

TALAVERA COMMUNITY DEVELOPMENT DISTRICT

DISTRICT OFFICE · WESLEY CHAPEL, FLORIDA 33544
MAILING ADDRESS · 3434 COLWELL AVENUE · SUITE 200 · TAMPA, FLORIDA 33614

Stormwater System and Pond Maintenance Information

If You See An Illicit Discharge In Talavera

Our waterways are very important to the community, and we must all work to protect them. The many ponds and lakes in our community are connected to each other and provide valuable resources to help prevent floods in our community. Keeping them healthy and free flowing is very important. Illicit discharges can destroy the Eco life of the waterways and also prevent them from doing their job.

The drainage in the neighborhood is designed to funnel all the water from the streets into these waterways. This means if you see someone discharging liquids into our streets, it is actually going DIRECTLY into the ponds and lakes behind your houses. If you see contractors or residents discharging liquid into the ponds or lakes directly, it is affecting our water quality.

It is illegal to discharge most liquids in the street or directly into our waterways. If you any illicit discharge, please report it via one of the 2 methods listed below:

- 1) Via the web <https://fl-pascocounty.civicplus.com/2373/Enforcement-Program>
 - 2) Via Phone 727-834-3611
-

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Southwest Florida *Water Management District*



Southwest Florida Water Management District

Who We Are

The Southwest Florida Water Management District (District) manages the water resources for west-central Florida as directed by state law.

The District encompasses roughly 10,000 square miles in all or part of 16 counties and serves a population of nearly 6 million people. The goal of the District is to meet the water needs of current and future water users while protecting and preserving the water resources within its boundaries.

A 13-member Governing Board oversees District activities. Members are unpaid volunteers appointed by the Governor and confirmed by the state Senate to set policy and administer the budget.

District funding comes from ad valorem property taxes, along with other intergovernmental sources. While the Legislature allows a tax levy up to 1 mill (\$1 for each \$1,000 of assessed land value), the actual tax levy has been less than the maximum.

What We Do

The District was established in 1961 as a flood protection agency. Since then, its responsibilities have grown to include managing the water supply, protecting water quality and preserving natural systems that serve important water-related functions.

[FOR MORE INFORMATION CLICK HERE](#)

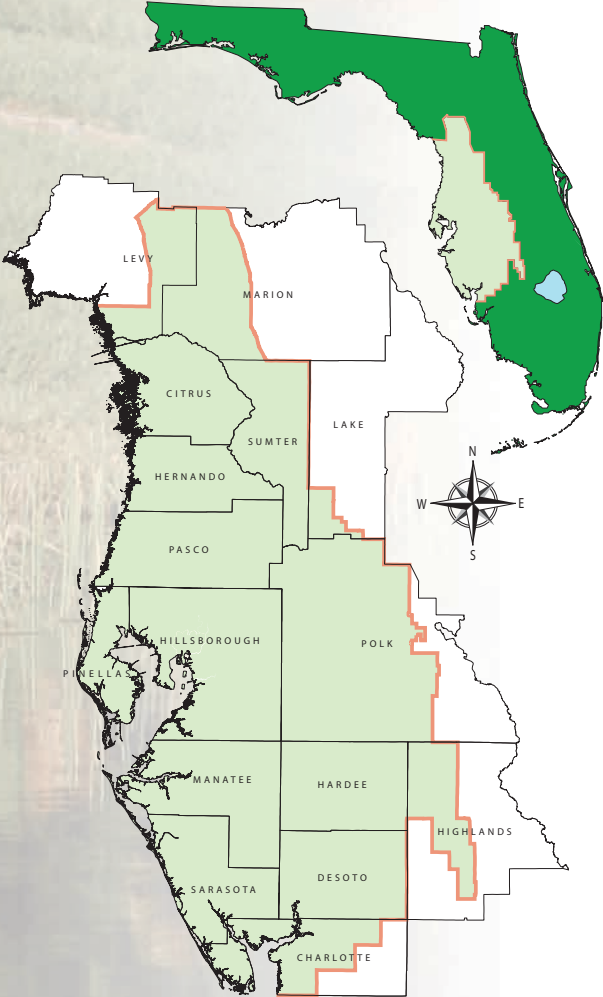
**Southwest Florida Water
Management District -
Stormwater Systems in
Your Neighborhood**

Stormwater Systems *in Your Neighborhood*



*Maintaining,
landscaping and
improving
stormwater ponds*

The Southwest Florida Water Management District (District) is the agency responsible for managing and protecting your water resources. The District's mission is to manage water and related natural resources to ensure their continued availability while maximizing the benefits to the public.



Southwest Florida Water Management District


Stormwater Systems

Simply put, a stormwater system is a tool for managing the runoff from rainfall. When rainwater lands on rooftops, parking lots, streets, driveways and other surfaces that water cannot go through, the runoff (called stormwater runoff) flows into grates, swales or ditches located around your neighborhood. These send the water into your stormwater pond. A stormwater pond is specifically designed to help prevent flooding and remove pollutants from the water before it can drain into the groundwater — our main source of drinking water — or into streams, rivers, lakes, wetlands, estuaries or the gulf. Your stormwater pond might be located in your backyard, down the street or on nearby property.



Without a stormwater system, the stormwater runoff usually flows into the nearest water body without treatment. The runoff carries pollutants such as litter, motor oil, gasoline, fertilizers, pesticides, pet wastes, sediments and anything else that can float, dissolve or be swept away by moving water.





History of Stormwater Systems

Wetlands are Florida's original stormwater systems and once covered more than half the state.

Wetlands are extremely valuable resources because they:

- Control flooding. They do this by soaking up and retaining excess water like a giant sponge. They also slow down water flow, giving floodwaters more time to recede.
- Serve as habitat for a variety of plants and animals. Many endangered plant and animal species depend on wetlands for their survival.
- Improve water quality. Wetlands slow down the flow of water and absorb pollutants, storing them, breaking them down and in some cases even using them as nutrients.

Unfortunately, because people once misunderstood the true value of wetlands, more than one-half of our original wetlands have been drained for agriculture or filled for roads, housing developments and industrial complexes.

As development increased and more paved areas covered the land, stormwater runoff became the primary source of pollution to surface waters in Florida. In the early 1980s, the Florida Legislature passed laws requiring treatment of stormwater.

How Stormwater Systems Work

Stormwater systems come in a variety of shapes, sizes and forms, but basically there are two types, retention and detention.



Retention System

Retention System

A retention system is designed to allow water to seep through soil into the shallow groundwater aquifer. A system can be constructed or it can be a natural depression. Grass stabilizes basin slopes and filters sediments. Retention systems are constructed so that stormwater percolates into the ground without direct discharge to natural surface water bodies.





Swale

A swale is a linear retention system. It is either a constructed or natural area shaped to allow water to be quickly absorbed into the ground or to allow the water to flow to other water bodies. As in a shallow ditch, a swale promotes water absorption through soils. Swales hold water during and immediately after a storm, but they are generally dry.



Detention System


Detention System

Detention systems (ponds) are the most recognizable stormwater system. They are designed to allow material to settle and be absorbed. After a storm, water slowly drains from the pond through a pipe in the “outflow”

structure. Part of the pond, known as the permanent pool, is always below the level of the drain structure. Constructed detention systems (ponds) are required to have aquatic plants around the perimeter to help filter sediment in stormwater runoff. The owner of the pond should refer to the permit for exact specifications.

Because retention and detention systems were designed to imitate natural processes, individuals may have stormwater systems on or near their property without realizing it. What appears to be a natural indentation in the backyard may have been designed as a stormwater swale. What looks like a wild patch of shrubbery may be an important vegetative buffer around a pond.





Responsibility for Stormwater Systems

In Florida, the responsibility for permitting most stormwater systems rests with the water management districts. After developers complete construction of permitted systems in residential areas, the permit and the legal responsibility for maintaining these systems are typically passed on to a homeowners, condominium owners or property owners association.

It is then that the upkeep and maintenance of the system becomes the responsibility of the association, not the developers or the water management district. The association is responsible for labor and expenses for keeping the system functional. This responsibility applies to every homeowner and property owner in the neighborhood, even if they do not live adjacent to a detention or retention system, as everyone's stormwater flows into the system.

Copies of your association's operation and maintenance permit, plans and maintenance guidelines were provided at the time of the transfer to your association's representative. For more specific information about your pond, you may call the Southwest Florida Water Management District's stormwater permitting staff. Contact information can be found on page 19 of this booklet.

Preventing Water Pollution

You can help conserve and improve the quality of water that enters the stormwater ponds and promote a healthy environment within your community by following the advice provided below.

Stormwater System Maintenance

If properly maintained, stormwater ponds help prevent flooding and filter out pollutants before they reach streams, rivers, lakes, wetlands, groundwater, estuaries and, ultimately, the gulf. The following are a few basic maintenance guidelines that can help keep your stormwater system functioning properly:

- Clear or clean inflow/outflow structures.
- Remove nuisance and excess vegetation.
- Repair eroded slopes.
- Clean up trash and yard waste in your yard and gutters and around storm drains.

Florida-Friendly Landscaping™

- Apply Florida-Friendly Landscaping™ principles to your landscape, which can conserve water and reduce pollution of water resources. By knowing your plants' soils and water needs, you can dramatically reduce the amount of water used for irrigation, chemicals used for pest control and fertilizers used for growth. Information on Florida-Friendly Landscaping™ can be found on the District's website, WaterMatters.org, or on the University of Florida's website, FloridaYards.org.





- Plant trees around the perimeter of a stormwater pond to help shade the area, absorb nutrients and lower the water table.
- Plant a buffer zone (minimum of 10 feet) of low-maintenance plants between your lawn and shoreline to absorb nutrients and provide wildlife habitat.

Chemical Use on Landscape

- Use nontoxic chemical alternatives whenever possible and pull weeds by hand.
- Avoid overuse of fertilizers, especially near the water's edge. Rain and lawn watering can wash excess fertilizer into water bodies where excess nutrients cause algal blooms (green pond scum) and undesirable weed growth. The University of Florida's Institute of Food and Agricultural Sciences recommends using fertilizers with a high percentage of slow-release nitrogen. The higher percentage of slow-release, the less chance of leaching into Florida's water bodies. Proper fertilizer application can result in less mowing, less thatch buildup, less irrigation, fewer nutrients washing into ponds and water bodies, and fewer insect and disease problems.
- Use only herbicides labeled for aquatic use when maintaining stormwater ponds. Herbicides not labeled for aquatic use may harm fish and other aquatic life, and their application to aquatic sites is prohibited by state and federal law.
- Wait until grass is actively growing to apply fertilizer. Fertilizer applied when grass is not growing wastes your money and time and can contaminate your water.

- If fertilizer is spilled on the lawn or on the sidewalk or pavement, sweep it up as thoroughly as possible and put it back in the bag.

Additional Tips for Preventing Water Pollution

- Never dump oils and other chemicals from your home directly into stormwater drains, which are direct conduits to your stormwater pond or natural water body. Contact your local government's waste management department for a list of disposal facilities.
- Keep vehicles tuned up and in good operating condition. Check for drips and repair leaks immediately to keep nuisance oils off pavement.
- Buy low- or no-phosphate cleaners and detergents. Phosphates act as a fertilizer and increase algae and aquatic weeds in stormwater ponds. When these plants die, they rob the water of oxygen and fish may die.
- Wash your vehicles, bicycles and home equipment on the lawn, where soapy water can't quickly run toward the nearest storm drain, picking up other pollutants as it goes. Wash your car with nontoxic, low-phosphate soap and use water sparingly.
- Sweep walks and driveways instead of hosing them down.
- Clean up pet wastes from which nutrients and bacteria can enter the stormwater drains and contaminate the water system.
- Avoid cutting your lawn too short, which reduces its effectiveness in capturing runoff. Leaving it taller will help it to survive dry periods.





