

DRAFT

**Descriptions of  
Estuarine Communities**

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**Classification of the  
Natural Communities  
of  
Massachusetts**

## ESTUARINE COMMUNITIES

### MARINE

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### ESTUARINE

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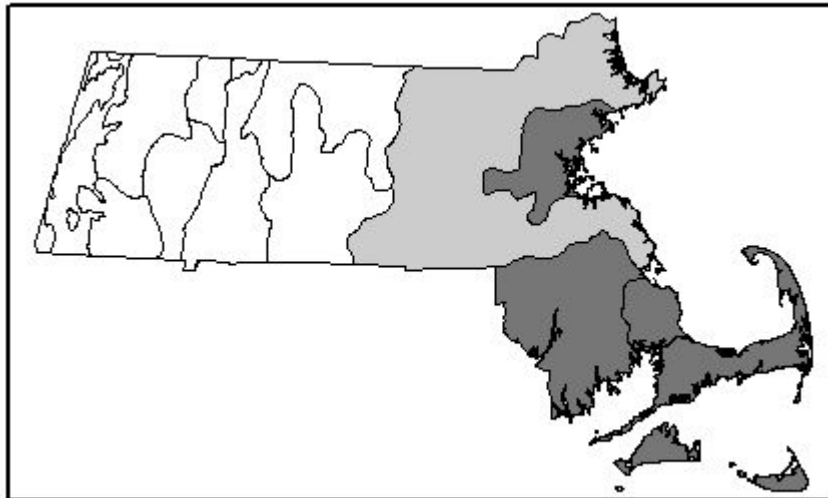
Fresh / Brackish Tidal Shrubland..... E - 30

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**Community Name:** MARINE SUBTIDAL: FLATS

**Community CODE:** CM1A000000

**SRANK:** S4



**Concept:** Sparsely to densely vegetated communities, dominated by invertebrates. Permanently submerged saline communities that occur in open ocean or near shore.

**Environmental setting:** Permanently flooded by ocean water. Sandy to muddy nearshore shallow water and offshore banks.

**Vegetation Description:** May include beds of eelgrass (*Zostera marina*). Other plants are macro- and micro-algae.

**Associations:**

**Habitat Values for Associated Fauna:** Water over flats are important feeding areas for gulls, terns, diving ducks, and other water birds, and many winter in Massachusetts waters feeding on eelgrass and/or the fish in it. Brandt (*Branta bernicla*) are particularly dependent on four foot deep eelgrass, and feed on it in Massachusetts waters in the winter. Eelgrass beds are key nursery areas for larval and juvenile fish. Loggerheads (*Caretta caretta*) and Atlantic Ridley (*Lepidochelys kempii*) sea turtles use deep Marine Subtidal Flats in Cape Cod Bay.

**Associated rare plants:**

NONE KNOWN

**Associated rare animals:**

CARETTA CARETTA	LOGGERHEAD	T
LEPIDOCHELYS KEMPII	ATLANTIC RIDLEY	E

**Examples with Public Access:** Billingsgate Shoals Wildlife Sanctuary, Wellfleet.

**Threats:**

**Management needs:**

**Synonyms**

**USNVC/TNC:** Includes: *Zostera marina* Permanently flooded - Tidal Herbaceous Alliance -- *Zostera marina* Herbaceous Vegetation [Provisional] [CEGL004336].

**MA (old name):** Southern New England & Gulf of Maine Saline/ Brackish Subtidal Estuarine Community.

**ME:** Marine - Mud bottom community.

**NH:** Possible, not described.

**NY:** Includes Marine eelgrass meadow.

**CT:** Includes *Zostera marina* Hydromorphic Vegetation.

**RI:** Brackish intertidal mud flat.

**Other:**

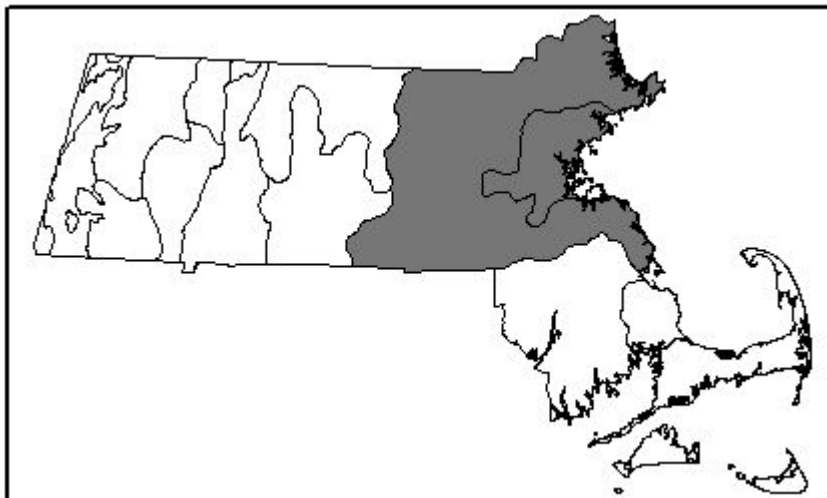
**Author:** P. Swain

**Date:** 1/1/00

**Community Name:** MARINE INTERTIDAL: ROCKY SHORE

**Community CODE:** CM2A000000

**SRANK:** S2



**Concept:** A community dominated by invertebrates and non-vascular plants, in a high-stress environment alternately covered by tides and exposed to desiccation and thermal stress.

**Environmental setting:** Along rocky shores, from the supratidal splash zone to the limits of light penetration in the subtidal zone.

**Vegetation Description:** The communities of rocky shores are dominated by crustaceans, mollusks, and macroscopic algae. The algae (seaweed) provide cover and food for the animals. The rocky shore community shows a distinct zonation from the splash zone to the zone of complete inundation.

**Associations:**

**Habitat Values for Associated Fauna:** This was probably the habitat of the extinct sea mink (*Mustela vison macrodon*). Wintering sea birds such as Northern Gannets (*Morus bassanus*) and Great Cormorants (*Phalacrocorax carbo*) feed among submerged rocks close to shore. Wintering Purple Sandpipers (*Calidris maritima*) forage among exposed rocks in low tide. The habitat includes tidal pools which support many marine invertebrates.

**Associated rare plants:**

NONE KNOWN

**Associated rare animals:**

NONE KNOWN

**Examples with Public Access:** Halibut Point State Park, Rockport.

**Threats:**

**Management needs:**

**Synonyms**

**USNVC/TNC:** [Nonvascular Sparse vegetation]

**MA (old name):** Southern New England/Gulf of Maine Rocky Intertidal Community

**ME:** Marine: Intertidal bedrock / boulder community..

**NH:**

**NY:** Marine rocky intertidal.

**CT:**

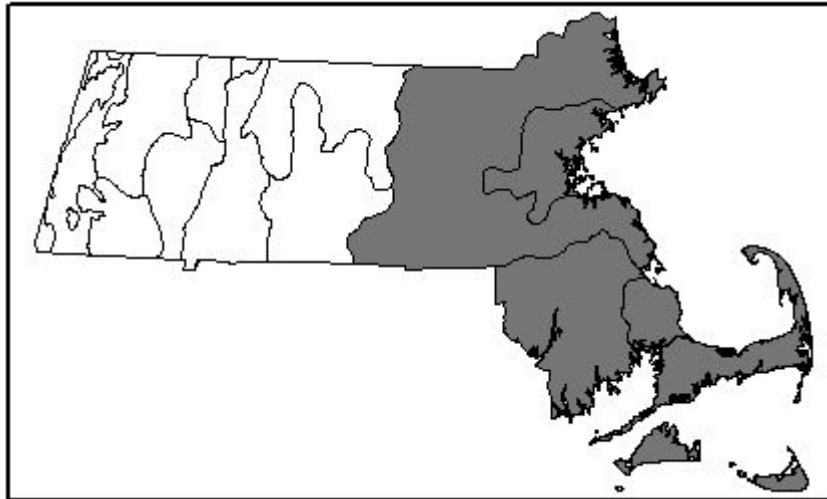
**RI:** Marine intertidal rocky shore.

**Other:**

**Author:** P. Swain

**Date:** 1/1/00

**Community Name:** MARINE INTERTIDAL: GRAVEL / SAND BEACH  
**Community CODE:** CM2B000000  
**SRANK:** S4



**Concept:** Invertebrates and nonvascular plants dominate the organisms of this highly stressed community in the intertidal (wave action) zone of beaches.

**Environmental setting:** Marine beaches exposed between high tides: below the wrack line and above the permanent water. These are high energy habitats. Beach strand communities above the high tide line support sparse vascular plants. Marine subtidal communities occur below the low tide line.

