

Leave the Leaves, Save the Stems: Wildlife-Friendly Winter Landscapes That Work for People, Too

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Presentation Overview: Autumn, winter, and early spring are important seasons for pollinators, birds, and all wildlife. Yet the needs of these creatures are sometimes at odds with our landscape management practices. Can we support them simultaneously as we make properties safe and attractive?

Three topics will be discussed: “Leaving leaves,” “saving stems,” and planning for attractive winter landscapes. Of those three, planning may be the most important!

“Leave the Leaves”

Autumn leaves offer great value. They increase soil fertility, enhance tree and shrub health, and nurture pollinators, birds, reptiles, amphibians, and small mammals. As they decay, leaves enhance the soil with all major and minor nutrients. Their decay processes support beneficial bacteria and fungi, as well as other microorganisms.

Many home and community properties have at least a few spaces where leaves could remain and decay, but convention often dictates they be cleared from every square inch. They are treated as trash and sent to leaf dumps, transfer stations, or other places off-property. To change this practice requires planning, decisions, and communications.

Instead of talking about “leaf litter,” it might be helpful to talk about “leaf assets.” Here are some ideas to help with “leave the leaves” planning:

Whole leaves:

- Whole leaves decompose into a form called “leaf mold” based on beneficial fungal action. Whole leaves are the best form for wildlife as well as fungi.
- Whole leaves can be used as a replacement for conventional bark mulch. Despite the objection that they will “blow around,” once they are moist, they do not move in wind.
- Allow “soft landings” beneath trees. This creates an overwintering habitat for insects that use tree canopies during the warmer months, particularly butterflies and moths. Download <https://www.pollinatorsnativeplants.com/softlandings.html> by Heather Holm. Get a copy of Heather Holm’s book, “Pollinators of Native Plants,” published by www.PollinationPress.com, 2014.
- Leaf-covered spaces as small as 4’x4’ can make a difference for tiny insects, but don’t pile the leaves too high. The depth of the pile changes the ways that creatures encounter it, including moisture, access to air, and the physical distance they must move to exit. Simply allow the natural depth—6” to 12”.

Mulch-mowed (shredded) leaves:

- If you are mulch-mowing leaves, they have several useful purposes. (Always keep leaves or bark mulch at least six inches away from stems and trunks.) Mulch-mown leaves can remain on the lawn up to one-half inch depth. If the volume is greater, remove the excess to compost piles or use it as mulch around shrubs, trees, and other plantings.
- Add leaves to compost piles, either whole or shredded. Shredded leaves decay in about six months to one year. Whole leaves decay in 12 to 24 months, depending on the species. Oak leaves take the longest.
- Pine needles are slowest to decay. They can be very useful in pathways and other areas where plants are being suppressed.
- Oak and maple leaves **do not acidify the soil**. They decompose to neutral pH.
- Use whole or mulched leaves as “sheet” mulching to smother areas of unwanted vegetation. Spread mulch-mowed leaves 12”-18” deep directly on soil, over unwanted lawn areas, or on garden beds. This approach kills many unwanted herbaceous plants in about one year. Woody or vining plants still require mechanical removal, but they will be easier to remove after one year under leaf mulch.
- It is okay to use the leaves of invasive plants such as autumn olive, Russian olive, tree of heaven, bittersweet, Norway maple, and others. Leaves do not generate new plants. However, be cautious about intermingled seeds of invasive plants.

“Save the Stems”

Twenty percent of southern New England bees are stem-nesters, and about 30 percent of bees nationwide. Other insects use stems for nesting as well. Standing seedheads are also of benefit to overwintering birds. Therefore, it is helpful to wildlife to allow dead perennials and grasses to stand through winter.

This recommendation collides with conventional fall landscape cleanup, unfortunately. Even the most dedicated pollinator supporters can grow impatient with the look of dead standing stalks by early March. Many ask, “Can I cut them yet?” The best practice is to leave the stems to stand whole for the first winter, allowing them to dry intact. After the first winter, the stalks can be cut to various heights between 6” – 24” beginning in March according to bee scientist Tracy Zarillo at the Connecticut Agricultural Experiment Station.

