

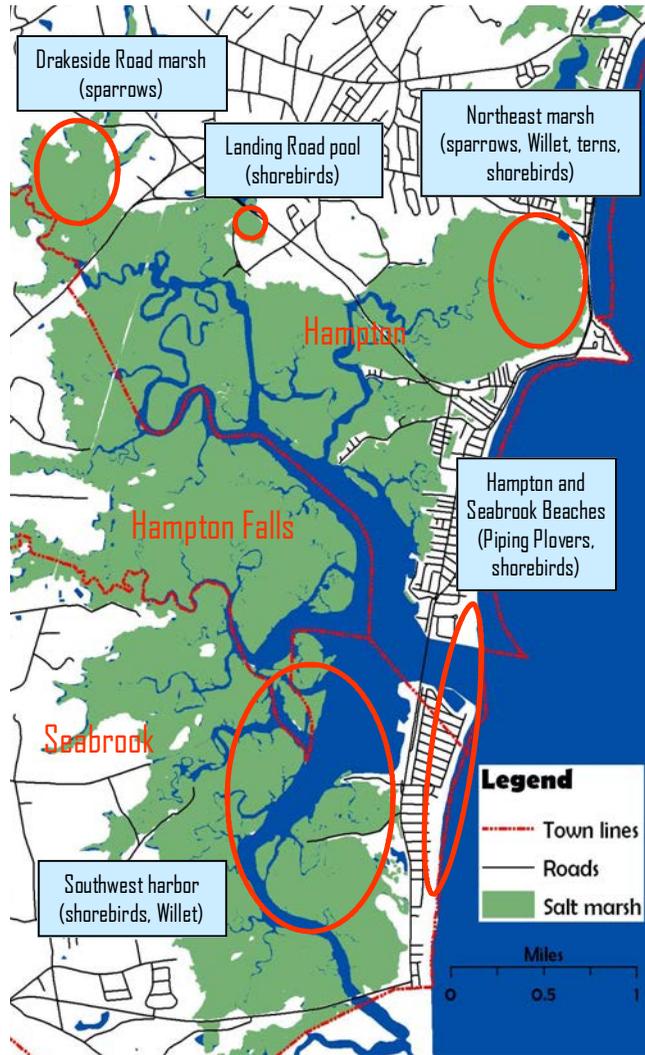
In an effort to better understand its bird populations, and inform future conservation activity, NH Audubon undertook a comprehensive “avian assessment” of the estuary in 2006-2007. Using both new and existing data, our ultimate goal was to identify the most important areas for both breeding and migrating birds.

During fall migration from July through September, the study focused on the sandpipers and plovers that feed on the estuary’s mudflats. NH Audubon biologists and volunteers spent many hours watching these shorebirds move back and forth between feeding and roosting areas. They were able to obtain population estimates for the estuary and determine when different species passed through the marsh.

Breeding species were studied from May through July 2007, with particular attention on Willets (a shorebird) and Saltmarsh Sparrows. Both these species are restricted to salt marshes along the Atlantic coast, and are considered “species of special concern” in New Hampshire. For this component, the project focused on population size and habitat measurements. Look inside for the results of the shorebird and sparrow projects.

An additional species of concern is the endangered Piping Plover, which breeds on barrier dunes and beaches. Although plovers weren’t studied in the NH Audubon project, their presence in the estuary was considered when identifying priority areas, as shown on the back of this brochure. The priority areas of the estuary stand out in terms of their importance to birds, and should be conservation priorities in the estuary, including salt marsh restoration, land protection, and additional research into the effects of disturbance and changing food supply.

### Red ovals indicate sites of conservation priority for birds within the Hampton-Seabrook Estuary



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With funding from the Davis Conservation Foundation



Printed on recycled paper



The Hampton-Seabrook Estuary is a defining feature of the New Hampshire Seacoast. At 5,000 acres, it is second only to the Great Bay Estuary in size. Extensive salt marsh dominates 80% of the estuary, making it the state’s largest expanse of this critical habitat. Hampton-Seabrook is the northern portion of a much larger marsh that extends south all the way to Cape Ann, and which is known in Massachusetts as the “Great Marsh.”

Salt marshes are among the harshest environments on earth. Twice each day they are inundated by the ocean, and twice each day these same waters recede, exposing plants and soil to baking sun. At the same time, tributary streams provide a constant input of sediment, nutrients, and fresh water. Despite extremes of temperature, moisture, and salinity, salt marshes are extremely productive. They are important nurseries for fish and shellfish, and historically their grasses were harvested for hay.



Greater Yellowlegs in tidal creek © Peter McKinley

Estuaries also provide critical habitat for many birds. Several marsh specialists breed only here, and many more species stop to feed at all times of year. For these reasons, NH Audubon recognized the Hampton-Seabrook Estuary as an “Important Bird Area” in 2003.



