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Life Along the Salt Marsh: Protecting Tidal Creeks with Vegetative Buffers

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South Carolina is home to some 350,000 acres of salt marsh, comprising 30% of all tidal salt marsh on the United States' eastern seaboard (Seabrook, 2012; Weigert and Freeman, 1990). This image shows a classic salt marsh in the South Carolina Lowcountry. Photo by Chris Ramaglia.

The salt marsh is the transitional area where the rivers meet the sea, comprised of intertidal water bodies in which salinity can range from near ocean strength (30 parts per thousand) to brackish water (greater than .5 and less than 30 parts per thousand). The salt marsh is ranked as one of the most biologically productive ecosystems on earth, providing nursery grounds for many species of birds and fish, as well as vital wildlife habitat (SCDNR, 2010). Additionally, the salt marsh provides many services to humans, including flood control during major storm events, nursery grounds for many commercially and recreationally important fish and shellfish species, and serves as a filter for removal of sediments and pollution from the water.

Vegetative buffers are one of the most effective ways to protect salt marsh habitat (SC DHEC OCRM, 2002).

Vegetative buffers provide the following benefits:

1. Reduce pollution in stormwater runoff
2. Reduce shoreline erosion and property damage caused by flooding
3. Provide increased privacy to the homeowner while still maintaining a view corridor (Figure 1)



Photo by Kim Counts

Figure 1

4. Serve as wildlife habitat (Figure 2)
5. Save the homeowner money, especially when native plant species are dominant, as little to no water, fertilizers or pesticides are needed to maintain this area of the yard (SC DHEC OCRM, 2002).



Photo by Kim Counts

Figure 2

Steps to Successfully Improving your Vegetative Buffer to Protect the Salt Marsh

1. Before Planting

Due to regulations in place to protect the salt marsh, understanding local, state or federal authority is a first and necessary step. The South Carolina Department of Health and Environmental Control-Office of Ocean and Coastal Resource Management (SC DHEC-OCRM) has direct permitting authority over “critical areas,” defined as coastal waters, tidelands, beaches and dune systems. Any land disturbance planned within the critical area may require a permit from SC DHEC-OCRM, in addition to any necessary authorizations from the local and federal governments. Learn more at http://www.scdhec.gov/environment/ocrm/permit_critical_area.htm. In most cases, establishing a vegetative buffer occurs on the adjacent upland and does not require disturbance in the salt marsh defined as a critical area; therefore, a special permit may not be necessary. For the purpose of this factsheet, the recommended buffer establishment and maintenance actions take place in the upland area above the high water mark, thus inland from the critical area.

Minimizing Impacts to the Salt Marsh, ...Naturally!

After European arrival in the “New World,” salt marshes and other wetland areas were diked, drained, and filed for human use; by 1954, these activities contributed to the destruction of nearly 50% of the nation’s wetlands (Kusler and Opheim, 1996). Though salt marsh is now protected under federal and state and some local laws, human threats still exist largely in the form of stormwater runoff and shoreline hardening. As coastal counties become increasingly popular and more people move to and visit these areas, additional infrastructure such as roads, rooftops and parking lots are needed. This increase in impervious area can significantly impact pre-existing hydrology and result in a larger volume of stormwater runoff to nearby waterways. Additionally, more people also means more contributors of nonpoint source pollution caused by seemingly harmless daily activities such as bacteria and pathogens from pet waste, sediment from construction activities, excess nutrients from improper fertilizer application and gasoline and oil from vehicles. *See H2O-003 Illicit Discharge Detection.*

The US Environmental Protection Agency (EPA) has identified polluted stormwater runoff as the greatest threat to water quality in the United States.



Before planting, consider the existing topography, vegetation, and soil present at the site. Whenever possible, use the natural contours and keep existing vegetation in place. The underground structure of existing plants helps to prevent erosion by holding soil in place with their fibrous roots system. Avoid unnecessary erosion by minimizing disturbance to the soil when planting or grading the shoreline bank. As with any new planting, having your soil tested will take the guesswork out of the pH and fertility of the site. See [HGIC-1652 Soil Testing](#).



Trees and shrubs may be shaped and “limbed up” to frame a view rather than blocking it. Silhouettes of branches and moss can make the salt marsh viewscape even more dramatic and aesthetically pleasing.

