A photograph of a constructed wetland pond. The pond is filled with water, featuring several large green lily pads and a single pink water lily in bloom. The pond is bordered by a rustic stone wall made of irregular, light-colored rocks. Tall green grasses and other vegetation surround the pond, creating a lush, naturalistic environment. The entire scene is framed by a dark blue border.

A Maintenance Guide for  
*Constructed Wetlands*  
of the Southern Coastal Plain

## *Cover*

The constructed wetland featured on the cover was designed and photographed by Verdant Enterprises.

## *Photographs*

Photographs in this books were taken by Christa Frangiamore Hayes, unless otherwise noted.

## *Illustrations*

Illustrations for this publication were taken from the works of early naturalists and illustrators exploring the fauna and flora of the Southeast.

## *Legacy of Abundance*

We have in our keeping a legacy of abundant, beautiful, and healthy natural communities. Human habitat often closely borders important natural wetland communities, and the way that we use these spaces—whether it's a back yard or a public park—can reflect, celebrate, and protect nearby natural landscapes. Plant your garden to support this biologically rich region, and let native plant communities and ecologies inspire your landscape.





A Maintenance Guide for  
*Constructed Wetlands*  
of the Southern Coastal Plain

Thomas Angell  
Christa F. Hayes  
Katherine Perry  
2015

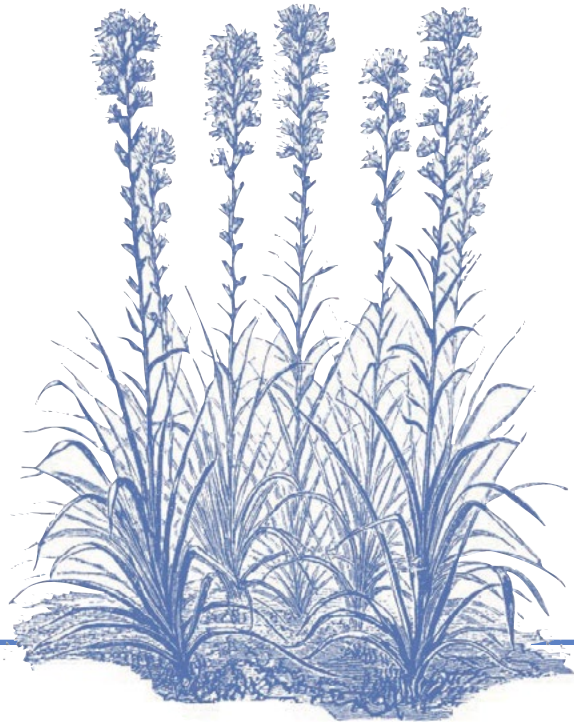
# Acknowledgments

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# *Introduction*

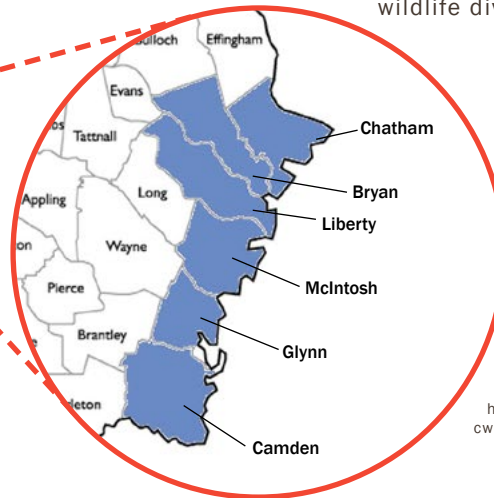
Wetlands and their Value

*Spartina cynosuroides*  
Big Cordgrass

# The Southern Coastal Plain



The Southern Coastal Plain ecoregion extends from South Carolina and Georgia through much of central Florida, then west along the Gulf Coast Lowlands of the Florida Panhandle, Alabama, and Mississippi. This book targets the coastal counties of Georgia, however the information and management techniques are just as valid throughout the Southern Coastal Plain. Designing with native plants and management of constructed wetlands associated with freshwater habitats is the main focus of this book. Although some of the freshwater wetland habitats described are influenced by tidal fluctuation, brackish and salt water systems are not addressed. Our goal is to provide you with tools to link your homes and businesses with natural freshwater communities through productive and visually pleasing solutions that support water quality and wildlife diversity.



Map graphic and text adapted from The Southern Coastal Plain Ecoregion: <http://www1.gadnr.org/cwcsPDF/13SouthernCoastalPlain.pdf>



# What is a Wetland?

A wetland is a transitional area between land and water. The term encompasses a range of environments in which surface or near-surface water is present, at least periodically. *The Natural Communities of Georgia* (University of Georgia Press, 2013) lists eight general wetland types: bog, fen, seepage bog, seepage slope, marsh, wet prairie, swamp, and bottomland forest. They are distinguishable by the depth, flow and drainage of water, and the types of vegetation present. One may also look at these wetland types as natural communities. Typically, they are then assigned habitat names that are more descriptive, as seen below in text adapted from Georgia's State Wildlife Action Plan. In the Southern Coastal Plain, fourteen of the twenty-five High Priority Habitats identified by the Georgia Department of Natural Resources are freshwater wetlands.

## ECOTONE:

Transitional areas between habitats where different communities meet and integrate. Ecotones are typically more diverse than the habitats on either side.

## HYDROGEOMORPHOLOGY:

The study of landforms created by the movement, or action, of water

## MACROPHYTES:

Aquatic plants with roots and/or stems and foliage fully or partially submerged

## PHYSIOGNOMY:

General form or appearance

## Alluvial (Brownwater) Rivers and Swamps

Large, low-gradient, meandering rivers with sandbars, sloughs and extensive floodplain swamps. Floodplains of these systems may remain inundated for extensive periods. Sand and silt are the dominant substrata and these rivers typically carry heavy sediment loads. Dominant canopy trees are bald cypress and tupelo gum; the understory tree/shrub vegetation may be patchy, often consisting of swamp privet, water elm, swamp dogwood, red maple, and Carolina ash. Cypress and gum-dominated swamps can be found along the Altamaha, Savannah, and Ogeechee rivers. These systems have been impacted by altered flows from upstream dams.

## Barrier Island Freshwater Wetlands and Ponds

Usually found in broad flats or in elliptical to linear interdune depressions on Georgia's coastal barrier islands. These wetland habitats are variable in physiognomy and species composition; deeper, more permanently flooded ponds often have a large extent of open water; shallower ponds are usually dominated by a combination of submergent, emergent and/or floating macrophytes. Trees or shrubs are present mainly along the edges of the ponds. These habitats have been impacted by groundwater withdrawals, fire suppression, and invasive exotic plants such as Chinese tallow tree.

## Bayheads and Titi Swamps

Forested wetlands dominated by broad-leaved evergreen trees: sweetbay, redbay, and loblolly bay. Usually found in domed peatlands, broad interstream flats, or shallow drainageways. Includes shrubby areas dominated by titi (*Cyrilla racemiflora*). Considered a late successional community in a variety of hydrogeomorphic settings in the Coastal Plain.

## Bottomland Hardwood Forests

Diverse hardwood-dominated forests found on natural levees, upper floodplain flats and terraces along brownwater and blackwater rivers. Characterized by a diverse canopy of hardwood species dominated by various oaks, green ash, sweetgum, red maple, water hickory, and other mesic species. These extensive forested systems provide habitat for a wide variety of wildlife species, and are especially important for wide-ranging forest interior species. Bottomland hardwood forests have been impacted by altered hydrologic conditions, forest conversion, and invasive exotic species.

## Canebrakes

Thickets of native river cane found along rivers and creeks under sparse to full tree cover. Canebrakes represent important wildlife habitat for a variety of neotropical birds and insects. These habitats require periodic fire or other forms of disturbance for maintenance.

## Coastal Scrub-Shrub Wetlands

Shrub dominated estuarine communities found along the upper border of salt marsh or brackish marsh. These habitats are infrequently flooded by tidal action and form ecotones between wetland and terrestrial environments. Typical shrubs include groundsel tree, marsh elder, yaupon holly, wax myrtle, Florida privet, and false willow. Wind-pruned redcedar may also be present.

## Isolated Depressional Wetlands

Seasonally or semi-permanently flooded forests of depressional features in broad interstream flats. Soils range from mineral to organic and canopy dominants may include pond cypress, slash pine, myrtle holly and/or swamp black gum. Fire plays a role in maintaining some of these systems. Isolated wetlands that do not support fish populations are very important breeding habitats for amphibians such as the flatwoods salamander.



Cay Creek Wetlands Interpretive Center in Midway, Georgia

## **Freshwater “Prairies”**

Semipermanently flooded freshwater wetlands dominated by emergent vegetation and floating macrophytes, with scattered cypress, buttonbush, and swamp blackgum. The primary example in this region is the Okefenokee Swamp. Fluctuations in water levels and/or periodic fire are required for maintenance. Many of these habitats have been impacted by altered hydrology (impoundment with dams or drainage) and/or fire suppression.

## **Hillside Seeps**

Small patch habitats found on moist to wet lower slopes in sandy terrain. These seeps represent natural groundwater discharge points. May be dominated by shrubs or herbs (including pitcherplants), with scattered trees such as pond, slash, or longleaf pine. Often found in oak-beech-magnolia forests or at the base of sandhills where they meet bay wetland communities.

## **Nonalluvial (Blackwater) Rivers and Swamps**

Large, meandering rivers with stained, but translucent waters and narrow to wide floodplains. Dominant substrate is sand, which may form extensive bars in larger systems. Runs and pools are dominant habitats. Large snags are a significant component of habitat heterogeneity.

## **Open-Water Ponds and Lakes**

Open water aquatic habitats ranging from isolated depressions to impoundments created by beaver. Vegetation is sparse and consists primarily of emergent and floating macrophytes. These habitats are relatively uncommon in this region. Maintained by periodic fire and fluctuating water levels.

## **Tidal Rivers and Freshwater Tidal Marsh**

Includes the tidally influenced portions of rivers and creeks and associated wetlands. Freshwater tidal marshes are wetlands found along the margins of tidal rivers and creeks above the brackish water zone, typically dominated by giant cutgrass, sawgrass, pickerel weed, wild rice, cattail, rushes, and a variety of other herbaceous materials.

## **Wet Pine Savannas, Herb and Shrub Bogs**

Wet pine savannas are poorly drained wetlands with open to sparse canopies dominated by longleaf, slash, and/or pond pine. The shrub layer may be sparse, consisting mainly of gallberry, wax myrtle, and blueberries. The herbaceous layer is often diverse and dense, dominated by grasses, sedges, composites, orchids, and lilies. May include small peat-filled depressions dominated by titi and other shrubs or by herbaceous bog plants.



# Water Quality

Wetlands, whether formed by natural processes or by human activities, are characterized by slow flow and shallow water depth. Sediment has time to settle among the wetland vegetation's stems and roots, creating habitat for a vast and diverse community of organisms. As water moves slowly through the system, it has prolonged contact with the wetland's surfaces, and the matrix of organic and inorganic materials functions to filter, breakdown, or transform substances carried in the water. The natural processes taking place in a wetland environment work to improve water quality, and this is a primary reason that wetlands are increasingly designed to treat wastewater such as stormwater runoff, domestic wastewater, agricultural wastewater, or coal mine drainage. Wetlands have proven effective in reducing water pollutants including suspended solids, nitrogen, phosphorous, heavy metals, and pathogens.



## NATURAL WETLAND:

A wet area characterized by native wetland plant communities, which did not result from human activity or alteration

## CONSTRUCTED WETLAND:

An area designed to convey or retain water and planted with appropriately water-tolerant vegetation

## ENHANCED WETLAND:

A wetland, either manmade or natural, being managed to increase one or more natural wetland functions

## WETLAND RESTORATION:

The process of reestablishing natural wetland plant communities in order to restore function in a disturbed or altered wetland

# The Value of Constructed Wetlands

Finding beneficial ways to connect natural wetland communities with developed landscapes is all about improving our quality of life. Healthy wetland systems support natural resources utilized for personal enjoyment and economic vitality. Below are some important functions supported by properly designed and constructed wetlands.

## Groundwater Recharge

Wetlands store and slowly release water into groundwater and aquifers. Even wetlands with little or no visible surface flow have a significant storage capacity and play an important role in recharging groundwater.

## Flood Protection & Erosion

When wetlands capture and store water during major storm events, they help control stormwater by slowing the water flow. Decreasing the velocity of the water facilitates the deposition of suspended solids, while minimizing erosion and washout of banks and shorelines.

## Habitat & Species Diversification

The natural processes taking place in wetlands create a unique habitat that attracts a diverse cast of flora, fauna and microorganisms—a significant number of which can only survive in this specialized environment. Many species native to the Southern Coastal Plain thrive in constructed wetlands that mimic the region's natural wetlands.

## Aesthetics & Recreation

A well designed wetland can be an attractive solution to managing stormwater or treating wastewater. Designing a wetland also helps preserve open space and creates opportunities for recreation such as walking and bird watching.

