



2025 Annual Report



New Jersey Natural Lands Trust
Preserving New Jersey's Natural Diversity

NEW JERSEY NATURAL LANDS TRUST

2025 ANNUAL REPORT

STATEMENT OF PURPOSE

The New Jersey Natural Lands Trust, created by legislation in 1968, has been preserving New Jersey's biodiversity for more than 50 years. The intent of the Trust's enabling legislation was to create an independent agency with the mission of preserving land in its natural state for enjoyment by the public and protecting natural diversity through the acquisition of open space. The Trust preserves land primarily by donations of open space through acquisition of title in fee simple or of conservation easements, and manages its properties to conserve endangered species habitat, rare natural features, and significant ecosystems. The Trust invites passive use by the public for recreational or educational purposes wherever such use will not adversely affect ecological communities and biological diversity.

The Trust also recognizes that ownership and management alone are not enough to achieve its mission. Public education is an integral function of protecting natural diversity. The Trust distributes information designed to convey a conservation ethic for the protection of open space and its natural values.



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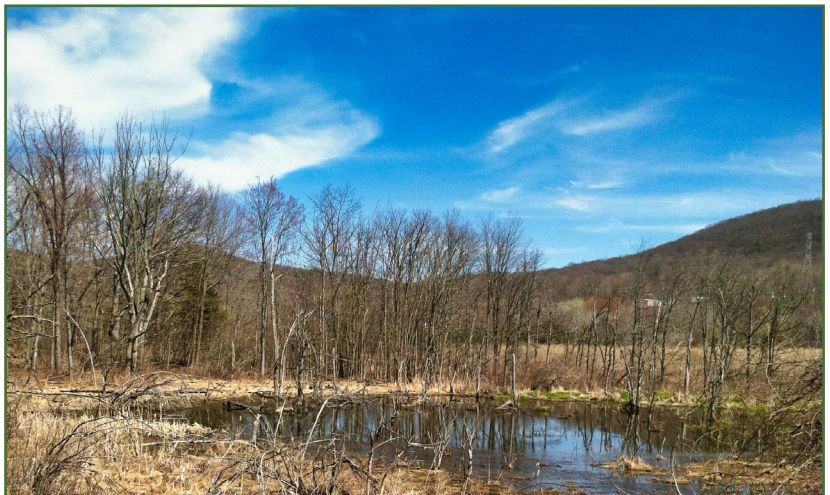
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IN 2025...

The New Jersey Natural Lands Trust added approximately 400 new acres to its stewardship of more than 120 preserves throughout the state that comprise the Trust's system of nature preserves.

These 2025 acquisitions expanded the Bears Head, Congleton, Four Mile Branch, Lincoln Grove, Mackenzie's, Thompsonstown, and Wallkill preserves.



Another 400 acres of Trust preserves open to visitors to explore. Clockwise from top left: Mackenzie's, Four Mile Branch, Wallkill, Thompsonstown, and Lincoln Grove preserves.

2025 Acquisition Highlights

By: Cari Wild

We highlight three 2025 acquisitions: one in North Jersey, one in Central Jersey, and one in South Jersey.

North Jersey: Wallkill

The Trust's Wallkill Preserve protects habitat along the Wallkill River, a slow-moving river, nearly 90 miles long that, like the Nile, flows north. Its headwaters are at Lake Mohawk in Sussex County where it spills over a dam and winds its way north into New York en route to the Hudson River. The Wallkill was reportedly used as a major transportation route for Native Americans moving between summering areas and hunting grounds. Waterfowl also utilize the river during their migrations, hiding in the patchwork of backwaters, oxbows, and beaver ponds. The entire Wallkill River watershed provides critical habitat for threatened and endangered plants and animals, including the state endangered bobcat, underscoring the significance of this preserve.

This year, the Trust added two parcels totaling 50 acres to the Wallkill Preserve, bringing the preserve's current acreage to 428. The newly acquired land along Route 517 in Ogdensburg Borough, Sussex County, consists mostly of forested freshwater wetlands traversed by the Wallkill River.

The Wallkill addition is mapped as "core habitat" by New Jersey Fish & Wildlife as part of its Connecting Habitat Across New Jersey ([CHANJ](#)) project. CHANJ is a blueprint for strategic habitat conservation that identifies areas crucial for wildlife habitat connectivity, offering wildlife a fighting chance against New Jersey's steady urbanization, dense networks of roads, and changing climate. According to CHANJ, "animals need to be able to move through the landscape to find food, shelter, mates, and other resources. Without [the] ability to move, healthy populations simply will not persist over the long term."

To help prevent plant depredation from deer browse, Wallkill Preserve is open to deer hunting with online registration on the Trust's website. Because of its ecological significance, the Trust will continue to prioritize additions to this preserve.



LEFT: The Wallkill River. **RIGHT:** The Wallkill Preserve provides bobcat habitat.

Central Jersey: Lincoln Grove

As Ralph Waldo Emerson said, “Adopt the pace of nature; her secret is patience.” The Trust’s 2025 acquisition of two parcels totaling 109.6 acres in Franklin Township, Somerset County, and South Brunswick Township, Middlesex County, as additions to the Lincoln Grove Preserve was more than two decades in the making, requiring a lot of patience.

“Adopt the pace of nature; her secret is patience.” Ralph Waldo Emerson

The two parcels, located on opposite sides of Route 27, include a mix of former agricultural fields with overgrown planted tree nursery stock and wetland hardwood forest. The NJ Department of Transportation (NJDOT) had purchased the parcels as part of its planned expansion of Route 92 from Exit 8A of the Turnpike west to Route 206 near Rocky Hill in Somerset County. In 1994, the Turnpike Authority determined that Route 92 would not be expanded west of Route 1 making the two parcels surplus property. In 2002, NJDOT offered to donate the surplus property to the Trust. Before the donation was finalized, NJDOT was persuaded by others to hold off on the donation so it could be used as compensation in future projects requiring wetlands permits. More than a decade later, the NJ Wetlands Mitigation Council approved the parcels as compensation for part of a Route 206 widening project. It then took more than another decade for the actual transfer.

These parcels now bring the Lincoln Grove Preserve to 250 acres and provide edge habitat along a mixed hardwood forest for a wide variety of songbirds including eastern yellow throat, catbird, and brown



Former nursery now Lincoln Grove Preserve.



Meadow of golden rod on a fall day at Lincoln Grove Preserve.

thrasher. The newly acquired forest surrounds a tributary to Carter’s Brook.

Preservation of these parcels completes a greenway around Kingston Village, one of the oldest communities in central New Jersey. These parcels connect the Trust’s Lincoln Grove Preserve with D&R Canal State Park, Rockingham Historic Site, Cook Natural Area, county-preserved land (known as the Holsten Farm), and the Trust’s Flemer Preserve. This greenway is especially noteworthy considering Kingston’s relationship to the Crossroads of the American Revolution and its listing on both the National and State historic registers. During the American Revolution, British and American Troops marched through Kingston many times. In fact, General George Washington paused in Kingston after the Battle of Princeton to evaluate tactical decisions. General Washington also stopped in Kingston en route to the Battle of Monmouth as well as establishing his headquarters at Rockingham during the 1783 Continental Congress. It is fitting that this greenway is now complete in time for the country’s Semiquincentennial, marking 250 years since the signing of the Declaration of Independence.

South Jersey: Thompsonstown

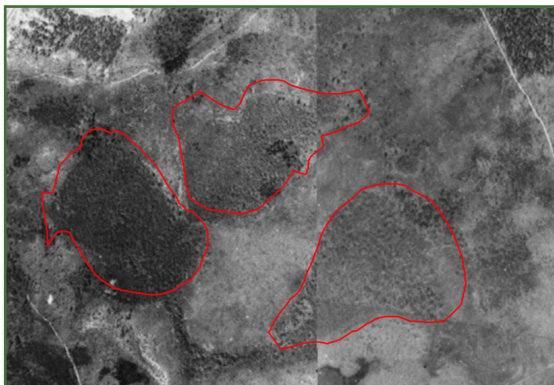
Named for the nearby site of a long-forgotten village along the east bank of the Great Egg Harbor River, the 240-acre Thompsonstown Preserve is a mix of pitch pine uplands and thick, hardwood swamp. This mix of forest types suits the state threatened barred owl and other wildlife that favor the deep forest habitat. Some isolated vernal ponds within this preserve provide habitat for state endangered Pine Barrens treefrog.

Established in 1994 thanks to a generous land donation, this preserve has continued to grow, with additional donations to the Trust and acquisitions by the Green Acres Program. Thompsonstown Preserve now is a hub connecting other public open space lands including the Trust's Hamilton and Catawaba preserves and Atlantic County parklands.

The 2025 five-acre acquisition fills an inholding within the preserve. Although it's relatively small in size, the property is comprised entirely of forested wetlands which have significant value as rare plant and threatened and endangered animal habitat and supports species such as the barred owl and species of concern such as the worm-eating warbler, Cooper's hawk, brown thrasher, and great blue heron.

Interestingly, Thompsonstown Preserve features three geological formations supporting distinct forested wetland types that are of high ecological value. Historical imagery shows these formations being relatively undisturbed going back to the 1930s.

To help prevent over browsing by deer, Thompsonstown Preserve is open to deer hunting with online registration on the Trust's website.