- Never deposit lawn clippings in water bodies and storm drains as this can increase oxygen demand in the water, which can significantly harm fish populations. Use lawn clippings for mulch or compost.
- Do not fill stormwater ponds, swales and retention systems because this can cause flooding and endanger water bodies. Stormwater systems are designed and constructed to an appropriate size. Any reduction in treatment volume will interfere with the pond's ability to hold stormwater runoff.
- Changing the elevation of large pieces of property can have drastic impacts on where stormwater flows. Consult the stipulations of your neighborhood's permit before any construction.

Aquascaping Your Stormwater Pond

Aquascaping is simply landscaping the shoreline of ponds with aquatic and wetland plants. Aquascaped ponds and lakes have fewer problems than those without aquascaping. Desirable vegetation will filter polluted runoff, trap sediments, control the growth of nuisance vegetation and help make the pond visually pleasing. Aquatic plants pump oxygen into the water and create habitats by providing cover and nurseries for fish and other organisms. More importantly, vegetated shorelines help improve water quality.

Choose desirable, low-maintenance plants to aquascape your stormwater pond. Not all plants are good for aquascaping, and the removal of prohibited or unwanted plants can be difficult. Associations are advised to contact a reputable pond management company for most vegetation management programs.

The next few pages contain a brief overview of some desirable, high-maintenance and prohibited aquatic plants.



Plants Desirable for Aquascaping

Aquascaping is landscaping in and around your pond. These plants are preferred for your “aquatic garden” as they grow slowly and require little maintenance.

American white waterlily... *Nymphaea odorata*

Arrowhead..... *Sagittaria latifolia*

Blue flag iris or Dixie iris ... *Iris hexagona*

Bog buttons *Lachnocaulon* spp.

Bur-marigold..... *Bidens laevis*

Duck potato..... *Sagittaria lancifolia*

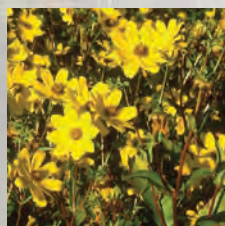
Giant bulrush *Scirpus californicus*

Golden canna *Canna flaccida*

Gulf Coast spikerush..... *Eleocharis cellulosa*

Lemon bacopa *Bacopa caroliniana*

Lizard’s tail..... *Saururus cernuus*



Bur-marigold
Bidens laevis

Photo: Vic Ramey
© 2002 Univ. Florida



Pickerelweed
Pontederia cordata

Photo: A. Murray
© 1999 Univ. Florida

Maidencane *Panicum hemitomon*

Pickerelweed *Pontederia cordata*

Pipewort *Eriocaulon* spp.

Soft rush *Juncus effusus*

Softstem bulrush *Scirpus
tabernaemontani*

Spikerush *Eleocharis* sp.

St. John's wort..... *Hypericum brachy
phylum*

Swamp lily *Crinum americanum*

Tapegrass or eelgrass..... *Vallisneria americana*

Threadleaf arrowhead..... *Sagittaria filiformis*



Golden canna
Canna flaccida

Photo: A. Murray
© 2000 Univ. Florida



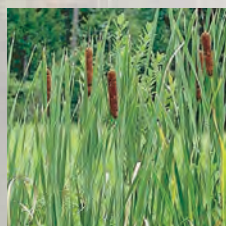
Spikerush
Eleocharis sp.

Photo: Photographer not listed
© date not listed Univ. Florida

High-Maintenance Aquatic Plants

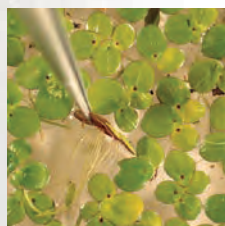
These plants may or may not be native, but they grow quickly and may become weedy. The list below is **not recommended**.

- Bladderwort..... *Utricularia* spp.
- Cattail *Typha* sp.
- Coontail..... *Ceratophyllum demersum*
- Duckweed..... *Spirodela polyrhiza*
- Mosquito fern..... *Azolla* sp.
- Paragrass..... *Urochloa mutica*
- Pennywort..... *Hydrocotyle* sp.
- Sedge..... *Cyperus* sp.



Cattail
Typha sp.

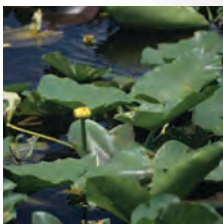
Photo: Kerry Dressler
1996



Duckweed
Spirodela polyrhiza

Photo: Vic Ramey
© 2000 Univ. Florida

- Smartweed..... *Polygonum* spp.
- Southern naiad..... *Najas guadalupensis*
- Spatterdock..... *Nuphar advena*
- Torpedograss *Panicum repens*
- Water fern..... *Salvinia minima*
- Wild taro..... *Colocasia esculenta*



Spatterdock
Nuphar advena

Photo: Vic Ramey
© 2005 Univ. Florida



Wild taro
Colocasia esculenta

Photo: Vic Ramey
© 2005 Univ. Florida

Prohibited Aquatic Plants

Prohibited plants are aggressive weeds that are restricted by state or federal law. These invasive plants may not be possessed, transported, cultivated or imported without a special permit.

Alligatorweed *Alternanthera philoxeroides*

Aquarium watermoss..... *Salvinia molesta*

Eurasian watermilfoil..... *Myriophyllum spicatum*

Hydrilla..... *Hydrilla verticillata*

Water spinach..... *Ipomoea aquatica*

Water hyacinth *Eichhornia crassipes*

Water lettuce..... *Pistia stratiotes*

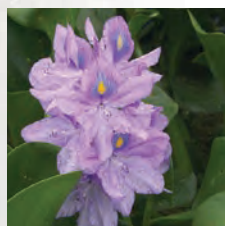
West Indian marsh grass.... *Hymenachne amplexicaulis*

For additional information, visit the Florida Fish and Wildlife Conservation Commission at MyFWC.com.



Hydrilla
Hydrilla verticillata

Photo: Vic Ramey
© 1999 Univ. Florida



Water hyacinth
Eichhornia crassipes

Photo: A. Murray
© 2002 Univ. Florida

Contact Information

Your stormwater pond has been designed and constructed to meet specific criteria to ensure that it functions properly. For more information about stormwater treatment systems in the Southwest Florida Water Management District, contact the nearest office below. You also can search the permit associated with your stormwater pond at WaterMatters.org/WMISERP.

Tampa Service Office

7601 Highway 301 North
Tampa, FL 33637-6759

(813) 985-7481 • 1-800-836-0797 (FL only)

This office issues all permits and provides assistance to residents in Hillsborough and Pinellas counties.

Brooksville Headquarters

2379 Broad Street
Brooksville, FL 34604-6899

(352) 796-7211 • 1-800-423-1476 (FL only)

This office provides assistance to residents in Hernando, Pasco, Citrus, Lake, Levy, Marion and Sumter counties.

Bartow Service Office

170 Century Boulevard
Bartow, FL 33830-7700

(863) 534-1448 • 1-800-492-7862 (FL only)

This office provides assistance to residents in Polk, Highlands and Hardee counties.

Sarasota Service Office

6750 Fruitville Road
Sarasota, FL 34240-9711

(941) 377-3722 • 1-800-320-3503 (FL only)

This office provides assistance to residents in Sarasota, Manatee, Charlotte and DeSoto counties.

The Southwest Florida Water Management District (District) does not discriminate on the basis of disability. This nondiscrimination policy involves every aspect of the District's functions, including access to and participation in the District's programs and activities. Anyone requiring reasonable accommodation as provided for in the Americans with Disabilities Act should contact the District's Human Resources Bureau Chief, 2379 Broad St., Brooksville, FL 34604-6899; telephone (352) 796-7211 or 1-800-423-1476 (FL only), ext. 4703; or email ADACoordinator@WaterMatters.org. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1-800-955-8771 (TDD) or 1-800-955-8770 (Voice).



BALANCING WATER NEEDS ... PROTECTING WATER RESOURCES

Southwest Florida
Water Management District

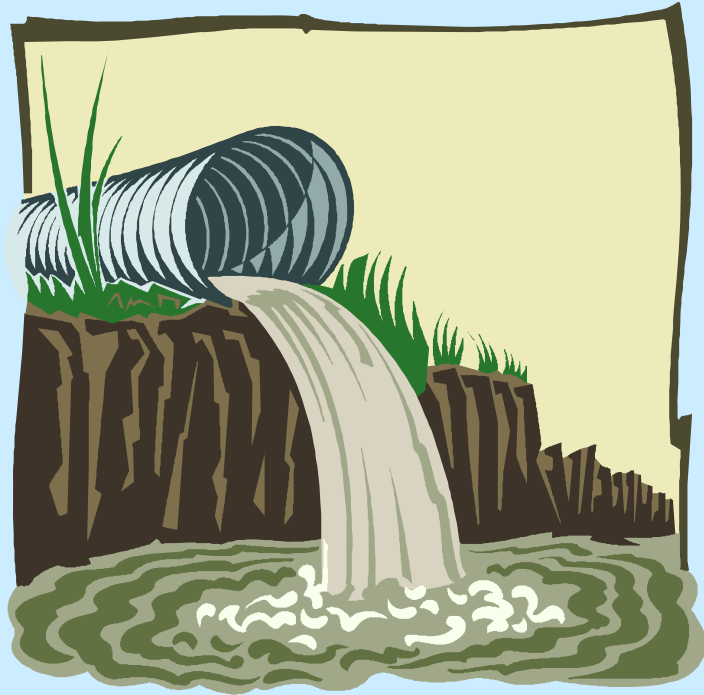


WATERMATTERS.ORG • 1-800-423-1476

**For more information, please contact:
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
(352) 796-7211
1-800-423-1476 (FL only)**

*Some text excerpted from the
Neighborhood Guide to Stormwater Systems.
Used with permission of the St. Johns River Water Management District.*

**Identification And Elimination
of Illicit Discharges - Florida
Department of Environmental
Protection NPDES Stormwater
Section - Stantec**



**IDENTIFICATION
AND
ELIMINATION OF
ILLICIT
DISCHARGES**

**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
NPDES STORMWATER SECTION**

PURPOSE...

- Educate staff and contractors to recognize, report, and stop illicit discharges.
- Create a culture of Pollution Prevention (P²) within OUR agency and community to prevent “pointless personal pollution.”



WHY AM I HERE?

- **YOU are in the field as part of your job**
- **YOU are the “eyes” of our local government or agency**
- **YOU are part of the front lines in preventing illicit discharges**
- **YOU need to know what to look for and what to do if you see illicit discharges**

WHAT IS THE MS4?

- **“Municipal Separate Storm Sewer System”**
- **It is your “Master Drainage System”**
- **The “system” includes road drainage, catch basins, channels, detention ponds, swales, ditches, pipes, etc.**
- **Owned by local governments, WCDs, special districts**
- **Ultimately discharges to surface waters (lakes, rivers, bays, ocean, wetlands)**

HOW STORMWATER REACHES SURFACE WATER

- Sanitary sewer
- Storm sewer



WHAT IS A NPDES MS4 PERMIT?

- **Required by Federal Clean Water Act and by 403.0885, Florida Statutes**
- **NPDES = “National Pollutant Discharge Elimination System”**
 - **Implement Stormwater Management Program (SWMP) to minimize stormwater pollutant loadings.**
 - **Prohibit non-stormwater discharge to the MS4 through education, rules, policies, and inspections.**
 - **Improve and restore impaired waters by reducing stormwater loads.**

ALLOWABLE DISCHARGES INCLUDE...

- **Flows from emergency fire fighting activities.**
- **Water line flushing.**
- **Irrigation from lawn watering.**
- **Air conditioning condensate**
- **Rising ground waters.**
- **Dechlorinated/desalinated swimming pool water.**
- **Residential car washing.**



WHO IS RESPONSIBLE?

- *Everyone is!*
- We have a permit and moral obligation to future generations.
- Contact your MS4 staff for assistance in identifying a possible illicit discharge you have observed and how to prevent it.



