

YOUR WATERFRONT PROPERTY AND AQUATIC RESOURCES



INCLUDE THE AQUATIC ELEMENT IN YOUR LANDSCAPE:

Sustainable shoreline development and restoration includes a variety of techniques – from maintaining natural shoreline habitat to modifying it with native plants. By incorporating these techniques on your property, you can create a landscape that complements nearby waters. These techniques are generally less expensive than traditional shoreline hardening techniques, and they function better. They filter nutrients and pollutants from runoff, prevent erosion and provide valuable fish and wildlife habitat. The result is an attractive landscape that sustains the environmental values that initially attracted you to the water. Fish and wildlife populations thrive under these conditions. By processing stormwater runoff, these techniques filter pollution, and reduce the likelihood of unsightly algal blooms and excessive vegetation that can harm water quality and access for recreation.

Riparian Reform: A New Way to Improve Shoreline Habitat and Property Value

People have always been attracted to the water's edge for necessities – water, fish and other resources. Now the appeals of recreation and relaxation draw property owners to the areas bordering the clean, tranquil waters of North Carolina. Many homeowners currently enjoy living in an aquatic landscape, a landscape near water, and more homeowners will soon join them. Their ever-increasing demands on our water supplies and recreational resources make it vital that we pursue development in a manner that does not harm people, fish or other wildlife that live along the water's edge – the riparian zone.

Like you, most waterfront landowners are attracted to the water because they value what it provides: a tranquil, aquatic landscape, boating and fishing opportunities, wildlife viewing opportunities and clean water. A healthy aquatic ecosystem – the total community of living things in an aquatic environment – supports all of these amenities. A poorly planned waterfront development, however, puts these amenities at risk. In some cases, it can degrade the qualities that initially attracted you to the water's edge. This brochure describes some techniques that you can use to sustain the riparian zone and the value of your property.



Scenic vistas are relaxing and one of many reasons people are attracted to lake living.

How Waterfront Development Affects the Riparian Zone

Waterfront properties are often developed in a way that does not fully consider the adjacent water and associated amenities. Traditional residential lawns extend to the water's edge, where a seawall separates a manicured lawn from the water. While the intent of a seawall is to minimize property erosion and provide a view of the water, it often does not meet these needs. Seawalls, a shoreline armoring technique, eliminates fish and wildlife habitat. However, shoreline restoration techniques can be implemented to showcase the adjacent water, prevent erosion, filter nutrients and pollutants from stormwater runoff, and create habitat that allows fish and wildlife populations to thrive.

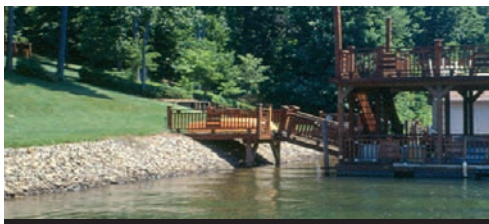
THE DRAWBACKS OF SEAWALLS

- Expensive to build
- Professional installation required
- Frequent maintenance necessary
- May not adequately prevent erosion
- No filtering capacity

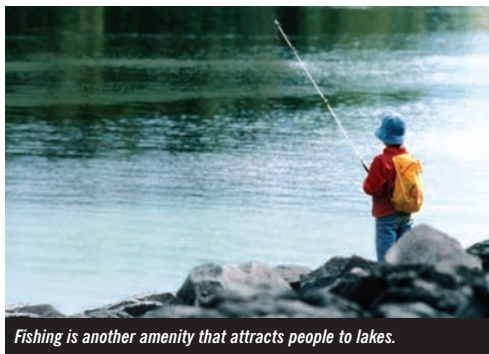
Seawalls and riprap (*shown below*) do not process stormwater, eliminate erosion or provide fish habitat as well as a natural shoreline. However, riprap provides improved habitat over that of a seawall.



Seawall



Riprap



Fishing is another amenity that attracts people to lakes.

How to Sustain the Riparian Zone

Riparian reform – using modern techniques to restore and maintain natural habitat along the water's edge can help to increase property values and create a shoreline that meets the needs of property owners at a reduced cost. Most important, it can help to sustain a healthy aquatic ecosystem and maintain the environmental amenities that waterfront residents value. This is a winning combination for people and the aquatic ecosystem.

FISH HABITAT AND THE WATER'S EDGE

Loss of habitat has contributed to the decline of fish populations throughout the state. Without adequate habitat, fish often do not reproduce successfully, and young fish may not have enough shelter or food to survive, grow, and contribute to future generations.

For many fish species, shoreline habitat is especially important. Fish abundance near shorelines is usually much higher than in the adjacent open water. The shoreline provides feeding, nesting and rearing habitats for many freshwater species. Destruction of this habitat through unwise construction can reduce fish populations to fractions of their original size.

How do you use your shoreline? If relaxation and scenic outlooks are top priorities, consider a natural shoreline that frames the water against any old-growth trees that surround it. Instead of removing all shoreline trees, consider clearing a view corridor by strategically removing a few tree limbs (while leaving tree trunks intact) to create a

better view of the water. Supplemental plantings of native vegetation can add color and interest through the seasons. Chemicals, nutrients and sediments can easily reach the water without a zone of grasses, plants and trees to filter runoff. The algal blooms and muddy water that result are unsightly, and the chemicals in runoff can contaminate fish and wildlife.



