

REOURCES for Lorraine Johnson's presentation for PollinateTO, April 2021

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- Lorraine's most recent book, co-written with Dr. Sheila Colla, *A Flower Patch for the Rusty-Patched Bumblebee: Creating Habitat Gardens for Native Pollinators in the Greater Toronto Area*, is available as a **free downloadable PDF** from Friends of the Earth: foecanada.org/bee-garden-guide
- Lorraine's book *100 Easy-to-Grow Native Plants for Canadian Gardens* (3rd edition published by Douglas & McIntyre Books): Douglas & McIntyre is offering a 25% discount. Click on this link and use the checkout code "BUTTERFLYRANGER". The code doesn't expire so it can be used indefinitely.
<https://douglas-mcintyre.com/discount/BUTTERFLYRANGER?redirect=%2Fproducts%2F9781771621441>

100 Easy-to-Grow Native Plants for Canadian Gardens is also available in local bookstores (yay!) or by ordering online: <https://www.amazon.ca/Easy-Native-Plants-Canadian-Gardens/dp/1771621443>

LAND ACKNOWLEDGEMENT: WHOSE TERRITORY?

- Territory map: Aaron Carapella, CommonWord
- www.native-land.ca

NATIVE PLANTS RECOMMENDED IN PRESENTATION:

SPRING:

Spring-blooming, sun-loving: Field pussytoes (*Antennaria neglecta*)

Spring-blooming, sun-loving: Kinnikinnik, aka bearberry (*Arctostaphylos uva-ursi*)

Spring-blooming, sun-loving: (*Anemone canadensis*) Canada anemone

Spring-blooming, sun-loving: Wild strawberry (*Fragaria virginiana*)

Spring-blooming, sun-loving: (*Geum triflorum*) Prairie smoke

Spring-blooming, sun to partial shade: Golden Alexanders (*Zizia aurea*)

Spring-blooming, sun to shade: (*Aquilegia canadensis*) Wild columbine

Spring-blooming, shade-loving: Red baneberry (*Actaea rubra*)

Spring-blooming, shade-loving: (*Asarum canadense*) Wild ginger

Spring-blooming, shade-loving: Blue cohosh (*Caulophyllum thalictroides*)

Spring-blooming, shade-loving: (*Hydrophyllum virginiana*) Virginia waterleaf

Spring-blooming, shade-loving: Wild geranium (*Geranium maculatum*)

Spring-blooming, shade-loving: Mayapple (*Podophyllum peltatum*)

Spring-blooming, shade-loving: Bloodroot (*Sanguinaria canadensis*)

SUMMER:

Summer-blooming, sun-loving: (*Penstemon*) Beardtongue

Summer-blooming, sun-loving: Wild strawberry (*Fragaria virginiana*)

Summer-blooming, sun-loving: Pearly everlasting (*Anaphalis margaritacea*)

Summer-blooming, sun-loving: Wild bergamot (*Monarda fistulosa*)

Summer-blooming, sun-loving: (*Allium cernuum*) Nodding wild onion

Summer-blooming, sun-loving: Virginia mountain mint (*Pycnanthemum virginianum*)

Summer-blooming, sun-loving: Vervain (*Verbena hastata*)

Summer-blooming, sun-loving: Spotted Joe-pye weed (*Eutrochium maculatum*, formerly *Eupatorium maculatum*)

Summer-blooming, sun-loving: Butterfly milkweed (*Asclepias tuberosa*)

Summer-blooming, sun-loving: Culver's root (*Veronicastrum virginicum*)

Summer-blooming, sun-loving: New York ironweed (*Vernonia noveboracensis*)

Summer-blooming, shade-loving: Black snakeroot (*Cimicifuga racemosa*)

Summer-blooming, shade-loving: White snakeroot (*Ageratina altissima*)

Summer-blooming, partial shade: Pokeweed (*Phytolacca americana*)

Summer-blooming, partial shade: (*Helianthus divaricatus*) Woodland sunflower

FALL:

Fall-blooming, sun-loving: Cup plant (*Silphium perfoliatum*)

Fall-blooming, sun-loving: Bottle gentian (*Gentiana andrewsii*)

Fall-blooming, sun-loving: Sky-blue aster (*Symphotrichum laeve*) and Panicked Aster (*Symphotrichum lanceolatum*) and New England aster (*Symphotrichum novae-angliae*)

Fall-blooming, sun-loving: Canada goldenrod (*Solidago canadensis*)