### POTENTIAL APPLICATIONS FOR CONSTRUCTED WETLANDS

- Residential
- Commercial
- Urban
- Industrial
- Retrofit
- Highway/Road

### WETLANDS FILTER WATER THROUGH THE FOLLOWING PROCESSES:

**SEDIMENTATION:** When suspended particles settle out of a solution and accumulate against a barrier

**ADSORPTION:** The adhesion of molecules from a gas, liquid, or dissolved solid to a surface

**BIODEGRADATION:** The dissolution of particles by some biological means such as bacteria or fungi

**FILTRATION:** The process of removing or separating impurities from a solution



*Maintenance & Management*  
of Constructed Wetlands

*Tradescantia ohiensis*  
Bluejacket Spiderwort



# Types of Constructed Wetlands

**Surface flow** - A constructed wetland in which the water level is above the ground surface and vegetation. This type of wetland looks much like natural wetlands.

**Subsurface flow** - A constructed wetland in which the water level is below ground, and flows through a sand or gravel bed. The wetland is designed so that the water level remains below the top of the substrate, making this type of wetland more cold tolerant and minimizing pests and odors.

**Shallow Wetlands** - Large surface area constructed wetlands. The shallow water has ample direct contact with the substrate and vegetation, which improves water quality.

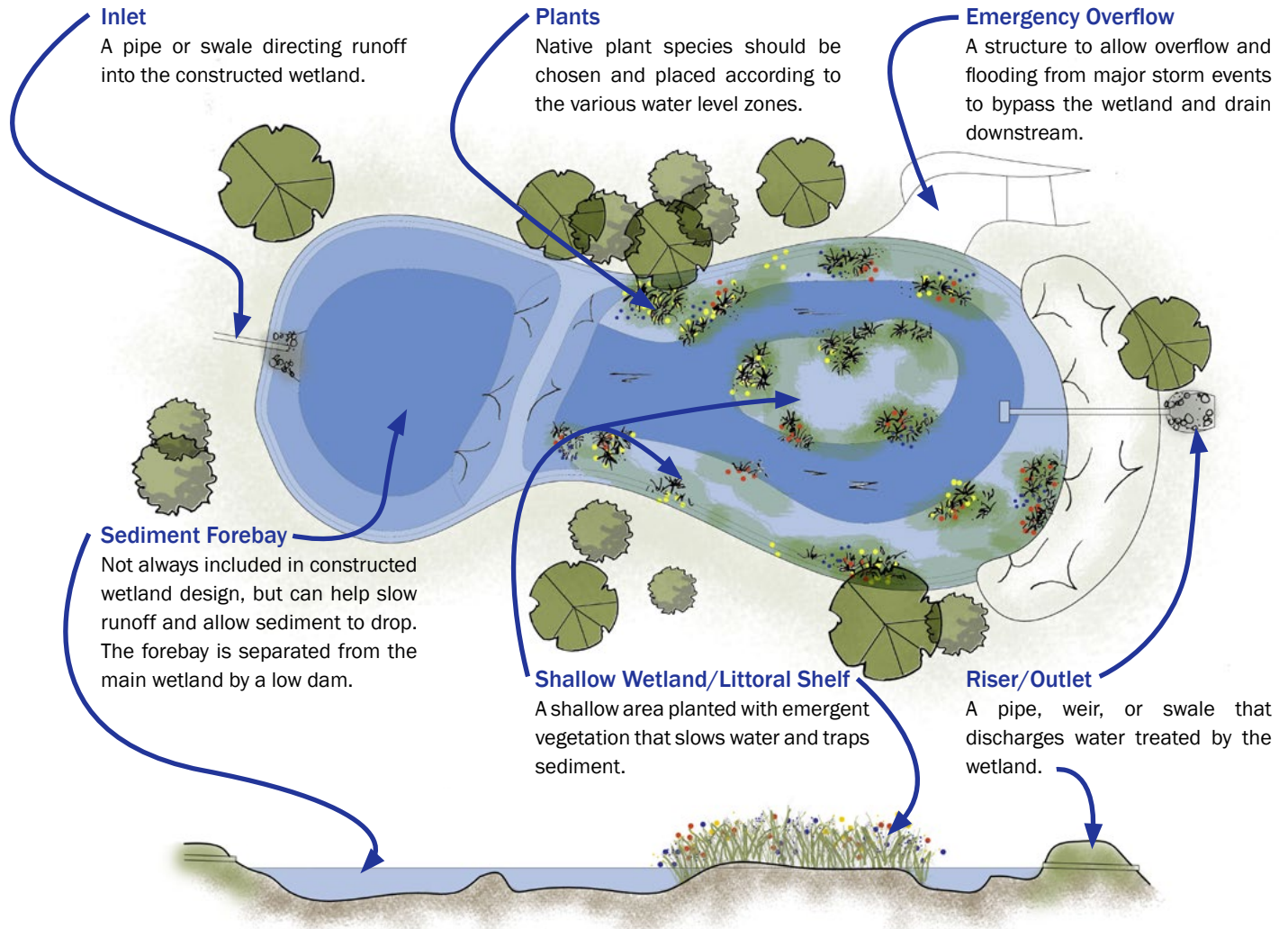
**Extended Detention Shallow Wetlands** Similar to Shallow Wetlands but use extended detention as another mechanism for water quality and peak rate control.

**Pocket Wetlands** - Smaller constructed wetlands that serve drainage areas between approximately 5 and 10 acres and are constructed near the water table.



Constructed bog in a residential setting  
(designed and photographed by Verdant Enterprises)

# Components of Constructed Wetlands





# Caring for a Newly Constructed Wetland

**During the first growing season,** provide temporary irrigation and inspect vegetation every 2 to 3 weeks.

**During the first two years,** inspect the constructed wetland at least quarterly and after any major storm event (more than 2 inches in 24 hours). Inspections should assess the following factors, and problems should be corrected as soon as possible:

- Vegetation
- Erosion
- Flow channelization
- Bank stability
- Inlet/outlet conditions
- Sediment and debris accumulation

**During the first three years,** vegetation will require watering, weeding, mulching, and possibly replanting. Exotic invasive species should be removed and may need to be replaced with desirable native plants. Consider using environmentally safe mosquito dunks with *Bacillus* bacteria to control mosquitoes until the wetland becomes established, but natural predators will eventually colonize and effectively control mosquitoes in most circumstances.

## General Management Considerations

Once established, constructed wetlands should be relatively low-maintenance landscapes, but they greatly benefit from a designed management plan. The management plan should both maximize ecological function and also maintain wetland aesthetics by considering the following factors:

- Water depth control structures
- Cleaning and maintaining inlet and outlet structures
- Inspecting embankments and monitoring devices
- Inspecting embankments and structures for damage
- Depth of sediment accumulation before removal is required
- Acceptable range of water depth fluctuation
- Supplemental water sources
- Wastewater application schedule (if part of the design)
- Wildlife management
- Vegetation management





# Following Major Storm Events

**Inlet** - Inspect inlets and remove debris. Check area around inlet for erosion and cracking, and make any necessary repairs immediately.

**Sediment Forebay** - Check the forebay for accumulated sediment. In general, the forebay should be dredged if sediment fills over 50% of design volume.

## Control structures, pipes, and weirs

- Inspect all pipes for leaks and erosion.
- Clear all blockages such as sediment build up, debris, or overgrown vegetation.
- Determine if anti-seep collars need repair or replacement.
- Check outfall and water discharge areas for erosion.
- Check that energy dissipaters, such as rip rap, are adequate.

**Emergency overflow** - Check that emergency path remains clear of debris and blockages. Check flow path for erosion and make any structural repairs immediately.

**Erosion and bank stability** - Inspect banks for settlement, erosion, scouring, cracking, sloughing, seepage, and rilling. Remove new woody vegetation growth to avoid root damage to banks.

**Water body** - Remove rubbish and floating debris. Inspect for algal blooms and fish kills, and test water quality if these problems are suspected.

**Littoral zones** - Remove exotic invasive plant species such as Water Hyacinth (*Eichhornia crassipes*) and Alligator Weed (*Alternanthera philoxeroides*) and ensure at least 85% vegetated cover in the emergent vegetation zone.

**Soil** - Inspect for loss of soil on wetland banks due to erosion. If plants are struggling it may be necessary to apply soil amendments.

## ALGAL BLOOMS:

A rapid increase in the population of algae, which can occur in either freshwater or marine environments. Algal blooms are typically characterized by dense water discoloration or surface scum.

## EMERGENT VEGETATION:

Plants rooted underwater, but with leaves and stems extending above the water surface

## FISH KILLS:

An early indicator of environmental stress, and typically a sign of eutrophication—low oxygen levels—caused by high nutrient loads or pollutants

## LITTORAL ZONE:

Shallow area near a shoreline where sunlight is able to penetrate all the way to the sediment, allowing aquatic plants to grow

#### SEDIMENT REMOVAL:

Sediment should be removed before it fills 50% of the forebay. Before dredging, test sediments for contaminants like heavy metals. Uncontaminated sediment can be spread on-site and used as a soil amendment, or it can be dried out, buried on-site, and planted with native vegetation. Large areas used as sediment disposal sites are no longer suitable for structural support or building foundations. Sediment can also be disposed of in a landfill or similar site suitable for its contaminant levels.

## Monthly

**Inlet** - Inspect inlets and remove debris. Check area around inlet for erosion and cracking, and make any necessary repairs immediately.

**Control structures, pipes, and weirs** - Inspect all pipes for leaks and erosion. Clear all blockages such as sediment build up, debris, or overgrown vegetation.

**Emergency overflow** - Check that emergency path remains clear of debris and blockages. Check flow path for erosion and make any structural repairs immediately.

**Erosion and bank stability** - Inspect banks for settlement, erosion, scouring, cracking, sloughing, seepage, and rilling. Remove new woody vegetation growth to avoid root damage to banks.

**Water body** - Remove rubbish and floating debris. Inspect for algal blooms and fish kills, and test water quality if these problems are suspected.

**Soil** - Inspect for loss of soil on wetland banks due to erosion. If plants are struggling it may be necessary to apply soil amendments.

## Quarterly

**Vegetation** - Clear wetland plants of weeds, prune and replace plants as necessary (see “Plant Management” section, p. 17)

# Biannually

**Inlet** - Check area around inlet for erosion and cracking.

## Control structures, pipes, and weirs

- Inspect outflow pipes for leaky joints or soil piping erosion
- Determine if anti-seep collars need repair or replacement
- Check outfall and water discharge areas for erosion and restore and restabilize if necessary
- Check that energy dissipaters, like rip rap, are adequate

**Littoral zones** - Remove exotic invasive plant species such as Water Hyacinth (*Eichhornia crassipes*) and Alligator Weed (*Alternanthera philoxeroides*) and ensure at least 85% vegetated cover in the emergent vegetation zone.



# Annually

**Valves and pumps (if present)** - Ensure pumps and valves are functioning properly. Check moving parts for corrosion and lubricate if required.

**Vegetation** - Annual harvesting of wetland vegetation should generally be conducted during the summer so there is adequate re-growth before winter (see “Plant Management” section, p. 17). Remove exotic invasives and limit areas of overly aggressive species such as Cattails (*Typha latifolia*), Golden Canna (*Canna flaccida*), and Swamp Sunflower (*Helianthus angustifolius*).

# Every 2+ Years

**Wetland Liner** - If using a synthetic liner, inspect for leaks and fix according to the manufacturer’s instructions.

**Sediment Forebay** - Sediment should be removed before it fills 50% of the forebay.

## NATURAL WAYS TO CONTROL MOSQUITOES

- Design wetlands to hold water for no more than 24 hours after a storm event.
- Cultivate habitat for fish species, such as *Gambusia affinis*, that eat mosquito larvae.
- Plant flowering vegetation to attract dragonflies and other mosquito-eating species, such as frogs.



# Case Study: Native Demonstration Garden

## Cay Creek Wetlands Interpretive Center | Midway, Georgia

Cay Creek Wetlands Interpretive Center provides an opportunity for the public to experience a freshwater, tidal wetland and its diverse range of inhabitants. The design below lays out a wetland demonstration garden between the parking lot and the natural wetland. The design features a network of swales that conveys water to and from two vegetated rain gardens. The Native Demonstration Garden is an example of a simplified constructed wetland system, to which the general maintenance schedule in the preceding pages could be applied.



**Wetland Plan** 

### Inlet/Outlet

A system of swales moves water into and out of the designed wetlands.

### Sedimentation Bay

This design does not include a defined sedimentation bay. Sediment will collect on the floor of the upper and lower rain gardens and against the cedar log check dams, where water will pool during storm events.

### Littoral Shelf

The shallow areas on the banks of each rain garden, planted with emergent vegetation, are the littoral shelves.

### Emergency Overflow

When rainfall exceeds the capacity of the main swale/wetland system, excess water follows the path indicated by the red dotted line.

Designed by Verdant Enterprises for:



**GEORGIA**  
DEPARTMENT OF NATURAL RESOURCES  
COASTAL RESOURCES DIVISION



# *Plant Management*

Heroes & Rogues of Wetland Plants

*Helianthus angustifolius*  
Swamp Sunflower

# Planting Design for Constructed Wetlands

## MOISTURE GRADIENT:

Sloping banks create a gradient ranging from moist to completely submerged habitat.

## NATIVE PLANT COMMUNITY:

A population of interacting and coevolved indigenous plant species.

## ALGAE:

Algae may look like small plants, but they are single-celled or multicellular photosynthetic organisms that lack complex organs and tissues. They are mainly aquatic in nature.

