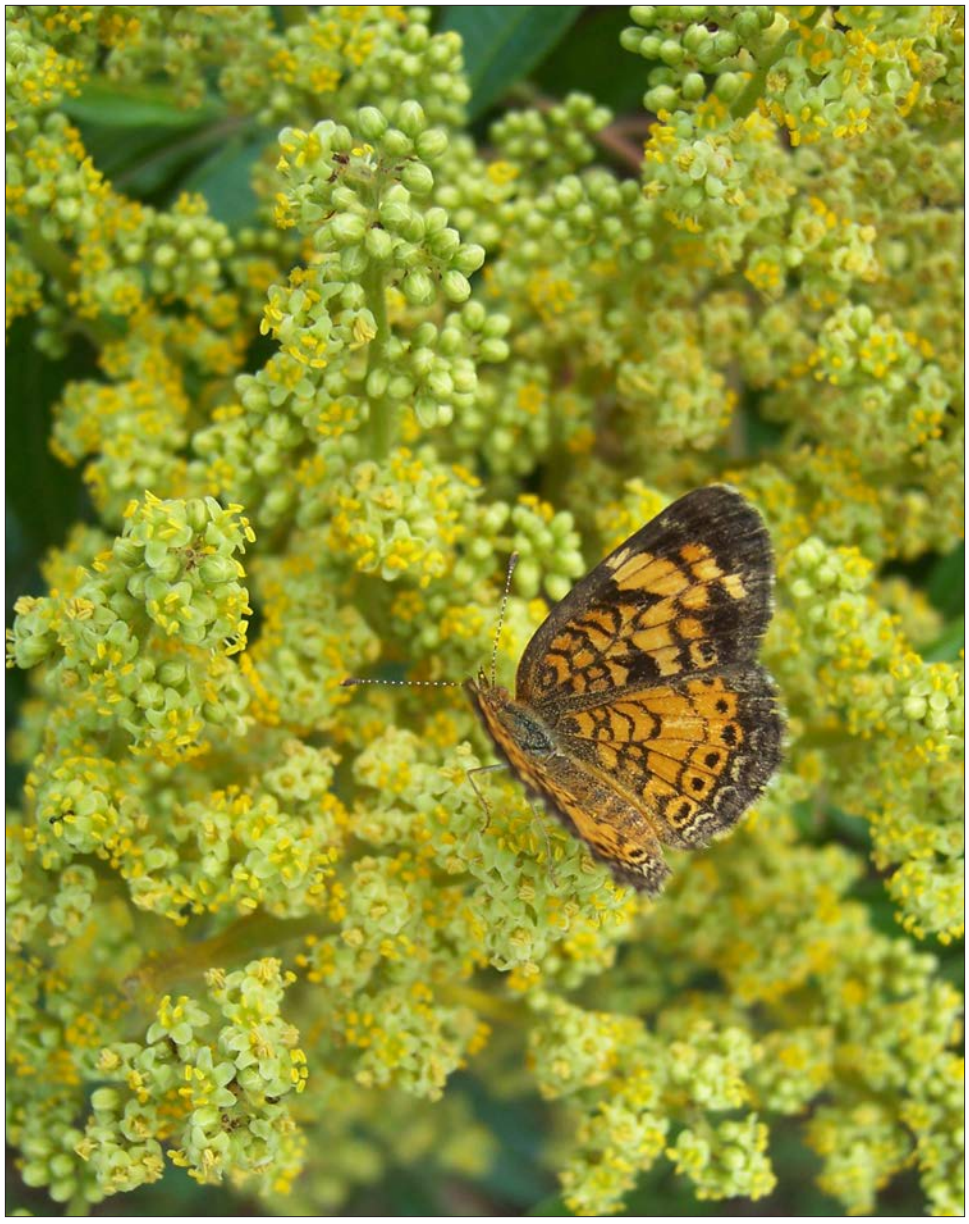
XERCES SOCIETY
for Invertebrate Conservation

Hedgerow Planting (422) for Pollinators

Rhode Island

Installation Guide



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Cover: Pearl crescent (*Phyciodes tharos*) on winged sumac (*Rhus copallinum*). *Below:* Metallic green sweat bee (*Augochlora pura*) foraging on coastal sweetpepperbush (*Clethra alnifolia*). (Photographs by Phillip Merritt (cover) and Tom Potterfield, via flickr.com.)

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Artwork

We are grateful to Philippe Andrevon (lemondedevictor.net) and Woodcutter (woodcutter.es) for creating and sharing the icons used for Recommended Native Hedgerow Plants for Pollinators icons (p.9–10) and Native Pollinators & Associated Host Plants icons (p.11). The copyrights for all artwork are retained by the designers.

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The Xerces Society for Invertebrate Conservation is a nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat. Established in 1971, the Society is at the forefront of invertebrate protection, harnessing the knowledge of scientists and enthusiasm of citizens to implement conservation programs worldwide. The Society uses advocacy, education, and applied research to promote invertebrate conservation.

