Collier County™
POLLUTION CONTROL
LIVE GREEN. SAVE BLUE.

STORMWATER POND MANAGEMENT

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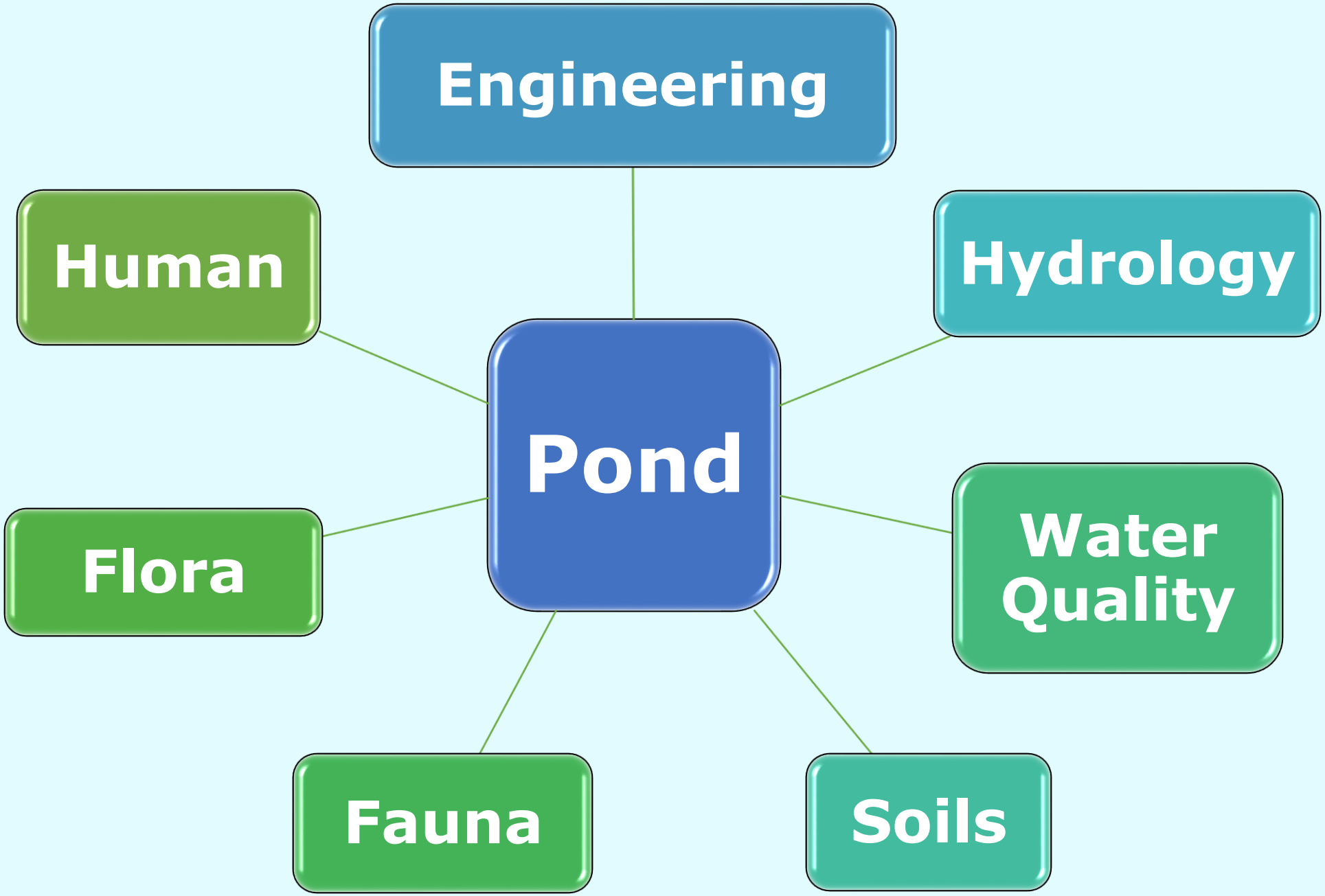