Plantings of native vegetation not only enhances the scenic beauty of a shoreline, they also provide valuable protection to water quality and habitat for fish and wildlife. (photo credit: Bob Kirschner)

If additional access to the water's edge is desired, you can improve accessibility by using small paths made of permeable materials. Creating narrow, mulched paths that cross the riparian zone can enhance wildlife viewing opportunities and allow runoff to be filtered by the soil before reaching the water.

BUFFERS WITH GRASSES AND TREES FILTER POLLUTANTS

Type of Buffer	Width	Approximate Percent Reduction of Each Pollutant		
		Sediment	Nitrogen	Phosphorus
Grass	15 feet	61%	4%	29%
Grass	30 feet	75%	22%	24%
Forest	60 feet	90%	74%	70%
Grass/Forest	80 feet	96%	75%	79%
Grass/Forest	95 feet	97%	78%	77%

Source: U.S. Environmental Protection Agency



Adding structure under piers enhances habitat for fish.

Enhance pier habitat. If you want a pier for access to the water, consider one with a walkway that spans vegetation and fallen trees – both provide excellent habitat for fish. A higher walkway will allow more sunlight to reach vegetation, ensuring that it survives and continues to provide habitat for fish of all sizes. Other parts of a pier can be enhanced to improve fish habitat. By anchoring and securing a discarded Christmas tree, tree

limbs, or a variety of artificial structures under your pier, you can make this area more attractive to fish. Feeding fish around these structures during spring and summer is an excellent way to attract fish to your pier. This also provides a place to introduce youth to the environment and the joys of fishing. Fishing success from the pier can be expected to improve after these enhancements are made.

Upgrade Your Shoreline

New and existing lakeshore landowners must decide how to best manage their shorelines. There are many techniques available to enhance waterfront property values while maintaining water-related values that attracted the buyer to the water. By implementing riparian reform techniques, you not only improve the aesthetics of your property, but you also improve fish and wildlife habitat, protect water quality, and preserve environmental values that are important to many waterfront property owners.

As more and more people use North Carolina waters, overall environmental and recreational quality can be reduced if not properly addressed. By countering this reduction through riparian reform techniques, you help maintain high-quality water-related experiences for fellow property owners, boaters and anglers, and the aquatic ecosystem.



By adding native plants to riprapped shoreline, erosion is controlled and the aquatic habitat is enhanced.



By adding riprap and native plants to a seawall, the fish and wildlife habitat is greatly enhanced.

Riparian Reform: Simple Techniques to Improve Shoreline Habitat

Maintain a Buffer

Create a buffer between your lawn and the water's edge by not mowing in the riparian zone. A buffer greatly improves the filtering capacity of grasses and small plants. The area between your lawn and the buffer zone can include curved edges and additional landscaping near the edge of the buffer to create a manicured appearance. Paths made of permeable materials, such as bark and mulch, allow runoff from heavy rains to be filtered by the soil and can provide improved access to the water's edge.

Landscape with Native Plants

Including native plants within the buffer can create interesting landscape effects that frame the beauty of the nearby water. Plants should be native to prevent them from overtaking your property. Properly placed trees and shrubs muffle sounds of boat traffic and deter nuisance waterfowl like resident geese and ducks that leave droppings on your yard and property. These plantings also provide fish habitat and protect water quality by filtering nutrients from stormwater runoff.

Enhance Your Pier

Piers that extend from the shoreline can also be enhanced to create better habitat. Small limbs, brush, and discarded Christmas trees can be submerged and anchored beneath your pier to enhance habitat. Prefabricated fish habitat modules are also available for purchase. Count on fishing in the vicinity to improve following this type of enhancement. Piers with narrow, elevated walkways will allow additional sunlight to reach shoreline vegetation, ensuring its survival. Piers can easily span fallen trees, eliminating the need for tree removal and associated costs.

Seek Professional Help

Most county Cooperative Extension centers and Natural Resource Conservation Service offices have excellent information on plant selection and planting techniques for areas near water. Local nurseries and garden centers can also provide plant selection advice.

Why It Works

Riparian zones are vital components of healthy aquatic ecosystems. They are rich and diverse areas that provide habitat for healthy populations of fish and other wildlife. Riparian reform techniques conserve these habitats and help fish survive and grow, and they can provide many advantages for shoreline property owners as well.

A reformed riparian zone resists erosion without a seawall. Naturally sloping shorelines with rooted and fallen trees, along with native plants and grasses, naturally resist erosion by slowing wave energy and trapping nutrients and sediments from runoff before they reach the water. They dissipate wave energy, more efficiently than vertical seawalls and result in less erosion. Attempts to stabilize shorelines using seawalls often do not work as well and can even increase erosion around the armored area. Maintaining natural areas sustains a property's aesthetic values and provides a cost-effective alternative to constructing a seawall. Without natural buffers, shorelines are prone to excessive sedimentation and erosion, which can degrade the environment and decrease your property's value.

