

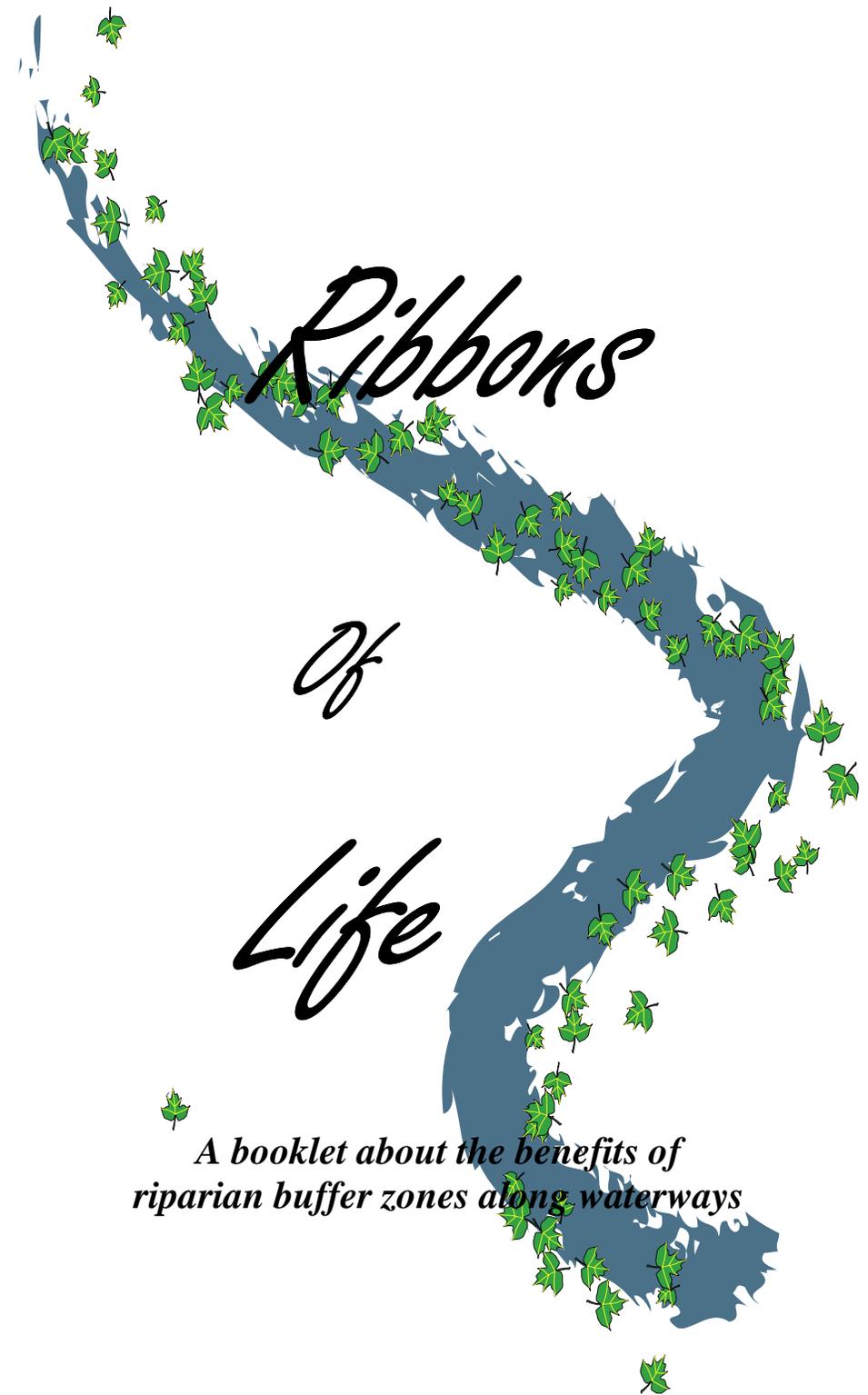
Funding provided by the  
Alachua County Environmental Protection Department  
and also  
Supported by the  
Alachua County Board of County Commissioner's  
Community Agency Partnership Program