Fall-blooming, sun-loving: Rigid goldenrod (*Solidago rigida*)

Fall-blooming, sun-loving: Silverrod (*Solidago bicolor*)

Fall-blooming, sun-loving: Early goldenrod (*Solidago juncae*)

Fall-blooming, sun-loving: Rough-stemmed goldenrod (*Solidago rugosa*)

Fall-blooming, sun-loving: Tall goldenrod (*Solidago altissima*)

Fall-blooming, shade-loving: (*Solidago flexicaulis*) Zig zag goldenrod

Fall-blooming, shade-loving: Heart-leaved aster (*Symphotrichum cordifolium*)

Fall-blooming, shade-loving: Blue-stemmed goldenrod (*Solidago caesia*)

Native grasses are also important pollinator habitat!

They provide pollen, nesting sites and shelter

e.g.: Canada wild rye (*Elymus canadensis*)

Indian grass (*Sorghastrum nutans*)

Big bluestem (*Andropogon gerardii*)

Little bluestem (*Schizachyrium scoparium*)

Switchgrass (*Panicum virgatum*)

Some of the best early-blooming plants for pollinators are native trees and shrubs: e.g., willows, black cherry, viburnums, dogwood

Some Beautiful Native Woodland Shrubs:

alternate-leaved dogwood (*Cornus alternifolia*)

witch hazel (*Hamamelis virginiana*)

purple-flowering raspberry (*Rubus odoratus*)

snowberry (*Symphoricarpos albus*)

spicebush (*Lindera benzoin*)

serviceberry (*Amelanchier*)

northern bush honeysuckle (*Diervilla lonicera*)

Other native shrubs for the region:

- *Ilex verticillata* (winterberry)
- *Ceanothus americanus* (New Jersey tea)
- *Hypericum ascyron* great St. Johns wort)
- *Sambucus canadensis* (common elderberry)
- *Symphoricarpos albus* (snowberry)
- *Viburnum lentago* (nannyberry)

Some Beautiful Native Trees:

red maple (*Acer rubrum*)

Chokecherry (*Prunus virginiana*)

Pin cherry (*Prunus pennsylvanica*)

hackberry (*Celtis occidentalis*)

musclewood (*Carpinus caroliniana*)

The following are among the top plant genera and species to support pollen specialist bees:

- **Goldenrods** (*Solidago* spp.): Tall goldenrod (*Solidago altissima*); Silverrod (*Solidago bicolor*); Blue-stemmed goldenrod (*Solidago caesia*); Canada goldenrod (*Solidago canadensis*); Zig zag goldenrod (*Solidago flexicaulis*); Early goldenrod (*Solidago juncea*); Rigid goldenrod (*Solidago rigida*); Rough-stemmed goldenrod (*Solidago rugosa*); Showy goldenrod (*Solidago speciosa*)
- **Sunflowers** (*Helianthus* spp.): Thin-leaved sunflower (*Helianthus decapetalus*); Woodland sunflower (*Helianthus divaricatus*); Gigantic sunflower (*Helianthus giganteus*); Maximilian's sunflower (*Helianthus maximiliani*); Pale-leaved sunflower (*Helianthus strumosus*); Jerusalem artichoke (*Helianthus tuberosus*)
- **Asters** (*Symphotrichum* spp.): Heart-leaved aster (*Symphotrichum cordifolium*); Heath aster (*Symphotrichum ericoides*); Smooth aster (*Symphotrichum leave*); Panicked aster (*Symphotrichum lanceolatum*); Calico aster (*Symphotrichum lateriflorum*); New England aster (*Symphotrichum novae-angliae*); New York aster (*Symphotrichum novi-*

belgii); Sky blue aster, aka azure aster (*Symphotrichum oolentangiense*); Swamp aster (*Symphotrichum puniceum* var. *puniceum*)

- **Coneflowers** (*Rudbeckia* spp.): Black-eyed Susan (*Rudbeckia hirta*); Green-headed coneflower, aka cut-leaved coneflower (*Rudbeckia laciniata*)

Source: Jarrod Fowler and Sam Droege

SOME NATIVE PLANTS FOR CONTAINERS:

