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FOR INVERTEBRATE CONSERVATION



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Hedgerow Planting (422) for Pollinators

Florida

Installation Guide



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Brown-belted bumble bee (*Bombus griseocollis*) heading to highbush blueberry (*Vaccinium corymbosum*). (Photograph by Nancy Lee Adamson, The Xerces Society.)

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Native mining bee on highbush blueberry (*Vaccinium corymbosum*). (Photograph by Nancy Lee Adamson, The Xerces Society.)

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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.

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Hedgerow Planting (422) for Pollinators: Florida

Florida

Purpose

These instructions provide in-depth guidance on how to install linear rows of native flowering shrubs and trees that provide nectar and pollen throughout the growing season, and nesting habitat for bees in the southeast, focused on Florida.

Client Conservation Objectives

Depending on landowner objectives and project design, pollinator habitat may also provide food and cover for other wildlife, provide windbreaks, reduce soil erosion, protect water quality, and support other beneficial insects the reduce crop pest populations.

Key Site Characteristics

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

- **Existing Conditions:** If existing vegetation is mostly native, consider alternative Practice Standards to enhance floral diversity such as Tree/ Shrub Site Preparation (490) (to encourage natural regeneration of desirable woody plants) or Prescribed Burning (338).
- **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. Pesticides toxic to pollinators include some approved for 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 may need to be hand-planted to minimize soil disturbance. Consider Critical Area Planting (342) or other suitable Practice Standards.
- **Weed Pressure:** Areas with high weed pressure will take more time and effort to prepare for planting. 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/ or native plants), use of pre-emergent herbicides or other chemicals, and soil compaction can affect plant establishment. Conditions such as poor drainage (or potential flooding) make habitat establishment more difficult and require extra care in plant selection.
- **Soils and Habitat:** Choose plants to best match site conditions from this guide's Appendix, from the Florida NRCS *Pollinator Species Mixes and Cost Estimator Spreadsheet* (<http://go.usa.gov/WWcx>), Plant Materials Fact Sheets No. 3 *Planting Native Species for Flower Rich Pollinator Habitats* (<http://go.usa.gov/XQkC>), or No. 4 *Developing Planting Mixtures for Pollinator Habitats* (<http://go.usa.gov/XQ83>). If combining this planting with a 30-foot-wide herbaceous planting, as encouraged by NRCS, see Plant Materials Fact Sheets No. 3 (linked above), as well.
- **Irrigation:** When establishing plants from plugs, pots, or bare roots, careful consideration to planting season is necessary to ensure survival. Irrigation may be helpful.
- **Other Functions:** The planting may offer opportunities to serve other functions, such as run-off prevention, stream bank stabilization, wildlife habitat, or windbreaks. Those 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. This diverse mix of plants in South Carolina provides a variety of forage and nesting sites for native bees and more.



(Photograph by Amy Overstreet, Vermont NRCS.)

Plant Selection

Native Plants: Plant species selection should target plants providing pollen- and nectar-rich forage resources and nesting sites for bees. The Appendix provides information on acceptable shrubs and trees for Florida, and the NRCS spreadsheet includes a longer list of plants sourced each year for availability.

If you are designing a custom plant list, choose a mix of plants to ensure consistent and adequate floral resources throughout the seasons. The Conservation Reserve Program requires a minimum of three species for each blooming period (spring, summer, and fall). For parts of Florida and the south, providing winter-blooming plants is also vital for supporting pollinators. 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: Focus plant selection on pollen- and nectar-rich native plants, but include non-invasive, non-native plants when cost and/ or availability are limiting factors.

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 diverse native plantings harbor fewer pests than unmanaged weedy borders.

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) for Pollinators Installation Guide: Florida*, see Appendix).

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 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 can add height and/ or structure to berms.

Figure 2 Site preparation should focus on removing existing weedy vegetation. The site above is not ready for planting. Weedy vegetation has been removed from the site below; 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.)