It’s important to note that only some bees will use the stems in early spring, while others wait until mid-summer. This is one reason why the timing of stem-trimming is nuanced.

Not all plants have hollow stems, but those that do are potential habitat for the eggs of stem-nesting bees. Here are some plant groups where researchers find pith-nesting bees in eastern North America: Ragweed, Brassica (mustard) genus, thistle, teasel, horseweed, Helianthus (sunflower) genus, wild lettuce, phragmites, pokeweed, Rhus (sumac) genus, roses, Rubus (bramble) genus, Sambucus (elderberry) genus, sassafras, lilac, mullein, ironweed.

Source: www.CT.gov/caes

When eggs are laid inside the stalk, the parent bee deposits pollen balls (“bee bread”) and fibrous materials as resources for the developing eggs, larvae, and pupa. Researchers have found leaves and fiber from a variety of plants inside hollow stems, including maples, hollyhock, alder, serviceberry, birch, redbud, thistle, clematis, dogwood, hazelnut, strawberry, hops, alfalfa, primrose, knotweed, poplar, rose, willows, greenbrier, spiraea, clover, grape, and assorted bunching grasses, such as yellow wood grass (*Sorghastrum nutans*). Source: www.CT.gov/caes

Below, find some native (and nearby-native) flowering perennials with hollow stems that stay upright throughout winter in my gardens. Some benefit from support with stakes and Velcro, or tomato cages, and other creative approaches.

- Amsonia spp.
- Anise Hyssop, *Agastache foeniculum*;
- Asters:
 - New England Aster, *Symphotrichum novae-angliae* (with staking)
 - New York Aster, *Symphotrichum novae-belgii* (with staking)
 - Smooth Aster, *Symphotrichum laeve* (with staking)
 - Bushy aster, *Symphotrichum dumosum*
- Beardtongue, *Penstemon digitalis* (with staking)
- Black Cohosh, *Actea racemosa* (with staking)
- Fairy Candles, a.k.a. Culver’s Root, *Veronicastrum virginicum* (with staking)
- Goldenrod, *Solidago* spp.; especially *Solidago rugosa*, *S. speciosa*, and *S. sempervirens*
- Great Coneflower, *Rudbeckia maxima*;
- Green-headed Coneflower, *Rudbeckia laciniata*; (with staking)
- Helen’s Flower, a.k.a. sneezeweed, *Helenium autumnale*, (with staking)
- Hyssop-leaved Boneset, *Eupatorium hyssopifolium*; (with staking)
- Ironweeds:
 - Common ironweed, *Vernonia fasciculata*, cultivar ‘Iron Butterfly’
 - Narrow-leaved ironweed, *Vernonia lettermanii*, cultivar ‘Southern Cross’
 - New York Ironweed, *Vernonia noveboracensis* (very tall, needs staking)
- Joe-Pye Weed, *Eutrochium* genus (some very tall, use support)
- Mountain Mint, *Pycnanthemum muticum*
- Purple Coneflower, *Echinacea purpurea* (with staking)
- Wild Bergamot, *Monarda fistulosa* (with staking)

Also observed in other gardens:

- Bush Clover, *Lespedeza capitata*;
- Sunflowers: *Helianthus angustifolium*, *H. decapetalus*, *H. divaricatus*, *H. strumosus* (may need support)

Grasses that are winter larval hosts for moths, skippers, and butterflies

- Switchgrass, *Panicum virgatum*
- Little Bluestem, *Schizachyrium scoparium*
- Purpletop, *Tridens flavus*