Willet © Eric Masterson

© Pamela Hunt

## Intercontinental Rest Stop: the Value of the Estuary to Migrating Shorebirds



White-rumped Sandpipers © Pamela Hunt

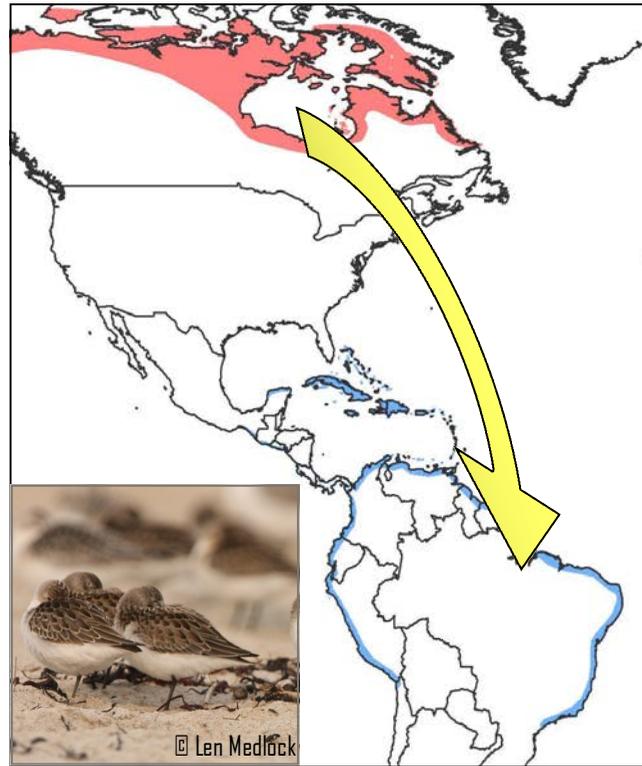
Depending on when you visit, the core of the Hampton-Seabrook Estuary is either a large bay or an extensive mudflat. It is the mudflats that provide a critical resource to migratory shorebirds such as sandpipers and plovers. Each fall, thousands of these birds stop at coastal locations in the Northeast to refuel on their southbound journeys from breeding grounds in the Canadian arctic. Here in the estuary they feed for two to four weeks and nearly double their weight in preparation for a non-stop flight over the western Atlantic Ocean to their wintering grounds in the Caribbean or South America.

The most abundant shorebird in the estuary is the Semipalmated Sandpiper, with an estimated 2,000 individuals using the mudflats each fall from July through September. Other common species include Black-bellied and Semipalmated Plovers, Whimbrels, Willets, Least Sandpipers, Dunlins, Greater and Lesser Yellowlegs, and Short-billed Dowitchers. When not feeding, most of these shorebirds roost in salt pannes or high areas of the marsh (including south of the border in Salisbury, MA), or on Seabrook Beach later in the season when human use is low.



Whimbrel © Len Medlock

Although they are here for only a small part of their year, shorebirds rely on foraging areas like the Hampton-Seabrook Estuary to complete their fall migration. Disturbance or habitat degradation at such stop-over sites can reduce the birds' chances of making it to the wintering grounds. For example, if roosting birds are regularly flushed by people or dogs, they waste precious energy moving around and may depart without enough fat to complete the next stage of their journey. Similarly, draining of pools or salt pannes at the edge of the marsh may reduce overall feeding area or prey populations at these sites. Finally, dredging or filling activity can reduce habitat, and if done during migration can be a disturbance as well.



Breeding range (red), winter range (blue), and fall migration route (yellow arrow) of the Semipalmated Sandpiper



© Len Medlock

## Living on the Edge: the Secret Lives of Salt Marsh Nesting Birds



Salt marsh at Hampton © Peter McKinley

Salt marshes are not just an important breeding area for fish. Several species of birds nest here, including four that are restricted to these habitats along the Atlantic coast. Foremost among these in New Hampshire is the aptly-named Saltmarsh Sparrow, a bird whose entire range is restricted to a narrow strip of coastline from Maine to North Carolina. Other breeding species include a small population of Willets, and the occasional Seaside Sparrow or Nelson's Sparrow. A small colony of Common Terns also nests here, and many more terns from the Isles of Shoals commute to the estuary to feed.

An estimated 800 Saltmarsh Sparrows use the Hampton-Seabrook Estuary, making it by far the largest concentration in New Hampshire. These sparrows nest in the "high marsh," an area slightly higher than the rest of the estuary and closest to adjacent uplands. Even here they are at great risk from the daily tidal cycle, and during



Saltmarsh Sparrow © Scott Young

extreme tides most nests are flooded. The birds have adapted by being able to re-nest and raise their young before the next extreme tide.

Saltmarsh Sparrows are not evenly distributed across the estuary. Most are found in the area of marsh north of Route 101 in Hampton, with another concentration in the northwest. Only a few are scattered through the remaining salt marsh. These two areas with higher sparrow numbers share an important characteristic: they are the only areas of marsh without extensive ditching. Ditches were histori-

cally created in attempts to drain the marsh, reduce mosquito populations, or improve hay production, and these ditches remain as scars on the landscape for years to come. At the same time, poorly-designed bridges and culverts restrict tidal flows and allow invasion by freshwater and invasive plants.



Satellite view of part of Seabrook, showing extensive salt marsh ditching. © Google Earth

Given the risk of nest flooding by extreme tides, it is not surprising that alterations from ditching or tidal restriction make habitat less suitable for sparrows. The highest sparrow populations are in the more pristine portions of the estuary, and these areas are thus conservation priorities. At the same time, restoration of degraded marshes has the potential to increase sparrow populations at other sites.

As we consider salt marsh restoration in the Hampton-Seabrook Estuary, another important factor cannot be ignored. Rising sea levels resulting from climate change will force marshes inland, and in heavily developed coastal New Hampshire they have few places to go. Identifying and protecting such areas is a critical conservation strategy if we are to ensure the long-term future of the estuary and its birds.