Engineering
Human
Hydrology
Pond
Flora
Water Quality
Fauna
Soils

Characteristics of Healthy Ponds

- ❑No bare soil or washouts
- ❑No pet waste, trash, or yard debris
- ❑Permitted littoral vegetative cover is 80% or more
- ❑Ten foot low maintenance zone
- ❑Shoreline provides habitat and diversity
- ❑Diverse fish and wildlife populations
- ❑Invasive and nuisance plants and wildlife managed
- ❑Landscape managed with lakes in mind
- ❑30% desirable aquatic vegetation

Water Quality

- Water pH 6.5 – 8.5
- Water clarity three foot or greater
- Chlorophyll less than 20µg/L
- Dissolved oxygen 38 – 100% saturation

Hydrology

Dry Season

Rainy Season

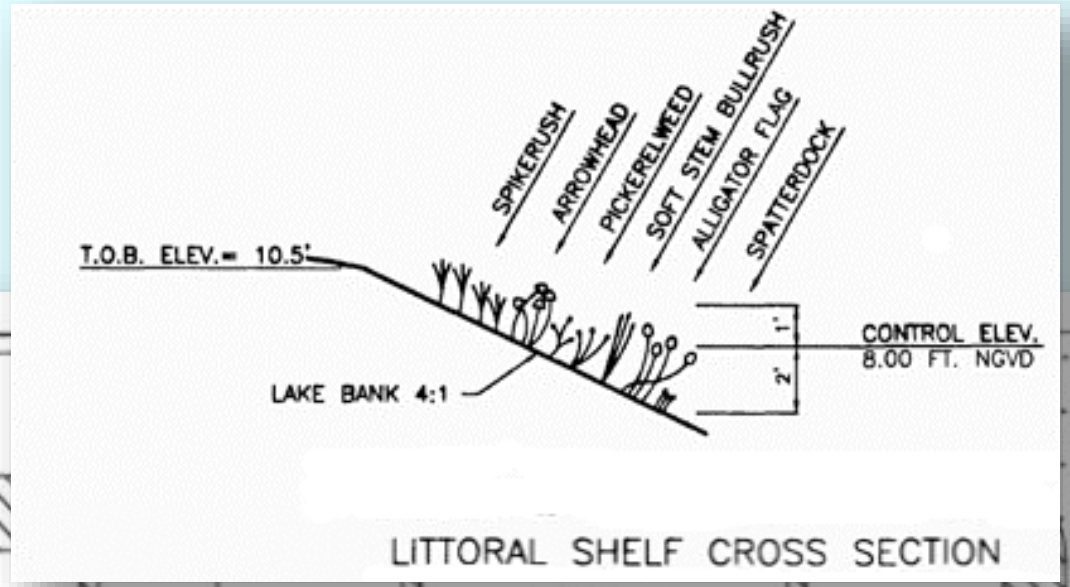
Shorescape