Table 1 **Site Preparation Methods**

METHOD: MOWING OR STRIP TILLAGE	
Where to Use <ul style="list-style-type: none"> Conventional farms and organic farms* Areas with a low risk of erosion Areas accessible to sprayer 	Timing <ul style="list-style-type: none"> Total time: 6+ months Begin: Winter or early spring after the first weed growth Plant: Fall
Basic Instructions: <ol style="list-style-type: none"> Where weed pressure is low, mow or till the existing vegetation as low to the ground as possible for the length of the hedgerow. 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 <ul style="list-style-type: none"> Where weed pressure is high Conventional farms and organic farms* Areas with a low risk of erosion Areas accessible to sprayer 	Timing <ul style="list-style-type: none"> Total time: 1+ month(s) Begin: Anytime Plant: Anytime (as long as water needs are met)
Basic Instructions: <ol style="list-style-type: none"> Mow existing thatch as needed before beginning herbicide treatments to expose new weed growth to the herbicide spray. Apply a non-selective, non-persistent herbicide as per label as soon as weeds are actively growing in the early spring. If necessary, repeat herbicide applications at 6-week intervals until the desired level of weed control is achieved. 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. <p>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).</p> <p>* 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.</p>	
METHOD: SOLARIZATION	
Where to Use <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Total time: 6+ months Begin: Spring Plant: Fall to winter
Basic Instructions: <ol style="list-style-type: none"> Mow, rake, or lightly harrow and smooth the site (raking or burning off debris if necessary). After smoothing the site, lay UV-stabilized plastic (such as high tunnel plastic), following ground contours closely to reduce chances of tearing, and 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. If planting in fall, remove the plastic in early fall before the weather cools and the area beneath the plastic is recolonized by nearby rhizomatous weeds. Otherwise, remove shortly before planting, raking off debris, if necessary, prior to planting. Immediately install transplants. Refer to Planting Methods section of this document for specific bed preparation recommendations. <p>NOTE: After solarization 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.</p>	



Two-spotted bumble bee (*Bombus bimaculatus*) on silverbell (*Halesia diptera*). (Photograph by Nancy Lee Adamson, The Xerces Society.)

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. 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. Regardless of when planting occurs, however, watering the transplants thoroughly immediately after planting is advisable. 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. Non-native plants may require more frequent irrigation, and may still require supplemental irrigation once established.

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 or other disturbances.

Mulching is recommended to reduce weed competition and to retain moisture during the establishment phase. Recommended materials include leaf mulch, 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 the *Conservation Cover (327) for Pollinators Installation Guide: Florida*.

Figure 3 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 Whitney Cranshaw, Colorado State University, Bugwood.org.)

Planting Method Photos

Figure 4 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 by Gwendolyn Ellen, Oregon State University.)

Figure 5 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 Conservation Cover (327) for Pollinators Installation Guide: Florida. 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 Jessa Kay Cruz, The Xerces Society.)



(Photograph by Kelly Gill, 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/ 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, called 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. If more than 30% must be disturbed annually, spread disturbance out through the season, avoiding nesting season.

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 6 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 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 7 Many species of native bees emerge very early the spring, which is why it is essential to include plants that bloom in winter or early spring; such as highbush blueberry (*Vaccinium corymbosum*), left, and eastern redbud (*Cercis canadensis*), right, shown with the southeastern blueberry bee (*Habropoda laboriosa*).



(Photographs by Nancy Lee Adamson, The Xerces Society)



