

NAPLES
BOTANICAL
GARDEN

Conserve





Enveloped in native plants, intern Tori Mann surveys the Preserve as part of her summer-long immersion into land management and plant conservation. Photo by John Eder.

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From Our Leadership

As a longtime Naples Botanical Garden Board Member, I enjoyed an inside view of the organization’s many endeavors. But in my term as interim CEO, I’ve gained an even more intimate understanding of what it takes to protect plants.

Through this issue of *Conserve*, you, too, have an opportunity to explore the behind-the-scenes work of botanical gardens. You’ll stay close—our seed bank and our Preserve—but also venture far away. Did you know waterlily seeds from our collection are a part of an effort to conserve an African waterlily once thought extinct? Or that our Garden recently helped convene hundreds of plant professionals in the Dominican Republic for a week’s worth of collective action?

In this interim tenure, I’ve also had a chance to more closely witness the academic activities happening in the Garden. We’re delighted by the presence of students and professors from Florida Gulf Coast University, which has a satellite campus here, and from nearby Florida SouthWestern State College. Learn more about their research projects and how they align with our plant conservation goals. In addition, discover how an FGCU biochemistry professor is using samples from our orchid collection in his quest to find plant-derived cancer-fighting compounds!

The next time you’re strolling the Garden, I hope you’ll think about these unseen activities and remember the critical part you play in making them happen. Every donation made, every ticket sold, every membership purchased or renewed, every meal in Fogg Café and purchase at the Berger Shop in the Garden helps fund this work. Thank you for being a part of this mission.




Carl Crosetto
Interim President & CEO
Naples Botanical Garden

Once, when I was very young, I remember deadheading flowers with my grandmother. We knelt in the dirt by her garden beds, and she taught me to pinch back the spent flowers of her marigolds. What are those black and white things, I asked her, curious about match-like strands within the dried flowers. Those are seeds, she explained. We’ll plant them next year so we’ll always have flowers.

That was my first memory of learning about seeds.

I was fascinated that this tiny little thing was alive, that within it lies a sleeping plant that I could awaken at any moment. Years later, the tradition shifted, and my daughter and my mom began growing and saving marigold seeds. As a family, we kept those same marigolds alive for generations. For me, seeds have come to represent hope for the future.

This year, as we celebrate the Garden’s seed bank, I hope that you can find your own magic in these little seeds. In this issue, we share an exciting milestone for our seed conservation, the projects on the horizon, and what they mean for our community. We also give you a behind-the-scenes look at what it takes to protect native plants in our Preserve, share some innovative research related to our botanical collections, and offer a first-hand account of how we’re helping to unite botanical gardens and rally behind common causes.

This work wouldn’t happen without the support of our Members, Donors, conservation partners, and community advocates. Thank you for helping to protect our region’s environmental health—for today and for the future.




Chad Washburn
Vice President of Conservation
Naples Botanical Garden

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ON THE COVER

Encased in fruits, pods, nuts, and cottony tufts, seeds are a primary focal point for Garden conservationists, who deposited their millionth seed into the seed bank in 2026. *Photo illustration by John Eder.*



Questions and letters to the editor may be sent to email@naplesgarden.org.

In Brief

Naples Botanical Garden Helps Determine North American Conservation Strategies

NEARLY 4,000 PLANTS native to North America are considered at risk, but more than 1,000 botanical gardens throughout the continent are reaffirming their commitment to save them.

Conservation leaders are writing a new U.S. Strategy for Plant Conservation. This document will help guide plant protection efforts throughout the continent for the next decade.

Naples Botanical Garden is co-leading the Ecological Restoration Working Group, along with New York Botanical Garden. The group is charged with developing goals that support restoration, natural resource management,

native plant protection, and ecosystem functions—along with determining how they'll measure success.

The strategy's first iteration was released in 2006. The new U.S. Action Plan will align with global biodiversity goals and will guide collective action for the next decade. Organizations including the Center for Plant Conservation, American Public Gardens Association, Botanic Gardens Conservation International, and several botanical gardens are leading its development.

"The opportunity to collaborate with garden leaders from across the country to develop this plan is a great honor," Vice President of Conservation Chad Washburn said. "I could never have imagined in 2009 when we first opened the Garden's doors that we would play such an important role on the global stage."

Garden conservationists survey rare scrub habitat. Photo by John Eder.

Mangos on Our Minds

WE'VE BEEN TALKING

a lot about mangos lately—and not just because we're producing this magazine during the height of harvest season.

The Garden holds a growing collection of *Mangifera*, including *Mangifera indica*—the species that yields popular mango varieties such as Hayden and Tommy Atkins. Our holdings go well beyond these supermarket staples, however. We currently have eight species of *Mangifera*, and we're working to identify more in need of protection.

Why?

For one, South Florida is the biggest domestic producer of mangos, and one of a handful of places in the United States capable of growing these fruits. For another, mangos are an important global food source. First cultivated in India some 5,000 years ago, the fruits are intrinsic to communities ranging from Asia to South America to the Caribbean to our own stomping grounds: Collier County, Miami-Dade, the Florida Keys, and Pine Island.

Finally, wild-growing *Mangifera* may hold advantageous traits that could be introduced into cultivated mangos and bolster the trees' ability to withstand stressors such as drought. The decline of Florida's citrus industry—devastated by an insect-borne disease called "greening"—is a hard lesson in the need for agricultural resilience.

The Garden already maintains collections of a wild-growing pawpaw and of swamp bay, an avocado relative. Our interest in agricultural resilience led us to connect with a new worldwide initiative to ensure edible plants are protected in botanical collections. The Global Conservation Consortium for Food Plants launched in 2025 and is led by New York Botanical Garden.



"Owing to its location in the subtropics," Curator of Special Collections Matt Herrman said, "the Garden is uniquely situated to grow, display, and conserve not only the familiar mango, but also its wild relatives, which are rarely cultivated outside of their native ranges in Southeast Asia."

The Hidden Barrier to Plant Conservation

YOU MIGHT EXPECT ISSUES

such as funding shortfalls, political attitudes, and development pressures to undermine plant conservation efforts.

Conservationists from 50 institutions worldwide—including Naples Botanical Garden—point out another big factor: fragmented technology.

A new paper, published in the January 2026 issue of the journal *Nature Plants*, warns that individual garden databases don't connect with each other, that under-resourced gardens lack the technology or staffing to maintain electronic plant records, that record-keeping practices vary from institution to institution, and that a history of competition and exploitation hinders transparency and openness. With this new awareness, conservation experts are determining how to break such barriers.



Scan to access the paper and hear from the authors, who offered additional insights to Naples Botanical Garden readers.

Salamanders Eat *What?*

Working in the Garden's Preserve, FSW students make new findings about wildlife diets, diseases, and the spread of an invasive plant

By Jennifer Reed

Amphiuma salamanders eat fruit. If you are an average person, you may be thinking, "So what?" But if you are a herpetologist—a scientist specializing in amphibians and reptiles—your reaction may be more like, "Whoa!"

That's what Florida SouthWestern State College Biology Professor Jordan Donini hopes, anyway. He and about a dozen students assessed the populations of two types of aquatic salamanders, the two-toed amphiuma (*Amphiuma means*) and greater siren (*Siren lacertina*), found in the Garden's Preserve. During the research (which deemed the populations to be healthy—an indicator of ecosystem well-being), one student, Nikko Bustamante, investigated the diet of amphiumas. They're known to eat worms, fish, and small invertebrates. By examining their feces, he found evidence of a more varied diet, including pond apple, cabbage palm, and sedge consumption. (Bustamante is now a student at Florida Gulf Coast University and an intern with the Conservancy of Southwest Florida.)

"There is only one other record of an herbivorous salamander, and that was algae consumption by a greater siren," Donini says. "It's a very cool finding."

He intends to publish this research and delve into a new question: Could the



salamanders act as seed dispersers?

In a separate but related study, Donini's students microchipped, measured, and monitored about 50 salamanders while also testing them for ranavirus disease, a deadly group of viruses that afflict amphibians, turtles, and fish.

Ranavirus is considered to be an emerging disease globally and has no known cure. Scientists are trying to learn more about its characteristics, including how it spreads from species to species and its overall prevalence among different organisms. These salamanders tested negative; however, Donini and his students plan to continue monitoring them.

A final study looked at whether Florida box turtles spread beach naupaka (*Scaevola taccada*). This invasive plant forms dense, impenetrable stands on coastal dunes, outcompeting native species (see page 28 to learn more about invasive species and their toll).