2. Right Plant, Right Place

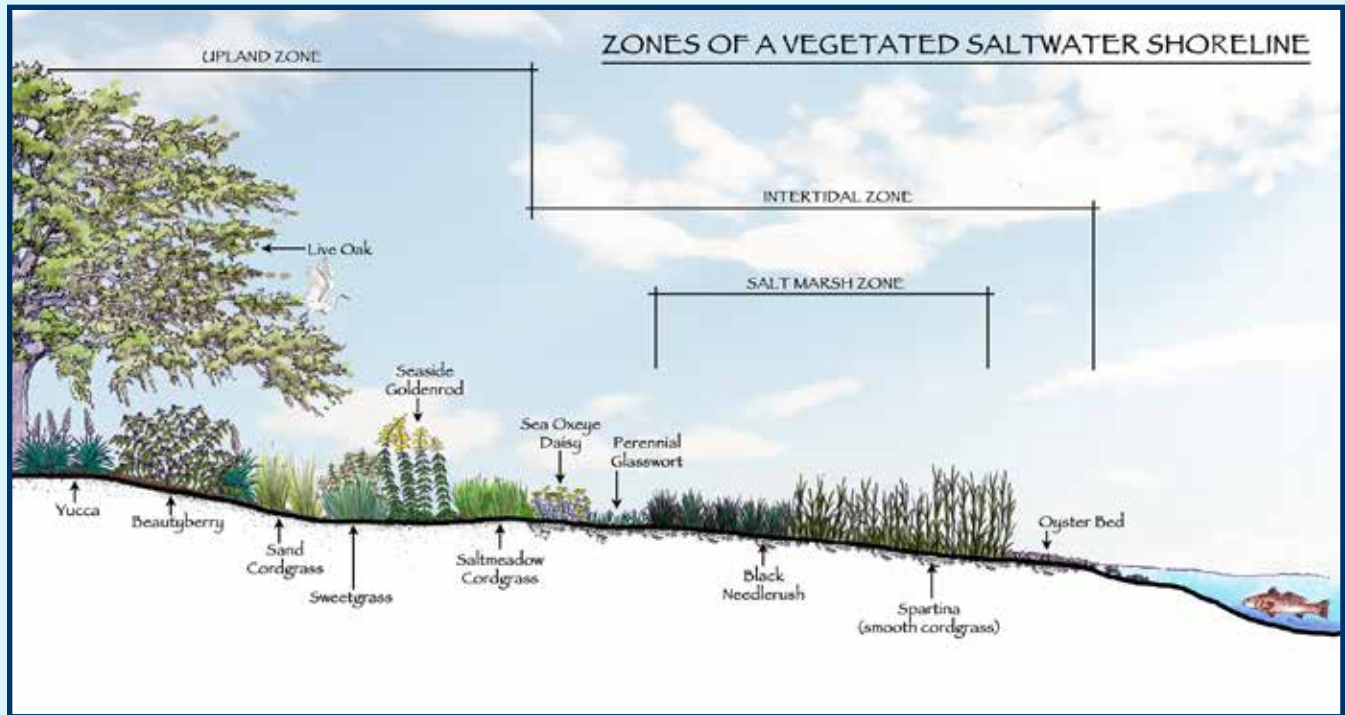
Using the “right plant” will increase the effectiveness and chances that the vegetative buffer will survive. Plant selection is narrowed by the dynamic conditions that exist adjacent to a salt marsh, including the ever-present elements of wind, salt, and exposure. There are few appropriate plants for such sites, and most of these will be the native plants that have adapted to the pressures of living near the salt marsh. Once established, native plants typically require less maintenance time and cost, while also supporting local wildlife such as birds and beneficial insects including butterflies and other pollinators.

3. Maintaining Your Vegetative Buffer Adjacent to the Salt Marsh

Maintaining your vegetative buffer is important in ensuring the continued success, function and aesthetic appeal of the buffer zone. For the purpose of this factsheet, the following recommended actions occur in the “buffer maintenance zone,” described as the area up to 50 feet inland from the critical area. Additional local buffer requirements may apply.

