

What is the status of the waterbird populations of Casco Bay?

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

Why Is It Important to Monitor Waterbird Populations in Casco Bay?

Waterbirds are vulnerable to human disturbance, pollution, and the effects of a changing climate. Collecting data on the locations where waterbirds congregate to feed, rest, and reproduce improves our ability to protect those vital habitat areas from the effects of human actions. Studying population numbers, as well as how birds use the spots they return to yearly for wintering and breeding, helps us to assess environmental impacts on the birds. Comparing the waterbird populations of Casco Bay to those in other parts of Maine and New England can help to determine whether habitat threats are of local origin – such as oil spills or loss of key habitat – or originate in other parts of the birds’ range.

In 2000, aerial surveys of Casco Bay waterbirds were conducted during the spring migration, nesting period, and



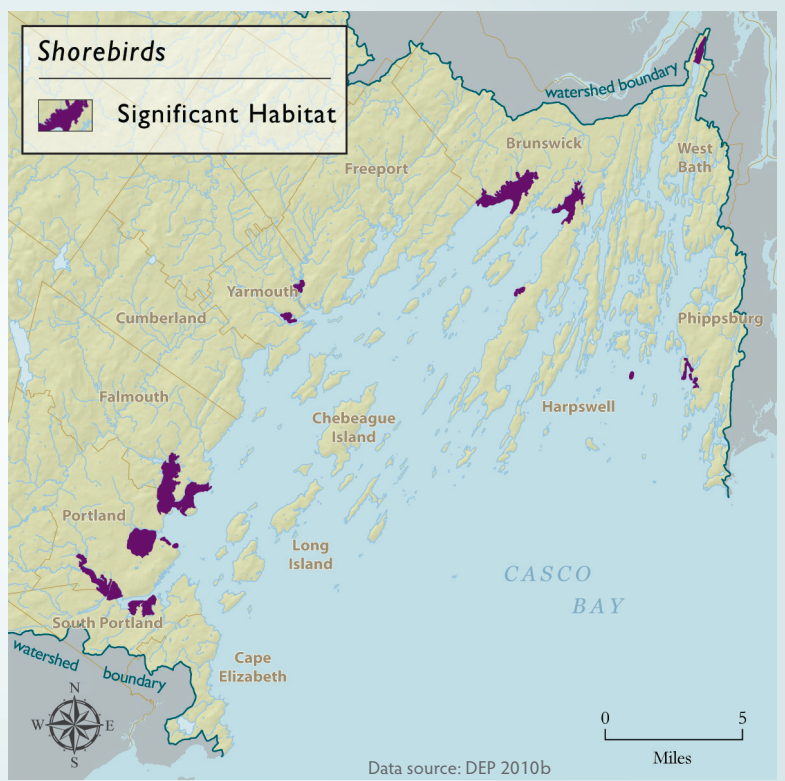
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Semipalmated sandpiper (*Calidris pusilla*) ranked highest among shorebirds identified to species during a 2009 survey in Casco Bay (Biological Conservation 2009). The bird needs to double its body weight in Maine before it migrates south. One of the birds banded in Eastport, Maine was observed only 48 hours later in Suriname, South America (Maine Audubon 2009).

STATE PROTECTION OF SIGNIFICANT BIRD HABITATS

MDIFW has identified and mapped Significant Wildlife Habitats including shorebird feeding and roosting areas; and inland and tidal waterfowl and wading bird habitat. In 2006, with modifications added in 2007, the DEP began regulating activities “in, on or over” those habitat areas, as well as in surrounding buffer zones

For example, more than 4,078 acres of shorebird feeding and roosting areas in the Casco Bay watershed now receive some protection from human disturbance (DEP 2007). The types of activities that require a permit within those habitats include residential and commercial development, road construction, the building of new wharves, and bridge construction. The permit may allow such activities if they are done in a way that minimizes harm to the birds and their habitat. Those protection measures support the survival and resilience of Casco Bay’s waterbird populations.





fall migration. The results of those surveys are discussed in the 2005 *State of the Bay* report. Since then, CBEP and others have continued to study and monitor Casco Bay waterbirds including shorebirds (birds that feed in the intertidal such as plovers and sandpipers), island-nesting terns, and common eiders. This section focuses on those studies.

Status and Trends

Shorebird Surveys

In summer 2009, with funding from CBEP and Maine Coastal Program, Maine Inland Fish and Wildlife (MDIFW), US Fish and Wildlife Service (USFWS), Biological Conservation began a ground-based shorebird monitoring program focusing on a subset of state-designated habitat areas (see sidebar). The multiyear study will help to characterize habitat functions and identify trends in habitat usage. The data can be used to develop management strategies to promote the resilience of Casco Bay's shorebird populations as they respond to ecological stresses, including habitat loss and climate change.

The 2009 monitoring focused on areas designated by MDIFW as shorebird staging areas (areas where birds feed and rest during migration periods). In addition, the program examined sites on 15 Casco Bay islands and ledges to identify important roosting areas – where birds rest during high tide.

The results are indicated in the table. A total of 35 non-shorebird taxa were also identified during the shorebird surveys, including gulls, waterfowl and cormorants. Shorebirds were not common at island roosting sites, perhaps because the island roosting survey took place on just a single day. Data collected during that initial sampling season suggest that 2009 was not a typical year. Birds arrived in Maine late, and heavy rainfall caused high water conditions in early summer. Analysis of long term trends in shorebird abundance is likely to require many years of data collection, so that year to year variation can be taken into account. In 2010, scientists will both increase monitoring of state-designated roosting areas, and increase frequency of monitoring at selected sites.

