



Natural Heritage
& Endangered Species
Program

Commonwealth of Massachusetts
Division of Fisheries & Wildlife
Route 135
Westborough, MA 01581
www.nhesp.org
(508) 792-7270 ext. 200/fax (508)792-7821

Natural Community Fact Sheet
Salt Marshes

Description

Located between the high spring-tide and mean-tide levels of protected coastal shores, salt marshes comprise one of the most productive ecosystems on Earth. In spite of the stresses of wide variations in temperature, level of salinity, and degree of inundation, the salt-tolerant vegetation of the salt marsh community provides the basis of the complex food chains in both estuarine and marine environments. In addition, salt marshes provide habitat for various species of wildlife – including migrating and over wintering waterfowl and shorebirds and the young of many species of marine organisms. In the northeastern United States, salt marsh communities are dominated by two species of perennial, emergent, halophytic (adapted to growth in salty soils) grasses – Salt marsh Cordgrass (*Spartina alterniflora*) and Saltmeadow Cordgrass (*Spartina patens*). While these dominant species give the community a deceptively simple, grassland-like



Salt Marsh at Kent's Island, William Forward Wildlife Management Area. Photo by Joanne Singfield



appearance, salt marshes are actually complexes of several communities, from salt shrub zones, high marsh and low marsh, to tidal creeks, and pannes (poorly drained depressions that develop in the marsh).

Environment

The environment of the salt marsh is one of constant change. A delicate balance between accretion of sediment and erosion by waves and tide permits salt marshes to form in locations that are protected from the full brunt of the ocean – such as the backs of barrier beaches, behind the tidal flats, within the confines of salt ponds, and along the quieter portions of estuaries. The salt marsh vegetation builds and maintains this changeable ecosystem: plants reduce erosion by waves, capture sediments around their bases and create their own substrate with their roots and fallen leaves. The tremendous amount of plant matter that is produced and shed each year not only contributes to the peaty soil of the salt marsh but forms the basis of the estuarine and marine food chains: very little salt marsh vegetation is eaten directly, or grazed. Instead, its energy is transferred when bacteria partially decompose dead plant matter. This particulate organic matter then provides food for such detrital feeders as insects, worms and plankton, and these, in turn, are eaten by larger animals. In addition, the nutrients released from detritus fertilize estuarine and coastal phytoplankton.

Tides constitute the major influence on salt marsh vegetation and result in distinct vegetational bands. For convenience, our salt marshes can be divided into two major zones: a low marsh community, dominated by Salt marsh Cordgrass, that extends from the lower high tide mark to the mean sea level and has a strong salt influence, and a high marsh community dominated by Saltmeadow Cordgrass that extends from high spring tide level to the lower high tide level and has more fresh-water influx.

Characteristic Species in Massachusetts

The high marsh community is dominated by species that can withstand only limited submergence. These include Saltmeadow Cordgrass (*Spartina patens*) – which is also known as Salt Hay and is still harvested for livestock in Essex county – Saltmarsh Cordgrass (*Spartina alterniflora*), and Spikegrass (*Distichlis spicata*). At the upper edge of the high marsh, Sea Lavender (*Limonium carolinianum*), Seaside Goldenrod (*Solidago sempervirens*), Seaside Plantain (*Plantago maritima*), Black-grass (*Juncus gerardii*), Switch Grass (*Panicum virgatum*), and Marsh Elder (*Iva frutescens*) grow. Finally, beyond the high marsh proper is a marshy area of Cattails (*Typha spp.*), Giant Reed Grass (*Phragmites australis*) and various sedges that is only occasionally infiltrated by saltwater.

The low marsh community is regularly flooded by the twice-daily tides and is dominated by Saltmarsh Cordgrass (*Spartina alterniflora*). In New England, this stiff, coarse plant grows from 1.25-3 m (4-10 ft.) high in virtually unbroken stands and was once used for roof thatch. Other pioneering, but infrequently occurring, plants species include Lesser Sea Blite (*Suaeda maritima*), Glaswort (*Salicornia europaea*), and Salt Marsh Sand-spurry (*Spergularia marina*). Macroscopic marine algae are also prominent in this region and include the brown sea wracks *Ascophyllum nodosum* and *Fucus vesiculosus*. At its

lower edge, that salt marsh surface may be distinctly colored by algal mats that grow on in the mud or bacteria that grow just beneath its surface. Here the low salt marsh grades into intertidal mud flat.