- **Turf grass in the buffer zone:** If turf grass exists within your buffer maintenance zone, the lawn should be kept at the maximum recommended height for the specific turf, which will allow for a more extensive root system, help stabilize soil, and afford a larger leaf area, which can work to slow runoff, and capture sediment. See [HGIC-1205 Mowing Lawns](#).
- **Irrigation considerations:** Irrigating within the buffer maintenance zone should be minimized to ensure that excess fresh water does not run off into salt marsh or tidal creeks. Stormwater occurs through irrigation efforts as well as rainfall events and can transport harmful pollutants to area waterways.
- **Chemical controls:** Consistent with management recommendations for areas adjacent to freshwater shorelines, pesticides and fertilizers should be avoided in the buffer maintenance zone. Weed control is best done by hand pulling. Mulch can help to unify the landscaped area and will also protect plants by conserving soil moisture and moderating temperature; however, mulch should only be spread in the upper portions of the buffer area to avoid being carried away during high tides. To reduce the potential for weed growth in the buffer area, consider spacing plants closely together.
- **Maintenance:** Any cut or mowed plant material within the buffer maintenance zone should be removed so that excess plant material does not wash away, potentially leading to water quality issues and water navigation challenges.

Zones of a Vegetated Salt Marsh Shoreline



The Salt Marsh – The salt marsh is designated as a critical area; any activity-taking place in the salt marsh will require a special permit from a regulatory authority. The salt marsh should be left untouched by maintenance or home gardening efforts.

Salt marsh vegetation is constantly inundated with varying water levels dependent on the twice-daily influence of the high and low tides. Soil in the salt marsh remains permanently saturated, forming a substrate affectionately known in the Lowcountry as “pluff mud.” Each year, the salt marsh vegetation, predominantly *Spartina alterniflora*, (commonly referred to as Smooth cordgrass) goes dormant in the winter months and grows back in the spring. This is obvious to the naked eye as the salt marsh appears brown and drab in the winter, vibrant green in the summer months, and near golden in the fall. As the Smooth cordgrass dies, it decays to form the base of a complex food web supporting not only next year’s salt marsh growth, but also a diverse array of animal life. In areas located upriver thus further away from the ocean, the water is less salty; the dominant plant in the salt marsh is *Juncus roemerianus* (commonly referred to as Black needlerush).



Photo by Kim Counts

The salt marsh is often dominated by a monoculture of *Spartina alterniflora* as this plant can withstand the dynamic conditions created by the tides.

The Intertidal Zone – The intertidal zone is part of the designated critical area; any activity-taking place in the intertidal zone will require a special permit from a regulatory authority. A vegetative buffer is created in the intertidal zone best by leaving the area untouched; for example, avoid the use of a lawn mower, weed eater or planting in areas reached by the high tide.

The intertidal zone is highly variable, parts of this zone may be inundated with water twice daily during high tide where as some portions of the zone may typically be above the high tide mark, thus rarely inundated by the tides. Regardless, this transitional area of land lies above water at low tide. Plants that occur naturally in this area and can potentially volunteer include the following:

Smooth cordgrass	<i>Spartina alterniflora</i>
Black needlerush	<i>Juncus roemerianus</i>
Saltwort	<i>Batis maritima</i>
Perennial glasswort	<i>Salicornia virginica</i>
Sea ox-eye daisy	<i>Borrchia frutescens</i>

The Upland Zone – The upland zone is the appropriate area to create a vegetative buffer where plants can be both aesthetically pleasing and help to protect water quality in the adjacent salt marsh.

The upland zone is the area of the bank slope that lies above the high tide line. Vegetation in the upland zone is not inundated with saltwater from high tides, but may be inundated with saltwater during major storm event such as hurricanes and tropical storms. Included below is a list of native grasses, perennials, and trees or shrubs that may be good plantings for your upland zone buffer.

Native Grasses:

Sweetgrass	<i>Muhlenbergia filipes</i>
Bushy bluestem	<i>Andropogon glomeratus</i>
Sand cordgrass	<i>Spartina bakeri</i>
Saltmeadow cordgrass	<i>Spartina patens</i>

Perennials:

Seaside goldenrod	<i>Solidago sempervirens</i>
Firewheel	<i>Gaillardia pulchella</i>

Trees and Shrubs

Live oak	<i>Quercus virginiana</i>
Yaupon holly	<i>Ilex vomitoria</i>
Groundsel tree	<i>Baccharis halmifolia</i>
Beautyberry	<i>Callicarpa americana</i>
Spanish dagger	<i>Yucca filamentosa</i>
Saw Palmetto	<i>Sereno repens</i>
Red buckeye	<i>Aesculus pavia</i>

Upland Plants for Salt Marsh Buffer Zones

Sweetgrass - *Muhlenbergia filipes* is a plant of cultural significance in the Lowcountry as the Gullah community utilizes this plant to make sweetgrass baskets. Sweetgrass has gained increasing popularity over the years as a landscape plant, and becomes the “queen of the garden” in the fall with a showy purple inflorescence. Sweetgrass grows naturally along the edge of the salt marsh and can tolerate full sun to part shade with some saltwater inundation.



