The Role of Riparian Buffers in your Local Landscape



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EXTENSION

What is a riparian corridor (buffer)?

- "Riparian" refers to the area by the banks of a river, stream, or other body of water.
- "Corridor" refers to a designated zone or strip of land of a specified width along the border of an area
- So a "Riparian Corridor" is the natural vegetation *and soil* cover adjacent to a river, stream, or other body of water.







Buffers are not new! In the sixth century, the area of Italy's coast between Rome and Naples was so popular that Emperor Justinian passed an ordinance preventing building within 100 ft of the water in order to protect views.

14 centuries later, Cape Cod building authorities passed an identical ordinance with the purpose of protecting the environment. (Colt 2003)

Why should we care about creating, managing or restoring riparian corridors?



Riparian Corridor Functions

- Water Quality
- Biodiversity
- Protection and Safety
- Economic Opportunities
- Productive Soils
- Aesthetics and Visual Quality
- Outdoor Recreation

Riparian Corridors Functions and Values

- first line of defense against the impacts of impervious surfaces
- slow runoff
- protect shorelines from erosion
- aid in flood control
- filter or trap pollutants



- provide habitat and corridors for wildlife
- shade waters for fish





Water quality

Streambank stabilization





Flood control

Shoreline Protection and Erosion Control



Biodiversity and Buffer Functions

- Increase aquatic and terrestrial habitat areas
- Protect sensitive habitats
- Restore connectivity
- Increase access to resources for animals
- Provide shade to maintain water temperature



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Riparian Buffers for aquatic species

- Provide woody debris for aquatic habitat structure
- Maintain in-stream microclimate
- Provide food for aquatic species
- Protect water quality





Fisheries – water quality and water temperature









Adding woody debris to a pool for amphibians and turtles.

Economic and Safety Benefits of Buffers

- Minimizing property damage
- Decreasing public investment in stormwater management, flood control, and pollution removal
- Increasing property values
- Reducing land maintenance costs (in comparison with managed areas) (Schueler 1995)



Increased property values near buffers



How big should a buffer be to provide water quality protection and/or improvement?





It depends.... on site conditions: location within the watershed, soil type and slope, hydrology AND what the function of the buffer is.

Riparian Corridor Widths for Specific Objectives

Bottom line: bigger is better

Small riparian corridors

(25 – 50 ft)

- Help to protect water quality
- Streambank stabilization
- Provide small scale travel routes
- May provide nesting/basking sites

Large riparian corridors (> 50 ft)

- Provide habitat components to more species
- Help to reduce secondary inputs
- Increased water quality protection
- Flood control
- Provide large scale corridors

Effectiveness of Different Vegetation Types for Specific Buffer Benefits

BENEFITS	grass	shrubs	trees	8	
stabilize streambank					Low
filter sediment and the nutrients, pesticides, & pathogens bound to it					
filter nutrients, pesticides, and microbes from surface water				(* 1997) 1990 - Maria Maria (* 1997)	Moderate
protect groundwater and drinking water supplies					
improve aquatic habitat					High
improve wildlife habitat for field animals					
improve wildlife habitat for forest animals					
provide economically valued products					
provide visual interest					
protect against flooding					

From Riparian Buffers for the Connecticut River Watershed No 8

Climate Change and Riparian Ecosystems

- Air and surface water temperature increasing
- Changes in the magnitude and seasonality of precipitation and run-off
- Shifts in reproductive phenology and plant and animal distribution



Why are riparian ecosystems important with regard to climate change?

Riparian Systems are naturally resilient to extreme weather events

Riverine habitats function as corridors for many plants and animals (cc causing distributional shifts in organisms)

Expanding thermal refugia - riparian areas absorb heat (water has high heat capacity) and protect riparian corridor organisms against extreme temperatures

Hydrologic Benefits (cc – increased frequency of extreme flood events, and altered seasonal patterns of ppt and runoff) Riparian vegetation increases infiltration; mitigates flood impacts

WHERE DO WE BEGIN?