**Current  
Problems**

Adopt A River  
Restore A Shore

PO Box 357098, Gainesville, Fl 32635  
[www.currentproblems.org](http://www.currentproblems.org)  
352-264-6827



*A booklet about the benefits of  
riparian buffer zones along waterways*

Shoreline or riparian buffers are corridors of native vegetation along rivers, streams, and other waterways that protect waterways by providing a transition zone between upland development and adjoining surface waters. Vegetated buffers are beneficial environmentally, aesthetically, and economically.

## INTRODUCTION

Healthy vegetated shorelines are “Ribbons of Life” that need to be re-established where they have been removed and protected where they are intact. Shoreline degradation has become an increasing problem in Alachua County as it has everywhere. The Alachua County Environmental Protection Department wants to encourage people to plant native species along their shorelines to re-establish viable buffer zones of vegetation once again around the county’s water bodies, thereby aiding the health of these aquatic ecosystems, from lakeshore to drainage ditch. Preserving natural riparian vegetation that is still intact is equally important for our lakes and ponds, rivers and streams, siphons and sinks, wetlands and marshes.

Water quality protection is a major function of lake and stream shorelines. The bio-mass of shoreline vegetation can act as a sink for nutrients and other pollutants. Vegetation acts as a filter for pollutants associated with urban stormwater runoff. This is especially important in older developed areas that do not have stormwater treatment systems and in areas where landscape practices adjacent to water bodies utilize fertilizers and other chemicals. Water quality will also be improved by planting native shoreline plants that do not require the use of fertilizers or other chemicals.

Wildlife habitat is another important function of lake and stream shorelines. Many animals that live in lakes and streams make use of vegetated wetlands and uplands adjacent to these water bodies for nesting, food, and shelter during different stages of their lives.



**BAD!**

**BETTER!**



**BETTER!**

**BEST!**



## Helpful websites

Alachua County Environmental Protection Department

<http://environment.alachua-county.org/>

Bureau of Invasive Plant Management

<http://www.dep.state.fl.us/lands/invaspec>

Center of Aquatic and Invasive Species -- IFAS

<http://aquat1.ifas.ufl.edu>

Current Problems, Inc – Adopt A River/Restore A Shore

[www.currentproblems.org](http://www.currentproblems.org)

352-264-6827

Chiapinni Farm Native Nursery, Melrose – 352-475-5413

[www.atlantic.net/~dchiapin](http://www.atlantic.net/~dchiapin)

FDEP Bureau of Invasive Plant Management

<http://www.dep.state.fl.us/lands/invaspec>

Florida Exotic Pest Plant Council

<http://www.fleppc.org>

IFAS Extension for Wetlands & Water Quality

<http://Soils.ifas.ufl.edu> (Soil and Water Science Department site)

<http://Wetlands.ifas.ufl.edu> (Wetland Biogeochemical Laboratory site)

<http://Wetlandextension.ifas.ufl.edu> (Wetland Extension outreach site)

Backyard Buffers for the South Carolina Lowcountry

<http://www.scdhec.net/ocrm/pubs/backyard.pdf>

Living by Water

[www.livingbywater.ca](http://www.livingbywater.ca)

Living Along A Kentucky Stream

<http://www.ca.uky.edu/agc/pubs/ip/ip73/ip73.pdf>

Adopt A Buffer Toolkit by Delaware River keeper

[www.delawareriverkeeper.org/monitoring/Toolkit-Final.pdf](http://www.delawareriverkeeper.org/monitoring/Toolkit-Final.pdf)

Shoreline Protection and Restoration –

A Northwest Florida Homeowner's Guide

<http://www.state.fl.us/nwfwmd/pubs/shoreline/shoreline.pdf>

Without this habitat many animals cannot survive. Many creatures cannot tolerate high water temperatures. A well vegetated shoreline results in cooler water temperatures in the waterway. Many beneficial invertebrates require clean water and vegetation to live. By providing appropriate habitat the abundance of fish, birds, and other desirable wildlife that feed on invertebrates can be increased, as well as wildlife in general.

