

Freshwater Tidal Mixed High Marsh



System: Palustrine

Subsystem: Herbaceous

PA Ecological Group(s): Tidal Wetland and River Floodplain

Global Rank: GNR

State Rank: S1

General Description

Intertidal high marsh occupies areas of low-lying, nearly level land adjacent to the upper edge of the sloping river bank. These areas are not flooded at every high tide but rather at times of the highest tides (new moon, full moon, or storms). However, high marsh often includes small tidal channels in which the water level varies with the tide. Unlike riverbank tidal marsh, high marsh is not distinctly zoned, except occasionally along the engraved channels. The vegetation is typically dense and is dominated by a large variety of robust herbaceous wetland species.

Species include tidal marsh specialists such as wild-rice (*Zizania aquatica*), swamp beggar's-ticks (*Bidens bidentoides*), showy bur-marigold (*Bidens laevis*), and salt-marsh water-hemp (*Amaranthus cannabinus*). Numerous more widespread wetland plants may also be present such as sweet-flag (*Acorus calamus*), common cat-tail (*Typha latifolia*), arrow-arum (*Peltandra virginica*), pickerel-weed (*Pontederia cordata*), wapato (*Sagittaria latifolia*), water-pepper (*Persicaria punctata*), halberd-leaf tearthumb (*Persicaria arifolia*), marsh-purslane (*Ludwigia palustris*), rice cutgrass (*Leersia oryzoides*), jewelweed (*Impatiens capensis*), sensitive fern (*Onoclea sensibilis*), rose-mallow (*Hibiscus moscheutos*), and climbing hempweed (*Mikania scandens*). Other species that may be present include false nettle (*Boehmeria cylindrica*), purple-stemmed aster (*Symphotrichum puniceum*), wingstem (*Verbescina alternifolia*), beggar-ticks (*Bidens frondosa*), mad-dog skullcap (*Scutellaria lateriflora*), common dodder (*Cuscuta groenovii*) and the dodder (*Cuscuta campestris*) may also be present growing on a variety of herbaceous hosts.

Invasive, non-native species that may be present include common reed (*Phragmites australis*), grass (*Arthraxon hispidus*), purple loosestrife (*Lythrum salicaria*), and yellow flag (*Iris pseudacorus*).

Rank Justification

Critically imperiled in the jurisdiction because of extreme rarity or because of some factor(s), such as very steep declines, making it especially vulnerable to extirpation .

Identification

- The lack of zonation distinguishes this tidal marsh type
- Dominated by wild-rice (*Zizania aquatica*), salt-marsh water-hemp (*Amaranthus cannabinus*), and swamp beggar-ticks (*Bidens bidentoides*)
- Occurs on Coastal Plain

Characteristic Species

Herbs

- [Wild-rice \(*Zizania aquatica*\)](#)
- [Swamp beggar-ticks \(*Bidens bidentoides*\)](#)
- [Showy bur-marigold \(*Bidens laevis*\)](#)
- [Salt-marsh water-hemp \(*Amaranthus cannabinus*\)](#)
- [Rose-mallow \(*Hibiscus moscheutos*\)](#)
- [Common cat-tail \(*Typha latifolia*\)](#)
- [Sweet flag \(*Acorus calamus*\)](#)
- [Arrow-arum \(*Peltandra virginica*\)](#)
- [Pickerel-weed \(*Pontederia cordata*\)](#)
- [Wapato \(*Sagittaria latifolia*\)](#)
- [Tussock sedge \(*Carex stricta*\)](#)
- [Dotted smartweed \(*Persicaria punctata*\)](#)
- [Tearthumb \(*Persicaria sagittata*\)](#)
- [Rice cutgrass \(*Leersia oryzoides*\)](#)
- [Clearweed \(*Pilea pumila*\)](#)

- [Marsh-purslane \(*Ludwigia palustris*\)](#)

International Vegetation Classification Associations:

[Freshwater Tidal Mixed High Marsh](#) (CEGL006325)

NatureServe Ecological Systems:

[Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh](#) (CES203.516)

Origin of Concept

Rhoads and Block

Pennsylvania Community Code

na : Not Available

Similar Ecological Communities

Freshwater Tidal Mixed High Marsh overlaps with the upper zone of Riverbank Freshwater Tidal Marsh, the two types have a number of species in common. The main difference between them is the elevation above mean high tide and the lack, in the high marsh, of a distinct slope and the resulting zonation of the vegetation. Freshwater Tidal Mixed High Marsh may also resemble Mixed Forb – Graminoid Wet Meadow community. However, the presence of tidal marsh species such as wild-rice (*Zizania aquatica*), salt-marsh water-hemp (*Amaranthus cannabinus*), and swamp beggar's-ticks (*Bidens bidentoides*) is definitive.

