

NAPLES  
BOTANICAL  
GARDEN

# Conserve











Garden conservationists, pictured here at Camp Lulu Key in Rookery Bay, gather data and ripe seeds from native plants.



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# From Our Leadership

As CEO, signing off on a prescribed fire is a tenuous call. We're surrounded by neighborhoods, schools, a church, and various small businesses.

But I trust in our staff, believe in the science of prescribed burning, and know that, ultimately, the practice makes the Bayshore District safer. Long before Florida was dredged, drained, and developed, lightning routinely enflamed ecosystems, encouraging new growth and consuming dead matter such as fallen leaves. Without such cleansing purges, plant debris accumulates until undeveloped land becomes a tinderbox set aflame at the slightest spark.

On page 22, you'll discover the science of prescribed burning and the many precautions we take to ensure its safety and success. You'll also find out how much wildlife loves these renourished ecosystems!

Conserving and managing Florida's natural habitats is part of our core mission—for reasons beyond what you might expect. On page 40, we'll unearth some thousand-year-old secrets found within our Preserve and discover how we're protecting more than plants.

Sometimes, though, we simply can't save land from pressures like storms and sea-level rise. But there are actions we can take to adapt to these changes. Join us on page 30 as we venture into Rookery Bay National Estuarine Research Reserve to collect seeds from imperiled habitats and preserve them for generations to come—in case the land is lost during ours.

None of this work is possible without our Members, Donors, and partnering agencies who share our passion for protecting plants and the ecosystems in which they are found. Thank you.



**Donna McGinnis**  
President & CEO  
Naples Botanical Garden



My first experience in the botanic garden world was in Belize, helping to develop the Belize Botanic Garden in San Ignacio. In 2006, we hosted one of the earliest Caribbean and Central American Botanic Garden Network meetings there. At that gathering, I was invited to speak. Leveraging my background in ecosystem restoration, I suggested that it was time for botanical gardens to think differently about our role and consider how we might use plants to solve environmental and social challenges.

Botanic gardens attract and employ experts in fields like horticulture, ecology, conservation, seed banking, botany, natural resource management, and research. Our plant collections, built over decades or centuries, contain a wealth of natural capital and hold the keys to climate adaptation. In my presentation, I proposed leveraging these resources to address ecosystem restoration, coastal resiliency, stormwater management, urban forestry, and other pressing needs. Now, nearly two decades later, we at Naples Botanical Garden are actively addressing urgent regional concerns.

In 2025, we launched the Center for Nature-Based Solutions. To date, we've collaborated with multiple partners to restore more than 13 miles of coastal beach dunes, demonstrated how to safely conduct prescribed fires in urban areas, addressed stormwater flooding and pollutants, and cooled cities by building more resilient urban forests. We are entering a golden age for botanic gardens, one where staff expertise, plant collections, and community connections come together to address some of our most pressing challenges. I'm proud to say that your Garden is leading the way.



**Chad Washburn**  
Vice President of Conservation  
Naples Botanical Garden

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## CONSERVE 2025

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## ON THE COVER

Surrounded by rising seas, a team from Naples Botanical Garden and Rookery Bay National Estuarine Research Reserve hunt for native seeds to gather and preserve for generations to come.  
*Photo by John Eder.*

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# In Brief

## A growing bank account

**GARDEN CONSERVATIONISTS** have been depositing to their bank frequently and in sizable amounts.

Since 2023, seed bank holdings have increased by more than 160,000 seeds to an approximate 394,200, representing 283 species. Almost 120 species are native to Florida; 19 grow only in Florida.

These figures include seeds held in long-term storage, protected for future generations as our region faces accelerated development, intensifying storms, rising seas, and other challenges. They also include seeds and cuttings destined for short-term restoration use.

Not yet tallied are the seeds from Fairchild Tropical Botanic Garden in Miami that arrived as Garden conservationists were crunching these numbers. It contained seeds from Big Cypress National Preserve, home to numerous state-endangered species. Fairchild's staff asked to back up the collection at our Garden as an additional safeguard.

Included in the package was Small's flax (*Linum smallii*), a slender, yellow-flowered plant known to exist only in the



Small's flax (*Linum smallii*)  
Photo by Joe MDO, iNaturalist

disappearing rockland habitats of Miami-Dade County. Another was iguana hackberry (*Celtis iguanaea*), a shrub or small tree that abounds in Central and South America but is considered threatened in Florida. The tree is tricky to conserve because its seeds can't withstand the drying process necessary for freezing them in the seed bank. Our conservationists instead will grow a collection in the nursery.

Also found in the nursery: some 20,000 coastal plants that Garden staff are nurturing for beach restoration projects in Southwest Florida. These plants, grown from seeds and cuttings that Garden staff hand collected in Collier County, will be used in turn to generate more seeds and cuttings (see page 20).

The Garden's 2025 – 2026 agenda includes collection trips through Rookery Bay National Estuarine Research Reserve (see page 30) where they will amass even more seeds for long-term protection and short-term restoration.

## Imperiled cacti: From dying to thriving

### PUERTO RICAN BOTANISTS AND NAPLES

Botanical Garden staff undertook a rescue mission in 2021 to save cacti that are under siege in Puerto Rico. Two pests, the cactus moth (*Cactoblastis cactorum*), and cactus mealybug (*Hypogeococcus pungens*), have infested much of the native cacti in the wild, and



scientists have yet to find an effective means of controlling them.

The conservationists shipped seeds and cuttings to Naples to protect the genetics in case the cacti are lost entirely in their native habitats.

Since then, our specialists have placed nearly 11,000 cactus seeds in the seed bank for long-term storage and managed a robust living collection of 880 plants. All told, the Garden's holdings include 15 species.