- Wild geranium (*Geranium maculatum*)
- Wild strawberry (*Fragaria virginiana*)
- Nodding wild onion (*Allium cernuum*)
- Pearly everlasting (*Anaphalis margaritacea*)
- Canada anemone (*Anemone canadensis*)
- Pussytoes (*Antennaria neglecta*)
- Wild columbine (*Aquilegia canadensis*)
- Heath aster (*Aster ericoides*)
- Canada milk vetch (*Astragalus canadensis*)
- Harebell (*Campanula rotundiflora*)
- Horsebalm (*Collinsonia canadensis*)
- Lance-leaved coreopsis (*Coreopsis lanceolata*)
- Pale purple coneflower (*Echinacea pallida*)
- Prairie smoke (*Geum triflorum*)
- False sunflower (*Heliopsis helianthoides*)
- Foxglove beardtongue (*Penstemon digitalis*)
- Black-eyed Susan (*Rudbeckia hirta*)
- False Solomon's seal (*Maianthemum racemosum*)
- Blue-eyed grass (*Sisyrinchium angustifolium*)

What Native Pollinators Need:

- Pollen and nectar from flowers in order to feed themselves and their larvae.
- Areas of diverse flowering plants, from spring to fall, with accessible pollen and nectar.
- Plants on which to lay their eggs, or nesting area in which to lay their eggs.
- Areas that are free of pesticides.
- Nesting and overwintering sites.

POLLINATOR GARDEN DESIGN TIPS

- Plant native plants in masses (3 to 5 plants of each species, in clusters) to provide abundant foraging opportunities.
- Plant a diversity of species (colours, flower shapes, etc.) that bloom from spring to fall.
- Leave some bare ground for ground-nesting bees.
- Leave dead, hollow stems for cavity-nesting bees.

- Include features such as rocks and decorative deadwood (old logs).
- Don't use pesticides.
- Avoid cleaning up your garden too early in the spring in order to allow bees overwintering in hollow stems time to emerge (when temps consistently 10 Celsius).

WHERE BEES NEST:

- Underground (e.g., abandoned rodent holes)
- Tree cavities
- Leaf litter and dense thatch
- Dead wood and branches
- Hollow stems
- Pithy stems
- Under rocks
- In snail shells! (one species of mason bee)

Where to get native plants:

- NO wild digging
- Native plant nurseries are best source
- Seed exchanges (e.g., North American Native Plant Society)
- Local horticultural society sale
- Organizations and projects such as Project Swallowtail
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SOURCES OF NATIVE PLANTS:

The best sources of native plants are nurseries that specialize in native plants, such as, for example:

- * Evergreen Brick Works (Toronto)
- * Native Plants in Claremont (near Pickering)
- * Kayanase (Six Nations of the Grand River)
- * Grow Wild! (Omeme)
- * Not So Hollow Farm (near Creemore)
- * In Our Nature (Mono)
- * Ontario Native Plants (online)
- * St. Williams Nursery (Long Point area), wholesale

AND HIGH PARK PLANT SALE; NANPS SALE

(For a full list of Ontario native plant nurseries, see NANPS website: www.nanps.org or the Ontario Native Plant Gardeners FACEBOOK page)

<https://can-plant.ca> (has a map with native plant nurseries all over Canada)—CAN-Plant

North American Native Plant Society (www.nanps.org) has a list of regional native plant societies

SOURCES OF INFORMATION ON NATIVE PLANT GARDENING:

- North American Native Plant Society (Canada); www.nanps.org
- WWF/Carolinian Canada: In the Zone project (Ontario): www.inthegardens.ca
- Project Swallowtail (Toronto): www.pollinatorpartnership.ca
- Websites and plant catalogues of native plant nurseries (see above for list) such as Native Plants in Claremont
- Master Gardeners of Ontario (info@mgoi.ca) or the Facebook page of Master Gardeners of Ontario
- Toronto Master Gardeners: <https://www.torontomastergardeners.ca/ask-list/>
- Credit Valley Conservation: <https://cvc.ca>
- Facebook groups such as Ontario Native Plant Gardeners

- Pollinator Partnership's regional guides
www.pollinator.org

How to Find out if a Plant is Native to Your Region:

- Forest Gene Conservation Association lists native trees by ecoregion.
- Conservation Authorities are great sources of information.
- Field botanist groups
- Naturalist groups
- Arboreta and botanical gardens
- Universities and colleges
- Elders and Knowledge Keepers
- Database of Vascular Plants of Canada (VASCAN)
<https://data.canadensys.net/vascan/search>

LEAVE THE LEAVES

ADD DECORATIVE LOGS AND DEADWOOD

Information on Invasive Plants:

Grow Me Instead booklet, is available as a free download from the Ontario Invasive Plant Council: <https://www.ontarioinvasiveplants.ca/resources/grow-me-instead/>

RE BEE HOTELS:

‘Bee Hotels’ as Tools for Native Pollinator Conservation: A Premature Verdict? By Scott MacIvor and Laurence Packer, PLOS One, 2015

RE BEE-WASHING (like Green-washing)

<https://www.bee-washing.com>

Considerations for Buying Managed Bees (e.g. honeybees):

www.pollinationguelph.ca

Nativars/Cultivars:

Dr. Annie White, “From Nursery to Nature: Evaluating Native Herbaceous Flowering Plants Versus Native Cultivars for Pollinator Habitat Restoration.”