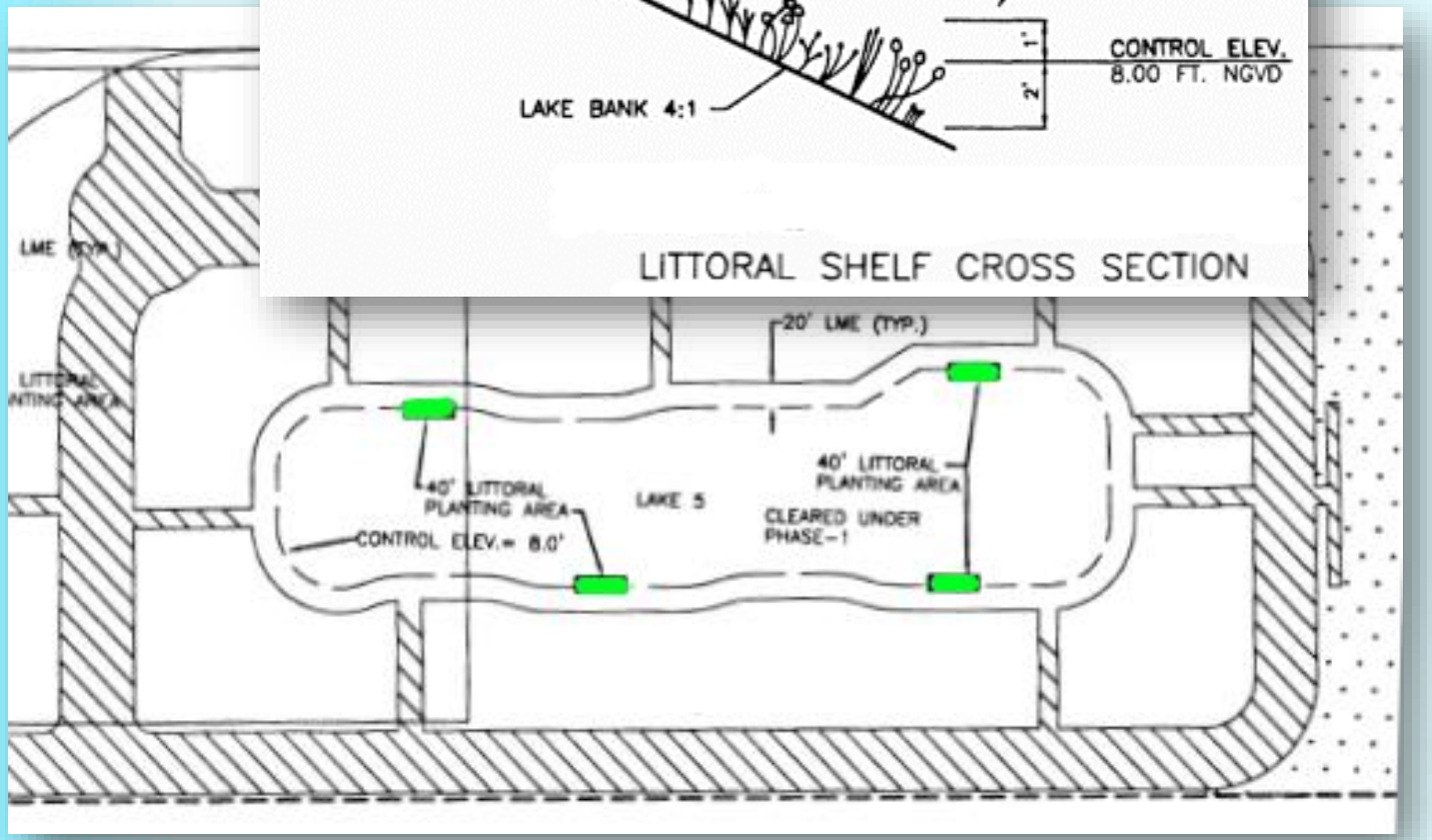
Soils

- Proper design
- Right Plant, Right Place
- Soil Testing
  - Soil Amendments
- Irrigation
- Salinity
- Tissue Testing
- Know your permit

Permits

Engineering





- ❑ Bathymetry
- ❑ Adhere to permits
- ❑ Slopes maintained
- ❑ Stormwater structures maintained
- ❑ Include at least three native littoral species
- ❑ Maintain 80% or more littoral cover

Zone D – Think Roots

Flora

4′

D C B

Zone C

- *Sagittaria* - **Duckpotato** – Zone B & C
- *Crinum* - **Swamp lily**
- *Pontederia cordata* **Pickerelweed**
- *Canna sp*. – Zone B & C
- *Ericaulon* **Pipeworts**
- *Xyris* **Yellow-eyed grass**
- Palms like **Royal** and ***Paurotis*** (Zone B)

Who you calling weed?

