

UNDERWATER NATURALIST

Fall 2017
Vol. 32
No. 2





Hey!

Your ad can be in the next Underwater Naturalist.

Thousands of birders, fishermen and outdoorsmen read it.

Call 732-291-0055 or email info@littoralsociety.org for rates.

Underwater Naturalist is the bulletin of the American Littoral Society, 18 Hartshorne Dr., Ste. 1, Highlands, NJ, 07732. It is a benefit of membership which costs \$30 for seniors and students, \$40 for individuals and \$50 for families and schools. Except where otherwise noted, permission is granted to reprint all or part of any article provided the credit is given to "Underwater Naturalist, Bulletin of the American Littoral Society" and to the author. Printed in the United States of America. © American Littoral Society, 1961-2017.



2017 BOARD OF TRUSTEES

Kathleen Gasienica
President

Tally Blumberg
Vice President

Gregory Quirk, EdD, CPA
Treasurer

Penney Riegelman
Secretary

David J. Chapman
Angela Cristini, PhD
Douglas Douty
Peter Hetzler, MD, FACS
George Kowallis, MD
Richard G. Lathrop, PhD
Mark Mauriello
Jennifer Samson, PhD
Cindy Zipf

COUNSEL

Gordon N. Litwin

EXECUTIVE DIRECTOR

Tim Dillingham

EDITORS

Pim Van Hemmen, Assistant Director
David Hawkins, Communications Manager
Meghan Brennan, Editorial Assistant

CONTENTS



**Return of the Osprey:
Jamaica Bay,
New York City**

6



**The Clean Water
Act: A Major
Improvement**

12



**A Local Victory:
The Return of
Whales to the New
York Area**

16



**Turtle
Turnaround**

20



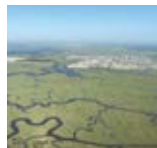
**DOCUMERICA:
A Slice of
Environmental
Time**

24



**Building A
Stronger
Delaware Bay**

30



**The Recovery
of New Jersey's
Mullica Valley**

36

On the Cover: An Osprey brings food to its family on a nest in Jamaica Bay.

Photo by Don Riepe/American Littoral Society



Split Second Racing

5K to Care for the Coast

*A fun walk/run for all ages, followed by a clambake on the boardwalk
to benefit the American Littoral Society*

April 7, 2018

Premiere Event Sponsor

\$5,000

The Littoral Society is partnering with Langosta Lounge in Asbury Park to put on the **2018 Lobster Trot – 5K To Care for the Coast**, a day for families, runners and outdoor enthusiasts, our members and the public to walk or run together to raise money to support the American Littoral Society. This “fun” run will wind through the streets of Asbury Park and end with a special lobster bake courtesy of Lusty Lobster, on the Asbury boardwalk in front of Langosta Lounge. Race begins and ends at Langosta.

Premiere event sponsor will have their corporate logo on all t-shirts and in all social media and other signage associated with the event. For information about opportunities for corporate support, please contact
Pim Van Hemmen at (732) 291-0055

From the Executive Director

It's easy to get caught up in all the bad news our planet and coastal environments face. There is climate change and sea level rise, too many threatened and endangered species to count, fish kills and polluted waters, to name just a few problems.

The litany of negatives might make it easy to conclude that our planet is damaged beyond repair.

However, over the last five decades we humans have made enormous progress in addressing many of the ills that our planet and our coasts face, and we think it's healthy to pause and take stock of our shared victories.

In this issue of the Underwater Naturalist, rather than look at all that is wrong, and there is plenty of that, we look at some of the major and minor environmental victories that have made our world a better place.

Our Jamaica Bay Guardian and Northeast Office Director Don Riepe writes about the return of the Osprey. Those raptors nearly disappeared from our land in the 1950s and '60s due to the ravages of DDT.

However, thanks to the work of the Littoral Society and many other people around the country, Osprey made a dramatic return over the last few decades. The Osprey's rebound from the abyss is so dramatic that they are now almost commonplace on most bodies of water in the United States.

The Bald Eagle and other raptors are not far behind because of similar efforts related to the 1972 DDT ban and other initiatives. The Osprey's story is proof that good science, strong laws, public education and robust restoration efforts can lead to positive results for the environment.

Underwater Naturalist contributor, Meghan Brennan looks at one such groundbreaking law, the 1972 Clean Water Act (CWA). The CWA and other environmental victories, have contributed to the increasing number of whales sighted off our coasts and promising signs of sea turtle recovery.

In this issue you'll also find a collection of images from the Library of Congress, which show the horrific levels of pollution the United States faced in the middle of the 20th century. Look out your window for proof of how far this nation has come in the past half century on addressing major environmental disasters. These images are a good reminder that at one time things were dire and that strong federal regulation and the creation of enforcement agencies like the EPA, helped reverse deadly pollution problems in the US.

You'll also find an article by Dr. Ken Able about the recovery of the Mullica Valley, and a five-year update on the Littoral Society's restoration work in Delaware Bay from Capt. Al Modjeski, our Habitat Restoration Director.



All these stories offer evidence that if we can identify what is broken, then we can fix it. Protecting and restoring the littoral environment has been the Society's mission since 1961. With your help we will continue to do so.

Much work remains to be done to make our planet healthy and sustainable. This issue of the Underwater Naturalist serves as a reminder that through commitment and collaboration our coast and oceans can be protected and restored.

Tim Dillingham

Sheer Beauty

An underwater photograph showing two dolphins swimming near the surface of the Atlantic Ocean. The dolphins are seen from below, with their sleek, grey bodies and white underbellies visible. The water is a deep blue-green color, and the surface is slightly rippled. The lighting is soft, highlighting the texture of the dolphins' skin and the clarity of the water.

Two Short-beaked common dolphins glide beneath the surface of the Atlantic



Ocean off East Hampton, New York. Photo by A. H. Kopelman for CRESLI

Return of the Osprey: Jamaica Bay, New York

Story and Photos
by Don Riepe



City



Before World War II, Ospreys (*Pandion haliaetus*) were common throughout coastal marshes. However, because of the indiscriminate post-war use of the insecticide Dichlorodiphenyltrichloroethane, more commonly known as DDT, Osprey populations, along with Peregrine Falcon, Bald Eagle and other raptor populations, were decimated.

DDT was used in the second half of World War II to control malaria and typhus among the troops, but after the war DDT was made available for public sale and it became a widely used agricultural pesticide.

Because raptors are top line predators, they built up higher concentrations of DDT as it passed up the food chain. DDT interfered with the birds' abilities to produce calcium, resulting in brittle eggs, which would collapse under the weight of an incubating parent. Unable to reproduce, Osprey populations plummeted throughout the 50s and 60s.

Even before it was used as an agricultural pesticide, the dangers of DDT – especially its penchant for killing beneficial insects, such as bees – were known, but ignored.

Rachel Carson's 1962 book *Silent Spring* brought international attention to DDT's detrimental effect on bird populations and led to a public outcry against its

use. Still, it would be another 10 years before President Richard Nixon signed an Executive Order that banned the use and sale of DDT in the United States.

When the Federal Endangered Species list became law in 1973, the Osprey, Bald Eagle and Peregrine Falcon were all placed on the list. However, because DDT breaks down slowly, the chemical continued to be present in the environment for at least another decade.

