

# Protecting and restoring habitat

## FACTSHEET

Habitats are places where plants and animals live, feed, find shelter, 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. These habitats are home to a diversity of species — from lobsters and clams to beaver 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 species. Sensitive to water quality changes, eelgrass is considered an indicator of ecosystem health. Casco Bay has the largest and densest concentrations of eelgrass beds mapped along the coast of Maine, more than 8,000 acres in total.

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 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.”*

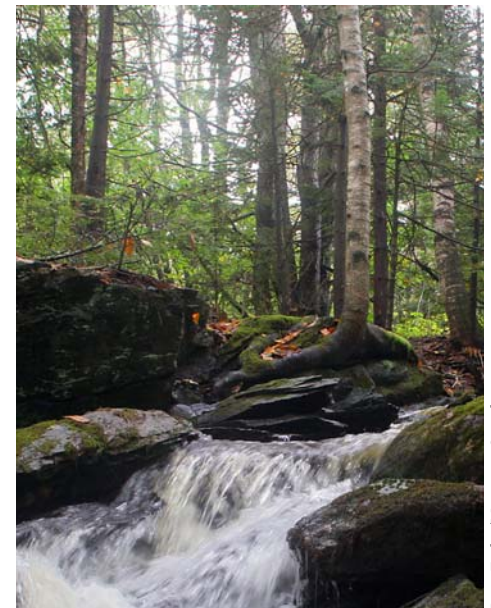
- Casco Bay Plan

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 stormwater 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/Waterview Consulting



Jerry Oldenettel



Eric Bégin



Kelly Colganazar



USFWS

Clockwise from top left: 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. However, 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 impact 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.

With the pace of development increasing in southern Maine and a relatively small percentage of its land protected, 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 a two pronged approach — 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 eelgrass planting, 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.

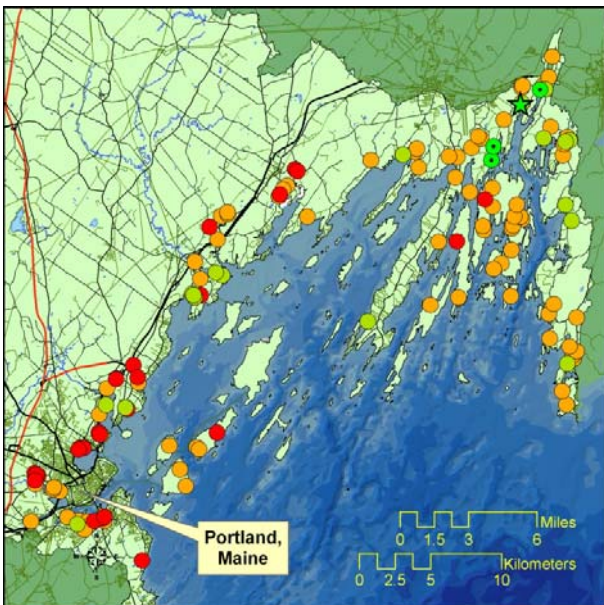
The projects have resulted in protection of a Casco Bay island and the purchase of land for a park in Bridgton, Maine. They include several projects to protect wetlands, mudflats, riparian areas, and forests. The projects provide significant opportunities for recreation, and two include efforts to support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



*The above photos show conditions at Smelt Hill before and after a buffer enhancement project funded in part by CBEP.*



*An open-bottom culvert is designed to restore water flow and fish passage in Thayer Brook in Gray, Maine.*



## Success stories

### ***Mapping Fringing Marshes along the Casco Bay Coastline***

Small wetlands make up a significant portion of Casco Bay’s wetland resource. They constitute critical links between larger wetlands, potentially reducing isolation of wetland habitat. However, many of those “fringing” marshes are too small to be included in national wetland maps.

To better understand wetland distribution in Casco Bay, CBEP funded the first-ever comprehensive effort to identify and map fringing marshes along the Casco Bay shoreline. Scientists at the Wells National Estuarine Research Reserve conducted field work, analyzed aerial photography, and evaluated restoration opportunities. The project increased the total mapped area of wetland along the Casco Bay coast by approximately 10 percent.

### ***Restoring Fish Passage with a New Culvert Design***

Culverts are structures that allow streams to pass below road crossings. Outdated and poorly designed culverts can limit fish passage, cause up-stream sedimentation, and exacerbate flooding. To test a new, open-bottom culvert design, CBEP funded a culvert replacement project in a tributary to the Pleasant River in Gray, Maine (see photo, left). The 14-foot bottomless structure – one of the first installed in the region – spanned a six-foot wide stream and was designed to restore fish passage. CBEP staff and partners are monitoring the site to learn how this small New England stream will respond.

### ***Identifying Barriers to Fish Passage***

CBEP initiated a survey to identify barriers for migration of fish throughout the watershed. Working in collaboration with the U.S. Fish & Wildlife Service Gulf of Maine Coastal Program and the Sebago Chapter of Trout Unlimited, CBEP recruited and trained interns and volunteers, who collected data at more than 700 road-stream crossings. Data gathered are now being analyzed to identify and prioritize restoration projects within each sub-watershed.

### ***Identify Salt Marsh Tidal Restrictions***

CBEP is developing a database of sites around Casco Bay where tidal restriction threatens salt marsh habitat, with the goal of prioritizing sites for remediation. After examining surveys and aerial photographs, CBEP conducted field evaluations with the help of Maine Department of Transportation, the Maine Geological Survey, and the GIS lab at the University of Southern Maine. So far, CBEP has identified 133 tidal restrictions throughout the watershed (see map, left).

*CBEP coordinated a project to map tidal restriction in the Casco Bay watershed.*

## 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 (NOAA), 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 habitat 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 include:

**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 our most observable and charismatic fauna, and 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 industry. 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.