Boehmeria cylindrical
– Zone C

Pluchea spp
– Zone C

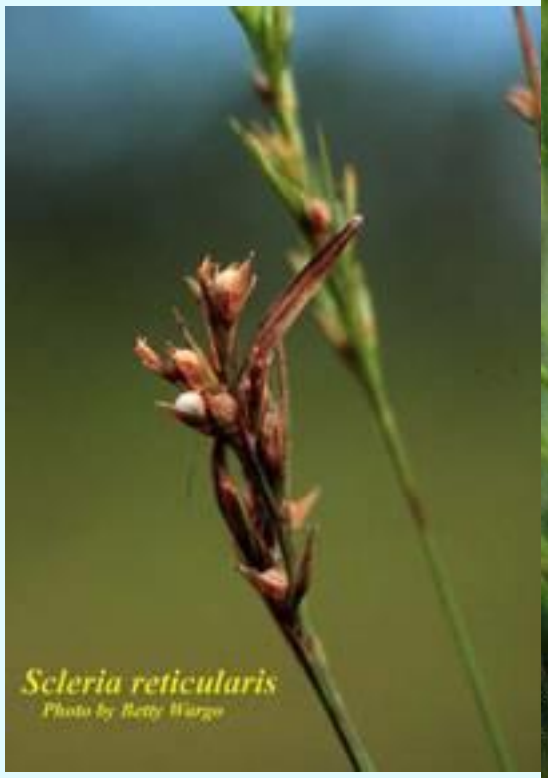
Low Growing or Creeping

- *Lindernia grandiflora* – Zone C
- *Bacopa spp.* – Zone B & C
- *Diodia virginiana* – Zone C
- *Phyla nodiflora* – Zone D
- *Commelina* – Zone C

Cyperaceae
-Big Happy Family

* Zone dictates species

- *Cyperus*
- *Fimbristylis*
- *Scleria*
- *Eleocharis*
- *Rynchospora*
- *Scirpus*