As a result, there were still no



nesting Ospreys in New York City during the 1980s.

The raptors were successfully nesting out on Long Island and seemed to be spreading westward. In anticipation of an Osprey nesting in Jamaica Bay, my fellow National Park Ranger Bob Cook and I enlisted some volunteers from the New York City Sierra Club and put up a platform on a 20-foot pole in Yellow Bar Hassock marsh in the western section of the bay.

In 1990, we had our first Osprey take up residence, which was probably the first one in all of New York City since the 1960s. We then put up another high platform at another marsh site, which was promptly occupied by another Osprey pair.

We quickly realized that if we built them, they would come.

In 1991, we enlisted Chris Nadareski, who was banding Peregrines in New York City. He started banding young Ospreys and Barn Owls in Jamaica Bay as well. Aside from hoping to get some feedback regarding migration patterns and longevity, another concern was that our Ospreys were getting into trouble by flying over John F. Kennedy International Airport runways. As far as we know, only one of our 200 banded Ospreys has been found dead near a runway at the airport since we started the program.

Over the years, as Osprey numbers increased, the birds began looking for new nest sites – which eventually included the top of a crane, channel markers, an abandoned boat, and even an overturned industrial trashcan. Two young Ospreys successfully fledged on top of that can.

Since Ospreys were nesting on low structures like old boats and docks, I started putting up





platforms on 6-foot tall 4X4s. Not only were they easier to erect, but it also made it less complicated to monitor and band the young.

As part of the evolving design, we placed Tree Swallow nest boxes underneath each platform. Since Ospreys eat fish, primarily menhaden, the swallows were not deterred by the presence of a large raptor nesting a foot or so above them. Since swallows eat insects (we always hope they eat lots of greenies and deer flies), the two species

got along swimmingly. Every one of those Tree Swallow boxes is occupied each year.

In the early 2000s, with a grant from a private donor, biologist Bob Kennedy placed a GPS device on a male Osprey from a nest bordering the West Pond trail at the Jamaica Bay Wildlife Refuge. That allowed us to track the bird as it hunted each day. He rarely left the bay. Clearly, the fishing was good in Jamaica Bay.

At the end of September, the Osprey



(who we named “Coley”) flew south to Colombia, South America for the winter. Using Google Earth, we could easily see the spot where Coley was roosting alongside a large lake. In early March, Coley started his long journey north and returned to his Jamaica Bay nest site in early April. I happened to be walking the West Pond trail and saw him fly into the south marsh and greet his mate who had arrived a week earlier. That year another male Osprey nesting in the bay (named “Coley 2”) was tagged and migrated all

the way to Venezuela for the winter.

This year I located 29 nest sites in Jamaica Bay, including three that were placed on trees, and Ospreys are now nesting in large numbers across the United States. Clearly, thanks to good legislation and some human assistance, this species has fully recovered.

Don Riepe is the Littoral Society's Northeast Chapter Director and Jamaica Bay Guardian, and a retired National Park Service employee.

The Clean Water Act:

By Meghan Brennan



A Major Improvement





On June 22, 1969, the Cuyahoga River in Cleveland, Ohio caught fire. While shocking, this event was not unusual. The Cuyahoga River, because of the immense amount of pollutants and contaminants in its waters, had caught fire at least 12 other times in the previous one hundred years. The 1969 fire barely made the local news. It only lasted two hours and caused just \$50,000 in damage. In 1952 a much larger fire had caused \$1.5 million in damages. However, a *Time* magazine article turned the 1969 fire into national news, comedians made Cleveland the butt of jokes, and the fire then helped fuel what is now known as one of the largest, most comprehensive

environmental laws in United States history, the Clean Water Act.

The Clean Water Act was initially called the Federal Water Pollution Control Act of 1948 and saw numerous iterations under various administrations over the next two decades. Amendments to the act in 1972 led to the change in name, and to the Clean Water Act as we know it today. At the time, President Nixon vetoed the bill because he considered its \$24 billion price tag “budget-wrecking,” but a strongly bipartisan Congress overrode his veto. On October 18, 1972 Nixon signed the Act into law, but he tried to impound half of the funds. A 1975 Supreme Court decision overruled Nixon’s



attempt to kill the Act by underfunding it.

The goal of the Clean Water Act was for all US waters to be “fishable and swimmable” by 1985. While this goal has still not been reached, the Clean Water Act has been successful in other ways.

The Clean Water Act included numerous provisions that revolutionized the health of our country’s waterways. It prohibited the discharge of hazardous substances into our waterways without a permit and required that all wastewater be treated before being released into waterways. This might seem like a no-brainer today, but prior to 1972, hazardous substances and chemicals were released

into waterways without thought.

The Clean Water Act allotted billions of dollars of federal money for construction of sewage treatment plants to minimize the pollutants released into our waters. The Clean Water Act also gave the Environmental Protection Agency (EPA) the power to prosecute any industry, business or person(s) who discharged pollutants into the water. This prosecutorial power meant that polluters could finally be held accountable for their actions. These provisions are just a few of the ways that the Clean Water Act helped restore waterways across the United States.

The Clean Water Act continues

to evolve today. The Clean Water Rule, also known as the Waters of the United States rule, was implemented in 2015 to clarify the jurisdiction of the Clean Water Act. Prior to the Clean Water Rule, there were disagreements concerning which waterways the Clean Water Act covered. The Clean Water Rule clarified protections for streams and wetlands that feed into larger bodies of water. This rule is integral in expanding protection for our country’s waterways.

Current EPA administrator Scott Pruitt plans to repeal the Clean Water Rule, and, thus, decrease protections on waterways.

In 1969, Clevelanders joked that “Anyone who falls into the Cuyahoga does not drown. He decays.”

Today the river is popular with kayakers, paddle boarders and other recreational boaters.

Given what The Clean Water Act did for the Cuyahoga and countless other US waters, perhaps Americans should be asking themselves if they want to return to the not-so-distant days when our rivers burned.

Pages 12 and 13: The Cuyahoga River was once one of the most polluted rivers in the United States. It caught fire a total of 13 times dating back to 1868, including this blaze in 1952, which caused over \$1.3 million in damages. Photo courtesy of Cleveland State University Library

Facing Page: Today, the Cuyahoga River is still used by commercial boat traffic, but now also sees regular use by recreational boats, including kayaks, paddle boards and other small craft. Photo by Erik Drost.



A Local Victory: The Return of Whales to the New York Area

By Meghan Brennan



Over a century ago, the New York Bight – which is comprised of waters from Montauk, Long Island to Cape May, NJ – was booming with marine life.

Unfortunately, decades of over-fishing and unchecked water pollution (by 1984 the Bight was considered the ocean dumping capital of the world and was home to eight sites where barges regularly dumped everything from sewage sludge to medical waste) drove out a great many native plant and fish species, including the humpback whale (*megaptera novaeangliae*).

But in 2010, fishermen began to see whales again in the waters surrounding New York City.

There are multiple reasons for the return of cetaceans to the area. For one, the New York Bight has become healthier since the implementation of the Clean Water Act in 1972. Secondly, menhaden, favored as a food source by many species including humpback whales, have increased in numbers closer to shore.