WHY BE CONCERNED WITH ILLICIT DISCHARGES?



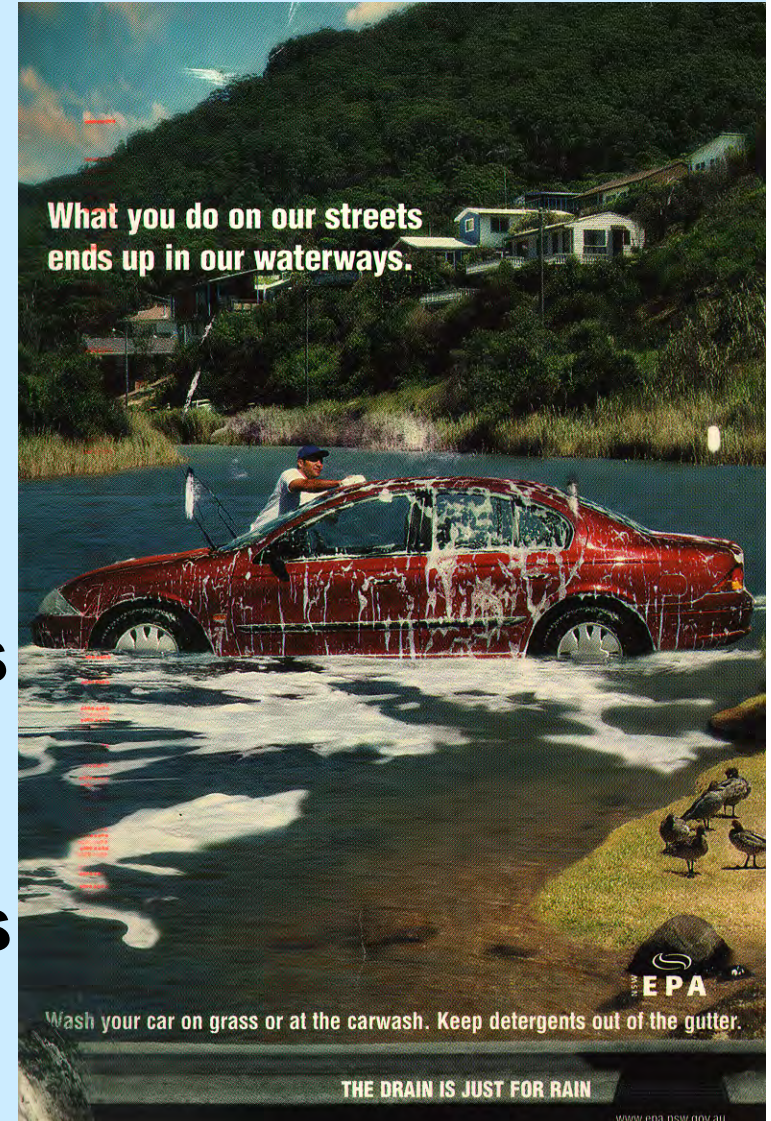
- **To ensure that only stormwater goes into our MS4.**
- **To protect our lakes, rivers, estuaries, and wetlands from pollution.**

ILLICIT DISCHARGES ARE...

- **Any discharge to an MS4, surface water, or ground water that is not composed entirely of stormwater runoff.**
- **Illicit Discharges may include:**
 - **Deliberate discharges or dumping**
 - **Incidental runoff from sites with chemicals, raw materials, or bare soil.**

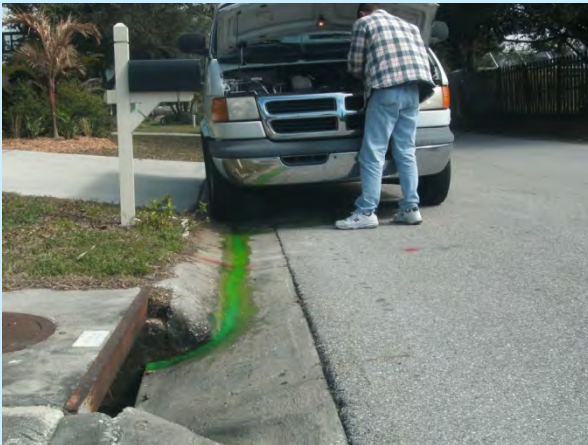
What are Examples of Illicit Discharges?

- Raw Sewage/ Septic Effluent
- Washing machine wastewater
- Car wash wastewater
- Improper oil or household toxics disposal
- Improper radiator flushing
- Paints, pesticides, herbicides
- Construction and other debris
- Pressure washing with soaps
- Grass clippings or yard waste
- Spills from roadway accidents



Types of Illicit Discharges

- **Illegal Dumping**
- **Illicit Connections**
- **Construction-related Discharges**
- **Pipe Defects (sanitary sewer)**
- **Accidental Discharge or Spills**



Illegal Dumping

Discharge of pollutants or non-stormwater materials into the storm sewer system



REPORT IMMEDIATELY

Illicit Connection

An improper physical connection to the stormwater system which can include non-permitted connection(s) to our MS4.

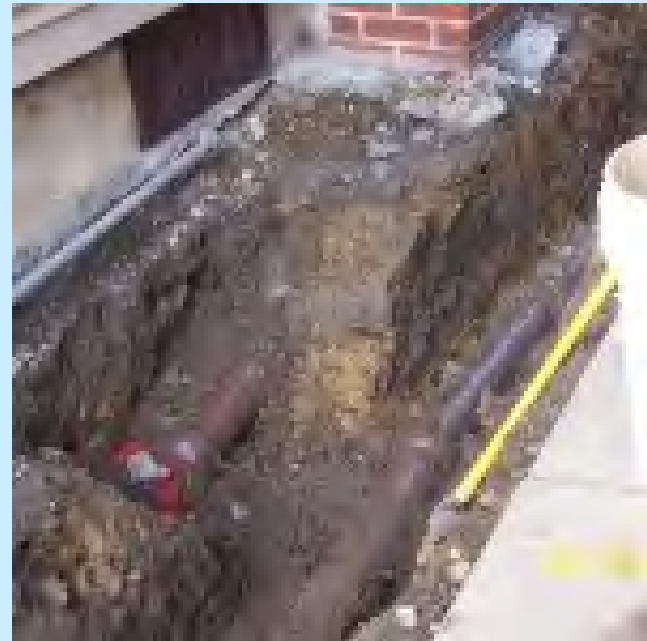
Direct Connection

- Wastewater piping
- Sewage from residential property
- Washing machine discharge
- Pipes to a stormwater drain



Indirect Connection

- Cracked sanitary systems
- Spills collected by drain outlets
- Paint or used oil dumped into drainage systems



Construction-Related Discharges

These are discharges into the MS4 or right-of-way from adjacent construction projects.

Some examples are:

- **Turbid water from dewatering and other construction activities.**
- **Contamination from discharges associated with remediation projects.**
- **Non-permitted dewatering discharges**



Sanitary Sewage

- Sanitary sewage may be present if there is black staining inside the drainage pipe; visible evidence of sanitary waste, floating debris, or opaque or gray water.
- Sewage may originate from septic tank overflow pipes or improperly dumped travel trailer waste.



Failing septic tank

Accidental Discharge or Spills

Reporting a discharge or spill

- The reporting requirements for spills are 25 gallons or more of petroleum or petroleum based products.



Florida State Warning Point 1-800-320-0519

DOCUMENTING & REPORTING ILLICIT DISCHARGES

- Each MS4 has it's own SOPs – Part 2 of training
- Typically use inspection checklist
- Need to know to whom and how to report possible illicit discharge

**FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FIVE
ILLICIT DISCHARGE DETECTION INSPECTION REPORT
NPDES MS4 STORMWATER PROGRAM**

Date: _____ Time: _____ Current Weather Condition: _____
Firm or Agency: _____ Name: _____ Phone # _____
Illicit Discharge Location (Address/Location): _____
_____ Mile Post: _____ (or) Station #: _____
Receiving Water Body: _____ Ultimate Receiving Water Body (if Known): _____

Physical Hydrologic/Hydraulic Data
Time since last rain event: > 72 hours < 72 hours Quantity of last rain event: _____ inches
Connection Type: Circular Elliptical Ditch or Swale Weir Culvert Arched Causal Unknown
Description: _____
Connection Material: RCP (Reinforced Concrete Pipe) CMP (Corrugated Metal Pipe) PVC (Polyvinyl Chloride Pipe)
and/or: Concrete Earthen Ductile Iron (DIP) Fiberglass Asphalt Unknown Other
Description: _____
Connection/Outfall Size/Diameter: _____ feet and/or _____ inches

General Observation of Illicit Discharge
Water Present: Yes No Abandoned Drums/Containers or Material Present: Yes No (If Yes Describe Below)
Water Color: Clear Red Yellow Brown Green Grey Dark Tannin Other _____
Odor: None Musty Sewage Sulfur/Rotten Eggs Sour Milk Fishy Other _____
Floatables: None Oil Sheen Garbage/Trash Sewage/Milt Other _____
Sedimentation: None Slight Moderate Heavy Suspended Solids Other _____
Turbidity: Clear Slightly Turbid Moderately Turbid Heavily Turbid Other _____
Incident Description/Observation: _____

Source: Ownership/Area Characteristics (Illicit connections only)
Municipality (City/County), if known: _____
Immediate upstream property owner's name and/or address: _____
Type of Facility/Operated or Property Description: _____
CC: () D5: Patrick Muench P.E. (386) 943-5434 Fax: (386) 736-5302

***** This section to be completed by Environmental Permitting Engineer *****
Follow-up inspection required? Yes No Date Scheduled: _____ Time: _____
Referred to _____ for further Investigation only, and/or Corrective action, by _____
Comments/Instructions: _____

FOR YOUR SAFETY ALWAYS REMEMBER: NEVER INHALE, TOUCH OR COME IN CONTACT WITH ANY UNKNOWN SUBSTANCES
Revised 3/22/2008

Spill Response Procedures

Information needed when reporting a spill

- Name, address and phone number of person reporting the spill
- Name, address and phone number of responsible party for the discharge (if known)
- Date and time of the spill and status of spill (ongoing or ceased)
- Estimated amount of the spill
- Location or address of the spill
- Source or cause of the spill
- Description of area affected by the spill
- Provide as much information as possible

What to look for – common signs of illicit discharges



Common Signs of Discharges

- Staining from paints or solvents on outfalls pipes, inlets and grates, and around pond bank
- Turbidity, oil/gas sheen, foam and/or suds
- Abandoned oil and gas containers, barrels, and paint cans
- Discoloration of water or vegetation
- Floatables and debris
- Pungent odors or other smells



Oil / Gas

- Recognized as a sheen on the water = rainbow
- Natural sheens may be differentiated from an oil/gas sheen by swirling the sheen around in the water. If it re-attaches, the sheen is oil/gas.



Foams / Detergents

- Products used to wash boats/vehicles/buildings may include chlorine, phosphates and ammonia.
- These products often enter lakes and streams as a result of improperly connected car washes or washing machines.



Examples of Previous Illicit Connections and Discharges



Unknown pipe into storm sewer inlet



Water by nature is not green!

Examples of Previous Illicit Connections and Discharges



Washing machine discharge



Unknown pipe to inlet

Examples of Illicit Connections and Discharges



Restaurant grease traps



Septic tank overflow



Pressure washing



Stains lead to storm sewer inlet



MORE INDICATIONS...



- A person emptying a drum or bucket of waste
- A tank or vactor truck draining its contents through a hose in a manhole
- A hose running out the back door of an industrial site into a ditch or a wooded lot

Even More Clues



- **Unauthorized pipe which has been connected to the storm sewer**
- **Discoloration of channels and pipes**
- **Flow where there shouldn't be any**

WHEN YOU FIND AN ILLICIT DISCHARGE...