## FLOATING PLANTS:

Roots do not attach to the wetland substrate, but rather hang loose in the water.

## SUBMERGED PLANTS:

Rooted plants, with most of their vegetative mass below the water surface.

## EMERGENT PLANTS:

Plants rooted underwater, but with leaves and stems extending above the water surface.

Planting design for constructed wetlands is both an art and a science. As natural wetlands vary significantly in their configuration, soils, pH, salinity, depths, period of inundation, and existing vegetation cover, so too do constructed or mitigated wetlands. The best designs for constructed or enhanced wetlands are informed by these site specific nuances, in order to fit into the surrounding topography and meld seamlessly with the native vegetation. These systems require an understanding of the integral relationship between moisture gradient and native plant communities. As our scientific understanding of dynamic natural systems is evolving, there is a great opportunity to also develop an aesthetic appreciation of these systems that is artfully reflected in constructed wetlands.

The main types of vegetation found in freshwater wetland systems of the Southern Coastal Plain are algae, floating plants, submerged plants, and emergent plants. Each plant type plays a role in covering the constructed wetland across a range of static and dynamic moisture gradients. In many cases, a 1" to 3" difference in elevation can greatly influence appropriate plant selection.

## A Project for the Curious Gardener

A successful planting plan will be organized by plant types associated with different levels, or strata, of moisture content. Nature will eventually take its course, blending these strata in a series of continual transitions. Be prepared for even the most sensitive and well-thought planting scheme to be re-arranged by nature. Like any garden, tweaking and shifting of certain species and elimination of others will be necessary over time—separating the “heroes” from the “rouges” in terms of what to plant or allow to volunteer in your constructed wetland is a function of experience and personal preference, with an element of happenstance. This seasonal flux, and the fact that many attractive native wetland species are relatively under-used, make constructed wetlands one of the great frontiers for the curious gardener.

### FACTORS INFLUENCING PLANT ZONATION

- Frequency of inundation
- Water salinity
- Surface and underground drainage
- Soil, temperature, rainfall and topography

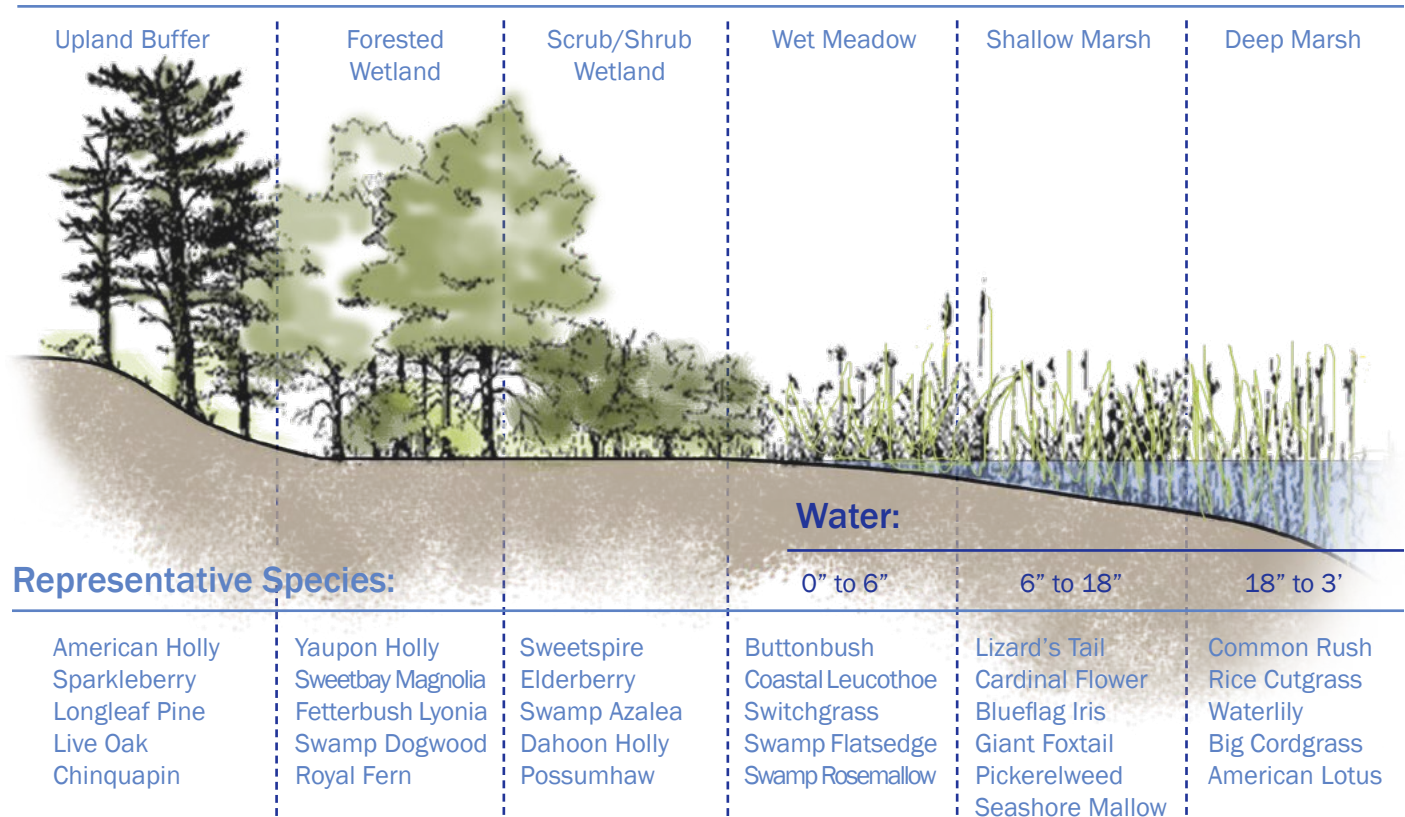


# Wetland Vegetation Zones

## PLANTING TIPS:

- Look for ditches or ephemeral wetland areas in your neighborhood for cues about plant selection
- Most wetland species are deciduous so include some evergreen rushes and sedges for winter color
- Consider biodiversity and plants that benefit attractive wildlife like butterflies and birds

## Vegetation Zone:



Graphic adapted from <http://www.slideshare.net/GreenJayInt/wetland-plants>

# Plant Maintenance

Using an indigenous planting palette should decrease the general need for maintenance. This is consistent with a more naturalistic aesthetic, which a complete biological system like a constructed wetland would inherently imply. Manipulating these systems is a balancing act between allowing the natural processes to take over, while keeping the area neat, orderly, and attractive. Plant selection and maintenance practices can be tailored to suit individual aesthetic preferences.

## Pruning

Most native trees and shrubs require only structural pruning for proper form and health. Routine sheering or topping is discouraged. Herbaceous plants can be selectively cut back once to twice a year. As most wetland grasses and forbs are deciduous, removing the duff or spent foliage in late winter (February) can promote a flush of new growth and limit the amount of detritus in the system. For certain robust perennials such as *Solidago*, *Ageratina*, *Phystostegia*, and *Helianthus*, a mid-season prune (early July) can help the plant dense-up and produce more bloom.

## Separation & Transplantation

Most wetland plants are sold in containers or bare root. The typical spacings are 18" to 36" on-center for herbaceous plants and 24" to 48" on-center for shrubs. Complete coverage of an area in order to suppress weeds between plants can take 1-2 years. It is desirable to separate clumps by division in early fall or early spring in order to infill other areas, discard or give away. Masses or groupings of a single species of at least five plants each can help bring unity to an overall planting design. Note the natural migration of species per the moisture gradient and various zones throughout the bog. Strengthen those natural patterns by selective removals and transplanting.

## Fertilization

Generally, native wetland plants should not be fertilized at the time of planting. Depending on soil conditions, about three months after planting apply an organic fertilizer to shrubs and trees. Products such as fish emulsion, composted cow manure, or Milorganite are increasingly available. Herbaceous plants may be fertilized once during the first year but if the soil mix is right should not require any supplemental fertilization after that.

## Mulching

Mulching in constructed wetlands is a complicated issue due to potential floating and migration during a heavy storm event. Selective use of mulch for weed suppression and moisture retention is still helpful in areas of the system less prone to washing or complete inundation. Aged, shredded hardwood is preferred over pine bark, cypress bark or pine needles.

## BMPs (Best Management Practices) for Constructed Wetlands:

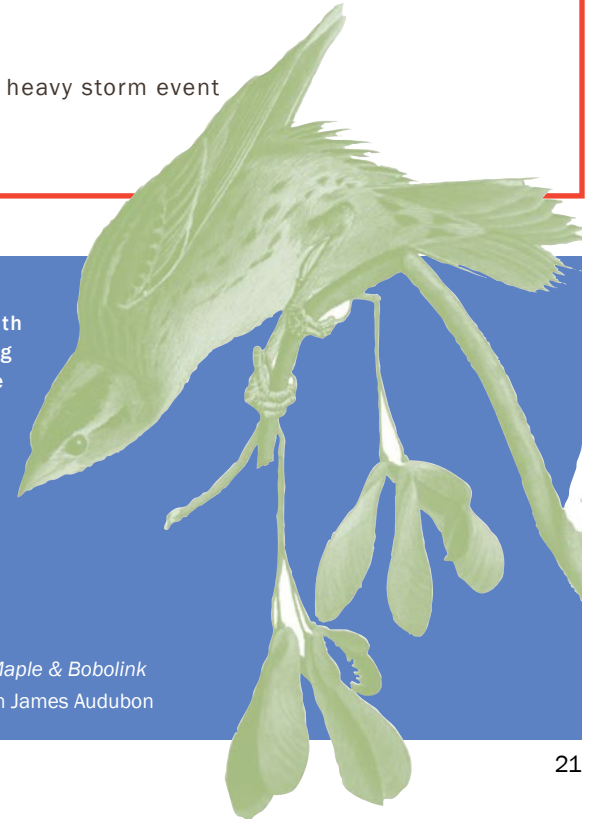
Creating a constructed wetland to handle stormwater is in-and-of-itself a form of bioretention, which is becoming a required facet of Low Impact Development (LID). Many municipalities are requiring these practices for new construction as part of an overall treatment strategy to reduce runoff and improve water quality. Specific post-construction maintenance of a constructed wetland includes the following:

- Minimize the use of herbicides and pesticides and if necessary, apply only per manufacturer's instructions between storm events
- Maintain diverse, native vegetation cover
- Eliminate invasive species
- Monitor the system with periodic inspections and after each heavy storm event
- Remove excess silt and vegetative or woody debris

### MAINTENANCE TIP:

As most wetland situations are characterized by highly organic soils with low-oxygen content, try to avoid compaction of wetland soils during planting and maintenance operations. Temporary walk boards may be placed to access planting areas and to pull weeds from between clumps. More permanent stepping stones of rocks or logs may be located for this purpose. Veins of coarse sand or river rock can accentuate planting areas, provide a clear water course and serve as occasional access routes.

*Red Maple & Bobolink*  
by John James Audubon





# What are Exotic Invasive Plants?

*Invasive species:* Any species that is not native or indigenous to a given region. These species are highly aggressive and disrupt natural reproductive cycles of fauna and flora of the communities they invade.

Exotic invasive plants are most threatening in dynamic ecosystems where natural disturbances, fire or fluctuating water levels for example, play vital roles. These kinds of ecosystems often support rare native plants. Invasive species also thrive where the continuity of a natural ecosystem has been disturbed, such as construction areas, spoil piles and road cuts. Even foot traffic can create a temporary void that is quickly invaded.

When invasive plants are taken out of their original environments, they are liberated of native pests and plant competitors. Without these natural controls, invasive plants are free to seed, grow, and spread virtually unchecked. Their numbers increase rapidly, taking over less aggressive native plants and eventually dominating a once diverse landscape. Birds, insects, and other wildlife that are dependent on the native plant communities for food and habitat suffer great losses.