Building on past riparian corridor work in Connecticut

- Developed a coastal riparian plant list with wildlife/pollinator values
- Created cross sections and plan views of what coastal riparian plantings could look like

https://media.clear.uconn.edu/projects/crlg/index.htm

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Coastal Riparian Landscaping Guide for Long Island Sound

Riparian corridors are the segments of land along our rivers, streams and wetlands including the natural vegetation and soil cover. These areas can provide multiple benefits, particularly as the first line of defense against the impacts of surrounding land uses. Corridors slow runoff from precipitation, aid in flood control, and filter or trap pollutants. These areas can also provide habitat and corridors for wildlife as well as scenic value and privacy. Within coastal areas, vegetated corridors can also be of significance in reducing the impacts of waves and overwash on properties. Recently, several major storms have caused extensive damage along the coast of Long Island Sound in both Connecticut and New York from erosion, scouring and salt spray.

In order to capture the benefits of coastal riparian corridors, lessen the impacts from storm events while still allowing for view sheds and water access, we offer the following tool as a resource for those living on or near the waters and tributaries of Long Island Sound. Instead of having lawn and turfgrass exclusively between the home and water, we suggest plantings that can withstand this harsh environment and show how plantings can be placed to still provide view sheds and water access, while incorporating the ecological benefits of riparian plantings. This tool includes a series of fact sheets describing the functions and values of coastal riparian corridors, how to prepare an area for planting, and how to plant. We provide a listing of native plants and indicate their ability to withstand salt spray and inundation. Additionally, we provide a series of landscaping diagrams to get you started including both plan views and cross sections.



Contents

Introduction Fact Sheet 1 Fact Sheet 2 Fact Sheet 3 Plants Zone 1 Zone 2 Zone 3 Key to the Plant List Soils Availability from Nurseries

Which Landscaping Option is Right for your Property?

Does your property experience:
Salt spray on a regular basis?
salt spray only during storm events?
Does your property have:
a seawall present?
O no seawall? The slope of your property is:
5% (almost flat).
20% (slight incline).
35% (moderately steep).
○ 50% (steep).
1

Submit

Coastal Riparian Plant List

- Dry, sandy soils and moist/wet, poorly drained soils
- Salt spray tolerance (Zone 1, 2 or 3)
 - Zone 1: highest salt tolerance, salt spray and saltwater overwash
 - Zone 2: tolerate moderate levels of salt spray, need some protection – plant either behind zone 1 or greater distance from water
 - Zone 3: least salt tolerance, plant behind zone 2 or in areas with substantial protection
 - Exposure (sunlight)
 - Foliage (evergreen/deciduous)
 - Availability from nurseries

Natives and non-native... What to include?

Shore juniper (Juniperus conferta)





Cross Section: F Salt spray: Occurs rarely (only during major storm events) Shoreline: Seawall present Slope of property: 20% (Slight incline)

Use Zones 2+3 upland plants. Use a mix of trees, shrubs and herbaceous perennials.



Cross Section: K

Salt spray: Occurs often (property adjacent to Long Island Sound) Shoreline: Rocky/sandy shoreline with no seawall Slope of property: 35% (Moderately steep)

During high tide events and storms, areas at lower elevations may be flooded for a short period of time. If this is the case, use Zone 1 plants that can tolerate poorly drained soils (PDST). If lower elevations do not flood, use Zones 1+2 upland plants. Depending on planting scheme, some Zone 3 plants may do well if protected from salt spray.

+/- 25'

Zone 1

PDST

Beach

+/- 10'

Zones 1+2

Upland Plants

Lawn

F

Plan view: A Salt spray: Occurs rarely (only during major storm events) Shoreline: Seawall present Slope of property: Gentle slope Plan view indicates how water access, views and lawn can be retained with a riparian buffer.