Rhode Island

Purpose

These instructions provide in-depth guidance on how to install nectar and pollen habitat for pollinators in the form of linear rows of native flowering shrubs. To plan a specific project, use this guide with the Implementation Requirements/ Job Sheet found at the end of this document.

Client Conservation Objectives

Depending on landowner objectives and project design, pollinator habitat may also provide windbreaks, food and cover for other wildlife, reduce soil erosion, protect water quality, and attract other beneficial insects—such as predators and parasitoids of crop pests.

Key Site Characteristics

Site selection for pollinator habitat should take the following into consideration:

- **Pesticide Drift:** Habitat must be protected from pesticides (especially insecticides and bee-toxic fungicides and herbicides). Only sites with no to very low risk for pesticide drift should be established as new habitat. This includes some pesticides approved for use on organic farms.
- **Accessibility:** New habitat should be accessible to equipment for planting and maintenance operations.
- **Sunlight:** Most native shrubs grow best in full sunlight.
- **Slope:** Steep or highly erodible sites should not be disturbed. For re-vegetating such sites, consider Critical Area Planting (342) or other suitable Conservation Practice Standards.
- **Weed Pressure:** Areas with high weed pressure will take more time and effort to prepare for planting. It is also important to note the primary weed composition. Knowing the most abundant weed species on site, their reproductive methods, and whether they are grass or broadleaf, perennial or annual, and woody or herbaceous, will help significantly in planning for site preparation and follow-up weed management during establishment.
- **Site History:** Factors such as past plant cover (e.g., weeds, crops, grass sod, and native plants), use of pre-emergent herbicides or other chemicals, top soil loss, and soil compaction can affect plant establishment. It is also important to know if sites may have poor drainage or may flood, as such conditions make habitat establishment more difficult or require a plant mix adapted to the site.
- **Soils and Habitat:** Most plants listed in the Appendix of this guide are tolerant of many soil conditions and types, however all plants establish better when matched with appropriate conditions.
- **Irrigation:** To establish plants from plugs, pots, or bare root will require irrigation or site must be suitably moist, mesic soils.
- **Other Functions:** The site may offer opportunities to serve other functions, such as run-off prevention, stream bank stabilization, wildlife habitat, or windbreaks. Existing structures, such as shelter belts, hedges, or living fences, can be rehabilitated for increased pollinator benefits. These factors can influence plant choice and/ or design.

Figure 1 Hedgerow plantings for pollinators can serve other functions, such as habitat for wildlife or beneficial insects. The pollinator hedgerow featured below includes a diverse mix of native, fruiting forbs and shrubs—providing a variety of forage and nesting sites for both native bees and wildlife throughout the year.

(Photograph by Sarah Foltz Jordan The Xerces Society.)

Plant Selection

Plant species selection should be limited to plants providing pollen- and nectar-rich forage resources for bees and host plants for butterflies. The Appendix provides information on acceptable plants in Rhode Island.

If you are designing a custom plant list, individual species should be chosen so that there are consistent and adequate floral resources throughout the season. In order to achieve this goal, a minimum of three species from each blooming period (early, mid, and late season), should be included. Plant composition (i.e., percent of each species) can be designed to complement adjacent crop bloom time or other abundant species in the landscape, with more plants blooming immediately before and after adjacent crops.

Non-Native Plants: Plant selection should focus on pollen- and nectar-rich native plants.

Alternate Pest or Disease Hosts: In most cases, native pollinator plants do not serve as alternate hosts for crop pests or diseases, but selected plants should be cross-referenced for specific crop pest or disease associations. Research indicates that borders dominated by non-native weeds harbor more pests than are found in diverse native plantings.

Site Preparation

Site preparation is **one of the most important** and often inadequately addressed components of project success. It is also a process that may require more than one season of effort to reduce competition from invasive, noxious, or undesirable non-native plants prior to planting. *In particular, site preparation should focus on the removal of perennial weeds* (there are more options to address annual or biennial weeds after planting). Regardless of whether the objective is to establish herbaceous or woody vegetation, more effort and time spent eradicating undesirable plants prior to planting will result in higher success rates in establishing the targeted plant community. Weed removal methods are provided in **Table 1**. For site preparation where wildflowers will be seeded within or adjacent to a hedgerow, see *Conservation Cover (327) Practice Standards*.

Note: If weed pressure is high, then the weed abatement strategies detailed here should be repeated for an additional growing season. High weed pressure conditions are characterized by:

- Persistent, year-round cover of undesirable plants (covering the entire surface of the site);
- Sites where weeds have been actively growing (and producing seed) for multiple years;
- Sites dominated by introduced sod-forming grasses (e.g., Bermuda grass) and rhizomatous forbs (e.g., Canada thistle).

If desired, site preparation can also include the creation of a berm to serve as the hedgerow base. Hedgerows with berm-bases are preferred in some regions for greater windbreak and screening benefits (due to the raised base). In areas where drainage is poor, they may support a wider range of plants. Hedgerow berms are often roughly 3' in width and height, and are created using soil excavated from the sides of the berm (creating a parallel ditch on both sides of the hedgerow). Field stones are sometimes added to hedgerow berms as well, adding additional height and structure.

