

General Guidelines for Planting a Littoral Zone

Step 1: Determine water level fluctuations in your pond

Water levels and planting elevation in a stormwater pond are interconnected. The tolerance levels of wetland plants vary. Some plants can survive in deeper water with year-round flooding while others require flooding for only a portion of the year. Determine your extreme wet season water level and your extreme dry season water level. Make note of how long each area of the bank stays flooded.

Step 2: Pick the right plant for the right place

[Table 1](#) lists some typical native wetland plants commonly used in littoral zones. The list is divided into 4 planting zones (Figure 1). These planting zones were determined based on the plants maximum water depth (the maximum water depth under which a plant can survive) and the flooding duration (the amount of time a plant can survive submerged in water). Each plant's maximum water depth and flooding duration must be considered before determining its planting elevation.

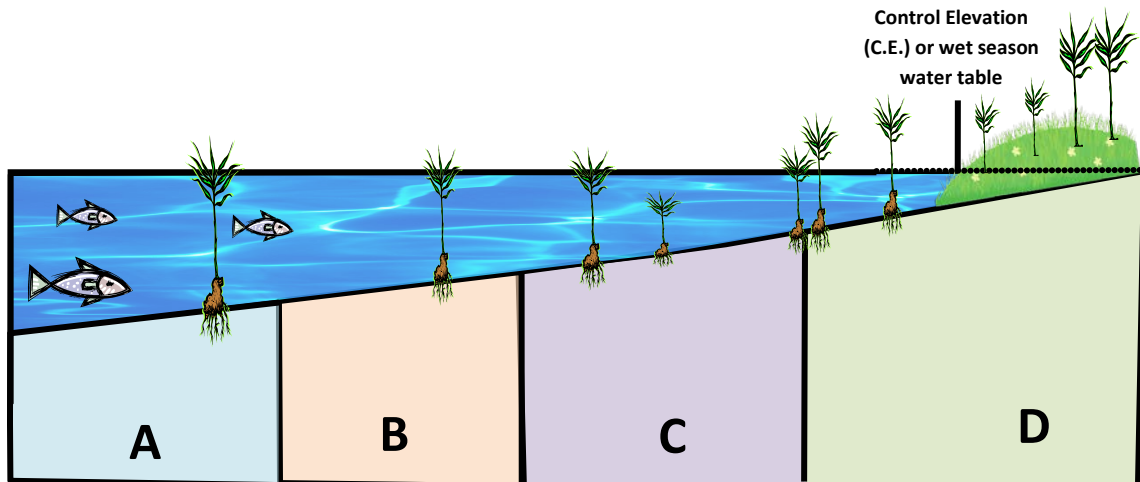


Figure 1. Planting Zones

(A) **Deep** – These plants need at least 9 –11 months of flooding per year and can survive in water that is 3 feet deep or greater.

(B) **Mid** – These plants need at least 3.5 – 8.5 months of flooding per year and can survive in water that is 2 to 3 feet deep.

(C) **Shallow** – These plants typically grow in water that is 1 to 2 feet deep and are inundated by water for at least 2.5 months annually.

(D) **Transitional** – These plants can survive in water that is 0 to 1 feet deep and do not need to be completely flooded, others just require wet or soggy soils.

Step 3: Determine planting elevation

Most stormwater ponds in Collier County fluctuate quite a bit between the wet and dry seasons. Each elevation along a shoreline will have a different hydroperiod and is based on the yearly fluctuation between the **Dry Season Water Table (DSWT)** and the **Control Elevation (C.E.)**. The DSWT should be the average water elevation during the driest time of the year – typically the months of April and May. The C.E. (wet season water table) should be the average water elevation during the wettest time of the year – typically the months of September and October. Some lakes may only fluctuate by 1 foot; others may fluctuate by as much as 6 feet.

In ponds with a fluctuation of 5' or greater, plant survival can be a challenge. It is advised that only the hardiest of plant species be chosen in lakes with this type of fluctuation. This will increase the likelihood of vegetative success and higher potential for propagation. Hardy species might include: spikerush, soft rush, bulrush, alligator flag and sand cord grass.

