



LANDSCAPING ON THE EDGE

Oceanfront – Coastal dunes and canal edges need plants that can withstand wind and salt.

Sea Oats, *Uniola paniculata*, are a protected shoreline plant that grow in clumps. This growth characteristic serves to trap sand blown about by the wind making these plants important features in shoreline erosion control and in the establishment of dunes. Stabilized sand dunes also provide shoreline protection against hurricanes.



Dune Restoration



Secondary Dune



Coastal Dune Plants



Beach Sunflower • *Helianthus debilis*



Silver Saw Palmetto • *Serenoa repens*



Sea Oxeye Daisy • *Borrchia*



Seagrape • *Coccoloba uvifera*



Cabbage Palm • *Sabal palmetto*



Railroad Vine • *Ipomoea pes-caprae*



Morning Glory • *Ipomoea sagittata*



Sea-Lavender • *Argusia gnaphalodes*



Beach Verbena • *Glandularia maritime*



Blanket Flower • *Gaillardia pulchella*

Sustainable Landscape Designs/ Diversity of Plant Palette

Sustainable landscape designs should strive to mimic the complexity and diversity found in native plant communities whenever possible. Do not feel compelled to plant repetitive masses of a small number of species.



Landscape Performance Including Reclaimed Water and Seasonality

Do not rely solely on reference books to determine whether plants "look good" at different times of the year. There can be great variation in general appearance within a species and in its seasonal behavior, depending upon location.

Reclaimed Water

- Reclaimed water tends to be higher in nutrients
 - Reclaimed water can be beneficial in landscape irrigation
 - Typically cord grass can reach up to 6 feet, in an area using reclaimed water they have been noted up to 12 feet!
- Can this affect your design?

Mangroves



Mangrove Benefits

- Buffers against hurricane winds
- Help prevent soil erosion
- Breeding grounds for fish & shrimp
- Shelter for shore birds
- Mangrove branches are rookeries, or nesting areas for coastal birds

Require Special Permits for Pruning

Mangroves grow in coastal and brackish areas and are protected under the Florida State "1996 Mangrove Trimming and Preservation Act." For more information, contact the Broward County Aquatic and Wetlands Resources Program at **954-519-1483**.

Living on the water presents benefits and responsibilities

Broward County has more than 1,700 miles of canals and hundreds of man-made lakes.

- Part of an extensive drainage and flood control system
- Provide essential aquifer recharge
- A wealth of recreational opportunities and valuable wildlife habitat.
- Maintenance of the adjacent shorelines strongly influence the quality of these water bodies, with implications for water supply, flood control and dependent wildlife

Seawalls

Many shorelines have been altered with seawalls to stabilize banks and provide for boat docks, while others may be severely eroded. These altered shorelines inhibit the establishment of shoreline vegetation that provide natural removal of pollutants and contaminants present in storm water and landscape runoff.



Living Shoreline with Mangrove planter

Use landscape practices and maintenance methods to reduce pollutants in stormwater runoff and improve the quality of receiving waters and ecosystems.

A Florida-friendly shoreline helps to reduce water pollution by acting as a buffer between a water body and pollution sources. In contrast, traditional landscapes are often a source of pollution. Regardless of what type of waterfront property you have, you can help protect Florida's natural resources through:

- Shoreline protection
- Landscape design
- Proper maintenance

Stormwater Retention Ponds "Lakes"

- Are very effective in removing certain pollutants, including sediments, some nutrients and heavy metals from water
- Reduce peak stormwater flows
- Help to replenish our drinking water supply
- Serve as treatment areas for stormwater pollutants
- Provide recreational activities for wildlife viewing, fishing and boating
- Provide critical habitat for native and migratory wildlife
- Can be beautiful



