1m	white-purple	May - July	partial shade	moist	bees, flies, butterflies	X
<i>Geranium viscosissimum</i>	sticky purple geranium	less than 1m	purple	May - July	sun, partial shade to shade	moist	bees, butterflies	X
<i>Helianthus maximiliani</i>	Maximilian sunflower	1-3m	yellow	August - September	sun	dry to moist	bees, flies, butterflies	X
<i>Lobelia kalmii</i>	Ontario lobelia	less than 1m	white to blue	July - August	sun	well drained to moist	bees	
<i>Lupinus bicolor</i>	miniature lupine	less than 1m	purple	April - June	sun	well drained	bees	
<i>Lupinus sericeus</i>	silky lupine	less than 1m	white, purple	June - August	sun to partial shade	dry to moist	bees, hummingbirds	
<i>Monarda fistulosa</i>	wild bergamot	less than 2m	pink-purple	May - August	sun to partial shade	dry to moist	bees, butterflies, humming birds	
<i>Nothochelone nemorosa</i>	woodland beardtongue	1m	pink to purple	June - August	partial shade	dry	bees	

CONTINUED ON PAGE 20

PLANTS THAT ATTRACT POLLINATORS IN THE LOWER MAINLAND

Botanical Name	Common Name	Height	Flower Colour	Flower Season	Sun	Soil	Pollinators	Also a host
<i>Penstemon confertus</i>	yellow penstemon	less than 1m	white to yellow	July	sun	dry	bees	
<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 hastata</i>	silverleaf phacelia	less than 1m	white to purple	May - July	partial shade	dry to well drained	bees	
<i>Phacelia sericea</i>	silky phacelia	less than 1m	white to purple	June - July	partial shade	well drained	bees	
<i>Polemonium viscosum</i>	sticky polemonium	less than 1m	purple	July - August	sun	well drained	bees	
<i>Rudbeckia hirta</i>	blackeyed Susan	less than 1m	yellow	June - September	sun to partial shade	dry to moist	bees, butterflies	X
<i>Solidago canadensis</i>	Canada goldenrod	1-2m	yellow	September - October	sun to partial shade	dry to moist	bees, butterflies, moths, beetles, flies	
<i>Solidago missouriensis</i>	Missouri goldenrod	1m	yellow	July - September	sun	dry to well drained	bees, butterflies, moths, beetles, flies	
<i>Symphotrichum ascendens</i>	western aster	less than 1m	purple	July - September	sun	moist	bees	
<i>Symphotrichum laeve</i>	smooth blue aster	1m	purple	August - September	sun to partial shade	well drained to moist	bees	
<i>Symphotrichum lanceolatum</i>	white panicle aster	1m	white	August - September	sun to partial shade	well drained	bees, flies	
<i>Trifolium wormskioldii</i>	cows clover	1m+	white to purple	May - August	sun to partial shade	well drained	bees	
<i>Verbena bracteata</i>	bigbract verbena	less than 1m	pink to purple	May - September	sun	dry to well drained	bees	
Vines								
<i>Lonicera hispidula</i>	pink honeysuckle	1-2m	pink, yellowish pink	June - August	partial shade to shade	dry to moist	hummingbirds	
Shelter Plants								
<i>Bouteloua curtipendula</i>	sideoats grama	up to 1m	yellow, orange, red	June - September	sun to partial shade	dry to moist		
<i>Elymus canadensis</i>	Canada wildrye	up to 1m	yellow, green, brown	March - June	sun	moist		
<i>Eragrostis pectinacea</i>	tufted lovegrass	up to 1m	yellow, brown	April - August	sun	well drained		
<i>Schizachyrium scoparium</i>	little bluestem	less than 1m	yellow, green, brown	June - December	sun	dry		

HABITAT HINTS

FOR THE LOWER MAINLAND

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				
Passion flowers			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											
Almond	x						x				x
Apple							x				
Blueberry	x	x									x
Cherry							x				x
Eggplant	x		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. The majority of honey bees are managed by beekeepers in hives. 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 from. Clovers, lavenders, mints, and sages are great nectar source. 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:

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 10,000 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 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:

Soft dead wood, poplar, cottonwood or willow trunks and limbs, structural timbers including redwood. 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 weather.