ABOVE: A deer path along the upland ridge at Thompsonstown Preserve and a view of the Thompsonstown Preserve forest.

LEFT: Three distinct geologic formations at Thompsonstown Preserve outlined in red.

Petty's Island Preserve: The Power of Partnerships

By: Linda Cairnes

For the past few years, the Trust has made a concerted effort to increase awareness of and opportunities for programming to local residents about Petty's Island in Pennsauken Township, located off the City of Camden's Delaware River shoreline. Our greatest success in engaging residents has been through establishing partnerships with community-based organizations and schools. Awareness has grown each year, especially in the neighborhoods along Camden's Delaware River shoreline, including North Camden, Cramer Hill, East Camden, and Waterfront South.

In 2025, the Trust worked with various partners to deliver 54 programs for 1,059 participants, increasing participation by over 50 percent from 700 in 2024. The Trust has developed relationships with community partners through collaboration on mutually aligned goals and objectives. Most partner engagement begins with Trust participation in stakeholder meetings or through assisting at events and activities in Camden communities. This participation leads to discussing what types of programs the community is looking for and then co-designing and delivering these programs. This year, the Trust delivered 24 co-designed community programs.

The co-design model has resulted in several interesting partnerships with unique goals. Landscape architecture students from the University of Pennsylvania's Weitzman School of Design visited Petty's in 2025. Their goal was to create landscape designs for space across the river near Penn Treaty Park and Rivers Casino on the Philadelphia waterfront—an area known in William Penn's days as Shackamaxon. Indeed, an early former name for Petty's was Shackamaxon Island. The visual and cultural perspective gained from visiting Petty's allowed students to critically examine the cohesiveness of the waterfront. It was also a great opportunity to discuss current development in Camden and the role of Petty's, along with issues around social and environmental justice. A visit to Petty's is now part of the Weitzman School of Design's curriculum.



Architecture Students from the University of Pennsylvania's Weitzman School of Design along Petty's Island shoreline across from Penn Treaty Park.

Another unconventional partnership that has developed is with the Edward D. Viner Center for Humanism at Cooper Medical School of Rowan University (Cooper Medical), which promotes humanistic healthcare practices to prioritize empathy, compassion, and respect in patient care. Cooper Medical has been drawn to public art in Camden and has engaged local artists (including Petty's own artist Priscilla Rios) to explore connections between art and health. This year, Priscilla reinstalled her 2024 art exhibit, *Nature's Embrace*, for several groups of Cooper Medical students. Visits to Petty's Island included tours led by Priscilla, not only focusing on her art, but also offering her perspective on living in Camden and strategies for medical professionals to reach communities that are sometimes hard to engage. The positive feedback from these programs has encouraged Cooper Medical to schedule dates for 2026 and beyond.

Authentic partnerships create understanding and trust within communities.

Priscilla also co-facilitated a walk and cleanup with the Camden Youth Advisory Council, a program that falls under the auspices of the Food Bank of South Jersey. Her work and words resonated with Camden teens who were excited about her art and with experiencing wildlife on Petty's Island.

UrbanPromise has become one of our strongest partners due to their heavy focus on the environment and outdoor access. Their goals closely align with the Trust's, and their skills are helpful with community engagement, including expanding student activities. For example, they operate a woodshop within the Camden Shipyard & Maritime Museum where students build canoes that they then regularly use on the Delaware River back channel. And they stepped in to help install several kestrel nest boxes on Petty's. The boxes required installation at least eight feet off the ground in an open field, difficult at Petty's due to soil issues. UrbanPromise was determined to find a solution and evaluated three-foot wooden posts already installed in a meadow near the former Crowley Marine terminal. With guidance from



Kestrel box installed at the former Crowley Marine terminal.

Tom Kulp, UrbanPromise's Director of Experiential Learning, the students used two-by-four inch lumber to extend the posts to the correct height and attach the boxes. After enjoying this project, the students constructed additional kestrel nest boxes and installed them on the north end of the island. When UrbanPromise held a fundraising event, a highlight was students helping donors to build nesting boxes. The donors were very impressed with both the students and their work on Petty's.

Over the summer months, the Trust hosted New Jersey Department of Environmental Protection (NJDEP) Youth Inclusion Initiative (YII) groups from the cities of Salem and Trenton for nature and history hikes on the island. After the Trust made some of its partners aware of the lack of funding to Camden youth due to federal funding cuts, YII expressed their interest in supporting Camden's participation in 2026.

One of the Trust's successful partnerships in 2025 was not with an organization, but with neighbors living just blocks away from Petty's Island, commonly referred to as the 36th Street Crew. The Trust



Urban Promise donors building kestrel boxes.

supported the Crew with neighborhood cleanups and food/clothing drives. The Crew is led by Yolanda Nunez and Eve Medina, both local activists proud of their neighborhood and its proximity to Petty's. In turn, the Crew regularly shows up at Trust programs with family, friends, and other neighbors.

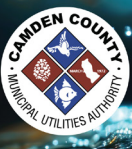


Members of the 36th Street Crew.

The Trust regularly partners with the Center for Aquatic Sciences (Center) to deliver a variety of programs. This year, Center staff hosted tours of Petty's Island for two organizations: Sustainable NJ and Climate Revolution NJ. They also facilitated a professional development opportunity for Stockton University's Climate Change Learning Collaborative, a regional center funded by the NJDEP to assist K-12 educators in meeting NJ Student Learning Standards in Climate Change. Petty's Island is a barometer for climate change, being susceptible to impacts from storms and droughts.

Some programs are a team effort. Trust and Center staff delivered three sunset bat hikes in July and August, with great turnout (including the 36th Street Crew). At each hike, everyone enjoyed the beautiful sunset, followed by a walk at dusk with detectors in hand for brown bats, Eastern red bats, and hoary bats as they flew overhead.

Another team effort was the Trust and Center partnering with Adventure Aquarium to host the annual Petty's Island RiverSweep. This cleanup is part of a national initiative by the Association of Zoos and Aquariums called Party for the Planet to celebrate Earth Week. RiverSweep resulted in the collection of 4,542 single-use plastic bottles, as well as random items, including a ladder, fire extinguisher, balls, helmets, buckets, plastic drums, tires, random toys, fishing line, lots of styrofoam, and a knee-high boot.



Record-Breaking Cleanup on Petty's Island: 144 Volunteers, 4,542 Plastic Bottles, and One Ladder Later....

On May 1st, Petty's Island saw its largest cleanup yet: 144 volunteers strong-gathering as part of the "Petty's Island River Sweep," an Earth Month event co-organized by Adventure Aquarium and the New Jersey Natural Lands Trust.

(continued on page 2)



The Journey of Water, Part III:

Oxygen at Work: The Secret Life of Clean Water

If you've ever flushed a toilet, washed your hands, or rinsed out a smoothie cup, you've sent wastewater on a journey. And no, it doesn't just "disappear." It heads to one of the hardest-working places you've probably never thought about: your wastewater treatment plant.

That's where the real clean-up crew takes over.

First stop: the clarifiers.

Think of it as a giant settling pool. Here, wastewater slows down so that gravity can do its thing.

Heavier solids sink to the bottom as sludge, while the clearer water floats on top. It's the first big separation step, and it makes a major difference in how much gunk continues on.

This is a slow but steady process. It looks calm on top, but our clarifier tanks are hard at work below.

Some of the sludge collected gets reused in the treatment process, while the rest is processed further, sometimes even repurposed as fertilizer. From there, the cleaner water flows into the aeration tank, where things get a little more active.

(continued on page 3)

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Above: Pages from the CCMUA Mailer about the record-breaking Petty's Island RiverSweep.

Below: A group memorializing their Petty's visit with a selfie.

(continued from page 1)

"Thanks to events like this, its future looks a little cleaner and a lot more hopeful."

- LINDA CAIRNES




Together, volunteers collected a staggering **4,542 single-use plastic bottles**, along with an unforgettable haul: a ladder, a fire extinguisher, two plastic drums, eight tires, toys, Styrofoam, helmets, buckets, and even a knee-high boot. CCMUA's Tom Hale and many CCMUA volunteers helped haul out the debris from this cleanup. In true Camden spirit, the cleanup didn't stop at trash - teams took on side projects like removing a netting mass buried in sand and clearing a huge, downed tree from a side trail.

The goal for CCMUA in this cleanup is to keep debris like this from clogging up the river.

This event was part of the "Party for the Planet" initiative by the Association of Zoos and Aquariums, celebrating Earth Month with meaningful conservation action. "RiverSweeps" are Adventure Aquarium's staff-led Delaware River clean up initiative, removing trash and pollution from our local waterways and preventing it from reaching the ocean.

"Petty's Island, once an industrial site, is a 300-acre island in the Delaware River, on its way to becoming a nature preserve open to the public."

- LINDA CAIRNES




Scan to learn more about the history of Petty's Island: A Journey Back to Nature

"Thanks to events like this, its future looks a little cleaner and a lot more hopeful," said Linda Cairnes, Camden County Program Coordinator for the New Jersey Natural Lands Trust.

She emphasized the importance of involving local residents in the preservation efforts, as the island is located in Pennsauken on its border with Camden and could potentially be a green space for residents to enjoy.

Visit the Center for Aquatic Sciences' event calendar if you're interested in visiting or volunteering to help restore this beautiful island and make it part of the Camden community.



