Eelgrass Beds Decline as Green Crab Numbers Explode

Casco Bay Estuary Partnership

Eelgrass beds are facing serious declines, prompting CBEP and partners to monitor their status and assess restoration potential.

SeagrassLI.net

A Valuable and Vulnerable Resource

A seagrass that forms extensive intertidal and subtidal beds in Casco Bay, eelgrass (*Zostera marina*) provides food for migratory winter waterfowl and critical nursery habitat for fish and shellfish. It also helps sustain water quality by stabilizing sediments and filtering nutrients and suspended particles.

Eelgrass thrives in clean water where adequate light can reach its slender leaves. Beds become stressed when water quality declines due to increased suspended sediments and excess nitrogen, which fuels algal growth and reduces light availability. Eelgrass can also be lost or damaged due to dredging, boat propellers, moorings, anchors, docks, and shellfish dragging. In addition, the invasive European green crab (*Carcinus maenas*) can decimate eelgrass beds by clipping and uprooting vegetation, and fouling of leaves by invasive colonial tunicates can reduce eelgrass growth and production.

Local Beds Experience Dramatic Losses

The *State of the Bay 2005* report cited eelgrass bed coverage as 7,056 acres in 1993-1994, and 8,248 acres in 2001-2002. In 2013, CBEP and the Maine Department of Environmental Protection (DEP) facilitated mapping of eelgrass beds using high-resolution aerial photographs and underwater videography. That survey quantified eelgrass bed coverage as 3,650 acres, representing a loss of more than 55 percent


Source: Maine DEP

Because Casco Bay's green crab population is not well understood, predicting its future impact on the remaining eelgrass beds is difficult.

from 2001–2002 acreage. Eelgrass distribution can also be characterized by the relative density, or percent cover, of eelgrass within a bed. Casco Bay's highest density eelgrass beds (between 70 and 100 percent cover) declined by 4,392 acres between the 2001-2002 survey, and the 2013 survey.

Much of the eelgrass decline occurred between 2012 and 2013, coinciding with a population explosion of European green crabs— which are known to disturb sediments and uproot and clip eelgrass when foraging. This loss was disproportionally concentrated in areas that historically supported extensive and dense eelgrass beds, particularly Maquoit and Middle Bays. Research by Dr. Hilary Neckles of the USGS Patuxent Wildlife Research Center suggests that disturbance by green crabs was a leading cause of eelgrass loss (Neckles 2015).

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Partners Explore Restoration Sites

Recognizing the need for a rapid and coordinated response, CBEP convened a series of meetings in 2013 and 2014 that sparked formation of a broad partnership focused on eelgrass conservation. In 2015, a pilot study was launched to identify suitable sites for large-scale eelgrass restoration, gauge effective eelgrass transplant methods, and determine which environmental factors contribute to restoration success. The study also seeks to determine whether green crab control is necessary to restore eelgrass beds. CBEP worked with other partners to build local capacity for eelgrass restoration. Plants were harvested from Broad Cove in Cumberland, and planted at two upper Casco Bay locations in Freeport and Brunswick. Monitoring of the study plots will continue through 2016.

PARTNERS WORKING FOR CASCO BAY EELGRASS CONSERVATION

CBEP, US Geological Survey Patuxent Wildlife Research Center, Maine Department of Environmental Protection, The Nature Conservancy in Maine, Friends of Casco Bay, Bowdoin College, Town of Brunswick, US Fish and Wildlife Service–Gulf of Maine Coastal Program, local citizens in Cumberland and Freeport, Southern Maine Community College, Mount Desert Island Biological Laboratory, Maine Coastal Program, University of New Hampshire Jackson Estuarine Lab, Resource Access International

For additional references and information, please view the Bibliography of the full *State of the Bay 2015* report at www.cascobayestuary.org/state-of-the-bay-2015.