Sediments entering a water body have detrimental effects on both water quality and wildlife populations. Heavily vegetated shorelines help to prevent habitat smothering sedimentation by capturing sediments from runoff and also by preventing bank erosion.

Finally, buffers improve the quality of life for residents of the county by providing aesthetically pleasing natural areas and opportunities for wildlife viewing in developed areas. The establishment of restoration areas by the community's residents will further these goals for all citizens in addition to the owners of waterfront property. Your participation in this effort adds to the overall welfare of our community. Take this opportunity to contribute to water and wildlife by building a buffer on your property or help plant a demonstration buffer strip on public-owned property or perhaps your neighborhood's pond.

Existing conditions, such as changes to the hydrology of urban creeks and adjacent land uses, necessarily limits the extent to which the above stated goals can be met. And while pristine conditions will never be obtained in a heavily urbanized area, improvements over existing conditions can certainly be achieved and are highly encouraged. Our waterways are suffering a death by a thousand cuts, many of those cuts coming straight from our yards. Buffer strips can help!

*All photos by Fritzi Olson unless otherwise noted.*



## THE BEAUTY OF BUFFERS

Buffers offer so many benefits it's hard to know where to begin! The very best is the kind that was never destroyed in the first place. Who among us has not cherished moments alone in these special places filled with fascinating plants and critters. Let's take a closer look at some of the important benefits that buffer strips bring to our surface waters of all types – lakes, ponds, creek, rivers, swamps, marshes, springs, sinks, canals, even ditches.

### Water quality

Today water quality in our county's waterways suffers from a number of different assaults. Oil, anti-freeze, and brake lining asbestos come from the roads every time it rains via the storm drains. So does our carelessly tossed litter along with sediments from a variety of sources, construction sites being a major one. Our lawns and golf courses add fertilizers, herbicides, and pesticides to the mix. Toxic compounds

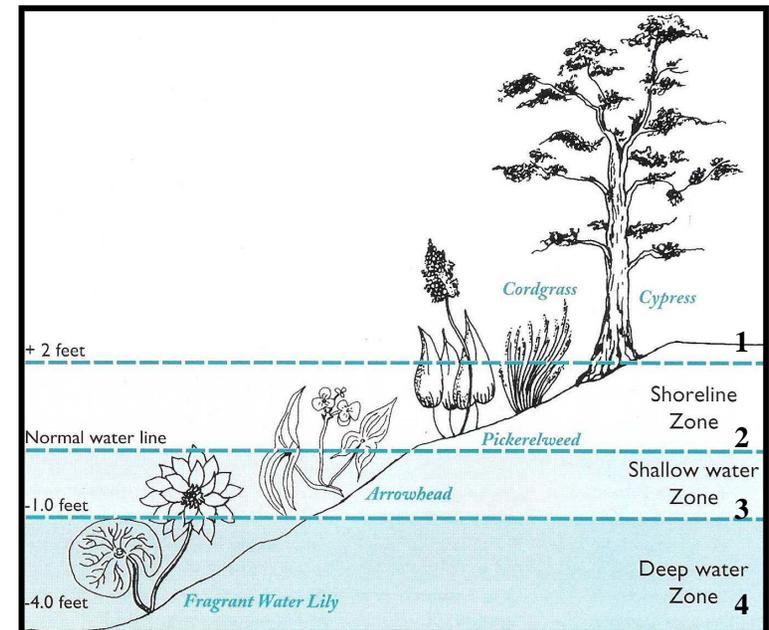


find their way to surface waters in the same manner when accidentally spilled or intentionally dumped on the ground, or worse, poured down storm drains – substances like lacquer thinner, mineral spirits, paints, and so on. Fecal coliforms get added to the soup from sanitary



