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Water Bird Data Focus on Shorebirds and Ospreys

Casco Bay Estuary Partnership

Late-summer surveys of wading birds on six tidal flats showed an average (over four years) of more than 13,000 birds feeding (mostly small sandpipers); Casco Bay's osprey populations are robust, but current reproductive measures are lower than they were in the early 1980s.

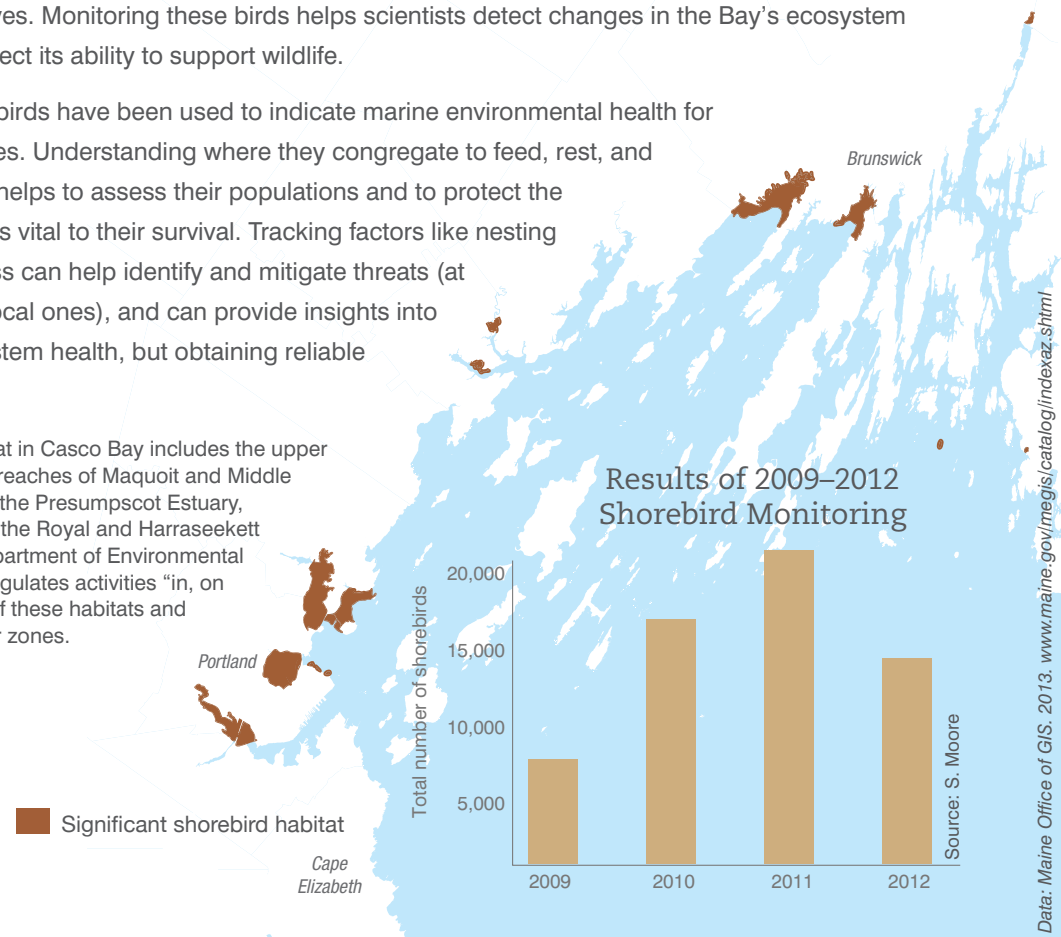
Chris DeSorbo, BRI

Water Bird Populations Can Signal Ecosystem Health

Water birds (such as seabirds, wading birds, waterfowl and shorebirds) are vulnerable to human disturbance, pollution and the effects of a changing ecosystem. Most of the region's water birds are migratory but depend on food and habitat in Casco Bay for part of their lives. Monitoring these birds helps scientists detect changes in the Bay's ecosystem that affect its ability to support wildlife.

Water birds have been used to indicate marine environmental health for decades. Understanding where they congregate to feed, rest, and breed helps to assess their populations and to protect the habitats vital to their survival. Tracking factors like nesting success can help identify and mitigate threats (at least local ones), and can provide insights into ecosystem health, but obtaining reliable

Prime shorebird habitat in Casco Bay includes the upper Fore River and upper reaches of Maquoit and Middle Bays, Back Cove and the Presumpscot Estuary, along with portions of the Royal and Harraseekett Rivers. The Maine Department of Environmental Protection currently regulates activities "in, on or over" 3,927 acres of these habitats and the surrounding buffer zones.



information is resource-intensive. Field methods vary greatly, and some recent methods use high-resolution aerial imagery (Allen *et al.* 2012).

Shorebird Numbers Fluctuate

Historically, human impact on water bird populations has been severe. Many seabirds were harvested for food, bait, and feathers, and combined with development of nesting islands, several species were extirpated from New England (Allen *et al.* 2012).

During the summers of 2009–2012, with funding from CBEP, the Maine Coastal Program, Maine Department of Inland Fisheries and Wildlife (MDIFW) and the U.S. Fish and Wildlife Service, Biological Conservation LLC conducted a ground-based shorebird monitoring program focused on several state-designated habitat areas (see map). Total shorebird observations rose from 6,724 in 2009 to 20,054 in 2011 before dropping to 13,246 in 2012. The decline from 2011 to 2012 was due to lower counts of "peeps" (the five smallest North American sandpipers). Within Casco Bay, the Presumpscot Estuary consistently had the Bay's highest total shorebird counts over the four years.

Ospreys Experience Declines in Nest Success, Productivity and Brood Size

Due to their long lifespan, fish-based diet, fidelity to nesting sites, and sensitivity to environmental contaminants, osprey (*Pandion haliaetus*) populations are monitored worldwide as an indicator of ecosystem health. With funding from CBEP, the Biodiversity Research Institute and MDIFW worked jointly between 2011 and 2013 to determine the abundance, distribution and reproductive status of Casco Bay's ospreys.

Through annual surveys checking up to 185 nest sites, researchers found that ospreys are still broadly distributed throughout the Bay, but that nest success, productivity, and brood size varied widely and were generally lower compared to osprey populations elsewhere in Maine. Although researchers believe the osprey population is stable, productivity (a reproductive measure of young fledged per occupied nest) reached the level associated with population stability during only one of the three years surveyed.

Researchers also found evidence of a long-term decline in osprey productivity. Between 2011 and 2013, Casco Bay's osprey population generated an average of 0.73 young per breeding pair annually, while the population surveyed in 1982-1983 by MDIFW produced an average of 1.10 young per breeding pair annually. Researchers suspect this difference is largely attributable to changes in food availability (the number of young produced are known to fluctuate in response to changes in food supply).

While bald eagles (*Haliaeetus leucocephalus*)—a known adversary of osprey–may be affecting osprey populations in areas such as Penobscot Bay, eagle populations are still in the early stages of recovery in Casco Bay and so likely have only a minor negative influence on the current resident osprey population.

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.

Nesting success (the percentage of nests that successfully produce at least one young) of confirmed breeding pairs of osprey, determined during aerial surveys in 2011–2013.

Data: BRI 2015