Appendix: Recommended Plants, Sources, and References

Recommended Native Hedgerow Plants

COMMON NAME	SCIENTIFIC NAME	HEIGHT & FORM ¹	BLOOM PERIOD	RANGE ²	WATER NEEDS ³	NOTES	
Winter & Very Early Season Blooming Species							
Chickasaw plum ^{4, 5, 6}	<i>Prunus angustifolia</i>	15–30'	T	W, SP	N, C	L	See Notes ^{4, 5, 6}
Corky passionflower ⁵	<i>Passiflora suberosa</i>		V	W, SP, Su, FA	C, S/ ST	L (UPL)	Fritillary and heliconian host plant ⁵
Fetterbush ^{4, 5, 7}	<i>Lyonia lucida</i>	3–5'	S	W, SP	N, C, S/ ST	M (FACW)	Showy, fragrant flowers ^{4, 5, 7}
Firebush	<i>Hamelia patens</i>	8–12'	S	W, SP, Su, FA	C, S/ ST	L (FACU)	Showy red flowers excellent for hummingbirds and butterflies
Highbush blueberry ^{5, 6, 8}	<i>Vaccinium corymbosum</i>	6–12'	S	W, SP	N, C, S	M (FACW)	Showy flowers and foliage ^{5, 6, 8}
Necklace pod ^{5, 9}	<i>Sophora tomentosa</i>	8'	S	W, SP, Su, FA	C, S/ ST	L	Butterfly host plant; showy flowers ^{5, 9}
Red maple ^{4, 5}	<i>Acer rubrum</i>	20–60'	T	W, SP	N, C, S/ ST	L (FAC)	Excellent late winter/ early spring resource ^{4, 5}
Simpson's stopper ^{5, 6, 7, 10}	<i>Myrcianthes fragrans</i>	20'	T	W, SP, Su, FA	C, S/ ST	L	Versatile and showy ^{5, 6, 7, 10}
Sparkleberry ^{5, 6}	<i>Vaccinium arboreum</i>	6–25'	S	W, SP	N, C, S	L (FACU)	Showy flowers and foliage ^{5, 6}
Early Season Blooming Species							
American holly ⁷	<i>Ilex opaca</i>	15–30'	T	SP	N, C, S	L (FAC)	See Notes ⁷
Coastal plain willow ⁵	<i>Salix caroliniana</i>	25–60'	T	SP	N, C, S/ ST	M (OBL)	See Notes ⁵
Dahoon holly ^{5, 6, 7}	<i>Ilex cassine</i>	20–30'	T	SP	N, C, S/ ST	M (FACW)	All hollies excellent for bees ^{5, 6, 7}
Eastern redbud ⁵	<i>Cercis canadensis</i>	15–30'	S	SP	N, C	L (FACU)	Henry's elfin and io moth host plant ⁵
Hog plum ^{4, 5, 6}	<i>Prunus umbellata</i>	3–5'	S	SP	N, C, S	L	See Notes ^{4, 5, 6}
Inkberry ⁷	<i>Ilex glabra</i>	3–10'	S	SP	N, C, S/ ST	M (FACW)	See Notes ⁷
Mountain azalea ⁴	<i>Rhododendron canescens</i>	4–8'	S	SP	N	M (FACW)	Important for hummingbirds migrating north ⁴
Silverbell ⁵	<i>Halesia diptera</i>	30'	T	SP	N	L (FAC)	See Notes ⁵
Yaupon ⁷	<i>Ilex vomitoria</i>	8–10'	S	SP	N, C	L (FAC)	See Notes ⁷
Early–Mid Season Blooming Species							
American snowbell	<i>Styrax americanus</i>	6–10'	S	SP, Su	N, C	M (FACW)	Small shrub for moist habitats
Blackgum ^{5, 6}	<i>Nyssa sylvatica</i>	60–80'	T	SP, Su	N, C	L (FAC)	Abundant nectar and pollen ^{5, 6}
Coral bean ^{6, 9}	<i>Erythrina herbacea</i>	20'	S	SP, Su	N, C, S/ ST	L (UPL)	See Notes ^{6, 9}
Elderberry ^{6, 8}	<i>Sambucus nigra</i>	10–15'	S	SP, Su	N, C, S/ ST	L (FAC)	Pithy stems provide nesting sites for bees ^{6, 8}
False indigobush ⁹	<i>Amorpha fruticosa</i>	12'	S	SP, Su	N, C, S/ ST	M (FACW)	Southern gogface, gray hairstreak, and silver-spotted skipper host plant ⁹
Peelbark St. Johnswort ⁵	<i>Hypericum fasciculatum</i>	3–5'	S	SP, Su	N, C, S/ ST	H (OBL)	Abundant showy yellow flowers ⁵
Saw palmetto ^{5, 6}	<i>Serenoa repens</i>	10–12'	S	SP, Su	N, C, S/ ST	L (FACU)	Monk and palm skipper host plant ^{5, 6}
Southern magnolia ^{5, 6, 7}	<i>Magnolia grandiflora</i>	30–50'	T	SP, Su	N, C, S	L (FAC)	See Notes ^{5, 6, 7}
Swamp rose ^{5, 6, 8}	<i>Rosa palustris</i>	3–8'	S	SP, Su	N, C	M (OBL)	Rosehips high in vitamin C ^{5, 6, 8}
Swamp tupelo ^{5, 6}	<i>Nyssa biflora</i>	70–100'	T	SP, Su	N, C, S	M (OBL)	Abundant nectar and pollen ^{5, 6}
Sweetbay magnolia ^{5, 6, 7}	<i>Magnolia virginiana</i>	30–50'	T	SP, Su	N, C, S/ ST	M (FACW)	Eastern tiger swallowtail host plant ^{5, 6, 7}
Tuliptree ⁵	<i>Liriodendron tulipifera</i>	80–120'	T	SP, Su	N, C	L (FAC)	Abundant nectar and pollen ⁵