Staff from Campell's Soup, American Water, Subaru, New Jersey Tree Foundation, and the NJDEP all participated in the event. Camden County Municipal Utility Authority (CCMUA) staff contributed by moving collected debris into a dumpster. CCMUA highlighted the event in a quarterly customer billing statement.

The strength of Camden partnerships was on full display in November when the Bicycle Coalition of Greater Philadelphia hosted an event that brought together several of our Camden partners to highlight the Delaware River Heritage Trail under development in Camden. Youth from the Center, Urban Promise, the Neighborhood Collaborative Community Gardens, and Mastery Charter High School gave presentations on their work and how the trail will benefit the community. The event included a Petty's Island tour, which was a great opportunity for everyone to celebrate successes to date and visualize future opportunities.

Partnerships resulting from application of the co-design model have been the key to successful community engagement. With partners, the Trust has expanded community engagement to build awareness of Petty's Island and increase access to Camden residents with their interests in mind. Authentic partnerships create deeper understanding and trust within communities. Residents are inspired to speak out about goals for their neighborhood and feel supported. The Trust and its partners are already discussing ways to collaborate in 2026 to provide Camden residents with new opportunities.



Bicycle Coalition of Greater Philadelphia, Urban Promise, and Neighborhood Collaborative Community Gardens.

Partnership with the Center for Aquatic Sciences

By: Barbara Kelly, CEO, Center for Aquatic Sciences

The Center for Aquatic Sciences (Center) has partnered with the NJ Natural Lands Trust to provide educational programming on Petty's Island for several years. Although the Center brings residents to the island for a variety of programs, from nature walks to clean-ups to evening bat hikes, some of the most meaningful trips are through their Community and Urban Science Enrichment (CAUSE) program. The CAUSE program works with Camden teens, engaging them in community service and environmental science activities as they enter 9th grade and continue through their senior year.

As 9th graders, their first trip to Petty's Island, just minutes from their home, seems like an entirely new world. Going to the island for the first time, CAUSE teen Kori remembers, "I'd never seen a place like that before ... seeing all the different animals and the different ... frogs. It was kind of mind-blowing." Almost every teen in the program has first memories of the island that stay with them. They often include wildlife and the sense of something so beautiful and wild yet so close to their city. When asked about Petty's Island, CAUSE teen Alex commented that his "favorite thing about Petty's would definitely be the ... animals. There's an eagle's nest. There's a bunch of different birds. Just the other day, I was sitting ... by the water and there were two beavers swimming up to Petty's."

It is so empowering for the teens to have access to the island and to think about what that could mean for their community. As CAUSE teen Jermyne shared, "it shows what the world could look like, if we learn how to be more mindful with our environments. Seeing it go from the history of it, from how I remember it used to be, but now it is not like that anymore." Kori adds, "it's a place that is different than we are used to."

"It's a place that is different than we are used to."



LEFT: American eel pulled from the Delaware River by CAUSE teens. **RIGHT:** CAUSE teens walking the island's trails.

As the teens continue to visit the island year after year, an amazing transformation occurs as they move from visitors to stewards of the land. They begin to take an active role in caring for the island by working together and with other groups on cleaning up the trash that always seems to be caught along the island's edge. Kori noted that one of the things that always impresses her is, "seeing how people have a passion for Petty's. How they want it to be clean. Groups like that are inspiring." In 10 years, Jermyne pictures it "with more wildlife and definitely less trash."

As the teens continue to learn about and explore their world, places like Petty's become an important local treasure. Kori may have said it best when she was asked to describe it: "it's like a free place where you can kind of just go on a little vacation."



ABOVE: CAUSE teens checking out a snake skin found on the trail.

BELOW: CAUSE teens taking water samples from the Delaware River.



Petty's Island Update

By: Cari Wild



A landscape of 40 aboveground storage tanks has been returned to a natural state at Petty's Island.

In 2009, the same year that the NJ Natural Lands Trust accepted a conservation easement across Petty's Island, the NJ Department of Environmental Protection (NJDEP) executed an Administrative Consent Order (ACO) with CITGO Petroleum Corporation (CITGO) for the remediation of the island. The ACO made clear that remediation of Petty's Island was CITGO's responsibility and established a schedule for the submission of various samples and plans. The remediation of the island included 179 Areas of Concern (AOC). Remediation was to be customized within each AOC depending on the specific type and extent of contamination.

As of 2025, CITGO has completed remediation in 110 of the 179 AOCs either through the issuance of a No Further Action letter or through a Response Action Outcome to be issued in a Remedial Action Report. To get to this point, a number of actions have been taken: approximately 40 aboveground storage tanks were demolished and removed leaving behind a functional system of freshwater wetlands; 50 acres of asphalt were removed and restored to warm season grass meadow; and over 1,175 sediment samples and 8,864 soil samples taken to guide the ongoing remediation process.

Even with this progress, the remediation process has had its challenges. CITGO reasoned that the 2009 ACO required remediation to be governed by non-residential cleanup standards, with the exception of a five-acre area adjacent to the future visitor's center where residential standards are required. Following the 2009 ACO

and some regulatory changes, the NJDEP took the position that remediation must be based upon ecological standards that are much stricter than residential and non-residential standards. This year, a compromise was reached and the ACO amended whereby ecological standards are required only within environmentally sensitive natural resource areas on the island, not across the entirety of the island. This compromise should ensure that the remaining remediation moves forward more quickly.

In the meantime, as remediation progresses the Trust continues to conduct programming, engage and co-design programming with local partners and communities, and oversee scientific research on the island. Due to a lack of grant funding, the Trust was unable to renew its programming contract with the Center of Aquatic Sciences (Center). Nonetheless, the Trust and Center continue to partner on a number of programs and events at Petty's Island. For years, the Trust and Center have jointly hosted Alliance for Watershed Education (AWE) Fellows each summer, and 2025 was no exception.

Under the AWE Fellowship program, each of the 20 AWE centers hosts a Fellow for 12 weeks during the summer. The Fellowship program aims to increase engagement and action toward protecting and restoring the Delaware River Watershed while introducing high school graduates and/or college students to experiences and potential careers in environmental education. In addition, each AWE Fellow works all summer on a capstone project; a creative and unique research and project to benefit the host center.

This year, Luis Colon and Kristin Lewis were the Trust and Center Fellows. Kristin is a Sophomore at Howard University, and her ultimate career goal is to become a research scientist focused on combating climate change, specifically in an aquatic environment. For her capstone, she researched and created a poster presentation about pollution in the Delaware River.

Luis is Junior at Rowan University studying biology. For his capstone, Luis created a website that catalogs different species on Petty's Island, focusing on invasive, native, and nuisance plant species, as well as creating a customized version of [Pokédex](#) - *PettyDex* where people can identify and "catch" their own species like true field scientists.



Kristin Lewis and Luis Colon along the Petty's shoreline and amongst the crowd at a Petty's bat hike that they helped to lead.



Clockwise from top left, three pictures from Nature's Embrace and one of the Motus wildlife telemetry system.

Nature's Embrace, the art exhibit by Priscilla Rios featured in the Trust 2024 Annual Report, was installed again this year to inspire and educate visitors about the many critters and plants that call Petty's home. By popular demand, the Trust hopes to install portions of *Nature's Embrace* throughout 2026.

New to the island this year is a Motus wildlife telemetry system that uses cellular technology to pick up signals from miniaturized tags on birds, bats, and insects flying in the area of Petty's Island. These tags transmit information about migrating species to this and other stations placed along the Atlantic flyway. There is a public website that shows what species are being tracked as they pass through the Petty's Island area. So far, two tagged species have been detected at the station.

Throughout 2025, there was much press about the sale of CITGO. While this is an evolving situation, what we know is that at the end of November 2025, Delaware Judge Leonard Stark authorized the sale of shares in the Venezuela-owned parent of CITGO to Amber Energy (Amber), an affiliate of Elliott Investment Management. The sale follows the judge's approval of a \$5.9 billion bid from Amber in a court-ordered auction of CITGO. The sale was the last major legal step in a lengthy auction process aimed at paying many creditors for debt defaults and expropriations that occurred in Venezuela. The Trust has been advised that the sale will probably be concluded within 2026.

As the Trust understands it, Amber's acquisition of CITGO includes the liability for remediation of Petty's Island. Amber's acquisition is also subject to the Trust's conservation easement over the entire island, as well as the obligation to transfer the island in fee to the Trust once the island has been remediated. Therefore, the sale should not alter the ultimate objective of all parties to transfer ownership of the island to the Trust and bring to fruition general public access and a future environmental center to the residents of the underserved greater Camden community.



Dryopteris goldieana. PHOTO: [Donald Cameron](#)

*Because the Trust's mission is to preserve land in its natural state and protect New Jersey's natural diversity, our annual report profiles a selected rare plant each year. This year we profile **Dryopteris goldieana**,*

Goldie's Wood Fern

By: Juakin Goodbar

*"In the golden twilight of the deeper woods this stately plant unfurls its tall, broad, bright-green fronds, studded on their backs with the round fruit-dots which are so noticeable in this *Aspidium*, adding much to their attractiveness by the suggestion of fertility." from *How to Know the Ferns* by Frances Theodora Parsons (1899)*

Of New Jersey's many native ferns, one in particular stands out not only for its stately stature but also its rarity and storied history. While perhaps not as famous as the curly grass fern (*Schizaea pusilla*) – which you can read more about in our 2022 Annual Report – Goldie's wood fern (*Dryopteris goldieana*) has its own unique identity and intriguing botanical history.