**Vegetation Description:** Sparse non-vascular plants. Invertebrates are the most abundant group.

**Associations:**

**Habitat Values for Associated Fauna:** Many shorebirds, such as Sanderlings (*Calidris alba*), Least Sandpipers (*C. minutilla*), Semipalmated Sandpipers (*C. pusilla*), and Semipalmated Plover (*Charadrius semipalmatus*), forage along shorelines during migrations. Part of important resting areas for shorebirds when exposed. Piping plovers (*Charadrius melodus*) nest on the beach strand and forage in the wrack line. Gulls (*Larus* spp.) are ubiquitous in all shore and shallow water environments. Tiger beetles also forage on exposed portions of the intertidal beach. Few mammals use this portion of the beach for more than passing through.

**Associated rare plants:**

NONE KNOWN

**Associated rare animals:**

CHARADRIUS MELODUS	PIPING PLOVER	T
CICINDELA DORSALIS DORSALIS	NORTHEASTERN BEACH TIGER BEETLE	E

**Examples with Public Access:** Cape Cod National Seashore; Monomoy NWR, Orleans and Chatham; Horseneck Beach State Reservation, Westport; Parker River NWR, Newbury.

**Threats:** Disturbance of resting birds by domestic animals, people, and off road vehicles.

**Management needs:**

**Synonyms**

**USNVC/TNC:** Sand, non-vegetated.

**MA (old name):** Southern New England/Gulf of Maine Intertidal High Energy Sand / Gravel Beach.

**ME:** Marine: sand beach community and gravel/ cobble beach community.

**NH:**

**NY:** Marine intertidal gravel/sand beach.

**CT:**

**RI:** Marine intertidal gravel/ sand beach.

**Other:**

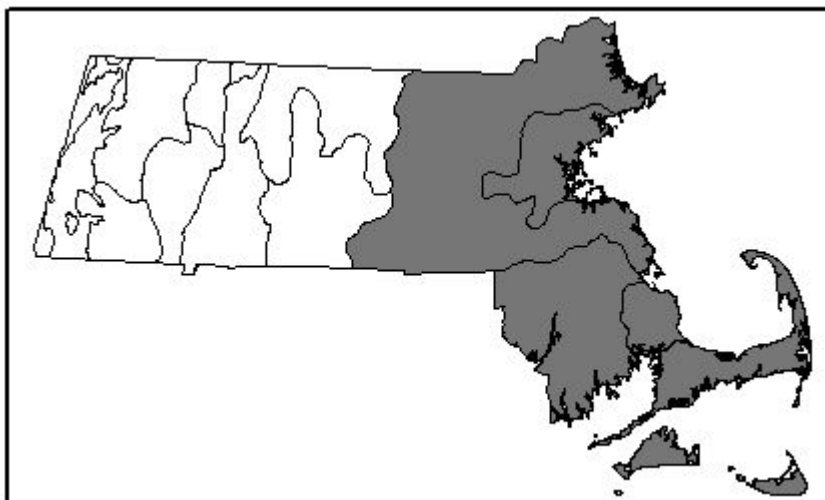
**Author:** P. Swain

**Date:** 1/1/00

**Community Name:** MARINE INTERTIDAL: FLATS

**Community CODE:** CM2C000000

**SRANK:** S4



**Concept:** Marine intertidal areas protected from intense wave action, with relatively stable sediments, in various proportions of silt, clay, sand, and organic materials.

**Environmental setting:** Found in protected, low-energy coastal sites, such as bays and coves behind headlands or barrier beaches, between low and high tidal limits. More protected than Marine intertidal gravel/sand beaches. Marine intertidal flats are sometimes bordered by salt marshes on the landward side and tidal channels or subtidal eelgrass beds on the seaward side. Tidal flats are physically and biologically linked to other coastal marine systems; organisms of tidal flats depend upon organic materials brought in from adjacent coastal, estuarine, riverine, and salt marsh habitats.

**Vegetation Description:** Includes some areas with eelgrass (*Zostera marina*), but other areas are sparsely vegetated. Invertebrate species richness can be high. Mud areas tend to have a higher productivity than sand or gravel areas. Micro-algae are abundant.

**Associations:**

**Habitat Values for Associated Fauna:** Habitat is used by many of the same species as use the intertidal gravel/sand beaches: Sanderlings (*Calidris alba*), Least Sandpipers (*C. minutilla*), Semipalmated Sandpipers (*C. pusilla*), Stilt Sandpiper (*C. himantopus*), Greater Yellowlegs (*Tringa melanoleuca*), Black-bellied Plover (*Pluvialis squatarola*), and Semipalmated Plover (*Charadrius semipalmatus*) for foraging and staging during migrating. Resting areas for water birds when exposed. Habitat for polychaetes, snails, clams, oysters, sand dollars, and other invertebrates. Coastal and estuarine fishes migrate over tidal flats during high tides and feed on organisms in and on the sediments. During high tides, terns and water birds fish over flats. Mammals, reptiles, and amphibians do not seek out this habitat.

**Associated rare plants:**

NONE KNOWN

**Associated rare animals:**

NONE KNOWN

**Examples with Public Access:** Nauset Beach; Chatham Beach; Merrimack River mouth, Newbury.

**Threats:**

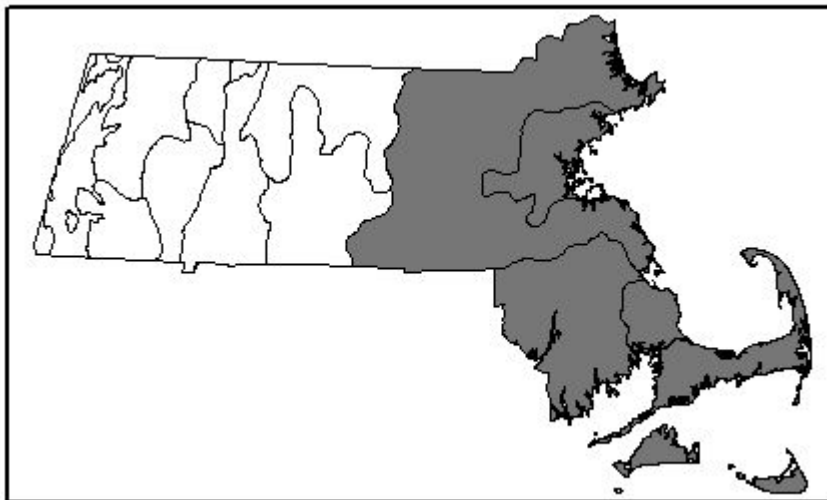
**Management needs:**

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Synonyms**

**USNVC/TNC:** Non-vegetated.  
**MA (old name):** Southern New England / Gulf of Maine Intertidal Low Energy Mud Flats.  
**ME:** Marine: Intertidal mud flat community.  
**NH:**  
**NY:** Marine intertidal mudflats [mostly invertebrates].  
**CT:**  
**RI:** Marine intertidal mud flat.  
**Other:**  
**Author:** P. Swain **Date:** 6/9/99

**Community Name:** ESTUARINE SUBTIDAL: SALINE/ BRACKISH FLATS  
**Community CODE:** CE3A100000  
**SRANK:** S4



**Concept:** Estuarine areas not exposed between tides, generally without emergent vegetation. Areas less than two meters deep sometimes support submerged or floating plants.

**Environmental setting:** Includes beds of tidal creeks draining salt marshes and river mouths. The salinity of the water changes with the tides and flow of rivers or streams. Actual species present at any place depend on salinity, water temperature, depth, and substrate type. More protected than Marine subtidal communities.

**Vegetation Description:** Eel grass (*Zostera marina*) and widgeon grass (*Ruppia maritima*) may form dense beds. Waterweed (*Elodea nuttallii*), coontail (*Ceratophyllum demersum*), sago pondweed (*Potamogeton pectinatus*), and horned pondweed (*Zannichellia palustris*) may be mixed in or form locally dense beds. Macroalgae [seaweeds] can be locally dense. Invertebrates vary with substrate and depth.

**Associations:**

**Habitat Values for Associated Fauna:** Submerged vegetation provides winter feeding sites for waterfowl including Brandt (*Branta bernicla*) and American Black Duck (*Anas rubripes*), and sea birds. Vascular plant beds also provide habitat for larval and juvenile fishes and surfaces for attachment of invertebrates including shellfish. Fish such as Alewife (*Alosa pseudoharengus*), American shad (*A. sapidissima*), and Striped bass (*Morone saxatilis*) are characteristic of estuarine subtidal habitats.