Figure 2 Site preparation should focus on removing existing weedy vegetation. The upper site is not ready for planting. Weedy vegetation has been removed from the lower site; creating a clean planting area where hedgerow plants can become established with less competition for sunlight and water.

(Photograph by Ed Vaughn.)

(Photograph courtesy of the Oregon NRCS.)

Figure 3 *Opposite:* Spicebush swallowtail (*Papilio troilus*) caterpillar on northern spicebush (*Lindera benzoin*) leaf. (Photograph by Ryan Hagerty, USFWS, via flickr.com.)

Table 1 **Site Preparation Methods**

METHOD: MOWING OR STRIP TILLAGE	
Where to Use • Where weed pressure is low • Areas with a low risk of erosion • Areas accessible to mowing or tilling equipment	**Timing** • Total time: 1 month • Begin: Any time • Plant: Any time
Basic Instructions: 1. Where weed pressure is low, mow or till the existing vegetation as low to the ground as possible for the length of the hedgerow. 2. If necessary, rake or lightly harrow the strip to create a clean surface for installing transplants.	
METHOD: NON-SELECTIVE (NON-PERSISTENT) HERBICIDE	
Where to Use • Where weed pressure is high • Conventional farms and organic farms* • Areas with a low risk of erosion • Areas accessible to sprayer	**Timing** • Total time: 1+ month(s) • Begin: Any time • Plant: Any time
Basic Instructions: 1. Mow existing thatch as needed before beginning herbicide treatments to expose new weed growth to the herbicide spray. 2. Apply a non-selective, non-persistent herbicide as per label when weeds are actively growing. 3. If necessary, repeat herbicide applications at six-week intervals until the desired level of weed control is achieved. 4. Plant the transplants, waiting at least 72 hours after the last herbicide treatment. Refer to the Planting Methods section of this document for specific recommendations. ***NOTE: Do not till. Avoid any ground disturbance that may bring up additional weed seed. An additional year of site preparation is recommended if weed pressure is particularly high. Avoid use of herbicides that are bee-toxic (e.g., Paraquat and Gramoxone).*** **** Choice of herbicides must be acceptable to OMRI for organic operations; or, if not, used outside of certified ground AND approved by an organic certifier.***	
METHOD: SOLARIZATION	
Where to Use • Where weed pressure is high • Conventional farms and organic farms • Areas with a low risk of erosion • Areas accessible to mowing equipment • Locations with full sun	**Timing** • Total time: 6+ months • Begin: Spring • Plant: Fall to winter
Basic Instructions: 1. Mow, till, or lightly harrow and smooth the site (raking off debris, if necessary). 2. After smoothing the site, irrigate the site well and lay UV-stabilized plastic (such as high tunnel plastic), burying the edges to prevent airflow between the plastic and the ground. Weigh down the center of the plastic, if necessary, to prevent the wind from lifting it. Use greenhouse repair tape for any rips that occur during the season. 3. Remove the plastic in early fall before the weather cools and the area beneath plastic is recolonized by nearby rhizomatous weeds. 4. Immediately install transplants. Refer to Planting Methods section of this document for specific bed preparation recommendations. ***NOTE: Avoid any ground disturbance that may bring up additional weed seed. An additional year of site preparation is recommended if weed pressure is particularly high.***	

Planting Methods

Regular shovels are usually adequate for transplanting most woody nursery stock. However, dibble sticks or mechanical transplanters are sometimes helpful for plug-planting. Power augers and mechanical tree spades can be helpful for larger plants.

Depending on weed pressure, hedgerow plants can be installed through planting holes cut into landscape fabric (after which the fabric is typically covered with mulch). While this practice may be highly effective for weed control, it likely reduces nesting opportunities for ground-nesting pollinators and other wildlife. Approximately 70% of North American native bee species nest in the ground, making the undisturbed ground beneath hedgerows potential nest sites. As landscape fabric can deter bees from accessing the soil, hedgerows should be installed without landscape fabric whenever possible.

Plant size at maturity should be considered when planting. Most woody shrubs can be spaced on 4′ to 10′ centers (depending upon size at maturity), with most herbaceous plants spaced closer on 2′ to 3′ centers. It is helpful to measure the planting areas prior to purchasing transplants, and to stage the transplants in the planting area prior to installing them in the ground.

Transplanting can occur any time the ground can be worked, but should be timed to avoid prolonged periods of hot, dry, or windy weather. Fall is often a good time to transplant shrubs and trees. Regardless of when planting occurs, however, the transplants should be irrigated thoroughly immediately after planting. Holes for plants can be dug and pre-irrigated prior to planting, as well. Follow-up irrigation is dependent upon weather and specific site conditions, but generally even native and drought-tolerant plants would benefit from at least 1″ of water per week (except during natural rain events), for the first two years after planting. Long, deep watering is best to encourage deep root system development and shallow irrigation should be avoided. Drip-irrigation is useful, and other methods that allow for deep watering can be successful. It is advisable to irrigate at the base of plants and avoid overhead irrigation that would encourage weed growth. Once plants are established, irrigation should be removed or greatly decreased.