With fronds growing to more than a meter in length, it is the largest species of the genus *Dryopteris* native to eastern North America – comparable in size to the more familiar ostrich fern (*Matteuccia struthiopteris*) or cinnamon fern (*Osmundastrum cinnamomeum*). In addition to its size, other distinguishing features of its form in botanical vernacular include its broad, ovate blade (leaf or frond) that abruptly tapers at the tip, the large brown scales at the base of the stipe (leaf stalk), the shallowly toothed pinnae (leaflets), and the rows of large, round sori (structures containing reproductive spores) along the midvein of the pinnules (smallest leaflets). In New Jersey, Goldie's may be found growing alongside the marginal wood fern (*Dryopteris marginalis*). But it can be differentiated by the placement of the sori at the margins of the pinnules for *D. marginalis* versus along the midvein of the of pinnules for *D. goldieana*.

The name itself – common or scientific – may evoke images of aureate fronds imbued with golden sunlight, and it certainly can appear that way at times. But the namesake of the plant is John Goldie, the botanist who first formally collected and described the species in the early 19th century. While eponymous epithets (i.e.,

species named after a person) don't provide much insight into the plant itself, they can provide a window into the history of its discovery - and its discoverer.

Born in Scotland in 1793, John Goldie was the first in his family to change his name from his father's surname, Goudie. After apprenticing as a gardener in his teenage years, he gained much of his botanical training by working at the Glasgow Botanic Garden. One of his mentors there included the eminent English botanist Sir William J. Hooker. By age 24, Goldie had saved up enough funds to travel to North America for a botanical expedition.

In June of 1817, Goldie departed on a boat from Leith, Scotland, to New York, but bad weather diverted the ship to Halifax. Unperturbed, he botanized his way down to Quebec and continued collecting there for another two weeks. He shipped his collections back to Scotland, but it was all lost in transport. From Quebec, he travelled to Montreal, then to Albany, and then to New York City, his original destination. For much of the remainder of that season, he botanized in the New Jersey Pinelands, making extensive collections near Quaker's Bridge, now central to Wharton State Forest. He later described it in 1822 as, "a country which, though barren and thinly inhabited, yet presents many rarities to the botanist, and gave me more gratification than any part of America that I have seen." He again tried to ship his collections back to Scotland, this time from New York, but this shipment was also lost at sea.

That winter, to recoup some money, Goldie took a job as a schoolteacher in a small town near New York State's Mohawk River. In April of 1818, he returned to Montreal, hoping that he'd be able to join traders on a journey to the Northwest. However, those plans fell through. Goldie worked as a general laborer for that summer, botanizing on his two days off each week. That autumn, for a third time, he shipped his collections off to Scotland. Two months later he learned that the ship carrying his specimens had sunk in the St. Lawrence River.

Later that year he borrowed enough money from a friend to conduct one more botanical expedition. He spent the entire summer of 1819 travelling on foot from Montreal to Pittsburgh and back. His diary of this journey, separate from his botanical notes, still survives. An article based on Goldie's diary entries describes his appearance while travelling:



Both sides of fronds of *Dryopteris goldieana*.



John Goldie, c. 1860s.

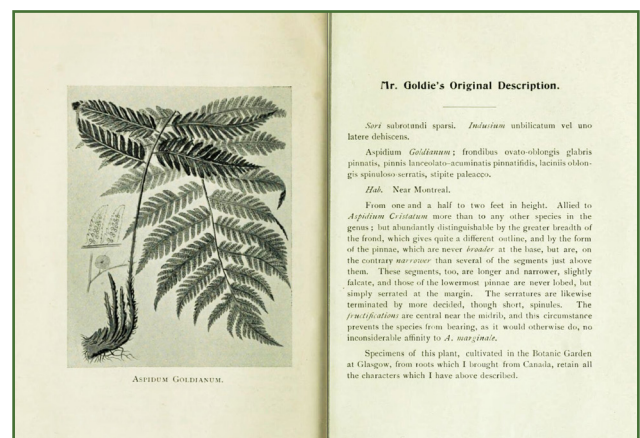
A man of average height for the time, brown eyes shaded by a hat stuck with an assortment of insect specimens, with a back-pack bulging with plant material, and a book in each hand, John must himself have been something of a curiosity as he strode, pipe in mouth, along the tracks that passed for roads.” *John Goldie, Botanist and Traveler* by Alan R. Hickman. Previously published in ‘Papus’ Vol 19 No 2. Summer 2000 by Royal Botanical Gardens, Burlington, Ontario

In September of 1819, Goldie safely sailed from Montreal back to Greenock, Scotland, this time with all of his collections. In 1822, he published the *Description of some new and rare plants discovered in Canada in 1819* through the Edinburgh Philosophical Society with the assistance of Sir William J. Hooker. It was Hooker who would name the newly described wood fern in Goldie’s honor. In 1848, Asa Gray’s *A Manual of the Botany of the Northern United States* (also known simply as *Gray’s Manual of Botany*), gave Goldie’s wood fern its currently accepted scientific name and authority: *Dryopteris goldieana* (Hook. ex Goldie) A. Gray.

In New Jersey, Goldie’s wood fern is ranked S2 (imperiled) by the Department of Environmental Protection’s Natural Heritage Program, with less than 20 populations across the northern half of the state. It is often found in rich, moist, mature woods, sometimes in soil underlain by calcareous (i.e., limestone) geology. Though it’s more common in northern states and to the southwest along the Appalachians, it is rare in many states. In Goldie’s

day, there may have been more occurrences in New Jersey. James Montgomery and David Fairbrothers note in *New Jersey Ferns and Fern Allies* (1993) that specimens of Goldie’s wood fern were collected near Newark in 1862. In fact, this collection was from the ‘Orange Mountains,’ probably West Orange. Habitat destruction and fragmentation resulting from human development in the intervening 160 years poignantly highlights the plight suffered by much of New Jersey’s imperiled native flora.

While conserving habitat for rare plants is undoubtedly important, careful monitoring and management is also needed to ensure the survival of the more than 2,000 native plant species that call New Jersey home. While many species were likely always rare due to their fidelity to a narrow ecological niche (e.g., exposed ridgetops, acidic bogs), some are rare because of loss or modification of habitat. More recently, competition from non-native and invasive plant species and the impacts of an evolving climate have been added to the many threats faced by native plants. In some cases, several factors may be at play. The rich calcareous soils of our Ridge and Valley physiographic province provide the necessary substrate for many unique and uncommon plants – including Goldie’s wood fern – but are equally attractive to barberry (*Berberis thunbergii*), a shrub native to Asia. Understanding the ecological interactions at play in natural systems is crucial to applying successful management. The NJ Natural Lands Trust seeks to use its botanical expertise to perform effective species management to ensure that Trust preserves continue to serve as refuges for these vulnerable components of our state’s natural heritage.



Excerpt from *Diary of a journey through Upper Canada and some of the New England states 1819*. John Goldie.

Surveys and Inventories: Getting a Handle on What's Out There

By: Jason Hafstad

Each year, the Trust's Board of Trustees appropriates funds for biodiversity inventories. Surveys inform staff about what biota our preserves support so the Trust can properly manage these elements of biodiversity and protect their essential habitats. Surveys also contribute to the understanding of species' rarity, distribution, and life histories. Surveys also provide baseline data that allows staff to measure how these resources are faring over time, with or without management.

During 2025, the Trust contracted 13 surveys for eight taxa groups at 15 separate preserves. Counties in which these preserves are located rather than naming the preserves are provided to protect taxa from unscrupulous collectors:

* **Lichenized fungi (fungal species partnered with an algae and/or cyanobacteria)** (Warren County): This inventory by Dennis Waters yielded 94 taxa. Several species were observed for the first time in New Jersey, including *Agonimia tristicula* and *Lepraria disjuncta*. The former has a very large geographic range and is more commonly found in Europe and the Pacific Northwest. This is the second record from eastern North America, the first being from 1998 at Harriman State Park in New York. *L. disjuncta* is a recently described species and is likely more widespread than records suggest due to confusion with the more common *Lepraria finkii*. Other notable species from the inventory include *Arthonia ruana* (a single other NJ record from 1896) and *Caloplaca oxfordensis* (a single other NJ record from 1992).

* **Lichenized fungi (fungal species partnered with an algae and/or cyanobacteria)** (Multiple counties): This inventory by Dennis Waters involved single-day surveys at four separate preserves and yielded 110 taxa. Several taxa were observed for the first time in New Jersey, including *Agonimia vouauxii*, *Pertusaria superiana*, and *Skyttea radiatilis*. Other notable species include *Protoparmeliopsis muralis* (last recorded from New Jersey in 1986), *Collema furfuraceum* (last recorded in New Jersey in 1992), *Ochrolechia trochophora* (collected once in the late 1800s), and *Psora pseudorussellii*. The *Psora pseudorussellii* observation is the second population found in New Jersey since the 1800s, both of which are on Trust preserves.

Surveys provide baseline data allowing staff to measure how resources are faring over time.