Additionally, the Marine Mammal Protection Act banned the “take” of numerous mammals, including whales, and has allowed certain whale populations to

rebound.

Finally, the global decline of the whaling industry has helped stabilize some of whale populations. It is important to note that though whaling has ceased in the great majority of



Previous Page: A humpback whale dives 1.5 miles off the coast of Long Island. Photo by A.H. Kopelman for CRESLI.

This Page: A humpback whale rises out of the waters off Montauk, New York. Photo by A. H. Kopelman for CRESLI.

countries, it is a limited victory. Some countries, including Japan, Norway, and Iceland continue to practice whaling.

Other threats loom closer to

home. Efforts are being made to open the Atlantic to oil and gas exploration. Seismic testing and drilling platforms pose additional threats to whale populations, as well as other species.



Turtle Turnaround

By Meghan Brennan





According to the International Union for the Conservation of Nature, six of the world's seven species of sea turtles are classified as vulnerable,

endangered, or critically endangered.

However, a recent study published in *Science Advances*, a peer-reviewed multidisciplinary open-access scientific



journal, details a promising rebound of sea turtle populations worldwide.

The study examined 299 nesting sites over the course of six to 47 years,

and found that 95 of the sites had a significant increase in nests, while just 35 sites had a significant decrease in nests.

The increase in sea turtle nest abundance is partially attributed to localized conservation efforts begun in the 1950s. Such efforts include protecting sea turtle eggs, reducing habitat destruction, and improving sustainable fishing measures aimed at reducing bycatch. Bycatch is a fish or other marine species that is unintentionally caught, such as dolphin in fishing nets.

Much work remains to pull sea turtles back from the brink of extinction. Other threats they face include:

- The growing amount of plastic in the ocean (which can block sea turtle digestive systems if eaten or prevent them from swimming properly if they become entangled),
- Other forms of pollution (such as agricultural runoff, oil spills, sewage, and industrial chemicals), which can affect everything from egg formation to food sources, and
- Earth's changing climate, which will have dramatic effects on nesting habitat and ocean currents.



Pages 20 and 21: Photo by Ale Art.
These Pages: Photo by Wexor Tmg

DOCUMERICA: A Slice of

In 1969, a massive oil spill fouled the California coast and sulfur dioxide pollution emitted by factories near Gary, Indiana caused acid rain that burned lawns, dissolved tree leaves, and caused birds to lose their feathers.

The very next year, 20 million people in the United States participated in the first Earth Day, making it clear that America and Americans had awoken to the fact that they needed to clean up their environment.

On December 2, 1970, the Environmental Protection Agency (EPA) was formed and in November 1971 the young agency announced a photography project called DOCUMERICA to record the condition of the American landscape in the 1970s.

Shot by freelance photographers hired by the agency, DOCUMERICA focused on the major environmental concerns of the time, including water, air, and noise pollution; rampant development; and the impact of environmental conditions on public health.

In his guidelines to photographers, the project's director, Gifford Hampshire wrote, "future Americans should understand our successes and failures."

The project ended in 1977. About 80,000 images were shot and about 15,000 are now available in the National Archives.

Today, the collection is a slice in time that shows the environmental condition of the United States some 40 years ago. It also serves as a reminder of



what still remains to be done.

The work continues and so does the need for a strong Environmental Protection Agency.

You can see more DOCUMERICA images at <https://www.archives.gov/research/environment/documerica-photographers.html>

of Environmental Time



This Page: July, 1972, original caption: Burning discarded automobile batteries, Houston, Texas. Photo by Marc St. Gil/ DOCUMERICA.

The lead, plastic and acid inside batteries would leak into the ground and contaminate water supplies. When batteries were burned they would release noxious fumes and heavy metals into the air. In May of 1996 the EPA enacted the Battery Act, which led to the recycling of auto batteries. Nowadays, the majority of car batteries are repurposed in a closed loop, keeping them out of incinerators and landfills and thus out of our water supply and air.



This Page: May 1973, original Caption: Wastes from this home in Broad Channel are carried into Jamaica Bay via ditch. The community lacks a municipal sewage system. Photo by Arthur Tress/DOCUMERICA.

The Clean Water Act that went into effect in 1972 included millions of dollars to build new waste water treatment plants around the country. In 1973 some of the existing plants around New York City's Jamaica Bay were already more than 70 years old. Their systems were outdated, incapable of keeping up with the city's population explosion and obviously unable to treat waste from homes that were not connected to the system. The community of Broad Channel, which sits in the middle of Jamaica Bay finally got sewers in the late 1980s. In 2010, The Littoral Society, along with the Jamaica Bay Ecowatchers, NY/NJ Baykeeper, and the Natural Resources Defense Council threatened to sue the city under the Clean Water Act if they didn't upgrade the four waste water treatment plants that ringed Jamaica Bay. In 2011 New York City pledged 100 million dollars for upgrades to cut nitrogen load from the plants in half by 2020, as well as \$15 million for marsh restoration. In 2011 a previously planned \$400 million plant was opened in Canarsie, Brooklyn, to treat storm water and sewage from the city's combined sewer systems. And in 2014, as part of the 2011 pledge, the City of New York completed an \$83 million upgrade at an existing plant in Queens to reduce nitrogen load in the bay. Additional upgrades are ongoing. Today Jamaica Bay is in much better shape than it was in 1973, but the nitrogen load still needs to be reduced further to return the bay to its former health.



This Page: June, 1973, original caption: Rusty oil cans pile up near a home in Broad Channel, a Jamaica Bay community with numerous pollution problems. Photo by Arthur Tress/ DOCUMERICA.

Today, New York City's Broad Channel is a much cleaner community, although problems continue. Since 1985 Broad Channel has been the home of the American Littoral Society's Jamaica Bay office, which organizes clean-up efforts, restoration projects and field trips. In 1986, the Society started the New York State Coastal Cleanup by cleaning four beaches. Today, over 250 shorelines are cleaned and documented annually. Over the past 30 years, the Society has removed over 50 tons of debris from Jamaica Bay's marshes and beaches.

This Page: June, 1973, original caption: Abandoned car in Jamaica Bay. Photo by Arthur Tress/ DOCUMERICA.

In 1978, New York City collected 79,000 abandoned cars from its streets. During the 1970s and 1980s, abandoned cars were a common sight in the marshes and creeks of Jamaica Bay. A big effort by New York City parks and environmental groups stopped the abuse and few cars are seen in the bay today. Abandoned boats have continued to be a problem, but since 1990, the Society's *Operation Jamaica Bay Clean Sweep* has removed over 200 derelict boats and abandoned docks from the bay.



This Page: October, 1973, original caption: Exhibit at the First Symposium on Low Pollution Power Systems Development held at the Marriott Motor Inn, Ann Arbor. Vehicles and hardware were assembled at the EPA Ann Arbor Laboratory. Part of the exhibit was held in the motel parking lot. Photo shows participants looking over the Esb “Sundancers”, an experimental electric car. Photo by Frank Lodge.