Most of the plants in the Appendix are adapted to a variety of soil conditions and do not need any specific amendments. However, in areas where the soil is compacted, degraded, or depleted, compost should be used during planting. Compost should be free of weed seeds, aged properly, and mixed thoroughly with soil in the holes during planting.

Where rodent damage may occur, underground wire cages around roots are recommended. Plant guards also may be needed to protect plants from above ground browsing or antler damage by deer. Newly-planted areas should be clearly marked to protect them from herbicides, mowing, or other disturbances.

Mulching is recommended to reduce weed competition and to retain moisture during the establishment phase. Recommended materials include wood chips, bark dust, weed-free straw, nut shells, grapeseed pumice, or other regionally appropriate weed-free mulch materials.

Seeding Wildflowers: Wildflowers can also be planted from seed within, or adjacent to, hedgerows to provide additional plant structure and diversity. Seeding requires **excellent** site preparation to reduce weed pressure since weed control options are limited when the wildflowers start to germinate. For more information on establishing wildflowers from seed, see *Conservation Cover (327) Practice Standards*.

Figure 4 Hedgerows provide more than forage for pollinators, as many native bee species nest in the stems of plants (left) or in the undisturbed ground underneath hedgerow plantings (right).

(Photograph by Nancy Lee Adamson, The Xerces Society.)

(Photograph courtesy of Whitney Cranshaw, Colorado State University, Bugwood.org.)

Planting Method Photos

Figure 5 Hedgerow plants can be staggered in multiple rows, providing a wider habitat feature, with greater secondary benefits (such as screening, wind reduction, and dust control) (left). Where weed pressure is particularly severe, the ground below the hedgerow can be covered in weed barrier landscape fabric (right). The use of weed barrier, however, may reduce the value to ground-nesting wildlife, including many species of bees.

(Photograph by Eric Lee-Mäder, The Xerces Society.)

(Photograph courtesy of Gwendolyn Ellen, Oregon State University.)

Figure 6 Grow tubes or trunk protectors may help during establishment to reduce browsing by herbivores and trunk damage from mowers or weeding operations (left). Wildflowers can be seeded alongside newly-planted hedgerows to provide pollen and nectar resources while slower-growing shrubs become established (middle). Site preparation and weed eradication needs to be very rigorous prior to planting seeds. See the *Conservation Cover (327) for Pollinators Installation Guide and Job Sheet: Rhode Island*. Most species will benefit from 1" of water per week during the first two years of establishment, either from natural rainfall or irrigation, such as the drip-irrigation lines used on this hedgerow (right).

(Photograph by Sarah Foltz Jordan, The Xerces Society.)

(Photograph by Sarah Foltz Jordan, The Xerces Society.)

(Photograph by Eric Lee-Mäder, The Xerces Society.)

Maintenance During Establishment (Short-Term)

Weed control is critical in the first and second years after planting. If the site is well prepared, then less effort will be required for weeding after project installation. Maintenance practices must be adequate to control noxious and invasive species and may involve tools such as mowing, string-trimming, hand-hoeing, or spot-spraying with herbicides.

Weeds should be prevented from going to seed in, or adjacent to, the hedgerow during the first two (and possibly three) years after planting to help ensure long-term success. Familiarity with the life cycle of weeds will facilitate appropriate timing of management activities.

Common weed-management strategies include:

- **Spot-spraying:** Spot-spraying with herbicides can be effective, relatively inexpensive, and require minimal labor—even on larger project areas. Care should be taken that herbicides do not drift or drip onto desirable plant species.
- **Selective Herbicides:** Grass-selective herbicides can be used to control weedy grasses in hedgerows. Contact a local crop advisor or Extension specialist for appropriate herbicide selection and timing.
- **Managing Irrigation:** Whenever possible, irrigation should be supplied at the base of the transplant (through drip irrigation, for example) to avoid watering nearby weeds.
- **Mowing or String-trimming:** Mowing or string-trimming can be utilized to keep weedy species from going to seed and shading out hedgerow plants.
- **Hand-weeding:** Hand-weeding (including hoeing) can be effective in small areas with moderate weed pressure.

Operations and Maintenance (Long-Term)

Control herbivores as needed, but remove tree guards or other materials that could impede plant growth as soon as possible after establishment. In most cases, irrigation can be removed from transplants by the end of the second year after planting. Continue to protect habitat from pesticides and herbicides, except when necessary to control noxious or invasive plants. Ongoing herbicide use (spot-treatment) or occasional hand-weeding may be necessary to control noxious weeds. Maintain the long-term plant diversity of pollinator habitat by re-planting as necessary.

