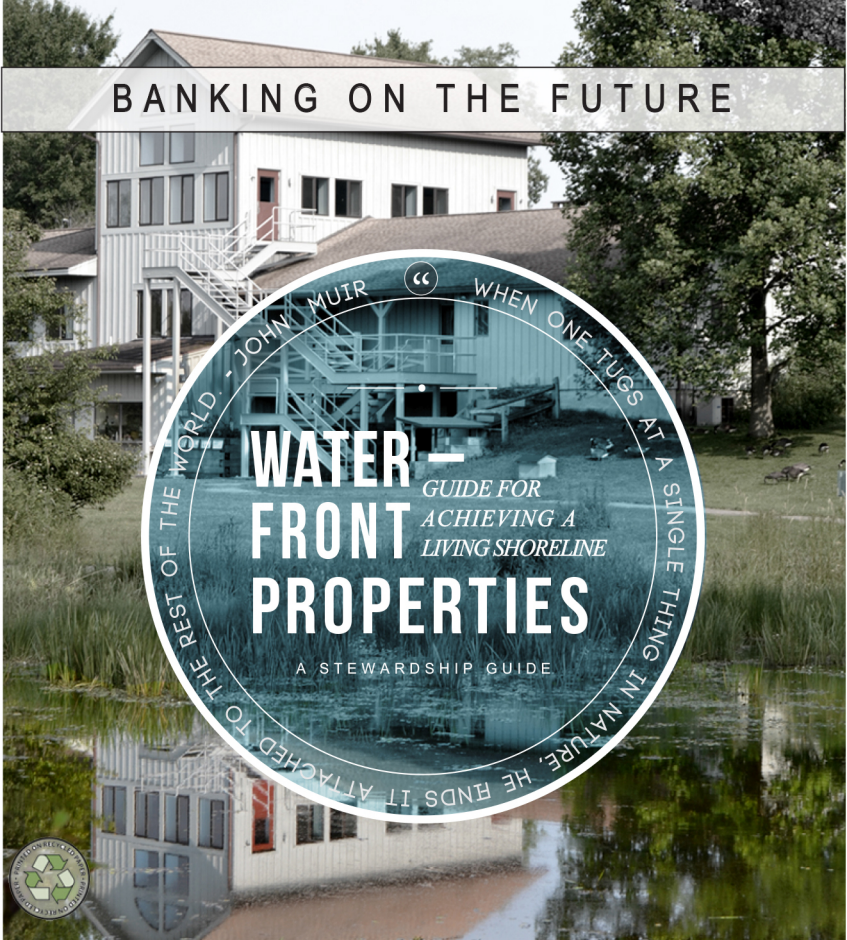
BANKING ON THE FUTURE



"WHEN ONE TUGS AT A SINGLE THING IN NATURE, HE FINDS IT ATTACHED TO THE REST OF THE WORLD." - JOHN MUIR

WATER–FRONT PROPERTIES

GUIDE FOR ACHIEVING A LIVING SHORELINE

A STEWARDSHIP GUIDE

BUFFALO NIAGARA **RIVERKEEPER®**

AESTHETIC OF CARE

1. West River Parkway, Grand Island, NY 2. Tall grass habitat, NY (Image Source: Bluejaybarrens.blogspot.com) 3. Small vegetated buffer and intelligent mowing at Bergeson Audubon Society, Jamestown, NY 4 & 5. Emergent vegetation at East River Marsh, Beaver Island, NY 6. Naturalized wave buffer in the Niagara River, NY

THE BEAUTY OF A LIVING SHORELINE

THE EVOLVING AESTHETIC

Our strong cultural convention for what justifies natural beauty has produced a monolithic landscape of turf lawn that exists unbroken and all-encompassing across our country. This cultural convention is well-developed and resistant to change, making this guide and your cooperation a necessary catalyst for developing a new set of aesthetic expectations for waterfront landscapes. Our goal is to make healthy landscapes recognizable and highly visible in order to cause widespread change, and it starts in your backyard.