### Grasses & Rushes

<i>Chasmanthium latifolium</i>	River oats	1,2
<i>Juncus effusus</i>	Soft rush	1
<i>Muhlenbergia capillaris</i>	Muhley grass	1
<i>Panicum hemitomon</i>	Maidencane	2
<i>Scirpus californicus</i>	Giant bulrush	2
<i>Scirpus validus</i>	Soft-stem bulrush	2,3
<i>Spartina bakeri</i>	Sand cordgrass	1,2
<i>Zizaniopsis miliacea</i>	Southern wildrice	2



**This drawing shows the planting zones involved with every shoreline, from deep water to upland. Use it to help you decide which plants to put where.**

### Note:

Many species will do quite well above and/or below the line of a particular zone, though this is not true for all. Check a book or website information source to learn more.

### **Shrubs**

<i>Cephalanthus occidentalis</i>	Buttonbush	2,3
<i>Cyrilla racemiflora</i>	Ti-ti	1
<i>Euonymus americanus</i>	Hearts-a-bustin	1
<i>Hypericum spp.</i>	St. Johns wort	1
<i>Ilex glabra</i>	Gallberry	1
<i>Lyonia lucida</i>	Fetterbush	2
<i>Myrica cerifera</i>	Wax myrtle	1
<i>Rhapidophyllum hystrix</i>	Needle palm	1
<i>Rhododendron canescens</i>	Wild azalea	1
<i>Sabal minor</i>	Dwarf palmetto	1,2
<i>Serenoa repens</i>	Saw palmetto	1
<i>Styrax americanus</i>	Snowbells	1,2
<i>Vaccinium corymbosum</i>	High bush blueberry	1
<i>Viburnum obovatum</i>	Walters viburnum	1,2

### **Herbaceous**

<i>Canna flaccida</i>	Canna lily	2
<i>Crinum americanum</i>	Swamp lily	2
<i>Hibiscus coccineus</i>	Scarlet rosemallow	2
<i>Hibiscus grandiflorus</i>	Swamp hibiscus	2
<i>Hymenocallis henryae</i>	Spider Lilly	2
<i>Iris virginica</i>	Blue flag	2
<i>Lachnanthes caroliniana</i>	Redroot	2
<i>Lobelia cardinalis</i>	Cardinal flower	1
<i>Nuphar advena</i>	Spatterdock	4
<i>Nymphaea odorata</i>	White waterlily	4
<i>Osmunda cinnamomea</i>	Cinnamon fern	2
<i>Osmunda regalis</i>	Royal fern	2
<i>Pontederia cordata</i>	Pickerelweed	2,3
<i>Sagittaria latifolia</i>	Duck potato	2,3

### **Note:**

Many of the herbaceous and shrubby species need significant tree canopy cover and will not do well in full sun. In such cases, establish your canopy trees first and add the herbaceous and shrub species later. Consult a reference for light requirements.

sewage overflows, leaking connections in sewage lines, failing septic tank systems, pet waste, homeless populations, and wildlife. The bad thing is, all this ends up in our aquifer – the water we drink – or the ocean, depending on where we live in the county.

Heavily vegetated riparian zones, or buffer strips, can have a tremendous impact on decreasing the onslaught of all these substances entering our surface waters, much of it a direct result of stormwater runoff, either by uptake or filtering (trapping). Water bodies experiencing toxics and nutrient loading by other means (septic systems, eg.), also benefit from well vegetated riparian zones because the plants take up a good share of these compounds as they grow. Water quality improvement is reason enough to promote the re-planting of our denuded shorelines, ponds, and ditches, but there are also others.

### **Wildlife**

Wildlife definitely benefits from healthy riparian buffer zones.