- **On a property under your control...**
 - **Stop the discharge.**
 - **Notify supervisor and/or safety officer.**
 - **Cleanup discharge or spill.**
 - **Implement strategy to prevent illicit discharges in the future.**

WHEN YOU OBSERVE AN ILLICIT DISCHARGE...



- On a property not under your control...
 - Take picture and/or note location, characteristics, date, and time.
 - Identifying marks
 - Commercial vehicle?
 - Any ID on the door?
 - License Number
 - Report to MS4 immediately.

CREATING A CULTURE OF POLLUTION PREVENTION (P²)...

- Administration and Communication
 - Create a plan of action/SOPs to manage illicit discharges.
 - Stormwater Pollution Prevention Plan
 - Spill Cleanup Plan and Spill Cleanup Kits
 - Create channels of communication of reporting potential or observed illicit discharges.
 - These channels should go up and down the Org. Chart.
 - Like safety, P² is everyone's responsibility.



WE MUST SET AN EXAMPLE

CREATING A CULTURE OF POLLUTION PREVENTION (P²)...

- **Housekeeping and Materials Management**
 - **Vehicle Washing/Maintenance**
 - **Wash water should never discharge to storm sewer or surface waters.**
 - **Maintenance should be performed indoors.**



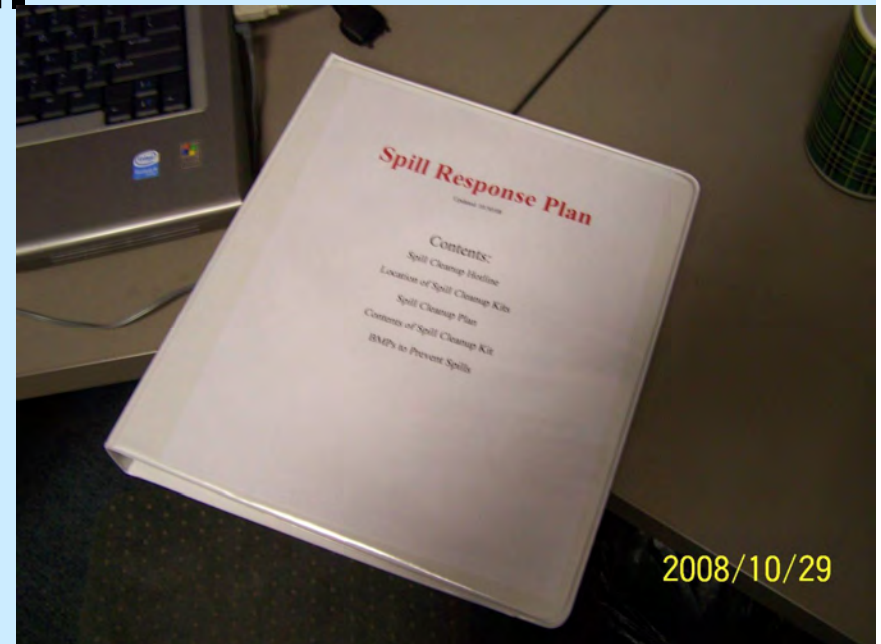
CREATING A CULTURE OF POLLUTION PREVENTION (P²)...

- Housekeeping and Materials Management
 - Spill Prevention
 - Use drop cloths, drip pans, and secondary containment.



CREATING A CULTURE OF POLLUTION PREVENTION (P²)...

- Housekeeping and Materials Management
 - Spill Reporting and Response
 - Spill reporting hotline.
 - Spill Cleanup Plan.
 - Spill Cleanup Kit.



CREATING A CULTURE OF POLLUTION PREVENTION (P²)...

- **Housekeeping and Materials Management**
 - **Street and Yard Maintenance**
 - **Street sweeping.**
 - **Inlet protection.**



CREATING A CULTURE OF POLLUTION PREVENTION (P²)...

- **Housekeeping and Materials Management**
 - **Material Storage**
 - **Cover stockpiles, drums, and other containers.**
 - **Know manufacturers storage guidelines.**



CREATING A CULTURE OF POLLUTION PREVENTION (P²)...

- **Housekeeping and Materials Management**
 - **Landscaping and Lawn care**
 - **Keep clippings out of street and stormwater inlets.**
 - **Sweep up spills and reuse the fertilizer.**
 - **Use Florida-friendly fertilizers = low or no phosphorus and slow release nitrogen.**
 - **Know manufacturers application rates.**
 - **Keep pesticides and fertilizers away from lakes, rivers, wetlands, streets, and stormwater inlets.**



GUARANTEED ANALYSIS	
Total Nitrogen (N).....	35.0%
35% Urea Nitrogen*	
Soluble Potash (K ₂ O).....	5.00%
Boron (B).....	0.03%
Copper (Cu).....	0.05%
Iron (Fe).....	5.00%
0.10% Water Soluble Iron (Fe)	
Manganese (Mn).....	0.05%
Molybdenum (Mo).....	0.0006%
Zinc (Zn).....	0.05%
Derived from: Polymer-coated Urea, Urea, Muriate of Potash, Sodium Borate, Copper Oxide, Ferric Oxide, Ferrous Sulfate, Manganese Oxide, Molybdic Oxide and Zinc Oxide.	
* Contains 15% slowly available Nitrogen from coated Urea.	
F1074	



THE CONSEQUENCES...

- Florida DEP and the US EPA can levy very hefty fines...

FOR IMMEDIATE RELEASE: September 29, 2008
CONTACTS: Amy Graham, (850) 245-2112 or (850) 778-7258

DEP AGENTS CRACK DOWN ON WASTE VIOLATIONS STATEWIDE

-Two arrests triggered by citizen calls to State Warning Point-

TALLAHASSEE- Florida Department of Environmental Protection (DEP) law enforcement agents made three separate arrests last week for waste violations, including one for storing, processing or disposing of solid waste within 200 feet of a natural body of water, a first degree misdemeanor punishable by up to six months in jail and/or a fine up to \$10,000.



FOR IMMEDIATE RELEASE: October 17, 2008
CONTACTS: Amy Graham, (850) 245-2112 or (850) 778-7258

DEP SLEUTHS SOLVE WETLANDS CRIME

~Suspect arrested after destroying 10 acres of wetlands~

BAY COUNTY- After a three month investigation, Florida Department of Environmental Protection (DEP) law enforcement agents last week arrested a man with causing pollution, a third degree felony punishable by up to five years in prison and a fine of up to \$10,000. Thomas Bodie, who was arrested after clearing and filling approximately 10 acres of state jurisdictional wetlands, was also charged with failing to obtain a permit, a misdemeanor punishable by up to one year in jail and a fine of up to \$1,000.

Search:

[Tips](#)

Articles

Four Of The Nation's Largest Home Builders Settle Storm Water Violations

June 12, 2008

Washington, D.C. — Four of the nation's largest home builders have agreed to pay civil penalties totaling \$4.3 million to resolve alleged violations of the Clean Water Act, the Justice Department and Environmental Protection Agency announced recently. The companies also have agreed to implement company-wide compliance programs that go beyond current regulatory requirements and put controls in place that will keep 1.2 billion pounds of sediment from polluting our nation's waterways each year.

The home builders are Centex Homes, based in Dallas; KB Home, based in Los Angeles; Pulte Homes, based in Bloomfield Hills, Mich.; and Richmond American Homes, based in Denver. The four separate settlements resolve alleged violations of storm water run-off regulations at construction sites in 34 states and the District of Columbia. Each company will pay the following penalties:

Centex: \$1,485,000

KB Home: \$1,185,000

Pulte: \$877,000

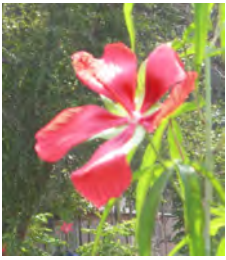
Richmond: \$795,000

**Guide to Selection and
Enhancement of Stormwater
Pond Plants for Talavera -
Gail Hansen, Shangchun Hu
UF/IFAS Environmental
Horticulture Department
Center for Landscape
Conservation and Ecology -
Stantec**

Guide to Selection and Installation of Stormwater Pond Plants



Gail Hansen, Shangchun Hu
UF/IFAS Environmental Horticulture Department
Center for Landscape Conservation and Ecology



Plant Selection

Selecting aquatic and shoreline plants for stormwater ponds is more challenging than selecting plants for a typical landscape. The site conditions can vary greatly and are more difficult

to control. Water depth can fluctuate widely over the year and create wet and dry conditions that the plants must be able to tolerate. The water quality can also vary with rainfall and fertilizer inputs and steep slopes can make plant establishment difficult.

The concept of using the right plant in the right place is important in the shoreline environment because the shoreline includes a variety of conditions including a dry slope, a littoral shelf, and deeper water areas. Selecting the right plant requires knowledge of plants, including function, aesthetics, and environmental/growing requirements and knowledge of site characteristics. Three questions to ask about plants are:

1. Aesthetically: what do you want the plant to look like?
2. Functionally: what do you want the plant to do?
3. Environmentally: what conditions does the plant need to grow?

Aesthetics

There are common plant characteristics that are generally considered to have aesthetic value. Most people enjoy a variety of color, texture, and forms in plant material. Aesthetic characteristics describe the look of the plant and can be used to create a pleasing composition that enhances the aquatic habitat. Aesthetics also refers to the organization of plants in the landscape through repetition of plants and color, form, or texture at specific locations in the landscape to create a recognizable pattern.

Color- Color is usually the most attractive visual characteristic of plants, but it also is the most fleeting, as most plants only display prominent color during short bloom periods. Light qualities of the site--sunny or shady areas--affect the perception of color. Warm colors such as white, yellow, orange, and red show up more in aquatic and shady environments because they contrast with the darker blues, greens, and browns of water and foliage. Cool colors such as blues and dark purples are less noticeable because they tend to blend with greens. Including a variety of greens in the aquatic plants will create interest year-around.

References

Denny, G, and Hansen, G. (2012) *Right Plant– Right Place: The Art and Science of Landscape Design-Plant Selection and Siting*. <http://edis.ifas.ufl.edu/ep416>.

Hansen, G. & Alvarez, E. (20120) *Landscape Design: Aesthetic Characteristics of Plants*. <http://edis.ifas.ufl.edu/ep433>.

Texture- Textures are typically described as coarse (large, broad leaves and big stems) medium (average leaves and stems), or fine (tiny leaves, thin stems). Texture can provide contrast and interest, particularly when there is a lack of variety in color. Texture is the most variable quality of a plant- it can change with the seasons when plants lose their foliage, and it can change with viewing distance. Stormwater ponds are often viewed from a distance so bold textured plants with large, broad leaves and big flowers show better. Use a fine textured plant, such as a grass, to contrast with the bold texture and provide more interest.

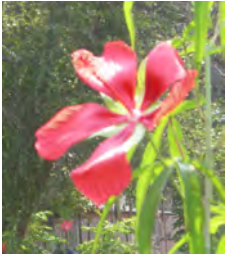
Form– Growth habit or form, is the most recognizable quality of a plant. Choose the plant form most appropriate for the desired function. It is important to remember that plant change over time as they grow. Form also helps determine if plant material should be used in masses or as individual specimens. In large open areas such as ponds large upright plants with well defined leaves that grow in large clumps are often preferred. Floating plants with broad flat leaves, such as water lilies, work well as long as they don't spread and cover the entire pond surface.

Size- It is important to consider the size of the plant when it is fully mature. Tall plants can sometimes block views when they are mature so consider height as well as spread. The slope to the water affects the visual height of the plant depending on the location of the plant on the slope. Tall plants at the top of the slope will block the view of the water so locate low growing plants at the top of slope and taller plants at the bottom.

Function

When choosing plants for a particular site, consider the Function of the plants. Functional characteristics include density of foliage to block views, density of root mass to prevent erosion, and ability to take up nutrients and pollutants to improve water quality.