* **Birds** (Ocean County): This survey by Becky Laboy yielded 115 species from surveys that took place between January 12 and November 29. A total of 47 rare or uncommon species were observed, including the northern harrier, black-crowned night heron, and Savannah sparrow.

* **Birds** (Sussex County): This survey by Wild Bird Research Group yielded 70 species, 51 of which exhibited signs of breeding. Of these, 18 have state- or region-level conservation statuses, including barred owl, Blackburnian warbler, black-winged warbler, and scarlet tanager.



Blackburnian warbler. PHOTO: William Culp



TOP: *Tarzettia catinus*; BOTTOM: *Virbia nigricans*.



* **Moths** (Warren County): This autumnal survey by Ann Marie Woods yielded 73 species, four of which are not native to New Jersey. The survey site was chosen due to the high abundance of *Collinsonia canadensis*, a host plant species to multiple known rare moths. One moth found during the survey, *Papaipema astuta*, is globally rare and listed by NatureServe as G3.

* **Moths** (Cape May County): This survey by Ann Marie Woods yielded 75 species, of which one was not native to New Jersey. The Virginian tiger moth (*Spilosoma virginica*) was by far the most numerous moth, but it is not considered rare.

* **Moths** (Hunterdon County): This survey by Biostar Associates targeted potential suitable habitat for *Virbia nigricans*, a diurnal moth species ranked by NatureServe. On August 3, a *Virbia* species was netted and placed in a jar. The specimen was sent to Tony McBride, New Jersey Fish & Wildlife, for further examination, which supported the identification of *Virbia nigricans*. A sample has been sent to the Canadian Center for DNA Barcoding (CCDB) and the results of the analysis are pending. This record may mark the first observation of this species globally since 1967, and make this the only known, extant population for *Virbia nigricans* in the world.



Osmia felti on *Rubus* sp.



Maevia inclemens.

* **Fireflies** (Burlington, Ocean, and Salem counties): This survey by Dr. Chris Heckscher yielded a new locality for *Photuris scheckscheri*, a recently described firefly species that is thought to be restricted to Atlantic white cedar swamps. This record marks the 5th occurrence for the species in the world. The type locality is New Jersey (Webbs Mill Bog), and it's also been found in Salem County. The other two locations are from Sussex County, Delaware and Wicomico County, Maryland.

* **Odonates** (Ocean County): Mark Manning conducted two separate surveys for dragonflies and damselflies, both at preserves in Ocean County. In total, he documented 31 species, including two species listed as Species of Concern in New Jersey: the scarlet blue (*Enallagma pictum*) and the golden-winged skimmer (*Libellula auripennis*).

* **Native Bees** (Burlington County): This survey by Max McCarthy recorded 36 species, all considered native to New Jersey. The most notable of these was the large metallic blue mason bee (*Osmia felti*), which is ranked G2G4 by NatureServe. Despite targeted search efforts, the *Ilex* specialist cellophane bee *Colletes banksi* was not detected. The only modern records of this species in New Jersey are on *Ilex glabra* in the pine plains near Warren Grove. It's unclear why it is often absent from other sandy areas in Pinelands where its host plant is abundant.

* **Spiders** (Burlington County): The Trust contracted Joseph Salmieri Jr. again to conduct a spider inventory for one of the Trust's preserves in Burlington County. New Jersey has very little information on spider taxa, with no checklist of what's present or any idea about which species might be rare or declining. Available records suggest New Jersey has at least 353 species of spiders, of which 33 species were recorded during this inventory and identified to species level. These include *Hentziectypus globosus* and *Spintharus flavidus*, both of which appear to be county records. An additional 25 taxa were identified to the genus level.

* **Non-lichenized fungi** (Fungi that is not a lichen) (Ocean County): Brandon Roddy found 120 taxa total. Many fungi in New Jersey are under-documented and have questionable taxonomies, making it difficult to infer rarity or conservation significance. That said, Brandon located several rare to under-documented species, including some previously not reported from New Jersey. These include, *Laccaria maritima*, *Entoloma luridum*, *Tarzetta catinus*, *Geoglossum sphagnophilum*, and *Bogbodia uda*. Several collections will be submitted for DNA sequencing.

* **Baseline biodiversity inventory** (Sussex County): EcolSciences, Inc. conducted baseline surveys at a preserve in Sussex County, with an emphasis on plants, birds, odonates, and lepidoptera. Notable finds include the sable clubtail (*Stenogomphuru rogersi*), swamp birch (*Betula pumila*), Kalm's lobelia (*Lobelia kalmii*), barred owl, and cricket frog.

In addition to the above contractual biodiversity surveys, Trust staff also conducted ecological inventory work. This included updating known populations of rare plant species and conducting de novo surveys for previously unknown populations on Trust preserves.

Preserve Manager's Inspections Report

By: Jason Hafstad

While all Trust properties are protected from development, they still face substantial threats of misuse by visitors, including illegal ATVs, dumping, vandalism, and poaching. A large portion of the Preserve Manager's time is spent documenting and attempting to resolve these issues. Below is a summary of issues, both resolved and ongoing, from 2025.

Encroachment at Hardwick Meadows Preserve

On or about June 3, 2025, the Trust's Preserve Manager Jason Hafstad discovered that a neighbor to the Hardwick Meadows Preserve, Hardwick Township, Warren County, had used a tractor to clear vegetation and create an approximately one-mile-long road through the preserve. The road lead directly from the neighbor's backyard, where there was a Kubota bobcat tractor parked. Jason called [1-877-WARN DEP](tel:1-877-WARN-DEP) and, on June 4, 2025, State Park Police Officer Justin Somers responded with a visit to the preserve. Officer Somers issued summonses to the neighbor for four State Park Service Code violations.

The matter was scheduled in North Warren Municipal Court where the Trust sought \$8,100 in restitution for estimated damage to the preserve. Restitution was calculated based on area of disturbance/damage (one acre), cost of land per acre when acquired adjusted for inflation (\$7,100 per acre), plus \$1,000 for the cost of a gate to be installed blocking the defendant's future access onto the preserve. In addition, the State sought to permanently ban from using the preserve.

At the trial on October 9, 2025, the judge advised that the defendant could agree to restitution as part of a settlement and that he would incorporate restitution into his order. The defendant agreed to settle the case after the DEP dropped one of the four code violations, resulting in \$547.00 in total fines and court costs for the remaining three charges and reduced the restitution claim to \$5,000. The judge incorporated the restitution amount payable to the Trust into his court order and indicated that he will enforce any nonpayment of these amounts.

In addition to the successful prosecution for this encroachment, it is noteworthy that the judge did not question that the State Park Service Code could be used for violations on a Trust preserve, considered to be a state park and forest, which is defined at *N.J.S.A. 13:1L-3* as all State-owned lands administered by the NJDEP, but not including wildlife management areas or reservoir lands.



These pictures depict the damage done to the Hardwick Meadows Preserve by a neighbor attempting to create a road from his property across the preserve. In addition to being fined, the neighbor is banned from the preserve.

Additional Instances of Illegal Vegetation Clearing

In March of 2024, the Trust responded to a complaint of a neighbor clearing trees next to his property at the Trust's Four Mile Branch Preserve in Monroe Township, Gloucester County. A site inspection by Trust staff documented the removal of 22 mature trees ranging from seven inches to 22 inches diameters. A court hearing was held on May 20, 2025, where the neighbor was found guilty of criminal defiant trespass and ordered to pay court fees. He also received a lifetime ban from the preserve.

On September 3, 2025, Trust staff discovered a 0.53-mile-long path of cleared vegetation in the upland forest at First Time Fen Preserve in Green Township, Sussex County. This eight- to 10-foot-wide path was made using a tractor and created a loop originating from a neighboring property. An officer from the New Jersey State Park Police visited the neighbor who explained he was unaware of the cleared vegetation and surmised that it was a friend who he allowed to hunt on his property. The Trust has installed camera to monitor the path, but no further enforcement actions were taken.

On September 8, 2025, our partners at the Ridge and Valley Conservancy (RVC) alerted us to the construction of a log cabin at Blair Creek Preserve in Stillwater Township, Sussex County, a property the Trust co-owns and manages with RVC and The Nature Conservancy in New Jersey (TNC). A site inspection by staff from RVC and the Trust documented the clearing of at least 25 small trees ranging from two inches to six inches in diameter as well as the removal of rocks from a nearby stream for a chimney. A sign was placed on the cabin indicating this activity was not permitted and a trail camera was installed to try to catch those responsible, but no progress has been made in identifying the violators. A day with staff from RVC, TNC, and the Trust to demolish the cabin is tentatively planned for spring of 2026.

On October 2, 2025, Trust staff discovered a path of cleared vegetation leading from an upland field, along the edge of a wetland, and ending at multiple hunting stands at the Wildcat Branch Preserve in Sparta Township, Sussex County. The Trust left a note and the hunter reached out to explain that he used a weed-whacker to clear the vegetation to access his hunting spot. The Trust explained this activity is not permitted. No further enforcement actions were taken.



TOP LEFT: Four Mile Branch Preserve clearing for trail; **BOTTOM LEFT:** Cabin constructed at Blair Creek Preserve.
RIGHT: Trail constructed at Wildcat Branch Preserve.