Hedgerow plantings may need to be managed over time to prevent shrub encroachment into adjacent fields or roadsides, or to cut back large trees that shade out other hedgerow species. Depending on management goals (e.g., preferred wildlife structure), larger hedgerow species are sometimes cut back to a stump and allowed to re-sprout (called 'coppicing') to produce multiple bushy stems. Another practice—hedge-laying—involves cutting most of the way through upright trunks, then pushing the still partially attached trunks over at an angle in line with the hedgerow. New growth from the stumps and laid trunks results in thicker hedgerow structure and fills in gaps where other shrubs may have died. Regardless of management needs, do not prune hedgerow plants during critical wildlife nesting seasons (consult your state wildlife biologist for specific guidance). After establishment, no more than 30% of the habitat area should be disturbed in any one year to ensure sufficient undisturbed areas for pollinators and other wildlife.

Finally, note that some common farm-management practices can cause harm to bees and other beneficial insects. Insecticides are especially problematic, including some insecticides approved for organic farms. Therefore, if insecticide spraying is to occur on the farm, it is critical that the pollinator hedgerow is outside of the sprayed area and/ or protected from application and drift.

Figure 7 Newly-planted areas should be clearly marked to protect them from herbicides or other disturbances (left). Using signs (right) can be a useful tool to designate protected pollinator habitat. (*Note: Due to wildlife safety concerns, we recommend attaching habitat signs to the top hole of the fence post or plugging the top hole of a typical t-post with a bolt and nut. Alternatively, posts which do not have holes—such as solid wood stakes—should be used.)*

(Photograph by Kelly Gill, The Xerces Society.)

Figure 8 Many native pollinators, such as cellophane bees (*Colletes* spp.), emerge very early in the spring, making early-blooming plants like pussy willow (*Salix discolor*) essential for their survival.

(Photograph courtesy of Jason King, via flickr.com.)

Figure 9 Blueberries (*Vaccinium* spp.) are highly attractive to many native bees, like (clockwise from top left): large and small mining bees (*Andrena* spp.), green sweat bees (Halictidae), and bumble bees (*Bombus* spp.).

(Photographs by Nancy Lee Adamson, The Xerces Society.)

Appendix: Recommended Plants, Sources, and References

Recommended Native Hedgerow Plants

	COMMON NAME	SCIENTIFIC NAME	Height	Water needs	COMMENTS
Early–Mid Spring	Canadian serviceberry[1]	*Amelanchier canadensis*	6–20′+	M	(Charming underwing, red-spotted purple); pest and disease prone (mostly cosmetic)
	Northern spicebush	*Lindera benzoin*	12′	H	(Spicebush swallowtail, promethea silkmoth); establishes quickly
	Pussy willow[2,3]	*Salix discolor*	15′	M–H	(Viceroy, Acadian hairstreak); dioecious; adapted to a range of habitats; responds well to coppicing
Early–Late Spring	Black cherry[1,4,5]	*Prunus serotina* var. *serotina*	25–110′	M	(Spring azure, red-spotted purple, cecropia moth, promethea silkmoth, wild cherry sphinx moth); foliage and seeds can be toxic to livestock and children; establishes quickly
	Black chokeberry[5]	*Aronia melanocarpa*	3–12′	M	Tolerates flooding
	Highbush blueberry[2]	*Vaccinium corymbosum*	6–12′	M–H	(Spring azure, summer azure, Henry's elfin); showy flowers and foliage
	Lowbush blueberry[3, 4]	*Vaccinium angustifolium*	0.5–2′	M	(Spring azure, summer azure, Henry's elfin)
	Silky willow[3]	*Salix sericea*	12′	H	(Acadian hairstreak); dioecious
Mid/Late Spring–Early Summer	American plum[1]	*Prunus americana*	15–30′	M	(Henry's elfin, spring azure, red-spotted purple, short-lined chocolate, cecropia silkmoth)
	Beach plum[1]	*Prunus maritima* var. *maritima*	6–18′	M	(See p.11); foliage and seeds can be toxic to livestock and children
	Black willow[2,3]	*Salix nigra*	30–60′	H	(Viceroy, Acadian hairstreak, darling underwing); dioecious; highly variable depending on conditions
	Cockspur hawthorn[1,5]	*Crataegus crus-galli*	20–30′	L	(Charming underwing, chokeberry underwing, and 25+ moth species); adaptable; candidate for coppicing; attracts songbirds; alternate host for apple maggot
	New Jersey tea[2]	*Ceanothus americanus*	4′	M	(Spring azure, summer azure, mottled duskywing); extremely adaptable; nitrogen-fixing; attractive to deer; slow growing
	Red chokeberry	*Aronia arbutifolia*	6–12′	H	Showy foliage and fruit
	Smooth arrowwood	*Viburnum dentatum*	6–12′	M	(Summer azure, spring azure, Henry's elfin); highest value for migratory songbirds; multiple wildlife benefits
	Smooth serviceberry[1]	*Amelanchier laevis*	15–25′	M	(Charming underwing, red-spotted purple); fruit is rich in iron and copper
Late Spring–Mid Summer	Black huckleberry	*Gaylussacia baccata*	1–2′	L	(Henry's elfin); valuable resource to wildlife
	Chokecherry[1,4]	*Prunus virginiana*	20–30′	M	(Henry's elfin, spring azure, short-lined chocolate, cecropia silkmoth, red-spotted purple); foliage and seeds can be toxic to livestock and children; tolerates shade; candidate for coppicing
	Common blackberry[1]	*Rubus allegheniensis*	3–6′	M	Pithy stems provide nesting sites for solitary bees and beneficial wasps
	Common winterberry[2,3]	*Ilex verticillata*	5–15′	H	Dioecious; evergreen; toxic if ingested
	Inkberry[2,3]	*Ilex glabra*	5–10′	H	Dioecious; evergreen; tolerates flooding; toxic if ingested
	Pasture rose[1]	*Rosa carolina*	5′	L	(Mourning cloak, cecropia moth); rose hips high in vitamins C, E, and K