Erosion control - Trees in the water at the pond edge can help control erosion by breaking up the wind and wave action that contributes to shore erosion. Large trees that do well in wet conditions include: Red Maple (*Acer rubrum*), Loblolly Bay (*Gordonia lasianthus*), and Bald Cypress (*Taxodium spp.*). Strongly rooted emergent plants also help prevent erosion . Emergent plants include: Bulrush (*Scirpus spp.*), Spike Rush (*Eleocharis app.*), Pickerel weed (*Pontederia cordata*), and Duck Potato



Growing Conditions

A site inventory and analysis will guide plant choices by noting environmental conditions in the pond and on the shoreline. Conditions that affect plants in aquatic habitats include water depth, fluctuating water levels,

foraging fish, soil structure, the slope of the littoral shelf, and light availability. Conditions that affect landside plants include bank slope and soil structure.

Water Depth

Water depth must be considered when choosing plants because wetland plants grow in three different groups or zones with varying water depths. Emergent wetland plants are rooted in the soil in the shallow water of the upper littoral zone with the upper portion of the plant out of the water. Emergent wetland plants are further divided into short-stemmed marginal plants that do well in wet mud or sand and marginal plants that grow on the bank and prefer changing water levels. Submerged plants grow entirely underwater and are typically located in the lower littoral zone where the water is deepest. The floating wetland plants have roots that dangle and are rooted in the pond bottom in the middle littoral zone. Creating deeper areas by excavation can help expand the size of planted areas.

Fluctuating Water Levels

Ponds that have fluctuating water levels present a challenge when selecting plants. The plants need to thrive in both wet and dry conditions, sometimes for extended periods. Emergent plants that are more tolerant of draw-downs (exposed pond soil) include: Pickerel-weed, (*Pontederia* spp.), Duck Potato (*Sagittaria lancifolia*), Bulrush (*Scirpus* spp.), Golden Canna (*Canna flaccida*), Spike Rush (*Eleocharis* sp.) and Blue Flag Iris (*Iris virginica*).

Controlling Grass Carp

Although Grass carp (sterile triploid) are sometimes used for biological control of aquatic vegetation they can present problems with new plantings. Grass carp prefer submerged plants, but they also browse on the tips of young tender emergent plants. To prevent loss of new plants install a barricade around the plants, such as four wire fencing or plastic net fencing from the pond bottom to the top of the water until the plants are larger and less tender.

Soil Structure

Soil (substrate) conditions are important for plant growth. Rocky bottoms in the pond are too hard for plant roots to penetrate and muck soil is too soft and unstable to anchor plants. Sandy soil with some organic matter (between rocks and muck) is usually best. Too much organic matter can create high levels of acids, methane, ethylene, and alcohols which are toxic to plants.

Slope of Littoral Shelf

Steep slopes, that create changes in water levels and growing conditions make establishment more difficult. It is important to determine the average water level along the shoreline on a yearly basis because many plants will die if they are too wet or too dry for long periods. Manipulating the depth and slope is one of the best ways to encourage plant growth. Littoral zone size often increases as the pond gets older because increased sedimentation and water movement decreases the depth of the lake.

Slope of Pond Bank

The slope of the bank leading to the waters edge can present challenges for the establishment of the no-mow or no-maintenance zone. Several techniques can be used to prevent erosion and capture irrigation water for the slope plants. Installing mini-baffles (short lengths of plastic edging or landscape timbers) on the downhill side of plants will hold water and keep soil from eroding. Porous landscape fabric such as burlap or jute will also trap sediment and water. Rip rap made from stone, concrete rubble or pavers can help slow water runoff and creating swales and berms along the bank will intercept water and allow it to percolate.

Light Availability

Light availability is the most important factor in plant growth and is primarily determined by water clarity and depth. Water clarity is determined by organic color and suspended particles, both organic and inorganic. Bottom feeding fish such as carp and catfish can increase suspended sediment which blocks light and may limit plant growth. Slowing surface runoff with plant buffers and no-mow zones and using rip-rap at drain discharge areas will help decrease turbidity caused by water movement. Nutrient levels in ponds, both from soil and human-caused, can affect light availability by increasing algal growth which decreases water clarity. Reducing algae growth will increase light available to plants.

References

White, Gilbert, F., Worthington, E.B., and Ackerman, V.C. (1973) *Man-Made Lakes: Their Problems and Environmental Effects* American Geophysical Union, William Byrd Press, Richmond Virginia.

Shoreline Plant Installation

1. Shoreline preparation

Remove undesirable plant species in the shoreline area. Remove roots of undesirable species to prevent regrowth.

Determine the average shoreline water level on a yearly basis. This is especially important because water levels may vary dramatically that making plants harder to survive if they are kept too wet or too dry for extended periods.

Measure maximum water depth in areas to be planted. These measurements will assist in deciding the numbers and types of plants you need and the boundaries in which to plant them.

Consider increasing the size of planting zones. Deepening the margins around the edge of a pond can help prevent undesirable plants, such as non-native torpedo grass, from invading into the water.

Develop a detailed planting plan that includes types and numbers of plants needed. The accuracy and detail of your measurements will play a key role in the planting plan. A detailed plan will increase efficiency during planting and promote plant survival.

Note that stormwater ponds are planned and permitted according to Florida Department of Environmental Protection or local Water Management District criteria, and proper approvals must be obtained prior to modifying these types of ponds. Counties and local governments may also have guidelines or policies on stormwater ponds. It is advisable to contact the county public works office to ensure planting plans are permissible.

2. Shoreline plant installation

When to Plant. Perennials and grasses should be planted during peak growing season (in mid-to-late summer) to allow enough time for their root systems to become established before they go dormant in the late fall. Trees and shrubs should be planted in spring and fall when there is adequate rainfall to help them develop strong roots and leafy growth.

Handle wetland plants with care during planting. Plants should be wrapped in wet newspaper to avoid injury and drying. Do not place plants in the trunk of a car or in the back of a truck where they will overheat. When planting, start with plants in the deep water zones and work up the banks. Planting should be conducted in the early morning or late afternoon to avoid the hot midday sun.

Where to Plant. If possible, locate aquatic plants 2 or 3 feet from the planted bank or plant low-growing plants. The gap between the aquatic plants and the shore plants will prevent accidental trimming of aquatic plants with the weed trimmer when maintaining the shore plants on the bank.

Plant in clumps. Planting like species in clumps creates attractive concentrations of color and provides more varied habitat features. Three or four plants of the same species should be installed in the same hole and they will expand into a cluster of plants. Installing plants in clusters will increase survivability of shoreline plants, facilitate management of weeds, and minimize colonization of unwanted plants.

3. Maintenance after installation

Routine maintenance is needed during the initial stage after the installation of plants to allow expansion of the desirable plants and control the growth of invasive species. Desirable native species do not require fertilizers or spray.

Generally, maintenance requirements are minimal after the plantings become established. Herbicides may be needed if undesirable the plants become established after the first year when wetland plants are better established. Only herbicides that are registered specifically for use in wetlands by the U.S. Environmental Protection Agency and the Florida Depart-

Adapted from:

Main, M. B. , Allen, G. M., and Langeland, K. A., 2006. *Creating Wildlife Habitat with Native Florida Freshwater Wetland Plants*. UF IFAS Extension publication. <http://edis.ifas.ufl.edu/fa007>

Seminole County Department of Public Works, (n.d.). *How to Plant Your Lakefront*. <http://www.seminole.wateratlas.usf.edu/upload/documents/How%20to%20Plant%20Your%20Lakefront%20Booklet.pdf>

Wilson, D. and Korb, G., 1999. *Shoreline Plants and Landscaping*. University of Wisconsin–Extension. <http://cfpub.epa.gov/npstbx/files/wiexlandscape.pdf>

Recommended Shoreline Species For Neighborhood Ponds

Water Edge Zone



Height: floating leaves
Light: full sun to partial shade
Water: 30-36"
Distribution: FL Statewide

<http://www.dep.state.fl.us/lands/invaspec/2ndlevpgs/pdfs/Circular4.pdf>

Fragrant Water Lily *Nymphaea odorata*



Height: 2.5 ft.
Light: full sun to partial shade
Water: 6-12"
Distribution: FL Statewide

<http://www.dep.state.fl.us/lands/invaspec/2ndlevpgs/pdfs/Circular4.pdf>

Spikerush *Eleocharis cellulosa & interstincta*



Height: 3 ft.
Light: full sun to partial shade
Water: 6-12"
Hardiness zone: 6-10

<http://www.southeasternflora.com/viewfull.asp?picid=1688>

<http://www.southeasternflora.com/viewfull.asp?picid=1687>

Duck potato *Sagittaria lancifolia*



Height: 3 ft.
Light: full sun to partial shade
Water: 6-18"
Hardiness zone: 3b-10

<http://cherylharner.blogspot.com/2010/02/wetland-plants-and-dragonfly-fever.html>

Pickerelweed *Pontederia cordata*



Height: 3 ft.
Light: full sun to partial shade
Water: 12-18"
Hardiness zone: 8-10

<http://www.dep.state.fl.us/lands/invaspec/2ndlevpgs/pdfs/Circular4.pdf>

http://www.onlineplantguide.com/PlantDetails.aspx?Plant_id=414

Golden canna *Canna flaccida*



Height: 2 ft.
Light: partial shade
Water: 3"
Hardiness zone: 7-11

<http://www.guitarfish.org/2008/08/12/swamp-lily-flower>

Swamp lily *Crinum americanum*



Height: 4 ft.
Light: full sun
Water: dry to wet; water edge
Hardiness zone: 8b-11

<http://www.apriliani.com/sand-cordgrass>

Sand Cord Grass *Spartina bakerii*



Height: 2 ft.
Light: partial shade
Water: moist to wet; water edge
Hardiness zone: 8b-11

<http://www.wellsphere.com/healthy-living-article/friday-flowers-wild-iris/442029>

Blue Flag Iris *Iris virginica*

Bank Slope Zone



Height: 4 ft.
Light: full sun to partial shade
Water: dry to moist
Hardiness zone: 8-11

http://www.paulverlander.com/index_TR-Tripsacum%20dactyloides-Fakahatchee%20Grass.php

Fakahatchee Grass *Tripsacum dactyloides*



Height: 3 ft.
Light: full sun to partial shade
Water: dry to wet
Hardiness zone: 8-11

http://apofl.com/plants/contract-growing/grasses_/page/2/

Florida Gamagrass *Tripsacum floridanum*



Height: 3 ft.
Light: full sun
Water: dry to wet
Hardiness zone: 7-11

<http://www.dickersonlandscaping.com/nursery/grasses-bamboo.aspx>

Muhly Grass *Muhlenbergia capillaris*



Height: 2 ft.
Light: full sun to partial shade
Water: moist
Hardiness zone: 4-11

http://www.sbs.utexas.edu/bio406d/images/pics/ast/conoclinium_coelestinum.htm

Blue Mistflower *Conoclinium coelestinum*



Height: 1.5 ft.
Light: full sun to partial shade
Water: dry
Hardiness zone: 10-11

<http://vaniliana.wordpress.com/rosliny-plants-plantas/opisy-roslin-plant-files-fichas-de-plantas/>

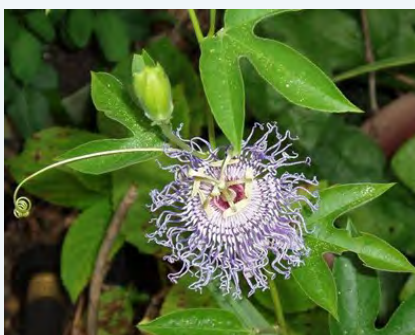
Scorpion Tail *Heliotropium angiospermum*



Height: 2 ft.
Light: full sun
Water: dry to moist
Hardiness zone: 9-11

<http://www.pbbase.com/hjsteed/image/99274631/original>

Blue Porterweed *Stachytarpheta jamaicensis*



Height: 0.5 ft. (as ground cover)
Light: full sun
Water: moist
Hardiness zone: 8-11

http://folsomnps.org/passion_vine.html

Passion Vine *Passiflora incarnata*



Height: 3 ft.
Light: full sun to partial shade
Water: dry to wet
Hardiness zone: 8b-11