The turtles are indeed among the seed spreaders, according to Donini and student researcher Jordan Rios, who published their findings in the November 2025 edition of *Frontiers in Amphibian and Reptile Science*. To come to that conclusion, the pair borrowed space at the Garden's Evenstad Horticulture Campus to grow two sets of naupaka seeds: those that had passed through turtles' digestive systems and those that had not.

The two groups of seeds germinated at similar rates, Donini and Rios reported. This confirmed the turtles' ability to serve as seed dispersal

The Garden's Preserve serves as a living laboratory. Photo by John Eder.

agents. But that finding opens many additional questions, including whether the turtles might spread invasive species beyond coastal habitats as they roam into different ecosystems. They plan to continue their studies.

The Garden's Preserve is an ideal learning laboratory, Donini says.

"It's a nice, very accessible place to introduce young scientists to field work," he says. "This is sometimes their first experience ever."

Jennifer Reed is the Garden's Editorial Director.



A Burning Question about Prescribed Fire: How Often Should Habitats Ignite?

FGCU ecology students investigate the needs of two native plants

By Jeannine Richards

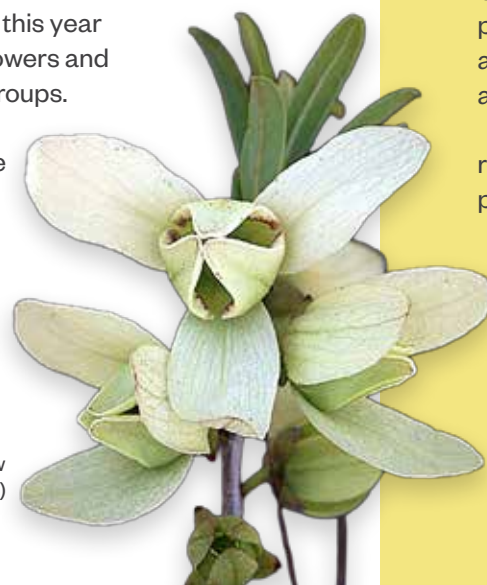
Ecologists have long understood that fire spurs growth and reproduction in many plant species, making prescribed burning an important land management tool. But how frequently should we burn? Not all plants have the same needs when it comes to fire, so understanding how different species respond is critical, especially when working with rare species.

During the 2026 spring semester, students in Florida Gulf Coast University's Plant Ecology class collected data on two fire-dependent, rare species found in the Garden's Preserve, hoping to answer that question. The answer turned out to be rather nuanced, adding complexity to the Garden's prescribed fire program.

Netted pawpaw (*Asimina reticulata*) is a shrub found in pine flatwoods habitats. It is related to the edible pawpaw fruit that grows in much of the eastern United States. We compared flowering and fruiting in three groups of plants: those that experienced prescribed fire this year; those that burned three years ago; and those that have never ignited in the decades for which we have records.

The pawpaw plants burned this year produced significantly more flowers and fruits than either of the other groups. Interestingly, fire's benefits did not seem to extend for multiple years—the plants that burned three years ago had very low reproduction, similar to those that had not burned at all. Thus, for pawpaw, frequent fire is highly desirable. This makes sense because,

Netted pawpaw
(*Asimina reticulata*)



historically, pine flatwoods typically would have experienced wildfires every 1 – 5 years.

Florida rosemary (*Ceratiola ericoides*) is a small shrub that occurs in scrub habitats with extremely dry soil and low ground cover. This species does not appear to be reproducing in the Garden's natural areas, and we wanted to figure out why. We know Florida rosemary is very slow to reach reproductive maturity, taking about 10 years before it flowers for the first time. The adult plants can be killed by fire, but fire also stimulates the germination of new seeds so that the population replaces itself.



Florida rosemary
(*Ceratiola ericoides*)

The students surveyed two populations of Florida rosemary to learn more about why it might not be reproducing. The species has separate male and female plants, so we hypothesized that perhaps only males or only females were present. We also wondered if the plants were not getting pollinated, and therefore not producing seeds. We investigated

both questions and learned that neither is the problem—the Garden has both male and female plants interspersed in roughly equal numbers. And we found seeds on about 40% of

the female plants, indicating that many are reproducing. Thus, the mystery continues.

However, what we know about Florida rosemary's slow maturity and response to fire suggests that it benefits from much less frequent burning than the netted pawpaw does. Historically, Florida scrub ecosystems would only have experienced wildfires about every 15 – 20 years. This suggests in writing the Garden's prescribed burn management plan, land managers need to consider the individual needs of rare plant species, where they are located on the landscape, and their unique relationships to fire before igniting a blaze.

Dr. Jeannine Richards is an Associate Professor of Restoration Ecology at The Water School at Florida Gulf Coast University.

How We Apply Student Research to Land Management

Before the students' research, we knew our Florida rosemary plants were declining, but we really didn't know much else about the populations within our Preserve. Their project allows us to rule out a few potential causes—and start thinking about our next actions.

We didn't know, for example, that we had roughly equal numbers of male and female plants and that they are, in fact, making seeds. So, we know those aren't the issues. (Note: We don't yet know if the seeds are viable because we haven't done germination studies.) We know fire can kill adult plants but prompt seedlings to germinate. However, if we aren't getting good seedling recruitment, even after a prescribed fire, we may need to change strategies.



We are now planning to collect Florida rosemary seeds and store them in our seed bank. As we work to determine the causes and solutions of our declining population, we will still be able to grow new plants and restore our site using its original genetics.

Eric Foht is the Garden's Natural Resources Director.

Mangroves and Marshes on the Move

How the Garden's wetlands may help answer big questions about coastal resilience

By Brian Bovard

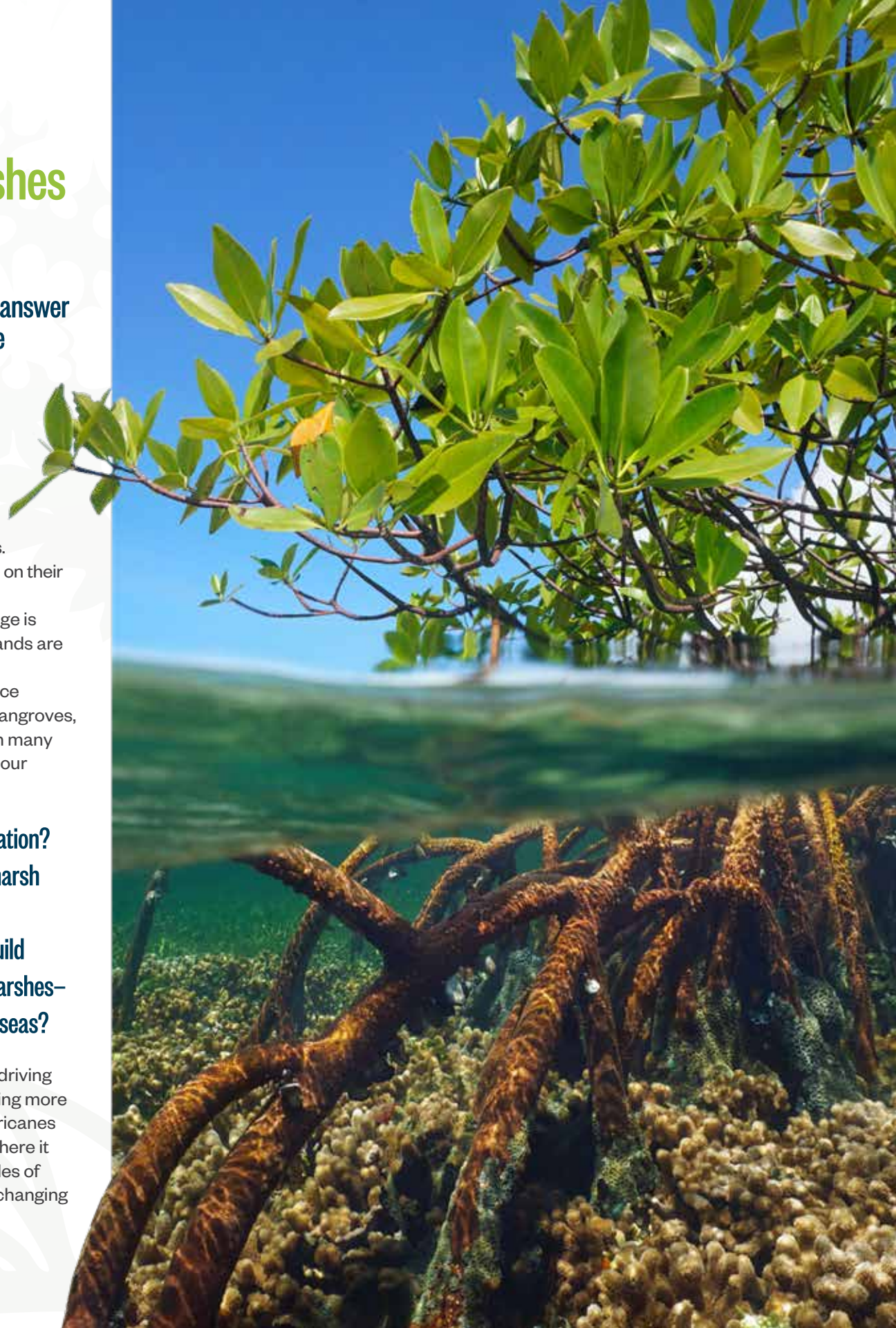
The south end of Naples Botanical Garden's natural areas appears quiet and timeless. Patches of sawgrass and black needle rush weave their way across subtle elevation and salinity gradients. Closer to the water's edge, mangroves perch on their spindly, leg-like trunks.