KEY: Bloom time; Water needs: low (L), medium (M), high (H); Height; Butterfly/ moth larval host plant; Edible fruit; Supports wildlife (see *Notes*); Coastal tolerant (see *Notes*)

Recommended Native Hedgerow Plants *continued*

	COMMON NAME	SCIENTIFIC NAME	Height	Water needs	COMMENTS
Early–Late Summer	Black elderberry	*Sambucus nigra* ssp. *canadensis*	12′	M	(Cecropia moth); abundant, shallow flowers; pithy stems provide nesting sites for solitary bees and beneficial wasps; tolerates coppicing
	Buttonbush[2]	*Cephalanthus occidentalis*	6–12′	H	(Cecropia moth, hydrangea sphinx); Excellent mid-summer nectar and pollen source; will survive periodic flooding; shade tolerant; foliage may be toxic if ingested
	Staghorn sumac[3]	*Rhus typhina*	15–30′	L	(Summer azure, spotted datana)
	Swamp rose[2]	*Rosa palustris*	6–8′	H	(Mourning cloak, cecropia moth*); rose hips high in vitamins C, E, and K; most wild roses are pest/disease susceptible (e.g., Japanese beetles, leaf rollers), but also highly attractive to wildlife
	White meadowsweet[1]	*Spiraea alba*	3–6′	H	(Spring azure, summer azure); produces small, pod-like fruit; long-lasting blooms; best used in hedgerow understory or edges; pest/disease susceptible
Mid/Late Summer–Early Fall	Coastal sweetpepperbush	*Clethra alnifolia*	16′	H	(Summer azure); excellent mid-summer nectar and pollen source
	Steeplebush[1]	*Spiraea tomentosa*	3–6′	M	(Spring azure, summer azure, cecropia moth); very attractive to butterflies; long-lasting blooms; best used in hedgerow understory or edges; pest/disease susceptible
	Winged sumac[2,3]	*Rhus copallinum*	20–35′	L	(Summer azure, spotted datana); fruit is used for lemonade-like drink; drought and pest resistant; late winter resource for wildlife; thrives in disturbed sites

KEY: Bloom time; Water needs: low (L), medium (M), high (H); Height; Butterfly/ moth larval host plant; Edible fruit; Supports wildlife (see *Notes*); Coastal tolerant (see *Notes*)

Recommended Native Hedgerow Plants for Pollinators *Notes*:

1. Alternative host for fire blight.
2. Abundant nectar and/ or pollen—an excellent resource for bees and other pollinators (especially honey bees and butterflies).
3. Dioecious—pollen-producing (male) and nectar-producing (female) flowers found on separate plants. Male plants sometimes documented to provide more important resources for brood-rearing bees. Only female plants produce fruit.
4. Potential host for BMSB—*Host Plants of the Brown Marmorated Stink Bug in the U.S.* A publication of the Brown Marmorated Stink Bug IPM Working Group in conjunction with the Northeastern IPM Center. (Available at: www.stopbmsb.org/where-is-bmsb/host-plants/)
5. Alternate host to plum curculio and diseases of fruit trees; do not plant near orchards.

Support birds and other wildlife with fruit/seeds/nuts and nesting materials/ sites.

Coastal tolerant—plant adapted to tolerate salt spray, salt soil, acidic soils. (Source: http://web.uri.edu/rinativeplants/glossary/)

Figure 10 Many lepidopteran species require specific host plants as larvae, like the spicebush swallowtail (*Papilio troilus*), which feeds almost exclusively on northern spicebush (*Lindera benzoin*).

(Photograph courtesy of John Flannery, via flickr.com.)