Digger bees:

Sandy soil, compacted soils, stream banksides. Anthophorid bees (now in the Apidae) are usually active in the morning hours, but can be seen at other times. Keep some parts of your garden exposed and avoid applying thick layers of mulch that are hard to dig through.

Small carpenter bees:

Pithy stems including roses and blackberry canes. These bees are more active in the morning but can be found at other times.

Squash and Gourd bees:

Sandy soil, may nest in gardens (where pumpkins, squash and gourds are grown) or pathways. These bees are early risers and can be found in pumpkin patches before dawn. Males often sleep in the wilted flowers.

Leafcutting bees:

Pre-existing circular tunnels of various diameters in dead but sound wood created by emerging beetles, some nest in the ground. Leave dead limbs and trees to support not just pollinators but other wildlife. Leafcutting bees can be seen foraging throughout the day even in hot weather.

Mason bees:

Pre-existing tunnels, various diameters in dead wood made by emerging beetles, or human-made nesting substrates, drilled wood boards, paper soda straws inserted into cans attached to buildings. Mason bees are generally more active in the morning hours.

Sweat bees:

Bare ground, compacted soil, sunny areas not covered by vegetation. Like most bees, sweat bees forage for pollen earlier in the morning and then for nectar later. Keep some parts of your garden exposed and avoid applying thick layers of mulch that are hard to dig through.

Plasterer or cellophane bees:

Bare ground, banks or cliffs. Colletid bees can be active in the morning or later in the day.

Yellow-faced bees:

In dead stems. These bees are more active during morning hours.

Andrenid bees:

Sunny, bare ground, sand soil, under leaf litter or in soil in banksides and cliffs. These generally spring-active bees are most commonly seen on flowers during the morning when pollen and nectar resources are abundant.



A BASIC CHECKLIST

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. NOTE: It is not necessary to identify each species when you first get started. As an example, note if it is a bee that likes the yellow flower that blooms in the fall.
- ✿ Consult a local field guide or web site when you are ready to learn more details.
- ✿ Take photos of the bumble bees you see and submit them to the identification service offered at bumblebeewatch.org

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 – Lower Mainland
<http://www.ecozones.ca/english/region/196.html>

Statistics Canada - Ecoregional Profile: Lower Mainland of British Columbia
www.statcan.gc.ca/pub/16-002-x/2009004/article/11031-eng.htm

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

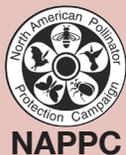
Buchmann, S.L. and G.P. Nabhan. 1997. *The Forgotten Pollinators* Island Press: Washington, DC.

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/nativeplants.html

UBC Botanical Garden and Centre for Plant Research
www.botanicalgarden.ubc.ca



RESEARCH AND WRITING:

MARY K. BYRNE
DR. VICTORIA WOJCIK

EDITORIAL:

MARY K. BYRNE, DR. VICTORIA WOJCIK

CONTRIBUTORS:

Elizabeth Elle _____ Simon Fraser University
Jennifer Heron _____ British Columbia Ministry of Agriculture
Lacey Samuels_UBC Botanical Gardens and Centre of Plant Research
Cynthia Sayre VanDusen _____ Botanical Gardens
Shona Ellis _____ University of British Columbia
Walter Muma _____ Ontario Wildflowers
Susan Chan _____ Native Pollinator Program, Farms at Work

DESIGN:

MARGUERITE MEYER

FUNDING:

Stanley Smith Horticultural Trust

ILLUSTRATIONS:

Carolyn Vibbert



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!**

For a copy of this brochure, or for another region, visit www.pollinatorpartnership.ca

The Pollinator Partnership™/North American Pollinator Protection Campaign

423 Washington St., 5th Floor, San Francisco, CA 94111 – 415-362-1137

www.pollinatorpartnership.ca  www.nappc.org