

# Protecting and restoring habitat

## FACTSHEET

Habitats are places where plants and animals live, feed, and reproduce. The Casco Bay watershed includes many productive habitat types, including upland forests, riparian areas, salt marshes, seagrass beds, tidal mudflats, and rocky outcrops. Those habitats are home to a diversity of species — from lobsters and clams to alewife and moose.

### Habitats of the Casco Bay Watershed

Due to its wide tidal variations and varied underwater topography, Maine has the most extensive **intertidal habitat** (the area between high and low tides) found along the U.S. Atlantic Coast. Salt marshes along Casco Bay’s edge provide critical habitat for wildlife, filter stormwater from upland development, act as buffers during storms, and reduce damage from flooding.

Below the low-water line, **subtidal habitats** abound with plant and animal species. Eelgrass is a particularly valuable submerged aquatic plant. Sensitive to water quality changes, eelgrass is considered an indicator of ecosystem health. Casco Bay has historically had the largest concentrations of eelgrass beds mapped along Maine’s coast: more than 8,000 acres. Scientists are currently investing the cause of recent loss of eelgrass beds in Maquoit and Middle Bays.

Casco Bay’s **rocky shores** are home to plants and animals like seaweeds, barnacles, crabs, starfish, and seals. Colonial nesting sea birds can be sighted on many of the Bay’s more than 750 islands, islets, and exposed ledges.

Upstream from Casco Bay, the watershed boasts more than 1,350 miles of rivers and streams and many lakes. These **freshwater systems** support a variety of fish species like alewife, trout, perch, and pickerel, as well as birds and mammals.

**Upland forests** throughout the watershed provide habitat for Maine’s native birds, fish and mammals. Certain species, including large herbivores and predators such as hawks and owls must roam over large areas of forest, and thus cannot survive in the small forests found in suburban areas. Many warblers and other migrant songbirds are forest specialists, nesting successfully only in large blocks of forest. While the Casco Bay watershed is still largely forested, forest interior habitat may be in short supply.

*“Casco Bay has long been recognized for its richness and diversity of wildlife. When compared to four similar water bodies around the world, Casco Bay illustrates its richness in numbers of living organisms.”*

-Casco Bay Plan

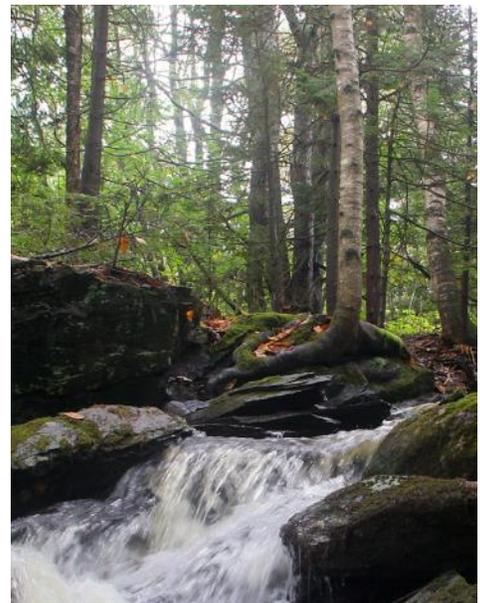
#### Mean Density of Organisms/Square Meter

Casco Bay.....	8,743
Gullmars Fjord, Sweden.....	4,198
Mystic River, Massachusetts.....	3,000
Lambert Bay, South Africa.....	1,153
Delaware Bay, Pennsylvania.....	722

source: Casco Bay Plan, 1996

The work of the Casco Bay Estuary Partnership is guided by the *Casco Bay Plan*, which identifies five priorities for watershed protection:

1. Minimize pollution loading from storm-water and combined sewer overflows
2. Open and protect shellfish beds and swimming beaches
- 3. Protect and restore habitat**
4. Reduce toxic pollution
5. Promote responsible stewardship



Peter Taylor/Waterway Consulting



Jerry Oldenettel



Eric Beign



Kelly Colganear



USFWS

*Clockwise from top: Scarlet tanager, lynx, wood thrush (with young cowbird, a nest parasite), and brook trout are among the species in Maine that need interior forest habitat.*

## Threats to habitat

Casco Bay and its watershed continue to provide valuable habitat for a range of fish and wildlife species. But habitat can be lost or degraded by human activity, especially urban and suburban development. Land development also increases impervious cover, causing higher volumes of pollutant-laden stormwater runoff to streams, rivers, and coastal waters.



