LIVING SHORELINES

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 that create a seamless transition from land to water. These incredibly productive shoreline landscapes provide a wide range of benefits including: runoff filtration, habitat diversity, visual character of the shoreline, flood mitigation, and erosion resistance. 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 hardened shorelines (structural edges) or mowed edges, which become weaker over time, a living shoreline gets better with age as it grows stronger and more resilient. A living shoreline is not only an investment in the environment, it is also an investment in your home and quality of life.

HAR DENED / MOWED SHORELINE

LIVING / NATURAL SHORELINE

A. Household (ZONE 1)
B. Native grasses and wildflower meadows (ZONE 2)
C. Woodland habitat (ZONE 3)
D. Stone and/or sandy beach
E. Wetlands with emergent and submerged aquatic vegetation (ZONE 4)
F. Large boulders, rocks, and/or secured logs across breakwater

DESCRIPTION

The diagram above compares two different shoreline approaches for waterfront property owners. Both options address erosion on your property, but the living shoreline approach to waterfront property management offers many additional benefits for the homeowner and the larger environment. The photograph shows how an ecologically sensitive living shoreline design can provide a managed, harmonious aesthetic while incorporating the three target ecologies (meadow, woodland, and wetland). Such an innovative system provides an essential contribution to shoreline function that will be further explored in the following posters.
The illustration below shows common conditions and some of the best practices to be considered for property owners to minimize the impacts on our waterways.

**ICON KEY:**

- WATER STORAGE / ABSORPTION
- SEDIMENT FILTER
- NUTRIENT UPTAKE

**DESCRIPTION**

Your home and property are important aspects to consider as part of a living shoreline. This area typically contains hardened surfaces such as roofs, driveways, and sidewalks which prevent water from absorbing into the ground, thus contributing to stormwater runoff. Many waterfront properties are also dominated by turf grass landscaping which contributes to increased amounts of pollutants entering the water, eroded habitat, and diminished shoreline resistance to erosion. Rain gardens, swales, rain barrels, and permeable pavement are some of the common ways to reduce residential runoff from entering local waterways.

**RESIDENTIAL RUNOFF:**

Waterways and receiving waters near urban and suburban areas are often adversely affected by stormwater runoff. Stormwater runoff affects water quality, water quantity, habitat and biological resources, public health, recreational use, and the aesthetic appearance of our local waterways. Runoff may include nutrients and debris from fertilizers, pesticides, sediments, and oil from lawn mowers or vehicles. The proper use of green infrastructure including rain gardens, swales, rain barrels, green roofs, and permeable pavement can dramatically reduce the likelihood of these residential contaminants from ever reaching local waterways.

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NATIVE PLANTS:
Native plants and natural communities comprise an important part of our healthy ecosystem. They typically require less maintenance and additives, such as fertilizers, pesticides, or excessive watering compared to non-native plants. Native plants have evolved long-standing, symbiotic relationships with other native fauna and flora providing important shelter and food for local wildlife. In addition to encouraging diversity, one of the other benefits of attracting wildlife to your property is that you will create a balanced environment where beneficial birds and insects will reduce the presence of less desirable pests such as mosquitoes.

SHORT GRASS IS GOOD FOR PLAYING GAMES, BUT WILL NOT EFFICIENTLY SLOW RUNOFF OR PROVIDE ADEQUATE HABITAT FOR DIVERSE WILDLIFE. WHEN MOWING AND MAINTAINING SHORT TURF GRASS, KEEP THESE GUIDELINES IN MIND TO ACHIEVE A SMARTER LANDSCAPE:
- Mowed pathway (ten feet wide or less)
- Recreation area (not exceeding 400 ft²)
- Succession forest control (mow once every 1-3 years to maintain meadow habitat and to prevent woodland habitat from establishing)

DESCRIPTION

MEADOW habitats, dominated by native grasses, wildflowers, and shrubs, will naturally provide improvements to water quality in adjacent waterbodies. The fine texture of grasses and flowers typical of these ecosystems act as coarse filters that slow down and clean the runoff draining from the land. This action increases water infiltration into the ground, absorbs pollutants before they enter waterbodies, and reduces flooding. The plants contained in this habitat type also feature deep, fibrous root systems which hold fine sediments together adding shoreline stability, thus reducing erosion. Meadows consisting of native plants provide additional habitat for wildlife, attracting up to 20x more species than non-native plants do.

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**WOODLAND**

**ICON KEY:**
- Water Storage / Absorption
- Sediment Filter
- Nutrient Uptake
- Habitat Creation

**DESCRIPTION:**
Defined areas of mature trees add character to residential landscapes while offering a framed view of your waterfront and many additional ecological benefits. Woodland trees can absorb excess groundwater nutrients and potentially harmful toxins before they enter the water in large quantities due to their size. While the fibrous roots of meadow plantings effectively hold sediments together, the thicker root structure of trees provide protection from the damaging impacts of waves, wind, and ice. Woodland areas along the shoreline are also beneficial to wildlife, providing empty habitats for birds and overhanging limbs cast shadows on the water, which is ideal for fish.

**PHYTOREMEDIATION:**
Phytoremediation is a cost-effective plant-based approach to remediation that takes advantage of the ability of plants to concentrate elements and compounds from the environment and to metabolize them in their tissues. Toxic metals and organic pollutants are the major targets for phytoremediation. Deep root zones typically associated with native plants have the ability to soak up excessive nutrients and other contaminants found in stormwater runoff. Large trees are able to take up more toxins and store them for longer durations of time, making them an important component of a healthy landscape.
Coastal wetlands found in the zone 3 or adjacent to waterbodies create a natural transition from land to water. The roots and rhizomes that grow in the wetland sediments add texture to your shoreline and create habitat for species such as crabs, salamanders, and dragonflies which are important part of the ecosystem. Wetland ecologies also absorb flood waters and regulate storm fluctuations, thereby improving shoreline stability. The vegetation that grows here provides food for many fish species, and the fallen woody debris that collects along the shoreline offers protection from predators. Aquatic plants add oxygen to the water, discourage the establishment of unwanted algae, and improve water quality for aquatic life.

Description:

LIFE CYCLES:

This area serves as crucial habitat for fish and other aquatic life. 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.

Flood Water Retention:

This area takes the brunt of any severe erosive force from the water. Loose rock, boulders, or other bio-engineering techniques may be necessary in order to ensure the stabilization of the bank. Contact a professional before completing any in-water work on your property.