But underneath this serene setting, change is underway. Southwest Florida's coastal wetlands are on the move.

Salt marshes are migrating into areas once dominated by freshwater wetland plants; mangroves, in turn, are moving into salt marsh habitat. In many places, these changes are slowly reshaping our coastal ecosystems.

Are these marshes gaining or losing elevation? Does prescribed fire help maintain salt marsh habitat? Should we try to preserve those grasslands? Or are mangroves—which build soils and elevate wetlands faster than marshes—better equipped to keep pace with rising seas?

We know several interacting factors are driving these changes. Rising sea levels are propelling more saltwater into coastal wetlands. Recent hurricanes pushed large volumes of saltwater inland, where it lingered for weeks. At the same time, decades of development have altered local hydrology, changing how water moves across the landscape.



But we don't know the ramifications of such transitions. Are these marshes gaining or losing elevation? Does prescribed fire help maintain salt marsh habitat? Should we try to preserve those grasslands? Or are mangroves—which build soils and elevate wetlands faster than marshes—better equipped to keep pace with rising seas?

These coastal wetlands also support the rich web of life that defines our estuaries.

To help answer some of these questions, Garden Natural Resources Director Eric Foht and I, with the help of my Climate Change Ecology class, established two sets of long-term research plots within the Garden's Preserve. One was established in a freshwater sawgrass marsh and the other in an adjacent black needle rush salt marsh. We wanted to understand how different types of coastal wetlands are responding to today's changing environmental conditions and how they may do so in the future.

As we monitor these sites, we're paying particular attention to elevation changes. That's because in wetlands, a matter of inches can determine the future of an ecosystem. Small changes in elevation determine whether a marsh persists, transitions into another ecosystem, or becomes open water.

These are not simply academic questions.

Coastal wetlands function as natural protection systems during storms and heavy rains. Wetlands act like enormous sponges, absorbing water and releasing it gradually across the landscape. This natural water management helps reduce flooding, slows storm surge, and protects nearby communities from hurricanes and extreme weather. As sea levels rise and storms become more intense, these wetlands will play an increasingly important role in protecting our coast.

These coastal wetlands also support the rich web of life that defines our estuaries. They function as a cafeteria for estuarine life, supplying food and protections for countless species of fish, crabs, shrimp, and birds. Many of the fish and shellfish that support Southwest Florida's recreational and commercial fisheries spend critical stages of their lives hidden in these coastal wetlands.



An American white ibis (*Eudocimus albus*) rests on a mangrove in the Preserve. Photo by Dick Murray.



Roseate spoonbill
(*Platalea ajaja*)

Botanical gardens are often thought of as places of beauty and collections of plants, but they also serve as living laboratories where science and conservation come together.

If we fail to understand how these systems are responding to sea-level rise, storms, and changing hydrology, we will not know how to protect and care for them effectively. With data to guide us, we might strategically deploy prescribed fire to slow the mangroves' migration into the marsh. Or we might decide that a heavier mangrove barrier is advantageous and may find ways to encourage their spread, such as by planting additional propagules.

If we cannot manage these wetlands appropriately, they may well disappear beneath a rising sea. If that happens, we risk losing the benefits they provide our community—flood protection, wildlife habitat, fisheries—the very elements that underpin Southwest Florida's economy and quality of life.

Botanical gardens are often thought of as places of beauty and collections of plants, but they also serve as living laboratories where science and conservation come together.

By establishing these research plots now, Naples Botanical Garden is creating a baseline for understanding how coastal wetlands respond to sea-level rise, storms, and management decisions. The lessons learned may help guide management across Southwest Florida, informing decisions in places like Naples Bay, Collier-Seminole State Park, the Fakahatchee Strand, and Big Cypress National Preserve. In many ways, these small marshes may help answer some of the biggest questions about the future resilience of Southwest Florida's coast.

Dr. Brian Bovard is Associate Dean of Faculty and Student Affairs and an Associate Professor of Wetland Plant Ecology at The Water School at Florida Gulf Coast University.

Reawakening the Magic

How the wonder of nature inspires playfulness and purpose

By Britt Patterson-Weber

A few weeks after my 22nd birthday, I drove 43 hours from Missoula, Montana, to Fort Myers, Florida, for a six-month environmental education internship. I had not yet looked up Fort Myers on a map when I accepted the job; I just knew I needed to get somewhere sunny. The plan was to defrost in Southwest Florida for the spring semester before heading back west for graduate school in the fall.

I spent my days teaching 7-year-olds about pine flatwoods, cypress swamps, and their inhabitants, and I spent my nights in those same pine flatwoods and cypress swamps. My internship provided on-site housing, and I was the only one living on that 107-acre property. Without television, let alone internet, I wandered the grounds at night, curious about my new home. Through this immersion, I slowly developed a fondness for wild Florida.

As my internship wound down, a reluctance to leave tugged at me. I started to question my career path. The internship had been a passion project, an interlude from my study of anthropology and linguistics. What *exactly* did I intend to do with that?

Then I had one transcendent day in nature that changed everything.

I chaperoned a group of fifth-grade summer campers on a field trip to Cayo Costa State Park. We hiked around a bit before heading to the beach, a shoreline unlike any I had ever experienced. No hotels, no souvenir shops, just sand, trees, and plants as far as I could see. We found a lagoon that connected with the Gulf via a natural “lazy river.” The kids and I plopped into the warm water at one end and quickly floated to the other end, where we got out and ran back to do it again ... and again ... and again. When we wore ourselves out, we found a place where we could sit in the sand and dangle our legs into the water. Pretty soon, a manatee came by to investigate, followed by dolphins. Walt Disney could not have scripted anything more magical.

I contacted my advisor to let her know I would not be enrolling in the fall.

That was nearly 25 years ago. I am still chasing the magic I experienced that summer day, but my quest has gone beyond that: I became a full-time environmental educator, helping others discover the unique joy of the outdoors. On the surface, the work of environmental educators may look a bit like facilitated play—a more formalized version of the Cayo Costa lazy river.



But there's a deeper intentionality to our work. Pro-environmental behavior starts with meaningful relationships with nature. We environmental educators believe, as the Lorax so aptly put it, “Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.”

Fittingly, children understand that right away. We see their curiosity alight in the Garden's Nature Play spaces and on field trips all the time. But kids grow up, and sometimes that sense of wonder gets buried under the weight of adulthood.

Can we reawaken it? Absolutely. Offer adults opportunities to put aside “adulting” for a stretch, and they'll remember how to engage with nature. I see it time and again with students in our Nature Journaling program, who tell us how even their front yards look different to them over the course of their studies. After slowing down to sketch and write about nature near them, nature is suddenly everywhere they look.

Likewise, first-time Garden visitors who join an educator-led tour may leave as Members after engaging with the botanical curiosities throughout our landscape. There is a reason the very first

sign as you enter the Garden reads: “Stop for a moment to feel how the plants are affecting your senses with shade, fragrance, color, texture, and even sound.”

Not every experience is going to be transcendent, but every pause is an opportunity to get to know the natural world a bit better, a chance to fall in love with the land we are trying to protect.



Britt Patterson-Weber is the Garden's Interim Deputy CEO and Vice President of Education & Interpretation.