Zone C

Woody plants

Salix caroliniana

Zone B

Acer rubrum

Zone B & C


Utricularia floridana
Photo by Randy Zerr


Native –
beneficial

Chara or muskgrass

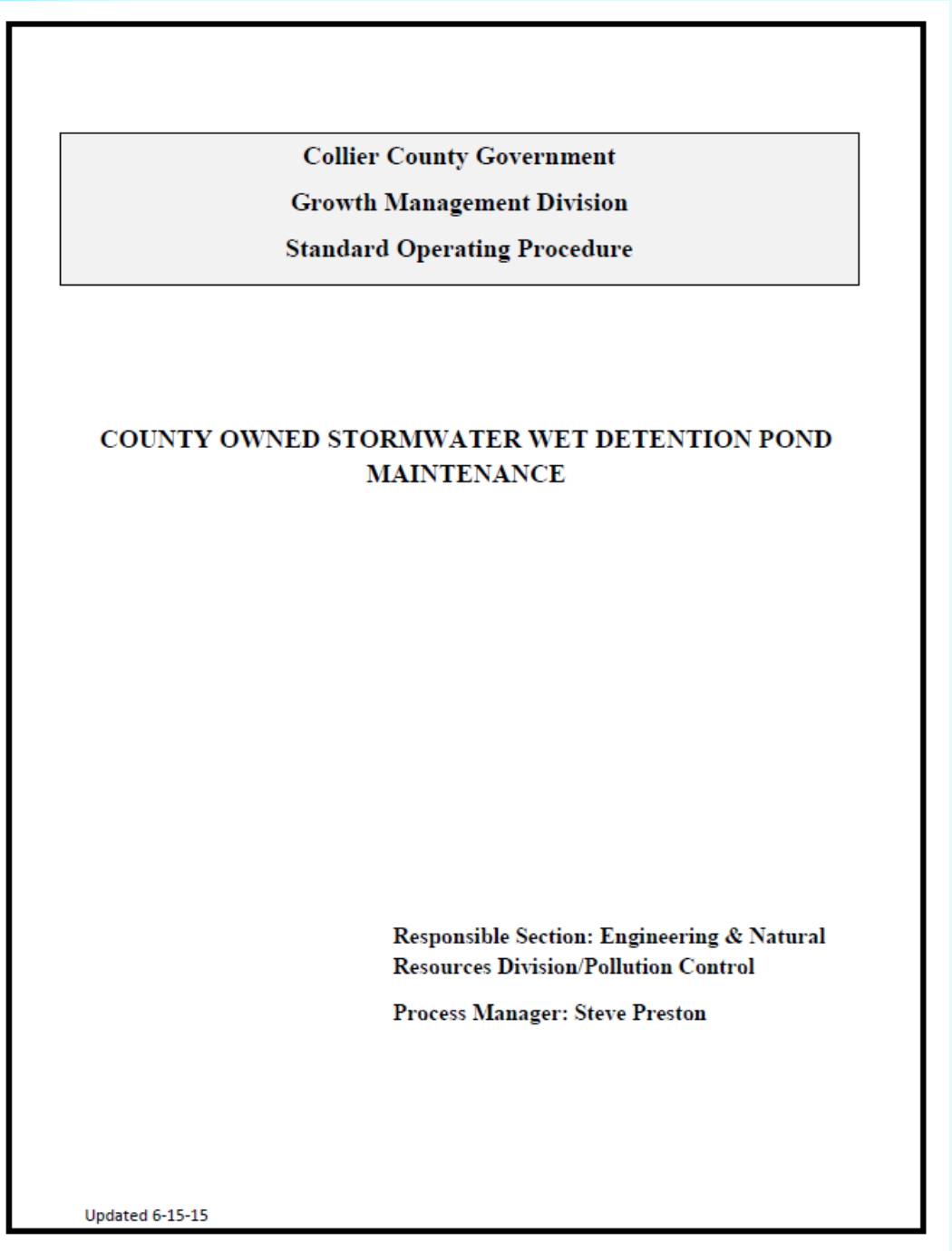
Native – beneficial SAV

Control the Human Factor

Human

Fauna

- Aesthetic values
- Uses (irrigation & recreation)
- Improper landscape management
- Ideology and management shifts
- Excessive chemical applications
- Active management of wildlife
- Pet waste management
- Proper trash management



Proactive Management

- Location within watershed
- Location within community
- Mapping
  - Control Elevation
  - Acreage
  - Drainage Area
- Proper plant survey
  - Encourage mechanical maintenance
  - Invasive management

Quarterly Inspections

Collier County Aquatic Plant Control Wet Detention Inspection Sheet (Front)

Facility ID & Name:_____ Date:_____

Drainage Basin: _____ Inspection Work Order#_____

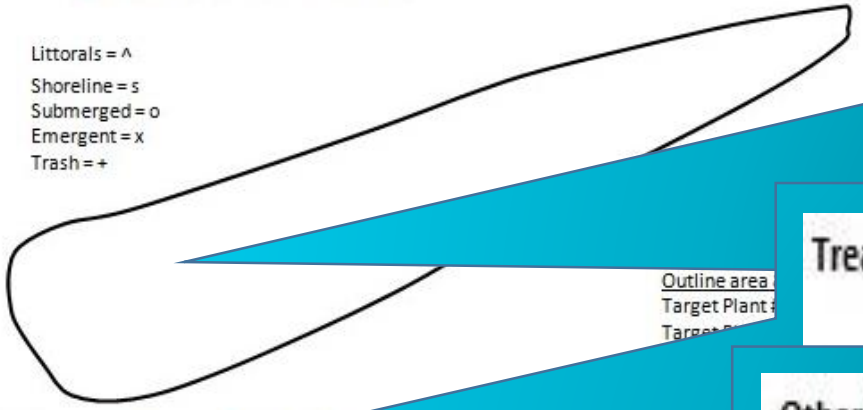
Pre-work Inspector Name/Dept:_____

Pre-work Inspector Name/Dept:_____

Reason for Inspection: Scheduled___ Internal Request ___ by who:_____

or Complaint___ Complainant Source_____

Littorals = ^
Shoreline = s
Submerged = o
Emergent = x
Trash = +



Outline area
Target Plant #

Treatment: Herbicide___ Mech

Priority (choose one) 1= Immediately 2= 2 weeks 3= 3 Weeks 4= Recheck 1 Month

Check one: Shoreline:____ Floating:____ Emergent:_____ Submerge

Target Plant #1:_____Growth Stage: Beginning_____ Me

Target Plant #2:_____Growth Stage: Beginni

Target Plant #3:_____Growth

Herbicides Recommended:_____ Application Rate:

Other Inspections

Mowing Needed: Y / N 10-foot Mowing Buffer in Place: Y / N Comment:_____

Invasive Exotics: N / Y_____ Growth Stage: Beginning_____ Medium

Erosion: None___ Beginning___ Medium___ Mature___ Place:_____

Converted to Work Order #_____ Post-work Inspection Date

Results: Approve / Disapprove (reason):_____

Post-work Inspector Name/Dept:_____

Post-work Inspector Name/Dept:_____

Littorals = ^
Shoreline = s
Submerged = o

Treatment: Herbicide___ Mechanical Removal___ None___ (needs comment):_____

Other Inspections

Mowing Needed: Y / N 10-foot Mowing Buffer in Place: Y / N Comment:_____

Invasive Exotics: N / Y_____ Growth Stage: Beginning_____ Medium_____ Mature_____