**Associated rare plants:**  
NONE KNOWN

**Associated rare animals:**  
NONE KNOWN

**Examples with Public Access:** Joppa Flats, Newbury.

**Threats:**

**Management needs:**

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Synonyms**

**USNVC/TNC:** *Zostera marina* Permanently flooded - Tidal Herbaceous Alliance --*Zostera marina* Herbaceous Vegetation [Provisional] [CEGL004336]; *Ruppia maritima* Permanently Flooded - Tidal Temperate Herbaceous Alliance -- *Ruppia maritima* Acadian, Virginian Zone Herbaceous Vegetation [CEGL006167].

**MA (old name):** Southern New England & Gulf of Maine Saline/ Brackish Subtidal Estuarine Communities.

**ME:** Marine - Mud bottom community; Tidal creek community.

**NH:** Possible, not described.

**NY:** Marine eelgrass meadow; Tidal creek --Widgeon grass; Brackish subtidal aquatic bed.

**CT:** *Zostera marina* Hydromorphic Vegetation.

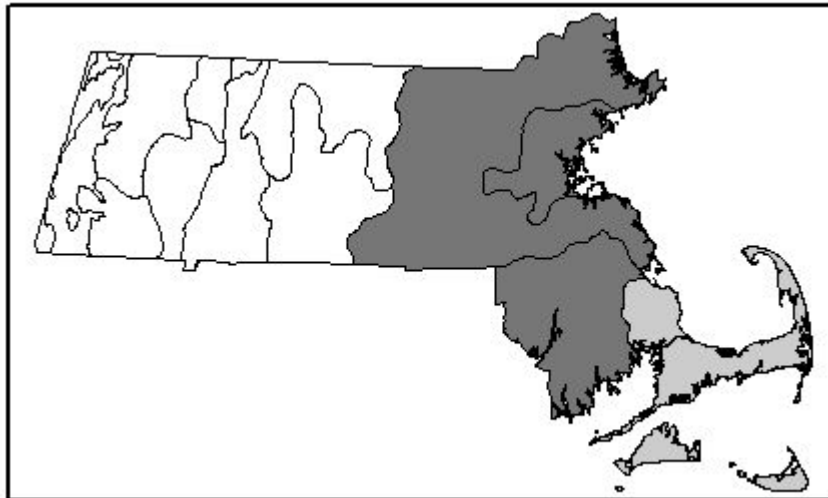
**RI:** Brackish intertidal mud flat; Tidal creek --Widgeon grass.

**Other:**

**Author:** P. Swain

**Date:** 6/11/99

**Community Name:** ESTUARINE SUBTIDAL: FRESH / BRACKISH FLATS  
**Community CODE:** CE3A200000  
**SRANK:** S2



**Concept:** Permanently flooded freshwater to brackish areas subject to tidal fluctuations. Aquatic beds form where water is less than two meters at low tide.

**Environmental setting:** Permanently flooded upper reaches of estuaries, including upper reaches of tidal creeks. Such areas tend to be warmer and shallower than closer to the river mouth, as well as less saline. Shores lined by Freshwater or Brackish Tidal Marshes. Seldom closed by ice.

**Vegetation Description:** Sago pondweed (*Potamogeton pectinatus*), horned pondweed (*Zannichellia palustris*), tapegrass (*Vallisneria americana*), and naiads (*Najas guadalupensis* and *N. minor*) are characteristic vascular plants.

**Associations:**

**Habitat Values for Associated Fauna:** Fish such as Alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), and Striped bass (*Morone saxatilis*) are characteristic. Invertebrates include Horseshoe crabs (*Limulus polyphemus*) and mud crabs (such as *Neopanope texana*). Gulls forage year round, and in winter waterfowl and eagles are common.

**Associated rare plants:**

NONE KNOWN

**Associated rare animals:**

LAMPETRA APPENDIX

AMERICAN BROOK LAMPREY

T

**Examples with Public Access:**

**Threats:**

**Management needs:**

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Synonyms**

**USNVC/TNC:** Potamogeton pectinatus - Zannichellia palustris Permanently Flooded - Tidal Herbaceous Alliance  
-- Potamogeton pectinatus - Zannichellia palustris Permanently Flooded - Tidal Herbaceous  
Vegetation [CEGL006027].

**MA (old name):** Southern New England & Gulf of Maine Fresh /Brackish Subtidal Estuarine Communities.

**ME:** Estuarine community: subtidal estuary community.

**NH:** Possible, not described.

**NY:** Includes Estuarine intertidal, Brackish subtidal aquatic bed; Freshwater subtidal aquatic bed.

**CT:** Includes Vallisneria americana Hydromorphic Vegetation.

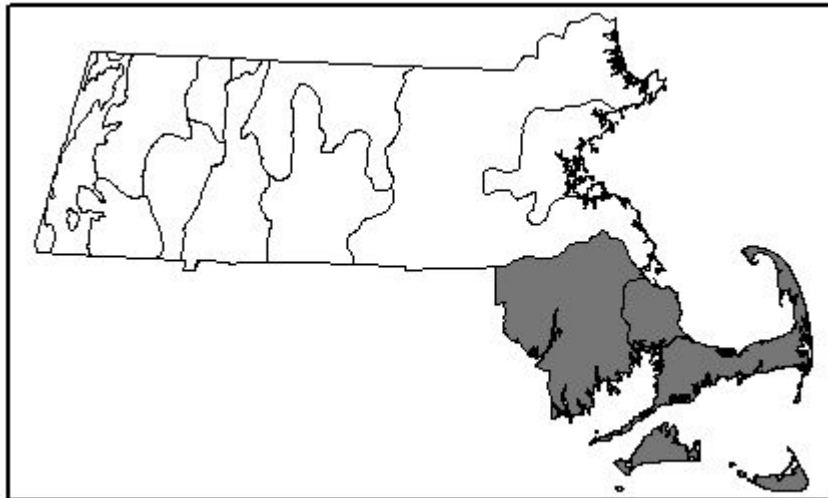
**RI:** Includes Brackish subtidal Aquatic Bed; Fresh subtidal aquatic bed.

**Other:**

**Author:** P. Swain

**Date:** 6/13/99

**Community Name:** ESTUARINE SUBTIDAL: COASTAL SALT POND  
**Community CODE:** CE3B000000  
**SRANK:** S2



**Concept:** The vegetation surrounding and in coastal saline to brackish ponds with shallow water. The inland ends tend to be fresher, with denser, taller vegetation developing.

**Environmental setting:** Salt ponds are found on the south and east sides of Cape Cod, Martha's Vineyard, Nantucket, and in Buzzards Bay. The ponds are more or less isolated from the ocean by sand spits that cut off a bay. When closed, the ponds tend to be brackish and have little tidal action. The spit may become broken by storms or human intervention and close again by drifting sand. Water levels fluctuate when the ponds are closed to the ocean, with freshwater inflow from streams and rain maintaining the levels. Shorelines often support marsh areas that are similar to brackish salt marshes. Sea-level fens are very restricted areas within the marshes.

**Vegetation Description:** Eelgrass (*Zostera marina*) beds are often dominant communities of the subtidal areas. Other areas may not be vegetated. Towards the ocean, mud or sand shores appear during dry spells that support mud flat species such as mudwort (*Limosella australis*), dwarf spikerush (*Eleocharis parvula*), seaside flatsedge (*Cyperus filicinus*), seaside crowfoot (*Ranunculus cymbalaria*), false pimpernel (*Lindernia dubia*), waterwort (*Elatine minima*) and shore pygmy-weed (*Crassula aquatica*). The vegetation of inland ends is similar to the landward, brackish, portions of other salt marshes, with beds of narrow-leaved cattail (*Typha angustifolia*), common reed (*Phragmites australis*), freshwater cord-grass (*Spartina pectinata*), saltmarsh switchgrass (*Panicum virgatum* var. *spissum*), bulrushes (*Scirpus* spp. Particularly *S. pungens*), and mock bishop's-weed (*Ptilimnium capillaceum*).

**Associations:**

**Habitat Values for Associated Fauna:** Eel (*Anguilla rostrata*), alewife (*Alosa pseudoharengus*), and white perch (*Bairdiella chrysura*) are typical fish. Important for shell fish beds.