The current convention for waterfront properties utilizes hardened structures such as bulkhead retaining walls and mowing-to-the-edge practices. These conventions decrease the overall stability of the shoreline and increase the rate of erosion, resulting in the loss of highly valuable fish and wildlife habitat. These conventional waterfront landscapes are often laden with good intentions, social meaning, and personal pride, but our perceived good intentions have resulted in unforeseen and unintended harm to the very landscape we take pride in.

It is essential that we start to shift our perspectives on what justifies a beautiful landscape in order to restore harmony to the larger ecological system. The ecological future of our water systems cannot solely rely on large swaths of public land being maintained by professionals, but rather, must rely upon the individual stewardship and efforts undertaken in the backyards of every private landowner along the water's edge.

LIVING SHORELINES

WHAT ARE THEY?

When using the term "living shoreline" we are actually referring to a combination of different natural ecosystems such as meadows, woodlands, wetlands, and aquatic habitats which create a seamless transition from land to water. These incredibly productive shoreline landscapes provide a wide range of benefits including improvements to: runoff filtration, habitat diversity, visual character of the shoreline, flood mitigation, and erosion resistance along the edge.

THE BIG PICTURE

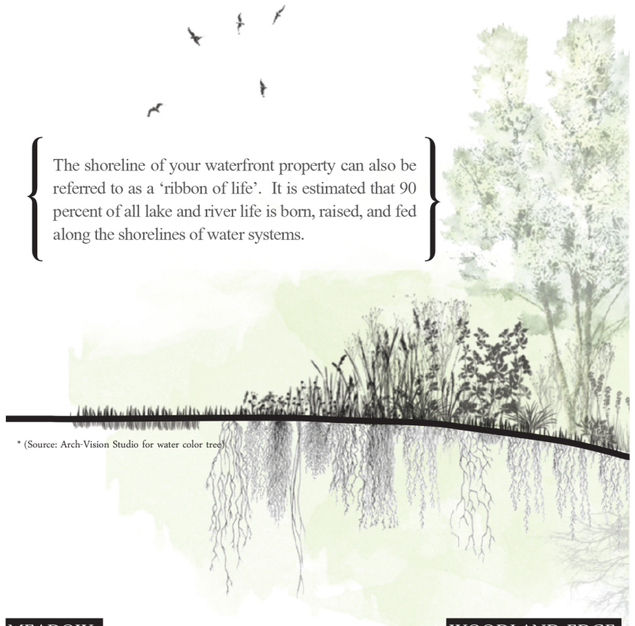
~41,971

Multiply the benefits of a living shoreline by the amount of households that abut a river or lake system in the Niagara River watershed and we will see substantial improvements to the health of our waterways.

MEASURABLE BENEFITS

–	18	X	POLLUTANTS
+	13	%	PROPERTY VALUE
–	48	%	MAINTENANCE COSTS
+	500	%	BIODIVERSITY
+	50–100	%	FILTERED SEDIMENT

The shoreline of your waterfront property can also be referred to as a 'ribbon of life'. It is estimated that 90 percent of all lake and river life is born, raised, and fed along the shorelines of water systems.



* (Source: Arch-Vision Studio for water color tree)

MEADOW → WOODLAND EDGE

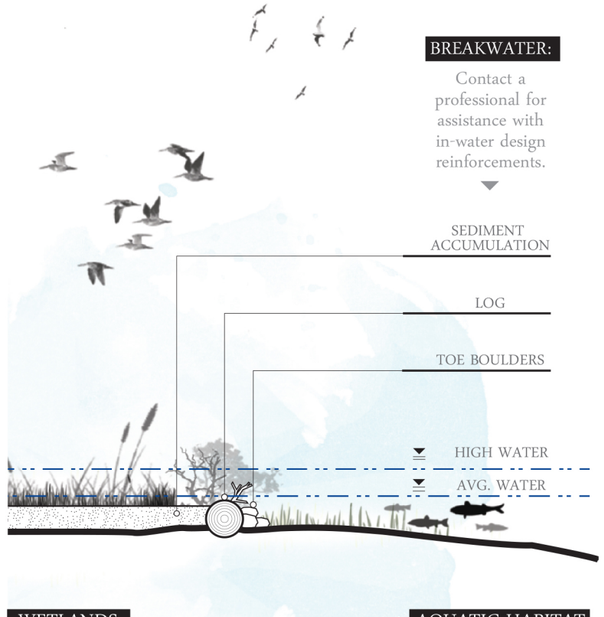
The fine textures of grasses and shrubs typical of meadow and woodland edge ecologies act as coarse filters that strain stormwater runoff, removing sediments and contaminants as water drains downhill towards the waterbody. Deep root zones add stability to the shoreline and soak up excessive nutrients carried in stormwater runoff before it enters a waterbody.