Shorebirds observed at Casco Bay sites during July 23 – October 14, 2009 surveys of state-identified feeding areas. Each site was surveyed on six separate days at least one week apart, with the exception of Mackworth Flats, which was surveyed four times. The Presumpscot, Stroudwater and Mackworth areas had the greatest number of shorebirds observed at each site. ("Peeps" refers to small sandpipers not identified to species.) (Biological Conservation 2009).

	Upper New Meadows	Maquoit Bay	Royal River	Presumpscot River	Mackworth Flats	Back Cove	Stroudwater River	Upper Fore River	TOTAL
Black-bellied plover	0	155	17	118	0	83	0	21	394
Semipalmated plover	0	53	74	9	259	90	27	1	513
Killdeer	0	0	0	0	0	2	0	0	2
Greater yellowlegs	7	85	14	7	0	96	1	6	216
Lesser yellowlegs	0	33	6	3	1	2	3	2	50
Yellowlegs spp.	0	9	0	0	0	0	0	0	9
Solitary sandpiper	0	0	0	0	0	0	0	0	0
Willet	0	7	0	0	0	0	0	0	7
Spotted sandpiper	1	1	1	1	0	1	0	0	5
Ruddy turnstone	0	0	0	0	0	1	0	0	1
Semipalmated sandpiper	2	130	237	308	47	656	259	0	1639
Western sandpiper	0	0	1	0	0	0	0	0	1
Least sandpiper	25	60	29	1	1	18	13	0	147
White-rumped sandpiper	0	0	1	0	0	0	1	0	2
Baird's sandpiper	0	0	0	0	0	1	0	0	1
Pectoral sandpiper	1	0	0	0	0	0	0	0	1
Peeps	0	0	307	2665	0	0	719	2	3693
Dunlin	0	18	0	0	0	0	0	0	18
Short-bill. dowitcher	0	76	0	13	2	1	0	1	93
Dowitcher spp.	0	0	1	0	0	0	0	0	1
TOTAL	36	627	688	3125	310	951	1023	33	6793



Phyllis Cooper

Common tern (*Sterna hirundo*).

Restoring Island Nesting Terns

Common terns (*Sterna hirundo*), the most abundant tern species found in Casco Bay, breed on coastal islands and often return to the same site year after year.

Once abundant, tern populations had fallen sharply by the late 1990s, largely due to gulls and other predators. Terns are now classified as a “species of special concern” by MDIFW. Colonies on Outer Green Island and Jenny Island are monitored and managed by National Audubon’s Seabird Restoration Program headed by Dr. Steve Kress. CBEP has contributed funding to the effort. Those Casco Bay islands are among the few islands in Maine that still support hundreds of nesting pairs, making them especially important common tern nesting sites (MDIFW 2006).

In 2009, despite 26 inches of rain, 837 nesting pairs of common terns at Outer Green Island achieved the third-highest productivity (hatchlings fledged per nest) in the Gulf of Maine. The field crew is now using vegetation management to ensure bare-ground habitat remains available for nesting. On Jenny Island in 2009, the 578 nesting pairs of common terns had the highest productivity seen there since 1997, largely due to the absence of predators and abundant herring in the diet of chicks (National Audubon Seabird Restoration Program 2009).

Common Eiders on Flag Island, Casco Bay

Flag Island in Harpswell is one of the most significant seabird nesting islands in Casco Bay, a premier coastal nesting site for common eiders (*Somateria mollissima dresseri*). The island was permanently protected in 2002 by the cooperative efforts of a federal, state and private partnership that included CBEP and the US Fish and Wildlife Service Gulf of Maine Coastal Program. The Rhode Island North Cape Oil Spill settlement provided major funding for the effort.

A survival and productivity study conducted on the island from 2003-2008 revealed that Flag Island eiders rely on

important brood-rearing habitats in eastern Casco Bay, including Sebasco Harbor in Phippsburg and Cundy’s Harbor. The nesting eider population on the island during the study period was fairly stable except for 2006, when only

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Common eider (*Somateria mollissima dresseri*).

200 pairs nested, perhaps related to a virus that affected eiders overwintering in Massachusetts. In 2008, 500 pairs were nesting (Allen *et al.* 2008). Pond Island and Ragged Island are also sizeable eider nesting islands in East Casco Bay.

Solutions and Actions

Protecting the habitat of Casco Bay’s waterbirds is key to improving the birds’ ability to survive human and environmental stresses. CBEP plans to continue the shorebird monitoring surveys over the next several years. The results of those surveys will help MDIFW evaluate the accuracy of their maps of Significant Wildlife Habitat, and will aid DEP in implementing regulatory protections under the National Resources Protection Act.

Oil spills are one of most dramatic impacts that waterbird populations periodically confront, causing short-term damage from the oil itself and long-term health effects related to toxic PAHs (polycyclic aromatic hydrocarbons) that can linger in the environment. DEP has developed Environmental Vulnerability Index Maps that identify coastal resources at risk from marine oil spills, including Significant Wildlife Habitat areas for waterbirds. The maps provide first responders with a tool for prioritizing and targeting protection of vulnerable habitat during the event of an oil spill (DEP 2010a).

Ongoing programs such as the monitoring, restoration and protection efforts described above are helping to ensure that the waterbird populations of Casco Bay and the larger Gulf of Maine will have the resilience to survive and remain healthy well into the 21st century.

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