Fike Crosswalk

None. This type is new to the Pennsylvania Plant Community Classification developed from inventory studies of Bucks County by Morris Arboretum.

Conservation Value

Freshwater Tidal Mixed High Marsh is a rare community type in Pennsylvania and provides habitat for species not found elsewhere in Pennsylvania. This community also serves as a buffer for sediment and pollution runoff from adjacent developed lands by slowing the flow of surficial water causing sediment to settle within this wetland, providing a flood buffer along the Delaware Estuary. Rare species may include wild-rice (*Zizania aquatica*), showy bur-marigold (*Bidens laevis*), salt-marsh water-hemp (*Amaranthus cannabinus*), swamp beggar's-ticks (*Bidens bidentoides*), river bulrush (*Schoenoplectus fluviatilis*), Walter's barnyard grass (*Echinochloa walteri*), and gypsy-wort (*Lycopus rubellus*).

Threats

Threats to intertidal high marsh communities include sea level rise; conversion to residential, commercial, or industrial uses, water pollution, and colonization by non-native invasive species,

especially common reed (*Phragmites australis* ssp. *australis*). Inappropriate land use, such as planned waterfront housing developments, continues to threaten the remaining unprotected tidal marsh occurrences.

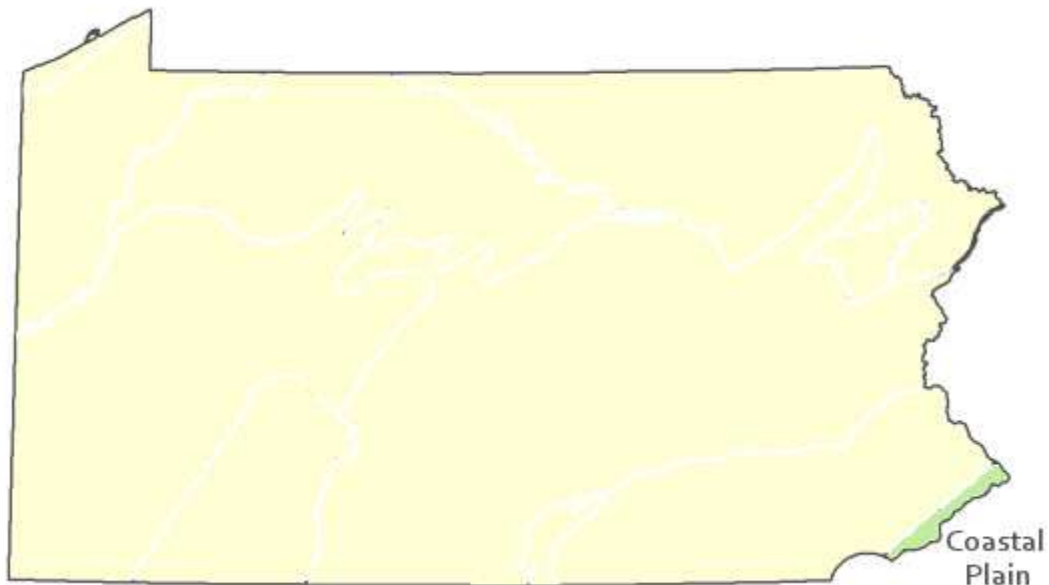
Management

There is a need to identify sites where existing land use could allow for inland migration of freshwater tidal marsh communities as sea level rises and secure these sites as protected open space. All remaining freshwater tidal marsh communities should be protected from incompatible land use. Opportunities for restoration of freshwater tidal marsh communities should also be pursued. Invasive species control should be implemented at sites where common reed (*Phragmites australis* ssp. *australis*) is established.

Research Needs

All remaining freshwater tidal marsh sites should be inventoried, evaluated, and mapped. In addition, quantitative inventory data are needed to refine descriptions of species composition. Regular monitoring should be instituted at selected sites.

Range Map



Pennsylvania Range

Tidal high marsh is very limited in Pennsylvania, the best remaining examples are found in Bucks County along the Neshaminy Creek at Neshaminy State Park and at Biles Island.

Global Distribution

Northeastern North America coastal region from Quebec to Virginia (NatureServe 2011)

References

Stone, B., D. Gustafson, and B. Jones. 2006 (revised). Manual of Procedure for State Game Land Cover Typing. Commonwealth of Pennsylvania Game Commission, Bureau of Wildlife Habitat Management, Forest Inventory and Analysis Section, Forestry Division. Harrisburg, PA. 79 ppg.

Pennsylvania Department of Conservation and Natural Resources (DCNR). 1999. Inventory Manual of Procedure. For the Fourth State Forest Management Plan. Pennsylvania Bureau of Forestry, Division of Forest Advisory Service. Harrisburg, PA. 51 ppg.