WILD ABOUT BEES BROCHURE is a free download from:

<https://www.toronto.ca/services-payments/water-environment/live-green-toronto/tips-to-create-a-pollinator-friendly-garden/>

If you’re interested in Information regarding specific relationships between plants and pollinators:

- Any book by Douglas Tallamy (e.g., *Bringing Nature Home*)
- Any book by Heather Holm (e.g., *Pollinators of Native Plants*)
- “Pollen Specialist Bees of the Eastern United States,” by Jarrod Fowler and Sam Droege, 2020: https://jarrodfowler.com/specialist_bees.html

Importance of Citizen Science:

- Bumble Bee Watch
www.bumblebeewatch.org
- iNaturalist

TRADITIONAL ECOLOGICAL KNOWLEDGE AND INDIGENOUS WRITINGS ON NATIVE PLANTS:

- *Braiding Sweetgrass*, by Robin Wall Kimmerer
- *Gathering Moss*, by Robin Wall Kimmerer
- *Our Knowledge Is Not Primitive*, by Wendy Makoons Geniusz
- *Plants Have So much to Give Us, All We Have to Do is Ask*, by Wendy Makoons Geniusz
- *Buffalo Bird Woman's Garden*, by Gilbert L. Wilson
- Anything by Nancy Turner (western Canada)

If you're interested in the scientific papers referred to in the presentation:

A special issue of the Proceedings of the National Academy of Sciences, published January 12, 2021, was devoted to the topic of insect decline:

<https://www.pnas.org/content/118/2/e2023989118>

Pollinators in Peril, published 2017, by the Center for Biological Diversity:

https://www.biologicaldiversity.org/campaigns/native_pollinators/pdfs/Pollinators_in_Peril.pdf

Research papers by Dr. Sheila Colla, York University:

<https://scholar.google.ca/citations?user=p6x1YCMAAAAJ&hl=en>

e.g., "Evidence of decline in eastern North American bumblebees (Hymenoptera: Apidae), with special focus on *Bombus affinis* Cresson," by Sheila Colla and Laurence Packer, in *Biodiversity Conservation*, 2008; and many, many other papers on the rusty-patched bumblebee, pollinator conservation, and honey bee impacts, among other subjects of research

Nyssa Trip, Victoria MacPhail, Sheila Colla, Beatrice Olivastri, "Examining the public's awareness of bee (Hymenoptera: Apoidea: Anthophila) conservation in Canada," *Conservation Science and Practice*, October 2020

Alexandra-Maria Klein et al (2007), "Importance of pollinators in changing landscapes for world crops," *Proceedings of the Royal Society B*

Garibaldi, L, et al (2013), "Wild Pollinators Enhance Fruit Set of Crops Regardless of Honey Bee Abundance," *Science* magazine

N. E. Stork, "How many species of insects and other terrestrial arthropods are there on Earth?" *Annu. Rev. Entomol.* 63, 31–45 (2018)

"Do non-native plants contribute to insect decline," Douglas Tallamy et al, *Ecological Entomology*, 2020.

DeCandido et al., 2001; Dolan et al., 2011; McKinney, 2006, 2008; Qian and Ricklefs, 2006; Standley, 2003, cited in "Do Cultivars of Native Plants Support Insect Herbivores?" by Emily C. Baisden, Douglas W. Tallamy, et al, *HortTechnology* 2018 (vol 28; issue 5)

"Horticulture as a Pathway of Invasive Plant Introductions in the United States: Most invasive plants have been introduced for horticultural use by nurseries, botanical gardens, and individuals," by Sarah H. Reichard and Peter White, *BioScience*, 2001

"Pollen Specialist Bees of the Eastern United States," by Jarrod Fowler and Sam Droege, 2020

Re lawn statistics: Cristina Milesi, NASA Earth Observatory, 2005