The electric vehicle (EV) was invented in the 19th century and by 1900, 38 percent of automobiles were powered by electricity. However, by the 1920s, the EV lost out to gas powered vehicles and did not regain traction until the 21st century. Even though in 1971 an EV had been driven on the moon, neither the 1973 oil crisis nor the 1979 energy shortage could spur car manufactur-



This Page: October, 1973, original caption: Mary Workman holds a jar of undrinkable water that comes from her well, and has filed a damage suit against the Hanna Coal Company, Steubenville (Jefferson county, Ohio). Photo by Erik Calonius/ DOCUMERICA.

In 1974, Congress passed the Safe Drinking Water Act, allowing the EPA to regulate the quality of public drinking water. Despite the law, problems still occur. In 2014, the City of Flint, MI, switched its local water supply from Lake Huron to the Flint River, which was rich in iron. The iron in the water corroded home water supply lines, which were made of lead. As a result, many children in the community tested positive for lead poisoning. An anti-corrosive agent could have prevented the problem. An investigation revealed that Federal law had not been followed. Without the law, the city could not have been forced to change the water supply back to Lake Huron. Sadly, problems still continue in Flint, because the damaged lines still have not been replaced.



ers to put electric vehicles into mass production. In 2017 China announced it would establish aggressive targets for car manufacturers to up their EV production to get gas and diesel vehicles off China's roads to combat air pollution. Tesla and Chevy currently lead the charge in the United States, and Renault in Europe, but other manufacturers, including luxury brands like BMW have gotten into the game. Meanwhile nearly half of all EVs in the United States are sold in California, which has some of the highest air pollution levels in the country. Car emissions are responsible for 20% of global warming in the United States. Automotive exhaust also causes acid rain, which damages both the air and the oceans. Widespread use of EVs would significantly reduce all of these problems.



This Page: May, 1973, original caption: The George Washington Bridge in heavy smog. View toward the New Jersey side of the river. Photo by Chester Higgins/DOCUMERICA.

In 1953 a 6-day smog event killed an estimated 220-240 people in New York City. Two additional smog events, one in 1963 that killed at least 300 people in a two week period, and one in 1966 that is estimated to have killed 80 people over the Thanksgiving weekend, forced state and city officials to address the problem. The city identified coal burning energy plants, apartment incinerators and city busses as major culprits. In 1970 the Clean Air Act displaced the Air Quality Act of 1967, and gave the federal government the power to impose air quality standards on states. Since 1966, sulfur dioxide levels and other air pollutants have been drastically reduced. One factor has been the conversion of buildings' heating systems from coal and oil to natural gas. Great strides have been made, but more work needs to be done. In 2013 the City of New York estimated that in a single year 2,700 premature deaths could still be attributed to air pollution.

Building A Stronger Delaware Bay

By Captain Alek Modjeski





In 2012, Hurricane Sandy's powerful westerly winds caused a storm surge so strong it stripped the sand right off most of the beaches on the New Jersey side of Delaware Bay. The sand was washed into adjacent marshes, exposing large sections of peat and leaving the sand well above the high-tide line.

In the storm's aftermath, conservation groups rallied together with community and state leaders, local biologists, and local contractors to deal with the environmental damage.

"It was a crisis response; we were racing against a firm deadline of the horseshoe crabs arriving on the beach," said Tim Dillingham, Executive Director of the American Littoral Society. "But we were also intent on rebuilding habitats along Delaware Bay in order to strengthen the ecology, communities, and economy of that area. We set out to build partnerships and relationships that would invest everyone in working for a healthy and resilient Delaware Bay."

The immediate concern was that

Previous Page: Volunteers carry shell bags into the water to be placed on the reef during the 2nd Annual "Shell-Abriation" at Moores Beach in 2016. Photo by William Reinert/ American Littoral Society.

This Page: Executive Director Tim Dillingham (left) and Elizabeth Freiday, Private Lands Coordinator of the U.S. Fish & Wildlife Service's New Jersey Field Office (right), work with volunteers to build a new oyster reef at Dyer Cove in 2017. Photo by David Hawkins/American Littoral Society.



nearly 70 percent of horseshoe crab beach habitat was destroyed and its loss imperiled not only the horseshoe crabs that spawn there, but also shorebirds like the Federally listed Red Knot, which stop on those beaches each spring to feed on crab eggs before flying to their nesting grounds in the Canadian Arctic. The birds and crabs help fuel a multi-million-dollar annual ecotourism industry in New Jersey's Delaware Bayshore region.

"The horseshoe crabs can't lay eggs on these beaches because the exposed sediment is anoxic [devoid of oxygen]. If the crabs were to lay eggs here, they would just die," said local biologist Larry Niles. "In just one day, these very



important beaches went from highly suitable to unusable.”

Just days after the storm ended, over a mile of damaged horseshoe crab beach habitat was restored. With further funding from the United States Fish and Wildlife Service (USFWS) and the National Fish and Wildlife Foundation (NFWF), the Littoral Society, which oversaw the project, was able to continue efforts. By 2017 the various partners had restored eight Delaware Bay beaches to their pre-Sandy footprints by bringing in more than 200,000 cubic yards of coarse-grained sand and removing 2,000 tons of rubble. The Littoral Society restoration team also designed and constructed five inter-tidal oyster reefs

to keep the sand on the beach, while beginning work to restore portions of the marsh behind those beaches.

“No one seemed to care about [Reeds] beach before,” said local resident Harry Bailey. “Storms came and destroyed the beaches, and no one came to fix it. These organizations came in; now the beach is built up, the horseshoe crabs are back, and birders from all over the world come here to see the birds.”

“The economy of Cape May County is so heavily tourism dependent, and more and more people come to the bay because of the scenic beauty and the wildlife,” said Cape May-Lewes

Ferry Marketing Manager Michal Porch. “It’s in our best interest to maintain the economy and peoples’ jobs by protecting and preserving the environment.”

For the construction companies involved, millions of dollars of the grant funding went directly to them and further stimulated local businesses.

“It’s what drives our economy down here,” said JR Heun of H4 Enterprises. “Without the tourism, the infrastructure wouldn’t be there for us to have our workload.”

However, this restoration may mean more to the bay communities, the residents, the businesses, and the economy of the bay than simply protecting streams of revenue.



This Page: Horseshoe crabs spawn on Thompsons Beach in 2015 as the restoration of the beach comes to an end. Photo by Jan Van der Kam.

Facing Page: Heavy equipment is used to place sand during the Kimble's Beach restoration in 2014. Photo by Shane Godshall/ American Littoral Society.

On Veterans Day in 2017, American Littoral Society Restoration Program Director Captain Al Modjeski (left) and Littoral Society Veteran Intern member Bill Anderson dedicate the oyster reef at Thompsons Reef to all members of the United States Air Force. Modjeski is an Air Force veteran and Anderson is an Army veteran. The Society dedicated a previous reef to the US Army. Photo by Quinn Whitesall/ American Littoral Society.

As part of the restoration, the Society began a paid U.S. Military Veteran Intern Program, where local veterans were hired to help with the restoration work and monitoring.

That program “has given me something to do and I’m learning as I’m doing it, so I’m enjoying it tremendously,” said U.S. Army Veteran William Anderson, regarding his internship.

The Society also held Local Leader Focus Groups to engage surrounding municipalities, and community events like annual “Shell-a-Brations,” where hundreds of volunteers were involved in constructing the oyster reefs at restored beaches. Tying together all of those other efforts were yearly “Veteran’s Day on the Bay” gatherings, where the reefs were named to honor U.S. military veterans



and the resolve of the Bay community to persevere against all odds.