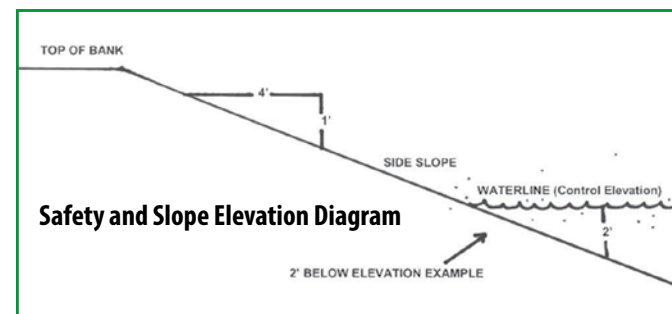
Providing Wildlife Habitat

- Man-made lakes are sterile
- Planted littoral zones provide a place for fish and other aquatic life to find a haven and a food source while growing to maturity
- Aquatic wading birds need shallow water to feed
- Small fish and other aquatic life find safe haven in planted littoral zones; wading birds find a source of food



Erosion

- Due to the type of soils found in South Florida, wave action and upland runoff, side slopes tend to recede from the banks of lakes
- Planted littoral zones are very efficient in maintaining side slopes
- Planting on the water's edge provides bank stabilization



Step 3: Plant installation

Where do you plant littoral plants?

Shoreline vegetation should be planted closest to the shore along a gentle slope. Remember to:

- Choose plants according to salt tolerance, soil types, water depth, sun and water requirements
 - Keep safety in mind when planting and maintaining this area
- ## Step 4: Follow Landscape Best Management Practices
- Maintain a ring of responsibility — keep fertilizers and pesticides at least 10 feet away from the water's edge
 - Clean up any spills of potentially hazardous materials, such as oil, fertilizer, and pesticides
 - Do not store fertilizers, pesticides, or hazardous materials near water
 - When mowing near the shore, direct the grass clippings away from the water body
 - Pick up pet waste

Remember to Scoop the Poop - Protect our Water

Pet waste is an environmental pollutant that contains parasites and bacteria like E. coli, salmonella and giardia that are harmful to humans, other pets, wildlife, and aquatic plant life. Pet waste pollutes local waterways if left behind. As it lays in the grass and decays, toxic bacteria seeps into the soil or is carried down storm drains into our local canals, contaminating our waterways. Bacteria can leach into our groundwater & aquifer where we get our drinking water supply from. Excess nutrients can cause algae blooms, fish kills and habitat destruction, while pathogens can pose health risks for humans and wildlife.



Controlling excessive plant growth/maintenance

- Many native plants have natural controls, but sometimes herbicides or mechanical controls are needed when excessive growth occurs
- Controls are needed to maintain water flow and water quality
- This includes physically removing the vegetation by hand or with specifically engineered equipment



Not all natives are nice

Cat-tail *Typha spp.* is extremely aggressive. It crowds out all other plants and becomes a monoculture. Choose another native species or thin them out once a year.

Neighborhood canals

Connect to larger canals operated by local drainage/water control districts which, in turn, feed into even larger canals operated by the SFWMD. Restrictions on shoreline plantings may vary by water management entity. Check before planting.



Exotic Species

Invasive exotic fish and plants have been introduced into water bodies purposefully or accidentally, altering water flow, native habitat, and nesting grounds for wildlife.

- Non-native plants tend to grow rapidly and can displace native plants
- Lakes that have high nutrients and minerals due to stormwater runoff and excessive fertilization form a perfect environment for algae and invasive plants to establish and flourish
- Do not dispose of aquarium fish, plants, or water in or near water bodies
- Check boats and trailers after use
- Place exotic plants and animals in a sealed bag for disposal

Hydrilla

Once sold as an aquarium plant, today it is a prohibited invasive exotic that takes considerable resources to control in our waterways. Hydrilla has been shown to out-compete phytoplankton communities for nutrients, thereby destabilizing the aquatic food chain and leading to lower fish populations. Since its introduction to North America, hydrilla has become the worst aquatic weed problem in the southeastern United States.