<http://njaes.rutgers.edu/images/photos/deerresistance/iris-sibirica.jpg>

African Iris *Dietes iridioides*

Bank Top Zone



Height: 2 ft.
Light: full sun
Water: dry
Hardiness zone:
4-11

<http://www.gossettsnursery.com/plants/juniper-parsons>

Parson's Juniper *Juniperus chinensis 'parsonii'*



Height: 3 ft.
Light: full sun
Water: dry
Hardiness zone:
8-10

<http://www.learn2grow.com/plants/paspalum-quadrifarium-images/>

Crown Grass *Paspalum quadrifarium*



Height: 3 ft.
Light: full sun
Water: dry
Hardiness zone:
8b-11

<http://it.pinellas.k12.fl.us/Teachers7/ByersS/images/BCF4D24A64646B7B7F125C88A2AAD17.jpg>

Beach Sunflower *Helianthus debilis*



Height: 0.5 ft.
Light: full sun
Water: dry
Hardiness zone:
8-11

<http://okeechobee.ifas.ufl.edu/News%20columns/2008.Plants.htm>

Sunshine Mimosa *Mimosa strigillosa*



Height: 4 ft.
Light: full sun
Water: dry
Hardiness zone:
7-10

http://www.floridasnature.com/landscape/lantana_camara.htm

Pineland Lantana *Lantana depressa*



Height: 2 ft.
Light: full sun to
full shade
Water: dry
Hardiness zone:
8b-11

<http://fnpsblog.blogspot.com/2010/08/coonties-captivating-cycads.html>

Coontie *Zamia floridana*



Height: 1.5 ft.
Light: full sun
Water: dry
Hardiness zone:
9-11

<http://nanak-mygardenpath.blogspot.com/2010/04/sunny-blooms.html>

Tampa Vervain *Glandularia tampensis*



Height: 1.5 ft.
Light: full sun to
full shade
Water: dry
Hardiness zone:
8-11

<http://foliagefirst.bestplants.com.au/destiny.html>

Flax Lily *Dianella tasmanica*

Trees and Large/Medium Shrubs– all Zones



<http://www.allnativeflora.com/loblolly>

Loblolly Bay *Gordonia lasianthus*

Height: 50 ft.
Spread: 25 ft.
Light: part sun
Water: wet
Hardiness zone:
8-9



<http://www.arborday.org/trees/detail/Red-Maple>

Red Maple *Acer rubrum*

Height: 45 ft.
Spread: 30 ft.
Light: full sun
Water: wet
Hardiness zone:
8-10



<http://www.texas-trees.org/cms/wp-content/uploads/2010/07/bald-cypress>

Bald Cypress *Taxodium spp.*

Height: 60 ft.
Spread: 20 ft.
Light: full sun
Water: wet
Hardiness zone:
8-10



<http://www.awkellys.com/Images/trees/Holly-Dahoon>

Dahoon Holly *Ilex cassine*

Height: 25 ft.
Spread: 15 ft.
Light: full sun/
shade
Water: wet
Hardiness zone:
8-10



<http://www.yorkccd.org/wordpress/wp-content/uploads/2009/12/Buttonbush>

Buttonbush *Cephalanthus occidentalis*

Height: 12 ft.
Spread: 7 ft.
Light: full sun
Water: wet
Hardiness zone:
8-11



<http://www.my-photo-gallery.com/wp-content/uploads/2010/Sweet-Peperb>

Sweet Pepperbush *Clethra alnifolia*

Height: 6 ft.
Spread: 6 ft.
Light: full sun to
full shade
Water: wet
Hardiness zone:
8-9



http://upload.wikimedia.org/wikipedia/commons/1/16/Hamelia_patens_Flowe

Firebush *Hamelia patens*

Height: 15 ft.
Spread: 6 ft.
Light: full sun to
shade
Water: well to
medium drained
Hardiness zone:
9-11



<http://foliagefirst.bestplants.com.au/destiny.html>

Virginia Sweetspire *Itea virginica*

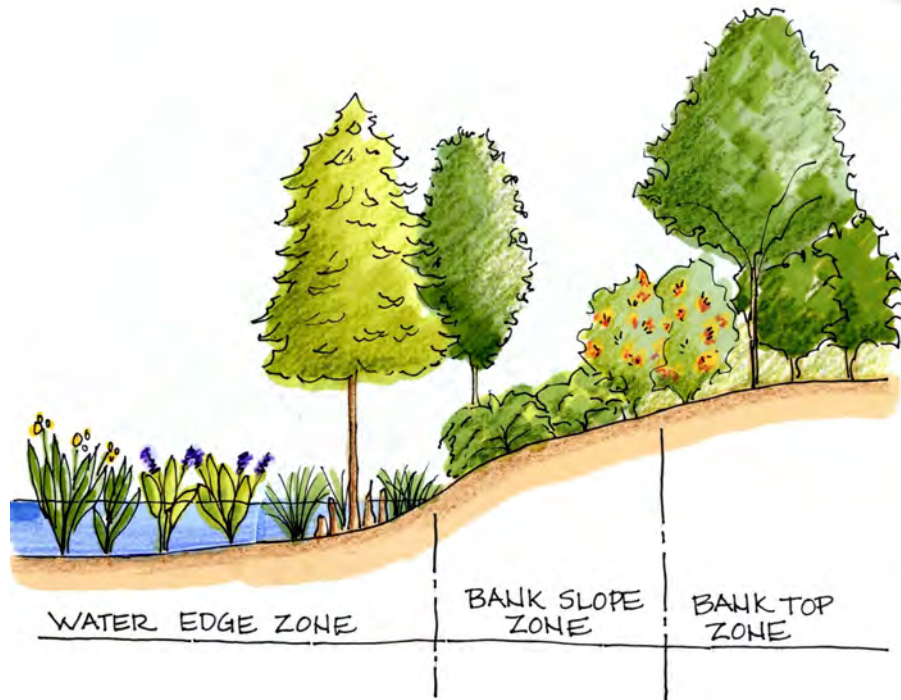
Height: 6 ft.
Spread: 4 ft.
Light: full sun to
full shade
Water: wet
Hardiness zone:
8-9









Moderate to gentle slope with shrubs and trees

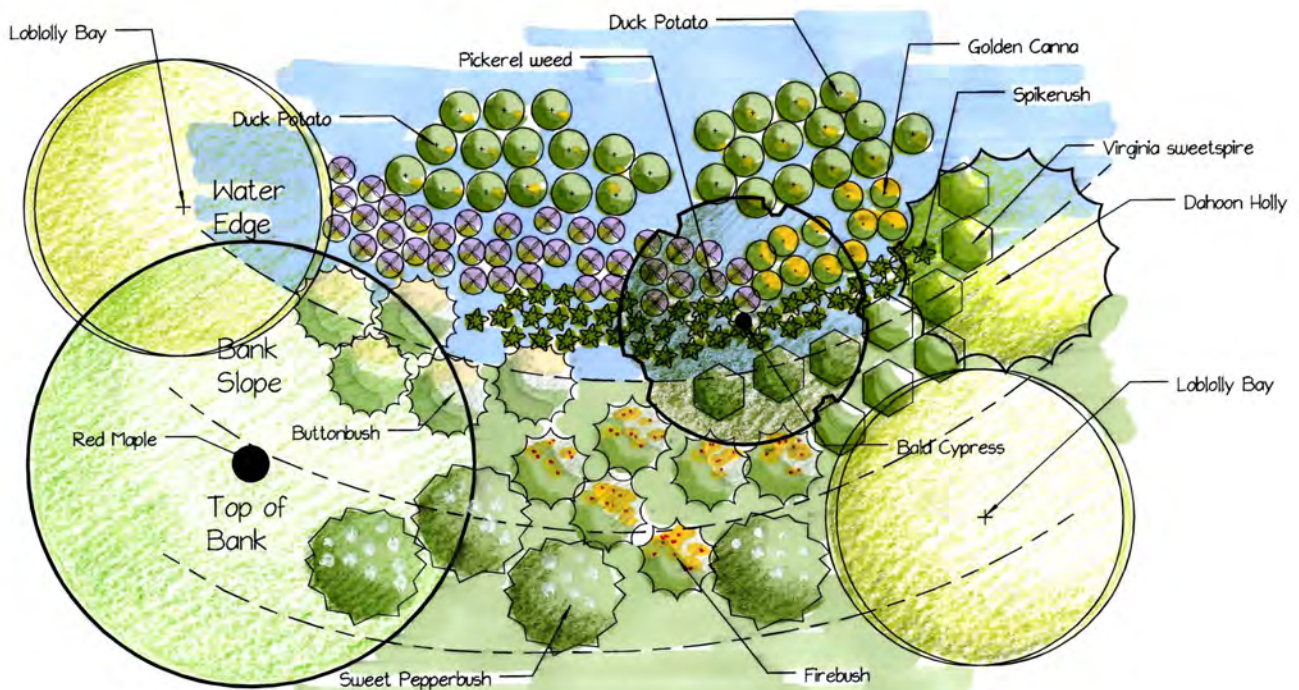
10 foot slope and 8 foot top of bank. 60 foot wide lot = 148 plants

The slope and top of bank is planted with large and medium shrubs to provide a transition from the pond edge to a wooded area. Use aquatic plants of various heights for interest. Cluster in the water for a natural look.

(Image credits: Gail Hansen)



-  Spikerush
-  Pickerel Weed (*Pontederia cordata*)
-  Golden Canna (*Canna flaccida*)
-  Duck Potato
-  Virginia Sweetspire (*Itea virginica*)
-  Firebush (*Hamelia patens*)
-  Sweet Pepperbush (*Clethra alnifolia*)
-  Buttonbush (*Cephalanthus occidentalis*)

