



ACADIA NP • APPALACHIAN NST • BOSTON HARBOR ISLANDS NRA • MARSH-BILLINGS-ROCKEFELLER NHP • MINUTE MAN NHP
MORRISTOWN NHP • ROOSEVELT-VANDERBILT NHS • SAINT-GAUDENS NHS • SAUGUS IRON WORKS NHS • SARATOGA NHP • WEIR FARM NHS

Baseline Salt Marsh Vegetation Data Collected for Boston Harbor Islands

Results of 2012 salt marsh vegetation monitoring on Snake, Calf, and Peddocks Islands

Background

The biological integrity of intertidal marsh habitats in the Boston Harbor Islands National Recreation Area is a high priority for the park, which led to NETN selecting salt marsh vegetation as a vital sign for monitoring. Types and abundance of salt marsh vegetation can be sensitive to stressors coming from within or without estuary ecosystems. These stressors can be local such as reductions or increases in tidal flow, regional such as changes in nutrient inputs, or global such as sea level. NETN is measuring salt marsh vegetation species diversity and abundance on selected park islands over a 3-year cycle. A recently published report summarizes salt marsh vegetation monitoring data collected at Calf, Peddocks, and Snake Islands during 2012 (available online - see More Information section). In 2013, salt marsh vegetation monitoring will take place in the two salt marshes located on Thompson Island as well.

Methods

In each sampling year, approximately 30, 1-m² vegetation plots are randomly located throughout the salt marsh area on each island. For 2012, salt marsh habitat was sampled based the Boston Harbor Islands draft vegetation map. In each of the salt marsh plots, plant community composition and species percent cover were sampled, along with recording dead vegetation and non-vegetative covers (e.g., bare ground, permanent water, rock). Sampling occurred in August and September on Calf, Peddocks, and Snake Islands.

Results

Calf Island

At just over an acre, the marsh on Calf Island is small. It lies between two beach berms with a salt panne (a low area that retains water). The marsh sometimes gets a shot of salt water from storm events or high lunar tides, but is not regularly inundated by the tides or storms. Thirty-one plots were sampled in the salt marsh on Calf Island in late August. On the sampling day, the small pond had water and mosquito larvae were plentiful, indicating that at that particular period the pond lacked fish. Park researchers also attested to the fact that adult mosquitos were abundant and, as noted in the report, “aggressive”.

Seventeen plants and three non-vegetative classes were observed in the plots. Saltgrass and smooth cordgrass were the most frequently observed and had the highest relative cover in the plots, dominating a large central area. Some chairmaker’s bulrush bordered the northern edge of the marsh. The salt panne at the southern end of the marsh harbored some slender glasswort and dwarf needle spikerush. No Massachusetts state-listed plants were observed

There was a small area of invasive common reed at the southern border and invasive broadleafed pepperweed was abundant along the marsh upland edges and on the beach berms. One individual of blooming invasive purple loosestrife was observed along the western marsh border and jimsonweed was abundant along the upland marsh edges.



A view of the salt marsh on Calf Island.
Photograph by MJ James-Pirri.



Location of vegetation plots on Peddocks Island. Hatched polygons show NETN salt marsh sampling area based on mapped salt marsh communities.

Peddocks Island

The 6.5 acre salt marsh that was sampled on Peddocks Island lies between two beach berms and has a large central pond. The salt marsh and pond are inundated daily by tidal water from Boston Harbor via a tidal creek. Twenty-nine plots were sampled in the salt marsh in mid-September. Seventeen vegetative (including “dead plant”) and five non-vegetative covers were observed in the plots. Common cover types were saltmeadow cordgrass and smooth cordgrass which surround the pond, and bare ground. There was a small dense area of common reed in the northeast portion of the marsh, though no sampling plots were located in this area. Saltmeadow cordgrass and dead plants were the most frequently observed cover type in the plots. No Massachusetts state-listed plants were observed in the Peddocks Island sampling plots.

Park staff has conducted control of several invasive plants in the Peddocks Island salt marsh in recent years. Broadleafed pepperweed control was conducted on the western and northwestern edges of the marsh from

2006 to 2012. During the same period, Japanese barberry, multiflora rose, Norway maple, and black swallowwort were manually targeted along the west and northwest sides of the marsh. In 2009, common reed was unsuccessfully treated on the east side of the marsh, and from 2009 to 2011 Japanese knotweed was treated with moderate success.

Snake Island

There are two main marsh areas on Snake Island that total about 8.5 acres: an interior salt marsh panne and an exterior fringing marsh that encircles the entire island. A small tidal creek leads to the salt marsh panne that drains at low tide. Thirty plots were sampled in the salt marshes on Snake Island in early September 2012. Seventeen vegetative (including “dead plant”) and four non-vegetative covers were observed in the plots. The most common cover was smooth cordgrass, which composed 36% of the relative cover and was observed in more than 75% of the plots. Other frequently observed cover types were wrack and litter (which surrounded the panne and was presumably washed in by high storm tides), and dead plant material. No Massachusetts state-listed plants were observed in the Snake Island sampling plots.

Seepweeds were present along the edges of the salt panne. Invasive common reed infiltrated the outer edges of the salt panne and along the east edge of the interior marsh where it became a dense monoculture. Park staff conducted manual control of invasive broadleafed pepperweed along the east edge of the marsh in 2008, and in 2012 assorted annual and perennial herbs along the upper beach were targeted to clear habitat for nesting terns and oystercatchers. Anecdotal reports indicate that the interior marsh used to extend further into the upland as a meadow, but it is now dominated by a shrub/scrub community.

The fringing marsh is dominated by smooth cordgrass with rockweeds present at lower elevations near the water’s edge. Common reed is present along the upland edges of the fringing marsh and there is concern it will encroach onto the gravel beach and into the exterior fringing marsh, negatively impact nesting oystercatchers and terns.

More Information

MJ James-Pirri
Project Lead Scientist

E-mail
mijp@gso.uri.edu

Brian Mitchell
NETN Program Manager

Phone/E-mail
802-457-3368 ext. 37
brian_mitchell@nps.gov

Full Report online at:
<http://science.nature.nps.gov/im/units/netn/monitor/programs/wetlandsSalt/wetlandsSalt.cfm>



Northeast Temperate Network
54 Elm Street, Woodstock, Vermont 05091
802-457-3368
<http://www.science.nature.nps.gov/im/units/netn/>



Northeast Temperate Network