**Associated rare plants:**

CRASSULA AQUATICA	PYGMYWEED	T
HYDROCOTYLE VERTICILLATA	SALTPOND PENNYWORT	SC

**Associated rare animals:**

NONE KNOWN

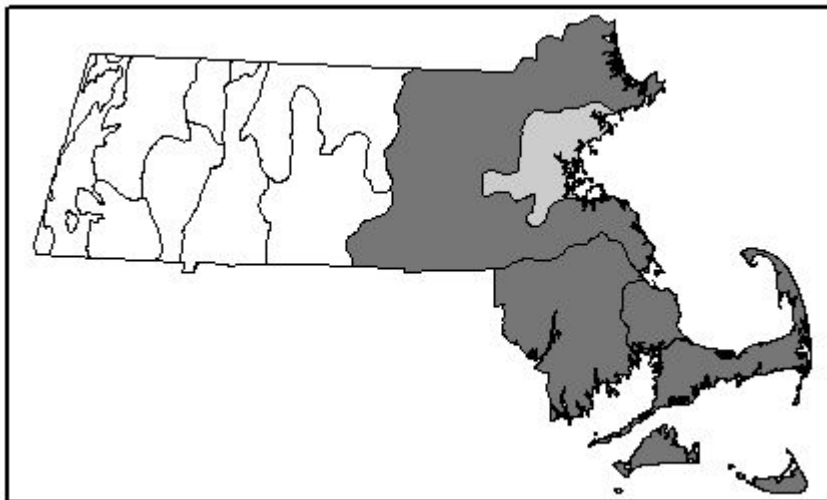
Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

<b>Examples with Public Access:</b>	Sesachacha Pond, Nantucket; Allen's Pond, Dartmouth; Long Pond, Tisbury.		
<b>Threats:</b>	Artificially maintaining ponds open or closed. The increasingly invasive Mute Swan ( <i>Cygnus olor</i> ) is becoming more abundant and displacing native species.		
<b>Management needs:</b>			
<b>Synonyms</b>			
<b>USNVC/TNC:</b>	Zostera marina Permanently flooded - Tidal Herbaceous Alliance -- Zostera marina Herbaceous Vegetation [Provisional] [CEGL004336]; Includes Scirpus pungens Tidal Herbaceous Alliance - Scirpus pungens - Eleocharis parvula Herbaceous Vegetation [CEGL006398].		
<b>MA (old name):</b>	Coastal Salt Pond.		
<b>ME:</b>	Marine - Mud bottom community part of Marine - Salt Pond Community.		
<b>NH:</b>	Similar to Coastal salt pond marsh.		
<b>NY:</b>	Marine eelgrass meadow; Coastal salt pond.		
<b>CT:</b>	Likely present, not named.		
<b>RI:</b>	Brackish subtidal aquatic bed (eelgrass); part of Coastal salt pond.		
<b>Other:</b>			
<b>Author:</b>	P. Swain	<b>Date:</b>	6/13/99

**Community Name:** ESTUARINE INTERTIDAL: SALINE /BRACKISH FLATS

**Community CODE:** CE2A100000

**SRANK:** S3



**Concept:** Non-organic substrates exposed between tides with sparse vegetation.

**Environmental setting:** Lower estuarine areas exposed between high tides, covered with brackish or saline water at high tide. Flats accumulate in areas sufficiently quiet for sediments to accumulate. Species are patchy. Grades into Brackish Tidal Marsh, mud flat zone, which has more organic sediments.

**Vegetation Description:** Sparsely vegetated with patches of predominately rosette leaved aquatics such as riverbank quillwort (*Isoetes riparia*), river arrowhead (*Sagittaria subulata*), saltpond spike-rush (*Eleocharis parvula*), and Atlantic mudwort (*Limosella australis*). Patches of algae and eelgrass (*Zostera marina*) can also occur. The plants are completely submerged at high tide and usually coated with mud.

**Associations:**

**Habitat Values for Associated Fauna:** Gulls and shorebirds feed on flats at low tide, American Black Duck (*Anas rubripes*), other diving ducks, and other water birds feed on flooded flats. Polychaetes, snails, clams, and amphipods are abundant in mud and sand flats. Essentially the same fauna as on marine intertidal flats.

**Associated rare plants:**

NONE KNOWN

**Associated rare animals:**

NONE KNOWN

**Examples with Public Access:** Flats in Brewster, Cape Cod Bay; and Joppa Flats, Merrimack River mouth.

**Threats:**

**Management needs:**

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Synonyms**

**USNVC/TNC:**

Isoetes riparia tidal sparsely Vegetated Alliance -- Isoetes riparia Tidal Sparse Vegetation [CEGL006058]; Sagittaria subulata - Limosella australis Tidal Herbaceous Alliance -- Sagittaria subulata - Limosella australis Tidal Herbaceous Vegetation [CEGL004473].

**MA (old name):**

Southern New England/Gulf of Maine Saline/ Brackish Intertidal flat; Southern New England/Gulf of Maine Fresh/ Brackish Subtidal Estuarine Community.

**ME:**

Intertidal mud flat community Intertidal sand - gravel flat community; Estuarine - Brackish tidal marsh community, mudflat zone, Intertidal mud flat community; Intertidal sand - gravel flat community.

**NH:**

Possible, not described.

**NY:**

Marine intertidal mudflats (mostly invertebrates); Estuarine intertidal, Brackish intertidal mudflats.

**CT:**

Sagittaria subulata - Zannichellia palustris community.

**RI:**

Marine intertidal mud flat.

**Other:**

**Author:**

J. Lundgren

**Date:**

6/13/99



**Synonyms**

**USNVC/TNC:**

**MA (old name):** Southern New England & Gulf of Maine Fresh/ Brackish Intertidal Flat Community.

**ME:** Marine: Intertidal mud flat community; Intertidal sand - gravel flat community.

**NH:**

**NY:** Estuarine intertidal: Freshwater intertidal mudflats.

**CT:**

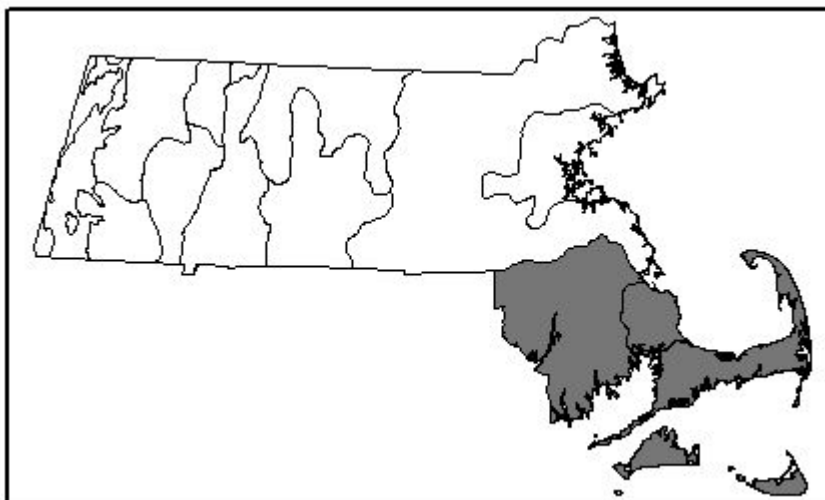
**RI:**

**Other:**

**Author:** P. Swain

**Date:** 6/13/99

**Community Name:** ESTUARINE INTERTIDAL: COASTAL SALT POND MARSH  
**Community CODE:** CE2B200000  
**SRANK:** S2



**Concept:** The vegetation surrounding coastal salt ponds. The inland ends tend to be fresher, with denser, taller vegetation developing. Similar to salt marsh.

**Environmental setting:** Inland ends and shores of salt ponds. Sea-level fens [described in palustrine classification] are within the areas of Coastal salt pond marshes, but more restricted. .

**Vegetation Description:** Beds of narrow-leaved cattail (*Typha angustifolia*), common reed (*Phragmites australis*), freshwater cord-grass (*Spartina pectinata*), coastal switchgrass (*Panicum virgatum* ssp. *spissum*), bulrushes (*Scirpus* spp., particularly *S. pungens*), and mock bishop's-weed (*Ptilimnium capillaceum*) grow at the inland ends of the salt ponds.

**Associations:**

**Habitat Values for Associated Fauna:**

**Associated rare plants:**

CRASSULA AQUATICA	PYGMYWEED	T
HYDROCOTYLE VERTICILLATA	SALTPOND PENNYWORT	SC
SETARIA GENICULATA	BRISTLY FOXTAIL	SC
SUAEDA CALCEOLIFORMIS	AMERICAN SEA-BLITE	SC

**Associated rare animals:**

SPARTINIPHAGA INOPS	SPARTINA BORER	SC
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**Examples with Public Access:**

**Threats:**

**Management needs:**

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Synonyms**

**USNVC/TNC:** Scirpus pungens Tidal Herbaceous Alliance -- Scirpus pungens - Eleocharis parvula Herbaceous Vegetation [CEGL006398].

