

Natural Heritage Resources Fact Sheet

Tidal Freshwater Marshes

Introduction

Tidal freshwater marshes (TFMs) are important components in Virginia's estuarine ecosystem. TFMs are found in tidal estuaries where the lunar tides of the ocean meet out-flowing freshwater moving through rivers and streams from their headwaters. This combination creates a unique environment where the ebb and flow of the tide dominate the water cycle. The rising and falling waters, however, are fresh, not salty or brackish. This combination of factors makes TFM one of the most species-rich and structurally diverse ecosystems in the Chesapeake Bay.

Distribution

TFMs are found in most estuaries along the coastlines of the world. However, a high concentration of TFM is found in the Mid-Atlantic region of the eastern United States. Numerous, well-mixed estuaries occur here, which favor the formation of TFM. Nearly all tributaries of the Chesapeake Bay give rise to TFM.

Physiographic Setting

TFMs vary in form and size from narrow fringing marshes of only a few square feet in size to vast point marshes that cover hundreds of acres. Soils are hydric mineral soils in the low marsh zones closest to the stream channel. Moving inland, a mix of mineral and organic soils form the substrate of the high marsh



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zone. TFMs rely on sediment brought from upstream runoff, natural bank erosion and storm tides to restore the marsh elevation and keep up with winter erosion within the marsh. The input also allows the TFM to maintain a relative elevation with sea level rise. The slopes of the larger marshes are gradual and drain nearly completely at low tide through many small tidal creeks and underground muskrat runs.

Tides in TFM occur twice daily and lag behind tides at the mouth of the Chesapeake Bay by as much as six hours. Tidal range varies from about 1 foot in the upper Rappahannock just southeast of Fredericksburg, Va., to more than four feet on the Mattaponi River at Walkerton, Va. The latter is the

largest tidal range in the Chesapeake Bay drainage.

Zonation and Vegetation

Spatterdock dominates the boundary between the marsh and open water. Moving landward between the low water and high water line is a thin fringe of herbaceous marsh dominated by arrow arum and pickerel weed. Farther inland above the water line lies a zone called the mixed marsh. The mixed marsh is by far the largest and most species rich portion of TFM. Arrow arum is the dominant species early in the growing season in the mixed marsh zone. As the season progresses, many other species, such as northern wild rice, cut rice grass, tear thumb, sweet flag, tussock sedge and several ferns play an



Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL AND RECREATIONAL RESOURCES

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important role. Studies conducted by staff of the Virginia Institute of Marine Science identified more than 60 species of vascular plants in Sweet Hall Marsh on the Pamunkey River. Many are an important source food and habitat for waterfowl.

TFMs harbor several rare plant species found only along the Atlantic coastal plain. These include narrow leaved spatter dock, found in the spatter dock zone of the Chickahominy River, and sensitive joint vetch, found only in TFM and slightly brackish marshes of Virginia, Maryland and New Jersey.

In the winter, TFMs appear like mud flats. Unlike the salt marshes dominated by more fibrous and persistent species, TFM species quickly decompose. The shallow water-ward slopes and lack of a berm allow the plant remains in the TFM to wash away from the marsh into the adjacent estuary.

Fauna

Many mammals are common in TFM. Muskrats, as mentioned earlier, play an important role in the vegetation and marsh substrate dynamics. Beaver, otter, eastern raccoon, mink and marsh rabbit also inhabit TFM. Other mammals, such as Virginia opossum, red and gray fox, bobcat and white-tailed deer, make frequent forays into TFM.

The diverse structure of the TFM formed by the high number of plant

species provides a good habitat for birds. Two-hundred and eighty species of birds use TFM. Mallards, Black Ducks and Red-winged Blackbirds are common inhabitants, and Great Blue Herons go there often to feed. Rare bird species in Virginia that use TFM include the Least Bittern, Snowy Egret, Northern Harrier, Swamp Sparrow and Bald Eagle.

Amphibians and reptiles are well represented. One study recorded more than 100 species throughout mid-Atlantic TFMs. While lizards are rare, snakes and turtles are common. The turtles found in TFM include the eastern mud turtle, the red bellied turtle and the occasional snapping turtle. Snakes found here include common species such as northern water snake, eastern kingsnake, rainbow snake and the glossy crayfish snake, which is extremely rare in Virginia.

Values

Besides supporting many important and/or rare species of plants and animals, TFMs provide many other ecosystem values as well. These include flood mitigation and improved water quality. Another important function of TFM is the aesthetic appeal of wild, natural, open space. Hunters, fishermen, birdwatchers, photographers and painters all enjoy such places. More and more businesses cite natural

beauty and environmental quality as significant factors in choosing a region in which to locate. Clearly, the protection of TFMs and other ecologically important places enhances the wealth of the people of Virginia in many different ways.

Conservation

Wetland conservation and management have evolved rapidly the last several decades. Landowners and land managers can implement a wide variety of *best management practices* to ensure the activities on their lands do not adversely impact these vital wetland communities.

To learn more about Virginia's rare plant and animal species and rich biological communities write to the following: *Plant and Insect Species* - Virginia Department of Agriculture and Consumer Services, Office of Plant Protection, P.O. Box 1163, Richmond, Virginia 23209; *Animal Species* - Virginia Department of Game and Inland Fisheries, P.O. Box 11104, Richmond, Virginia 23230; *Plants, Animals, or Biological Communities* - Virginia Department of Conservation and Recreation, Division of Natural Heritage, Main Street Station, 1500 East Main Street, Suite 312, Richmond, Virginia 23219.

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