Example of a “Save the Stems” sequence:

| | 2024 | 2025 | 2026 |
|--|--|---|---|
| Autumn, winter, early spring, first year | Allow the stems of selected perennial plants to stand in the winter of 2024-25. The stems do not yet have bee eggs! Many stems will fall naturally, but some will remain and form a resource for the nesting bees of 2025. | | |
| March-May, 2 nd year | | Cut standing stalks from 2024 between 6” – 24” beginning in March 2025. | |
| Summer, second year | | Allow 2025 perennials to emerge around the standing 2024 stalks. | |
| Summer, second year | | Stem-nesting bees lay eggs and provide them with resources within the hollow stem chamber of 2024 stalks. Larva and pupa develop inside the stem. Only adults emerge and fly, but the timing of emergence depends on the species. A few species may emerge in 2025; most bees will not emerge until 2026. | |
| Autumn, winter, early spring, second into third year | | The 2024 stalks may contain developing bees at the end of the 2025 season. Leave them in place as much as possible. They will emerge in 2026. | Cut 2025’s stalks in spring 2026. If 2024 stalks remain, it will be safe to remove them after June 1. |

“Gray areas” and “worst autumn practices”:

- Avoid adding leaf piles on top of natural leaf fall in woodland areas. Some insects that overwinter in leaf litter drop from the tree canopy into the tree’s fallen leaves. They may be adapted to natural depths and may not survive the added depth.
- Avoid patching tiny holes in soil surfaces in spring. The holes may be entries to nests of native ground-nesting bees, including bumblebee queens. These holes are often found in sandy areas and on lawn edges, where lawn grass is sparse. Avoid “repairing” lawns over and around these holes until nighttime temperatures are consistently above 50 degrees.
- Bumblebee queens often use abandoned rodent holes for winter nesting. Avoid repairing these holes from October to June.
- Avoid collecting leaves in plastic bags and placing them into mainstream trash. Avoid open burning and dumping on roadsides.
- Don’t rake or blow leaves into streets, where they can enter storm drains. Leaves clog drains and alter water flow. They also hurt water quality. *See next point.*
- Avoid putting leaves into waterbodies: Research shows that when leaves enter water bodies directly or through storm drains, they are a potent source of phosphorous and have adverse effects, such as encouraging algae blooms. Excess leaves in waterbodies can also interrupt the lifecycles of creatures such as the larval stage of dragonflies. See <https://www.cleanlakesalliance.org/leaves/> to learn more about leaves and phosphorous pollution.

Books, Articles, Videos, Websites

- ****Pollinators of Native Plants**, Heather Holm, Pollination Press, 2014** A classic in this field.
- **The Nature Of Oaks**, Douglas Tallamy, Timber Press. Very readable!
- **The Northeast Native Plant Primer**, Uli Lorimer, Timber Press. Very helpful plant selection guide.
- **Deer Resistant Native Plants**, Clausen and Tepper, Timber Press. A perennial topic.
- **The Pollinator Victory Garden**, Kim Eierman, Quarry Books; 2020. How to succeed at increasing pollinators.
- **The Complete Compost Gardening Guide** by Barbara Pleasant and Deborah L. Martin provides a comprehensive overview of all composting methods.
- **The Nature of Oaks** by Douglas Tallamy. Extensive discussion on oak leaf litter and its roles in sustaining insect and other arthropod communities.
- **Entangled Life** by Merlin Sheldrake is about all things fungi, including relationships of fungi with fallen leaves.
- **“12 Creative Ways of Feeding Your Garden Soil That Use Fall Leaves”** by Nikki Jabbour, <https://savvygardening.com/12-creative-ways-to-use-your-fall-leaves/>
- **Mulching with leaves:** <https://www.gardeningknowhow.com/garden-how-to/mulch/mulching-with-leaves.htm>
- **Leaves are a Feast for Stream Life**, by Dave Strayer, <https://www.caryinstitute.org/news-insights/feature/leaves-are-feast-stream-life>
- **Leave Leaves Alone**, <https://www.caryinstitute.org/news-insights/leave-leaves-alone>
- **Watching Autumn Leaves Fall**, <https://blogs.nicholas.duke.edu/citizenscientist/watching-autumn-leaves-fall/>
- Cornell University’s composting “how-to”: <http://cwmi.css.cornell.edu/smallscale.htm>
- For a wide selection of compost containers: www.gardeners.com/buy/outdoor-living/composting/

- Brush pile sculptures and other ideas: <https://www.pinterest.com/parcpins/wood-piles-and-brush-piles-for-amphibians-reptiles/>
- Innovative online view of what pollinators “see” in our garden beds: <https://pollinator.art/pathmaker>.

