

Blooms for Bee Biodiversity

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Introduction

Nearly 30% of ~400 New England native bee species have special diets restricted to one plant family or a few plant genera. For example, specialist species of solitary mining bees (e.g. *Andrena* spp., Family: Andrenidae), cellophane bees (*Colletes* spp.; Family: Colletidae), and oil bees (*Macropis* spp., *Melitta* spp.; Family: Melittidae) exclusively provision nests with pollen from particular plants (Fowler and Droege 2016). Herbaceous and woody plants such as goldenrod (*Solidago* spp.), willow (*Salix* spp.), aster (*Symphotrichum* spp.), sunflower (*Helianthus* spp.), and blueberry (*Vaccinium* spp.) host specialists and provide pollen for populations of generalists, such as bumble bees and honey bees. Therefore, particular plants can be propagated to provide pollen for bee biodiversity.

Materials and methods

This document presents a list of 100 plants that feed both generalist and specialist bees. The list is not exhaustive. All selections are adapted to Northeastern climates and are native or non-invasive non-native plants. If host-plants are already present in a given ecoregion or habitat, then those host-plants should be conserved or enhanced. Readers are encouraged to research specific site-conditions and species growth requirements before selecting plants for habitat enhancement. Pesticide-free seed or nursery stock should be sourced for habitat health.

Enhancement of host-plants should proceed according to best management practices as defined by local, regional, and national pollinator conservation authorities (e.g. Mäder *et al.* 2010, 2011; USDA NRCS 2009, 2012, 2016; Vaughn *et al.* 2015; Xerces 2014a, b). Abundant and diverse pollinator populations are supported by designing contiguous and large habitat patches (e.g. ≥ 50 m² or 10%–30% of crop acreage) composed of abundant clumps or drifts (≥ 1 m²) of host-plants buffered (≥ 10 m) from any areas treated with pesticides. Host-plant ecotypes with known bee associations should be selected for richness (e.g. 12–20 spp.) and diverse phenology (≥ 3 spp. blooming per season), while avoiding weedy species that might host crop pests or diseases.

Site-preparation is vital for successful habitat establishment and can be achieved with or without cultivation using methods such as sheet mulching, solarizing, and tilling with or without cover- or smother-cropping throughout one or more growing-seasons. Site-propagation is commonly performed with hand broadcast and mechanically dropped or drilled seeding or container and nursery stock transplanting. Site-maintenance occurs on both short- and long-term scales and is performed by protecting, re-propagating, and restoring habitat areas. Disturbance-based maintenance practices such as pruning, mowing, grazing, or burning should be triennially rotated through 33% of habitats. Overall, these performance practices promote sustainable pollinator habitats (Fowler 2015).

References

- Fowler, J. (2015). *Sustainable pollinator habitats*. PDF available online
- Fowler, J., S. Droege. (2016). *Specialist bees of the Mid-Atlantic and Northeastern United States*. Available online
- Lindtner, P. (2014). *Garden plants for honey bees*. Kalamazoo, MI: Wicwas Press
- Mäder E., M. Spivak, E. Evans, and Natural Resources, Agriculture, and Engineering Service. (2010). *Managing alternative pollinators: A handbook for beekeepers, growers, and conservationists*. Beltsville, MD: SARE. PDF available online
- Mäder, E. and The Xerces Society for Invertebrate Conservation. (2011). *Attracting native pollinators: Protecting North America's bees and butterflies: The Xerces Society guide*. Storey Pub, North Adams, MA. 384 pp.
- USDA, NRCS. (2009). *Pollinator biology and habitat: New England pollinator handbook*. PDF Available online
- USDA, NRCS. (2016). *Pollinator habitat enhancement plan, Practice activity code (146) (No.)*. PDF Available online
- Vaughan, M., E. Mäder, J. Guisse, J. Goldenetz-Dollar, and B. Borders. (2012). *Conservation cover (327) for pollinators, New England installation guide and job sheet*. Manuscript in preparation. Portland, OR: The Xerces Society. PDF available online
- Vaughan, M., E. Lee-Mäder, and J. Fowler. (2015). *Native shrubs and trees for pollinator conservation in New England*. PDF available online
- Xerces Society, The. (2014a). *Farming with native beneficial insects: Ecological pest control solutions*. North Adams, MA: Storey Pub
- Xerces Society, The. (2014b). *Pollinator habitat assessment form and guide*. PDF Available online