**MA (old name):** Coastal Salt Pond Marsh.

**ME:** Marine - Salt pond community.

**NH:** Coastal salt pond marsh.

**NY:** Coastal salt pond.

**CT:** Possible, not described.

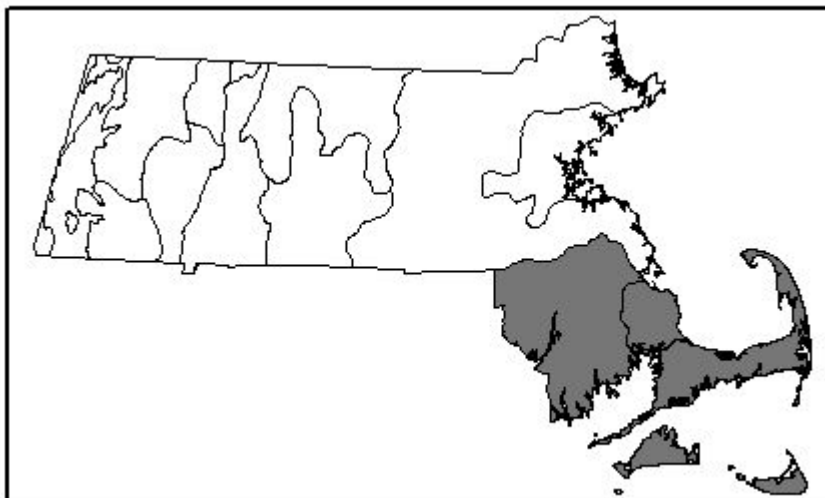
**RI:** Coastal salt pond.

**Other:**

**Author:** P. Swain

**Date:** 6/13/99

**Community Name:** (Palustrine) SEA-LEVEL FEN  
**Community CODE:** CP2B0B3000  
**SRANK:** S1



**Note:** palustrine community associated with salt ponds.

**Concept:** Herbaceous/graminoid peatlands that occur at the upland edges of ocean tidal marshes. The combination of upland freshwater seepage and infrequent salt or brackish overwash produces a mixed plant community of freshwater and estuarine species.

**Environmental setting:** Sea-level fens occupy the interface between estuarine marshes and upland seepage slopes, and therefore have a distinct species assemblage including both estuarine and palustrine species. There are two hydrologic influences: acidic freshwater seepage from the uplands and periodic salt or brackish overwash from the adjacent marsh. Both are needed to produce the combination of species observed in sea-level fens.

**Vegetation Description:** Probable community type in Massachusetts, but vegetation descriptions are lacking. There are two probable occurrences reported from Martha's Vineyard that have saltmarsh spike-sedge (*Eleocharis rostellata*) co-occurring with acidic fen species. Plot data are needed. Ludwig (1995) described the flora of sea-level fens from Virginia, Delaware, New York, and Connecticut. He described three diagnostic species: saltmarsh straw-sedge (*Carex hormathodes*), saltmarsh spike-sedge (*Eleocharis rostellata*), and saltmarsh-threesquare (*Scirpus americanus*). Other common species include: New York aster (*Aster novi-belgii*), twig-sedge (*Cladium mariscoides*), spatulate-leaved sundew (*Drosera intermedia*), Canada rush (*Juncus canadensis*), pondshore-rush (*Juncus pelocarpus*), swamp-candles (*Lysimachia terrestris*), common reed (*Phragmites australis*), white beak-sedge (*Rhynchospora alba*), swamp-rose (*Rosa palustris*), common threesquare (*Scirpus pungens*), poison ivy (*Toxicodendron radicans*), and marsh St. John's-wort (*Triadenum virginicum*). [State Historical, deceitful spike-sedge (*Eleocharis fallax*) listed as common in more southern occurrences.]

**Associations:** No associations have been described in Massachusetts.

**Habitat values:** More information is needed.

**Associated rare plants:**

ELEOCHARIS FALLAX	DECEITFUL SPIKE-SEDGE	H
ELEOCHARIS ROSTELLATA	BEAKED SPIKE-SEDGE	- WL

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Associated rare animals:**

METARRANTHIS PILOSARIA	COASTAL SWAMP METARRANTHIS MOTH	SC
VERTIGO PERRYI	OLIVE VERTIGO	SC

**Examples:** on Martha's Vineyard

**Threats:** Alteration to the natural hydrologic regime. Development in the uplands may have negative effects on upland seepage.

**Management needs:** Maintain natural hydrology and upland buffer.

**Synonyms**

**USNVC/TNC:** Cladium mariscoides-Drosera intermedia-Eleocharis rostellata herbaceous vegetation [CEGL006310].

**MA (old name):** Not described.

**ME:** Not described.

**VT:** Not described.

**NH:** Not described.

**NY:** Sea-level fen

**CT:** Cladium mariscoides-Drosera intermedia-Eleocharis rostellata community?

**RI:** Sea-level fen

**Golet & Larson, 1974:**

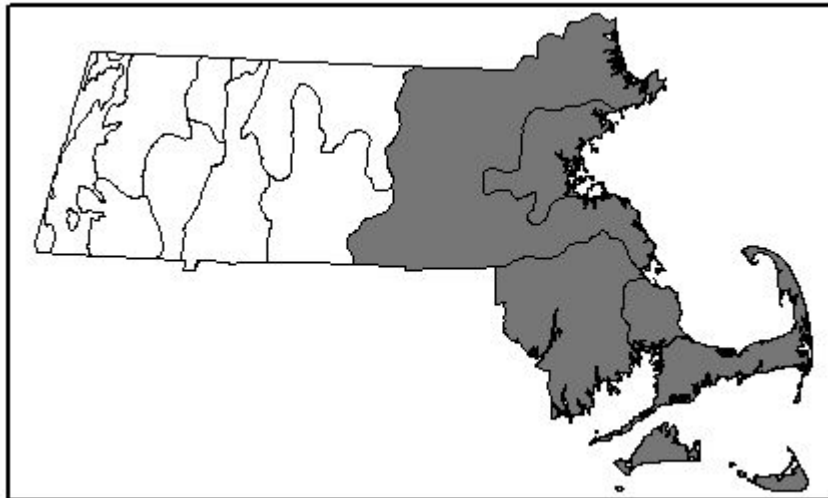
**Other:**

**Author:** J. Kearsley

**Date:** 7/21/99

modified 3/30/00, PCS

**Community Name:** ESTUARINE INTERTIDAL: SALT MARSH  
**Community CODE:** CE2B100000  
**SRANK:** S3



**Concept:** A graminoid dominated, tidally flooded coastal community with several zones.

**Environmental setting:** Salt marshes form in areas subject to oceanic tides, but are somewhat sheltered from wave energy. They usually occur in estuaries and behind barrier beaches and spits. A peat develops in the higher marshes, with marsh plants extending into flats in stabilized areas, raising the surface area and allowing the marsh to expand. Upper edges may be brackish.

**Vegetation Description:** Saltwater cord-grass (*Spartina alterniflora*) dominates the low marsh area, between the low and mean high tide. Between the mean high tide and the spring high tide, the high marsh area, salt-marsh hay (*Spartina patens*) dominates, usually mixed with spike grass (*Distichlis spicata*). Towards the upland edge, black grass (*Juncus gerardii*) becomes more common. Mixed throughout, especially towards the upper edges sea - lavender (*Limonium carolinianum*), seaside goldenrod (*Solidago sempervirens*), and other salt tolerant species. At the freshest edges, salt marsh switch grass (*Panicum virgatum*) may be common. At those upper edges and on ditch spoils, groundsel-tree (*Baccharis halimifolia*) and saltmarsh elder (*Iva frutescens*) can form shrubby zones. Scattered in low, poorly drained, salty areas, salt pannes form, with populations of glasswort (*Salicornia* spp.) and saltwort (*Salsola kali*).

**Associations:** Low marsh, high marsh, salt shrub, and salt panne are often described as separate communities within the salt marsh system.

**Habitat Values for Associated Fauna:** Many species of birds forage in salt marshes. A few such as Seaside Sparrow (*Ammodramus maritimus*) and the Saltmarsh Sharp-tailed Sparrow (*A. caudacutus*) nest there as well. In fall and winter, Short-eared Owls (*Asio flammeus*), Snowy Owls (*Nyctea scandiaca*), and Northern Harrier (*Circus cyaneus*) hunt in salt marshes. In summer, Snowy Egrets (*Egretta thula*) and Glossy Ibis (*Plegadis falcinellus*) forage in pools at low tide. Few mammals are resident in salt marshes, but Meadow voles (*Microtus pensylvanica*) use them, retreating to dryer areas during high tides. Fiddler crabs are invertebrates that are identified with salt marsh creeks.