Illegal Off-Road Vehicles

The Trust's Tilton Creek Preserve in Toms River Township, Ocean County, has an obvious entry point utilized by ORVs from Bay Ave. A trail camera placed at this entrance captured a jeep illegally entering the preserve on May 17, 2025. Because the license plate was visible, it was reported to NJ State Park Police, who called the registered owner. The owner claimed he was unaware that driving through the woods on this preserve was illegal and assured the officer he would not do it again.

The Trust's Hamilton Preserve in Hamilton Township, Atlantic County, has long been plagued by widespread and extremely damaging ORV activity. In an attempt to curtail this activity, the Trust purchased large, one-ton cement blocks to be placed at known ORV access points around the perimeter of the preserve. On August 15, 2025, the New Jersey Forest Fire Service used their tractor equipment to place these blocks at eight access points. Follow-up inspections by Trust staff revealed that while some of these barricades remain in place others have either been moved or alternate routes created to circumvent the blocks. Additional cement blocks are planned to be added in the spring of 2026.

The Trust's Hagedorn Preserve in Glen Gardner Borough and Lebanon Township, Hunterdon County, has also suffered from extensive ORV damage originating from multiple access points. Trail cameras have documented dozens of different vehicles driving in the preserve. On December 16, 2025, Trust staff visited the preserve and documented extensive ORV tracks following a mid-December snowstorm. Vegetation had been cut and fallen logs cleared with a chainsaw to maintain access along the old logging roads. Numerous hunters have called to complain that persistent ORV activity at Hagedorn is disrupting their deer management activities.

ORVs also continue to be issues at Crossley, Long-a-Coming, Lubber's Run, Bear Swamp at Red Lion, Great Piece Meadows, and Sweet Hollow preserve, among others.

BELOW: ATV rider and illegally created trail at Tilton's Creek and Hagedorn preserves, respectively.



The Continuing Saga of Easement Monitoring

By: Terry Caruso

Reviewing easement terms, contacting property owners, and inspecting easements is time consuming and hard work. As the Trust reported in its 2023 and 2024 Annual Reports, the Trust's real estate portfolio includes 24 conservation easements which protect a total of almost 2,800 acres of land throughout the state. In 2025, the Trust completed inspections of easements at the Reinhardt, Taylor, Petty's Island, and Tolz Shorebird preserves, completing a three-year monitoring cycle for all 24 of the Trust's easements.

The Reinhardt Preserve Easement located in Montague Township, Sussex County, was donated to the Trust by Abner and Elizabeth Layne on December 30, 1988. The forested parcel contains 23.65 acres and abuts High Point State Park. It is part of a larger continuous area of open space providing much needed habitat for plants and animals of the northwest region of the state. The original landowner has passed away, and the parcel now has three landowners. No notification of easement transfers was made to the Trust, and tracking down and notifying the new owners was necessary to conduct the inspection. All three landowners were informed in 2025 of the land restrictions through letters and phone calls. Fortunately, field inspection reflected full compliance with the terms of the easement.

The Taylor Preserve easement located in Cinnaminson Township, Burlington County, was acquired by the Trust from numerous Taylor family members on June 6, 1965, as the Trust's first land acquisition. The easement abuts the State-owned portion of Taylor Preserve managed by the Trust and contains 89 acres of land containing a mosaic of habitats along the Delaware River. The easement was found to be in full compliance. Indeed, the easement is managed with the help of volunteers with the Friends of Taylor Wildlife Preserve who patrol the land, perform trail maintenance, and pick up litter, especially floatable litter from the Delaware River. There are several private homeowners and an abandoned community garden that surround the easement area. During the inspection, Trust staff learned that current landowners will be building a solar installation adjacent to the easement. This is an area that will need to be monitored in the future to ensure compliance with the easement.



ABOVE: Reinhardt Preserve Easement.

RIGHT: Taylor Preserve Easement.



The Camden County Municipal Utilities Authority (CCMUA) easement located in Camden City, Camden County, represents one of the Trust's more recent acquisitions, having been donated July 31, 2013. This forested riparian parcel encompasses approximately 25 acres adjacent to the bridge to Petty's Island on the Delaware River. It is known as the Cramer Hill Nature Preserve but also considered to be part of the Petty's Island Preserve. Serving as a crucial habitat for native flora and fauna within a densely urbanized region, the easement offers residents opportunities to experience nature and enjoy scenic river views. Both county officials and local community organizations actively promote public awareness of this property through educational initiatives and participate in annual cleanups to remove litter and debris from the river. There were no easement compliance issues.

The Tolz Shorebird Preserve easement, Middle Township, Cape May County, was donated to the Trust by Herman Tolz on December 2, 1987. This approximately 12.5-acre salt marsh and beach area is adjacent to Delaware Bay in an important migratory shorebird area. The underlying fee interest in the land, acquired by the U.S. Fish and Wildlife Service, is now part of the Cape May Wildlife Refuge and is being managed by the federal government for conservation purposes.

Although small, all four easements function as important buffers to existing preserved land and/or provide critical habitat. Ongoing monitoring respects the original landowners' conservation commitment by ensuring compliance and responsible land stewardship.



ABOVE: Tolz Shorebird Preserve Easement.



ABOVE: CCMUA Easement also known as Cramer Hill Nature Preserve.

Understanding Climate Change Vulnerability of New Jersey's Federally Listed Plant Species

By: Amanda Hernandez

Introduction

New Jersey's native plants are already experiencing the effects of a rapidly changing climate. The state's major environmental stressors (rising sea levels, shifting rainfall patterns, warmer temperatures, higher carbon dioxide (CO₂) levels, and more frequent severe storms) are expected to pose serious challenges for many species in the decades ahead ([NJDEP 2025](#)). These changes interact with habitat fragmentation, development pressure, and natural climate variability, shaping where plants can grow and how successfully they reproduce and survive.

To help guide conservation decisions, the New Jersey Department of Environmental Protection (NJDEP) Natural Heritage Program (NHP) is evaluating the climate vulnerabilities of rare and federally listed plant species across the state.

Climate Change and New Jersey Plants: A Brief Overview

One of the clearest indicators is shifting phenology (the seasonal timing of life events like leaf-out, flowering, and fall color). Many species are now flowering earlier in spring compared to historical records, which can disrupt interactions with pollinators and reduce reproductive success ([NJDEP 2025](#)).



Fires are more frequent under drought conditions.
PHOTOS: James Douglas



Beach erosion is a growing problem in coastal areas.

Climate change is also causing many species to adjust their range. Some plants may move northward or to higher elevations to follow suitable temperatures ([NJDEP 2025](#)). Meanwhile, heat stress, drought, changes in salinity, and CO₂ shifts can reduce plant physiological efficiency (how well a plant carries out essential processes like photosynthesis). These pressures can lead to population declines, increases in invasive species, or even local extinctions when native species cannot adapt quickly enough.

All these patterns highlight the need for science-based, climate-informed plant conservation strategies, especially for species that are already rare.

Measuring Impacts: NatureServe's Climate Change Vulnerability Index (CCVI)

Although research on climate change is extensive, managers often need tools that translate complex science into clear conservation priorities. NatureServe's Climate Change Vulnerability Index (CCVI) is a model used to help bridge this gap by providing a structured way to assess how vulnerable a species is to climate change ([NatureServe 2026](#)). The CCVI evaluates three key dimensions:

- Exposure - how much climate change a species is projected to experience in the places it lives
- Sensitivity - how strongly it is affected by climate factors like heat, drought, or flooding
- Adaptive capacity - its ability to cope, recover, or adjust

The CCVI scores species and assigns it to one of five categories of vulnerability within its geographical area based on available evidence:

- Extremely Vulnerable - Extremely likely to substantially decrease or disappear by 2050.
- Highly Vulnerable - Likely to decrease significantly by 2050.
- Moderately Vulnerable - Likely to decrease by 2050.
- Less Vulnerable - Will not increase or decrease substantially by 2050, although actual range boundaries may change.
- Insufficient Evidence - Information about a species' vulnerability is inadequate to calculate an Index score.

These scores help managers understand which species may require urgent attention, which may adapt well, and where research gaps exist. NJDEP incorporates CCVI results alongside [State Wildlife Action Plan](#) priorities and rare plant rankings to guide conservation planning.

Explore by Species



Mammals

[EXPLORE THESE SPECIES >](#)



Birds

[EXPLORE THESE SPECIES >](#)



Reptiles

[EXPLORE THESE SPECIES >](#)



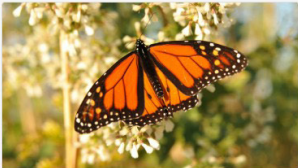
Amphibians

[EXPLORE THESE SPECIES >](#)



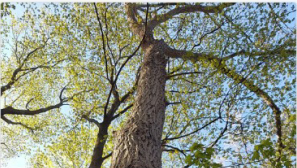
Fish

[EXPLORE THESE SPECIES >](#)



Invertebrates

[EXPLORE THESE SPECIES >](#)



Plants and Fungi

[EXPLORE THESE SPECIES >](#)



Data Deficient Species (SGCN)

[EXPLORE THESE SPECIES >](#)

Explore climate vulnerability species by species using the [State Wildlife Action Plan](#).