Discover what it takes to create a Garden education program.





Seed Banking Takes Center Stage

As the Garden's collection tops 1 million seeds, new partnerships promise even more progress

By Jennifer Reed
Photos by John Eder



Sand Hill Island



Photo by Stan Shebs, iNaturalist



Photo by Jared Franklin, iNaturalist

The Garden's seed bank celebrates its fifth birthday in 2026 and marks a transition from its scrappy, pandemic-born infancy into a robust industry leader with a million seeds to its name and big plans on the horizon.

Garden conservationists began collecting seeds during COVID-19, advancing long-term goals in the seclusion of the outdoors. The seed bank officially launched in 2021 with a handful of nodding pinweed (*Lechea cernua*), gathered from our Preserve.

Five years later, seeds of the woolly lupine (*Lupinus pilosior*), collected in May 2026, pushed the Garden's holdings across the 1 million mark. As of that month, the seed bank included nearly 170 species in various stages of deep freeze, some intended to last decades, others to be defrosted and put to use if natural disasters strike.

The Garden and the Seminole Tribe of Florida have embarked on a new collaboration, with

Clockwise from top: Kalani Bankston of the Seminole Tribe collects seeds from our Preserve; a rare patch of woolly lupine (*Lupinus pilosior*); Nodding pinweed (*Lechea cernua*)

tribal conservationists learning seed banking techniques in the Garden. They intend to preserve species on their inland reservations, complementing the Garden's efforts, which, to date, have focused along the coast.

Colin Clubbe, the former Head of Conservation Science for Britain's Royal Botanic Garden, Kew, plans to spend several weeks in Naples this winter laying the groundwork for a potential expansion, one that would allow botanical gardens throughout the Caribbean to back up their seed collections in Naples.

"Plants are not optional. They're the foundation of the ecosystem—and the food chain. They make us more resilient to storms and help us adapt to a changing climate. They even drive our economy."

**—Chad Washburn,
Vice President of Conservation**

All the while, Garden conservationists continue to ramp up seed collecting efforts, especially with their counterparts at Rookery Bay National Estuarine Research Reserve. The two institutions are trying to conserve native plants from ecosystems disappearing due to erosion, sea-level rise, storms, and related causes.

"Plants are not optional," says Vice President of Conservation Chad Washburn. "They're the foundation of the ecosystem—and the food chain. They make us more resilient to storms and help us adapt to a changing climate. They even drive our economy. After all, who travels to Southwest Florida to sit indoors?"

Saving Plants—One Excursion at a Time

On a May morning, conservationists from the Garden and Rookery Bay landed a boat on Sand Hill, a secluded, windswept island in the Reserve's north. The landscape was breathtaking—an ancient sand dune, looming 25 feet above sea level, dominated by a rare expanse of coastal scrub habitat.



Vice President of Conservation Chad Washburn points out native plant characteristics to artist Lauren Shapiro. Photo by Sten Kerwin.

New Exhibition Shines Artistic Lens on Seed Conservation

You can't see our seed bank.

It's tucked away in the Harvey Kapnick Education and Research Center, and we restrict the number of times we open the door.

But what's inside that minus-6-degree chest is magic—entire ecosystems suspended in time. Miami-based artist Lauren Shapiro is about to animate them. In summer 2026, she joined our team on seed collecting trips, learned about the preservation process, and peered at seeds up close, in preparation for casting sculptures that interpret and amplify these tiny wonders.

Walking with our team helped her see ecosystems in new ways—from tangles of green to individual plants. "It's a treasure hunt and a discovery, and that's what I want the artwork to be in the Garden," Shapiro said. "I want people to stumble upon it, discover it, and look a little closer to see all the textures and details I've observed."

What is Gathered Remains runs from January 23 – June 1, 2027.



This exhibition is made possible by the Schoonmaker Foundation.

The team clambered up a narrow footpath, absorbed in the scenery, when Conservation Associate Jonathan Farquhar, the Garden's seed bank lead, abruptly stopped.

Lupine, he announced. The wildflower was among their targeted species, a plant that is hard to find and finicky to grow. Farquhar delicately removed a few pods, taking care not to strip the plant of too many. In that moment, he didn't know it was the species that would tip his seed counter to seven digits. "Hey, there's more over here," Mike Cox, the Garden's Natural Resources Manager, called from around a bend.

Although the team is happy to record unicorn-like finds like this flower, they are



Intern Jacob Holcombe (left) and Conservation Associate Jonathan Farquhar collect fruits from the Florida prickly pear (*Opuntia austrina*).

Meet our Seed Master



I gained the skills necessary for environmental conservation in the most indoor of spaces, a university archive, where my days were spent deep in bankers' boxes and paper records.

In an interesting twist, my archival work revolved around plants and ecology. It started in 2021, installing my first exhibit for Florida Gulf Coast University's Library Archives and Special Collections. It was called *The Shape of Orchids: An Eternal Love Affair*, a Victorian-esque narrative showcasing rare prints, photographs from Clyde Butcher, herbarium specimens, a myriad of orchid-adorned materials, and a live orchid wall on loan from Naples Botanical Garden.

When I wasn't installing exhibits, I was curating collections pertaining to Southwest Florida's unique ecosystems. This work included organizing, analyzing, maintaining and digitizing various types of materials.

The largest collection consisted of renowned ecologist Kevin Erwin's papers, correspondence, field notes, photographs, publications, and related documents. I worked

directly with Kevin, a Fort Myers resident who led FGCU's environmental design and permitting and has worked on environmental projects around the world. As the only science major working within the Archives, the Kevin Erwin Ecological Environmental Collection slowly became my labor of love.

It was Kevin who realized that archiving documents and cataloging seeds was really the same work. He reached out to Garden Vice President of Conservation Chad Washburn, offering me a five-star review, which no doubt persuaded Chad that a guy working in a library could just as easily manage a laboratory. Since then, I have been organizing, analyzing, maintaining and digitizing the seeds coming into our seed bank and the data that's collected with them. I've loved Florida's wilderness since I was a kid, and I am so appreciative that I not only get to work in conservation, but I get to help preserve the only place I've ever called home.

Jonathan Farquhar is a Conservation Associate who oversees the Garden's seed bank.

equally enthusiastic to collect common plants like *Rhynchospora megalocarpa*, a sedge found throughout the state, or *Opuntia austrina*, Florida prickly pear, so prevalent throughout Sand Hill and other natural areas that our team frequently shouts out warnings to avoid its pricklers.

That's because a few years—and a few storms—into their seed banking efforts, Garden conservationists began expanding their ideas of what's worth saving.

"In seed banking, historically, a lot of the work is focused on rare plants or imperiled plants," Washburn says. "But we realized after hurricanes and fires and droughts and flooding and storm surge that our coastal community is being impacted more quickly than we can really understand what's happening to plant species and their ecosystems."

Now, the Garden and its partners gather everything from the seeds of tropical trees to those of native wildflowers. "If we don't get out and collect and conserve the plants that make up the ecosystem," Washburn says, "then those building blocks will be gone."

Coastal marshes will be the Garden's next target, he says. Those wetlands are disappearing, transforming into mangrove forests in some cases or simply sinking underwater in others as seas rise and soils collapse (see page 14). Marshes serve as flyways and feeding grounds for migratory birds, as stormwater purification tools, and as a storage bank for carbon dioxide.

Whether the Garden will use its seeds to restore existing marshes or try to introduce new grasslands further inland—a practice known as "assisted migration"—is yet to be determined. Our conservationists are focused on protecting seeds now so they can determine a course of action later.



Farquhar leads seed processing efforts in the lab.

Inviting New "Deposits"

When he visited our Garden in early 2026, Colin Clubbe, the Kew scientist, was struck with an idea: What if Naples expanded its seed bank and served as a repository for the Caribbean region?

Clubbe, who has worked extensively in that area, said many islands don't adequately conserve native seeds because their power supply is unstable or inadequate. Clubbe believes establishing a regional hub spreads the risk and will allow gardens to scale up seed banking.

"You can get systems in place so there is a rapid transport of the collections," he says.

Our Garden's emphasis on education and knowledge-sharing positions it well for serving as a regional resource, he adds.

Expanding the seed bank is not just a matter of adding more freezer capacity; our team needs to understand complex international laws governing plant sharing, learn to manage a broader range of species, and work with potential partners to draft policies governing the use and ownership of the seeds. The latter is a sensitive topic in nations that were once colonized and exploited for their natural resources.