Research articles:

- [Chemical changes in wood caused by decay fungi](#) by Robert A. Zabel, Jeffrey J. Morrell, in Wood Microbiology (Second Edition), 2020
- [Composting and Formation of Humic Substances](#), R.B. Harrison, in Encyclopedia of Ecology, 2008,
- Evaluation of leaf removal as a means to reduce nutrient concentrations and loads in urban stormwater. Selbig, William. (2016). The Science of the Total Environment. 571. 124-133. 10.1016/j.scitotenv.2016.07.003.
- Rutgers University Fact Sheet on Nutrients in leaves: <https://njaes.rutgers.edu/pubs/publication.php?pid=FS824>

Blight ordinances, homeowner association (HOA) rules, and unhappy neighbors

Reactions to naturalized landscapes can range from negative comments to fines and lawsuits. Here are some resources for working with unhappy neighbors and blight ordinances:

- Wild Ones Sample Native Plant Ordinance: <https://wildones.org/resources/>
- Wild Ones Webinar on Weed Ordinances: <https://wildones.org/weed-ordinances-webinar-2022/>

Podcast interview with Roseanne Plante, author of draft Native Plant Ordinance at Wild Ones: <https://www.thomaschristophergardens.com/podcasts/fighting-back-against-weed-ordinances>

Turn Down the Lights for Bird and Pollinator Support:

Strategic foundation lighting can add to the beauty of a home at night and increase the feeling of safety. However, research does not support the common belief that always-on lighting reduces break-ins and home invasions. (In one famous Chicago study, crime increased with always-on lighting.) Learn about the extent of night lighting and its impact at www.darksky.org/light-pollution/

Research does show that "always on" lighting interferes with bird migrations and bats’ ability to find food. Night lighting also interferes with nocturnal pollination and insect reproductive cycles, especially among fireflies and moths.

- For safety, down-light the area—not the whole yard. Use down-lighting from the underside of the eaves or overhang, with low-voltage LEDs pointed toward the foundation.
- Research shows that motion sensors, not light sensors, are more effective for home security.
- Use yellow or amber lights to protect insects. International Dark Skies Association (IDA) offers extensive guidance to wildlife-friendly outdoor lighting: <https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/>

Learn more about optimizing outdoor lighting for personal safety as well as wildlife support at <https://www.darksky.org/>. Also see: Lights Out CT: <https://www.lightsoutct.org/>

Research study on nocturnal moths and butterflies: Nocturnal behavior of moths and butterflies: Kawahara, A.Y., Plotkin, D., Hamilton, C.A. *et al.* Diel behavior in moths and butterflies: a synthesis of data illuminates the evolution of temporal activity. *Org Divers Evol* 18, 13–27 (2018). <https://doi.org/10.1007/s13127-017-0350-6>

Articles by Kathy Connolly:

- Turn Down the Lights: See <https://www.zip06.com/living/20240426/bright-nights-help-create-dark-future-for-birds-and-other-living-things/>
- Where Did All the Fireflies Go? <https://www.zip06.com/living/20200708/where-did-all-the-fireflies-go>
- Death, Taxes, and Autumn Leaves. <https://www.zip06.com/living/20210929/death-taxesdeath-taxes>
- Where Are the Bees and Butterflies in 2023? <https://www.zip06.com/living/20230830/where-are-the-bees-and-butterflies-in-2023/>
- Small Changes Help Small Creatures in a Changing World: <https://www.zip06.com/living/20230419/small-changes-help-small-creatures-in-a-changing-world/>
- Is Your Yard on the Map? <https://www.conngardener.com/is-your-yard-on-the-map/>

Plants with ornamental qualities in winter:

Key to symbols:

- **N = Southern New England native plants (CT, RI, MA)**
- **SEN = Southeastern US native**
- **MWN = Midwest US native**
- **DR = Deer resistance. Where DR appears, one or more research sources mention it as at least moderately resistant. When no DR appears, no research is available.**
- **Winter = May provide special winter interest, such as good winter color or winter-persistent berries.**

