

Science at the National Seashore: Past, Present and Future

by Bridget Macdonald

Coming from the Great Smoky Mountains National Park, which had been established in the 1930s and is among the most diverse national park ecosystems, Vernon "Tommy" Gilbert might have imagined his new position at the national seashore would be like a day at the beach. But the national seashore's first Chief of Natural Resources had his hands full.

There were no restrictions against driving vehicles through the dunes, private developers had been pushing the limits of construction ahead of the park's arrival, and there were no permanent scientists on staff. Seasonal rangers helped Gilbert with his main responsibility at the time: creating hiking trails to provide public access to scenic places in the national seashore.

Today, Chief of Natural Resources Shelley Hall oversees a staff of about ten permanent scientists, as well as numerous seasonal workers and interns, specializing in a broad range of resource management issues. Piping plovers, salt marsh restoration, kettle pond monitoring, amphibian monitoring, air quality, acid rain and mercury deposition, vegetation management, exotic species, and coastal geomorphology are but a few.

However different the scope, the mission of the natural resources division has been the same from day the national seashore was established: to protect the natural environment while allowing an appropriate level of human activity.

In a relatively small national park with an enormous human history, it's an inherently complicated mission. By the time the seashore was founded, Cape Cod had already experienced four centuries of heavy human use. From clearing forests and draining marshes to agriculture and even revegetation efforts, the inhabitants had left an indelible mark on the land.

"Humans have been changing the natural environment on the Cape for centuries," said Hall. "We are working from an altered baseline."

Square One

From the beginning, resource scientists have been trying to pin down the national seashore's ecological identity. "A lot of what scientists do at this park is not just research; it's trying to identify what the natural resources are, or were, for managers to really target them," explains retired national seashore ecologist John Portnoy.

"It was fine to say you wanted to preserve the land in perpetuity, but there had to be some serious thinking about what exactly the goals are," he continues. "You can't just

hold the national seashore to 1961 conditions."

The first wave of scientists working in the park, mostly visiting university researchers, started by trying to figure out what exactly those 1961 conditions were. They studied processes like bluff erosion, dune migration, and sand deposition, and conducted a comprehensive survey of vegetation on the Outer Cape.

Then during the 1970s, the researchers themselves started driving ORVs through the dunes.

"They built a test loop," says Mark Adams, Cape Cod National Seashore's Geographic Information Systems Specialist. "They would drive around and around to see what the impact was on vegetation," he explained. "It was this documentation of the effects on the landscape that led to the ORV permit program."



The issue of ORVs has dominated the list of issues throughout the seashore's history.

Throughout the national seashore's history, scientific research has followed a similar course: identify the resources that need protection and then determine the level of human activity that threatens their integrity.

It's a give-and-take process, necessitated by the unusual circumstances of the national seashore's establishment. The founding legislation mandated the protection of the Cape's traditional way of life, as well as its natural and cultural resources.

While the establishment of the national seashore in the midst of six communities was a public policy landmark, it also represented uncharted territory for natural resource science.

"It was sort of an education by and for the scientists," says Portnoy. It was also an opportunity for them to rediscover a place that had been inhabited for hundreds of years.

Pioneering Research

Portnoy became the first permanent scientist on staff at the Seashore when he was hired in 1979. With a background in wildlife



GIS Specialist Mark Adams takes an elevation measurement at the Herring River dike.

biology, he was brought on to study the unnaturally large gull population attracted by open landfills on the Outer Cape. But over time, Portnoy became interested in exploring a new scientific frontier that was emerging at the national seashore.

In the 1980s, he and his superiors began to look at the effects of historic diking and draining on salt marsh ecosystems. Eventually, he says, "I morphed from a wildlife biologist to a water chemist."

Now, salt marsh restoration is among the most critical efforts taking place in the national seashore, and Portnoy has been at the forefront. He was instrumental in the restoration projects at Hatches Harbor in Provincetown and at East Harbor in North Truro, and although retired from the park, he is involved in the ongoing restoration project at the Herring River in Wellfleet.

"There is a lot of altered salt marsh on Cape Cod, and some of the biggest diked salt marshes are within the national seashore," says Portnoy. "The national seashore inherited these alterations. It's sort of an accident of history."

To complicate matters, these historic alterations are embedded in the local communities. David Manksi, Chief of Natural Resources from 1988 to 1994, was also involved in the Hatches Harbor restoration project. "I coordinated the planning and design work, but the actual restoration took place after I left," he says, explaining that the project involved a lengthy negotiation process because of concerns about potential impacts on the Provincetown Airport.

"So the project started before I got there, and ended a year or two after I left," said Manksi, who currently serves as Chief of the Division of Resources Management at Acadia National Park in Maine.

Because of the national seashore's relationship with the six surrounding towns, even after scientific data has been collected, there has to be local collaboration to effectively address resource management issues.

"Cape Cod is a good training ground for those who are interested in science and resource management," said Manksi, "but it can be very complicated and stressful."

He pointed out that the top issues he dealt with as Chief of Natural Resources – like shorebirds, drinking water, and private development – were the same that his predecessor Barbara Samora dealt with and the same that Shelley Hall is dealing with today.

Manksi stated, "Some of these problems will be very challenging to solve because of the unique mix of private and public lands contained within the seashore boundary."

Lessons from Compromise

The issue of ORVs has dominated the list of issues throughout the national seashore's history. Mark Adams explains that the first researchers to study the impacts of ORVs in the 1970s began with the question: How

much damage can the dunes handle, and when will they reach the carrying capacity? "They decided we had already passed it," he says.

From the mid 1970s to the mid 1980s, there were more than a dozen different studies related to ORVs, looking at their impacts on salt marsh vegetation, sediment movement, dune topography, shorebird nesting, and even on the microenvironment found within the high tide drift line on the beach.

Manksi came to the Cape in 1988 at the height of the ORV controversy. An ORV management plan had been implemented a few years earlier without any input from vehicle owners or shore fishermen, so the park undertook a more public process to negotiate a new set of rules.

"It was a reality you needed to address. Surf fishing (catching fish standing on the shoreline) is a traditional recreation activity at the park, so there had to be a balancing act with the fishing community," he explained.

Despite the ups, downs, and perpetual challenges of resource management, the past 50 years are a testament to the value of a comprehensive and inclusive approach to natural resource protection.

Thinking back, Manksi pointed out that the top issues were not really just natural resource issues. "They were about looking at relationships between people and their use of the land," he said. "Now people have come to realize that even in a traditional western park – like Yellowstone or the Grand Canyon – you can't manage a park in isolation."

The Next 50 Years

Looking forward, Hall said one of her main priorities is to make the work of the natural resources division more accessible to the public through educational programs and citizen science initiatives.

It's more than just a feel-good mission. On the local level, community involvement will be essential for confronting looming problems with waste disposal and access to drinking water.

In order to address broader issues that have implications for society as a whole, like sea level rise, climate change, and sustainability, generating awareness is critical. "We want to show people how to use observations to ask the right questions, and figure things out," says Adams. "We rely on the public for values, but we need to empower them to make informed decisions."

Ultimately, the national seashore's natural resource managers will continue the effort initiated by the first chief of natural resources: creating public inroads to the park, while trying to minimize the impact on natural resources.

"That's part of the challenge," said Hall. "The enabling legislation envisioned a human dimension to this park."



Veteran CACO scientist John Portnoy (Ret.) uses a watercraft to reach survey points on East Harbor. Salt water was reintroduced to East Harbor in 2001.