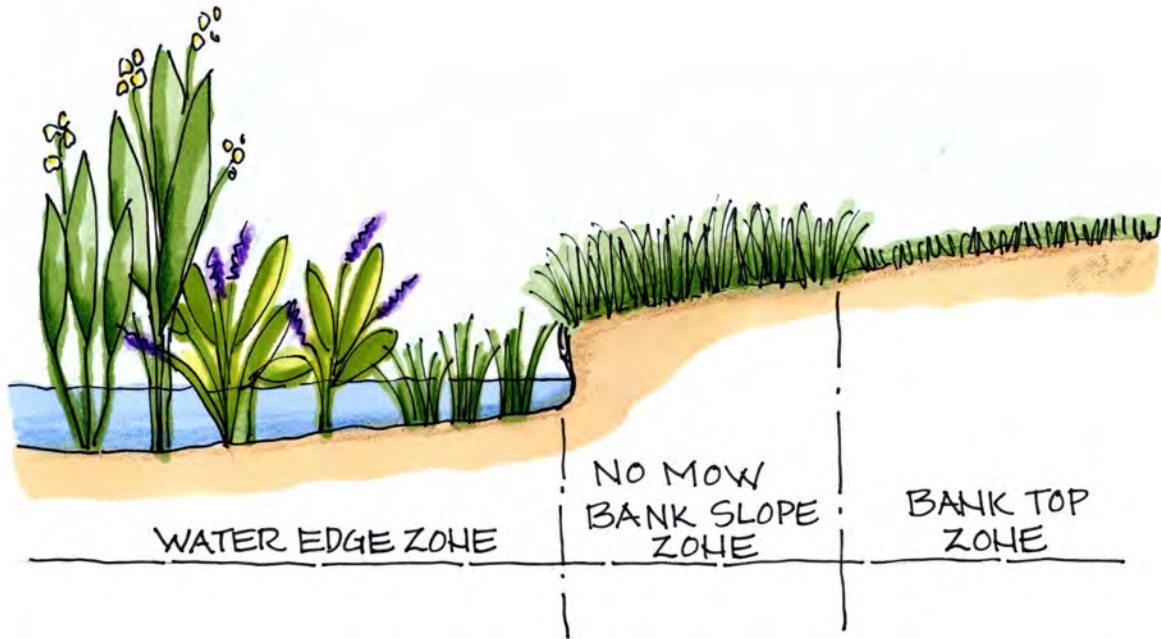






Moderate to Gentle Slope with cut bank

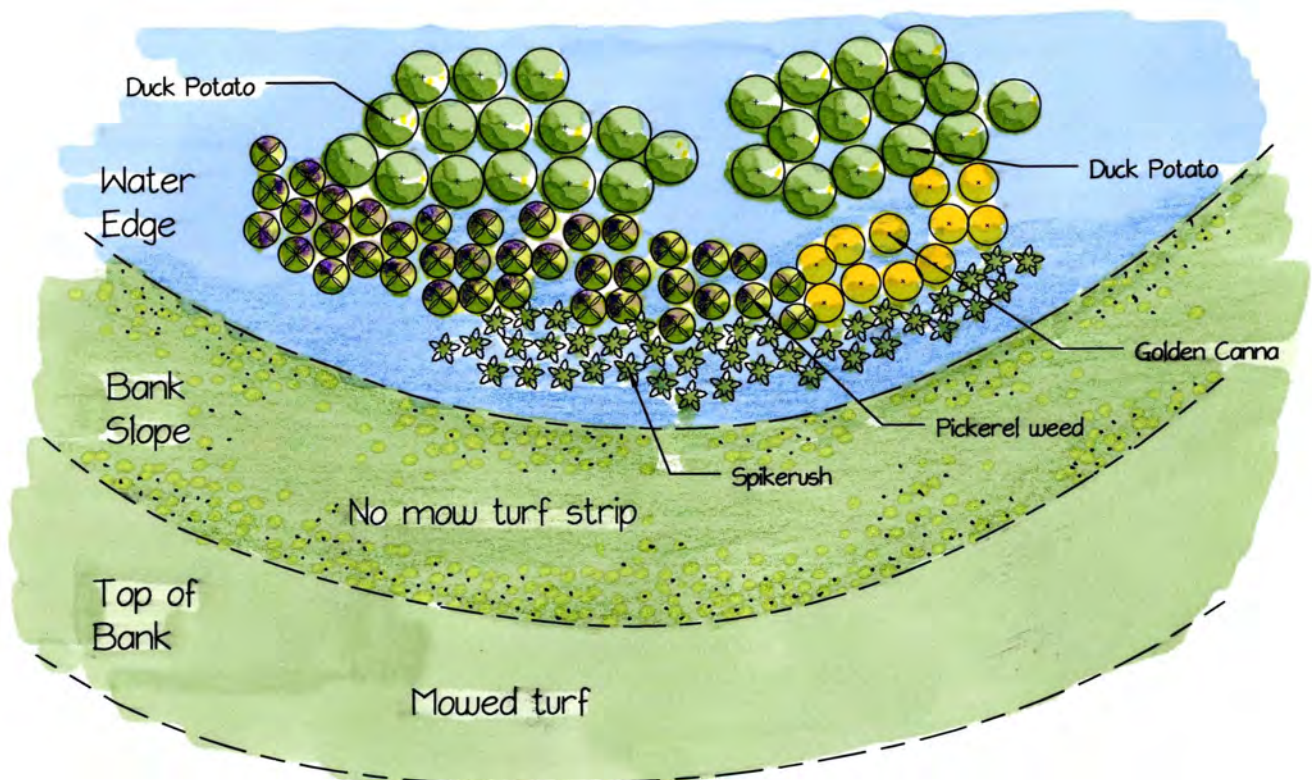
5 to 10 foot no-mow strip (cut bank caused by erosion) – 60 foot wide lot = 119 plants

Turf is planted to the water edge and a no-mow zone is established around the perimeter of the pond. The no-mow strip can be top-trimmed to maintain a neater appearance. Use low aquatic plants or leave a small gap next to the shoreline to avoid cutting aquatic plants with trimmer. Cluster in the water for a natural look.

(Image credits: Gail Hansen)



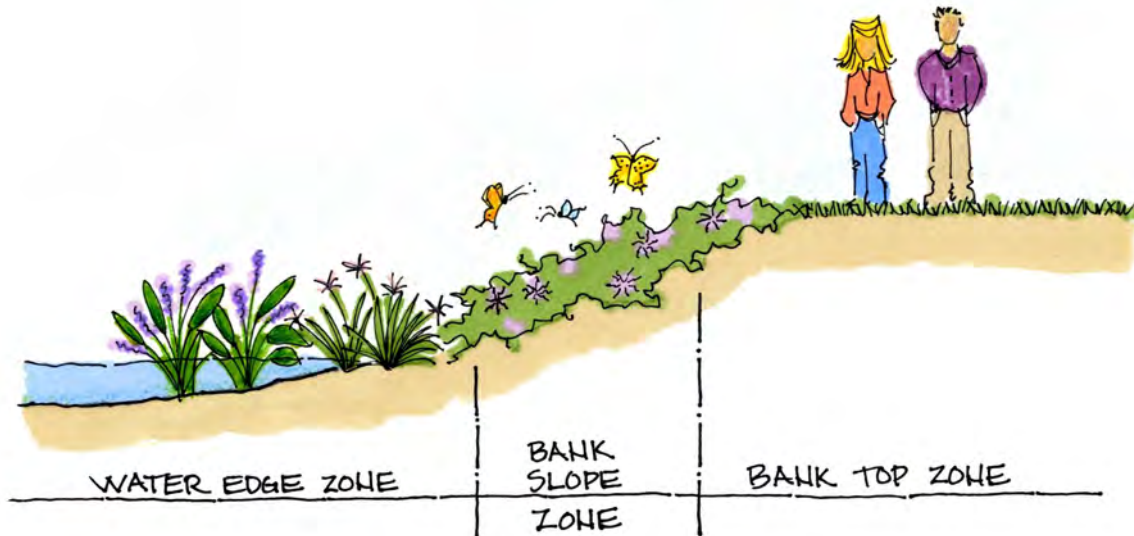
- | | | | |
|---|--|---|---|
|  | Golden Canna (<i>Canna flaccida</i>) |  | Spikerush (<i>Eleocharis</i> spp.) |
|  | Duck Potato (<i>Sagittaria lancifolia</i>) |  | Pickerel Weed (<i>Pontederia cordata</i>) |



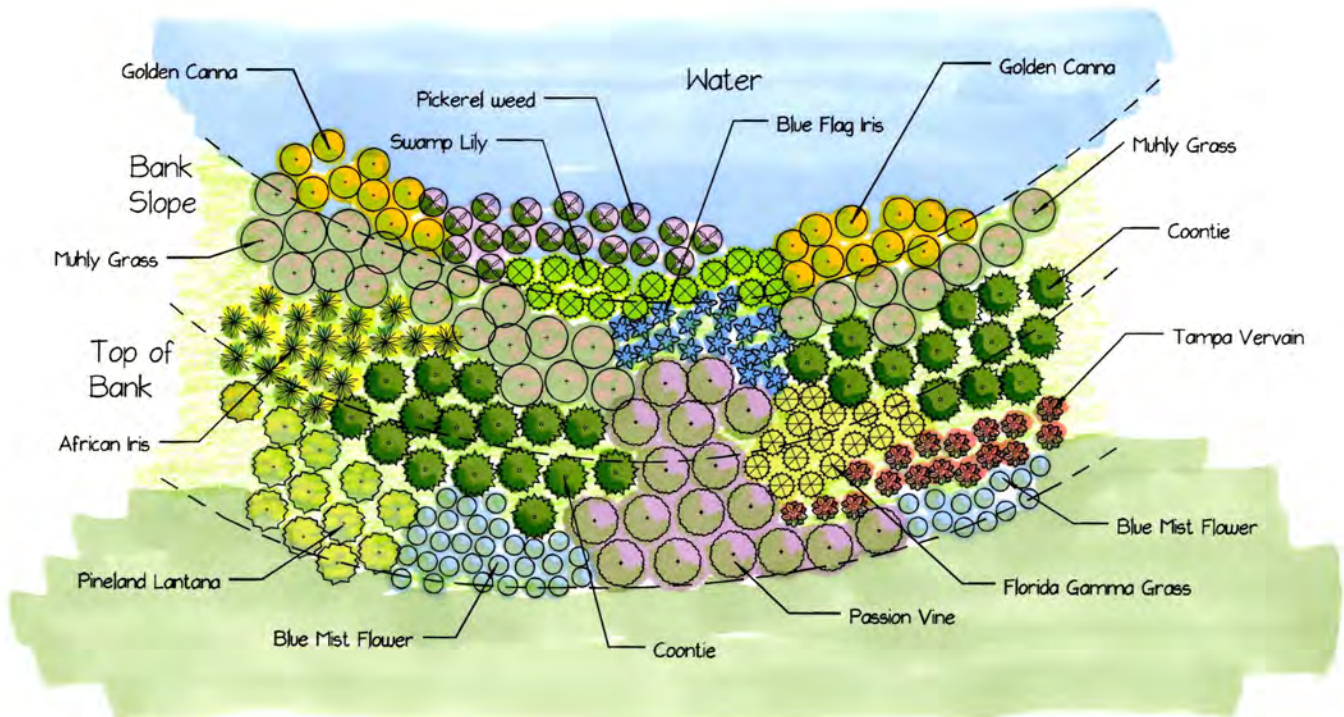
Short, Steep Slope– 15 to >20%

10 foot slope and 5 foot top of bank– 60 foot wide lot = 242 plants

Use low-growing, sprawling ground cover such as Sunshine Mimosa, Beach Sunflower, or Passion Vine on steep slopes. Plant at the top of the bank and encourage plants to grow down the bank by pinning the vines in the direction you want them to grow. Cluster or group similar plants for a natural look. (Image credits: Gail Hansen)



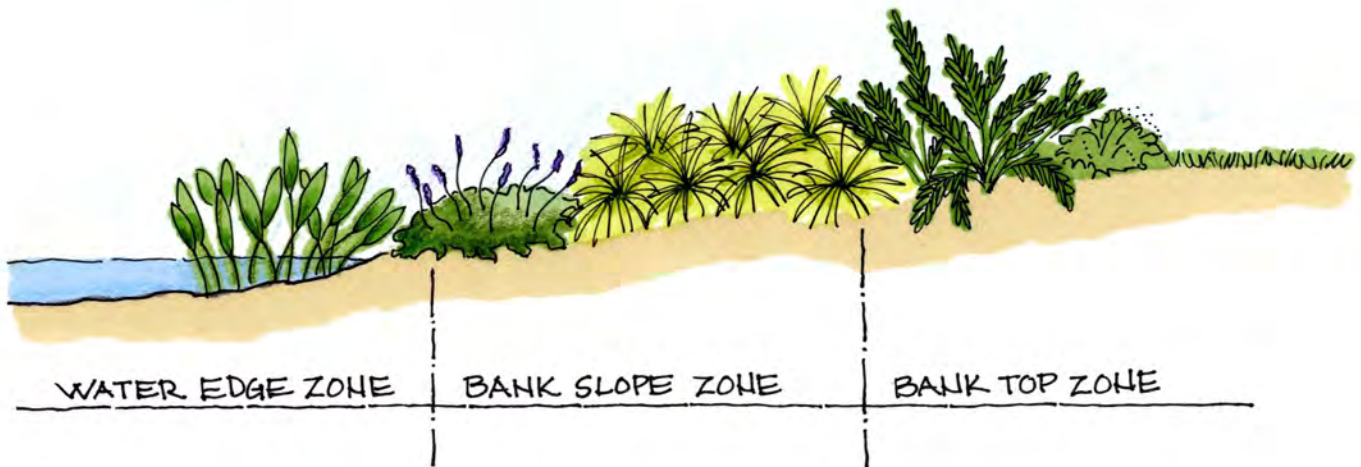
- | | | |
|--|--|---|
|  Blue Mist Flower (<i>Conoclinium coelestinum</i>) |  Florida Gamma Grass (<i>Tripsacum floridanum</i>) |  Blue Flag Iris (<i>Iris virginica</i>) |
|  Tampa Vervain (<i>Glandularia tampensis</i>) |  Muhly Grass (<i>Muhlenbergia capillaris</i>) |  Golden Canna (<i>Canna flaccida</i>) |
|  African Iris (<i>Dietes iridioides</i>) |  Pineland Lantana (<i>Lantana depressa</i>) |  Swamp Lily (<i>Crinum americanum</i>) |
|  Coontie (<i>Zamia pumila</i>) |  Passion Vine (<i>Passiflora incarnata</i>) |  Pickerel Weed (<i>Pontederia cordata</i>) |