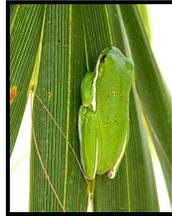
When we pursue the traditional lawn practices of manicuring our yards right down to water's edge, we destroy the homes of many more animals than we ever realize. Birds and squirrels need trees for nests and food; fish need trees to shade



*Cathy Parlapiano*

and cool the water in order to survive; some of the insects need trees, too. Then there is the understory, made up of small trees and woody shrubs plus plants like ferns and wildflowers. Butterflies make use of the flowers, and their caterpillars thrive on the leaves. All kinds of animals use these plants for shelter even if not for nesting and food – shelter from the hot sun, predators, and humans. Then there are the littoral plants, or those growing at water's edge. They, too, provide important sources of shelter, food, temperature control, and nesting places. Some wildlife species require as much as 1500 feet to buffer them from human disturbance; others require much less. The uptake of contaminants mentioned earlier aids wildlife health and safety by providing the animals cleaner water for both drinking and swimming. Replanting the riparian zones so that the water body has a

healthy buffer of native vegetation brings back into our lives the wildlife we love. By building buffer strips we provide the animals with corridors through which they may travel safely from one place to another, rather than exposing themselves dangerously to clear and open spaces or roads. New buffers also mean new territories, allowing populations to expand. Leave or plant as wide a buffer zone as you possibly can in order to benefit a greater diversity of species.



Michael Drummond

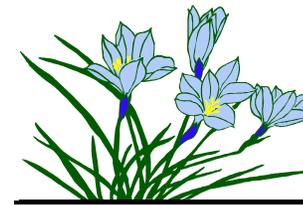
We need to minimize our impact on wildlife through our lifestyles as much as possible, for all creatures have their place in the grand scheme of things. And we humans need to live in harmony with them.

### Erosion and sedimentation

Erosion and sedimentation result from several situations. Some of the sedimentation we see in streams comes from construction sites or unpaved roads. Some comes from stormwater flowing across our yards in a sheet flow, or worse, drainage ditches from our property. The introduction of sediments increases turbidity in the water, clogging fish gills and burying small invertebrates, including many aquatic insect larvae that serve as important food sources for other wildlife forms. In the water body itself, wave action beats up bare shorelines, and fast moving water scours away banks with insufficient vegetation.



Buffers contribute much to alleviate the problem of erosion and the sedimentation of waterways. Heavily vegetated buffers abate sediment runoff from construction on waterfront properties, and well vegetated drainage ditches will help trap sediments from roads. Littoral plants, woody shrubs, and trees along a shoreline will help to quell wave action tremendously. Those in and along ditches and streams serve to slow down fast moving water during



### Some suggested plants

Species	Common Name	# zone
<b>Trees</b>		
<i>Acer rubrum</i>	Red maple	1
<i>Aesculus pavia</i>	Red buckeye	1
<i>Betula nigra</i>	River birch	2
<i>Carpinus caroliniana</i>	Ironwood	2
<i>Carya aquatica</i>	Water Hickory	2
<i>Cornus foemina</i>	Swamp dogwood	1
<i>Crataegus marshallii</i>	Parsely hawthorn	2
<i>Fraxinus caroliniana</i>	Carolina ash	2
<i>Fraxinus pennsylvanica</i>	Green ash	2
<i>Fraxinus profunda</i>	Pumpkin ash	2
<i>Gordonia lasianthus</i>	Loblolly bay	2
<i>Ilex cassine</i>	Dahoon holly	2,3
<i>Juniperus silicicola</i>	Southern red cedar	1
<i>Liquidambar styraciflua</i>	Sweetgum	1
<i>Magnolia virginiana</i>	Sweet bay magnolia	2,3
<i>Nyssa aquatica</i>	Water tupelo	2
<i>Nyssa sylvatica</i>	Swamp tupelo	2
<i>Persea borbonia</i>	Red bay	2
<i>Persea palustris</i>	Swamp red bay	2
<i>Pinus glabra</i>	Spruce pine	1
<i>Pinus palustris</i>	Longleaf pine	1
<i>Planera aquatica</i>	Water elm	2
<i>Prunus serotina</i>	Black cherry	1
<i>Quercus virginiana</i>	Live oak	1
<i>Quercus michauxii</i>	Swamp chestnut oak	1
<i>Quercus nigra</i>	Water oak	1
<i>Sabal palmetto</i>	Sabal palm	1
<i>Taxodium ascendens</i>	Pond cypress	2,3
<i>Taxodium distichum</i>	Bald cypress	2,3
<i>Ulmus americana</i>	American elm	1