Photo by Kim Counts

Sweetgrass

Sand Cordgrass - *Spartina bakeri* is related to the dominant plant in the salt marsh, *Spartina alterniflora*, yet *S. bakeri* thrives naturally in isolated freshwater wetlands. Sand cordgrass also does well in dryer conditions, but certainly does not thrive in consistent saltwater intrusion as Smooth cordgrass. For this reason, Sand cordgrass should be planted well above the high tide line. Sand cordgrass can take full sun and makes for an excellent buffer as it grows low and thick, thus allowing a view while also slowing stormwater runoff. Like Sweetgrass, Sand cordgrass is becoming increasingly popular in the landscape industry.



Photo by Kim Counts

Sand Cordgrass

Live oak - *Quercus virginiana* is one of several important oak species found in the upland zone. The Live Oak is the most notable and grand with its low spreading branches and it produces acorns and habitat for many species of small mammals, reptiles, birds, and insects. Live oaks are frequently adorned with two epiphytic species Spanish moss (*Tillandsia usneoides*) and Resurrection fern (*Pleopeltis ploypodioides*). Laurel oak (*Quercus laurifolia*) and water oak (*Quercus nigra*) are also common and can tolerate some salt spray.



Photo by Kim Counts

Live oak

Yaupon holly - *Ilex vomitoria* is a coastal plain plant that has naturalized to more northern and western locations as it was thought to have been traded by early Americans for its use in ritual ceremonies. The leaves contain caffeine. Male and female flower on separate hollies; berries are produced on the female plants and utilized by songbirds for food. Yaupon holly is found in nature as an understory tree in the maritime forest. These attractive evergreen plants can be used as mass plantings and also single or multi-trunk small trees, limbed up as “see through” landscaping.



Photo by Kim Counts

Yaupon holly

Groundsel tree - *Baccharis halimifolia* is a member of the Aster family and is extremely salt tolerant. This shrub is very attractive in the fall when the female plants bloom and make white snowy clusters of airborne achenes. The flowers are also a very important nectar source to pollinators, especially honeybees and migrating Monarch Butterflies.



Photo by Kim Counts

Groundsel tree

Beautyberry - *Callicarpa americana* is a deciduous shrub with opposite leaves and small light lavender sessile flowers which are fragrant and attractive to beneficial insects. In the fall, clusters of bright purple berries appear and are eaten by birds. Beautyberry can grow up to 8' but it may be pruned in winter without sacrificing its glamour.



Photo by Kim Counts

Beautyberry

Saw palmetto - *Serenoa repens* is a low growing evergreen shrub that is both salt and drought tolerant. The Saw palmetto is one of four native palms found in South Carolina and its habitat includes maritime forests and coastal dunes. Saw palmetto can be planted in cluster form to create a ground cover or used as a stand-alone planting.



Photo by Kim Counts

Saw palmetto

Red buckeye - *Aesculus pavia* is one of the first nectar sources for early migrating hummingbirds attracted to its clusters of red tubular flowers. It is found in maritime forests. Buckeye is a small deciduous shrub or tree and grows about 12 feet high. Deer do not eat them, and they grow well in wet or dry soils.



Photo by Amy Dabbs

Red buckeye

Wax myrtle- *Morella cerifera* is a favorite of birds who use them for nesting and cover as well as for food by foraging on the waxy berries found on the female plants. The leaves are mostly evergreen and are aromatic when crushed. Wax myrtle can grow to a 25 foot tree, but can also be maintained as a hedge, windbreak, or limbed up as a standard.



Photo by Kim Counts



Photo by Laura Lee Rose

Wax myrtle

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For More Information

See *Life at the Water's Edge* for information on designing your waterfront to stop erosion, protect water quality, and beautify your shoreline. This book can be purchased at your county Extension office or online from Clemson PSA Publishing at <https://shopping.clemson.edu>.

Download *Backyard Buffers* for information on buffer design and recommended plant species. This is a publication of the South Carolina Department of Health and Environmental Control, available at: www.scdhec.gov/environment/ocrm/docs/backyard_buffers.pdf.