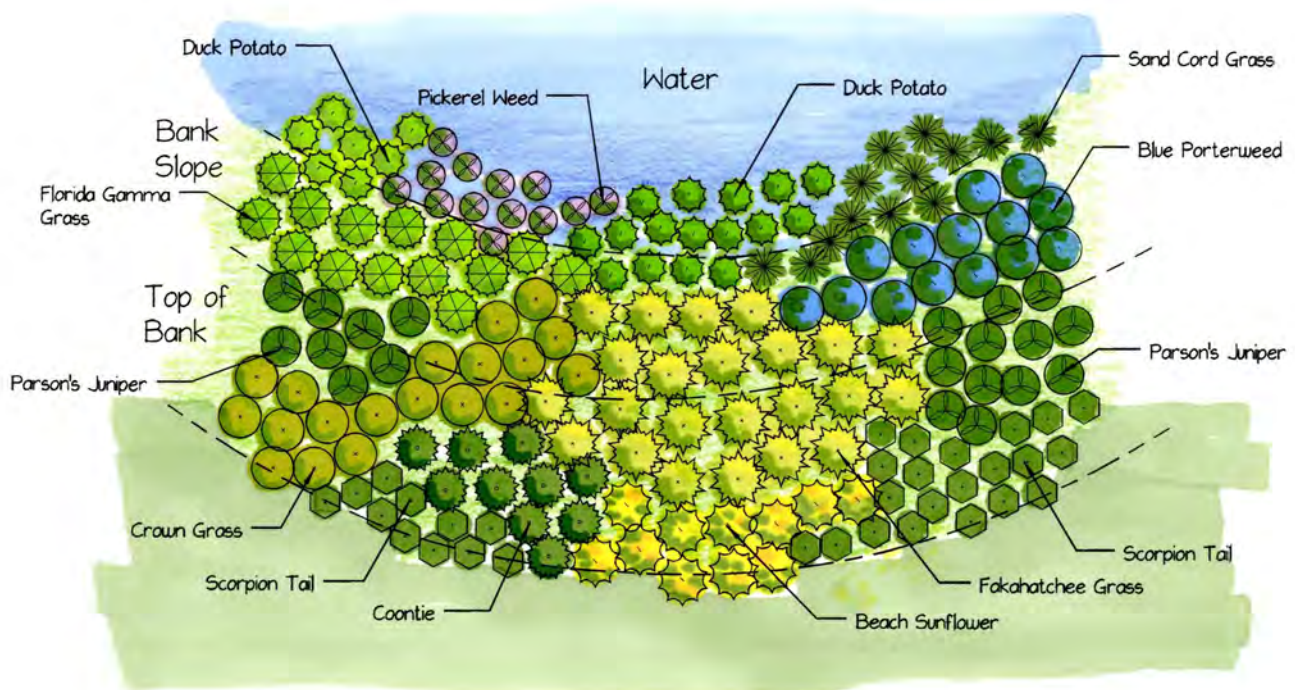
Moderate Slope– 10 to 15%

10 foot slope and 8 foot top of bank– 60 foot wide lot = 192 plants

Use clump grasses and mounding low-growing shrubs or clumping perennials at the top of the bank where the slope starts, such as Coontie, Crown Grass and Fakahatchee Grass. On the slope use sprawling plants such as Blue Porterweed. (Image credits: Gail Hansen)



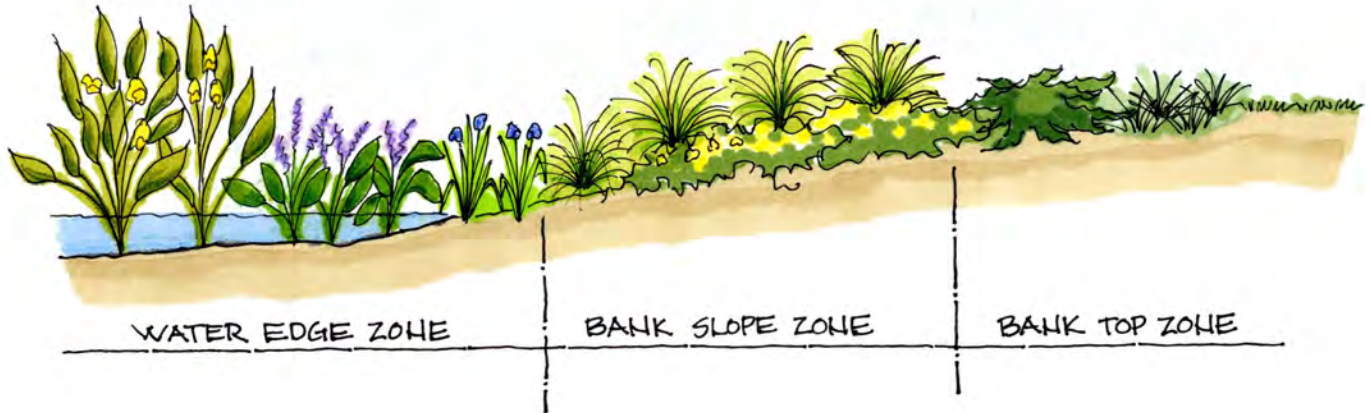
- | | | |
|--|--|--|
|  Blue Porterweed (<i>Stachytarpheta jamaicensis</i>) |  Fakahatchee Grass (<i>Tripsacum dactyloides</i>) |  Duck Potatoe (<i>Sagittaria lancifolia</i>) |
|  Parson's Juniper (<i>Juniperus chinensis parsonii</i>) |  Beach Sunflower (<i>Helianthus debilis</i>) |  Pickerel Weed (<i>Pontederia cordata</i>) |
|  Coontie (<i>Zamia pumila</i>) |  Crown Grass (<i>Paspalum quadrifolium</i>) |  Sand Cord Grass (<i>Spartina bakerii</i>) |
|  Florida Gamma Grass (<i>Tripsacum floridanum</i>) |  Scorpion Tail (<i>Heliotropium angiospermum</i>) | |



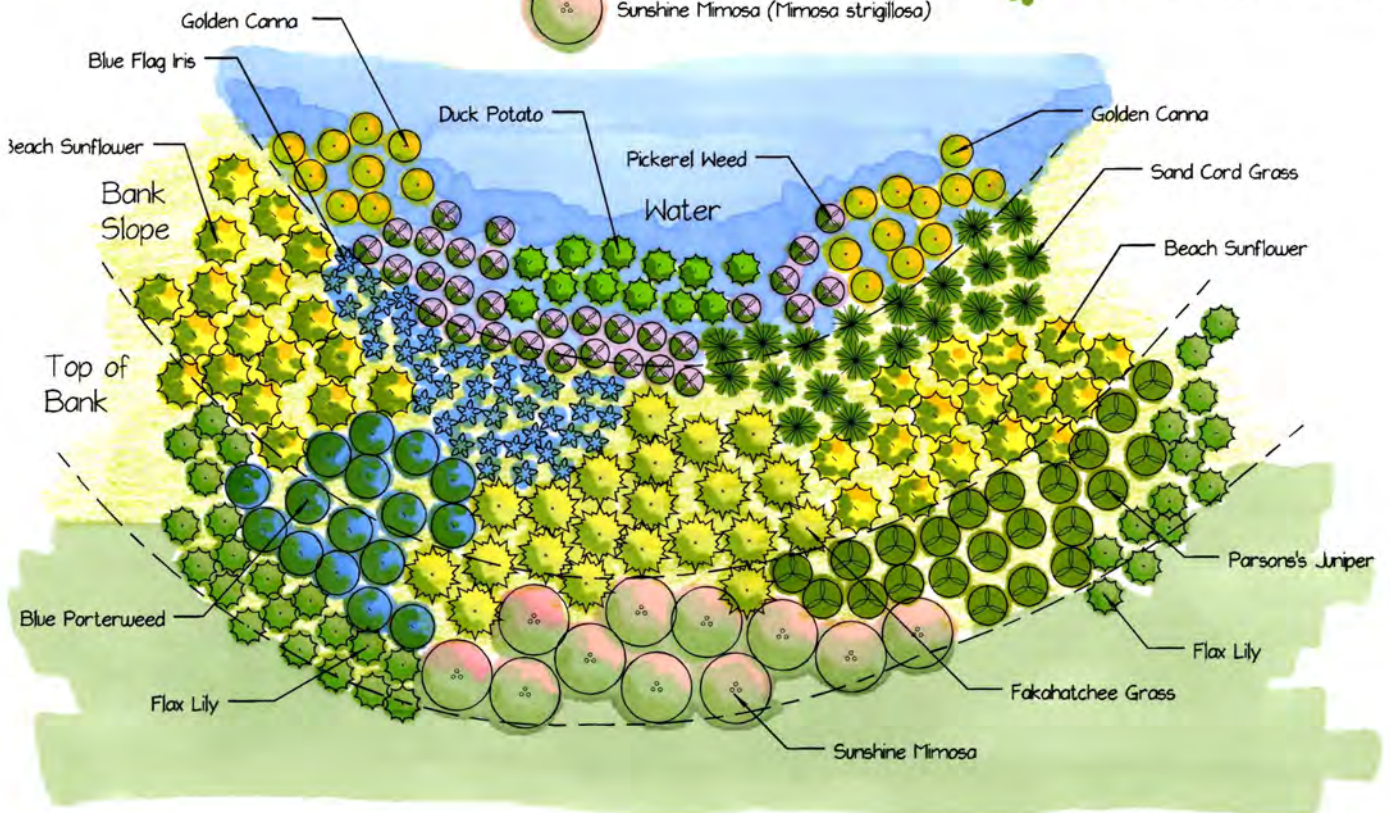
Long, Gentle Slope– 5 to 10%

15 foot slope and 8 foot top of bank– 80 foot wide lot = 260 plants

Use clump grasses, low-growing groundcover and small shrubs, such as Parson’s Juniper or Coontie on long, gentle slopes. Plant shrubs at the top of the bank and sprawling plants and grasses such as Beach Sunflower, and Fakahatchee on the slope. Cluster or group plants on land and in the water for a natural look. (Image credits: Gail Hansen)



- | | | |
|--|---|---|
|  Blue Porterweed (<i>Stachytarpheta jamaicensis</i>) |  Blue Flag Iris (<i>Iris virginica</i>) |  Duck Potatoe (<i>Sagittaria lancifolia</i>) |
|  Flax Lily (<i>Dianella tasminica variegata</i>) |  Fakahatchee Grass (<i>Tripsacum dactyloides</i>) |  Golden Canna (<i>Canna flaccida</i>) |
|  Parson's Juniper (<i>Juniperus chinensis 'parsonii'</i>) |  Beach Sunflower (<i>Helianthus debilis</i>) |  Pickerel Weed (<i>Pontederia cordata</i>) |
|  Sunshine Mimosa (<i>Mimosa strigillosa</i>) |  Sand Cord Grass (<i>Spartina bakeri</i>) | |



Pond Bank & Landscape Maintenance Map - Stantec