The poorly drained pannes occur throughout the salt marsh and continually retain highly saline water. Few plants grow here, with the exception of highly salt-tolerant species such as Widgeon Grass (*Ruppia spp.*). Nevertheless, as open areas in the marsh, pannes are important to migrating waterfowl. Tidal creeks – which facilitate the flooding and drainage of the marsh – have their own distinct flora and fauna. Common fish in tidal creeks include Mummichog (*Fundulus heteroclitus*), Four-spined Stickle-back (*Apeltoes quadracus*) and Striped Killifish (*Fundulus majalas*).

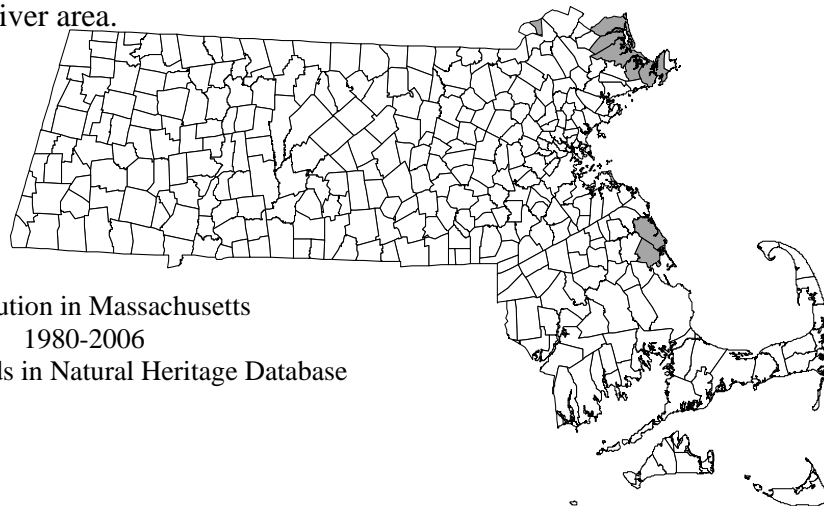
In fact, many animals utilize the abundant resources of the salt marsh. In the low marsh, marine species such as polychaete worms, snails, small crustaceans, and filter-feeding mussels dwell. Various insects graze on the vegetation or spend their larval stage in the mud. With the incoming tide, fish and crabs move in to feed. High marsh fauna tends to be more terrestrial in nature and includes Raccoons (*Procyon lotor*), Meadow Voles (*Microtus pennsylvanicus*), various spiders, and such insects as salt marsh mosquitoes (*Aedes spp.*) and greenhead flies (Tabonidae). Diamond-backed Terrapin (*Malaclemys terrapin terrapin*) can also be found in the high marsh. Some of the birds that frequent the salt marsh are the Black Duck (*Anas rubripes*), the Snowy Egret (*Egretta thula*) and the Willet (*Caoptrophorus semipalmatus*). Rare Massachusetts birds that utilize the salt marsh community include the Northern Harrier (*Circus cyaneus*), the Seaside Sparrow (*Ammodramus maritimus*), the Sharp-tailed Sparrow (*Ammodrammus caudacutus*), the Short-eared Owl (*Asio flammeus*) and the Least Bittern (*Ixobrychus exilis*).

Benefits of Salt Marshes

In addition to providing a nursery for many marine species – including commercially important fish and shellfish – salt marshes protect the coast from damaging surf, protect adjacent lowlands from flooding by terrestrial runoff, help absorb and breakdown water contaminants, and provide nesting and feeding sites for waterfowl and shore birds.

Range

Salt marshes occur sporadically along the Atlantic coast from the Gulf of St. Lawrence to Florida. Prime examples in Massachusetts are located at Nauset Marsh in Eastham and Orleans, Great Marshes in Barnstable, Sippewissett Salt Marsh in Falmouth, the North and South River system, which enters the ocean at Marshfield, and at the Plum Island/Ipswich River area.



Status

Since the arrival of the first Europeans, Massachusetts has lost a large portion of its salt marsh habitat. The Boston area was originally the site of an extensive salt marsh, most of which was destroyed by dredging and filling of Back Bay. Between the end of World War II and the mid-seventies, Massachusetts lost approximately 20,000 acres – a third of the total acreage it had at the beginning of this period. Fortunately, little development now occurs in salt marsh areas. Current threats to salt marshes includes some development, dredging for docks and marinas, and ditching for mosquito control – all of which change the water drainage patterns, and affect the viability of the community.

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