New Jersey's Rare Plant Context

The NJDEP NHP tracks 864 plant species of conservation interest statewide. Of these, 356 are state endangered, and six are federally endangered or threatened. To better understand how climate change may affect these vulnerable species, the NHP recently completed CCVI assessments for all federally listed plants found in the state. The sections below summarize vulnerability score, key climate threats, and traits for four of these species.

Sensitive Joint-vetch (Aeschynomene virginica) - Extremely Vulnerable

Sensitive Joint vetch is a delicate annual herb in the pea family (Fabaceae), with feathery leaves and bright yellow flowers. It grows in tidal wetlands and mudflats with freshwater to slightly brackish (mildly salty) conditions, primarily in the southern New Jersey counties. The species faces ongoing pressures from invasive vegetation such as *Phragmites australis* (common reed), changes in salt levels and sediment movement, and development related disturbance such as dredging and filling ([NJDEP 2025](#)).

For sensitive joint vetch, the fate of New Jersey's tidal marshes will define its future. Rising sea levels threaten to inundate many of the intertidal zones where this plant grows, especially in areas where hardened shorelines prevent marsh migration ([NJDEP 2025](#)). Even small increases in salinity can reduce germination, making it harder for new plants to establish. Because populations tend to be small and isolated, and because this annual species has only one reproductive window each year, it has very little capacity to recover from storm impacts or unfavorable seasons. These combined pressures contribute to its *Extremely Vulnerable* CCVI score.



Aeschynomene virginica (Dodds 2017).



Aeschynomene virginica (iNaturalist 2024).

Despite these challenges, sensitive joint vetch has traits that offer some resilience. Its seeds can disperse by floating on water, allowing them to reach new areas of suitable habitat when they become available. In productive years, plants can produce multiple flowers and fruits, which helps maintain populations when conditions align. These traits will not erase the risks, but they offer a natural mechanism to track shifting habitats as sea levels rise, provided we maintain space for marsh migration and reduce completion from invasive plant species.

Swamp Pink (*Helonias bullata*) - Extremely Vulnerable

Swamp pink is a long-lived, rhizomatous (root-spreading) perennial with clusters of small, fragrant pink flowers. It inhabits pristine, non-tidal wetlands, especially seepage swamps along stream headwaters across southern and central New Jersey. Its threats include deer browsing, hydrologic change, development, off-road vehicle activity, degraded water quality and stormwater runoff, groundwater withdrawal, and climate-driven shifts in rainfall and temperature ([NJDEP 2025](#)).



ABOVE: *Helonias bullata* (iNaturalist 2022).

Swamp pink's story is one of water: the species thrives under specific hydrologic conditions. Projected increases in drought frequency, altered rainfall patterns, and groundwater withdrawal threaten to disrupt the soil saturation levels that the species need to survive. Heavy rains and stormwater runoff can degrade water quality and physically disturb plants and their habitat. Swamp pink is also sensitive to competition and herbivory: dense shrub growth and high levels of deer browsing reduce flowering and limit seedling recruitment. Given its narrow tolerance for water regime shifts and sensitivity to extreme events, swamp pink receives a CCVI score of *Extremely Vulnerable*, indicating a high risk of substantial declines by mid-century.

Even with these constraints, Swamp Pink has traits that provide some resilience. Seeds can disperse by water, creating opportunities to colonize nearby where suitable habitat is available. As a multi-year perennial, established plants can persist through short-term fluctuations if hydrology remains within a viable range. Protecting headwater wetlands, maintaining natural water levels, and managing deer browsing can amplify these natural advantages and could help populations withstand climate variability.



ABOVE: *Helonias bullata* (iNaturalist 2022).



ABOVE: *Helonias bullata* habitat on a Trust preserve.

Small whorled pogonia (*Isotria medeoloides*) - Highly Vulnerable

Small whorled pogonia is a rare orchid of mid-successional woodlands, favoring partial canopy openings, rich leaf litter, and rotting logs. In New Jersey, it occurs mainly in northern counties. Identified threats include canopy closure, drought and soil drying (which disrupt fungal networks), insect and snail herbivory, deer browse, declines in American beech and hemlock (which support key fungi), poaching, and climate driven shifts in precipitation and temperature ([NJDEP 2025](#)).

This orchid's vulnerability is rooted in its dependency on specific mycorrhizal fungi (beneficial root associating fungi) and on a woodland structure that lets sunlight reach the forest floor at the right intensity and timing. Warmer temperatures and altered rainfall patterns can stress fungal communities and dry out soils, while natural forest succession gradually closes the canopy and reduces the light needed for flowering. Many occurrences are small, isolated, and genetically limited, reducing the species' capacity to adapt to rapid change. Combined with existing pressures, such as poaching and habitat fragmentation, these factors support its *Highly Vulnerable* CCVI ranking.

Even so, the species has several remarkable survival strategies. Small whorled pogonia produces thousands of dust like seeds that can be carried long distances by wind, increasing the chance of seed reaching suitable woodland openings. The species also exhibits prolonged dormancy, emerging from the forest floor only when conditions improve and serving as a natural buffer against unfavorable seasons. Some populations respond positively to disturbance, such as controlled burns, that restores the open canopy the species prefers.



ABOVE: *Isotria medeoloides* (iNaturalist 2020).



ABOVE: *Isotria medeoloides* in a New Jersey forest .



ABOVE: *Isotria medeoloides* (iNaturalist 2016).

Chaffseed (Schwalbea americana) - Moderately Vulnerable

Chaffseed is a perennial hemiparasitic plant (partly dependent on host roots for nutrients) found in open woodlands and maintained rights of way. Its threats include the loss of regular disturbance like mowing or fire, woody succession, incompatible roadside maintenance, off road vehicles, poor seedling survival, and changes to natural hydrologic fluctuations ([NJDEP 2025](#)).

Chaffseed's greatest challenge is its dependence on specific habitat conditions. Without routine disturbance, open canopy woodlands become denser, reducing sunlight and altering soil moisture in ways that disadvantage both the plant and its hosts. Even high seed production doesn't lead to many mature plants. Climate related changes in rainfall patterns may also disrupt the subtle wet/dry cycles that help cue germination. Collectively, these factors result in a CCVI score of *Moderately Vulnerable*.



Schwalbea americana (iNaturalist 2020).



Schwalbea americana (iNaturalist 2018).

Still, seed dispersal by wind is hypothesized (though not fully confirmed), which could enable colonization of open patches created by fire or management. Each plant produces many flowers and seeds, and with proper disturbance (such as timed mowing or selective thinning), seedlings can establish more successfully. Aligning management practices with species needs, and maintaining hydrologic variability in wetlands, can unlock these advantages.

What can be done to help protect these species?

Protecting New Jersey's rare plants in a changing climate means restoring the natural processes that maintain their habitats. Along the coast, this includes allowing inland marsh migration and preserving natural sand movement on beaches and dunes ([NJDEP 2025](#)). Inland, it means sustaining wetland water levels and quality, managing deer browse, and applying disturbance (where appropriate) to keep mid-successional woodlands open in the Pine Barrens.

Several species would benefit from deeper study of factors such as seedling survival and recruitment, seed banking, genetic diversity and connectivity among isolated populations, hydrologic thresholds, and ecological dependencies on pollinators, fungal partners, and host plants.

By integrating CCVI results into rare plant management, the NHP is abating climate risk and supporting conservation. This work strengthens New Jersey's ability to protect its rarest species in the decades ahead.

This Land is Your Land

By: Cari Wild

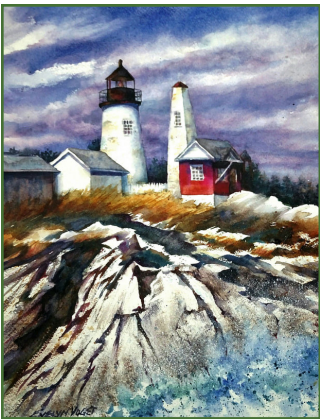
The Trust prides itself on its partnerships with others, including environmental and art organizations. Over the past few years, the Trust has collaborated with individual artists such as Priscilla Rios on *Nature's Embrace* and Sarah Kavage on *Water Spirit*, as well as art organizations such as *Writing the Land*, a collaboration between poets and land protection organizations.

This year, the Trust worked with the D&R Greenway Land Trust and the Garden State Watercolor Society (GSWS) on an open juried art exhibition, *This Land is Your Land*, inspired by the iconic folk song written by Woody Guthrie in 1940. This song reflects both the beauty and hardships of the American landscape and its people. The diverse art it inspired for this exhibition ran from October 1, 2025 through January 4, 2026 at the D&R Greenway Johnson Education Center.

At the October 3, 2025 opening reception, a number of jury awards were made. Four of these were awards sponsored by the Trust and named for New Jersey native plants.

- PawPaw Native Plant Award Winner: Evelyn Voget
- American Lotus Native Plant Award Winner: Thomas Rutlege
- Purple Milkweed Native Plant Award Winner: Hana Aviv
- Green Dragon Native Plant Award Winner: Carol Aklonis

On hand to present the Trust's awards was NJ Natural Heritage Program botanist Liz Olson. While presenting the awards, Liz provided interesting commentary on each of the plants for which the awards were named, piquing the curiosity of the winners, other artists, and reception attendees.



ABOVE FROM LEFT: Evelyn Vogt's *At the Edge*; Thomas Rutlege's *Boardwalk*; Hana Aviv's *Fireworks*; and Carol Aklonis' *Peace in the Garden*.

