



Forward, Marsh!

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Innovation sparks hope for this critical resource

BY COCO MCCABE

Peter Pinciario, a Beverly boy at the time and now The Trustees' Director of the Crane Estate in Ipswich, was just 13 when he first landed on Crane Beach almost a half century ago.

He had come by boat with a cousin from Amesbury, down the rivers and creeks snaking through the miles of grasses and mud flats that make up the Great Marsh.



Left: Tidal flats on the Great Marsh like this one—near the Crane Wildlife Refuge’s Patterson Island on the Essex River Estuary—are favorites for clammers. **Above:** Much of the Essex portion of the Great Marsh is seen in this 2008 aerial photo. Choate Island in the Crane Wildlife Refuge can be seen in the upper left, with Castle Neck and Crane Beach beyond.

Upstream, hugging a grassy bank, stood a massive rock that would soon become a lifelong beacon—a place Pinciario would return to, over and over again, with his father to fish for stripers; a place that lured the boy with a mix of fear and delight. The water into which the pair waded with their rods was crawling with horseshoe crabs and Pinciario wore only sneakers.

“I was petrified,” he recalls. And the bugs were voracious. But his dad had just the remedy. “He used to let me smoke cigars, at 13, to keep the midgies away.”

For Pinciario, and anyone else lucky enough to experience the wildness of the Great Marsh, memories like his are timeless—unlike the peat that once anchored the rock. It stands free now, separated from the land by erosion, a symbol of all the challenges threatening this vast and vital resource in the face of climate change and sea level rise.

At over 20,000 acres, the Great Marsh is the largest contiguous stretch of saltmarsh in New England. A complex system of barrier beaches, tidal creeks, uplands, and mudflats, the marsh serves as the foundation of a food pyramid where a host of aquatic life gets its start, including the clams and fish that support a vibrant local economy.

As important, migratory birds and threatened species, like the piping plover, depend on this ecosystem for their habitat. Without it, the saltmarsh sparrow, small and rusty-brown, could not exist: it is uniquely adapted to the rhythm of the tides in high marshes on the North Atlantic coast, building nests, laying eggs, and helping the young to fledge all in about 28 days—the time between the highest tides each month.

People depend on the marsh, too. The sea of grasses stretching to the horizon serves as a buffer during storms, minimizing the effects of flooding while keeping coastal homes and businesses safe from the hammering of waves. And when it comes to outdoor fun, the Great Marsh offers something for everyone, from swimmers and sunbathers on the beach, to sailors, kayakers, and other outdoor enthusiasts who explore the creeks in all seasons. Birders, recreational fishermen, and hunters all heed the call of this special place.

CHANGE DRIVES URGENT ACTION

But all of this beauty and security—once seemingly permanent and unchanging—is now facing an uncertain future. Can critical

parts of the marsh, and the plants and roots that bind it all together, grow fast enough to keep pace with sea level rise?

Already, troubling signs abound: at the Essex end of Crane Beach, erosion has swept away about 1,200 feet of the shore since 2008, effectively widening the opening into Essex Bay by the same amount. Across the marsh, creek walls topped with grass are collapsing into the mud, and during storms marsh roads increasingly flood.

For The Trustees, doing what it can to ensure the resilience of this unique wilderness is paramount. The organization protects about 15 percent of the Great Marsh, which winds through seven Trustees reservations, including Crane Beach, which attracts more than 350,000 visitors each year. In Ipswich, the Great Marsh also stretches into Castle Hill and reaches back to the Hamlin Reservation and Greenwood Farm. In Essex, the Crane Wildlife Refuge and Stavros Reservation encompass part of this important resource, as does Old Town Hill Reservation further north in Newbury.

“We have to be thoughtful about where we choose to act and about where we choose maybe to accept loss and change,” says Tom O’Shea, Trustees’ Program Director for Coast & Natural Resources. “This is a type of coastal habitat that is important for so many reasons and it is at risk. So, there is urgency to find ways to help the existing marshes become resilient to sea level rise.”

Peter Pinciario, *right*, stands beside the same rock that his father did in this 1970s snapshot, *left*. At the time, the rock hugged the grassy embankment of the Great Marsh. Now, some 40-plus years later, the old fishing rock stands by itself on the beach, no longer close enough to hug the marsh bank.



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Pulling out a map, Russell Hopping, Trustees' Ecology Program Director, traces a maze of lines crisscrossing the marsh like scars on an old wound. The red lines mark embankments early farmers built to keep salt water out, allowing them to manage

the flow of fresh water and increase their yields of marsh hay. The green lines mark the deep ditches dug by Depression-era crews to drain the marsh and rid it of the mosquitoes breeding abundantly in the wetness left by the abandoned embankments.

"We had forgotten this took place," said Hopping, noting that antique photos and patient trolling through old agricultural journals helped piece the history together. The embankments were built prior to the 1900s and now their remnants, coupled with the degradation of the mosquito ditches, are taking a toll. "It's really changing the hydrology of the marshes," he says. "Much of this water that floods onto the marsh cannot drain any more. It sits on top and kills the vegetation."

On his map, Hopping points to areas in transition from high marsh to low marsh—acres and acres, he says, noting that sometimes all it takes is a drop of a few centimeters in the height of the ground to trigger the shift: bad news for the saltmarsh sparrow, which could face extinction.