**Many invasive species are attractive and available for sale, but for the health of your constructed wetland and surrounding ecosystems avoid invasive exotic rogues and select native plants that are proven heroes in wetland habitats.**

## Characteristics of Invasive

- Not native to your region
- Spread rapidly
- Deep roots
- Reproduce quickly and easily
- High germination rate
- Long seed dormancy
- Able to reproduce asexually
- Mature quickly
- Efficient at seed dispersal
- Thrive on disturbed sites
- Grow in a variety of habitats
- Shade-out native plants
- Out compete native plant species



# Invasive Plants to Avoid and Remove

## Trees

**REPLACE** trees like  
Mimosa, Chinaberry and  
Tree of Heaven

**WITH** species such as  
Redbud, Fringe Tree and  
Coastal Plain Willow

**REPLACE** trees like  
Chinese Tallow, Tung-  
oil Tree, Camphor and  
Princess Tree

**WITH** species such as Red  
Maple, Black Gum and  
Basswood

### Avoid these wetland rogues:



Mimosa  
*Albizia julibrissin*



Chinese Tallow  
*Triadica sebifera*

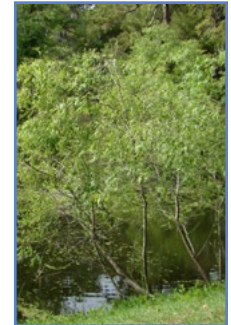
### And plant these native wetland heroes:



Redbud  
*Cercis canadensis*



Fringe Tree  
*Chionanthus virginicus*



Coastal Plain Willow  
*Salix caroliniana*



Red Maple  
*Acer rubrum*



Black Gum  
*Nyssa sylvatica*



Basswood  
*Tilia americana*

# Invasive Plants to Avoid and Remove

## Shrubs

**REPLACE** shrubs like  
Coralberry, Autumn Olive  
and Ligustrum

**WITH** species such as  
Dahoon Holly, Sweetleaf  
and Fetterbush Lyonia

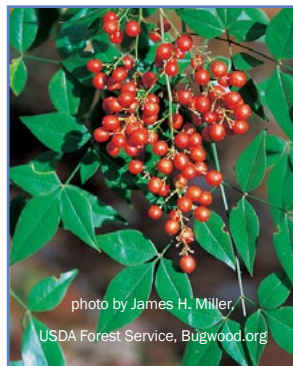
**REPLACE** shrubs like  
Nandina

**WITH** species like  
American Elderberry,  
Beautyberry and native  
Viburnums

### Avoid these wetland rogues:

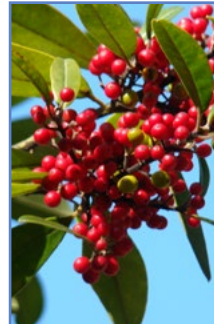


Coralberry  
*Ardisia crenata*



Nandina  
*Nandina domestica*

### And plant these native wetland heroes:



Dahoon Holly  
*Ilex cassine*



Fetterbush Lyonia  
*Lyonia lucida*



Sweetleaf  
*Symlocos tinctoria*



Beautyberry  
*Callicarpa americana*



American Elderberry  
*Sambucus canadensis*



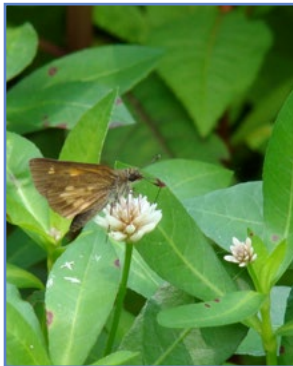
Possumhaw  
*Viburnum nudum*



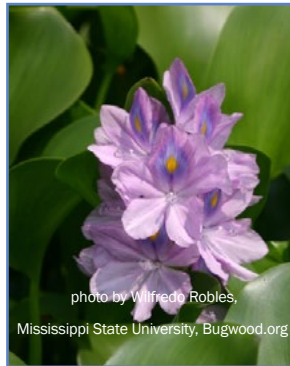
# Invasive Plants to Avoid and Remove

## Perennials

Avoid these wetland rogues:

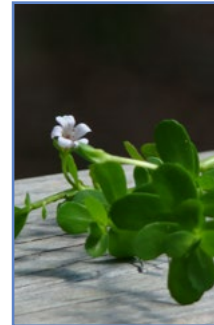


Alligator Weed  
*Alternanthera philoxeroides*



Water Hyacinth  
*Eichhornia crassipes*

And plant these native wetland heroes:



Water-hyssop  
*Bacopa monnieri*



Rattlesnakemaster  
*Eryngium aquaticum*



Southern Blue Flag  
*Iris virginica*



Rattlebox  
*Sesbania punicea*



Seashore Mallow  
*Kosteletzkya virginica*



Pickerelweed  
*Pontederia cordata*



Helmet Flower  
*Scutellaria integrifolia*

# Invasive Plants to Avoid and Remove

## Grass-like

Avoid these wetland rogues:



photo by Leslie J. Mehrhoff,  
University of Connecticut, Bugwood.org

**Giant Reed**  
*Arundo donax*

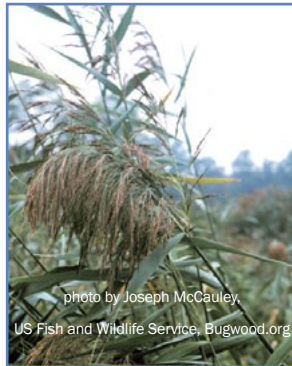
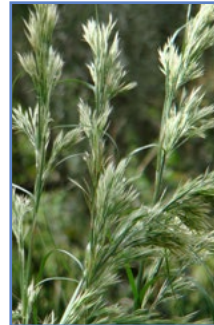


photo by Joseph McCauley,  
US Fish and Wildlife Service, Bugwood.org

**Common Reed**  
*Phragmites australis*

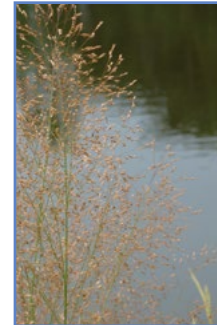
And plant these native wetland heroes:



**Bushy Bluestem**  
*Adropogon glomeratus*



**Carolina Fimbry**  
*Fimbristylis caroliniana*



**Switchgrass**  
*Panicum virgatum*



photo by Verdant Enterprises

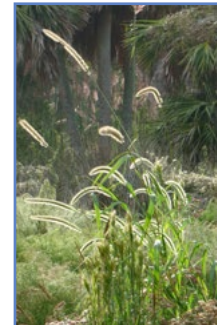
**Bamboo**  
*Phyllostachys sp.*



**Sugarcane Plumegrass**  
*Saccharum giganteum*



**Woolgrass**  
*Scirpus cyperinus*



**Giant Foxtail**  
*Setaria magna*



# Invasive Plants to Avoid and Remove

## Vines & Ferns

Avoid these wetland rogues:

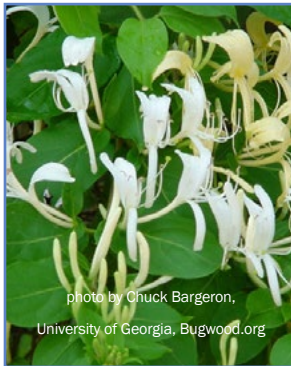


photo by Chuck Bargeron,  
University of Georgia, Bugwood.org

**Japanese Honeysuckle**  
*Lonicera japonica*

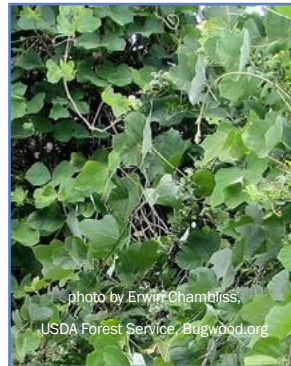


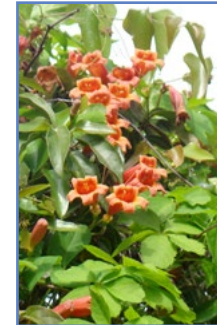
photo by Erwin Chambliss,  
USDA Forest Service, Bugwood.org

**Kudzu**  
*Pueraria montana*

And plant these native wetland heroes:



**Groundnut**  
*Apios americana*



**Trumpet Creeper**  
*Campsis radicans*



**Coral Honeysuckle**  
*Lonicera sempervirens*



photo by Chris Evans,  
Illinois Wildlife Action Plan, Bugwood.org

**Chinese Wisteria**  
*Wisteria sinensis*

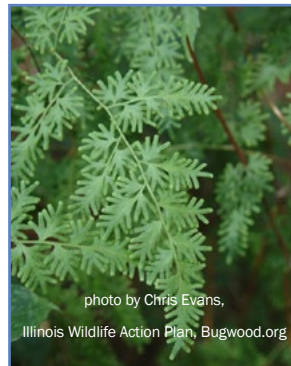


photo by Chris Evans,  
Illinois Wildlife Action Plan, Bugwood.org

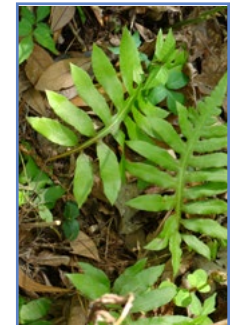
**Japanese Climbing Fern**  
*Lygodium japonicum*



**American Wisteria**  
*Wisteria frutescens*



**Royal Fern**  
*Osmunda regalis*



**Netted Chain Fern**  
*Woodwardia areolata*



# *Wetland Wildlife*

Creatures to consider when designing and maintaining a wetland

*Euptoieta claudia*  
Variegated Fritillary



# Reptiles & Amphibians

When constructing a wetland, or enhancing an existing one, it is important to consider the types of wildlife that will live in and move through the wetland habitat. Remember that amphibians and reptiles native to the Southern Coastal Plain need both UPLAND and WETLAND habitats. Frog species like the Gray Treefrog and Narrowmouth Toad spend most of their lives in forested habitats, moving to swamps and rain-swollen pools to breed. The turtle fauna of the region includes a number of aquatic species that either overwinter on land (Chicken Turtle, Eastern Mud Turtle) or have females that crawl considerable distances onto land for nesting (Yellowbelly Slider, Common Snapping Turtle).



Be careful not to obstruct the movement of these animals between upland and wetland habitat, with walls or barriers that a reptile or amphibian could not move through or over. The Cay Creek Native Demonstration Garden (pictured on page 16) incorporates a pile of softly graded rock, that will come to support ferns and other vegetation, to transition from upland to lowland instead of building a traditional retaining wall.

# Planting for Pollinators

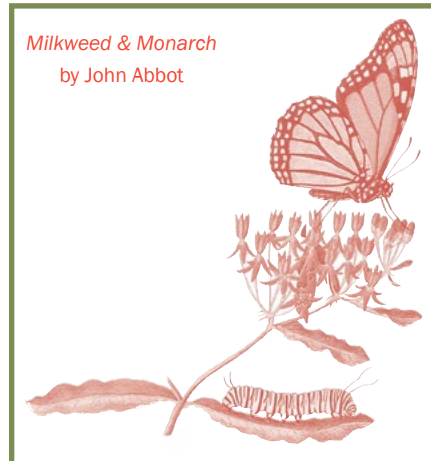
Pollination is the process of pollen being moved from the anthers of a flower to the stigma of a flower. When this happens, flowers are fertilized so seeds and fruit can develop. Pollination most often involves animal species (called pollinators), wind or water. Most pollination is done by insects.

Pollinators collect pollen on their feet, face or other body parts while feeding on the nectar of a flower. When they feed on the next flower, some of the pollen rubs off on that plant and fertilization occurs. Bees, butterflies, moths, beetles, flies, and hummingbirds are all common pollinators in the Southeast.

## Why is Pollination Important?

Pollination is an important part of the life cycle of all flowering plants—it is key to the survival of natural plant communities but also vital to agricultural ecosystems. Approximately 75% of crop plants world-wide are pollinated by animals, mostly insects. Pollinators provide a great ecosystem service by enabling the growth of plants humans depend upon for food, medicine, and other products.

Unfortunately, pollinator populations have been declining worldwide. Habitat loss and fragmentation, pesticide and herbicide use, and the introduction of invasive plant and animal species are some of the reasons for our loss of pollinators.



*Milkweed & Monarch*  
by John Abbot

## How can we help pollinators?

- Mend fragmented habitats by mowing smaller areas, mow less often to create flowering lawns, build wetland gardens, and plant native pollinator gardens
- Apply fewer or no pesticides and herbicides
- Use native plants when landscaping and gardening
- Remove exotic-invasive plants

# Wetland Butterflies

## Host Plant

Sugarcane Plume Grass  
*Saccharum giganteum*

Parsley Hawthorn  
*Crataegus marshallii*

Vanillaleaf  
*Carphephorus odoratissimus*

Coastal Plain Willow  
*Salix caroliniana*

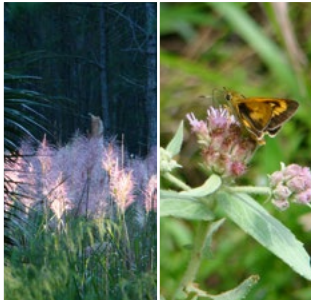
## Butterfly Species

Byssus Skipper  
*Problemata byssus*

Red-spotted Purple  
*Limenitis arthemis astyanax*

Little Metalmark  
*Calephelis virginiensis*

Viceroy  
*Limenitis archippus*



## Host Plant

Switchcane  
*Arundinaria tecta*

Gama Grass  
*Tripsacum dactyloides*

Groundnut  
*Apios americana*

Sweetbay  
*Magnolia virginiana*

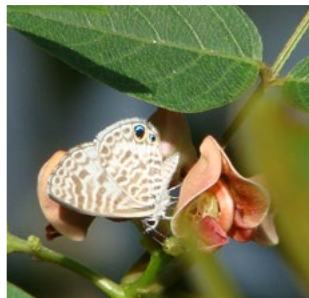
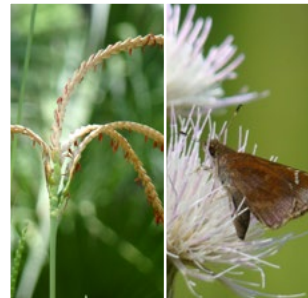
## Butterfly Species

Lace-winged Roadside-Skipper  
*Amblyscirtes aesculapius*

Clouded Skipper  
*Lerema accius*

Cassius Blue  
*Leptotes cassius*

Eastern Tiger Swallowtail  
*Papilio glaucus*





# Other Pollinators



Bee & Swamp Sunflower  
(*Helianthus angustifolius*)



Bee & Spider on Pickerelweed  
(*Pontederia cordata*)



Hummingbird & Swamp Rosemallow  
(*Hibiscus grandiflora*)



Wasps & Grassleaf Barbara's Buttons  
(*Marshallia graminifolia*)



Bee & Red Buckeye  
(*Aesculus parviflora*)



Bee & Bluejacket Spiderwort  
(*Tradescantia ohiensis*)

## POLLINATOR HABITAT:

Constructed wetlands are a great way to create habitat that attracts and supports pollinator species

- Staggered vegetation zones create different levels of vegetation and pockets of sun and shade
- Native wildflowers and grasses provide food for caterpillars and nectar for pollinators
- Trees, dense shrubs, and leaf litter in upland areas create shelter and food
- Deeper wetland areas and wet mud offer a water source

## WETLAND PLANTS FOR HUMMINGBIRDS:

Red Buckeye  
Silverbell  
Swamp Rosemallow  
Seashore Mallow  
Trumpetvine  
Coral Honeysuckle



# Dragonflies

The wetland habitat created by a constructed bog, rain garden, or swale can attract dragonflies—a colorful addition to any garden. Dragonflies love emergent vegetation because they use these plants during both their nymph and adult life stages. Additionally, dragonflies feed on small insects and can help control pests like mosquitos.