WOODLAND → WETLANDS

Large trees such as cottonwoods and willows have deeper root systems compared to the shallow spreading roots of upland tree species. These deep roots hold soil together, improving shoreline resistance to erosion. The large canopies of these trees provide habitat for birds and the shade they cast onto the water is ideal for fish and amphibians which eat mosquito larva.

BREAKWATER:

Contact a professional for assistance with in-water design reinforcements.



WETLANDS → AQUATIC HABITAT

Wetland ecologies absorb flood waters and regulate stream fluctuations, further improving shoreline stability. Aquatic vegetation grows here which provides food for fish, and the fallen woody debris that collects along the edge offers juvenile fish protection from predators and dissipates wave energy, protecting the fragile ecosystems located closer to the shore.

ACHIEVING A LIVING SHORELINE

STARTING A TRANSFORMATION

Transitioning your property towards a healthier shoreline is not as difficult as it may seem. You can begin to create an upland buffer by simply reducing maintenance frequency in strategic areas around your property. Creating a living shoreline, or vegetated buffer, involves three simple steps: planning, expanding habitat, and planting native vegetation. If implemented properly, a living shoreline can result in less work, less money spent on maintenance, and a healthier landscape to enjoy.

WHY BOTHER?

Erosion is a natural process, but the rate of erosion has dramatically accelerated due to human activities along water systems. Mow-to-the-edge practices can accelerate erosion, and manicured lawn lacks the ability to adequately intercept stormwater runoff before it enters a waterbody. Untreated stormwater runoff can carry varying amounts of petroleum, metals, pathogens, sediments, and other pollutants such as phosphorous and nitrogen. These pollutants can harm aquatic systems and reduce the enjoyment of waterfront living. It is estimated that 90 percent of all lake and river life is born, raised and fed along the shorelines of water systems. So, a healthy shoreline is key to achieving a healthy waterbody and that makes our experience on the water much more enjoyable.

SHORELINE PROTECTION

01 **LIVING SHORELINE** 01
Utilizes natural ecosystems to protect and enhance the shoreline.

VS.

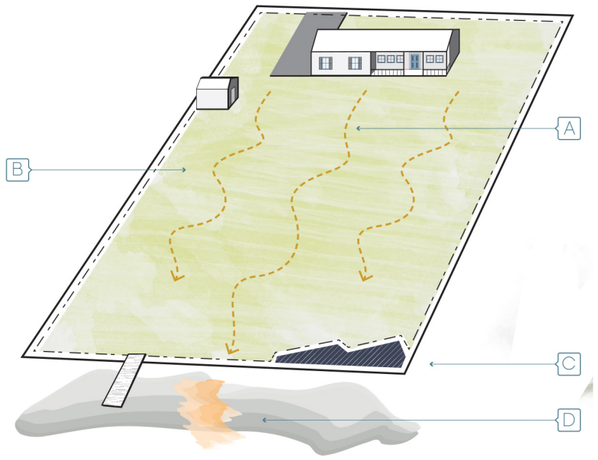
02 **STRUCTURAL EDGE** 02
Utilizes bulkhead retaining walls or other hardened measures.

ADVANTAGES AND LIMITATIONS:

	01	02
REDUCE CURRENT (on-site) EROSION	+	+
REDUCE FUTURE (on-site) EROSION	+	+
DECREASE NUTRIENT RUNOFF	+	–
IMPROVE WATER QUALITY	+	–
REGULATE STREAM FLOW	+	–
MAINTAIN ECOSYSTEM PROCESSES	+	–
CREATE FISH SPAWNING AREAS	+	–
INCREASE BIODIVERSITY	+	–
ABSORB WAVE ENERGY	+	–
RETAIN SHORELINE ACCESS FOR WILDLIFE	+	–
MAINTENANCE COSTS	LOW	HIGH
START-UP COSTS	LOW	HIGH
RESILIENCY	HIGH	LOW

01 MAKE A PLAN

Waterfront properties similar to the one shown below can easily be transformed into a healthy shoreline with proper planning. To start, locate areas where stormwater runoff is entering the waterbody and identify high erosion areas that need to be addressed. Next, locate and preserve any native plantings near the water that can be saved and expanded. Finally, identify the best water access points and plan out a strategic pathway to provide access down to the water's edge.