Intern Jacob Holcombe and Conservation Associate Jonathan Farquhar explore the wilds of Rookery Bay National Estuarine Research Reserve, looking for seeds.



Alyssa Osceola, a Tribal Member and the Seminole Environmental Protection Office's Community Engagement Coordinator, collects seeds in the Garden's Preserve.

"There's another level of trust that comes in," Washburn acknowledges. Our Garden has been building relationships for many years, serving as secretariat of the Caribbean and Central American Botanic Gardens Network (see page 42), an organization dedicated to sharing resources and advancing plant conservation. Botanically speaking, South Florida is considered part of this region for its overlapping plant palette.

Supporting Seminole Seed Saving

Within the Seminole Tribe of Florida, interest in seed banking was percolating. Young Tribal Members were looking for proactive ways to protect natural resources. Scientists in the tribe's Environmental Protection Office were exploring the idea of a seed bank as they attended the 2025 Society for Ecological Restoration conference and reconnected with Washburn, a fellow attendee. And Tribal Member Kalani Bankston returned home from Syracuse University, where he majored in biology and minored in Native American and Indigenous studies. Syracuse is home to the Haudenosaunee.

"One of the things that was really reinforced for me is the idea of seven-generations thinking," Bankston says. "Historically, when the Haudenosaunee are making decisions for the

community, they try and consider seven generations. That just really resonated with me, and I wanted to bring that home."

While at Syracuse, he also discovered the long tradition of the Onondaga people's seed saving practices. Bankston is now the inaugural seed bank manager within the Tribe's Environmental Protection Office. He visits the Garden's seed lab almost weekly as part of his seed conservation studies.

"A seed bank is a way for me and the tribe to guarantee the future," says Bankston. The tribe's focus is somewhat different from the Garden's—

they are looking to conserve medicinal plants and culturally important plants, and to ensure food security for their communities, which can feel isolated and vulnerable during natural disasters or other emergencies. Nonetheless, Washburn sees their efforts as a vital boost to native plant conservation in South Florida.

"There are more than 3,000 species native to the counties in South Florida, and there's no way that we could conserve all of those alone," Washburn says. "Collaborations with regional partners like the Seminole Tribe strengthen conservation for the whole region."

Jennifer Reed is the Garden's Editorial Director.

PUSHING **BACK**

Inside the ongoing battle to protect native plants and ecosystems from invasive invaders

By Jennifer Reed

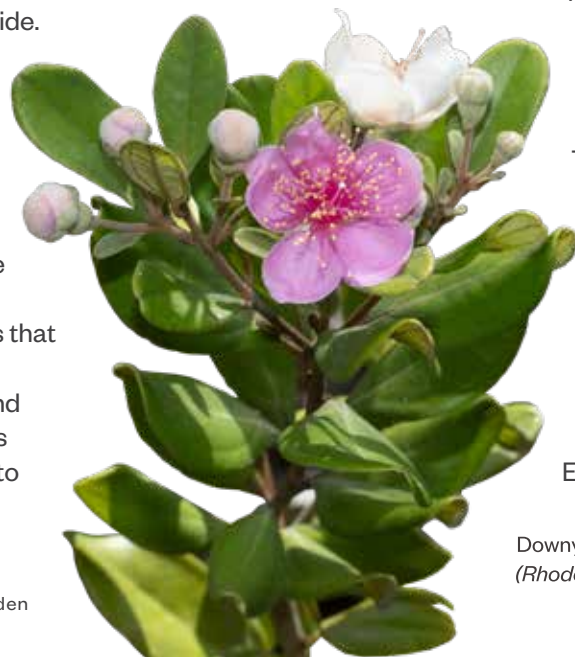
The downy rose myrtle is a beautiful shrub with a scientific name, *Rhodomyrtus tomentosa*, that rings strikingly close to the feeling it evokes in land managers: torment.

It has glossy leaves, produces clusters of rose-pink flowers and yields purple, velvety berries (“tomentosa” actually means fuzzy). “They taste soooo good,” gushes Miralny Marante, a Natural Resources Associate. “Like candy.”

But if she or one of her colleagues spots this shrub in our 90-acre Preserve, she’ll cut it down and snuff out its roots with a squirt of herbicide.

Left unchecked, the prolific plant will turn biodiverse ecosystems into uniform thickets of pink.

Downy rose myrtle is just one of many invasive, exotic plants that the Garden’s Natural Resources Team—and land managers across Florida—are fighting to keep at bay.



Downy rose myrtle
(*Rhodomyrtus tomentosa*)

“These invasive plants are so detrimental to the native ecosystems of South Florida and beyond,” says Natural Resources Director Eric Foht, whose team spends most of its time scouting and removing invasive plants from the Preserve. Without their efforts, this noxious subset of non-native species would overcome our native flora—limiting or even eradicating the very plants we’re trying to protect.

Invasive species are among the planet’s biggest environmental and economic stressors. A 2023 multinational study identified more than 3,500 “invasive alien species” around the world: plants, animals, or other

organisms that live outside of their native habitats and cause harm to their new environments. These invasive species have played a hand in about 60% of reported global extinctions, according to the report, by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.



Hydrilla (*Hydrilla verticillata*)

In Florida, about 175 species are regarded as invasive with almost 60 more on a watch list. Aquatic plants are among the worst offenders; some 96% of Florida’s waters contain one or more invasive species, such as hydrilla (*Hydrilla verticillata*), water hyacinth (*Pontederia crassipes*), and water lettuce (*Pistia stratiotes*).

In their home habitats, factors like diseases, insects and herbivores, and competition from other native species limit the growth and spread of plants. But when they’re exported to a foreign habitat, those controls may not exist to constrain them.

“In a lot of cases, all it takes is one or two invasive plants—and no management—and there’s a problem,” Natural Resources Manager Mike Cox says during a routine survey. As if on cue, the team oringes; someone spots a cluster of torpedograss (*Panicum repens*), among the worst of Florida’s invasive invaders. They ping the spot using a GPS so they can return later to treat it.

Why Land Management Matters

The Garden’s Preserve is home to more than 400 native plant species, including 13 found only in Florida. Twenty-three are considered rare.



Water lettuce (*Pistia stratiotes*)

Botanical gardens safeguard the world’s plants in several ways—tending them in nurseries and display gardens, propagating rare ones to bolster their numbers, preserving their seeds (see page 20), and protecting the native habitats in which they live, the gold star of plant conservation.

Keeping our Preserve healthy requires two primary land management activities, prescribed fire and invasive plant removal. The former is done occasionally; the latter, almost daily.

The Garden’s founding staff already reclaimed the land once from invasive plants. “It was 90% melaleuca, and the only living thing you could see was a random armadillo. It was pretty barren of biodiversity,” remembers Vice President of Horticulture Brian Galligan.

Today, camera traps monitored by the Natural Resources Team and Garden volunteers detect all sorts of wildlife: Florida black bears, white-tailed deer, river otters, coyotes, bobcats, native snakes, leopard frogs, box turtles, and, every few years, a Florida panther. The Garden is considered a birding “hot spot” with 229 species recorded. Invasive melaleuca trees (*Melaleuca quinquenervia*) are mostly gone, but Garden staff are on constant watch to make sure they don’t come back.

An untrained eye might not pick up on the differences between managed and unmanaged land, but once an expert points them out, it’s impossible not to notice. The Natural Resources Team offers this insight one morning. On the north side of a trail, sunlight permeates the canopy, supporting the growth of numerous types of native grasses, trees, and shrubs.

The trail’s south side, private land, is an impenetrable tangle of invasive species—air potato (*Dioscorea bulbifera*), earleaf acacia (*Acacia auriculiformis*), Brazilian



Melaleuca trees (*Melaleuca quinquenervia*)
Photo by A Clarke, iNaturalist



Air potato (*Dioscorea bulbifera*)
Photo by pax leyda, iNaturalist



Brazilian pepper (*Schinus terebinthifolia*)
Photo by timoclurg, iNaturalist

pepper (*Schinus terebinthifolia*), and lygodium (*Lygodium microphyllum*), a climbing fern that can take over forest canopies, block life-giving sunlight to other plants, and produce millions of spores per year.

Our land managers are especially concerned about fire risks created by invasive plants. Climbing vines, for example, can carry flames high into the trees, sparking potentially devastating “crown fires.” On the ground, plants such as cogongrass—one of the most flammable and aggressive species in South Florida—fuels flames. “It forms dense monocultures and burns very intensely, killing native trees and the plants that grow within them,” Foht says.