“I think it’s very important that with this project, these organizations are helping both veterans and youth as well as educating people about the environment and how important it is to take care of it,” said former mayor of Middle Township Tim Donohue. “It’s good to get kids and families involved in the project to understand the significance of the Bay.”

Though it has been only five years since the storm, the Society and its

partners hope to continue to holistically restore the Bay, and thereby help create even more sustainable and resilient natural and human-built communities that are informed by events of the past in order to be better prepared for the future.

Captain Alek Modjeski is the Habitat Restoration Program Director for the American Littoral Society.

A version of this article appeared as a guest post on the Department of the Interior’s USFWS northeast blog.

The Recovery of New

By Kenneth W. Able and Gabriel Coia



Jersey's Mullica Valley



The link between events on land and those under the water's surface are constant and intimate. But these have varied in intensity and location over recorded history. This is especially true relative to the "industrialization" of the Mullica Valley watershed in southern New Jersey from the late 1600's to the late 1800s. Since most industry died in the valley more than one hundred years ago, that area probably now more closely resembles the way it looked 2000 years ago than it did 200 years ago.

This can be seen by looking at the history of individual industries in the valley from the time of the earliest human inhabitants to the present (Fig. 1).

The Lenni-Lenape colonized the area after the last glaciation about

10,000 years ago. They were pre-industrial hunter-gatherers and evidence of their activities can still be found in the middens they left behind. Filled with shells of clams, oysters, and mussels, the most famous, the Tuckerton Mound, remains in the Great Bay Wildlife Management area. They fished as well, especially in the spring when the river herrings came up the estuary from the ocean in large numbers in order to spawn in easily accessible shallow waters.

When European settlers moved into the valley in the 1600s, mechanized industry soon followed. Most of this was driven by water-powered mills. Freshwater streams were dammed up throughout the watershed for grist, saw, and paper mills. Most of these mills no longer

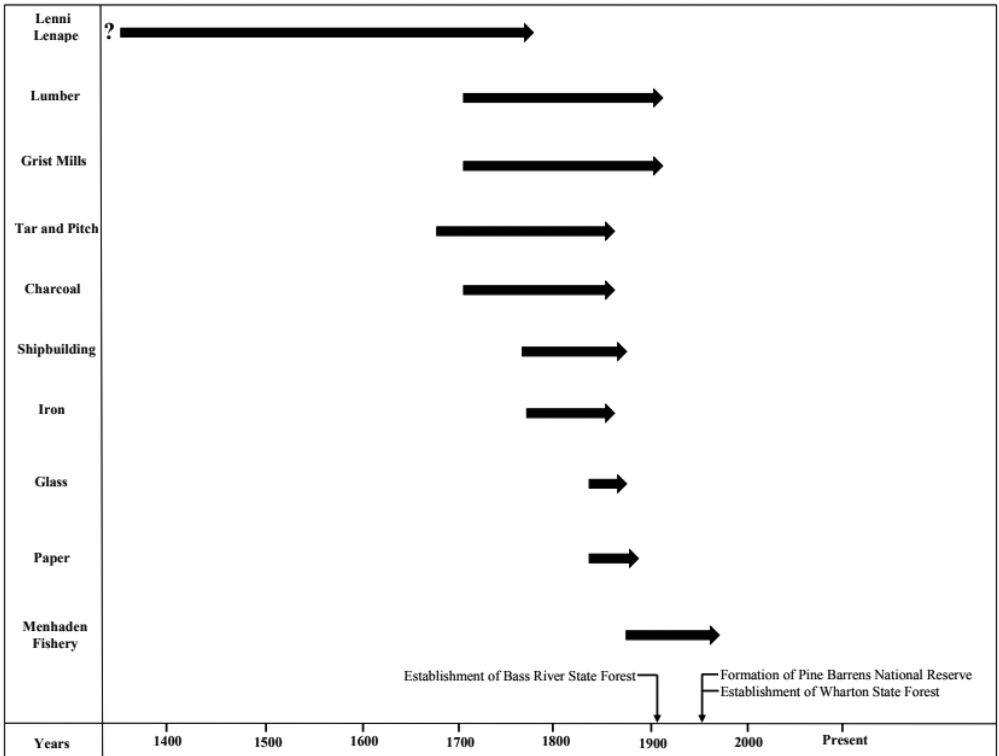


Figure 1. Timeline for individual industries in the Mullica Valley.

exist, though ruins still remain. An early aerial image shows one of the larger ones that formed New Pond on the Mullica River during the early 1930s (Fig. 2).

Other early industries in the valley included lumbering and charcoal manufacture, both of which stripped large areas of trees. The presence of durable and light Atlantic white cedar trees made shipbuilding an important business in the region, but by the late 1800s, clearcutting had killed that business too. The shipbuilding industry happened concurrently with the bog iron mining business. Mining for bog iron in the streams of the watershed developed quickly, and just as quickly it died out when the streams were depleted of ore. By the 1850s, when high-grade ore and coal was discovered in Pennsylvania, the iron industry disappeared from the Mullica region .

By the mid-1800s, in response to

the decline of these other industries, many manufacturing centers turned to glass making. Paper manufacturing also sprung up as an industry by harvesting local salt hay marshes. However, both activities also quickly vanished.

Thus, approximately 200 years ago, as the resources of the area were stripped clean and as other regions formed competing industries, the industrial era in the Mullica Valley was largely over.

A few industries managed to last into the 1900s and some continue until this day. The menhaden fishery, which developed in the early 1800s in the lower watershed, where access to the ocean and deeper waters was possible lasted into the 1900s. Several fish meal factories were opened in the area to process the catch, but the last surviving factory closed in the 1960s when overfishing had reduced abundance. Another industry, cranberry growing, was able to adapt

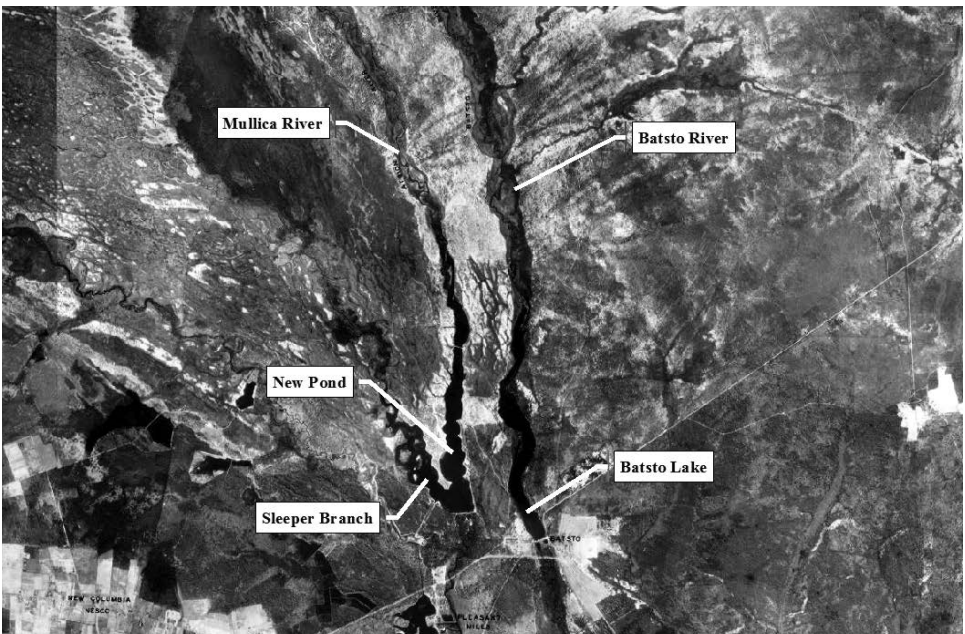


Figure 2. Aerial image from 1930 of an old dam that formed New Pond on the main stem of the Mullica River and the Sleeper Branch.