Melaleuca

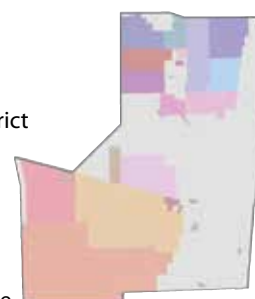
Melaleuca trees were planted to help drain the Everglades and wetlands. Today, they are being eradicated to restore the ecology and natural water holding capacity of wetlands. **Mulch made from the exotic melaleuca is a better choice for landscapes than mulch made from native cypress trees.**

For more information on invasive exotic plant species, contact NatureScape or visit the Florida Exotic Pest Plant Council website at fleppc.org.

If you are considering landscaping on the edge of your lake, canal or other water body, the following steps should be followed.

Step 1: Determine who owns and manages the body of water:

- Homeowners Association
- Municipality
- Broward County
- South Florida Water Management District (SFWMD)
- Local Drainage District
- State of Florida
- Other



Sovereign submerged land belongs to the State of Florida.

Check with them to determine if there are restrictions to planting on the edge, such as in the right of ways or easement. How can you find out which drainage/water control district you live in? Look on your tax bill, ask your municipality, or visit: broward.org/waterservices. South Florida Water Management District (SFWMD) **561-682-6973**.

Step 2: Safety and Slope Elevation

Determine if the bank has a proper slope elevation to ensure safe access during planting.

What is a proper slope elevation?

For every four feet out, there is a drop of one foot

- This applies to retention areas and lake banks but not to canal banks.
- Established for safety reasons, this gradual sloping would allow someone who falls in to climb back out
- Homeowners associations or individual property owners may be responsible for maintaining a proper slope elevation

Do's and Don'ts Right of Ways and Easements

Know your canal. Do you live on a South Florida Water Management District (SFWMD) primary canal or a secondary canal that is maintained by a municipality or drainage district?



What Is A Right of Way?

- A right-of-way is owned by the SFWMD
- The District has right of way along 2,000 miles of canals and levees, often next to private homes

Do not place anything, including trees, in the right-of-way without checking with the operator of the canal. Trees, shrubs, and structures are discouraged in this area because they can block access of maintenance vehicles and have the potential to possibly fall in and obstruct or impede water flow during hurricanes.

Evaluate the environment along the waterbody

Identify existing plants to determine if they are native or exotic. Plan for the removal of any plants identified as invasive exotics. Contact the UF/IFAS Broward County Extension Office for assistance with identification. **954-756-8519**

Where to plant littoral plants?

- You can plant on the water's edge and slope:
- Remove invasive exotic vegetation
- Choose plants according to salt tolerance, soil types, planting depth, sun and water requirements
- Plant only native vegetation in the water and on the littoral edge
- Keep safety in mind when planting and maintaining this area
- Avoid the use of fertilizers, pesticides and non-EPA approved aquatic herbicides
- Water newly installed plants in dry areas until they are established



Beneficial Native Aquatic Plants

How can shoreline vegetation help?

Shoreline plants utilize nutrients present in runoff and filter water that recharges the aquifer. Planting with appropriate shoreline plants also creates critical wildlife habitat. There is a direct correlation between the height of a plant and its capacity for absorbing nutrients - in other words, taller is better. Large shrubs and trees planted along the shoreline also provide shade that helps keep water temperatures lower, resulting in a favorable habitat for fish and other desirable aquatic organisms

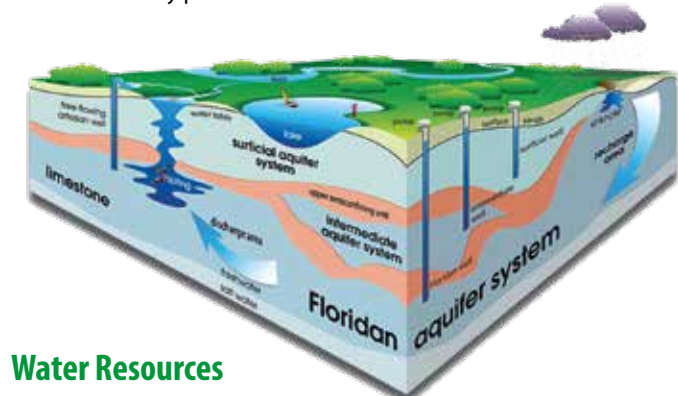
Broward County's Ecological Diversity

While we are visitors on the water, fish and other creatures are permanent residents. Our landscape practices and maintenance methods can improve the aquatic experience for all.