Native Pollinators & Associated Host Plants[1]

Group	Family	Common Name	Scientific Name	Blueberry fam.[2]	Plum/cherry fam.	—Black cherry	Willow fam.	—Blackwillow	—Pussy willow	—Silky willow	Black elderberry	Black huckleberry	Buttonbush	Canadian serviceberry	Coastal sweetpepperbush	Codspur hawthorn	New Jersey tea	Northern spicebush	Pasture/ swamp rose	Smooth arrowwood	Smooth serviceberry	Staghorn/ winged sumac	Steeplebush	Whitemeadowsweet
Bees	Bumbles	Rusty-patched bumble bee*⚠	*Bombus affinis*	★										★		✓		✓				✓	✓
		Yellow-banded bumble bee⚠	*B. terricola*		★	✓	✓	✓	✓	✓								✓				★	
Butterflies	Skippers	Dreamy duskywing	*Erynnis icelus*				✓	✓	✓	✓													
		Mottled duskywing*	*E. martialis*													★							
	Gossamer-wings	Acadian hairstreak*⚠ 🌊	*Satyrium acadica*				✓	★	★	★													
		Henry's elfin*⚠	*Callophrys henrici*	★	★	✓						✓							✓				
	Brushfoots &	Mourning cloak 🌊	*Nymphalis antiopa*				★	✓	✓	✓						✓			✓				
		Red-spotted purple 🌊[3]	*Limenitis arthemis*		★	★	★	✓	✓	✓				✓		✓					✓		
		Spicebush swallowtail 🌊	*Papilio troilus*														★						
	Swallowtails,	Spring azure 🌊	*Celastrina ladon*	✓	✓	✓										★			✓			✓	✓
		Summer azure 🌊	*C. neglecta*	✓	✓	✓								✓		★			✓		✓	★	★
		Viceroy 🌊	*Limenitis archippus*		✓	✓	★	✓	✓	✓						✓							
Moths	Owlet moths & allies	Charming underwing⚠	*Catocala blandula*										★		★					★			
		Chokeberry underwing⚠	*C. crataegi*												★								
		Darling underwing 🌊	*C. cara*				✓	★	✓	✓													
		Fragile dagger moth⚠	*Acronicta fragilis*		✓	✓	✓	✓	✓	✓													
		Short-lined chocolate⚠	*Argyrostrotis anilis*		★																		
		Spotted datana⚠	*Datana perspicua*																		✓		
	Saturnids	Cecropia moth⚠	*Hyalophora cecropia*	✓	★	★	✓	✓	✓	✓	★		✓			✓	×		×			✓	
		Promethea silkmoth⚠	*Callosamia promethea*		✓	★							×					★					
	Sphinx moths	Big poplar sphinx⚠ 🌊	*Pachysphinx modesta*				✓	✓	✓	✓													
		Hydrangea sphinx⚠ 🌊	*Darapsa versicolor*										★										
		Wild cherry sphinx⚠	*Sphinx drupiferarum*		✓	★																	

Key: ⚠ SGCN (see *Notes*) · * Imperiled or extirpated (see *Notes*) · 🌊 Wetland species (see *Notes*) · ★ Primary or highly preferred host plant · ✓ Readily-accepted host plant · × Limited success as host plant

Native Pollinators & Associated Host Plants *Notes*:

1. This list is limited to species native to Rhode Island mentioned in this publication and is not intended to be comprehensive.
2. FAM.—Family; i.e., blueberry (*Vaccinium* spp.), plum (*Prunus* spp.), or willow (*Salix* spp.).
3. Includes both the red-spotted purple (*L. a. astyanax*) and white admiral (*L. a. arthemis*), which hybridize in Rhode Island and neighboring areas, resulting in various color morphs.

⚠ SGCN—"Species of Greatest Conservation Need" in the 2015 revision of the Rhode Island Wildlife Action Plan. (Source: www.dem.ri.gov/programs/bnatres/fishwild/swap15.htm)

* Imperiled or extirpated— species is considered to be at high risk of extinction or elimination in Rhode Island by NatureServe. Please note that many species remain unranked due to a lack of current records. (Source: http://explorer.natureserve.org)

🌊 Wetland species—this lepidopteran species is often found in—or has been documented as being well-adapted to—wetlands, riparian areas, and coastal habitat. (Source: www.butterfliesandmoths.org)

Figure 11 Female butterflies and moths will frequently lay eggs on or near their preferred host plant, like this spring azure (*Celastrina ladon*) ovipositing on New Jersey tea (*Ceanothus americanus*).

(Photograph courtesy of Tom Potterfield, via flickr.com.)

References & Resources

Xerces Society Seed Mix Calculator
Develop your own pollinator conservation seed mix using this seed rate calculator.
www.xerces.org/xerces-seed-mix-calculator

Attracting Native Pollinators: Protecting North America's Bees and Butterflies
This comprehensive book on pollinator conservation includes information about pollinator ecology, guides for identifying common bees, and habitat designs for multiple landscapes.
www.xerces.org/announcing-the-publication-of-attracting-native-pollinators