Plants

- Arrowwood, *Viburnum dentatum*, (plant at least two for berry production) **N, V, DR, Winter berries**
- Atlantic white cedar, dwarf, *Chamaecyparis thyoides* 'Top Point' **N, DR, evergreen**
- Balsam fir, *Abies balsamea*, dwarf: 'nana' or 'hudsonia' **N, DR, evergreen**
- Black Gum, *Nyssa sylvatica* 'Zydeco Twist', handsome small tree, contorted branches, moist soil, **N, Winter**
- Blackhaw viburnum, *Viburnum prunifolium*, (plant two+ for berry production) **SEN, V, Winter, berries**
- Carolina rhododendron: *Rhododendron minus* var. *minus*, (a.k.a. *R. carolinianum*) **SEN, Winter, leaves**
- Chokeberry, black, *Photinia (Aronia) melanocarpa*, dwarf: 'Morton' or 'Iroquois Beauty'™, **N, Winter, berries**
- Chokeberry, purple, *Photinia (Aronia) floribunda*, **N, Winter, berries**
- Chokeberry, red, *Photinia (Aronia) arbutifolia* 'Brilliantissima', **N, Winter, berries**
- Cinnamonbark Clethra, *Clethra acuminata*, interesting bark, **SEN, Winter, bark**
- Creeping juniper, *Juniperus horizontalis* 'Wiltonii' (very low growing) **N, DR, evergreen**
- Creeping juniper, *Juniperus horizontalis* 'Bar Harbor' (to 15"), **N, DR, evergreen**
- Creeping juniper, *Juniperus horizontalis* 'Blue Chip' (to 2'), **N, DR, , evergreen**
- Common juniper, *Juniperus communis* 'repanda,' 'depressa,' 'saxatilis,' and 'Blueberry Delight' **N, DR, , evergreen**
- Cranberrybush viburnum, *Viburnum opulus*, (plant 2+ for berry production), moist to wet, **N, V, Winter, berries**
- Dogwood, Redosier, *Swida (a.k.a. Cornus) sericea* **N, Winter, stems**
- Dogwood, Yellow-twig, *Swida (a.k.a. Cornus) sericea* 'Flaviramea' **N, Winter, stems**
- Globe arborvitae, *Thuja occidentalis*, 'Rheingold'; 'Golden Globe'; 'Fire Chief'. **N, DR, Winter, fire-color evergreen foliage**
- Hawthorn, Green, 'Winter King', *Crataegus viridis* 'Winter King' Full sun. **SEN, DR, Winter, berries**

- Inkberries, *Ilex glabra*. Small varieties: 'Densa,' 'Compacta,' 'Shamrock'. Dwarf variety: 'Gem Box' (Requires male plant for berry production.) **N, DR, Winter leaves and berries**
- Kalm's St. Johnswort, *Hypericum kalmianum*, Full/part sun. **N, DR, Winter.**
- Mountain Laurel, standard varieties, **N, Winter leaves**
- Mountain-lover, (a.k.a. rat-stripper) *Paxistima canbyi*, broadleaf evergreen with good winter color, slow-growing, part to full sun, **SEN, DR, Winter shrub ground cover**
- Nannyberry, *Viburnum lentago*, (Plant two+ for berry production.) **N, V, Winter**
- River Birch, dwarf: *Betula nigra* 'Little King'. Full/part sun. Not a shade plant. **N, DR, Winter**
- River Birch, standard, **N, DR, Winter**
- Rosebay or Great Laurel Rhododendron, *Rhododendron maximum*, **N, Winter, leaves**
- White pine, dwarf: *Pinus strobus*. Cultivars include 'Sea Urchin'; 'nana'; 'globosa'; 'Blue Jay,' 'Soft Touch.' **N, DR, evergreen**
- Winterberry, *Ilex verticillata*, Dwarf varieties: 'Red sprite' (female), 'Jim Dandy' or 'Skipjack' (male) **N, DR**, Winterberries require compatible male plant for berry production.
- Withe-rod Viburnum, *Viburnum nudum var. cassinoides*, needs consistent moisture or a wet area. (Plant two+ for berry production), **N, V, DR, winter berries**