A. Increased stormwater runoff and pollutants B. Mowed lawn to the edge offers limited stability and provides insufficient habitat C. Erosion and property loss D. Poor water quality with little to no habitat

02 EXPAND HABITAT

Next, divide your property into different zones to be maintained at different intervals.(A) Frequent mowing is appropriate when maintaining a pathway or upland recreation areas.(B) Reduce mowing to once every 2-3 years to prevent forest growth and promote wildflower ecologies which won't obstruct views and will attract pollinator species.(C) Eliminating mowing altogether will eventually lead to forest growth.(D) Allow plant growth & reduce the clean-up of fallen woody debris to promote wetland ecosystems.

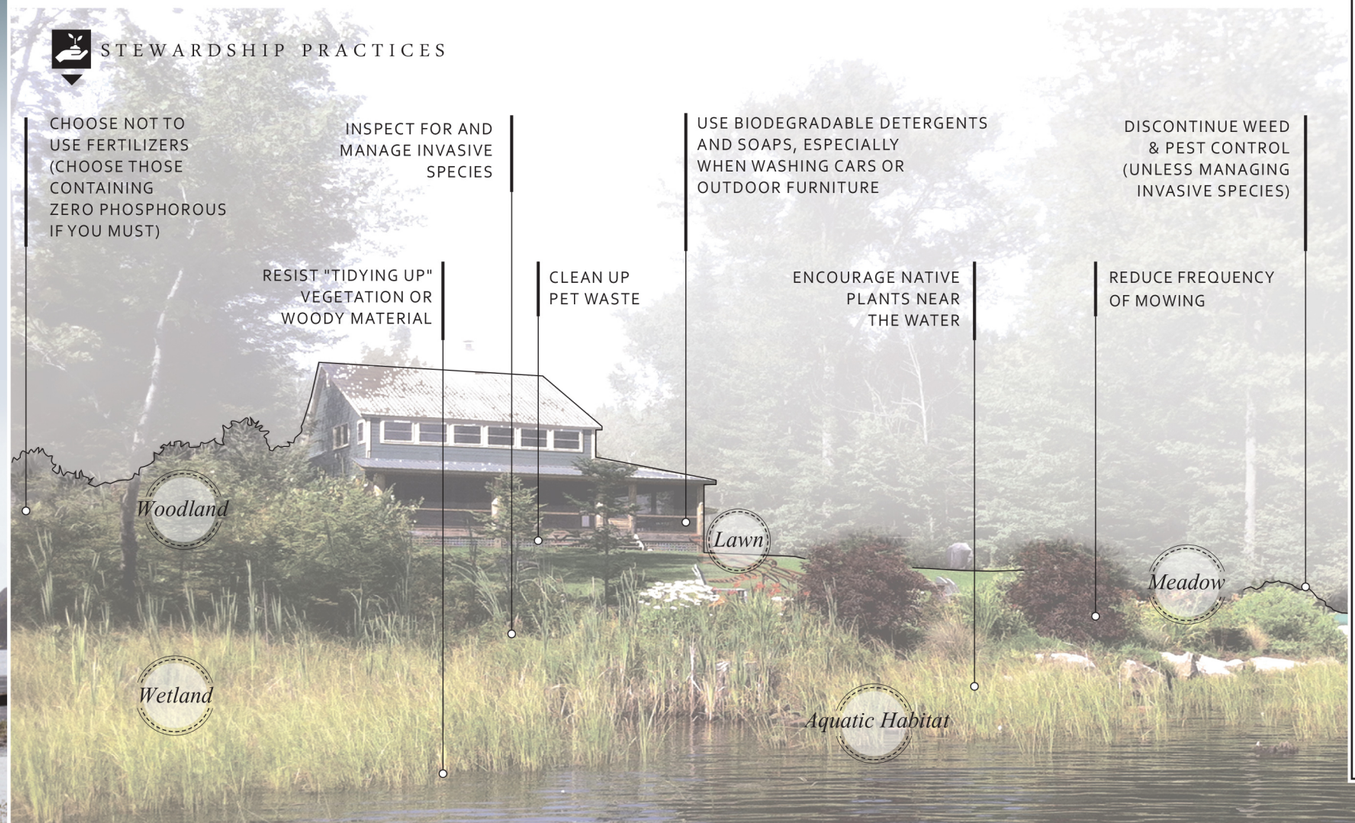
By simply altering the frequency of mowing/maintenance you can save money while establishing and improving upland habitat along the shoreline. Transforming the upland portion of your shoreline is the first step towards dramatic improvements.