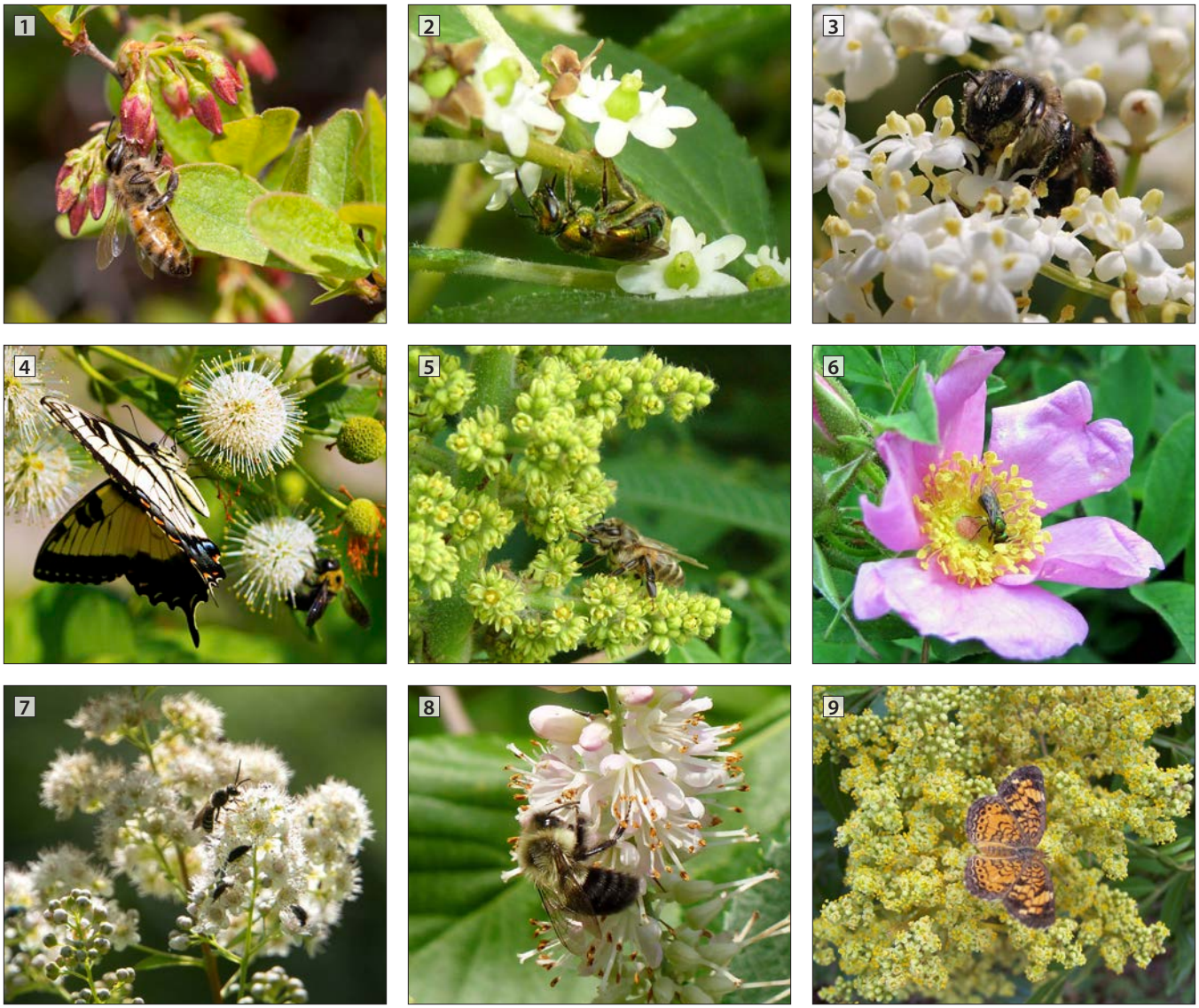
Pollinator Conservation Resource Center
For additional information on pollinator plant lists, conservation guides, pesticide protection, and more.
www.xerces.org/pollinator-resource-center

Conservation Buffers (US Forest Service Technical Guide)
Design guidelines for buffers, corridors, and greenways. Includes extensive information on hedgerows and windbreaks.
www.unl.edu/nac/bufferguidelines/docs/conservation_buffers.pdf

Windbreaks Designed with Pollinators in Mind (*Inside Agroforestry*)
An overview of multi-purpose windbreaks designed with pollinator-friendly trees and shrubs.
www.unl.edu/nac/insideagroforestry/vol20issue1.pdf

USDA PLANTS:
NRCS documents for pollinator conservation and enhancement.
www.plants.usda.gov/pollinators/NRCSdocuments.html

Figure 12 When installing pollinator habitat, it's important to include floral resources that will bloom later in the season, after the peak bloom period for many other pollinator plants and crops, such as: black huckleberry (*Gaylussacia baccata*)[1], common winterberry (*Ilex verticillata*)[2], black elderberry (*Sambucus nigra* ssp. *canadensis*)[3], buttonbush (*Cephalanthus occidentalis*)[4], staghorn sumac (*Rhus typhina*)[5], swamp rose (*Rosa palustris*)[6], white meadowsweet (*Spiraea alba*)[7], coastal sweetpepperbush (*Clethra alnifolia*)[8], and winged sumac (*Rhus copallinum*)[9].



(Photographs courtesy of Kent McFarland[1], John Beetham[2,8], John Baker (Penn State University)[3], Doug Wertman[4], Jon Hayes[2], rockerBOO[7], and Phillip Merritt[9]—via flickr.com; and by Nancy Lee Adamson, The Xerces Society[6].)