**Associated rare plants:** NONE KNOWN

**Associated rare animals:**

PANDION HALIAETUS	OSPREY	- WL
SPARTINIPHAGA INOPS	SPARTINA BORER	SC

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Examples with Public Access:** Parker River National Wildlife Refuge, Ipswich; Salisbury Marsh, Salisbury; Boston Harbor Islands, Great Marshes, Barnstable; Nauset Marsh, Eastham; Great Sippewissett Marsh, Falmouth

**Threats:**

**Management needs:**

**Synonyms**

**USNVC/TNC:** Includes *Spartina alterniflora* Tidal Herbaceous Alliance -- *Spartina alterniflora*/ (*Ascophyllum nodosum*) Acadian, Virginian Zone Herbaceous Vegetation [CEGL004192]; *Spartina patens* - (*Distichlis spicata*) Tidal Herbaceous Alliance -- *Spartina patens* - *Distichlis spicata* - *Plantago maritima* Herbaceous Vegetation [CEGL006006] and *Spartina patens* - *Agrostis stolonifera* Herbaceous Vegetation [CEGL006365]; *Panicum virgatum* Tidal Herbaceous Alliance -- *Panicum virgatum* tidal Herbaceous Vegetation [Provisional] [CEGL006150]; *Baccharis halimifolia* - *Iva frutescens* Tidal shrubland Alliance - *Baccharis halimifolia* - *Iva frutescens* / *Panicum virgatum* Shrubland [CEGL006063]; *Sarcocornia perennis* - (*Distichlis spicata*, *Salicornia* spp.) Tidal Herbaceous Alliance -- *Sarcocornia perennis* - *Salicornia* spp. - *Spartina alterniflora* Herbaceous Vegetation [CEGL004308].

**MA (old name):** Salt Marsh [formerly Southern New England and Gulf of Maine Salt Marshes].

**ME:** Includes Cord-grass saltmarsh community; Salt hay saltmarsh community.

**NH:** Present

**NY:** Includes Low salt marsh; high salt marsh; salt shrub; Salt panne.

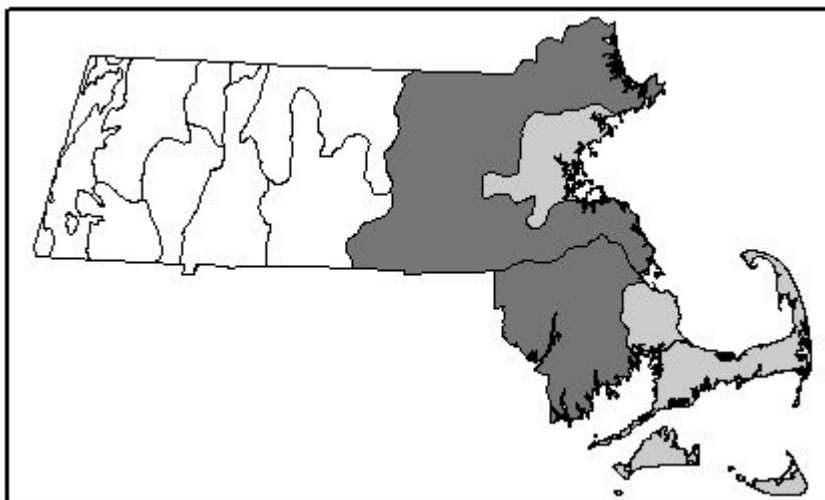
**CT:** Includes *Spartina alterniflora* community; *Spartina patens* - *Distichlis spicata* community. *Spartina patens* - *Agrostis stolonifera* community (brackish meadow); *Panicum virgatum* medium - tall grasslands; *Iva frutescens* / *Panicum virgatum* community; *Salicornia europea* - *Spartina alterniflora* community.

**RI:** Includes Low salt marsh; High salt marsh; Salt shrub; Salt panne.

**Other:**

**Author:** P. Swain **Date:** 6/15/99

**Community Name:** ESTUARINE INTERTIDAL: BRACKISH TIDAL MARSH  
**Community CODE:** CE2B300000  
**SRANK:** S1



**Concept:** Mixed herbaceous marsh that is flooded by daily tides, and occurs in brackish reach of coastal rivers. May also occur in smaller patches in upper zones of coastal salt marshes and salt ponds, usually near seepages or freshwater transition areas.

**Environmental setting:** Brackish tidal marshes occur along free-flowing coastal rivers. Smaller patches often occur along the edges of salt marsh habitat, near stream inputs, seepages or other freshwater transition areas. Tidal amplitude ranges from 0 to 150 cm [comparable to freshwater tidal marshes], while average annual salinity is [0.5] - 5-18 ppt. The community is often structurally diverse, including high marsh and low marsh, with occasional occurrences along rocky shores, seepages, and ditches. Brackish Tidal Marsh, mud flat zone is rich in organic sediments and, grades into adjacent less organic Brackish Mud Flats which are classified as Estuarine Intertidal: Saline/Brackish Flats.

**Vegetation Description:** Narrow-leaved cattail (*Typha angustifolia*) is typically dominant in the backmarsh, with frequent stands of common reed (*Phragmites australis*). Freshwater cord-grass (*Spartina pectinata*) and saltmarsh bulrush (*Scirpus robustus*) occur along the banks, associated with saltmarsh sedge (*Carex paleacea*) and marsh bentgrass (*Agrostis stolonifera*), which frequently sprawls over the edge. Low marsh supports stands of saltmarsh cord-grass (*Spartina alterniflora*) and threesquare (*Scirpus pungens*). Mudflats and shores support sparse low herbs such as water pimpernel (*Samolus valerandi* var. *parviflorus*), mud lily (*Lilaeopsis chinensis*) and creeping spearwort (*Ranunculus flammula* var. *ovalis*). Plants of freshwater tidal marshes occasionally occur in the higher zones of brackish marshes.

**Associations:** Massachusetts' brackish tidal marsh communities appear compatible with Connecticut's associations: (*Spartina alterniflora* - *Lilaeopsis chinensis* community; *Typha angustifolia* - *Hibiscus moscheutos* community; *Spartina patens* - *Agrostis stolonifera* community; *Scirpus pungens* - *Sagittaria* spp. tall grassland).

**Habitat Values for Associated Fauna:** This community provides outstanding general wildlife habitat, with abundant food sources for migratory and wintering waterfowl, and is generally associated with river reaches with spawning habitat for anadromous fisheries. Amphibian and reptile diversity is lower than in freshwater tidal communities.

**Associated rare plants:**

BIDENS EATONII	EATON'S BEGGAR-TICKS	T
CARDAMINE LONGII	LONG'S BITTER-CRESS	E
CRASSULA AQUATICA	PYGMYWEED	T

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

RANUNCULUS FLAMMULA VAR. OVALIS	CREeping SPEARWORT	-WL
SAGITTARIA SUBULATA VAR SUBULATA	RIVER ARROWHEAD	E
SETARIA GENICULATA	BRISTLY FOXTAIL	SC
SPARTINA CYNOSUROIDES	SALT REEDGRASS	SC

**Associated rare animals:**

CINCIANNATIA WINKLEYI	NEW ENGLAND SILTSNAIL	SC
LITTORIDINOPS TENUIPES	COASTAL MARSH SNAIL	SC

**Examples with Public Access:**

Large examples are known from the North and South Rivers; also occurs on the Palmer, Westport, Paskamansett, Weweantic, Agawam, Mashpee, and Merrimack Rivers, and probably along several other rivers on the north shore. Occurrences along salt marshes are not well documented.

**Threats:**

Invasive species appear to be the primary threat to this natural community. Brackish tidal marshes in several rivers are dominated by common reed (*Phragmites australis*), and purple loosestrife (*Lythrum salicaria*) appears to be more aggressive in brackish marshes than in freshwater tidal marshes.

**Management needs:**

Monitor invasive plant populations, and determine feasibility of control measures.

**Synonyms**

**USNVC/TNC:**

Includes Typha (*angustifolia*, *domingensis*) Tidal Herbaceous Alliance -- Typha *angustifolia* - Hibiscus *moscheutos* Herbaceous Vegetation [CEGL004201]; Scirpus *pungens* Tidal Herbaceous Alliance -- Scirpus *pungens* Herbaceous Vegetation [CEGL004188]; Spartina *alterniflora* Tidal Herbaceous Alliance -- Spartina *alterniflora*- Lilaepsis *chinensis* Herbaceous Vegetation [CEGL004193]; Spartina *patens* - (Distichlis *spicata*) Tidal Herbaceous Alliance -- Spartina *patens* - Festuca *rubra* Herbaceous Vegetation [CEGL006368]; Panicum *virgatum* Tidal Herbaceous Alliance -- Panicum *virgatum* Tidal Herbaceous Vegetation [Provisional] [CEGL006150]; Common reed (*Phragmites australis*) *australis* Tidal Herbaceous Alliance -- Common reed (*Phragmites australis*) *australis* Tidal Herbaceous Vegetation [CEGL004187]; Spartina *cynosuroides* Tidal Herbaceous Alliance -- Spartina *cynosuroides* Herbaceous Vegetation [CEGL004195].