## What are your concerns?

Concerns	Concerns Addressed
It'll block my view of the water.	Many native trees, shrubs, and grasses are fairly low-growing. With a well-designed landscaping plan, you'll be able to enhance scenic views and increase your privacy.
I like keeping my lawn looking neat and trimmed.	Some people are concerned that riparian vegetation will look unkempt. Sure, it's a switch from the manicured lawn; however, native trees, shrubs, and grasses at the shoreline or stream bank can be a low-maintenance landscaping alternative that is aesthetically pleasing in a very "natural" way.
All that weedy growth will attract rats and snakes.	Actually, native shrubs and trees are much more likely to attract beneficial wildlife, including butterflies and songbirds. The secret is to think about the types of wildlife you'd like to attract, and then choose native plants that provide food and/or shelter for those species.
It's difficult to find native trees and shrubs at my local garden center.	Check out the Association of Florida Native Nurseries website. They have a list of growers in the state that can help. <a href="http://www.afnn.org/">www.afnn.org/</a> .
A bunch of plants won't make much of a difference. If I'm really going to try to stop erosion, riprap will work better and last longer.	Without a doubt, there are certain locations experiencing severe erosion which require rock riprap or other solutions. For maximum benefits, establish a vegetative riparian zone in addition to hard armoring by planting native plants above the rock riprap – and remember, riprap will need a permit!

storms, helping to lessen erosion of the banks. In urban Gainesville, in-stream sedimentation from storm flow is the primary source of sediments entering the creeks.

### Flood damage control

The gentle slope of a natural shoreline gives flood water a place to go. Preservation of the floodplain prevents buildings from being poorly sited and protects downstream locations from inundation during exceptionally high water levels. Destruction of the riparian zone from fill simply causes flood



waters to rise higher and travel faster, resulting in severe erosion problems of the shoreline and threatening structures such as bridges, docks, and other facilities. Unfortunately, while planted buffers have the many virtues previously discussed, on filled properties they cannot greatly lessen flooding problems unless accompanied by reconstruction of the wide, gentle sloping floodplain. This can be done and is worthwhile doing, but it does require county and state permitting, and preservation of the original is by far easier. Still, buffers along filled shorelines do



help by storing water in their soils and slowing stormwater velocity during extreme floods. Buffers around retention ponds also aid with water storage and water removal by evapotranspiration of the plants and

trees. These ponds, collecting a share of the stormwater, decrease volume and velocity in the streams and contribute to flood control in this manner. Lastly, substantial riparian zones prevent flood

damage simply by keeping development back from the immediate banks of the waterways.

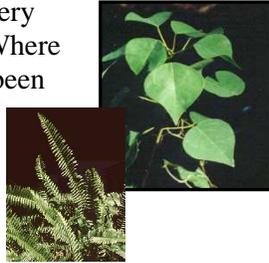
### Wind Protection

A buffer of any depth will offer your home wind protection from severe storms if the zone is planted thickly with canopy and understory trees. Of course, the greater the depth, the greater the wind reduction. The hurricanes of fall 2004 illustrated the effectiveness of such buffers during storms quite well. Homes and yards having heavily treed shorelines fared much better than those with the occasional specimen tree scattered throughout the property, especially on the lakes.

### Invasive plants

Exotic invasive plant species have become a very real problem along the county's waterways. Where the original natural and native vegetation has been removed, invasives move in easily.

Invasives are brought in with the water, in bird droppings, on the backs and feet of animals, in fill dirt, by intentional planting, and on the wind. They upset the native ecosystem that supports wildlife by eliminating beneficial native species. In turn, water quality may suffer in many cases.