A reformed riparian zone supports fish and other wildlife. Naturally sloping shorelines with fallen trees and vegetation offer refuge and food to fish and other members of the aquatic ecosystem. However, these shoreline features are usually eliminated during development and are not allowed to become re-established afterwards. Because many fish population declines have been linked to loss of habitat, it is important that high-quality shoreline habitat remains available. A naturally sloping shoreline with a variety of native plants offers excellent fish and wildlife habitat. However, armoring with large-grain rock (riprap) will offer more feeding and refuge habitat to fish than a seawall because riprap dissipates wave energy and provides more spaces for fish to feed and hide.

Remember, maintenance and re-establishment of natural habitat do not have to reduce access to the water. A well-planned riparian zone maintains ecosystem health while meeting your needs for access to the water.

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For More Information...

Riparian Reform Techniques

<http://www.sdafs.org/ncafs/outreach/shorelinedevelopment.htm>

N.C. Wildlife Resources Commission

For fish populations:

Phone: 919-707-0220

For wildlife populations:

Phone: 919-707-0050

<http://www.ncwildlife.org>

Duke Energy Corporation

For piers, lake, and shoreline management:

Phone: 1-800-443-5193

<http://www.duke-energy.com>

N.C. Department of Environment and Natural Resources

For surface water quality protection:

Phone: 919-733-5083 ext. 356

<http://h2o.enr.state.nc.us>

For stormwater management:

Phone: 919-733-7015

<http://www.ncstormwater.org>

For soil and water conservation:

Phone: 919-733-2302

<http://www.enr.state.nc.us/DSWC/pages/district%20offices.html>

Natural Resources Conservation Service:

Local NRCS Offices:

Phone: 919-873-2100

<http://offices.sc.egov.usda.gov/locator/app>

State and Federal Assistance Programs:

Phone: 919-873-2100

<http://www.nc.nrcs.usda.gov/programs/>

N.C. Cooperative Extension Service:

County Offices:

<http://www.ces.ncsu.edu/index.php?page=countycenters>

For selection of grasses, aquatic plants and landscaping for water quality:

<http://www.ces.ncsu.edu/depts/hort/consumer/index.html>

Pure Fishing

For prefabricated fish habitat modules:

Phone: 1-877-777-3850

<http://www.purefishing.com>

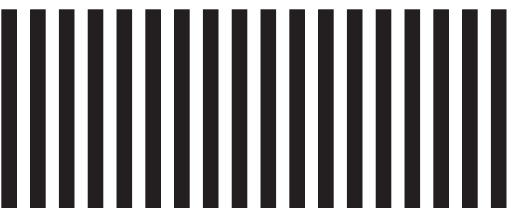
Dear Shoreline Landowner:

Thank you for your time in reading our brochure entitled "Riparian Reform Techniques." Your opinions of these techniques are important to us. Please take a few minutes to answer the following questions. Unless otherwise stated, please select the single best answer for each question. Your responses will help us better understand your needs as a shoreline landowner. Once completed, please detach this questionnaire along the perforated line and place into the mail. No postage is required. Thank you for your time.

1. Which value played the PRIMARY role in your decision to purchase waterfront property?
 Scenery Property value Wildlife viewing
 Swimming Fishing Boating
 Other (please specify): _____
2. How many days annually do you engage in an activity that involves water bordering to your property? Such activities include watching sunsets/sunrise by the water, fishing, boating, swimming, etc.
 0-49 50-99 100-199 200-299
 More than 300
3. Which do you currently have on your property or in the water bordering your property? Please select all that apply.
 Pier Seawall Crushed rock (riprap)
 Fallen trees Vegetation Sand beach
 Other (please specify): _____
4. Prior to reading the brochure, were you aware that shoreline improvement techniques existed?
 Yes No
5. After reading the brochure, how likely are you to implement enhancement techniques on your property?
 Definitely plan to include some of the techniques
 Will likely include some of the techniques
 Undecided
 Do NOT plan to include any of the techniques
6. If you do NOT plan to include any of the enhancement techniques, why not? Please select all that apply.
 Already maintain a natural shoreline
 Already have shoreline stabilization (seawall or crushed rock/riprap)
 Do not wish to block view of water from property or home
 Believe techniques to be unnecessary
 Too expensive
 Other (please specify): _____
7. Which enhancement techniques appealed to you MOST?
 Maintenance of natural shoreline
 Shoreline plantings
 Enhancement of habitat under piers
 Creating a buffer between land and water
8. Which enhancement techniques appealed to you LEAST?
 Maintenance of natural shoreline
 Shoreline plantings
 Enhancement of habitat under piers
 Creating a buffer between land and water
9. Which shoreline stabilization techniques do you currently have in place?
 Seawall Crushed rock (riprap) Natural shoreline
 Shoreline plantings (please specify type): _____
 No shoreline stabilization
10. What was your overall opinion of the brochure that you received?
 Excellent Good Fair Poor
 Other (please specify): _____
11. Would you recommend these techniques to others who live on the water?
 Yes No



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