Managing the Preserve also protects the adjacent cultivated gardens, where more than 20,000 plants—many of them rare—are on display at any time. The introduction of something like air potatoes could spell disaster, Galligan says. The vine, which gets its common name from its potato-like aerial tubers, grows quickly and smothers trees. Even when cut, it remains insidious. The severed vines react by producing pea-sized bulbils, or micro tubers, which sprout new plants.

Ornamental Horticulture Gone Awry

You can’t blame the plants themselves, of course. The same species plaguing land managers today were regarded as botanical wonders in generations past.

Downy rose myrtle, for example, was introduced to Florida in the 1920s for those beautiful pink blooms. Earleaf acacia was imported about a decade later, a seemingly ideal addition to Sunshine State landscapes because it can tolerate both dry and wet conditions. Brazilian pepper has been here since the 1800s, dubbed “Florida holly” by nursery growers, promoting it as an ornamental plant. Melaleuca, from Australia, was planted in the 1900s for an entirely different purpose—to soak up the water from Florida’s swamps, priming the land for development.

Attitudes toward their spread were markedly different then. What we might call “invasive”

Partnering to Protect Endemic Species

Natural Resources Associates **James Panciroli** and **Cody Weber** are co-chairs of the Southwest Florida CISMA, or Cooperative Invasive Species Management Area. CISMA is a partnership of agencies, organizations, and land managers working together to manage the spread of invasive plant and wildlife species and to enlist the public in their cause. There are 16 throughout the state, each focused on the invasive species most prevalent in their regions.

As chairs, they helped organize and staff the annual Invasive Species Symposium and Invasive Freshwater Fish Round Up and hosted education tables at community outreach events.

On why regional collaboration is so important

James: “Plant seeds and animals don’t stay put on one property. Working to fix one plot in an entire region won’t make much of a difference. It takes the work of a collaborative management effort, where stakeholders get together to share ideas, findings, and experiences.”

On chairing Southwest Florida CISMA

Cody: “I learned how important communication is. People want to help, but they need clear information, organization, and opportunities to get involved.”

On why this work matters

James: “Growing up, I was amazed by the natural beauty, power, and scale of the Everglades. I have since learned about the impact and threat of development, habitat degradation, and invasive species on our natural areas. Through my work at the Garden and as co-chair of CISMA, I have been able to see firsthand how invasive species removal and prescribed fire can combat these impacts and threats.”

Cody: “To me, it means protecting the wildlife, plants, and ecosystems that make Southwest Florida special. I want to help keep those places healthy for the future.”



Cody Weber



James Panciroli

today was advertised as “naturalizing well” then, Galligan says. Now, plant professionals are cautious about imports. “Every plant I bring in, I do have to worry, ‘Will this be the next Brazilian pepper?’” Galligan says. (See page 35 to learn the precautions the Garden takes.)

Not every non-native plant is an invasive one. South Florida’s landscapes are brimming with ornamentals from elsewhere compatible with our native ecosystems. Examples include tropical hibiscus (from Southeast Asia),



Water hyacinth (*Pontederia crassipes*)

bougainvillea (from South America), and ixora (from Southeast Asia).

But plants that do become invasive can overtake ecosystems with uncanny vigor. “They become almost ecosystem engineers; they can change the way an ecosystem functions,” says Dexter Sowell, Chair of the Florida Invasive Species Council, a collective of land managers and related professionals who work to control invasive plants and wildlife.

Once they take root, they’re impossible to eradicate—unless you

MEET THE LOCALS

By managing invasive plants, we allow endemic ones—plants unique to Florida—to thrive. The Preserve is home to 13 of them.



False vanillaleaf
(*Carphephorus odoratissimus* var. *subtropicus*)



Semaphore thoroughwort
(*Eupatorium mikanioides*)



Lesser Florida spurge
(*Euphorbia polyphylla*)



East Coast dune sunflower
Helianthus debilis subsp. *debilis*



Feay's palafox
(*Palafoxia feayi*)



Nodding pinweed
(*Lechea cernua*)



October flower
(*Polygonum polygamum* var. *brachystachyum*)



Yellow milkwort
(*Senega rugelii*)



Rugel's hoarypea
(*Tephrosia rugelii*)

How many will you spot during your next visit to the Garden?

Photos by James K. Wetterer, nathan_wood12, barefootz, David McCorquodale, dakota, Tom Field, LW Ridge, Natalie Furlow, Connor Gordon, solitaryviero on iNaturalist.org



Tall threeawn
(*Aristida patula*)



Curtiss' milkweed
(*Asclepias curtissii*)



Florida scrub roseling
(*Callisia ornata*)



Florida hammock sedge
(*Carex vexans*)



Natural Resources Director Eric Foht (above) examines downy rose myrtle. At right, Natural Resources Associate Miralny Marante removes it to inhibit its spread. Photos by John Eder.



How Much Do Invasive Plants Cost to Manage?

A statewide tally of invasive plant control expenditures doesn't exist, but for a sense of it, a single entity, the Florida Fish and Wildlife Conservation Commission, reported spending \$19 million to treat invasive plants on uplands areas and another \$22 million to treat aquatics in fiscal year 2024 – 2025. Private conservation groups, like the Garden, federal agencies, and other state entities similarly pour money into keeping the plants at bay.

catch a population in the very early stages, as in the case of a sedge called Eggers' nutrush (*Scleria eggersiana*), which is likely to be stamped out in Palm Beach County and possibly contained to Hendry County, Sowell says. But a species like Brazilian pepper or melaleuca, which can produce millions of seeds a year, is here to stay.

"We're never getting rid of that from the landscape," says Sowell, who is also the Invasive Plant Coordinator at the Florida Natural Areas Inventory.

That's why Garden Natural Resources specialists are on constant lookout for new growth. It's the hardest part of the job, Foht says. The team spends many hours hiking to remote and difficult-to-access areas to locate



Prescribed fire is one tool to manage invasive plants. Photo by John Eder.



Caesarweed (*Urena lobata*)
Photo by cesarperitop, iNaturalist

the plants. If left untended, these remote populations will likely seed out and radiate into nearby areas. “Consistency of management is the most important thing,” Foht says.

When they find problematic plants, our land managers use a range of techniques to remove them, including hand-pulling young seedlings and applying herbicides to older growth. (They do so in a way that targets invasives without hurting surrounding plants.) Prescribed fire can help, too, because it prompts seeds like

those of invasive Caesarweed (*Urena lobata*) to germinate all at once, allowing Garden land managers to remove them en masse.

Meanwhile, researchers are on the hunt for biocontrols—usually insects—that help keep an invasive plant population in check. Identifying, testing, and gaining government approval for their import and release can take as long as 15 years, Sowell says. The potential biocontrol must attack the targeted plant, but not our native flora, he explains. And they can’t unleash unintended consequences. Cane toads were imported to Florida in the 1930s to manage pests that were damaging sugar crops, Sowell points out. They turned out to be lethal to wildlife and pets because of a toxin excreted through their skin.

Another complication: A biocontrol can’t be too successful, Sowell explains. If an insect eats its way through its food source, it, too, will disappear. What, then, will keep the invasive plant in check when new seeds begin to sprout?

“Biocontrols will never be a magic bullet,” Sowell says. But there are instances where they help. An insect used to control melaleuca, for example, eats the tree’s new growth, where seeds will form, he says. Other approved

biocontrols include a moth that eats lygodium leaves, sap-eating thrips that munch on Brazilian pepper, a wasp that feeds on the developing buds of earleaf acacia, and a beetle in development to attack it as well.

During their trek through the Preserve, the Natural Resources staff stumbles on many finds: a baby gopher tortoise; a patch of shortleaf rosegentian (*Sabatia brevifolia*), a lovely white wildflower; a yellow milkwort (*Polygala rugelii*), listed as “imperiled” by the Institute for Regional Conservation. Along a trail, Cox stops abruptly to examine a lavender-colored flower.

It is rose-rush (*Lygodesmia aphylla*), a plant whose range is limited to Florida and southern Georgia. It is leafless (like a ghost orchid) and its stems reach up to 3 feet tall, topped by that striking bloom.

“I’ve never seen one!” Cox exclaims. Finds like that are why the Garden’s staff persists in the never-ending effort to control invasives.



Jennifer Reed is the Garden’s Editorial Director.

Florida Gulf Coast University senior Grace McCarley, a communications major, contributed to this report.