# Birds

Blue Grey Gnat Catcher

photo by Jeff Jones



Birds feed on berries and nuts as well as insects, so to draw birds to your wetland garden, plant bird food-bearing native plants:

- Elderberry
- Beautyberry
- Blueberries
- Hollies
- Asters
- Swamp sunflower
- Purple Coneflower



Goldfinch & Sunflower

A close-up photograph of Swamp Azalea (Rhododendron viscosum) flowers and buds. The flowers are white with long, slender stamens. The buds are covered in fine, white, hair-like structures. The leaves are green and have a slightly serrated edge.

# *Native Plant Guide*

Wetland Plants of the Southern Coastal Plain

*Rhododendron viscosum*  
Swamp Azalea

# Trees

## Management Tips

- When placing trees, keep the attributes of a mature specimen in mind. Trees take longer to reach a good size, but they eventually make more of an impact on the landscape.
- Consider canopy, mid-story and understory plants collectively to create a complimentary vertical structure of layers in the landscape.
- Visualize the winter effect of trees in the landscape as well as spring and summer displays. This will allow the structure of your design to become most apparent.
- Consider eventual height and spread in relation to existing structures such as roofs, pools and power lines.
- Hardiness, heat tolerance, soil type and moisture are factors that influence survivability. Choose plants native to the habitat in which you live.
- Foliage scale, color and texture are important design elements that can bring detail to the overall aesthetics of your landscape.
- Flowering time and color should always be taken into consideration. A large massing of Eastern Redbuds might clash with your house color or gracefully pick up the warm tones of a tile roof.
- Design with wildlife habitat, food and shelter in mind.

*Amelanchier arborea* | Common Serviceberry ✨

Light Requirements: ○ ● ●

Habitat: Grows in rocky woods and on slopes, as well as in wood borders or on stream banks.

Information: This large shrub or small tree reaches 15 to 25 feet. White, drooping racemes appear before the leaves, and the plant's bark is gray, smooth and streaked with longitudinal fissures. The species tolerates varying light levels, making it fairly flexible, but thrives in full sun. Landscape Uses: Serviceberry works well in natural plantings and in peripheral habitats like wood edges and stream banks. White flowers provide interest in the spring, and fall foliage turns an orange-yellow to pinkish-red. The Serviceberry's flowers attract pollinators, while the summer-ripe fruit is extremely popular with birds.



*Amelanchier arborea* (Common Serviceberry)

photo by Alan Cressler, hosted by the Ladybird Johnson Wildflower Center



*Crataegus marshallii* | Parsley Hawthorn ✨

Light Requirements: ○

Habitat: Grows in a variety of habitats.

Information: Foliage resembles parsley and has a fine texture. Known for its white showy flowers, the Parsley Hawthorn is a member of the rose family. Loose clusters of purple tipped white blooms appear in early spring. Tiny, apple like fruit provide vibrant red color and wildlife food in late summer to early fall.

Landscape Uses: Multi-trunked shape provides dimension to small areas. Flowers are abundant and attractive. If you have a wet site, try planting *C. aestivalis*, source of the famed Mayhaw jelly.



*Gordonia lasianthus* | Loblolly Bay ✨

Light Requirements: ○ ●

Habitat: Naturally found in swamps and freshwater wetlands.

Information: Can get up to 75 feet tall on moist sites. Evergreen leaves are dark green and leathery. Showy white blooms appear in June and continue until October. Flowers resemble Sweetbay Magnolia and Silky Camellia, which grow in similar environs.

Landscape Uses: Ornamental white blooms make an attractive display from mid-summer well into fall.

This a great choice for those difficult moist sites in gardens and yards. Adapts well to drier sites, but may not reach its full potential. Needs adequate sun to bloom. Form and foliage is similar to Sweetbay Magnolia.



*Halesia diptera* | Two-winged Silverbell ✨

Light Requirements: ●

Habitat: Found in rich woods and marsh margins

Information: This multi-stemmed or low-branched plant grows 3 to 15 feet high and presents itself as a large shrub or a small tree. This deciduous tree's leaves are dark, yellow-green in the summer and turn bright yellow in the fall. The Two-winged Silverbell sports white, tubular flowers and a sour green fruit that is appreciated by wildlife.

Landscape Uses: With delicate white, drooping flowers and a preference for partial shade, this species works well as an understory tree or accent shrub in a wetland setting.



*Ilex cassine* | Dahoon Holly ✨

Light Requirements: ○ ●

Habitat: Grows at the edge of freshwater wetlands.

Information: Reaches 20 to 30 feet in height. Flowers in the early spring providing nectar for the first wave of pollinators.

Landscape Uses: The ideal holly for moist spots in the landscape. Glossy, evergreen leaves and scarlet to yellow berries make a lovely foil to bare branches of deciduous species in the winter garden.



*Ilex cassine* (Dahoon Holly)

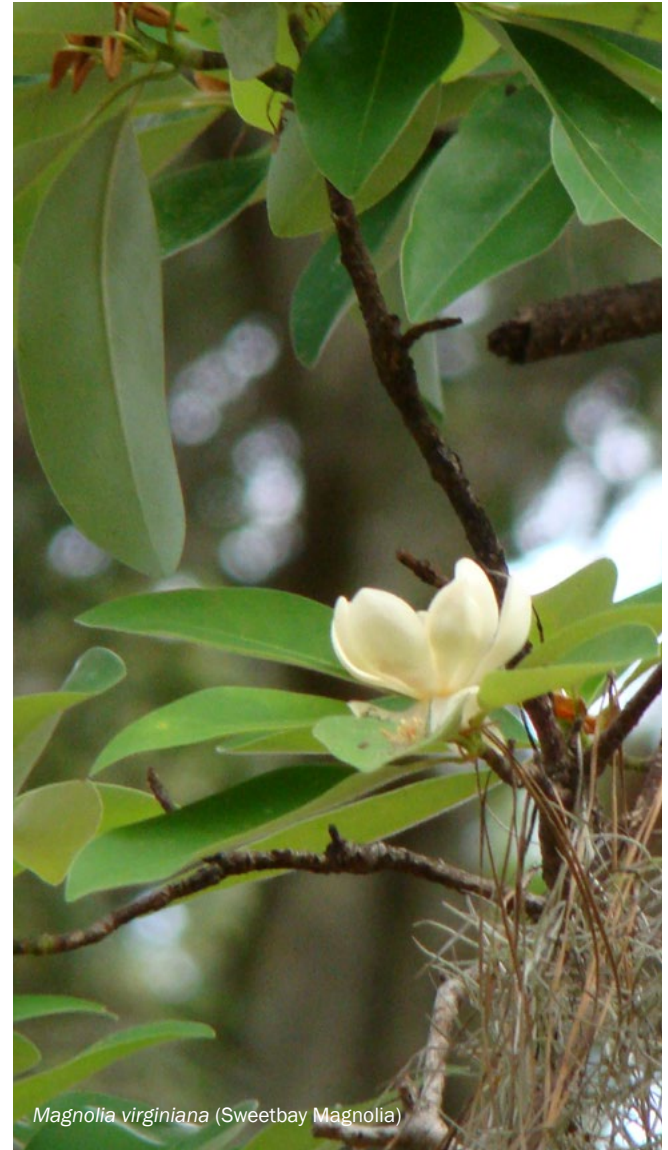
*Magnolia virginiana* | Sweetbay Magnolia

Light Requirements: ○ ●

Habitat: Naturally found in swamps and freshwater wetlands.

Information: An evergreen in the lower south. Can grow as tall as 60 feet, but is often much smaller. Foliage is rich green on top with silvery underside. Creamy white blooms appear in late spring through the late summer. Flowers are 2-3 inches in diameter and have a citrus fragrance.

Landscape Uses: Makes a wonderful landscape plant that should be used more often. Plant as a small tree or large shrub. Creates a great hedge or screen. Adapts well to shaping; can be espaliered against a wall or pruned. Ideal for moist areas with good drainage.



*Magnolia virginiana* (Sweetbay Magnolia)



*Nyssa sylvatica* | Black Gum ✨

Light Requirements: ○ ●

Habitat: Naturally found in a variety of upland sites.

Information: Large tree that can grow 60-100 feet tall. Is usually the first to change color in the fall, providing stunning color displays when the weather cooperates. Bluish, olive-like fruit appears in late summer.

Landscape Uses: Excellent choice for a shade or lawn tree. Growth is slow, making this a tree better suited for natural settings. Grows well in a variety of sites. Does well in soil with high organic content and does not tolerate pollution. Fruit enjoyed by birds. Near lakes or ponds, consider planting Water Tupelo, *N. biflora*, or Ogeechee Lime, *N. ogeche*, named for the beautiful Ogeechee River.

*Pinus glabra* | Spruce Pine

Light Requirements: ●

Habitat: Naturally found in rich woods and hammocks or coastal plain bottomlands.

Information: Spruce Pine can reach over 100 feet tall. Its smooth gray bark becomes closely ridged, looking more like spruce than the bark of other pine species. Unlike most pine species, the Spruce Pine does not occur mostly in pure pine forests, but rather is typically scattered through moist woodlands and mixed hardwood forests.

Landscape Uses: The Spruce Pine can add an architectural element and evergreen texture and interest in a mostly deciduous, hardwood mix.

Other Native Trees for Constructed Wetlands:

*Acer rubrum* (Red Maple)

*Fraxinus pennsylvanica* (Green Ash)

*Ilex decidua* (Possumhaw)

*Ilex opaca* (American Holly) ✨

*Ilex verticillata* (Winterberry)

*Juniperus virginiana silicicola* (Southern Red Cedar)

*Liriodendron tulipifera* (Tuliptree)

*Magnolia grandiflora* (Southern Magnolia)

*Quercus michauxii* (Swamp Chestnut Oak)

*Salix caroliniana* (Coastal Plain Willow)

*Taxodium ascendens* (Pond Cypress)

*Taxodium distichum* (Bald Cypress)

*Tilia americana var. caroliniana* (Southern Basswood)

*Ulmus americana* (American Elm)

# Shrubs

## Management Tips

- If you have native shrubs on your property use them as a point of departure for your midcanopy planting scheme.
- If you have a lawn and would rather bird watch than mow, plant clusters of shrubs and small trees away from foundations to define outdoor living spaces and animal viewing areas.
- Edges of group plantings and borders can be used as a backdrop for perennials, ferns or grasses.
- Dense natural plant communities close to a house might be thoughtfully cleared to create a wildlife-viewing area visible from a patio or window.
- Plant shrubs at the same time as large trees to allow the smaller plants a chance to get established before tree roots out-compete them.
- Match shrub selections to natural soil and moisture conditions.

*Aesculus pavia* | Red Buckeye ✨

Light requirements: 🌞

Habitat: Common in woods, on rocky hillsides, and along streams.

Information: This spring-blooming shrub boasts showy clusters of deep red or yellow flowers. The Red Buckeye's flowers are highly attractive to bees and hummingbirds, and squirrels enjoy the buckeye's nuts. Seeds and young shoots are poisonous to humans if ingested, so be aware of the plant's proximity to children's play areas.

Landscape Uses: The Red Buckeye's bright blooms can add visual interest in the spring, but its leaves tend to drop before the end of the summer. If possible, use this species in a place where it is highlighted in the spring but less conspicuous in the late summer and fall.



*Aesculus pavia* (Red Buckeye)





*Cephalanthus occidentalis* (Button Bush)

***Cephalanthus occidentalis* | Button Bush ✨**

Light Requirements: ○ ●

Habitat: Naturally found in swamps and freshwater wetlands.

Information: Has an open, many-branched crown that can grow anywhere from 3-15 feet in height with the same spread. Produces clusters of creamy white, ball-shaped flower heads that appear in the late spring. Highly attractive to butterflies and bees.

Landscape Uses: Can be used in full sun, shallow waters of ponds, or in wet soil at the edges of water. Every few years it should be cut to the ground and rejuvenated. Was much admired and cultivated in Europe and can be very useful in a coastal landscape.