*As population increases in the Casco Bay watershed, our pattern of settlement can affect natural resources like wildlife habitat and water quality.*

Humans also affect habitat by inadvertently introducing invasive species, which can edge out native species for space and resources, reducing biological diversity. Global climate change is likely to alter habitat characteristics (including temperature and precipitation), disrupting native species and opening habitats to invasion from non-native organisms.

The increasing pace of development in southern Maine, coupled with a relatively small percentage of protected land, means there is a great need for actions to protect and restore the habitats that sustain plants, animals, and people.

## CBEP's efforts to protect habitat

Habitat conservation is one of five priority areas identified in the *Casco Bay Plan*, the document that guides the work of the Casco Bay Estuary Partnership. CBEP works to conserve habitat through both restoration and protection.

**Restoration.** To help reverse the damage caused by past human impacts, CBEP supports a variety of restoration projects, from mapping and inventory development to on-the-ground restoration, project monitoring, and assessment. Projects have included dam removal, salt marsh restoration, invasive species control, fish ladder and fishway construction, riparian buffer and shoreline restoration, and water quality improvements to enhance aquatic habitat.

**Protection.** CBEP supports the long-term protection of high-value habitats by assisting with property acquisition, conservation easements, and mapping conserved areas. With growing development pressure in the watershed, habitat conservation is increasingly important and available funds are in high demand.

The amount of permanently protected land in the lower 16 municipalities of the Casco Bay watershed has more than doubled since 1997. That truly remarkable achievement reflects the diligence and hard work of many individuals and organizations throughout the region. CBEP has helped fund some of those efforts through its Habitat Protection Fund (see sidebar, right).



*CBEP's Habitat Protection Fund has helped preserve properties such as this one on Pettingill Island.*

### Habitat Protection Fund

CBEP's Habitat Protection Fund supports local conservation by providing seed funding in support of habitat protection efforts by land trusts, towns, and state agencies.

Between 2006 and 2010, CBEP invested more than \$250,000 to support a dozen conservation projects. While not all projects are complete – and thus permanent protection is not yet assured – the projects involve over 4,500 acres of land.

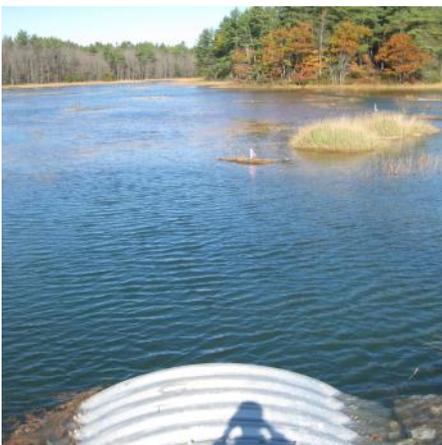
The projects have resulted in protection of a Casco Bay island and the purchase of land for a park in Bridgton, Maine. They include several projects to protect wetlands, mudflats, riparian areas, and forests. The projects provide significant opportunities for recreation, and two include efforts to support local agriculture.



Thomas Bay Marsh was the site of a tidal restoration project in 2011.



Before (above) and after dam removal at Chandler Brook, Pownal.



## Success stories

### *Casco Bay Salt Marsh Tidal Restoration*

Salt marshes are low-lying coastal wetlands that are flooded regularly by salty estuarine water. Tidal inundation is essential to maintain healthy salt marshes. Where roads, dams, and dikes cross salt marshes, ‘tidal restrictions’ limit the exchange of salt water between the upstream and downstream wetlands, altering natural cycles and plant and animal communities.

