

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.

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:

- 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 Holm’s book, “Pollinators of Native Plants,” published by www.PollinationPress.com, 2014.
- Where possible, leave leaves in their whole state—not mulch-mowed. They will decompose into a form called “leaf mold” based on fungal action. Whole leaves are best form for wildlife as well as fungi. Whole leaves, unshredded, can be a replacement for decorative bark mulch.
- 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:

- Use shredded leaves as decorative mulch around shrubs, trees, and other plantings. Keep mulch at least six inches away from stems and trunks.
- Where leaves must be removed or reduced, mulch-mow them directly onto lawns and leave them up to .5” depth. (*Use an electric mower for noise and pollution reduction?*) If mowing produces a cover deeper than one-half inch, remove the excess to compost piles.
- 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.
- Oak and maple leaves **do not acidify the soil**. As whole leaves, they are not reactive with soil. As shredded leaves mixed with green material, they are decomposed by bacteria and reach a neutral pH.
- “Sheet” mulching to “smother” areas of unwanted vegetation: Spread mulch-mowed leaves 18” deep or more, directly on soil, over unwanted lawn areas, or overwintering garden beds. It takes about one year to kill unwanted herbaceous plants with this approach. Woody or vining plants still require mechanical removal.
- 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 if the seeds of invasive plants are intermingled.

“Save the Stems”

In recent years, several pollinator protection organizations promoted the idea of allowing dead perennials and grasses to stand year-round. This is because 20 percent to 30 percent of bees, as well as other insects, use hollow stems for nesting. Standing seedheads are also of benefit to overwintering birds. This recommendation collides with conventional fall landscape cleanup. Even the most dedicated supporter of pollinators 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 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” after about May 1 in southern New England. The reasons and timing are nuanced, but they are explained in fact sheets from the Xerces Society:

- [Nesting & Overwintering Habitat: Pollinators & Other Beneficial Insects.](#)
- [Nests for Native Bees](#)
- [Tunnel Nests for Native Bees](#)
- [Save the Stems](#)

Tufts University Pollinator Initiative also offers advice on this practice:

<https://sites.tufts.edu/pollinators/2021/04/the-right-way-to-leave-stems-for-native-bees/>

Some plants have hollow stems and attract 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 stem-nesting bee also deposits pollen balls and fibrous materials—resources for the developing eggs, larva, 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

Here are some native (and nearby-native) flowers and grasses 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.

- Anise Hyssop, *Agastache foeniculum*;
- Beardtongue: *Penstemon digitalis*
- Black Cohosh, *Actea racemosa* (with staking)
- Bushy aster, *Symphotrichum dumosum*
- Fairy Candles, a.k.a. Culver’s Root, *Veronicastrum virginicum*;
- Goldenrod, *Solidago* spp.; especially *Solidago rugosa*
- Great Coneflower, *Rudbeckia maxima*;
- Green-headed Coneflower, *Rudbeckia laciniata*;
- Helen’s Flower, a.k.a. sneezeweed, *Helenium autumnale*, (with staking)
- Hyssop-leaved Boneset, *Eupatorium hyssopifolium*; (with staking)
- Joe-Pye Weed, *Eutrochium* genus (some very tall, use support)
- Little Bluestem, *Schizachyrium scoparium*;

- Mountain Mint, *Pycnanthemum muticum*;
- New England Aster, *Symphotrichum novae-angliae*
- New York Ironweed, *Vernonia noveboracensis*
- Northern sea oats, *Chasmanthium latifolium*
- Purple Coneflower, *Echinacea purpurea* (with staking)
- Smooth Aster, *Symphotrichum laeve*
- Switchgrass, *Panicum virgatum*
- Wild Bergamot, *Monarda fistulosa* (may need staking)

Also observed in other gardens:

- Bush Clover, *Lespedeza capitata*;
- Indiangrass, *Sorghastrum nutans* (May need to be tied for support.)
- Sunflowers: *Helianthus angustifolium*, *H. decapetalus*, *H. divaricatus*, *H. strumosus* (may need support)