03 PLANT NATIVES

Woodland, meadow, and wetland ecosystems will begin to emerge as you alter the frequency of mowing and maintenance on your property. The specific functions of each of these ecological systems, or "zones" contribute to the overall effectiveness of your living shoreline to stabilize, regulate, and enrich the edge. Paired with native plantings and seeds, your property will become even more productive and continue to offer more benefits as it develops.

A. Native grasses and wildflower meadows B. Woodland habitat C. Stone and/or sandy beach D. Wetlands with emergent and submerged aquatic vegetation E. Large boulders, rocks, and/or secured logs act as breakwater

STEWARDSHIP PRACTICES



04 IN-WATER TREATMENT 04

In-water treatment varies considerably on a site-by-site basis. Several factors including the flow dynamics of the waterbody and property location within the water system will influence the appropriate in-water design of a living shoreline. When developing a plan for the in-water treatment of your living shoreline consider the following:

- Understand your project and the permits required to do any in-water site work.
- Contact consultants who specialize in living shorelines for a site analysis, information, and financial estimates.

CONCLUSION

A living shoreline is considered the best practice that can be implemented to address all of the conditions typically associated with waterfront properties. In contrast to a hardened shoreline (structural edges), which becomes weaker over time, a living shoreline gets better with age as it grows stronger and more resilient. In addition to resisting erosion these living systems offer many other long term ecological, economic, and social benefits for waterfront property owners. A living shoreline isn't only an investment in the environment; it is also an investment in your home and quality of life.

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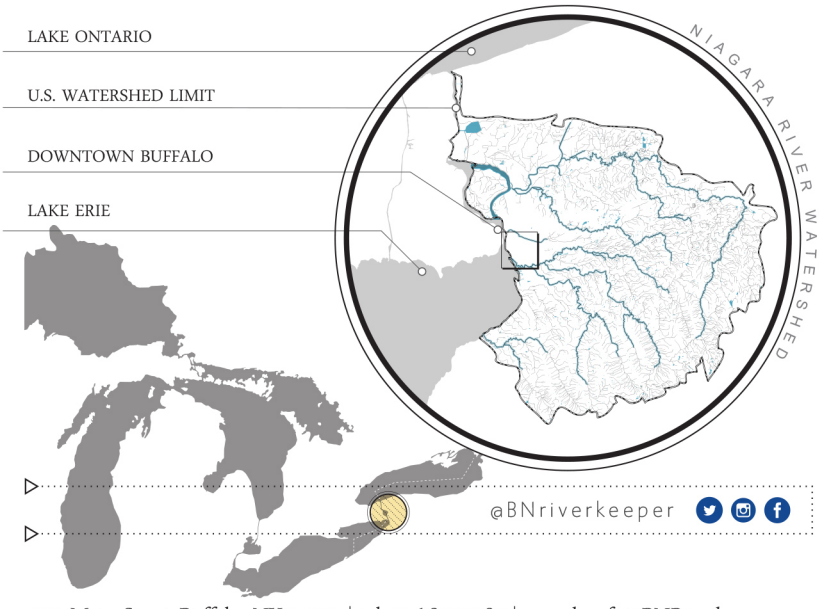
6. www.watershedcouncil.org



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