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Plants are ordered according to peak flowering month and presented alphabetically with common names, growth habits (A = Annual, B = Biennial, Bulb, P = Perennial, S = Shrub, ST = Shrub-Tree, and T = Tree), ranked pollen/nectar resources (*_***** or None) after Lindtner (2014), and number of known specialist bees hosted. Mix and match selections based on site conditions to maximize seasonal floral resources for both generalists and specialists.

March

Acer saccharinum, Silver maple, T, *****/**, 0
Eranthis hyemalis, Winter aconite, Bulb, *****/**, 0
Galanthus nivalis, Snowdrop, Bulb, *****/**, 0
Symplocarpus foetidus, Skunk cabbage, P, *****/None, 0

April

Acer rubrum, Red maple, T, *****/**, 0
Acer negundo, Box elder, *****/None, 0
Crocus vernus, Spring crocus, Bulb, *****/**, 0
Erythronium americanum, American trout lily, P, */*, 1
Lindera benzoin, Northern spicebush, S, */*, 0
Salix discolor, Pussy willow, ST, *****/**, 9
Salix eriocephala, Heart-leaved willow, S, *****/**, 9
Salix nigra, Black willow, T, *****/**, 9
Scilla siberica, Wood squill, Bulb, *****/**, 0

May

Acer saccharum, Sugar maple, T, *****/**, 0
Cardamine pensylvanica, Pennsylvania bitter cress, B, */*, 1
Cercis canadensis, Eastern redbud, ST, *****/**, 1
Claytonia caroliniana, Carolina spring beauty, P, */*, 1
Cornus alternifolia, Alternateleaf dogwood, S, *****/**, 2
Geranium maculatum, Spotted crane's-bill, P, */*, 1
Hydrophyllum virginianum, Eastern waterleaf, P, */**, 1
Krigia virginica, Virginia dwarf-dandelion, A, */*, 1
Liriodendron tulipifera, Tulip poplar, T, *****/****, 0
Lyonia ligustrina, Maleberry, S, */*, 2
Populus deltoides, Eastern cottonwood, T, **/None, 0
Potentilla canadensis, Dwarf cinquefoil, P, */*, 1
Prunus serotina, Black cherry, T, **/**, 0
Robinia pseudoacacia, Black locust, T, *****/****, 0
Rubus allegheniensis, Allegheny blackberry, S, *****/****, 0
Rubus occidentalis, Black raspberry, S, *****/****, 0
Uvularia sessilifolia, Wild oats, P, */*, 1
Vaccinium angustifolium, Lowbush blueberry, S, *****/****, 5
Vaccinium corymbosum, Highbush blueberry, S, *****/****, 5
Vaccinium stamineum, Deerberry, S, **/**, 2
Viola cucullata, Blue marsh violet, P, *****/****, 1
Zizia aurea, Golden Alexander's, P, *****/**, 1

June

Arabis pycnocarpa, Hairy rock cress, B, */*, 1
Ceanothus americanus, New Jersey tea, S, **/****, 1
Gaylussacia baccata, Black huckleberry, S, **/**, 1
Gleditsia triacanthos, Honey locust, T, *****/**, 0
Heuchera americana, American alumroot, P, */*, 1
Ilex glabra, Inkberry holly, S, **/****, 1
Ilex opaca, American holly, T, *****/**, 1
Ilex verticillata, Winterberry holly, S, *****/****, 1
Nyssa sylvatica, Blackgum, T, **/****, 0
Potentilla simplex, Common cinquefoil, P, *****/**, 1
Rhododendron maximum, Great rosebay, S, N/A, 1
Rhus glabra, Smooth sumac, ST, **/****, 0
Rhus typhina, Staghorn sumac, T, **/****, 0
Tilia americana, American basswood, T, *****/****, 0
Trifolium hybridum, Alsike clover, P, *****/****, 0