***Clethra alnifolia* | Sweet Pepperbush ✨**

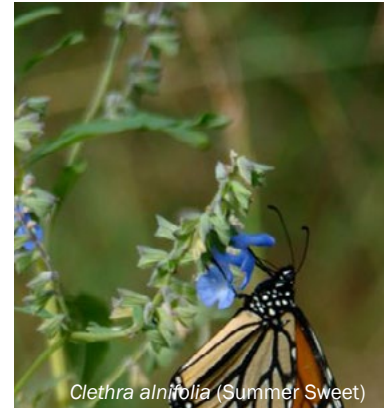
Light Requirements: ○ ●

Habitat: Naturally found in swamps and wetlands.

Information: Many branched form with exfoliating bark. The oval leaves may not appear until late spring, but achieve a rich yellow color in the fall. Small sweet-scented white or pink flowers bloom in the mid to late summer.

Landscape Uses:

Makes an attractive ornamental in sunny, moist areas. Moderately salt tolerant and can grow in moist soils. Great shrub for a naturalized garden. If possible, plant near house or walkway to enjoy its fragrance. Attracts butterflies and birds.



*Clethra alnifolia* (Summer Sweet)

***Cyrilla racemiflora* | Titi ✨**

Light Requirements: ○ ●

Habitat: Naturally found in swamps and freshwater wetlands.

Information: Can grow up to 30 feet tall. Typically evergreen in the lower and coastal south. Titi is most noted for its gnarly branching pattern. Fragrant white flowers appear in early summer and dangle in 4-6 inch sprays of minute blossoms.

Landscape Uses: Bright white blooms add sparkle when used as an understory tree. Good choice for a moist or wet area and is able to withstand periodic flooding. Can form dense colonies and best used in a larger landscape.



*Ilex glabra* | Inkberry ✨

Light Requirements: ①

Habitat: Naturally found in bogs, wet woodlands, and coastal plains

Information: This mound-shaped shrub becomes somewhat open in its habit with age. Inconspicuous white flowers appear during the summer and are followed by black berries, which remain through the winter. Both male and female plant must be present in order for the berries to appear.

Landscape Uses: Inkberry is highly attractive to honeybees as well as birds. It prefers moist soils and is flood tolerant, making it a great plant for use in constructed wetlands.

*Itea virginica* | Sweetspire ✨

Light Requirements: ①

Habitat: Naturally found in bottom lands and along rivers

Information: Can grow up to 3-10 feet in height. Has creamy white flowers along single 4 inch racemes. The fragrant blooms appear from April into early summer. Has purplish or bright red leaves in the fall.

Landscape Uses: One of the few medium sized shrubs that does well in moist or wet areas. Tends to form colonies in loose soil, offshoots can be easily transplanted in the winter. Wonderful plant, deer tend to love it as well. Pair with Viburnum and Blue Flag Iris for a lovely spring display.



*Itea virginica* (Sweetspire)



*Lyonia lucida* (Fetterbush Lyonía)

*Lyonia lucida* | Fetterbush Lyonía

Light Requirements: ① ●

Habitat: Grows in low woodlands and bogs.

Information: Fetterbush has an open, arching form and attractive, glossy, evergreen foliage. In the spring, pink, urn-shaped blooms dangle from the shrub's bowing branches.

Landscape Uses: This 3 to 5 foot shrub's showy blooms can brighten a wet, shady spot and, or shine as part of an understory planting.

*Osmanthus americanus* | Wild Olive

Light Requirements: ① ●

Habitat: Grows in a variety of habitats.

Information: An evergreen shrub or a compact small tree that can grow up to 15-25 feet in height. In natural conditions can grown as high as 40 feet. Leaves are a lustrous deep green on the surface and pale olive green on underside. Small, but fragrant creamy-white flowers bloom in the late winter to early spring. Fruit matures to a dark blue drupe that persists into the winter.

Landscape Uses: Wild Olive is a desirable shrub, it is used in a naturalized landscape or in a formal setting as a foundation plant. Can handle dry areas and is salt tolerant. It is a member of the olive family and related to the old, but exotic, garden favorite Teaolive. Try our native one. Produces fruit for fall bird migrations.



American Olive  
by William Bartram

*Rhododendron atlanticum* | Dwarf Azalea ✨

Light Requirements: ●

Habitat: Found in moist, flat woods and coastal plains.

Information: Only reaches about 3 to 6 feet tall. Possesses fragrant pink-white flowers that bloom in March and April. This species of *Rhododendron* is unique for its powdery bluish green foliage.

Landscape Uses: The Dwarf Azalea's flowers are incredibly fragrant and of special value to bumble bees. This species prefers sandy, well-drained soils and works well as an upland planting in a constructed wetland.



*Sabal minor* | Dwarf Palmetto ✨

Light Requirements: ○ ●

Habitat: Naturally found in maritime forests and along rivers and streams.

Information: Grows 3-8 feet tall. Looks best with adequate water but is drought resistant. Long blooming spray extends above fronds in summer. Grows in maritime forests where shell has amended the soil.

Landscape Uses: For smaller gardens this palm provides the structure of a sawtooth palmetto without the sprawl. It remains compact with attractive fronds leaning to a bluer green than most palms.

*Styrax americanus* | American Silverbells

Light Requirements: ○ ●

Habitat: Naturally found in wetland areas and along rivers and streams.

Information: Can grow up to 6 feet in height a 9 foot spread. Blooms in the spring. Fragrant bell-shaped white flowers curl upwards and expose yellow stamens. Has bright green leaves.

Landscape Uses: Tolerates a variety of soil types. Valuable in a deciduous understory for its showy white blossoms and upright form.

*Viburnum nudum* | Possumhaw ✨

Light Requirements: ○ ● ●

Habitat: Prefers wet, mucky soils found in wet woods and bogs.

Information: This dense shrub can range from 12 to 20 feet tall. Its upright stems begin to arch as the plant ages. Flowers appear mid-summer, as white, flat-topped clusters, and are followed by a blue-black fruit. Foliage turns a vibrant red in the fall.

Landscape Uses: Possumhaw provides colorful interest in both the summer and fall. As this species grows to be relatively tall and thick it could be used as an attractive screen.



*Viburnum nudum* (Possumhaw)



Witchhazel  
by William Bartram

### Other Native Shrubs for Constructed Wetlands:

*Alnus serrulata* (Hazel Alder)

*Aronia arbutifolia* (Chokeberry)

*Calliocalpa americana* (American Beautyberry) ✨

*Cliftonia monophylla* (Buckwheat Tree) ✨

*Decodon verticillatus* (Swamp Loosestrife) ✨

*Cornus stricta* (Southern Swamp Dogwood) ✨

*Euonymus americana* (Hearts-a-bustin')

*Fothergilla gardenii* (Dwarf Witch Alder) ✨

*Hamamelis virginiana* (Witchhazel)

*Leucothoe axillaris* (Coastal doghobble)

*Litsea aestivalis* (Pondspice)

*Rhapidophyllum hystrix* (Needle Palm)

*Rhododendron viscosum* (Swamp Azalea) ✨

*Rosa palustris* (Swamp Rose) ✨

*Sambucus nigra* (American elderberry)

*Symplocos tinctoria* (Common Sweetleaf) ✨

*Vaccinium sp.* ✨

(such as Highbush, Creeping, Elliott's, and Shiny Blueberry)

*Viburnum dentatum* (Arrowwood viburnum) ✨

*Zenobia pulverulenta* (Honeycup) ✨



# Forbs

*Asclepias incarnata* | Swamp Milkweed ✨

Light Requirements: ○

Habitat: Naturally found in swamps and freshwater wetlands.  
Information: Can grow 2-4 feet tall with branching stems. Opposite narrow lance-shaped leaves. Deep pink flowers cluster at the top of each stem. Blooms throughout the summer. Host plant to Monarchs.

Landscape Uses: Showy clusters of flowers attract butterflies and hummingbirds. Perfect for rain gardens and naturally wet spots. As with all milkweeds, elongated seed pods provide added interest in the autumn garden. Plant with Red Milkweed, *A. incarnata*, and Fewflower Milkweed, *A. lanceolata*, for scarlet accents, or Southern Milkweed, *A. viridula*, for a touch of white.

*Calopogon sp.* | Grasspink

Light Requirements: ○

Habitat: Naturally found in bogs and bog meadows.

Information: This delicate plant produces fragrant pink flowers in spring and summer. The genus name, *Calopogon*, is derived from the Greek words meaning “beautiful beard.” *Calopogon* species have long grass-like leaves, and conspicuous hairs on the flower lip.



*Calopogon sp.* (Grasspink)

Landscape Uses: These orchids thrive in wet soils and are ideal for rain gardens, constructed wetlands or in a naturally moist spot.

*Canna flaccida* | Yellow Canna ✨

Light Requirements: ○

Habitat: Naturally found in swamps and freshwater wetlands.

Information: Unlike most cannas, leaves emerge from a common base. Bright green foliage will rise to 3-5 feet tall. Tropical yellow flowers are showy, and appear from May to July. Cutting stalks to the ground after flowering will allow for repeat bloom.

Landscape Uses: Large foliage adds drama and dimension to the landscape. Useful as a backdrop for other plants. Most effective when grouped or massed. Prefers full sun and wet feet but is adaptable to drier conditions. Host to the Brazilian Skipper.



*Golden Canna* by William Bartram

*Conoclinium coelestinum* | Blue Mist Flower ✨

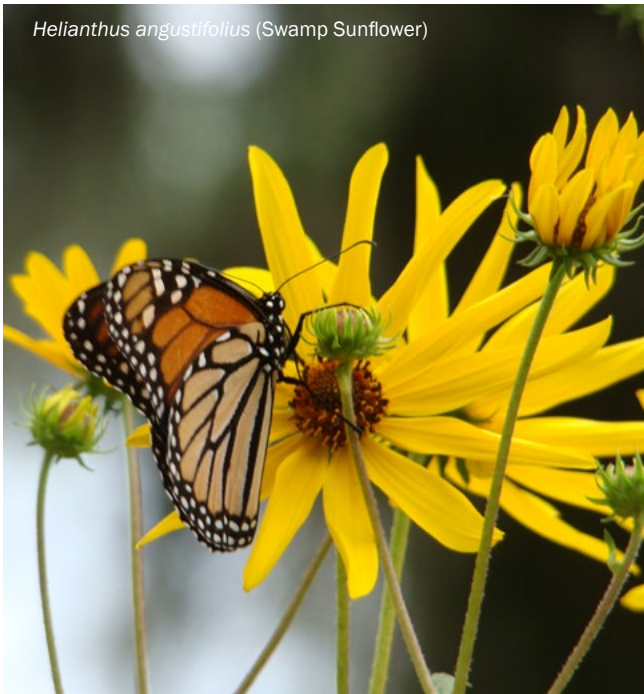
Light Requirements: ○

Habitat: Grows in a variety of habitats.

Information: Hardy perennial that can reach 2 feet in height. Flowers are grouped in flat, dense clusters of bright blue to light purple. Blooms put on a show from late summer into the fall and can be trimmed back to create a dense form.

Landscape Uses: One of the best plants for fall color and massing. Excellent choice for a butterfly garden or as a focal point for an autumn flowering bed. Will spread quickly if planted in rich moist garden soil.

○ FULL SUN   ● PARTIAL SUN   ● FULL SHADE   ✨ ATTRACTS POLLINATORS



*Helianthus angustifolius* (Swamp Sunflower)

*Helianthus angustifolius* | Swamp Sunflower ✨

Light Requirements: ○

Habitat: Grows in a variety of habitats.

Information: Tall, upright multi-branched perennial. Can grow to 12 feet tall with shiny needle like foliage. Prune back the top third of the stalk in early summer to encourage a denser form. The abundant golden flower display begins in midsummer and persists into fall.

Landscape Uses: Does well in the back of a perennial border, adding height and mounding color bursts. Is tolerant of salt and dry sites. Blooms in time for fall butterfly migrations. For beach front property or a sunny, dry site plant Cucumber-leaf Sunflower, *H. debilis*.

*Hibiscus coccineus* | Scarlet Hibiscus ✨

Light Requirements: ○

Habitat: Naturally found in swamps and wetlands.

Information: Can grow 4-7 feet tall. Upright to oval form. Deeply palmate leaves with prominent veins provide interesting detail. Deep scarlet flowers over 6 inches in width have an open star-like form. Blooms July through October. Great nectar plant for butterflies and hummingbirds.

Landscape Uses: A very showy species for sunny sites. Will form clumps creating an impressive display of color. Can tolerate standing water and be used by the edge of a pond but performs equally well in the garden. For pinks and white use Eastern Rose-mallow, *H. grandiflorus*.



*Hibiscus coccineus* (Scarlet Hibiscus)

*Iris virginica* | Southern Blue Flag ✨

Light Requirements: ○

Habitat: Naturally found in swamps and freshwater wetlands.

Information: Grows 1-3 feet tall with bright green sword shaped leaves. Flowers range in color from blue to purple and appear in late spring. Blossoms are showy.

Landscape Uses: Use in low-lying areas along streams or ponds. Can withstand periodic flooding so this is a great choice for an area that experiences constant moisture. Try it in rain gardens and at pond edges. Is highly deer resistant.

*Kosteletzkya virginica* | Seashore Mallow ✨

Light Requirements: ○ ●

Habitat: A variety of wetlands, from brackish to fresh.