How We Avoid Introducing Invasives



Horticulturists are always eager to trial new plants, and that spirit of experimentation is part of what makes modern landscapes so rich and engaging. As plant professionals, we continually evaluate new species to create layered, naturalistic displays that inspire both visitors and colleagues. This creativity is central to our work and one of the reasons botanical gardens are so compelling.

At the same time, we take the invasive potential of every species seriously. When we collect or source a plant, we first ask whether it has invasive relatives, how closely they are related, and which habitats those plants are known to invade. We review multiple reference sources—most based on data from the United States—and use that information to make careful, informed decisions about plant selection and placement.

Even so, the research can’t guarantee a plant won’t become problematic. Not every

species has been fully evaluated, especially in a setting as unique as ours, with our stormwater ponds and natural areas besides intensely managed landscapes. Our climate adds another layer of complexity. The way a species behaves in Hawaii, Puerto Rico, or even Tampa, may differ from how it does here in Southwest Florida. Moreover, as temperatures rise and rainfall patterns shift, historical data may not always predict future behavior. That is why we continually monitor our new additions.

Few things are more frustrating than introducing a beautiful plant only to discover that it is spreading into nearby natural areas or even around the parent plant. When that happens, we respond quickly, tagging it for removal and, if needed, eradication. We add it to our prohibited plant list, and we share our insights with other gardens, landscape professionals, and land managers so that they, too, will consider halting their use. Keeping our landscapes beautiful—and invasive-free—is very much a collective effort.

Brian Galligan is Vice President of Horticulture.



The Real-World Applications of Plant Collections

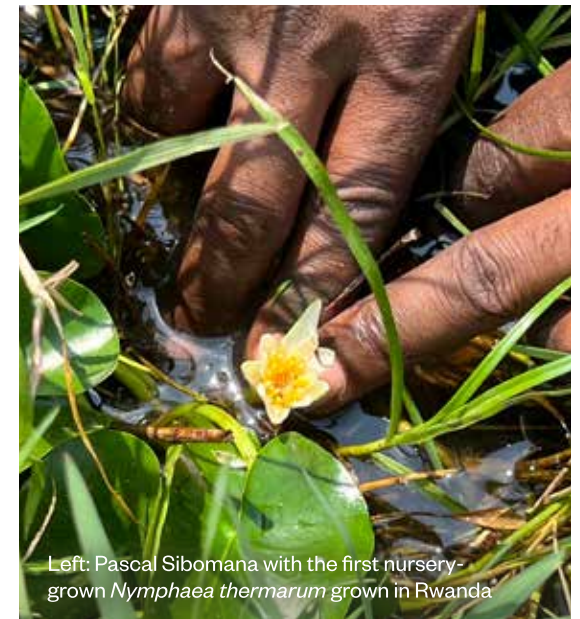
Shared seeds and cuttings advance scientific inquiries and conservation efforts around the world

By Jennifer Reed

The plant collections at Naples Botanical Garden draw some 230,000 people each year to our 170-acre subtropical wonderland. Beyond beauty, they are our way of safeguarding plants, squeezed by development and threatened by climatic changes. Within them, we find inspiration for nature-based solutions that benefit our community.

Botanical collections are important for another reason,

too. Organizations such as botanical gardens and arboreta share plant material for scientific inquiries, conservation initiatives, agricultural applications, and more. Discover how the Garden's plants and curators played a part in the comeback story of the world's smallest waterlily and how a research team is analyzing our orchids for potential cancer-fighting compounds.



Left: Pascal Sibomana with the first nursery-grown *Nymphaea thermarum* grown in Rwanda

An "Extinct" Waterlily Returns to Life

A German botanist "discovered" the Rwandan miniature waterlily in 1987. There's a reason for the quotation marks. We'll get to that.

The flowers were fingernail-sized specks floating in a Rwandan wetland. Scientists soon realized the magnitude of these miniature blooms; the waterlilies were the smallest ever recorded, belonging to a species previously unknown to Western science. Plant taxonomists named it *Nymphaea thermarum*, the species name indicative of the plant's warmwater habitat. To the best anyone could determine, they were limited to one population, in one wetland, in one East African country.

By 2009, *N. thermarum* was formally declared "Extinct in the Wild" by the International Union for the Conservation of Nature as "no one" had spotted them following several surveys over the years. However, individual specimens persisted in botanical collections outside Rwanda, including Naples.

Three years ago, an international research team led by the National Herbarium of Rwanda set out to further investigate the plant's disappearance. The researchers included Dr. Michael Thomas, an American conservation biologist working in Rwanda; Congolese botanist Bonny Dumbo, who was part of the 1987 discovery expedition; and Pascal

Sibomana, then a graduate student at the University of Rwanda. Skeptical of the plant's extinction, these researchers turned to local farmers for insight. "There was an explosion of information," Thomas remembered, as the team showed them photos and asked questions. They set off and within several hours, found a thriving population.

"It wasn't just one plant," he said. "There were hundreds of them."

The Rwandans had been using them all along; *N. thermarum*, which they call "imposha," is an important medicinal plant, used to treat fever.



Local farmers offer researchers guidance in their search for the *Nymphaea thermarum*.



Freshly germinated waterlily seeds offer hope for the species' future.

"It was lost to *Western* science," Thomas said, though he understands why outsiders believed the plant had vanished. Human activities including agriculture and mining had drained the wetland; when these activities changed, and the water's flow was restored, dormant seeds sprang to life.

The waterlily's future, however, remained perilous. In Rwanda, there were no specimens under conservation protection; no seed bank for long-term storage; and no guarantee the wetland would last. A multinational mining company that extracts limestone for concrete bought many of the adjacent parcels.

Thomas and his colleagues launched a multipronged species recovery project. It



included learning how to propagate the plant and multiply its population; planning for an eventual outplanting in a national park; training local villagers to develop a reserve to protect the lilies in the wetland; and developing seed banking techniques.

The latter is where Naples Botanical Garden enters the story.

No one had ever investigated whether *N. thermarum* seed could be dried and frozen for long-term conservation. Thomas and Sibomana didn't have the equipment in Rwanda to do so and doubted the government would let its critically endangered, endemic waterlily out of the country. Thomas turned to the seed biology lab of Professor Hector Pérez at the University of Florida—his alma mater—for help.

Pérez charged an undergraduate student, Isabella Chase, with figuring out seed storage protocols and testing germination rates. But the lab needed *N. thermarum* seeds for experimentation. Using the Botanic Gardens Conservation International's global database of living collections, the UF-Rwanda team reviewed the two dozen institutions that curate the Rwandan waterlily in their collections. The very first fruits donated came from our Garden. Curator of Special Collections Matt Herrman sent two (our collection is quite small), but each fruit contained hundreds of tiny seeds.



Rwandan conservationists have successfully grown hundreds of new waterlilies. Eventually, they hope to plant them in a protected national park.

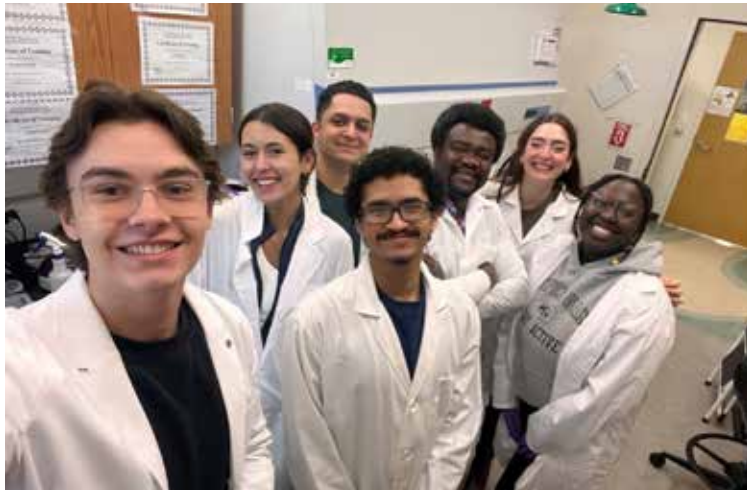
These "were the kickoff" to this seed dormancy research, Thomas said.