(continued on next page)

Recommended Native Hedgerow Plants *continued*

COMMON NAME	SCIENTIFIC NAME	HEIGHT & FORM ¹	BLOOM PERIOD	RANGE ²	WATER NEEDS ³	NOTES
Mid–Late Season Blooming Species						
American beautyberry ^{5, 6}	<i>Callicarpa americana</i>	5' S	Su	N, C, S/ ST	L (FACU)	Berries very showy ^{5, 6}
Buttonbush ⁵	<i>Cephalanthus occidentalis</i>	5–20' S	Su, FA	N, C, S/ ST	M (OBL)	Excellent mid-summer nectar and pollen source ⁵
Eastern rosemallow ^{5*}	<i>Hibiscus moscheutos</i>	4–6' S	Su	N, C	M (OBL)	Supports specialist hibiscus bee (<i>Ptilothrix bombiformis</i>), alt. Rosemallow or Okra bee ^{5*}
Loblolly bay ⁷	<i>Gordonia lasianthus</i>	30–60' T	Sp, Su, FA	N, C, S	M (FACW)	See Notes ⁷
Purple passionflower, maypop ^{5, 6, 8}	<i>Passiflora incarnata</i>	V	Sp, Su, FA	N, C, S/ ST	L	Fritillary and zebra longwing host plant ^{5, 6, 8}
Sourwood ⁵	<i>Oxydendrum arboreum</i>	30–70' T	Su	N	L (FACU)	Among the showiest trees for fall color (red foliage) ⁵
Spanish bayonet ^{5, 6, 8}	<i>Yucca aloifolia</i>	5–10' S	Sp, Su, FA	N, C, S/ ST	L (UPL)	Giant skipper host plant; edible flowers ^{5, 6, 8}
Winged sumac ^{5, 6, 8}	<i>Rhus copallinum</i>	5–15' S	Su	N, C, S/ ST	L (UPL)	Late winter resource for wildlife; used for lemonade-like drink ^{5, 6, 8}

Recommended Native Wildflowers for Pollinators Notes:

1. Mature height and form (T=tree, S=shrub or small tree, V=vine). *Eastern Rosemallow (*Hibiscus moscheutos*) is shrub-like, but herbaceous.
2. Water Needs abbreviations: L = low, M = medium, H = high; wetland indicator status in parentheses (see <https://plants.usda.gov/wetinfo.html> for more details).
3. Regions of natural range are: North (N), Central (C), South (S), and South Tropical (ST).
4. Species shown in **blue** may be toxic to cattle.
5. Excellent resource for bees and other pollinators.
6. Berries/ fruit support birds and other wildlife.
7. Evergreen.
8. Edible.
9. Legume—rich in nitrogen and attractive to a wide variety of wildlife.
10. Florida threatened species.

Figure 8 Buttonbush (*Cephalanthus occidentalis*), shown left with an eastern tiger swallowtail, and eastern rosemallow (*Hibiscus moscheutos*), shown right with the specialist hibiscus bee (*Ptilothrix bombiformis*), are excellent sources for pollen and nectar later in the season after peak bloom for many other plants.