Table 2 is an estimate of the planting elevations for the groups of plants from Table 1, according to average water level fluctuation.

Table 2. Estimated Planting Elevations Based on Water Level Fluctuation

Zone	2' or less fluctuation	Zone	3' or greater fluctuation
(A) & (B)	2' or greater below C.E.	(A)	3' or greater below C.E.
(C) & (D)	0' - 2' below C.E.	(B)	2' - 3' below C.E.
		(C)	1' - 2' below C.E.
		(D)	0' to 1' below C.E.

This is a simplified table. When designing a littoral planting area, keep in mind that many plants and trees may fit multiple categories. Some (A) plants may survive at (B), (C), and (D) plant levels; some (B) plants may survive at (C) and (D) plant levels, and so on. Just remember that almost all of these plants will be underwater at some point during an average rainfall year.

Step 4: Procuring plants

Check with your lake management company. They most likely have a supplier they commonly use. You can also consult with local nurseries or on the internet.

Step 5: Maintenance

Healthy littoral zones can reduce the need for chemical treatment, but just like any landscaping, some type of ongoing maintenance may be required. Common maintenance usually includes removal of litter and cattails. If [exotic or prohibited plants](#) are growing in your littoral area they should be physically removed whenever possible as chemical treatments may kill both exotic and native plants. If they cannot be removed physically without causing damage to the native littoral plants, ask your lake management contractor to treat them with care and do not broadcast spray the area with herbicides.

When herbicides are necessary choosing the appropriate chemical, meticulously following the label and using Best Management Practices is always advised. Applicators should have the appropriate pesticide licenses especially for applying in an around waterbodies.

[GRASS CARP](#) AND LITTORAL PLANTS DO NOT MIX!!!! Grass carp will eat aquatic plants. If you already have grass carp, you may need to exclude them from the LSPA's to prevent plant damage. Consult FL Fish and Wildlife for addition information FWC local office (239) 229-5403.

Mowing, trimming and fertilization should be minimized around ponds and is prohibited within 10' of a water body per [Ordinance No. 2011-24](#).

Other Littoral Zone Design Tips

If you have steeper (4:1 slope) shoreline, common [Bacopa](#) is a good native ground cover that will follow the water line. It may brown slightly during drier months but will benefit from irrigation run-off produced by existing sprinkler systems. Bacopa should help with erosion control on steeply sloped shorelines.

For detailed design tips refer to the Design Guidelines for County required Littoral Shelf Planting Area (LSPA).



Table 1: Suggested Plants for Littoral Shelf Planting Area (LSPA) and Stormwater Ponds in Collier County



Proposed Elevation Below C.E. (feet)	Planting Zone	Plant type	Common Name	Scientific Name <i>spp. = multiple species within that genus</i>	Comments	Flooding Duration at Proposed Elevation (months)	Size/height requirement	Plant Spacing maximum
0-1'	Transition (D)	Woody-tree	Paurotis Palm	Acoelorrhaphe wrightii	multi-stemmed small palm, prone to Manganese deficiency	0-2	3gallon/ 4' min	20'
0-1'	Transition (D)	Woody-tree	Sugar hackberry or sugarberry	Celtis laevigata	large deciduous tree	0-2	3gallon/ 4' min	20'
0 - 1'	Transition (D)	Herbaceous	Salt grass / spike grass	Distichlis spicata	brackish water only	0 - 2	12" min	36" on center
0-1'	Transition (D)	Woody-tree	Dahoon holly	Ilex cassine	evergreen	0-2	3gallon/ 4' min	20'
0 - 1'	Transition (D)	Herbaceous	Muhly grass	Muhlenbergia capillaris	fresh or brackish water	0 - 2	12" min	36" on center
0 - 1'	Transition (D)	Herbaceous	Seashore paspalum	Paspalum vaginatum	fresh or brackish water	0 - 2	12" min	36" on center
0 - 1'	Transition (D)	Herbaceous	Sand Cord grass	Spartina bakeri	other species available for brackish water	0 - 2	12" min	36" on center
0 - 1'	Transition (D)	Herbaceous	Fakahatchee grass	Tripsacum dactyloides	grass can grow very tall, larval host	0 - 2	12" min	36" on center
0-1'	Transition (D)	Herbaceous	Florida Gamagrass	Tripsacum floridanum	doesn't grow as tall as <i>dactyloides</i>	0 - 2	12" min	36" on center
1-2'	Shallow (C)	Woody-tree	Paurotis Palm	Acoelorrhaphe wrightii	multi-stemmed small palm, prone to Manganese deficiency	1 - 3	3gallon/ 4' min	20'
1 - 2'	Shallow (C)	Herbaceous	Blue maidencane	Amphicarpum muhlenbergianum		1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Herbaceous	Canna lily	Canna flaccida	perennial accent plant	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Woody-shrub	Buttonbush	Cephalanthus occidentalis		1 - 3	1gallon	5'

