

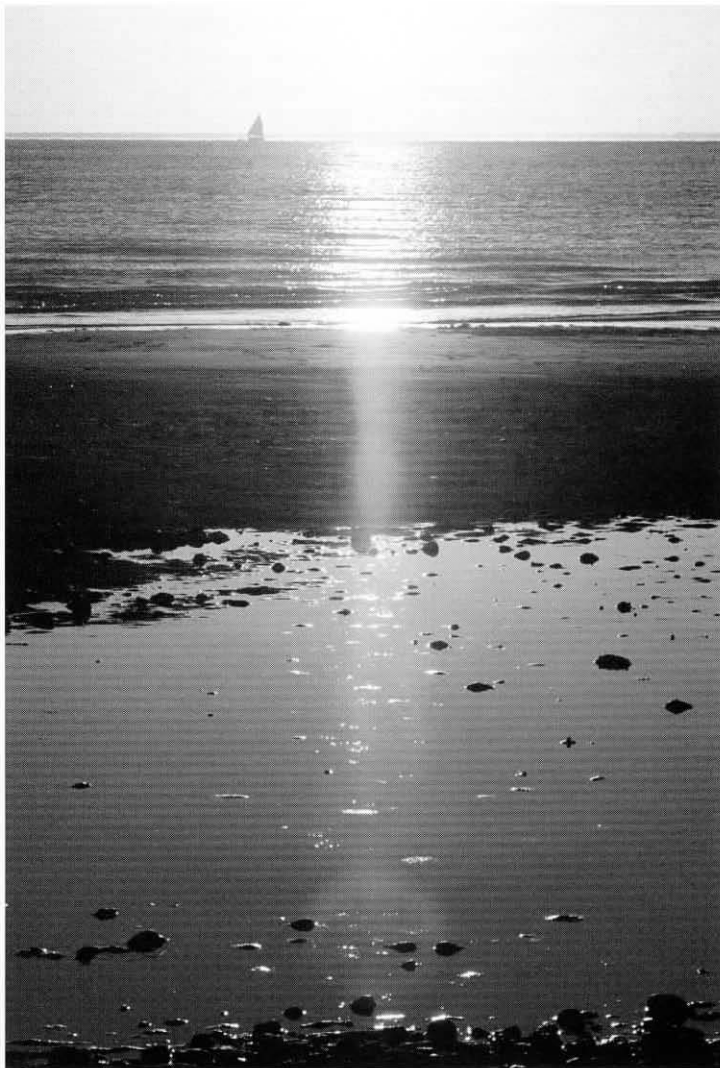
Great Sippewissett Marsh: Looking for Birds and Finding the Past

by *Ivan Valiela*

During the late summer months along the shores of Cape Cod there is a remarkable procession of coastal birds moving down from their Arctic nesting areas, southward to Central and South America, where they will spend the boreal winter. During these late summer weeks I regularly walk – late in the day, after beachgoers have left – along Black Beach and Great Sippewissett marsh (Fig. 1). One can count on seeing something of interest on almost every such walk. One afternoon, as the sun was getting lower in the horizon, and the colors on the western sky were turning toward orange and red, I was intently checking some new bird arrivals with my telescope, and in a side glance I noticed, at first with some annoyance, sets of tracks on the beach.

I should first explain that the name Black Beach surely derives from the appearance of dark colored layers of sediment here and there throughout this beach. These dark layers are old salt marsh peat. Cape Cod's salt marshes are, geologically speaking, relatively new features of the New England coastline, only some 9,000 to 11,000 years old. On the shores of Buzzards Bay, as elsewhere on the Cape, currents moved sand along shores, and built up sand bars and dunes, which provided protected bays where salt marsh vegetation could become established. These salt marsh grasses grew on coastal areas that were vacated as the thick glaciers that covered our region receded, and seawater reached farther in-

land. In most places, as glaciers melted, and sea level rose, salt marshes marched up into what previously was upland. In certain cases, such as George's Bank,



(Fig. 1) Late in the afternoon, looking west from Black Beach across Buzzards Bay. Photograph by Ivan Valiela.

there was no upland to grow up into, and today the erstwhile marshes that fringed George's Bank lie quite some distance beneath the sea surface.

In the case of Great Sippewissett marsh, salt water intruded into what was previously a low-lying area that sustained a large freshwater white cedar bog, and salt marsh grasses grew over the bog. As the centuries passed, the root mat of the salt marsh vegetation further stabilized sediment, and also built up peat, in some cases up to nine meters thick. The marsh-built peat is the dark layer that can be seen outcropping in Black Beach.

During the last century, as sea level was raised further, sand from beaches and dunes was driven eastward, more than once, into the salt marsh, covering the peat. The sand-covered beach and dunes also were often moved landward, a migration forced by storms and the rise in sea level. In fact, old maps of Great Sippewissett marsh show a remarkably plastic seascape, with inlet position and beach location either changing location or moving quickly to landward.

Evidence of such erosion-related changes in the shoreline include a large glacial erratic granite boulder – probably brought by glacial transport down



(Fig. 2) View from Black Beach, looking west over Buzzards Bay. The rock in the water is a glacial erratic that a few decades ago was under the dune that has since receded behind the place from which this image was taken. Photograph by Ivan Valiela.