Information: Grows from 4-5 feet tall and requires moist soil to grow to its full potential. 2-4 inch hibiscus-like blooms are a perfect pink with golden yellow centers. Flowers bloom all summer.

Landscape Uses:

Attracts hummingbirds. Should be used more widely in coastal gardens. Its multi-branched stems fill out the backdrop of a perennial border or an open spot in a natural wetland. Enjoyed by a variety of butterflies.



*Kosteletzkya virginica*  
(Seashore Mallow)

*Liatris spicata* | Gayfeather ✨

Light Requirements: ○

Habitat: Grows naturally in dry sandy soils.

Information: Grows 3-4 feet tall and is most noted for its spikes of lavender flowers that appear from June through August. Spikes of blooms can be dense and tend to put on a show.

Landscape Uses: One of the better known *Liatris* species. Attracts butterflies and hummingbirds. Useful to plant in a sunny perennial border or for color in a container arrangement. Can be somewhat drought tolerant and easily maintained after established. To extend seasonal bloom, plant Elegant Blazing Star, *L. elegans*, behind it. This 5 foot tall relation blooms September through October.

*Lobelia cardinalis* | Cardinal Flower ✨

Light Requirements: ○ ●

Habitat: Grows naturally along streams and moist woods.

Information: Grows 2-4 feet tall and produces showy spikes of brilliant scarlet blooms in late summer. Can spread from roots.

Landscape Uses: Plant is partial to shade unless plenty of water is available for sunny locations. Divide clumps in the spring after a couple of years. Very attractive to butterflies and hummingbirds. For a brilliant blue under similar conditions, plant Glade Lobelia, *L. glandulosa*.

*Ludwigia leptocarpa* | Anglestem Primrose-willow ✨

Light Requirements: ○ ●

Habitat: Found in pond and swamp margins.

Information: A shrubby, robust perennial that can reach over 6 feet in height. The stem is somewhat woody, and leaves are broadly lanceolate with long hairs. Small yellow flowers bloom pretty much year-round.

Landscape Uses: This plant gets relatively full and tall and can add nice texture and year-round color along the edges of a rain garden or bog.



*Ludwigia leptocarpa* (Anglestem Primrose-willow)



*Nelumbo lutea* | American Lotus

Light Requirements: ○

Habitat: Fresh water ponds.

Information: Grows in water to the depth of 3-6 feet. Pale yellow flowers reach 8-12 inches in diameter and rise above the water surface. Large waxy leaves can be 2 feet across and also emerge above the waterline.

Landscape Uses: This unusual plant is the only lotus native to North America. It provides a large scale presence in water features from ponds to garden pools. Beautiful, fragrant flowers, massive green leaves and attractive seed pods make for a stunning landscape addition. Blooms June through September.

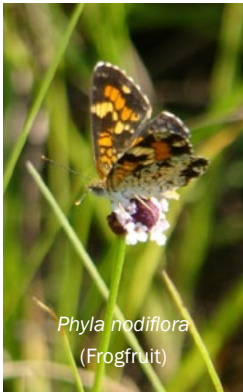
*Peltandra sagittifolia* | White Arrow Arum

Light Requirements: ○

Habitat: Found in acidic bogs and swampy woodlands.

Information: Reaches about 9 inches tall and flowers in early to mid-summer.

Landscape Uses: White Arrow Arum's distinctive coarse, arrow-shaped foliage and clean white blooms add interest to emergent plantings in bogs or rain gardens.



*Phyla nodiflora*  
(Frogfruit)

*Phyla nodiflora* | Frogfruit ✨

Light Requirements: ○ ●

Habitat: Grows in depressions like ditches and roadsides, and also in fields and meadows.

Information: Frogfruit makes a great groundcover, and can be evergreen in mild winters or in areas protected from frost. A member of the verbena family, the plant produces trailing, white, verbena-like flowers spring through fall.

Landscape Uses: Frogfruit is both a nectar source and a larval host for butterflies. It makes an attractive groundcover, with delicate white blooms in the warmer months and a purplish tint to the foliage in the winter.



*Pluchea odorata* (Sweetscent)

*Pluchea odorata* | Sweetscent ✨

Light Requirements: ○ ● ●

Habitat: Found in brackish marshes.

Information: This annual sports flat-topped clusters of pinkish-purple flowers in late summer and early fall. The plant smells faintly of camphor. Flower clusters are sometimes dried and included in flower arrangements.

Landscape Uses: Sweetscent adds a splash of color to marsh grasses at the end of the growing season, and blooms when many fall migrating species of butterflies pass through the Southern Coastal Plain.

*Pontederia cordata* | Pickerelweed ✨

Light Requirements: ○ ●

Habitat: Found in marshes and wet meadows.

Information: This pond plant can reach 3 feet in height. Long, heart-shaped leaves stand vertically beneath a single spike of deep purple-blue flowers. The plant attracts dragonflies, butterflies, and birds, which can be helpful in controlling mosquito populations.

Landscape Uses: Pickerelweed is a low maintenance plant perfect for adding cool summer color to a planted pond, swale, or rain garden.



*Pontederia cordata* (Pickerelweed)

*Rhexia virginica* | Virginia Meadowbeauty ✨

Light Requirements: ○ ●

Habitat: Grows in wet meadows, pond edges and savannas.

Information: Grows 1-2 feet. Bright pink flowers with four petals.

Landscape Uses: Blooms on loose terminal clusters. The bold pink blooms sport prominent yellow stamens that add to their ornamental value. Narrow leaves arch off angular stems. Very good rain garden or wetland plant.



*Rhexia virginica* (Virginia Meadowbeauty)

*Sabatia brevifolia* | Shortleaf Rose Gentian ✨

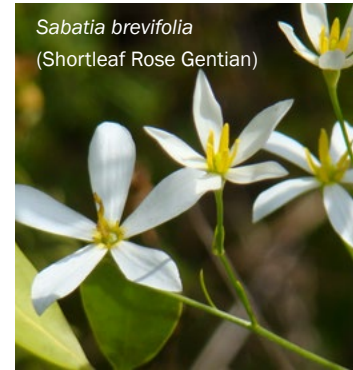
Light Requirements: ●

Habitat: Grows in wet pinelands and sandy uplands.

Information: This annual is characterized by a branching stem and white, star-like flowers.

Landscape Uses: Bright yellow stamens provide a contrast to the stark white, five-petaled flowers of the Shortleaf

Rose Gentian. Loving moist to drier sandy soils, this species is a good choice for transitional areas between upland and wet.



*Sabatia brevifolia*  
(Shortleaf Rose Gentian)

*Sagittaria latifolia* | Broadleaf Arrowhead ✨

Light Requirements: ○ ●

Habitat: Found in still waters or marshes.

Information: This colony-forming perennial is an aquatic plant that can reach about 3 feet above water. The large, long leaves are arrow-shaped and white flowers appear in mid to late summer. This species' rhizomes produce starchy

tubers that were once an important food source for Native Americans.

Landscape Uses: The delicate white flowers are a nice foil to the coarse and distinctive foliage. Makes a good planting for shallow marsh or wetland areas.



*Sagittaria latifolia*  
(Broadleaf Arrowhead)



*Saururus cernuus* | Lizard's Tail

Light Requirements: ●●

Habitat: Found in still water wetlands and on the edges of water bodies.

Information: Lizard's Tail is upright, producing a single spike of fine white flowers. The flowers are fragrant and the flower spike tends to take on a nodding form. Leaves are nearly triangular and have a cordate base.

Landscape Uses: Lizard's Tail can be a showy and fragrant addition to shallow wetland plantings, particularly when clustered in groups.

*Scutellaria integrifolia* | Helmet Flower ✨

Light Requirements: ○

Habitat: Grows in clearings and open woods.

Information: Grows 1 to 2 feet tall. This species has erect stems that typically branch near the base, and produces a two-lipped lavender flower in early summer.

Landscape Uses: Helmet Flower works well in wet soils found in shrub wetlands or wetland meadows.



*Sisyrinchium angustifolium* | Blue-eyed Grass ✨

Light Requirements: ○

Habitat: Grows in wetlands.

Information: Grows 1 to 2 feet tall. Bright green, narrow blades resemble grass. Intense blue-violet with yellow centers just above the leaves. Blooms in the spring.

Landscape Uses: Swaths of vibrant blue can be attained at the edge of a wet meadow or pond with this relative of the iris. It loves moisture but needs good drainage. It also does well in a garden or along a path when well watered.



*Solidago sempervirens* | Seaside Goldenrod ✨

Light Requirements: ○●

Habitat: Grows in a variety of habitats, from beach to salt marsh.

Information: Grows to be 4-6 feet tall once mature. A statuesque plant with floral spikes clustering into an elongated pyramid. Blooms appear in the fall and are a rich golden yellow.





*Solidago sempervirens*  
(Seaside Goldenrod)

Landscape Uses: Named for its tolerance of the “seaside” environment, Seaside Goldenrod is one of the best choices for adding fall color to a beach garden or marsh edge or any garden. The green foliage dominates through the summer but when the golden blooms arrive they become the focal point of any landscape. There are a number of other salt tolerant varieties that work in coastal gardens such as, Sweet Goldenrod, *S. odora* and Bluestem Goldenrod, *S. caesia*. For a great display and arching sprays of gold, try Goldenrod, *S. rugosa*.

*Symphotrichum novi-belgii* | New York Aster ✨

Light Requirements: ○

Habitat: Grows on shorelines and in wet meadows.

Information: Slender stems and narrow leaves support sprays of violet to pink flowers.

Landscape Uses: The multitude of flowers produced and their arrangement—lush petals radiating from a central yellow disk—make this species a showy and colorful plant choice for rain gardens or wetland meadows. The New York Aster is particularly attractive to native bees and other pollinators. For brackish environments try Southern Swamp Aster, *S. elliotii*.

*Zephyranthes atamasca* | Atamasco-lily ✨

Light Requirements: ○ ●

Habitat: Naturally found in wetland areas and along rivers and streams.

Information: Slender stems are adorned with white single flowers from April to May. After blooms appear, grass like foliage fills in around the base creating a delicate form.

Landscape Uses: Easily maintained and will reward your garden with abundant blooms for several seasons. Great fix for a moist semi shaded area.



*Zephyranthes atamasca* (Atamasco-lily)

## Other Native Forbs for Constructed Wetlands:

*Agalinis purpurea* (Purple False Foxglove) ✱  
*Aletris lutea* (Yellow Colic-root) ✱  
*Amianthium muscitoxicum* (Fly Poison)  
*Amsonia ciliata* (Fringed Blue Star)  
*Bacopa monnieri* (Water-hyssop)  
*Carphephorus ordoratisissimus* (Vanillaleaf) ✱  
*Cicuta maculata* (Spotted Water Hemlock) ✱  
*Eryngium aquaticum* (Rattlesnakemaster) ✱  
*Eryngium yuccifolium* (Button Eryngo) ✱  
*Eupatorium leucolepis* (Justiceweed) ✱  
*Eupatorium fistulosum* (Joe Pye Weed) ✱  
*Helenium autumnale* (Common Sneezeweed) ✱  
*Hibiscus grandiflorus* (Swamp Rosemallow) ✱  
*Hibiscus moscheutos* (Crimsoneyed Rosemallow) ✱  
*Hydrolea corymbosa* (Skyflower)  
*Hyptis alata* (Clustered Bushmint) ✱  
*Lachanthes caroliniana* (Red-root) ✱  
*Liatris gracilis* (Slender Gayfeather) ✱  
*Lilium catesbaei* (Pine Lily) ✱  
*Lobelia elongata* (Longleaf Lobelia) ✱  
*Lobelia glandulosa* (Glade Lobelia) ✱  
*Marshallia graminifolia* (Grassleaf Barbara's Buttons) ✱  
*Mitchella repens* (Partridgeberry)  
*Nymphaea odorata* (American White Waterlily) ✱  
*Packera tomentosa* (Woolly Ragwort)  
*Phlox carolina* (Carolina Phlox) ✱

*Ptilimnium capillaceum* (Herbwilliam) ✱  
*Rhexia alifanus* (Savannah Meadowbeauty) ✱  
*Rudbeckia laciniata* (Cutleaf flower) ✱  
*Sagittaria lancifolia* (Bulltongue Arrowhead) ✱  
*Teucrium canadense* (Canada Germander) ✱  
*Tradescantia ohiensis* (Bluejacket Spiderwort) ✱  
*Utricularia* sp. (Bladderworts)  
*Vernonia gigantea* (Giant Ironweed) ✱  
*Zizia aurea* (Golden Alexanders) ✱



*Fly Poison*  
 by William Bartram

# Ferns

## *Onoclea sensibilis* | Sensitive Fern

Light Requirements: ● ●

Habitat: Grows in moist woodlands, floodplains, swamps, and marshes.

Information: This shade and moisture-loving fern can reach up to 3 feet in height. Its bipinnate fronds are mottled green and deeply cut. Pale red fiddleheads pop up in spring and fronds appear in late summer.

Landscape Uses: This species earned its common name



*Onoclea sensibilis* (Sensitive Fern)

because of its sensitivity to frost, and its frond tend to wither early but remain upright, though dead, through winter. Another common name, Bead Fern, relates to the decorative, almost beaded appearance of the fern.

## *Osmunda regalis* | Royal Fern

Light Requirements: ○ ●

Habitat: Naturally found in swamps and freshwater wetlands.