**MA (old name):**

Brackish Tidal Marsh [formerly Southern New England and Gulf of Maine].

**ME:**

Similar to: Brackish Tidal Marsh community.

**NH:**

Likely present, not described.

**NY:**

Similar to: Brackish tidal marsh; Brackish Intertidal Mudflats; Brackish Intertidal shore.

**CT:**

Includes Scirpus *pungens* - Sagittaria spp. Tall grassland; Spartina *alterniflora* - Lilaepsis *chinensis* community; Spartina *patens* - Agrostis *stolonifera* community (also high salt marsh); and in part (with salt marsh) Panicum *virgatum* medium - tall grasslands; common reed (*Phragmites australis*) *australis* tall grasslands; Typha *angustifolia* - Hibiscus *moscheutos* community.

**RI:**

Similar to: Brackish marsh.

**Other:**

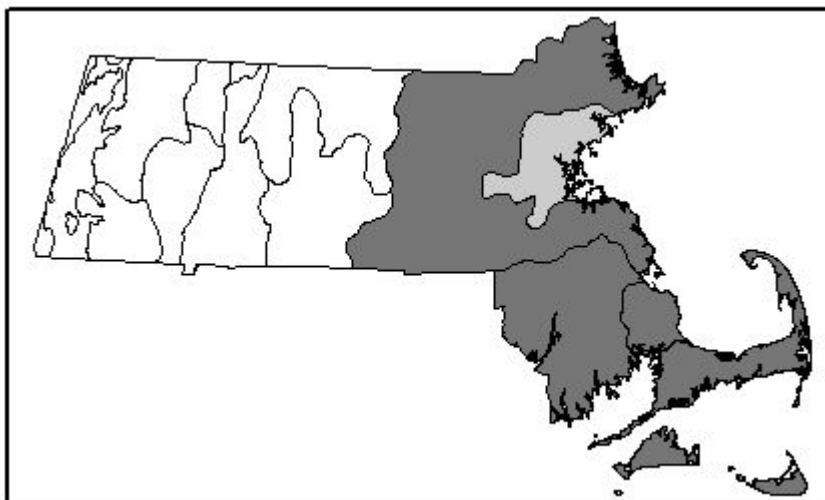
**Author:**

B. Reid

**Date:**

6/18/99

**Community Name:** ESTUARINE INTERTIDAL: FRESHWATER TIDAL MARSH  
**Community CODE:** CE2B400000  
**SRANK:** S1



**Concept:** Mixed herbaceous marsh flooded by daily tides, and occurring in the freshwater reach of coastal rivers.

**Environmental setting:** Freshwater tidal marshes occur along free-flowing coastal rivers. Tidal amplitude may range from 0 to 150 cm, and average annual salinity is less than 0.5 ppt. [from 0.5 ppt. to 5 pp. salinity, there is a gradient of species to the more clearly brackish, which has an average annual salinity of 5-18 ppt.]. This community occurs upstream of brackish tidal marsh, in the upper limits of tidal influence. The community may often be structurally diverse, including high marsh, low marsh, mud flats, rocky shore, ditches and seepages.

**Vegetation Description:** Dominant species include: blue joint (*Calamagrostis canadensis*), sedges (*Carex stricta*), narrow-leaved cattail (*Typha angustifolia*), wild rice (*Zizania aquatica*), smartweeds & tearthumbs (*Polygonum punctatum*, *P. arifolium*), jewelweed (*Impatiens capensis*), climbing hempweed (*Mikania scandens*) and sweet flag (*Acorus calamus*). Shrubs such as buttonbush (*Cephalanthus occidentalis*) and silky dogwood (*Cornus amomum*) may occasionally be present. Inundated False Pimpernel (*Lindernia dubia* var. *inundata*), which occurs in this community, is globally ranked by The Nature Conservancy but not listed in Massachusetts.

**Associations:** Caldwell & Crow (1992) describe eight cover types from a freshwater tidal area of the Merrimack River: (1) *Spartina alterniflora*; (2) *Sagittaria graminea*; (3) *Scirpus tabernaemontani*; (4) *Spartina pectinata*; (5) *Amaranthus cannabinus*; (6) *Scirpus pungens*; (7) *Acorus calamus*; (8) *Zizania aquatica*. That study area did not have a well developed high marsh area. Three of the TWINSPAN types were on rocky substrate, but within the freshwater tidal influence: (4) *Spartina pectinata*; (5) *Amaranthus cannabinus*; and (6) *Scirpus pungens*.

**Habitat Values for Associated Fauna:** This community provides outstanding general wildlife habitat, with abundant food sources for migratory and wintering waterfowl, and is generally associated with river reaches with spawning habitat for anadromous fisheries. It tends to have more vertebrate species than do the Brackish Tidal Marshes, such as freshwater snakes and muskrats.

**Associated rare plants:**

BIDENS HYPERBOREA VAR COLPOPHILA	ESTUARY BEGGAR-TICKS	E
CARDAMINE LONGII	LONG'S BITTER-CRESS	E
CONIOSELINUM CHINENSE	HEMLOCK PARSLEY	SC
CRASSULA AQUATICA	PYGMYWEED	T

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

ERIOCAULON PARKERI	ESTUARY PIPEWORT	E
SAGITTARIA SUBULATA VAR SUBULATA	RIVER ARROWHEAD	E
SCIRPUS FLUVIATILIS	RIVER BULRUSH	SC

**Associated rare animals:**

CINCINNATIA WINKLEYI	NEW ENGLAND SILTSNAIL	SC
LITTORIDINOPS TENUIPES	COASTAL MARSH SNAIL	SC

**Examples with Public Access:**

Best examples are along the North River , and the Merrimack River. Smaller examples on the South, Palmer, Mashpee, Agawam and Parker Rivers.

**Threats:**

Invasive plants purple loosestrife (*Lythrum salicaria*) and yellow flag (*Iris pseudacorus*) are established in some systems, although long-term threat is unknown. Alteration of river hydrology from excessive water withdrawal may have significant effect on plant communities. Development associated with recreational activity (*docks, landings*) may threaten rare plants in tidal shore habitat. In the past dams were often placed in rivers below the upper reaches of the tidal influence and so reduced the areas with tidal influence.

**Management needs:**

Monitor invasive plant populations. Determine hydrologic requirements, and develop system for monitoring hydrologic stress. Prevent alteration of tidal shores.

**Synonyms**

**USNVC/TNC:**

Includes: Eriocaulon parkeri Tidal Herbaceous Alliance -- Eriocaulon parkeri - Polygonum punctatum Herbaceous Vegetation [CEGL006352]; Nuphar lutea Tidal Herbaceous Alliance -- Nuphar lutea ssp. advena Tidal Herbaceous Vegetation [CEGL004472]; Peltandra virginica - Pontederia cordata Tidal Herbaceous Alliance -- Mixed Forbs (High Marsh) Tidal Herbaceous Vegetation [Provisional] [CEGL006325]; Zizania aquatica Tidal Herbaceous Alliance -- Zizania aquatica Tidal Herbaceous Vegetation [CEGL004202]; Amaranthus cannabinus Tidal Herbaceous Alliance -- Amaranthus cannabinus Herbaceous Vegetation [CEGL006080].

**MA (old name):**

FW Tidal Marsh [formerly Southern New England FW Tidal]

**ME:**

Freshwater Tidal Marsh

**NH:**

**NY:**

Includes: part of Brackish intertidal mudflats; part of Freshwater Intertidal Mudflats; Freshwater tidal marsh; Freshwater intertidal shore; Freshwater Tidal Marsh; understory of Freshwater tidal swamp.

**CT:**

Includes: Eriocaulon parkeri - Polygonum punctatum Community; Peltandra virginica - Cyperus strigosus; Pontederia cordata low forb vegetation; Eupatorium - Ludwigia palustris community; Hypericum mutilum - Gratiola aurea community; Zizania aquatica - Pontederia cordata community; Acorus calamus tall grasslands; Typha latifolia tall grasslands (semipermanently flooded); Peltandra virginica - Scirpus fluviatilis - Typha Community; Onoclea sensibilis - Scirpus fluviatilis - Typha spp. Community; Carex lacustris - Calamagrostis canadensis - Elymus canadensis community.