Erosion: None___ Beginning___ Medium___ Mature___ Place:_____

Target Plant #3:_____Growth Stage: Beginning_____ Medium_____ Mature_____

Herbicides Recommended:_____ Application Rate:_____

Evaluation

- Water clarity
- Wildlife
- Filamentous algae
- Anomalies
- Condition of stormwater structures

FLORA SCIENTIFIC NAME	FLORA COMMON NAME	SUBMERSED	EMERGENT	LITTORAL	% COVER pond/littorals	
Acacia auriculiformis	Earleaf Acacia *					
Acer rubrum	Red maple					
Ambrosia artemisiifolia	Common Ragweed					
Andropogon glomeratus	Bushy broom sedge					
Aster spp						
Baccharis halimifolia	Saltbush					
Bacopa spp	Lemon bacopa					
Bidens alba	Beggartick					
Centella asiatica						
Carex spp.						
Chara sp						
Coreopsis spp						
Cyperus spp.	Flat sedge					
Dichromena spp	White-top sedge					
Dioscorea bulbifera	Air Potato*					
Eleocharis sp.						
Eupatorium capillifolium	Dog fennel					
Fimbristylis sp.	Hurricanegrass					
Hydrilla venticillata	Hydrilla					
Hydrocytle	Dollar weed					
Juncus spp	Needlerush					
Leucaena leucocephala	Lead tree *					
Ludwigia spp.	Primrose willow					
Lygodium spp	Climbing fern*					
Melaleuca quinquenervia	Melaleuca *					
Mikania scandens	Climbing hempvine					
Muleynbergia	Muhly grass					
Panicum repens	Torpedo grass					
Phyla nodiflora	Frog fruit					
Pinus elliottii	Pine tree					
Pluchea ordorata						
Polygonum	Knot or smartweed					
Pontedaria cordata	Pickeralweed					
Quercus spp	Oak tree					
Rhynchospora spp	Beakrush					
Sagittaria spp	Duckpotato					
Salix caroliniana	Carolina willow					
Schinus terebinthifolius	Brazilian Pepper *					
Urocholoa sp	Bladderwort					
Wedelia sp.	Wedelia *					
Free Floating algae & type if identifiable: **Wildlife observations:**						

SCIENTIFIC NAME	COMMON NAME	SUBMERSED	EMERGENT	LITTORAL	% Cover pond/littoral

Priv

Irrigation condition:

- Water source(circle one) RECLAIMED STORMWATER UTILITY PRIVATE WELL
- Mobil Irrigation Lab (MIL) evaluation done YES NO

Pond(s):

- Vegetation present but not excessive(~30% submerged/emergent)

  _____
- Does the LSPA match the permit specifications_____
- Buffers present_____
- Pool or gutter discharges directed into the pond_____
- Condition of littoral shelves_____
- Aeration present_____
- Water clarity_____
- Water quality sampling_____
- Erosion of banks

  _____

  _____
- Wildlife_____
  - Fish stocking_____
  - Presence of Carp_____
  - Barriers in tact YES NO
- Nuisance wildlife present_____
  - Midges or mosquito problems YES NO
- Lake treatment
  - Who is the lake contractor_____
  - What is their treatment schedule_____
  - Do they use any mechanical removal or only chemical

    _____

How To Create a Healthy Pond

Engineering Soils, Hydrology

- Control erosion
- Inspect stormwater system regularly
- Understand your system design and permit
- Test soils

Water Quality

- Test appropriately and accurately

Flora Fauna

- Control pet waste and exotic wildlife
- Incorporate diversity in the design
- Be sure plants are being identified accurately
- Mechanical Removal whenever possible
- Incorporate landscape buffers and raingardens
- Florida Friendly Landscaping ™

How To Create a Healthy Pond

Human Factor

- Hire GI-BMP certified professionals
- Write contracts to incorporate BMP's
- Require communication between landscape and pond managers
- Maintain buffers at 10 feet
- Adhere to local ordinances
- Account for reclaimed water nutrients
- Use 100% controlled release fertilizer
- Protect storm drains when necessary
- Adaptive management

Provide Resources!

Thank You