Where do we get our water? What is an aquifer?

In Broward County our main source of water supply is the Biscayne/Surficial Aquifer. We receive most of our water from groundwater in the aquifer. It does not matter if you get your water from a public utility or from a private well – it all comes from the same source. Aquifers are underground geologic formations that were created hundreds of thousands of years ago when this part of Florida was under water. Countless generations of shellfish and reefs created the material that has become our aquifer. The underground limestone is very porous.



Water Resources

We obtain most of our drinking water from groundwater via wells. Groundwater supplies often lie near the surface and may be covered by nothing but sandy soil. Surface waters are very sensitive to even small additions of pollution.

Stormwater runoff – The number one water quality issue in Florida.

Other environmental concerns are:

- Shoreline overdevelopment
- Decline in fish and aquatic organisms
- Aquatic weeds
- Loss of habitat
- Water clarity
- Exotic species

Aquatic Habitats

Waterbodies represent critical resources

- Potable and agricultural water sources
- Habitat for commercial fishery species and native wildlife
- Refuge for native wildlife and threatened and endangered species



Surface Water Management Features

Surface water management systems include swales, ditches, retention areas, detention ponds, and neighborhood canals. These and other green designs help mimic natural processes and integrate stormwater management within the landscape. These features:

- Play an important role in stormwater management systems
- Are designed to convey or hold stormwater for flood control so water can percolate and recharge the aquifer
- Provide wetland habitat
- Maintain soil permeability and filter runoff and nutrients
- May be planted with appropriate native plants to enhance wildlife habitat

Be responsible and use Best Management Practices:

- Reduce fertilizer run off

Aquatic weeds and algae thrive on the nutrients in fertilizers and are difficult and expensive to control.

“Ring of Responsibility”

Keep a 10-foot “Ring of Responsibility” around water bodies where no fertilizers or pesticides are used. This amount may vary due to municipal ordinances with more stringent requirements. Install a fertilizer deflector shield on spreaders to prevent casting fertilizers into the water.



Native Plant Choices

Our County is home to hundreds of native aquatic and wetland plants that thrive in damp to wet soils, and some even more specialized plants that live entirely in, on, or under water.

They are classified as:

- Submersed plants
- Immersed plants (including grasses, sedges and rushes)
- Floating and floating-leaved plants

Aquatic Plant Habitat

Freshwater Surface or Floating Plants - Planting elevation: -3 to -0.5 ft.

Floating plants are desirable and help to filter pollutants, add color, and create shade in a pond. Roots provide fish with spawning beds and protection for juveniles. They can grow to cover a body of water and potentially restrict water flow, so they are not a good choice in canals.



Fragrant White Waterlily • *Nymphaea*



Spatterdock • *Nuphar Lutea* subspecies

Littoral Shelves

Littoral plants remove nutrients, prevent erosion, and attract wildlife. Submersed shelves or ledges around lakes can be planted with aquatic plants.

Expand habitat and improve water quality by planting shoreline native plants



This typical neighborhood lake bank provides no habitat for wildlife. Pesticides and fertilizers can easily run off into the water.



Native shoreline plants utilize nutrients present in runoff and filter water that recharges the aquifer.

Smart steps for successful landscaping on the water's edge

What is a littoral zone?

The area in which shoreline plants grow is known as the littoral zone. In the case of coastal waters, it is the area between high and low tide.

Planted littoral zones:

- Slow the flow of runoff
- Filter nutrients and sediments from runoff
- Hold soil in place and helps to prevent wave action erosion of shorelines
- Create or restore wildlife habitat
- Add beauty and increase property values

Installation Factors

- Right plant, right place
- Type of plant material
- Elevation is key
- Fluctuation in water levels- a 6" difference could cause failure
- Time of year

Emergent Plants

Emergent plants are plants that grow out of the water (or in exposed sediments when water levels are low). They are rooted to the bottom, but their stems, leaves and flowers are above the water.