July

Allium cernuum, Nodding onion, P, *****/**, 0
Asclepias incarnata, Swamp milkweed, P, None/****, 0
Asclepias syriaca, Common milkweed, P, None/****, 0
Cephalanthus occidentalis, Common buttonbush, S, **/****, 0
Cirsium discolor, Field thistle, B, **/****, 1
Clethra alnifolia, Coastal summer-sweet, S, **/****, 0
Fagopyrum esculentum, Buckwheat, A, **/****, 0
Helianthus decapetalus, Thin-leaved sunflower, P, *****/**, 3
Helianthus divaricatus, Woodland sunflower, P, *****/****, 3
Hydrangea quercifolia, Oak-leaved hydrangea, S, *****/****, 0
Lysimachia quadrifolia, Whorled yellow-loosestrife, P, **/None, 3
Lysimachia terrestris, Swamp yellow-loosestrife, P, **/None, 3
Monarda punctata, Spotted beebalm, P, *****/**, 1
Oenothera perennis, Little evening-primrose, B, **/**, 2
Oxydendrum arboreum, Sourwood, T, **/****, 0
Physalis longifolia, Longleaved ground cherry, P, **/**, 3
Pycnanthemum tenuifolium, Narrow mountain mint, P, **/****, 0
Symphoricarpos albus, Common snowberry, S, **/****, 0
Verbena hastata, Blue vervain, B, */**, 1
Vaccinium macrocarpon, American cranberry, S, **/****, 1

August

Cirsium muticum, Swamp thistle, **/****, 1
Euthamia caroliniana, Slender goldentop, P, *****/**, 3
Euthamia graminifolia, Flat-top goldentop, P, *****/**, 3
Eutrochium maculatum, Spotted Joe-Pye weed, P, *****/**, 0
Helianthus annuus, Sunflower, Herbaceous A, *****/****, 3
Helianthus strumosus, Pale-leaved Sunflower, P, *****/****, 3
Hibiscus moscheutos, Swamp rose-mallow, P, *****/**, 1
Hydrangea paniculata, Panicle hydrangea, S, *****/****, 0
Monarda fistulosa, Wild bergamot, P, *****/**, 1
Oenothera biennis, Common evening primrose, B, **/**, 2
Physalis heterophylla, Clammy ground cherry, P, **/**, 3
Pontederia cordata, Pickerelweed, P, *****/**, 2
Pycnanthemum virginianum, Virginia mountain mint, **/****, 0
Solidago canadensis, Canada goldenrod, P, *****/****, 11
Solidago juncea, Early goldenrod, P, *****/**, 11
Symphotrichum novi-belgii, New York aster, P, **/**, 7

September

Helianthus maximiliani, Maximilian's sunflower, P, *****/**, 3
Heptacodium miconioides, Seven-son flower, ST, *****/****, 0
Sedum telephium, Autumn Joy, P, *****/****, 0
Solidago altissima, Late goldenrod, *****/****/ 11
Solidago rugosa, Wrinkle-leaved goldenrod, P, *****/****, 11
Solidago speciosa, Showy goldenrod, P, *****/****, 11
Symphotrichum novae-angliae, New England Aster, P, *****/****, 7
Symphotrichum puniceum, Purple-stemmed aster, P, **/**, 7
Verbesina alternifolia, Wingstem crownbeard, P, *****/****, 0
Vernonia noveboracensis, New York Ironweed, P, *****/**, 1

October

Crocus speciosus, Fall crocus, B, *****/**, 0
Franklinia alatamaha, Franklin tree, T, *****/****, 0
Solidago sempervirens, Seaside Goldenrod, P, *****/****, 11
Symphotrichum laeve, Smooth blue aster, P, *****/****, 7