Example of a “Save the Stems” sequence:

| | 2023 | 2024 | 2025 |
|--|---|---|---|
| Autumn, winter, early spring, first year | Allow stems of perennial plants to stand uncut in fall and throughout the first winter. Note that the stems do not have nesting bees after the first season. Many stems will fall naturally, but some will remain and form a resource for nesting bees of 2024. | | |
| Mid-to-late spring, second year | | The standing stalks from 2023 can be cut to variable heights between 6” – 24” around May 1. | |
| Summer, second year | | Stem-nesting bees lay eggs and provision the eggs with resources within the hollow stem chamber. Larva and pupa develop inside the stem. Only adults emerge and fly, but the timing of emergence depends on the species. Some bees will not emerged until 2025. | |
| Summer, second year | | Allow 2024 perennials to emerge around the standing 2023 stalks. At the end of the 2024 season, the 2023 stalks may be still standing, and some will still contain developing bees. As much as possible, leave them in place. | |
| Autumn, winter, early spring, second into third year | | | Allow 2024’s fresh stalks to stand whole until May 2025 |

“Grey areas” and worst autumn practices:

- Avoid adding large leaf piles on top of natural leaf fall in woodland areas. Additional leaves alter the natural decay cycle. They may degrade habitat for overwintering insects, reptiles, and amphibians. 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 in added depth. Many overwintering birds wade into leafy areas for winter forage but can be impeded by too much depth.
- Avoid patching tiny holes in soil surfaces; the holes may be the entry 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.
- Bumblebee queens often use abandoned rodent holes for winter nesting. Avoid repairing these holes from October to June.
- Avoid collecting leaves in plastic bags, placing them into mainstream trash, open burning, 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

- **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-fungal, 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>
- **The Afterlife of Leaves** by Declan McCabe, Connecticut Woodlands, Winter 2021 <https://www.ctwoodlands.org/connecticut-woodlands/connecticut-woodlands>
- **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>.

Articles by Kathy Connolly:

- Turn Down the Lights: See <https://www.zip06.com/living/20210331/turn-down-the-lights>
- 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/>

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://sustainable-farming.rutgers.edu/wp-content/uploads/2014/09/Municipal_Leaves_Plant_Nutrients_Available_FS824_1998.pdf

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 cited in presentation: 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>

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

- 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**

- 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**
- Carolina rhododendron: *Rhododendron minus* var. *minus*, (a.k.a. *R. carolinianum*) **SEN, Winter leaves**
- Inkberries, *Ilex glabra*. Small varieties: 'Densa,' 'Compacta,' 'Shamrock'. Dwarf variety: 'Gem Box' (Requires male plant for berry production.) **N, DR, Winter leaves and berries**
- Mountain Laurel, standard varieties, **N, Winter leaves**
- Rosebay or Great Laurel Rhododendron, *Rhododendron maximum*, **N, Winter leaves**
- Atlantic white cedar, dwarf, *Chamaecyparis thyoides* 'Top Point' **N, DR, evergreen**
- Balsam fir, *Abies balsamea*, dwarf: 'nana' or 'hudsonia' **N, DR, evergreen**
- Globe arborvitae, *Thuja occidentalis*, 'Rheingold'; 'Golden Globe'; 'Fire Chief'. **N, DR, Winter, fire-color evergreen**
- 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, Winter berries** (Requires compatible male plant for berry production.)
- Arrowwood, *Viburnum dentatum*, (plant at least two for berry production) **N, V, DR, Winter berries**
- 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**
- 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**
- Withe-rod Viburnum, *Viburnum nudum* var. *cassinoides*, needs consistent moisture or a wet area. (Plant two+ for berry production), **N, V, DR, winter berries**
- Black Gum, *Nyssa sylvatica* 'Zydeco Twist', handsome small tree, contorted branches, moist soil, **N, Winter form**
- Blackhaw viburnum, *Viburnum prunifolium*, (plant two+ for berry production) **SEN, V, Winter berries**
- Hawthorn, Green, 'Winter King', *Crataegus viridis* 'Winter King' Full sun. **SEN, DR, Winter**
- Nannyberry, *Viburnum lentago*, (Plant two+ for berry production.) **N, V, Winter**
- River Birch, standard, **N, DR, Winter**
- River Birch, dwarf: *Betula nigra* 'Little King'. Full/part sun. Not a shade plant. **N, DR, Winter**

Plant Selection:

- 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>
- Homegrown National Park by Douglas Tallamy and Michelle Alfandari: www.HomegrownNationalPark.org.

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.

Perceived Barriers to Pollinator Protection

What gets in the way of changing 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 | | | | | | |