Preserve the original vegetation if you have the opportunity. If you are replanting a buffer zone, your efforts will pay off as progress is made. Re-establishing the native flora will make it more difficult for invasive species to gain a foothold. You may want to contact the appropriate agency staff for advice on the best plan of attack, as some species are particularly difficult. Helpful websites and agencies are listed on the last page of the booklet.

### Save Money

Buffers lessen property damage risks and expenses by keeping development away from floodwaters and storm surges. The investment in stormwater management costs the community less by the reduced flooding, erosion, and sedimentation. Air conditioning bills decrease.



all, so it is rather futile to plant shade loving species that do not like hot, sunny conditions until a tree canopy is established.

- ❖ Find sources from which to obtain plants. Many nurseries carry a good selection of native plants, but look for plants that are true natives, not cultivated varieties or hybrids. Please do not remove them from the wild, though. Besides, it's illegal! You can gather seed, though, and take cuttings. Then you can cultivate plants for future use.
- ❖ Rid the site of invasive exotic species. This may need to be done over time, especially if exotics are the only thing holding the bank together. Do be sure to keep them from overtaking your new plants, however. Remember, some invasive exotics require a permit from the Bureau of Invasive Plant Management before removal. These permits are free.
- ❖ Water your new plants frequently. Mulch them well. You will need to count on caring for them until they are well established. Watering is especially important the first 6 months.
- ❖ 11. The best time to plant is over the winter months.
- ❖ 12. Be sure to photograph the buffer's progress every few months and observe the changes that come. Note what works and what doesn't for future reference.
- ❖ 13. Enjoy!



***Look after your best shoreline insurance policy – a buffer strip of native plants along the shoreline. If you've got the space, make it 100 feet wide. The wider the strip the bigger the benefits!***

## If you have an already built situation

- ✿ Do what you can! Plant as wide an area as current conditions allow. If you have a seawall that can be removed, do so. (remember you need proper permits from the state and county environmental protection departments). If you can't do that, plant above and below the seawall. Simply do the best you can with the situation you have "inherited."
- ✿ Start small. It doesn't have to be done all at once. You may want to begin by putting in a few littoral plants along the water's edge. Maybe you'd like to try to re-establish maidencane in the water. Perhaps it makes most sense to begin by planting a number of canopy trees.
- ✿ Come up with a plan of what you'd like to accomplish. A rough sketch will do.
- ✿ Photograph the site as is. This will give you a comparison later.
- ✿ Check to see if you will need any permits before planting or before removing any exotics. Agencies to check in with include the Alachua County Environmental Protection Department, Florida Department of Environmental Protection – Bureau of Invasive Plant Management, city government if you are in a municipality, and your water management district.
- ✿ Make up a list of plants that would be appropriate for you to use. Check out natural areas at nearby waterways to get ideas about what species would normally be growing there. Ask agencies for advice on choosing plant species, and of course, check out the internet sites. Be sure the plants are native to this area, though!
- ✿ Consider what will grow under current conditions. For example, the soil around many man-made ponds is sandy. In such a case, it will be poor in nutrients and not hold moisture well. Even if nearby plants are wetland plants and native, they may not do well at all on the slope of one of these ponds. Or maybe there is currently no shade at



Your yard costs less to maintain, and you will have little or no need to spend money on pesticides or fertilizers. Chances of property damage resulting from Mother Nature's more severe moments are lessened, too.

### Aesthetics

Ah, the easiest reason of all to appreciate a well vegetated buffer zone! Frog choruses and bird concerts. Beautiful vistas. A much improved and restful view that is easier on the eyes. Sweet smelling flowers. Color brightens your life from the flowers, butterflies, birds, and then, the turning leaves of fall.



### Livable communities

Riparian buffer zones help make our cities "livable," bringing us cleaner air and water, less noise, peace, privacy, and beauty. A place to meditate, dream, or forget our troubles. Lower yard temperatures add to our comfort. And you get to feel good about yourself for the service you have provided the community and wildlife. All this plus you have more than likely raised your property value to boot! What a deal!!! Build a buffer!! You really can't lose!