(Photograph by Dennis Burnette.)



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

Regional Native Seed Vendors and Native Plant Nurseries

Inclusion on this list does not constitute an endorsement. Other vendors not listed below may also have suitable plant materials. Before ordering, ensure that all plants or seeds purchased for pollinator habitat have **NOT** been treated with systemic insecticides.

Plant Real Florida Searchable Database

Florida Association of Native Nurseries' native plant database that includes information on plant communities, habit, growing requirements, wildlife benefits, and contacts for nurseries with each species and professional landscapers.

321-917-1960 • www.plantrealflorida.org

Aquatic Plants of Florida (T) • Sarasota, FL

800-266-1272 • www.apofl.com

Biosphere Consulting (T) • Winter Garden, FL

407-656-8277 • www.biospherenursery.com

Ernst Conservation Seed (S&T) • Live Oak, FL

800-873-3321 • www.ernstseed.com

Florida Native Plants (T) • Sarasota, FL •

941-322-1915 • www.floridanativeplants.com

Florida Wildflowers Growers Cooperative (S) • Crescent City, FL

352-988-8117 • www.floridawildflowers.com

Maple Street Natives (S&T) • West Melbourne, FL

321-729-6857 • www.maplestreetnatives.com

The Natives (S&T) • Davenport, FL

863-422-6664 • www.thenatives.net

Southern Habitats (S&T) • Greenville, FL

850-879-7900 • www.southernhabitats.com

Notes: Seeds Only (S), Transplants Only (T), Seeds & Transplants (S&T)

References & Resources

SEED MIX CALCULATOR & PLANT INFORMATION

Florida NRCS Pollinator Species Mixes and Cost Estimator

Develop your own pollinator conservation seed mix using this seed rate calculator (updated annually for species availability).

[http://efotg.sc.egov.usda.gov/references/public/FL/FLPMFS4WS\(protected\).xlsx](http://efotg.sc.egov.usda.gov/references/public/FL/FLPMFS4WS(protected).xlsx)

Florida NRCS Plant Materials Fact Sheets

No. 3 Planting Native Species for Flower Rich Pollinator Habitats

<http://efotg.sc.egov.usda.gov/references/public/FL/FLPMFS3.pdf>

No. 4 Developing Planting Mixtures for Pollinator Habitats

<http://efotg.sc.egov.usda.gov/references/public/FL/FLPMFS4.pdf>

Atlas of Florida Vascular Plants

Check on the natural distribution of plants you are considering planting.

www.florida.plantatlas.usf.edu/

Florida Native Plant Communities

Choosing plants based on natural plant community composition best supports associated wildlife.

www.fnps.org/resources/native-plant-communities

www.plantrealflorida.org

Florida's Best Native Plants: 200 Readily Available Species for Homeowners and Professionals

Gil Nelson's guide includes trees, shrubs, wildflowers, and grasses, with photographs and detailed horticultural information to help determine the best plant based on site conditions.

Weeds in Florida (University of Florida Extension Website)

A collection of identification and management fact sheets to common weeds of Florida.

http://edis.ifas.ufl.edu/topic_book_florida_weeds

Pollinator Conservation Resource Center

For additional information on pollinator plant lists, conservation guides, pesticide protection and more.

www.xerces.org/pollinator-resource-center

COMPREHENSIVE GUIDES

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/

Farming with Native Beneficial Insects: Ecological Pest Control Solutions

The newest book from Xerces provides clear, effective, science-based conservation strategies that increase beneficial insect populations on farms through conservation systems.

www.xerces.org/farming-with-native-beneficial-insects/

SITE PREPARATION & PLANTING GUIDELINES

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.

<http://nac.unl.edu/documents/insideagroforestry/vol20issue1.pdf>

Soil Solarization: A Nonpesticidal Method for Controlling Diseases, Nematodes, and Weeds

This fact sheet, produced by the University of California Cooperative Extension discusses the solarization process, including plastic selection, installation, removal, and underlying principles.

http://vrc.ucdavis.edu/pdf/soil_solarization.pdf

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.