Plant Selection Databases:

- Native plant finder for garden situations. This site offers more than 30 filters to help narrow your search, including "pollinator powerhouse" and "ecoregion" filters: <https://plantfinder.nativeplanttrust.org/Plant-Search>
- List of Northeastern Coastal Plain ecoregion native plants: https://bplant.org/search.php?region_id=116&status_type_id=1
- Online guide to New England botany. Native and naturalized plants by county: <https://gobotany.nativeplanttrust.org/>
- National Wildlife Society native plant finder, based on work done by graduate students under the direction of Dr. Douglas Tallamy. The zip code-based site identifies which species of butterflies and moths use a plant as a caterpillar host: <https://www.nwf.org/nativePlantFinder/plants>
- Homegrown National Park: Douglas Tallamy's website: www.HomegrownNationalPark.org
- Native plant species for specific birds: <https://www.audubon.org/native-plants/>
- Pollinator conservation resources: <https://xerces.org/publications/plant-lists/native-plants-for-pollinators-and-beneficial-insects-northeast>
- Pollinator Pathway: www.pollinator-pathway.org
- Pollinators in Connecticut: portal.ct.gov/CAES/Publications/Publications/Pollinator-Information
- Univ. Rhode Island Native Plant Search: <http://web.uri.edu/rinativeplants> (herbaceous plants only, currently offline for maintenance. Returning in 2024)
- How to buy bee-safe nursery plants: https://xerces.org/sites/default/files/19-053_Buying%20Bee-Safe%20Nursery%20Plants_4%20pg%20%281%29.pdf

Books for Native Plant Selection

- Native Plants for New England Gardens, by Dan Jaffe and Mark Richardson
- Northeast Native Plant Primer: 235 Plants for an Earth-Friendly Garden, by Uli Lorimer, May 2022
- Pollinators of Native Plants, by Heather Holm, 2014

Cultivars and nativars

Cultivars are plants bred for particular characteristics. Unfortunately, breeding of native plants often interferes with those plants' value to native pollinators.

- Species vs. Cultivar Discussion: www.xerces.org/blog/cultivar-conundrum
- Nativars: Where do they fit in?: <https://wildones.org/resources/nativars/>
- Guidelines for Selecting Native Plants: The Importance of Local Genotype: <https://wildones.org/resources/guidelines-for-selecting-native-plants/>
- Dr. Annie White video presentation: <https://grownativemass.org/Great-Resources/experts-videos/How-Native-Plant-Cultivars-Affect-Pollinators>

Thanks to www.Xerces.org for the use of their "Leave the Leaves" infographics.

Thanks to www.HealthyYards.org for their "Leave Leaves Alone" infographics.

- See the Xerces Society's campaign by entering **#LeavetheLeaves** in a browser.
- See the Leave Leaves Alone campaign: LeaveLeavesAlone.org.

INVENTORY: WHAT GETS IN THE WAY OF CHANGING LEAF CLEAN-UP PRACTICES?

Perceived Barriers to Pollinator Protection

Read the left column for suggested practices. Read the top row for barriers to using best practices.

| Examples of barriers, top row: | Personal effort or cost | Social expectations or local rules | Personal safety | Personal preferences | Preferences of household members | Other considerations |
|---|-------------------------|------------------------------------|-----------------|----------------------|----------------------------------|----------------------|
| Reduce night lights | | | | | | |
| Mow less often | | | | | | |
| Reduce lawn size | | | | | | |
| Allow bare soil areas and animal burrows in lawns | | | | | | |
| Leave dead standing wood, logs, and sticks | | | | | | |
| Leave leaves on property | | | | | | |
| Save stems until following summer | | | | | | |
| Eliminate pesticides | | | | | | |
| Remove non-native invasive plants | | | | | | |
| Use ecotypic regional native plants | | | | | | |