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1 - 2'	Shallow (C)	Woody-tree	Buttonwood	Conocarpus erectus	evergreen	1 - 3	3gallon/ 4' min	20'
1 - 2'	Shallow (C)	Herbaceous	Swamp lily	Crinum americanum	accent plant blooming in summer; mix in with other herbaceous vegetation due to it spreading slowly	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Herbaceous	Spikerush	Eleocharis spp	Species: <i>interstincta, cellulosa, flavescens, atropurpurea, baldwinii, or vivipara</i>	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Herbaceous	Horsetail	Equisetum hyemale	naturalizes; food for waterfowl	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Herbaceous	Yellowtop	Flaveria linearis	perennial accent plant, easily grown from seed	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Woody-shrub	St. John's-wort	Hypericum fasciculatum	max growth 5'	1 - 3	1gallon/ 12" min	36" on center
1 - 2'	Shallow (C)	Woody-tree	Dahoon holly	Ilex cassine	evergreen	1 - 3	3gallon/ 4' min	20'
1-2'	Shallow (C)	Herbaceous	Prairie Iris	Iris hexaogona	accent plant blooming in spring	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Woody-shrub	Christmas Berry	Lycium carolinianum	brackish water only	1 - 3	1gallon/ 12" min	36" on center
1 - 2'	Shallow (C)	Herbaceous	Muhly grass	Muhlenbergia capillaris	colorful pink inflorescence, white variety too	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Herbaceous	Maidencane	Panicum hemitomon	looks similar to torpedo grass	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Woody-tree	Swamp bay	Persea palustris		1 - 3	3gallon/ 4' min	20'
1 - 2'	Shallow (C)	Herbaceous	Pickerelweed	Pontedaria cordata	accent plant blooming late summer	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Woody-tree	Royal palm	Roystonea regia		1 - 3	3gallon/ 4' min	20'
1 - 2'	Shallow (C)	Herbaceous	Arrowhead	Sagittaria spp	species: <i>latifolia</i> and <i>lancifolia</i>	1 - 3	12" min	36" on center
1 - 2'	Shallow (C)	Herbaceous	Lizard's tail	Saururus cernuus		1 - 3	12" min	36" on center