(Fig. 3) Early fall, Great Sippewissett marsh. View from within the marsh, looking west; the woods and houses on the horizon are on the dune that separates the marsh from Buzzards Bay. One other house was built to the left of the last house on the left, but was washed away during a February storm in the 1970s that eroded the barrier beach. Photograph by Ivan Valiela.

from New Hampshire – that is today visible off Black Beach (Fig. 2). When I first began ecological work in Great Sippewissett marsh in the early 1970s, that boulder was on shore. Further evidence of the erosion of the shoreline was provided by the fate of a house that was then located on the very southern tip of the dune behind Black Beach (Fig. 3). That structure was floated off its foundation during a February storm, and during highest tides, its carcass floated from place to place all through the marsh for some time. Some neighbors, I am told, finally grew impatient

and set it on fire. At high tide, the smoking hulk managed to float around; alarms were sounded, and the fire truck, so goes the story, haplessly went back and forth in West Falmouth, unable to pinpoint just where the smoke was coming from, or to approach the source of the alarm.

To return to the changes wrought by erosion, as the beach and dunes moved landward, they sometimes allowed views of the underlying peat over which the sand had accumulated, hence the name Black



(Fig. 4) First glance at the tracks on uncovered marsh peat. Photograph by Ivan Valiela.

Beach. Under certain circumstances, when currents and tides have intermittently removed more of the sand on Black Beach, more of the peat is revealed, particularly during extreme low tides. That was the case that day when I was trying to make sure that it was a Solitary Sandpiper I had in view in my telescope.

In my peripheral vision, I saw some tracks underfoot. "Darn," I gruffed, "some teenager in a vehicle has been driving around this beach." After I looked away from the bird, I looked a second time at the tracks (Fig. 4). No, these were not evidence of an all-terrain vehicle at all. They were far too narrow, and there were many of them, as if the vehicle had many times gone over the same route. A more careful look revealed many more tracks (Fig. 5), all records of travel on a north-south direction.

I followed the tracks a bit further, and it became apparent that these tracks were paired, and set about 1.5 meters apart and, more telling, there was an unmistakable third set of tracks between the paired tracks left by wheels (Figs. 6, 7 and 8). Suddenly, with a tremor of recognition, I felt the raw whiff of the past staring at me from that peat. An image from a painting by Martin Johnson Heade (1819-1904) immediately came to mind (Fig. 9). What were in front of me were tracks of hay carts, with the marks left by the hooves of the horse pulling the cart in between the traces of the wheels.

Our Cape Cod predecessors found salt marshes invaluable. The first-nation peoples used the marshes as food sources.

The Wampanoag village of Sackonessett (spelling varies with authors) was located near Little and Great Sippewissett marshes. Middens, or refuse heaps, contained mainly shell- and fin-fish remains, most probably the fruit of women's gathering, as well as the occasional deer bone. For the Wampanoag, foods collected from marshes were essential staples.



Above: (Fig. 5) More tracks on the peat exposed during the low tide. The tracks head in under the present dunes. Note again the glacial erratic emerging from the water on the top right: the dune field between Great Sippewissett marsh and Buzzards Bay has moved land-ward for a considerable distance. Below: (Fig. 6) Closer view of the multiple cart tracks on the marsh peat. The cobbles were large enough to remain behind after the tide took away the sand. Photographs by Ivan Valiela.





(Fig. 7) A second kind of track set midway between the wheel tracks: the hoof marks of the draft animal. Photograph by Ivan Valiela.

For later-coming peoples, marshes remained important: after the European colonization, property deeds often describe a parcel for the homestead, a woodlot, and a stand of salt marsh. The marshes provided a pasture that required no removal of trees and needed no maintenance, an invaluable asset. The collection of salt marsh hay in fact became a long-held tradition in New England where pastures were rare.

The tracks visible on Black Beach were inscribed on the reasonably solid peat, consolidated by the grass roots as the carts moved on what was then the salt marsh surface. The dunes and beach were, at that time, probably some distance to the east. From the

elevation of the tracks relative to the present-day marsh surface one could estimate the date of the tracks, but, even without detailed data, one would guess that the tracks were laid sometime during the 1800s. The peat was solid enough, and the burial under sand has been fast and continuous enough since then to preserve these fragile traces of Cape Cod history for perhaps one and a half centuries.

On that day, in September, the low tide gave me a glimpse of a mundane activity, a note about how we, long ago, used and depended on our natural environment. A few days later, the tides had done their work again, and the sand had returned, covered



(Fig. 8) More of the same tracks, hoof marks set in between cartwheel marks. Photograph by Ivan Valiela.

the evidence of our predecessors' work, and erased the magic of that moment. Every time I walk that beach now, however, I experience a sense of awe that I saw, in a magical revelation, an unequivocal glimpse of our actual past. History shared itself. I find it comforting, as I again walk the beach looking for migrant birds, that the tracks are still there, under the sand, saved for someone else to see some day in the future. And I am grateful to have found yet another reason for encouraging efforts at preserving one of my favorite places on earth, Great Sippewissett marsh.

Born in Buenos Aires, Argentina, Ivan Valiela is Senior Scientist at the Marine Biological Laboratory's Ecosystems Center. He has written widely-used textbooks on marine ecology and global coastal change and is author of more than 200 articles published in professional journals. In collaboration with many colleagues and students he has carried on research on Great Sippewissett marsh, Waquoit Bay and other Falmouth sites, and made them known throughout the world. He is a consultant in coastal ecology to educational institutions, government agencies and towns in Massachusetts. An avid birder, he is married to Virginia Valiela, long-time Falmouth Selectman.



(Fig 9) What Great Sippewissett marsh might have looked like in the 19th century. Marsh grasses were harvested and dried on cedar supports – staddles – that held the hay above the tide. The hay was essential as winter fodder for livestock. The illustration is “Hayfields: a clear day,” painted about 1871-1880 by Martin Johnson Heade. Reproduced from Stebbins, T. E. 1999. Martin Johnson Heade. Museum of Fine Arts, Boston.