Alligator Flag • *Thalia geniculata*



Blue Flag Iris • *Iris hexagona*



Golden Canna • *Canna flaccida*



Scarlet Rosemallow • *Hibiscus*



Soft Rush • *Juncus effusus*



Sand Cordgrass • *Spartina bakeri*



Starrush White Top • *Rhynchospora*



Lizard's Tail • *Saururus cernuus*



Frog Fruit • *Phylla nodiflora*



Crinum Lily • *Crinum americanum*



Rose Mallow • *Hibiscus grandiflorus*



Aquatic milkweed • *Asclepias*



Leather Fern • *Acrostichum*



Lanceleaf Arrowhead • *Sagittaria*



Pickerelweed • *Pontederia cordata*



Smooth Water Hyssop • *Bacopa*

Shoreline Plants



Swamp Mallow • *Kosteletzkya*



Swamp Milkweed • *Asclepias*



Bald Cypress • *Taxodium distichum*



Pond apple • *Annona glabra*

Transitional and Slope Plants



Dahoon Holly • *Ilex cassine*



Faxahatchee grass • *Tripsacum*



Coastal Plain Willow • *Salix*



Winged Loosestrife • *Lythrum alatum* var. *lancoelatum*



Mimosa • *Mimosa strigillosa*



Locustberry • *Bysonima lucida*



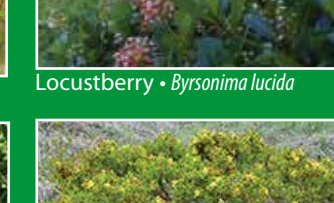
Narrowleaf Yellowtop • *Flaveria*



Buttonbush • *Cephalanthus*



Rain lily



St. Johnswort • *Hypericum*



Muhly grass • *Muhlenbergia capillaris*



Gulf Cordgrass • *Spartina spartinae*



Swamp fern • *Blechnum serrulatum*



Tickseed • *Coreopsis*



Cinnamon Fern • *Osmundastrum*

What is a NatureScape?

NatureScapes are Florida-friendly landscapes that conserve water, reduce pollution, and create habitat to attract native and migratory wildlife. Visit broward.org/naturescape

Broward County is a National Wildlife Federation Certified Community Wildlife Habitat.

The National Wildlife Federation works to protect, restore, and preserve habitat for native and migratory wildlife. Visit nwf.org to learn more about their programs and initiatives.

- Get Involved
- Get your yard certified
- Participate in waterway and roadside cleanups
- Attend a NatureScape Broward

Make a difference for people, plants and animals. For more information: Broward.org/NatureScape

NatureScape 954-519-0317

Resources and Credits

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regionalconservation.org/beta/nfyn/planlist.asp

Florida Aquatic Plant Management Society, Inc. fapms.org/

Florida Department of Environmental Protection, Mangrove Guidelines dep.state.fl.us/water/wetlands/docs

Phil Bussey, PhD., Agronomy Consulting, Inc. photo credit

UF/IFAS & Dept. of Environmental Protection; Best Management Practices Manual for the Protection of Water Resources by the Green Industries. (Dec. 2008)

UF/IFAS Circular 1204, "Help Protect Florida's Natural Areas from Native Invasive Plants", by K.A. Langeland

UF/IFAS; "Florida Waters: Ours to Protect", "Why We Manage Invasive Aquatic Plants"

UF/IFAS Broward County Extension Education Office Phone: 954-756-8519

sfyl.ifas.ufl.edu/broward/

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Wildlife Ecology and Conservation Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

Visit the EDIS Web site at edis.ifas.ufl.edu



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5,000 copies of this public document were promulgated at a gross cost of \$1,950.00 and \$0.390 per copy, to inform the public about landscaping on the edge.