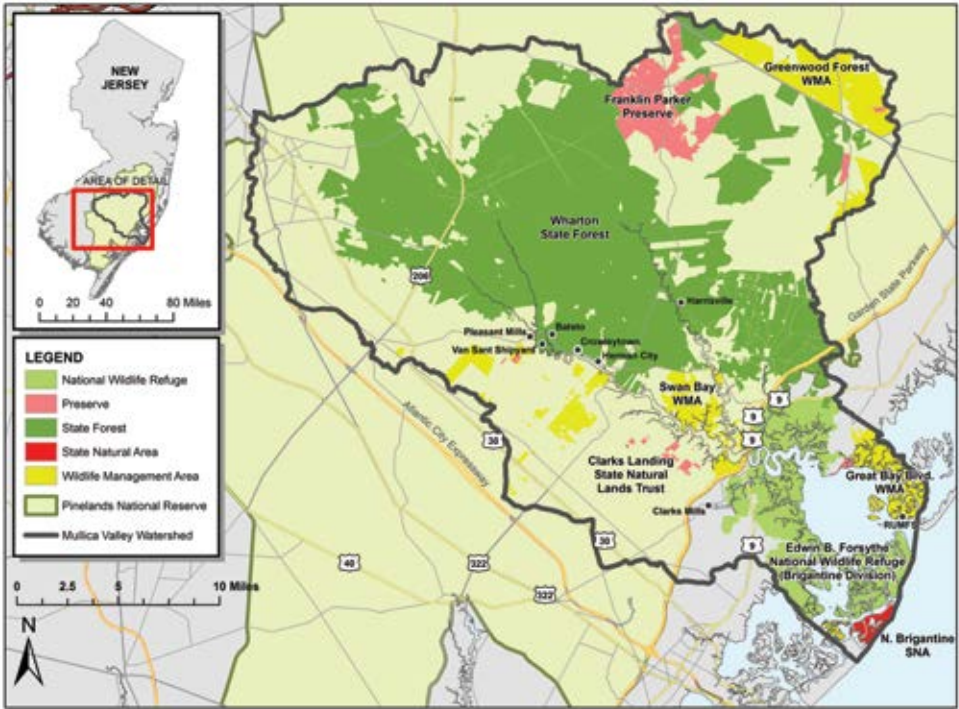


Figure 3. Mullica Valley with watershed boundary including state and federal holdings.

and still survives. Blueberry farming developed in the early 1900s and also continues.

Once many of its resources had been exhausted and industrialization in the watershed slowed, the population in the valley began to drop and public ownership of the watershed became possible (Fig. 1). A combination of Mother Nature and Father Time allowed the forests, intertidal meadows, and waterways to recover to their pre-industrial conditions. Mankind also gave a helping hand.

The formation of the Civilian Conservation Corps (CCC) during the Great Depression of the 1930s had a significant impact on the recovery of the Mullica Valley. Based from two work camps, one at Green Bank and another at Bass River, the CCC undertook extensive reforestation efforts. Unfortunately, by building a number of dams like the

one at Lake Oswego, the CCC also delayed the recovery of some waterways.

The largest manmade assist came in the mid-1950s with the creation of two protected areas, the Pineland National Reserve and Wharton State Forest (Fig. 3). Today they represent a large portion of the watershed and their creation further protected and enhanced the valley, thus making it available and attractive for research and education. In 1997, in recognition of its natural value, the 110,000 acre Jacques Cousteau National Estuarine Research Reserve was established in the lower part of the Mullica River watershed.

Today, the Mullica Valley consists of heavily forested areas with extensive marshes along the waterways (Fig. 4). The reforestation, along with the decline of the local industries, is credited for the excellent water quality in the Mullica



Figure 4. The Mullica Valley watershed is heavily forested at Jobs Creek, a tributary to the Bass River where it is crossed by Route 9.

Valley estuaries which have high levels of dissolved oxygen. According to Johns Hopkins University's Grace Brush, who did many years of extensive studies, the deforestation of the Chesapeake Bay area

is largely responsible for the decline of the Chesapeake and its associated fauna.

While much of the Mullica Valley watershed is protected, some threats remain and others are developing. Lagoon developments sprang up in the 1960s including those at Mystic Islands (Fig. 5) and Sweetwater Haven. These housing developments were created by dredging marshes and riverbanks. Fortunately, because of the detailed negative environmental impact evaluation of the Beach Haven West project in Barnegat Bay, the threat of development is less likely in the future.

Heavy development



Figure 5. Large lagoon developments at Mystic Islands (right) and Osbourne Island (left) which destroyed salt marsh as seen in the foreground.



Figure 6. Helicopter image of a Phragmite invasion as indicated by light brown irregular ovals. Invasive Phragmites displaced salt march cordgrass on the marsh surface along the Mullica River.

had an immediate impact on the locations where these projects were sited, but the subsequent increase in the human population, especially, on the periphery of the watershed, have heavily taxed its aquifer through major water withdrawals. This caused many ponds and streams to dry up, and the aquifer continues to be subjected to continued pressure from human consumption.

Invasive species also pose a threat. The hybrid form of common reed (Phragmites), likely introduced at the time of European settlement, impacts the natural flora and fauna, especially in the brackish portions of the watershed (Fig. 6). Invaders like the green crab have been in the United States nearly as long, but other invasives such as Japanese shore crabs and a new shrimp

(Palaemon) are recent additions. All of them compete with other species for space and resources, thus crowding out the native populations.

The biggest threat to the post-industrial watershed is climate change and sea level rise. This is becoming more apparent as “nuisance flooding” becomes more frequent, and as major storms like Sandy become more frequent and violent.

A more subtle but persistent indicator is the increasing prevalence of “ghost forests” especially Atlantic white cedar forests. As sea level rises, the Atlantic white cedar forests are being killed by the infiltration of salt water. Denuded, the rot resistant trunks continue to stand like sentries for years after. No longer capable of providing shelter for other flora and fauna they are harbingers of

what is to come.

These are all indicators of another round of shifting baselines during the post-industrial period, but it is important to understand the past so we can prepare for the future.

Dr. Kenneth W. Able is a Distinguished Professor of Marine and Coastal Sciences at Rutgers and director of the Rutgers University Marine Field Station in Tuckerton, NJ.

Gabriel Coia is an author, musician and photographer who grew exploring the Mullica Valley and swimming in its waters.