As part of the events surrounding the exhibit, Liz Olson delivered an interesting and engaging talk entitled *Rare, Threatened, and Endangered Plants of New Jersey*. During an Art and Science Mash Up event, Liz spoke about the more than 800 endangered and rare plant species found throughout New Jersey and many of the environmental threats they face.

Complementing Liz's talk, three of the exhibition artists spoke about their art in relation to plant science. Sandra Peters's painting *Pollinators Waltz* depicts bees pollinating the underappreciated native clover plant. Sandra spoke about how this land around us is dependent on little creatures such as bees to produce a fruitful abundance and variety of beautiful plants and food. Recognizing the importance of pollinators, each of the Natural Heritage Program's Rare Plant Profiles on its website includes a section on pollinator dynamics.

Katharine Philip's painting *After the Fire* depicts the regeneration of a forest after the ravages of fire. Indeed, as mentioned by Liz Olson, one of the most serious threats to some native plants is suppression of the fire they depend on to survive. Katherine's painting was inspired by the hope she felt seeing green puffs and sprouts in a sea of scarred and burned trees.

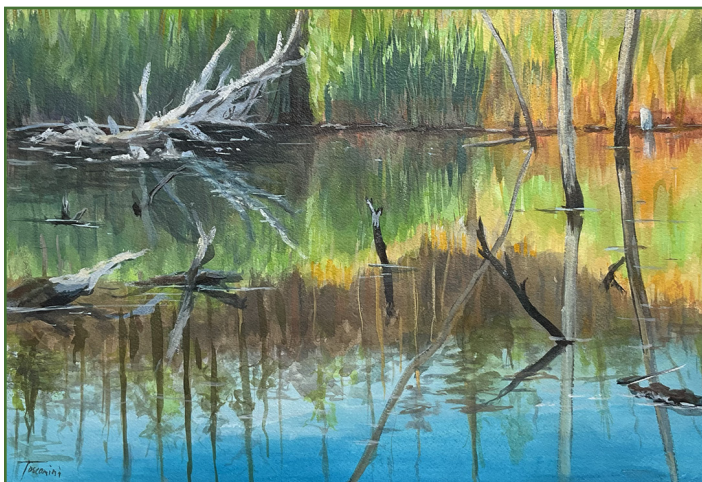
Daniella Toscanini spoke about the beauty of plants and animals in a serene coastal wetland setting that inspired her painting *Barneгат Bay Wetlands*. She also mentioned that while beautiful and serene, these wetlands serve as important nursery grounds for wildlife and as buffers against flooding. Liz Olson agreed and noted that a lot of New Jersey's rare plant species occur in wetlands, with many occurring specifically within salt marshes.



Sandra Peter's *Pollinators Waltz*.



Katharine Philip's *After the Fire*.



Daniella Toscanini's *Barneгат Bay Wetlands*.

While all the art in the *This Land is Your Land* Exhibit was beautiful and inspiring, it reinforced that we are all responsible for what we do to the land to ensure that it continues to be available for you and me, and the biota that depend on it. Beyond beauty, these lands, and the pollinators, fire, and wetlands that play a part in them, must be understood and respected so that they continue to exist and flourish for future generations.

Hunting News

During the 2025-2026 hunting season, there were 2,005 hunting registrations through its [website](#). In many cases, the same hunters registered at multiple Trust preserves with 1,485 individual hunters registering to hunt. The Trust allows hunting for deer only at 40 preserves totaling over 19,800 acres to maintain biodiversity. The deer population in New Jersey is far greater than the ecosystem can sustain. Over-browsing by deer depletes native vegetation resulting in impacts to animal and plant habitat, such as decreased food sources and increased invasive plants.

To hunt deer at selected Trust preserves, hunters access the Trust's website, electronically submit information to the Trust, and print their own hunter registration letter with the required accompanying preserve map. The Trust can use this information to sort hunter registrations by preserve. Trust staff may reach out to hunters registered at a specific preserve to determine their interest in volunteering for cleanups and maintenance projects.

It is important to note that the Trust does not allow hunting for waterfowl, small game, turkey, or bear, as it maintains that only over browsing by deer poses a threat to biodiversity. In addition, Sunday bow hunting is not authorized on Trust preserves as it is on state wildlife management areas and private property during deer season.

While hunting on Trust preserves, all rules and regulations in the New Jersey Fish & Wildlife game code must be followed. Hunting deer by bow and arrow, shotgun or muzzleloader are acceptable, depending on the preserve and season. No target shooting or discharge of weapons other than for deer hunting purposes is permitted. Permanent deer stands are not allowed, and portable deer stands, while permitted, must be labeled with the hunter's contact information and be removed after the hunting season is completed or are subject to confiscation by the Trust. Additionally, hunters are not permitted to damage or clear vegetation, and deer baiting/feeding is prohibited on all Trust preserves.

“Impacts of deer abundance are not limited to plant species, but cascade throughout the food web.” *



PHOTO: William Culp

* Kelly, JF. 2018. Results of white-tailed deer (*Odocoileus virginiana*) surveys in Watchung Borough in April 2018. Raritan Valley Community College.



Thanks to Our Volunteers

The Trust would like to acknowledge and thank its many volunteers for their invaluable contributions to the maintenance of Trust preserves.



Trust volunteers come in all ages and sizes. This crew of three families stepped in to repair an eroded trail at the Thomas F. Breden Preserve at Milford Bluffs Preserve and seemed to have fun doing it. Many thanks to the whole crew.

Contribute to the Delaware Bay Shorebird Fund

Each spring in Delaware Bay, from about the first week in May to the second week in June, the largest concentration of horseshoe crabs in the world comes onshore to spawn. At the same time, tens of thousands of shorebirds arrive at the Bay en route from southern wintering grounds to Arctic breeding territory, and Delaware Bay is their most critical stopover. The shorebirds need to quickly double their weight to complete their migration north and breed successfully. To refuel at such capacities and in only a 10-day window, high-energy horseshoe crab eggs provide essential nourishment. But since the early 1990s, there have been major declines in both the number of adult horseshoe crabs and their eggs. With the decline of their critical food source, shorebird numbers also plummeted. For the past 35 years, the Trust has funded scientific research and conservation efforts through the Delaware Bay Shorebird Fund with the goal that someday Delaware Bay's skies will be once again filled with shorebirds.

The Delaware Bay Shorebird Fund was initially created in 1985 through an agreement between the Department of Environmental Protection and Public Service Electric and Gas Company (PSEG). The agreement provided that \$600,000 would be transferred to the Trust, as a fiduciary, to invest and administer solely for protection and management of shorebird habitat. After funding critical shorebird research for the past 35 years, the Delaware Bay Shorebird Fund is now nearing depletion. With contributions, the Delaware Bay Shorebird Fund could continue critical long-term shorebird and horseshoe crab research.

In order to protect these shorebirds, please consider making a donation to the Trust's Delaware Bay Shorebird Fund. Donations can be made online through PayPal:

Donate with PayPal button:



Please indicate that the donation is being made to the Delaware Bay Shorebird Fund.



Delaware Bay Shorebirds.
PHOTOS: William Culp

Donations



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William Culp
Robert Shinn
William Penn Foundation
New Jersey Conservation Foundation
The Nature Conservancy
CITGO Petroleum Corporation
Clemencia Rodriguez
Independence Public Media Foundation
PowerCorps Camden
Camden County Municipal Utilities Authority (CCMUA)
NJDEP Endangered and Nongame Species Program
Dr. Jay F. Kelly/Raritan Valley Community College
Urban Promise - Camden
Ridge and Valley Conservancy
Pinelands Preservation Alliance
National Fish & Wildlife Federation
Bob Fink and the Fink Family
The Simini Family
The Tessieri Family
The Witman Family
Wayne Township
Wildlife Preserves, Inc.
Bruce Bieber
Keith Seager
Benjamin Tycko
Rosa Pereira

For more information about how you can donate to further the Trust's mission to acquire, preserve and manage lands for the protection of natural diversity, please visit the [Trust's website](#).



Board of Trustees

The Trust is governed by an eleven-member Board of Trustees. The Board is comprised of six representatives from the private sector and five representatives from State government. The State government members include the Commissioner of DEP and two DEP staff members designated by the Commissioner; the State Treasurer; and a member of the State House Commission. Employees of the Office of Natural Lands Management, State Parks, Forests & Historic Sites, serve as staff to the Trust and implement the policy set by the Board.

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In the spirit of healing, the Trust acknowledges the Lenni Lenape, Munsee Lenape, Ramapough Lenape, and Nanticoke tribes, the original people of the lands that we manage as Trust preserves. These people have been here for many thousands of years and the Trust acknowledges, honors, and respects their past, present, and future deep ties to these lands. The Trust takes responsibility to:

- * Better honor and respect the original people of this land in the stories we tell;*
- * Provide platforms for Native voices;*
- * Seek Native representation in managing these lands; and*
- * Remain humble and curious.*

The Trust strives to take all actions in the spirit of repair and justice without further harm or injustice to the Lenni-Lenape, Munsee Lenape, Ramapough Lenape, and Nanticoke tribes or these lands.



A South Jersey bog at sunset.
PHOTO: Judeth Yeany