**RI:**

Part of: Brackish intertidal mud flat [not in RI as such, no Eriocaulon parkeri]; Freshwater tidal marsh.

**Other:**

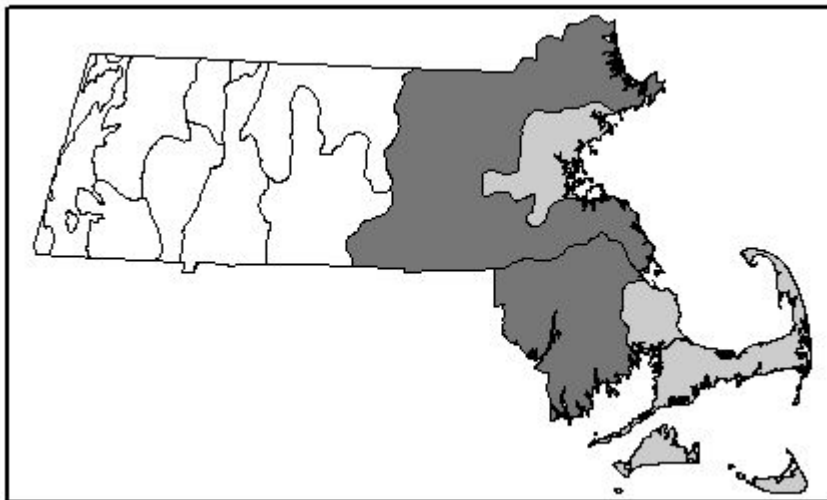
**Author:**

B. Reid; P. Swain 1/25/2000

**Date:**

6/18/99

**Community Name:** ESTUARINE INTERTIDAL: FRESH/ BRACKISH TIDAL SHRUBLAND  
**Community CODE:** CE2C000000  
**SRANK:** S1



**Concept:** Dense to open shrubland flooded by daily tides, occurring along the freshwater to brackish reach of coastal rivers.

**Environmental setting:** Normally located as a transition between freshwater tidal marsh and freshwater tidal swamp, there may also be patches of tidal shrublands throughout the freshwater tidal marshes. There is a great deal of micro-relief [tussocks and hollows] leading to high species diversity. Flood waters are typically slightly acid [pH less than 5] and soils are usually mineral without significant peat deposits. Average annual salinity values of less than 0.5 ppt. would be expected in freshwater tidal shrublands, and (0.5) -5 -18 ppt. in brackish tidal swamps.

**Vegetation Description:** Tidal freshwater, or slightly brackish shrublands dominated by sweet gale (*Myrica gale*) and smooth alder (*Alnus serrulata*) with some speckled alder (*Alnus incana* ssp. *rugosa*). Some examples may have a mixed canopy with other shrubs such as silky dogwood (*Cornus amomum*), swamp-rose (*Rosa palustris*), winterberry (*Ilex verticillata*), common elderberry (*Sambucus canadensis*), willow (*Salix* spp.), buttonbush (*Cephalanthus occidentalis*), and poison ivy (*Toxicodendron radicans*). More northern examples may contain arrow-wood (*Viburnum dentatum* var. *lucidum*) and meadowsweet (*Spiraea alba* var. *latifolia*). Tussock-sedge (*Carex stricta*) may also be present. Some herbaceous associates are Royal fern (*Osmunda regalis* var. *spectabilis*), marsh-fern (*Thelypteris palustris* var. *pubescens*), bedstraws (*Galium* spp.), common cat-tail (*Typha latifolia*), arrow-arum (*Peltandra virginica*), New York aster (*Aster novi-belgii*), false nettle (*Boehmeria cylindrica*), touch-me-not (*Impatiens capensis*), and swamp milkweed (*Asclepias incarnata*).

**Associations:**

**Habitat Values for Associated Fauna:** Because the size and structure of the shrubland present are more important to most animals that would use a such a habitat, than are the slight fluctuations in water levels on a daily basis the species present are often those of maritime and coastal shrublands. Coastal shrublands are particularly important to migrating flocks of song birds.

**Associated rare plants:**

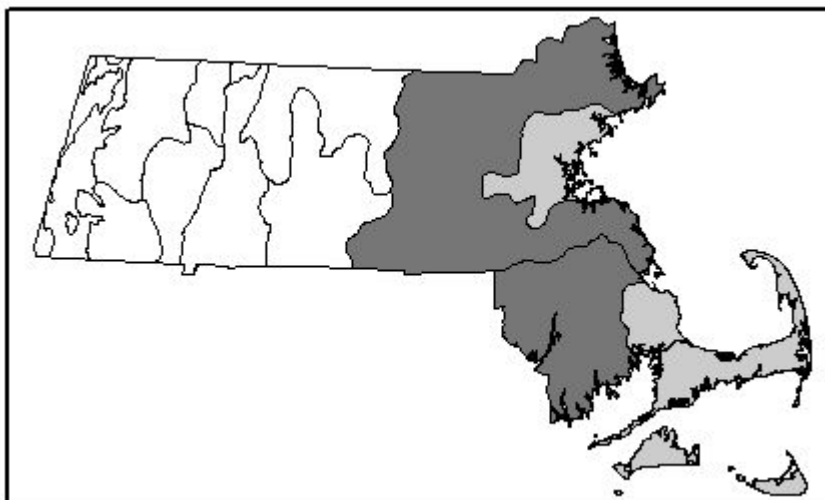
NONE KNOWN

**Associated rare animals:**

NONE KNOWN



**Community Name:** ESTUARINE INTERTIDAL: FRESH / BRACKISH TIDAL SWAMP  
**Community CODE:** CE1A000000  
**SRANK:** S1



**Concept:** Low stature forested wetland located along coastal rivers, at the upper limit of tidal influence, and flooded by daily tides. Dense shrub understory and unusually rich herbaceous layer.

**Environmental setting:** Tidal swamps occur along free-flowing coastal rivers, occurring upstream of freshwater tidal marsh, within the upper limits of tidal influence. The community represents an ecotone from tidal marsh to more typical non-tidal forested wetlands. Another variation of this community occurs along smaller streams at the upper limit of tidal influence. Tidal amplitude may range from 0 to 40 cm or more (estimated), and average annual salinity is less than 0.5 ppt. in freshwater areas, with gradients to 5 ppt. Brackish occurrences (average annual salinity (0.5) 5 - 18 ppt.) are also believed to occur, although more study is required. The best known occurrence of the community occurs along the edge of a freshwater tidal marsh, at the transition to a large Atlantic white cedar swamp.

**Vegetation Description:** Swamp white oak (*Quercus bicolor*) and red maple (*Acer rubrum*) occur on elevated hummocks, and form an open forest canopy. The shrub layer is often very dense, and typically includes arrowwood (*Viburnum dentatum* var. *lucidum*), winterberry holly (*Ilex verticillata*) and silky dogwood (*Cornus amomum*). Large mucky hollows flooded by daily tides support a diverse assemblage of herbs and graminoids. Most of these are typical of the nearby freshwater tidal marsh habitat, and include jewelweed (*Impatiens capensis*), sensitive fern (*Onoclea sensibilis*) and wild rice (*Zizania aquatica*). A similar association is dominated by more dense stands of Atlantic white cedar (*Chamaecyparis thyooides*).

**Associations:**

**Habitat Values for Associated Fauna:** The size of the swamp and structure produced by the forest and shrubs present are more important to most animals that would use a tidal swamp, than are the slight fluctuations in water levels on a daily basis.

**Associated rare plants:**

CARDAMINE LONGII	LONG'S BITTER-CRESS	E
CONIOSELINUM CHINENSE	HEMLOCK PARSLEY	SC
LYCOPUS RUBELLUS	GYPSYWORT	E

**Associated rare animals:**

NONE KNOWN

Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife

**Examples with Public Access:** The North River.

**Threats:** Alteration of river hydrology from excessive water withdrawal may have significant effect on plant communities.

**Management needs:** Determine hydrologic requirements, and develop system for monitoring hydrologic stress.

**Synonyms**

**USNVC/TNC:** Acer rubrum - Fraxinus pennsylvanica Tidal Woodland Alliance -- Acer rubrum - Fraxinus pennsylvanica / Polygonum spp. Woodland [CEGL006165].

**MA (old name):** Southern New England /Gulf of Maine Fresh/ Brackish Tidal Swamp.

**ME:** Present, not described.

**NH:** Possible, not described.

**NY:** Freshwater Tidal Swamp.

**CT:** Possible, not described.

**RI:** Possible, not described

**Other:**

**Author:** Brian Reid **Date:** 6/18/99