References

- Able, K.W. Station 119: From Lifesaving to Marine Research. Down the Shore Publishing. West Creek, New Jersey.
- Able, K.W. 2017. Manufacturing from Menhaden: A History in the Mullica Valley. Sojourn. South Jersey Culture & History Center.
- Brush, G. 2017. Decoding the Deep Sediments: The Ecological history of Chesapeake Bay. Chesapeake Perspectives. Maryland Sea Grant.
- Kinsella, T. and P.W. Schopp. 2015. Pine Barrens: Life and Legends. South Jersey Culture and History Center. Galloway, NJ.
- Pearce, J. E. 2000. Heart of the Pines. Batsto Citizens Committee, Inc. Hammonton, New Jersey.
- Pierce, A. D. 1957. Iron in the Pines: The Story of New Jersey's Ghost Towns and Bog Iron. Rutgers University Press. New Brunswick, New Jersey.
- Sebold, K.R. 1992. From Marsh to Farm: The Landscape Transformation of Coastal New Jersey. U.S. Department of the Interior, National Park Service, New Jersey Coastal Heritage Trail. Washington, DC.
- Sebold, K.R. and S. A. Leach. 1966. Historic Themes and Resources within the New Jersey Coastal Heritage Trail: Southern New Jersey and the Delaware Bay: Cape May, Cumberland and Salem Counties. U.S. Department of the Interior, National Park Service, New Jersey Coastal Heritage Trail. Washington, DC.
- Thomas, L. S. 1983. The Pine Barrens of New Jersey. Department of Environmental Protection, State of New Jersey.
- Wacker, P. O. 1979. Human Exploitation of the New Jersey Pine Barrens before 1900. Pp. 3 – 23. In: R. T. Forman (Ed). Pine Barrens: Ecosystem and Landscape. Academic Press, New York.
- Weiss, H. B. and R. J. Sim. 1956. The Early Grist and Flouring Mills of New Jersey. New Jersey Agricultural Society, Trenton, New Jersey.
- Weiss, H. B. and G. M. Weiss. 1965. Some Early Industries of New Jersey (Cedar Mining, Tar, Pitch, Turpentine, Salt Hay). New Jersey Agricultural Society. Trenton, New Jersey.

Dr. Kenneth W. Able is a Distinguished Professor of Marine and Coastal Sciences at Rutgers and Director of the Rutgers University Marine Field Station in Tuckerton, NJ.

Gabriel Coia is an author and musician who grew up exploring the Mullica Valley and swimming in its waters.

Calendar of Events

- Saturday, December 16, 5 p.m.-9 p.m.** – 28th Annual Holiday Fundraiser, Far Rockaway, NY
- Monday, January 1, 11a.m.-1p.m.** – New Year’s Day Beach Walk at Fort Tilden, NY
- Monday, January 1, 11a.m.** – New Year’s Day Beach Walk, Sandy Hook, NJ
- Friday – Sunday, January 12-14** – Montauk Winter Weekend, Montauk, NY
- Saturday, January 20, 10 a.m.** – Seal and Waterfowl Walk, Sandy Hook, NJ
- Saturday, February 3** – Wreck Pond Citizen Science Pot Luck Luncheon, Spring Lake NJ
- Thursday, February 15, 10 a.m.** – Seal and Waterfowl Walk, Sandy Hook, NJ
- Saturday, February 17**, Operation Oyster Two Rivers Pot Luck Luncheon
- Saturday, February 24, 10 a.m.-1 p.m.**, late Winter Thaw bird walk at Jamaica Bay
- Saturday, February 24, 10 a.m.** – Seal and Waterfowl Walk, Sandy Hook, NJ
- Wednesday, February 28, 10a.m.** – Seal and Waterfowl Walk, Sandy Hook, NJ
- Saturday, March 10** – Citizen Science Training (and re-training) at Wreck Pond
- Sunday, March 11** – Rumson St. Patrick’s Day Parade
- Tuesday, March 20, 5 p.m.** – Spring Equinox Walk, Sandy Hook
- Saturday, March 24, 10 a.m.-1 p.m.** – Early Spring Migration Bird walk at Jamaica Bay Refuge
- Saturday, March 31**, 4th Annual Shell-a-bration at Dyers Cove, Delaware Bay, NJ
- Saturday, April 7, 2 p.m.** – Annual 5K to Care for the Coast, Asbury Park, NJ
- Saturday, April 14, 10 a.m.** – Holly Forest Walk, Sandy Hook, NJ

- Saturday, April 21, 8 a.m.** – Surf Fishing Clinic, Sandy Hook, NJ
- Saturday, April 21** – Earth Day Grass Planting at Sandy Hook.
- Sunday, April 22, 11 a.m.-2 p.m.** – Jamaica Bay Clean-up
- Sunday, April 22, 10 a.m.** – Earth Day Beach Clean-up Moore’s Beach,
Maurice River Twp.
- Friday, April 27, 4 p.m.** – Holly Forest Walk (Arbor Day) Sandy Hook, NJ
- Saturday, April 28, 11 a.m.-2 p.m.** – Spring Migration Bird walk at
Jamaica Bay Refuge
- Tuesday, May 15, 6 p.m.** – Horseshoe Crab Walk (New Moon),
Sandy Hook, NJ
- Thursday-Sunday, May 17-20** – Assateague/Chincoteague Weekend
- Saturday-Sunday, May 19 and 20** – Ocean Fun Days at Sandy Hook and
Island Beach State Park. Staffed by interns.
- Friday, May 25, 7:30 p.m.** – Singles Night Horseshoe Crab Walk –
Fortescue Beach
- Saturday, May 26, 9 a.m.-12 p.m.** – Annual Horseshoe Crab Festival at
Jamaica Bay
- Sunday, May 27, 5-8 p.m.** – Sunset Ecology cruise, NY
- Tuesday, May 29, 6p.m.** – Horseshoe Crab Walk (Full Moon),
Sandy Hook, NJ
- Friday-Sunday, June 1-3** – Montauk Spring Weekend, Montauk, NY
- Saturday, June 2, 1 p.m.** Horseshoe Crab Walk - 1 p.m. – Thompson’s
Beach, Delmont
- Saturday, June 9, 11 a.m.-5 p.m.** Member’s Day
- Friday, June 15, 9:30 a.m.** Pine Barrens Canoe Trip, Mick’s Canoe
- Thursday, June 21, 6 p.m.** – Summer Solstice Walk, Sandy Hook, NJ
- Saturday, June 23, 10:30 a.m.** Fossil Hunt, Colts Neck, NJ

National Headquarters
18 Hartshorne Drive
Highlands, NJ 07732
(732) 291-0055

Executive Director

Tim Dillingham
tim@littoralsociety.org

Assistant Director

Pim Van Hemmen
pim@littoralsociety.org

Finance and Administrative Director

Lori Singer
lori@littoralsociety.org

*Development, Membership and
Outreach Director*

Laurie Bratone
laurie@littoralsociety.org

Fish Tagging Program Director

Jeff Dement
jeff@littoralsociety.org

Education Director

Lindsay Weil
lindsay@littoralsociety.org

Communications Manager

David Hawkins
dave@littoralsociety.org

Ocean Planning Manager

Helen Henderson
helen@littoralsociety.org

Habitat Restoration Director

Captain Al Modjeski
alek@littoralsociety.org

Habitat Restoration Coordinator

Zack Royle
zack@littoralsociety.org

Habitat Restoration Technician

Julie Schumacher
julie@littoralsociety.org

*Administrative and
Membership Assistant*

Diana Lucatelli
diana@littoralsociety.org

Administrative Assistant

Ellen Haggerty
ellen@littoralsociety.org

Delaware Bayshore Office
1025 North High Street
Millville, NJ 08332
(856) 825-2174