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1-2'	Shallow (c)	Herbaceous	Sand Cord grass	Spartina bakeri		1 - 3	12" min	1-2'
1-2'	Shallow (C)	Herbaceous	Fakahatchee grass	Tripsacum dactyloides	grass can grow very tall, larval host	1 - 3	12" min	36" on center
1-2'	Shallow (C)	Herbaceous	Florida Gamagrass	Tripsacum floridanum	doesn't grow as tall as <i>dactyloides</i>	1 - 3	12" min	36" on center
2 - 3'	Mid (B)	Woody-tree	Red (Swamp) maple	Acer rubrum		3 - 6	3gallon/ 4' min	20'
2 - 3'	Mid (B)	Herbaceous	Canna lily	Canna flaccida	perennial accent plant	3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Woody-tree	Buttonwood	Conocarpus erectus		3 - 6	3gallon/ 4' min	20'
2 - 3'	Mid (B)	Herbaceous	Sawgrass	Cladium jamaicense	serrated leaves install in areas with minimal maintenance needed. fresh and brackish	3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Herbaceous	Hibiscus	Hibiscus spp	freshwater and brackish. can be sensitive to pests. hummingbird plant. (Species: <i>coccineus</i> and <i>grandifloras</i>)	3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Herbaceous	Spikerush	Eleocharis spp	Species: <i>interstincta</i> , <i>cellulosa</i> , <i>flavescens</i> , <i>atropurpurea</i> , <i>baldwinii</i> , or <i>vivipara</i>	3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Herbaceous	Soft rush or Needle rush	Juncus spp.		3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Woody- shrub	Fern (Royal or Cinnamon)	Osmunda spp	partial to full shade only	3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Herbaceous	Lizard's tail	Saururus cernuus		3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Herbaceous	Bulrush	Schoenoplectus pungens		3 - 6	12" min	36" on center
2 - 3'	Mid (B)	Woody-tree	Pond Cypress or Bald Cypress	Taxodium spp	species: <i>ascendens</i> and <i>distichum</i>	3 - 6	3gallon/ 4' min	20'
3' - deeper	Deep (A)	Woody- shrub	Giant Leather fern	Acrostichum danaeifolium		6 - 9	1gallon	5'

3' - deeper	Deep (A)	Woody-tree	Pond apple	Annona glabra	evergreen	6 - 9	3gallon/ 4' min	20'
3' - deeper	Deep (A)	Herbaceous	Sawgrass	Cladium jamaicense	serrated leaves install in areas with minimal maintenance needed. fresh and brackish	6 - 9	12" min	36" on center
3' - deeper	Deep (A)	Woody-tree	Pop ash	Fraxinus caroliniana		6 - 9	3gallon/ 4' min	20'
3' - deeper	Deep (A)	Herbaceous	Spatterdock	Nuphar advena	small yellow flower	6 - 9	12"	N/A
3' - deeper	Deep (A)	Herbaceous	Water lily	Nymphaea spp.	species: <i>odorata, elegans, lotus, mexicana</i> . showy aquatic flower.	6 - 9	N/A	N/A
3' - deeper	Deep (A)	Herbaceous	Bulrush	Schoenoplectus spp.	Species: <i>pungens, californicus and tabernaemontani</i> . can grow tall and block view	6 - 9	12" min	36" on center
3' - deeper	Deep (A)	Herbaceous	Alligator flag	Thalia geniculata		6 - 9	12" min	36" on center

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Valuable species that do not meet LSPA requirements

Proposed Elevation Below C.E. (feet)	Planting Zone	Plant type	Common Name	Scientific Name	comments	Flooding Duration at Proposed Elevation (months)	Size/height requirement	Plant Spacing maximum
0 - 1'	Transition (D)	Herbaceous	Coreopsis	Coreopsis leavenworthii	Self seeds	0 - 2	n/a	36" on center
0 - 1'	Transition (D)	Herbaceous	Goldenrod	Solidago fistulosa	Showy yellow flower	0 - 2	n/a	36" on center
1 - 2'	Shallow (C)	Herbaceous	Water hyssop	Bacopa monnieri	Excellent sprawling groundcover could be an alternative to sod	1 - 3	n/a	36" on center
1-2'	Shallow (C)	Herbaceous	Lemon bacopa	Bacopa caroliniana	Excellent sprawling groundcover could be an alternative to sod	1 - 3	n/a	36" on center
3ft - deeper	Mid (B) or Deep (A)	Herbaceous	Tape-grass or eelgrass	Vallisneria americana	Growth rate dependant on water clarity; growth can become prolific	6 - 9	n/a	36" on center

updated June 2018