Information: These regal ferns can grow up to 6 feet in height with a 3 foot spread. Soft green foliage turns an attractive yellow in the fall. A large fern that likes light shade but will thrive in full sun if kept wet. The fertile stalks have golden clusters of spore cases.

## Landscape Uses:

Dramatic along streams and ponds. Performs very well in garden setting. Cinnamon Fern, *O. cinnamomea*, a close relative, provides a similar but lacier effect for smaller gardens or as an accent plant.



*Osmunda regalis* (Royal Fern)

## *Thelypteris kunthii* | Southern Shield Fern

Light Requirements: ○ ●

Habitat: Naturally found on limestone outcrops and seeps.

Information: The 3-4 foot tall fronds reach out in all directions. Individual fronds are light to medium green, can get up to 1 foot wide and have a bronze cast in winter.

Landscape Uses: The chartreuse yellow green color contrasts well with darker plants. Easy to colonize in a soft mass. Prolific, but not aggressive. Takes a variety of soils but prefers wet to moist sites. The attractive winter fronds should be cut back before the new spring growth begins. The perfect cover for emerging spring bulbs.

## Other Native Ferns for Constructed Wetlands:

*Athyrium filix-femina* (Lady Fern)

*Woodwardia areolata* (Netted Chainfern)

*Woodwardia virginica* (Virginia Chainfern)



# Vines

## *Ampelaster carolinianus* | Climbing Aster ✨

Light Requirements: ○ ●

Habitat: Grows in fresh water wetlands and along streams.

Information: Can grow up to 20 feet. Abundant lavender blooms with yellow centers cover this climbing aster. Flowers from October well into November. Pollinators love it.

Landscape Uses: This plant will adorn a garden fence or use a tree to cascade over a pond or stream. Adapts well to garden conditions and makes a colorful fall display paired with Swamp Sunflowers in rain gardens or any place in the landscape.



○ FULL SUN ● PARTIAL SUN ● FULL SHADE ✨ ATTRACTS POLLINATORS

## *Apios americana* | Groundnut

Light Requirements: ●

Habitat: Found in low, moist areas.

Information: Groundnut is a climbing vine with pea-like flowers showing in a range of reds. The plant's tubers are edible and were gathered by Native Americans. The generic name, *Apios*, is derived from the Greek word for "pear," a reference to the shape of the tubers.

Landscape Uses: Attractive flowers make this plant a summer standout in planted wetland edges. The fragrant flowers are also appreciated by butterflies, particularly the Silver-spotted Skipper, *Epargyreus clarus*, for which the Groundnut is a larval host.



## *Clematis crispa* | Swamp Leather Flower

Light Requirements: ○ ●

Habitat: Naturally found in wet woods and marshes.

Information: Can reach up to 10 feet with support. Pinkish purple flowers are mildly fragrant and hang upside down.

Landscape Uses: This vine provides interest over several seasons, typically blooming in spring, then again in early fall, and may also bloom lightly through the summer. Swamp Leather Flower is easily trained onto fences, screens, or other structures—even other plants. Without support, the plant can be allowed to sprawl over steps or low walls.



*Clematis crispa* (Swamp Leather Flower)

***Decumaria barbara* | Climbing Hydrangea ✨**

Light Requirements: ●

Habitat: Found in swamps, wet woods, and marshes.

Information: This deciduous woody vine has dark green, glossy leaves and displays flat-topped clusters of small white flowers during the summer. Reaching as long as 30 feet, the vine climbs by attaching rootlets to trees or other surfaces. Though the vine maintains its leaf coverage whether it is used as a creeping groundcover or it has climbed to the sunny canopy, Climbing Hydrangea will only bloom when it is climbing.

Landscape Uses: The dark, shiny leaves are handsome as a groundcover, or as a backdrop to the creamy white flowers when trained onto a structure like a trellis or arbor.

***Wisteria frutescens* | American Wisteria ✨**

Light Requirements: ○ ● ●

Habitat: Found in upland forests, on river banks, or in wet woods.

Information: A woody, deciduous vine reaching 30 feet in length. Dark green, pinnately compound leaves bear 9 to 15 leaflets. Clusters of purple blooms appear in early summer and may bloom sporadically throughout the summer and fall.

**Landscape Uses:**

American Wisteria is an equally beautiful but less-aggressive alternative to Asian species of Wisteria. The impressive purple blooms and characteristic fragrance make this vine a lovely addition to a wetland garden. Train American Wisteria on a wall or arbor, and enjoy the beauty of the vine as well as the moth and butterfly species for which the vine is a larval host.



*Wisteria frutescens*  
(American Wisteria)

*Morning-glory*  
by William Bartram



**Other Native Vines for Constructed Wetlands:**

*Campsis radicans* (Trumpet Creeper)

*Galactia volubilis* (Downy Milkpea)

*Gelsemium sempervirens* (Yellow Jessamine)

*Ipomoea sagittata* (Saltmarsh Morning-glory)

*Lonicera sempervirens* (Coral Honeysuckle)

*Mikania scandens* (Climbing Hempvine)

# Grass & Grass-Like

*Andropogon glomeratus* | Bushy Bluestem

Light Requirements: ○ ●

Habitat: Grows in a variety of moist habitats.

Information: Grows up to 4-6 feet in height. Forms clumps. Leaves are soft green, turning copper in the fall. Feathery, white flowers appear in late summer and are incased in salmon orange sheaths. Seed heads turn into billowing clouds of pale gold that last through the winter. Likes moisture but does well in normal soils.

Landscape Uses: Plant in masses for erosion control. Blooms at the same time as sunflowers and goldenrods. Shear dried stems to the base in late winter before new growth appears. Reseeds freely. Seeds are attractive to wildlife. For a grass with a blue hue and drought tolerance, try White Bluestem, *A. capillipes*, a native to dry pine forests.



*Carex grayi* | Gray's Sedge

Light Requirements: ● ●

Habitat: Found in bottomland forests

Information: Can grow up to 3 feet tall. Clump forming. Flowers in May.

Landscape Uses: Produces attractive flowering heads and leafy bracts. Wonderful rich green leaves can brighten any shady spot and rain garden or pond edge. Needs moisture.

*Chasmanthium latifolium* | River Oats

Light Requirements: ○ ●

Habitat: Found along woodland rivers and streams.

Information: Can grow 2-5 feet in height with 2 foot spread. Showy oat like flowers and seeds. Blooms in August with persistent seed heads.

Landscape Uses: Lovely drooping flower heads on delicate, arching stalks make an elegant statement. Bright green leaves turn copper in autumn.





*Juncus effusus* | Common Rush

Light Requirements: ○

Habitat: Naturally found in wet savannahs and freshwater wetlands.

Information: Grows to 4 feet. Bright green, clump forming.

Landscape Uses: Clusters of rich green spikes make attractive plantings for wet spots, rain gardens and pond edges. Provides structure and stature in the garden and for water features. Small clusters of pale green flowers emerge just below the stalk tip. Beautiful in slanted sunlight.



*Juncus effusus*  
(Common Rush)

*Leersia oryzoides* | Rice Cutgrass

Light Requirements: ●

Habitat: Found in swamps and ditches.

Information: This grass reaches 3 to 6 feet high and prefers very wet soils or standing water. Rice Cutgrass leaves are

prickly and unpleasant to touch. Small green blooms appear in summer or fall, but are inconspicuous.

Landscape Uses: This species is an adult food source and larval host for the Least Skipper, *Ancyloxypha numito*, and a good choice for deeper marsh or wetland plantings.



*Bobolink & Grass*  
by William Bartram

*Panicum virgatum* | Switchgrass

Light Requirements: ○ ●

Habitat: Naturally found on pond and stream margins, thin live oak woods and wet pinelands.

Information: Warm season clump-forming grass. Many garden cultivars available. Important seed source for song birds, game birds and small mammals.

Landscape Uses: Forms arching clumps. Panicles spread into delicate but large seed heads. Useful as accent specimens and for massing. Great when mixed with fall blooming flowers such as asters and goldenrods.



*Panicum virgatum*  
(Switchgrass)

*Piptochaetium avenaceum* | Black Oat Grass

Light Requirements: ○

Habitat: Well drained areas and stream banks.

Information: Black Oat Grass is distinctive because the thin inflorescence branches almost disappear, giving the impression that the species' long spikelets are floating. The grass is edible and actually grown commercially as a

cereal grain. Requires good drainage and often used in xeriscaping.

Landscape Uses: This grass adds a unique, ornamental texture to a naturalized garden or landscape. The deep root system makes this species beneficial for erosion control in vulnerable areas such as stream banks.



*Piptochaetium avenaceum*  
(Black Oat Grass)

*Rhynchospora colorata* | Whitetop Sedge

Light Requirements: ○ ●

Habitat: Naturally found wet savannahs and dune swales.

Information: Clusters of rich, green spikes appear to terminate in bright white flowers that are in fact bracts. These bracts attract pollinators.



*Rhynchospora colorata*  
(Whitetop Sedge)

Landscape Uses:  
A showy addition to a water garden and will also grow in a regular garden with plenty of water. Creates drifts of stars in wet areas. Try in rain gardens and difficult wet, sunny spots.

*Saccharum giganteum* | Giant Plume Grass

Light Requirements: ○ ●

Habitat: Naturally found in open wetland areas.

Information: Can grow up to 6-10 feet in height. Large clusters of mauve seed heads reach above the cane-like grass.



*Saccharum giganteum*  
(Giant Plume Grass)

Landscape Uses: Does best at the edge of ponds, streams, or water gardens. Highly attractive planted with dense, celadon green flower heads of Giant Foxtail.



*Setaria magna*  
(Giant Foxtail)

*Setaria magna* | Giant Foxtail

Light Requirements: ○ ●

Habitat: Found in swamps and wetlands.

Information: This annual grass can reach nearly 12 feet in height. Leaf blades can be almost 2 feet long and are rough to the touch. Inflorescence appear nearly year round as long, fuzzy spikes on the stem tips, and can have a drooping form. Landscape Uses: This grass is quite large and makes an architectural statement in the landscape. It can be used to add visual height in a wet area, and makes a good screen.



*Tripsicum dactyloides*  
(Eastern Gamma Grass)

*Tripsicum dactyloides* | Eastern Gamma Grass

Light Requirements: ○ ●

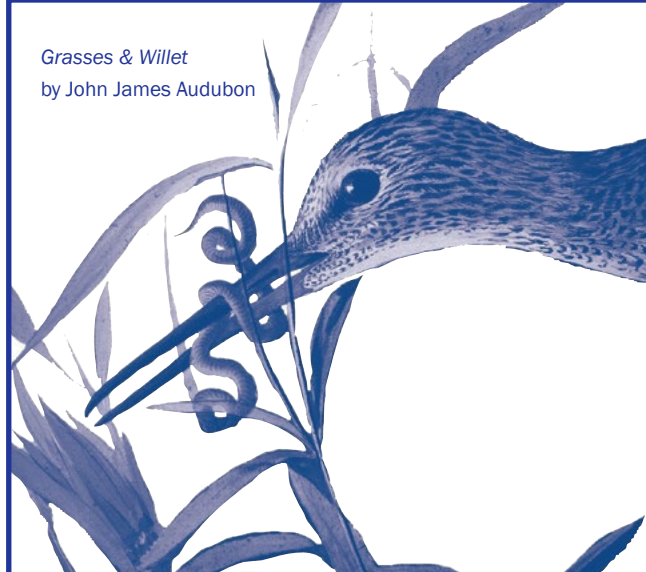
Habitat: Found in ditches, depressions and thin woods.

Information: Forms large, coarse, semi-evergreen clumps. Has attractive arching leaves. Flowering tassels of chartreuse spikelets appear in mid-summer. Male flowers range from yellow to burnt orange at the tip, with purple female inflorescence below. Ancient relative to corn.

Landscape Uses: A bold accent for a mixed grass border or lower areas of a meadow. May be used as singular accent or effective in large masses. Cut back in early winter to remove spent tassels and renew bright green foliage.

### Other Native Grass & Grass-like Plants for Constructed Wetlands:

- Carex glaucescens* (Southern Waxy Sedge)
- Chasmanthium laxum* (Slender Spikegrass)
- Cladium mariscus* ssp. *jamaicense* (Jamaica Swamp Sawgrass)
- Cyperus distinctus* (Swamp Flatsedge)
- Fimbristylis caroliniana* (Carolina Fimbry)
- Juncus megacephalus* (Bighead Rush)
- Rhynchospora latifolia* (Sandswamp Whitetop)
- Scirpus cyperinus* (Woolgrass)
- Setaria macrosperma* (Coral Bristlegrass)
- Spartina bakeri* (Sand Cordgrass)
- Stenotaphrum secundatum* (St. Augustine grass)



Grasses & Willet  
by John James Audubon



The background of the slide is a close-up photograph of the Wild Olive plant. The top half shows several large, dark green, lanceolate leaves with prominent veins. The bottom half shows a branch with clusters of small, white, tubular flowers. The text 'References & Resources' is centered in a white box with a blue border.

# *References & Resources*

*Osmanthus americanus*  
Wild Olive

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# Online Resources

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*Coastal WildScapes:* <http://www.coastalwildscapes.org/>

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*American Lotus*  
by William Bartram



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*Setaria magna* | Giant Foxtail