Delaware Bayshore Program Director

Emma Melvin
emma@littoralsociety.org

Habitat Restoration Coordinator

Shane Godshall
shane@littoralsociety.org

Habitat Restoration Technician

Quinn Whitesall
quinn@littoralsociety.org

*Delaware Bayshore Conservation
Coordinator*

Sarah Johnson
sarah.johnson@littoralsociety.org

*Delaware Bayshore
Outreach Coordinator*

Zach Nickerson
z.nickerson@littoralsociety.org

Trenton Office
204 State Street, 3rd Floor
Trenton, NJ 08608

Northeast Chapter
28 West 9th Road
Broad Channel, NY 11693
(718) 474-0896

Chapter Director
Don Riepe
don@littoralsociety.org

Assistant Chapter Director
Elizabeth Manclark
elizabeth@littoralsociety.org

Habitat Restoration Coordinator
Lisa Scheppeke
lisa@littoralsociety.org

Beach Cleanup Coordinator
Natalie Grant
nysbc@littoralsociety.org

Boston Office
62 Summer Street
Boston, MA 02110
(857) 957-0943

Ocean Policy Program Director
Sarah Winter Whelan
sarah@littoralsociety.org

Healthy Oceans Coalition Coordinator
Jenna Valente
j.valente@littoralsociety.org

Southeast Chapter
(941) 966-7308

Chapter Coordinator
John Sarkozy
mangrovejohn@verizon.net

Caring for the Coast Since 1961

The American Littoral Society promotes the study and conservation of marine life and habitat, defends the coast from harm, and empowers others to do the same.

The Underwater Naturalist welcomes contributions from its members, the scientific community and readers-at-large.

To submit an article, a letter to the editor, or to propose a story for publication, please contact Pim Van Hemmen at pim@littoralsociety.org.

www.littoralsociety.org



GIVE THE GIFT OF MEMBERSHIP

If you are enjoying this issue of the Underwater Naturalist chances are you are already a member or supporter of the American Littoral Society (or perhaps you found it in a friend's restroom 😊).

Funding from membership dues allows us to publish the magazine. Therefore, it is critical that our membership base continues to grow. So when you need a special gift for family or friends, please consider giving a membership with the American Littoral Society. It's an affordable gift, for an extraordinary experience. Members receive two issues of the Underwater Naturalist, two issues of the Littorally Speaking newsletter, an invitation to Members Day and other discounts and membership perks. Membership puts you in touch with the latest environmental issues and news. So please join the Society, or if you already have, please give the gift of membership to a friend.



I WANT TO HELP CARE FOR THE COAST

Enclosed is my check in the amount of \$_____ for the membership category checked below.

My company will match my membership contribution and I have enclosed a matching gift form.

- \$30 - Senior/Student
- \$40 - Individual
- \$50 - Family
- \$100 - Supporting
- \$250 - Advocate
- \$500 - Littoral Leader
- Or more \$ _____

My contact information has changed

Email: _____

Phone: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

*Please make check payable to American Littoral Society and mail to
18 Hartshorne Drive, Suite 1, Highlands, NJ 07732.*

For a credit card payment, please visit www.littoralsociety.org or fill out the below.

All contributions are tax-deductible.

I'd like to pay by credit card

Name as it appears on card: _____

Billing address: _____

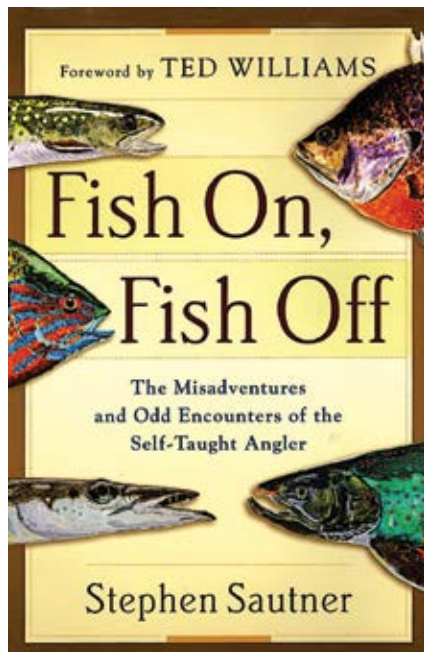
Card No: _____

Exp. Date: ____/____ Security Code: _____ Amount of Charge: \$ _____

The American Littoral Society promotes the study and conservation of marine life and habitat, protects the coast from harm, and empowers others to do the same. Caring for the Coast Since 1961.

Fish On, Fish Off
The Misadventures and Odd Encounters of the Self Taught Angler

Author: Stephen Sautner
 An imprint of Rowman and Littlefield,
 Guilford, CT
 Distributed by National Book Network
 Copyright © 2016 by Stephen Sautner
 Reviewed by Jeff Dement, American
 Littoral Society Fishtagging Program
 Director



Author Stephen Sautner, is a former trustee of the American Littoral Society, and a frequent contributor to the Underwater Naturalist. I have been an admirer of his literary works and style for some time now with my favorite satirical submission being, “Interview with a Striped Bass” (Vol. 28, Number 1, page 11). The interview is a must read for any striped bass enthusiast. Additionally, another reason to like this book is because it is dedicated to the late Dery Bennett (1930 – 2009). Bennett was the Executive Director of the American Littoral Society from 1968 – 2003 and is considered its spiritual father.

Being that both the author and I are New Jersey born and raised anglers, I can appreciate Stephen’s New Jersey centric take and experiences of, “The one that got away.” I could especially relate to some of the author’s Garden State style fishing tales, such as the opening day of trout season travails in suburban New Jersey and the high-summer bluefish party boat experience, replete with blood, gore, and shirtless, well-tanned, intoxicated head boat bluefish bullies. Most residents of the other 49 states think that New Jersey is the festering pustule of

petro-chemical nightmares that surround Newark Airport. Stephen and other Jersey anglers, including me know better.

While one could fish exclusively in New Jersey waters and experience a lifetime of world-class fishing, Stephen takes us on a world tour of angling stories and misadventures. From fishing semi-secret salmon streams in northern Canada, to fishing for tarpon from a bridge in the Florida Keys, and everything in-between, Stephen Sautner covers it all.

I wholeheartedly approve the reading of this great collection of fishing tales, especially for the winter fireside reading list. However, be forewarned, this book may cause spontaneous laughter and chuckling, and or, the compulsion to book a fishing excursion to some far off land that has been on your angling bucket list for years.

Stephen Sautner shows us that fishing is about a lot more than simply wetting a line and waiting for a jerk on the other end. It is about the collection of experiences, both shared and personal, that we accumulate over a lifetime of chasing “the one that got away”.



18 Hartshorne Drive, Suite 1
Highlands, NJ 07732
www.littoralsociety.org

Nonprofit Org.
U.S. Postage Paid
New Brunswick, NJ
Permit # 1