Chase tested batches of seeds after 6 and 12 months of cold storage. In each case, about half germinated. Encouraged by that outcome, Thomas plans to establish a seed bank in Rwanda, where Sibomana, who now leads the Rwanda Biodiversity Conservation Institute, has successfully propagated more than 500 plants. Eventually, Thomas hopes to distribute seeds to botanical collections worldwide to strengthen populations that may be losing genetic diversity after years of inbreeding. A bonus for our Garden: We received 100 newly germinated *N. thermarum* seedlings from UF's research to bolster our collection. Only two botanical gardens in Florida, Naples and McKee Botanical Garden in Vero Beach, have this critically endangered species. Ours are on display occasionally; these are finicky plants that require specific growing conditions related to sunlight, temperature, and water depth. Watch for signs in our water gardens indicating when they are out on display.

Share and Share Alike!

Behind the scenes, researchers at botanical gardens, arboreta, universities, and related institutions share information and plant material all the time.

During the last calendar year, we fulfilled research requests related to a dozen different species in our collections. Plant material or information went to places ranging from Harvard University's Arnold Arboretum to the National History Museum of Denmark.



Top left: Dr. Nwoku, at center, flanked by six foundational members of his Biomimetics and Modeling Lab at FGCU. Right: Dunbar High School senior Nishini Fernando monitors the freeze-drying progress of plant extracts.



diverse group of flowering plants, orchids have a long history of therapeutic uses, particularly in Asian cultures.

More broadly, plants are the foundation of common cancer drugs. Taxol (paclitaxel), best known as a breast cancer treatment, is derived from the Pacific yew tree (*Taxus brevifolia*). The drugs Oncovin (vincristine) and Velban (vinblastine), used to treat cancers of the blood, come from the Madagascan periwinkle (*Catharanthus roseus*). Scientists similarly are testing compounds found in turmeric, ginger, green tea, and parsley against cancer cells.

Nwoku, along with Associate Professor of Chemistry Daniel Lambrecht and student researchers Dayanis Del Risco and Julia Jurca, started by identifying orchid species that may have anticancer potential and running computational models on the chemical compounds found within them. They narrowed their inquiry to eight, all of which are in the Garden's collection. We shipped the requested plants to his lab in midsummer.

There, he and his students will isolate and test compounds within the plants against an enzyme known to drive cancer.

"We want to inhibit the enzyme," he said, "to stop it from functioning."

In a related project, Nwoku, his students, and a senior from Lee County's Dunbar High



Samantha Louis, an FGCU biology major, treats brain cancer cells with plant extracts.

School found promising cancer-fighting compounds within Florida native plants. Nishini Fernando, the Dunbar student, initiated the research for her entry in the Regeneron International Science and Engineering Fair, a prestigious competition for high-school students.



Locustberry (*Byrsonima lucida*)

and winged elm (*Ulmus alata*). Locustberry was most effective in killing cancer cells, followed by slash pine. Winged elm showed minimal toxicity but promising wound-healing

In the FGCU lab, the team evaluated the anticancer properties of three plants on glioblastoma, or brain cancer, cells: locustberry (*Byrsonima lucida*), slash pine (*Pinus elliottii*),

properties, according to their study, published in the June 2026 issue of Tropical Journal of Pharmaceutical Research. These were crude extracts, and further research is needed, Nwoku said. But the results are promising.

The work he's doing underscores the importance of plant conservation.

"Plants own the universe!" Nwoku exclaimed. They are the foundation for life on Earth, feeding us, housing us, healing our ailments, producing the oxygen we breathe in, assimilating the carbon dioxide we breathe out, and so much more. "Without plants," he said, "existence cannot be possible."

Jennifer Reed is the Garden's Editorial Director.

Photos are courtesy of Michael Thomas and Chukwumaobim Nwoku.

Orchids as Medicine

Could a treatment for cancer be hidden among our orchids?

Quite possibly, believes Florida Gulf Coast University's Chukwumaobim Nwoku.

Nwoku is an Assistant Professor of Biochemistry and Director of the Biomimetics and Modeling Lab. Biomimetics is a science that uses nature as a blueprint to solve human challenges—like waterproof materials inspired by water-repellent lotus leaves.

"My lab is anchored on the belief that there are natural solutions to every problem," said Nwoku, who has a special interest in plant-derived disease treatments.

His emerging focus on orchids is grounded in good science. The world's largest and most

Faced with Plant Losses, Botanical Gardens Team Up for Conservation Wins

A multinational coalition surges in size and scope—driven by its Naples-based coordinator

By Chad Washburn

Conservation, by nature, is a team sport. Inside a garden, it takes everyone from grant writers to gardeners, educators to ecologists. But a single institution can only do so much. Increasingly, we're phoning our friends—our lifelines.

The Caribbean region, which includes South Florida, is home to a staggering 11,000 native plant species. More than 70% are endemic—restricted to a single place—and nearly 5% are considered “globally threatened.”

Those numbers are why institutions like ours have banded together under the Caribbean and Central American Botanic Gardens Network. The Network is one of several multinational collaboratives under Botanic Gardens Conservation International (BGCI), the world's largest plant conservation organization. I participated in my first Network meeting in 2006 at the Belize Botanic Garden, where I started my career. Our numbers were small, but our dreams were big.



Twenty years later, the Network's bench is overflowing, thanks largely to its coordinator, Lina Ramirez. I hired her in 2022 and charged her with figuring out how to grow our still-modest Network into a plant conservation powerhouse. Together with BGCI, she's done just that. Lina is based at our Garden, which, incidentally, didn't exist when I attended my first Network gathering. Now, I'm proud to say we've grown into an international conservation leader. Here, Lina shares more about the Network, its objectives, and why collaboration matters.

Q: What is the Caribbean and Central American Botanic Gardens Network?

A: The The Network is a collective of plant professionals working to combat the disappearance of plants in the Caribbean, Central America, Mexico, and portions of the United States.

We're developing interdisciplinary solutions, touching on everything from ecology to education.

Opposite and below: Country representation at the 2022 and 2026 Botanical Bridges Congress, demonstrating the exponential growth of the Network. Map illustrations by Coralie Paschal.





Above: Attendees of the first Botanical Bridges Congress in 2022
Left: Attendees of the 2026 Botanical Bridges Congress.

the Network Coordinator, and my job is to bring people together and to provide opportunities for professional development within the region by organizing workshops, virtual technical talks, and conferences.

Q: How much has the Network grown since you became the coordinator?

A: It's hard to give precise figures because we're still figuring out standards for record keeping. But one tangible way I can demonstrate growth is through our Botanical Bridges Congress. In 2022, we had about 60 participants across 10 countries, representing roughly 20 institutions. Our 2026 Botanical Bridges Congress grew to over 200 participants across 32 countries, representing about 90 institutions. When you're talking about small gardens from small countries scattered across a tremendous geographic range, I think that shows a profound investment by the institutions in our region.

Q: What is the Botanical Bridges Congress, anyway?

A: It's a gathering of our Network members and a celebration of the progress we're making, held every two years. The Congress is an opportunity for professionals from institutions big and small to share their work on an international stage and build lasting partnerships.

This year's event was held at the Jardín Botánico Nacional Rafael M. Moscoso in the Dominican Republic. The Congress is a big deal in its host countries. Even the First Lady was in attendance!

Q: What are some of the Network's "wins?"

A: Professional development. Within the last two years we've been able to provide scholarships and professional development for over 80 participants across 17 countries. The



Photos courtesy of Jardín Botánico Nacional
Dr. Rafael M. Moscoso

last workshop we hosted was in Costa Rica, on propagation protocols. A lot of professionals are great at horticulture, but we don't really know how to grow some of the plants that are going extinct. This was one way for gardens across the region to start examining scientific methodology and sharing strategies that work.

Q: What does the Network mean to you?

A: The work that we're doing feels so meaningful because it shows the power of relationships and collaboration. I get to build bridges, and really, for me, that's the cornerstone of everything we do.

Environmental news got you down?

Headlines from the 2026 Botanical Bridges Congress may cheer you up. For four solid days, participants swapped ideas on how to restore ecosystems, save plants, develop nature-based solutions—and bring people closer to nature.



Discover some of the many initiatives underway in this special report following the Congress.

By the Numbers



11,000

native plant species
in the Caribbean region

70%

are endemic to the region

5%

are "globally threatened"

Botanical Bridges Congress 2022 vs. 2026

60
participants

10
countries

~20
institutions

200
participants

32
countries

~90
institutions

Inspired by this issue? Support the Garden's work.

Contact Rhea Merrill, Vice President and
Chief Strategic and Philanthropic Officer,
at 239.315.7282 or rmerrill@naplesgarden.org.



Scan to give now.

Hornbill's Ginger (*Hedychium longicornutum*). Photo by John Eder.



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