But the good news in all of this is that the solution is supported by The Trustees team of coastal experts: Wilson, Mary Rimmer, the MA Division of Ecological Restoration, and the U.S. Fish & Wildlife Service. Their method is to restore the natural hydrology by encouraging some of the ditches to "heal" themselves—to fill with sediments brought in by the tides, raising the base high enough to catch the sun so new grasses can take root and thrive. To speed the process, the approach requires periodically layering the base of the ditches with marsh grasses, cut from above, to hold the sediment. On average, ditches can fill in at the rate of nine to twelve centimeters a year. Depending on their depth, some of the ditches will need three rounds of hay-layering before they become shallow enough to allow grasses to colonize.

The work is expected to begin in August. The Trustees plans to closely monitor the project and share the results with other concerned groups and government agencies hungry for solutions to similar coastal problems. "In many cases science is showing marshes are not able to accrete fast enough to keep pace with sea level rise, but that's because they are already compromised," says Hopping. "I think the evidence will show, where they've measured this, an unimpaired salt marsh can keep pace."

There's an important lesson here, adds Wilson: "History matters."

HISTORY GENERATES SOLUTIONS

One way to boost resiliency is by paying attention to history, and understanding how early farmers and, more recently, mosquito control agencies used and altered the marshes for their purposes. That knowledge, newly acquired with the help of consultant Geoff Wilson of Northeast Wetland Restoration, now serves as the foundation for a major marsh restoration project.

Launched by The Trustees, in partnership with the Massachusetts Division of Fisheries and Wildlife, the innovative initiative aims to restore the health of 120 acres of marsh around Old Town Hill Reservation, off Newman Road in Newbury, and could eventually fortify an additional 200 acres of marsh in Ipswich and Essex. A \$15,740 grant from MassBays is funding the first phase of the Newbury project, which ultimately will take between 3-5 years to complete at a cost of about \$250,000 per 100 acres.



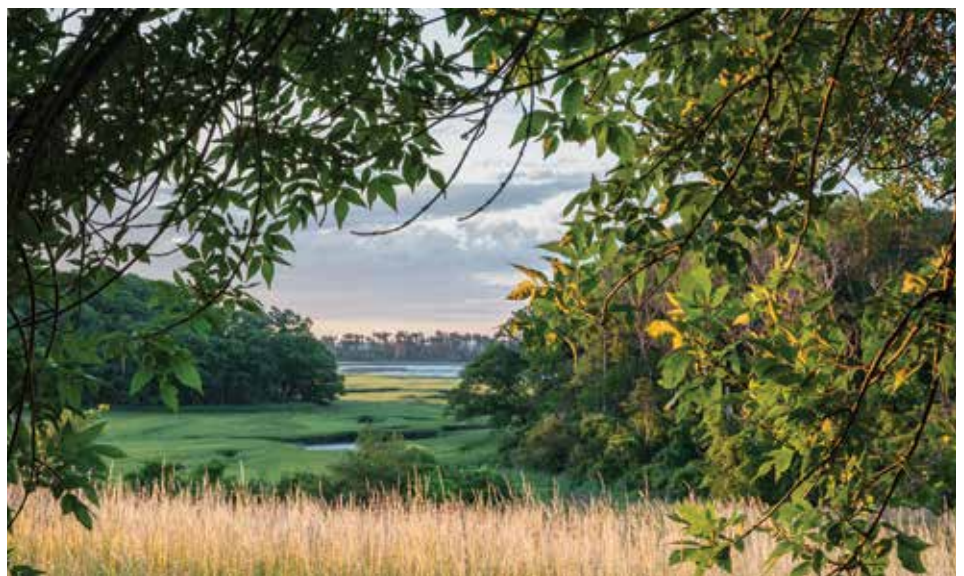
Above: Brilliant waves of green high marsh hay stand out against gray morning fog over Newman Road and Old Town Hill Reservation in Newbury. It is this high marsh habitat that is especially at risk from the effects of sea level rise. **Below:** Fox Creek winds its way through the Great Marsh, as seen from Argilla Road, just outside the entrance to Castle Hill on the Crane Estate in Ipswich.

ADAPTING FOR THE FUTURE

Back at Crane Beach, The Trustees and the town of Ipswich are moving ahead with plans to raise, by a little more than two feet, about half a mile of Argilla Road near the beach entrance to help it withstand flooding and erosion. A \$156,155 grant to the town from the Massachusetts Office of Coastal Zone Management is covering the first 30 percent of design costs.

Funding for the rest of the project, which will include “green” infrastructure designs as well as construction, is not yet in place. By at least one estimate, final costs could climb to \$1 million or more. Already flooded during some high tides, which means curtailed access to the beach, that stretch of road would likely be under water during every tide cycle by 2070 if adaptations aren’t made.

For Pinciario, these realities present challenges he must grapple with every day in the course of making sure visitors to the beach, Great House, and the wildlife refuge not only delight in all the Great Marsh offers, but stay safe, too. It’s a mission he’s committed more than 40 years of his life to.



And as the longest-serving Trustees employee, Pinciario, possibly more than anyone, knows in his bones how vital a healthy marsh is to the wellbeing of all of us.

“There are many nights when we’re coming or going along Argilla Road or the Ipswich marshes and you just have these ‘aha’ moments...it’s just so beautiful,” says Pinciario. “I think there is so much change

in people’s lives anyway [that] when you come back to a landscape like this over and over and see that it’s the same, it’s really comforting.”

Coco McCabe is an Ipswich writer and photographer who has lived next to the Great Marsh for many years.