Beach Wall

Lawn











Small Bayberry – *Morella caroliniensis*



Carolina rose - Rosa carolina



Virginia rose – *Rosa virginiana*

Beach plum – Prunus maritima

Eastern Red cedar – Juniperus virginiana (Zone2)

Serviceberry – Amelanchier canadensis (arborea, laevis)

Chokecherry – Prunus virginiana

Groundcovers

C-EE

Bearberry – Arctostaphylos uva-ursi

Seaside Goldenrod – Solidago sempervirens

American beach grass (*Ammophila breviligulata*)

Switchgrass (Panicum virgatum)

Little bluestem – (Schizachyrium scoparium)

Indiangrass (Sorghastrum nutans)

Joe Pye weed (*Eutrochium purpureum*)

Swamp rose mallow (Hibiscus moscheutos)

What about inland wetlands and water courses?

- In North Carolina, buffer rules have been established for numerous basins and watersheds. A 50-foot buffer is a minimum requirement, although some watersheds have stronger requirements.
- Under the Vermont Wetland Rules, buffer widths of 100 feet and 50 feet are required for Class I and II wetlands, respectively. Where Class I and II wetlands are contiguous to a waterbody, buffer widths of greater than 100 feet and 50 feet may be recommended based on case-specific application of this Guidance.

Strategies for enhancing visual preference of corridors

- Design the viewable part of the corridor to be visually pleasing while the interior can be designed to achieve the desired ecological functions.
- Use selective mowing to indicate stewardship without greatly reducing the ecological functions.
- Use bold planting patterns to indicate a designed landscape.

Enhance visual interest and diversity by increasing seasonal color and by varying plant heights, textures, and forms.

- Provide visual frames to contain and provide order around the corridor (such as a wooden fence).
- Provide simple habitat improvements such as nesting boxes and feeders.

Leave a three foot buffer zone of undisturbed vegetation along waterfronts to help filter stormwater runoff. Catherine Bray.

Trees for Riparian Corridors

Red maple

Sycamore

Tulip tree

Black gum

Sweetgum

Silver maple

Swamp white oak

Alternate-leaved dogwood

Canada serviceberry

Smooth serviceberry

Shrubs

Common alder

Silky dogwood

Buttonbush

Swamp azalea

Ferns and Fern Allies

Field horsetail

Sensitive fern

Cinnamon fern

Grasses, Sedges, and Rushes

Big bluestem

Tussock sedge

Herbaceous Plants

Jack in the pulpit

Swamp milkweed

Pickerel weed

Common boneset

Slender blueflag

Larger blueflag

Cardinal flower

Great blue lobelia

Monkey flower

New England aster

Take home message:

Riparian Corridors can play significant roles in protecting the functions and values of rivers and wetlands as well as mitigating impacts of climate change.

And they can reduce the amount of lawn while providing beauty, wildlife value and habitat.

https://s.uconn.edu/wshedtool

Connecticut Local Watershed Assessment Tool Home

riparian zones.

Our Analysis Using the tools Overview Watersheds Land Cover Results For each of the basins, we looked at the distribution of those three land cover categories both throughout the watershed, and within a 100-foot distance from either side of the waterway's centerline, an area called the Add 100-foot riparian zones

Story Map

CCI Dashboard

Scenario Builder

A metric was developed, called the **Combined Condition Index (CCI)**, that describes the probable health of a watershed based on the land cover within the watershed. The CCI for any basin can be calculated using the land cover information throughout the watershed and within the 100-foot riparian zones.

Local Watershed Assessment Tool

Home Story Map

CCI Dashboard

d 🛛 Scenario Builder

Strategies

Water quality is strongly related to land use. New high-resolution land cover data for Connecticut has made it possible to look at the land/water connection at a finer scale than ever before. Using the three sections of this website below, you can learn about our study, explore the landscape surrounding the over 4,300 local waterways in our state and the implications for the health of these waterways, and test out landscape change scenarios to see what effects they might have.