# LET'S FIX YOUR SHORELINE!



## What to consider

Give some thought to the features of your property that enhance your enjoyment of your waterside yard.

- ✿ **View:** Consider the views you want to maintain and frame a “view corridor” from your home with plantings composed of small trees shrubs, and/or native grasses (but not lawn) that will not obstruct your view. Keep the view corridor at one-third your lot’s total width or less. Preserve and plant larger trees in the rest of your buffer. Another option is to strategically trim trees within your view corridor, but avoid “topping” and radical pruning.
- ✿ **Attractive Foliage:** Do you want to attract certain wildlife to your backyard buffer, such as hummingbirds or butterflies? Certain plants will attract certain animals, while others are deer-resistant.
- ✿ **Plant Type:** Do you want flowering plants? Evergreens? What time of year do you want blooms?
- ✿ **Plant Location:** Determine where you want different plant types. Where do you want shrubs and where do you want trees, flowering plants, or native grasses? To aid you later in picking species, decide the maximum plant height and spread you want in certain areas. If you hope to attract birds or butterflies, determine where in your yard you would like to see them. Soil type, sun and shade, depth to the water table and the proximity to surface waters all must be considered, too.



## If you are building new.

- ✿ **Save what’s there, if it’s native.** Leave as wide a buffer as you can for maximum benefits. The wider the buffer the greater the number of wildlife species will benefit. Alachua County requires as much as 150 feet on certain lakes and river, but never less than 75 feet. Be sure to check with the Alachua County Environmental Protection Department, as well as state and local requirements.
- ✿ **Maximize your buffer by clearing the least amount of your property as possible,** clearing only what is needed for the building’s footprint. Build a small footprint house for the same reason.
- ✿ **Add winding paths, parallel or diagonal to the waterway** to preserve the integrity of the buffer from erosion.
- ✿ **Plant additional trees, understory species, and littoral plants** if the buffer zone is sparsely vegetated; for example, if the property had been over-grazed as pasture. *See list of suggested plants at end of booklet.*
- ✿ **Check for invasive exotic plant encroachment** occasionally and remove undesirable pest plants.

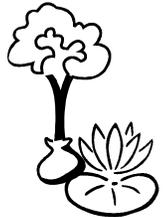


Table 2: A summary of pollutant removal effectiveness and wildlife habitat value of vegetated buffers according to buffer width (1 meter=3.28 feet) (Source: Desbonnet et al. 1994).		
Buffer Width	Pollutant Removal	Effectiveness Wildlife Habitat Value
5 meters (approx. 16.5 ft.)	Approximately 60% or greater sediment and pollutant removal.	Poor habitat value; useful for temporary activities of wildlife.
10 meters (approx. 33 ft.)	Approximately 60% or greater sediment and pollutant removal.	Minimally protects stream habitat; poor habitat value; useful for temporary activities of wildlife.
15 meters (approx. 50 ft.)	Greater than 60% sediment and pollutant removal.	Minimal general wildlife and avian habitat value.
20 meters (approx. 66 ft.)	Approximately 70% or greater sediment and pollutant removal.	Minimal wildlife habitat value; some value as avian habitat.
30 meters (approx. 100 ft.)	Approximately 70% or greater sediment and pollutant removal.	May have use as a wildlife travel corridor as well as general avian habitat.
50 meters (approx. 165 ft.)	Approximately 75% or greater sediment and pollutant removal.	Minimal general wildlife habitat value
75 meters (approx. 248 ft.)	Approximately 80% or greater sediment and pollutant removal.	Fair-to-good general wildlife and avian habitat value
100 meters (approx. 330 ft.)	Approximately 80% or greater sediment and pollutant removal.	Good general wildlife value; may protect significant wildlife habitat.
200 meters (approx. 660 ft.)	Approximately 90% or greater sediment and pollutant removal.	Excellent wildlife value; likely to support a diverse community.

The table above illustrates the increase in a buffer’s benefits that comes with an increase in width of the buffer