Efforts to restore tidal exchange at degraded marshes in Casco Bay are underway. CBEP is working with local partners at sites such as Adams Road in Brunswick (left) to remove tidal barriers and install larger, less restrictive structures. Until recently, tidal inundation of Thomas Bay Marsh upstream of Adams Road was limited by a small culvert. In 2011, several organizations teamed up to install a larger aluminum “pipe arch” culvert. As a result, more salty water now reaches further into the marsh for longer periods. CBEP is monitoring conditions at several sites to see how marshes respond to the increased exchange.

### *Restoring Fish Passage and Stream Connectivity*

Poorly designed culverts, dams, and other outdated or remnant infrastructure can alter natural river and stream processes by limiting the passage of water, aquatic organisms, woody debris, and sediments, resulting in habitat loss, flooding, and increased road maintenance costs. CBEP is working with several partners including Trout Unlimited, US Fish and Wildlife Service - Gulf of Maine Coastal Program, Maine Rivers, and others to restore fish passage at priority sites through the Casco Bay watershed. In 2013, Trout Unlimited successfully led two dam removal projects, including Randall Mill Dam on Chandler Brook, Pownal (left). At suitable locations, dam removal can provide immediate benefits to resident fish species such as brook trout. Over a longer term, reconnecting freshwater rivers, lakes, and streams with Casco Bay is necessary to restoring once abundant migratory fish such as American eel, alewife, and shad.

### *Sea Level Rise Mapping*

CBEP, with support from the Maine Coastal Program, looked at ten of the fourteen communities that line Casco Bay to identify potential areas of marsh migration and possible impacts to existing developed areas due to tidal inundation from sea level rise. The subsequent reports, *Sea Level Rise and Casco Bay’s Wetlands: A Look at Potential Impacts*, provide communities with maps of roads, parking areas, and other infrastructure adjacent to tidal wetlands, and illustrate projected sea level rise at one foot and three foot scenarios using high resolution Light Detecting and Ranging (LIDAR) data. The reports are designed to help municipal staff and decision makers understand risk levels and potential impacts associated with sea level rise, and to provide science-based projections to inform future policy-making responses.

## Habitat strategies

CBEP established the following goal and objectives in order to protect and restore habitat in the Casco Bay watershed.

**Goal:** Minimize adverse environmental impacts to ecological communities from the use and development of land and marine resources

**Objectives:**

1. Provide technical assistance necessary for habitat protection
2. Develop and implement plans to restore degraded habitat in Casco Bay
3. Continue a grant program to support local habitat protection and restoration activities
4. Participate in efforts to address the impacts of invasive marine organisms in Casco Bay

## Partners

As with all of CBEP's efforts, collaboration is critical to its habitat conservation work. CBEP works on habitat conservation and restoration projects with the Maine Land Trust Network, Maine Coastal Program, the National Oceanographic and Atmospheric Administration, Natural Resource Conservation Service, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service, among others.

## For more information

For more information about CBEP's grants and technical assistance programs, visit the website, or call 780-4820.

## Indicator Species

Protecting the quality and quantity of habitats is necessary in order to maintain biological diversity in and around Casco Bay. Individual species, however, can serve as broader indicators of the health of natural systems due to their unique habitat requirements or role within ecological communities. Some of the "indicator species" that CBEP tracks are:

**Eelgrass.** Eelgrass beds provide critical habitat for several commercially important fisheries. Eelgrass is a key biological indicator of the Bay's water quality because it both contributes to and depends upon good water quality.

**Waterbirds.** Waterbirds are among the most observable and charismatic fauna. Monitoring their status in Casco Bay serves as an important and visible indicator of ecosystem health.

**Marine invasive species.** Marine invasive species threaten to irreversibly change the structure of marine communities in Casco Bay and the Gulf of Maine, with significant implications for marine-based industries. Tracking the status and trends of such exotic species provides information about threats to the marine ecosystem.

*Protecting & restoring the ecological integrity of the Casco Bay watershed*



The Casco Bay Estuary Partnership works to preserve the ecological integrity of Casco Bay and to ensure compatible human uses of the Bay's resources, through public stewardship and effective management.