The collection resides in the Garden's Evenstad Horticulture Campus, a secure facility where horticulturists monitor plants carefully for signs of pests. (The cactus moth has been spotted in Florida.)

There, several species, including the Puerto Rico applecactus (*Harrisia portoricensis*), have fruited, and their seeds have been added to the seed bank. Garden conservationists intend to share seeds and cuttings with other botanical institutions, offering additional protection to these disappearing plants.

"The Garden is working to ensure that the species are not lost forever and are available for future generations," says Vice President of Conservation Chad Washburn.



Scan for the full story of this cacti rescue.



## Garden collaborator wins major award

### BOTANIC GARDENS CONSERVATION

International (BGCI) awarded Rodrigo De Sousa, of Costa Rica's Osa Conservation, the prestigious Marsh Award for International Plant Conservation for his role in pioneering a novel approach to tree conservation and climate adaptation.

Osa Conservation has spearheaded a "Ridge to Reef Restoration Network" that involved planting nearly 400,000 trees across 400 acres, and collaborating with local farmers, landowners, and other stakeholders to create a wildlife corridor. The reconnected landscape

forms a pathway for animals, insects, and plants to migrate from the warming coast to cooler, elevated regions. Twenty thousand of those trees represent threatened species.

The Osa Peninsula is one of the most biodiverse places on Earth, though it—and Costa Rica as a whole—has lost much of its tree cover to agriculture and development.

De Sousa, the Tropical Forests Program Manager, has given our Garden 350 seeds of native Costa Rican trees. Our staff is growing a living collection of these trees, experimenting with freezing techniques for long-term storage, and conducting research on how to best maintain the trees outside their natural settings. Two of the eight species we received are listed as "Endangered" and one as "Vulnerable" on the International Union for Conservation of Nature's Red List.

Our Garden serves as Secretariat of the Caribbean and Central American Botanic Gardens Network, under BGCI. As such, we look for opportunities to encourage collaboration, share expertise and resources, and advance tropical plant conservation.

"Rodrigo is not simply restoring ecosystems, he's transforming the way conservation is being approached in the region, inspiring both local communities as well as conservation professionals," says Lina Ramirez, the Garden's Regional Conservation Initiatives Coordinator. "The Network is fortunate to have such a valuable leader among us."



Rodrigo De Sousa





The City of Naples Urban Forest may become healthier and more resilient following an in-depth examination of trees following recent hurricanes. *Photo by John Eder*

# Which trees are most likely to crack under a hurricane's force?

New research examines past storm damage to shape future urban forest management

By Coralie Paschal

**W***idowmaker.* This morbid technical term, employed among foresters, is dark but descriptive. It denotes a dead or broken tree branch dangerously at risk of falling onto an unsuspecting passerby,

potentially turning their partner into a widow(er) with one fatal blow.

Hazard trees, including those with widow-makers, are the bane of foresters. Posing a danger to the public, they must be promptly pruned or removed to avert tragedy. Once a tree is removed, however, its services—production of oxygen, filtration of air, improvement of water quality, provision of shade, and reduction of solar radiation—are lost to us.

Perhaps a better strategy, both to improve public safety and maintain tree benefits, would be to prevent widowmakers from forming in the first place. We know that hurricane damage can produce hazard trees. And while we cannot control where a hurricane lands, we can control how we manage our urban forests.

As a graduate student in The Water School at Florida Gulf Coast University, I am collaborating with Heather Shields, Urban





New research aims to identify tree species most likely to stand up to storms and avoid the fate of this tree, damaged during Hurricane Ian.

Forest Manager for the City of Naples, to determine whether hurricane damage to an urban tree is impacted by its height, species, pruning regimen, proximity to utility lines, and distance to the nearest building, shoreline, or waterbody. I am assessing these risk factors and others using data from Hurricane Irma (2017) and Hurricane Ian (2022) provided for more than 5,000 City-managed trees.

Essentially, my goal is to create a “playbook” that municipal planners, landscapers, and arborists can leverage to make more informed decisions about urban tree selection and maintenance. For instance, species that are more susceptible to hurricane damage could be replaced by those demonstrating greater resistance, while pruning practices could be adjusted to reduce risk.

Preliminary results from this study suggest that hurricane damage to an urban tree is, in fact, impacted by the aforementioned

risk factors, with each species responding differently. Further analyses will offer greater illumination, enabling local governments like the City of Naples to better manage their urban forests and adding to the database at Naples Botanical Garden, which monitors tree performance. The insights gained from this research may ultimately lead to increased public safety, decreased public expenditure, and enhanced coastal resilience, creating a more sustainable community here in Naples for us all, people and trees alike.

*Coralie Paschal is a graduate student in The Water School at Florida Gulf Coast University.*



# The next wave of coastal research

Naples Botanical Garden and The Water School at Florida Gulf Coast University collaborate on research to help our region adapt to changing climate conditions and build resilience to storms.

Here, FGCU Assistant Professor of Restoration Ecology **Jeannine Richards** shares coastal research she and her students conducted during the 2024-25 academic year.

## Experiments in planting

**R**eplanting beaches is not as simple as sticking a few seedlings into the sand. What size plants do we start with? Do they need fertilizer? How deep do we bury them in the ground? How far apart should they be? These are just a few of the questions we ask ourselves when we begin restoring our beaches.

We addressed two of these questions—plant size and planting depth—in an experiment this spring at Lee County's Bunche Beach Preserve. Using two common beach dune species, bitter panicgrass (*Panicum amarum*) and sea purslane (*Sesuvium portulacastrum*), we tested planting plants started in 2-inch pots versus larger ones grown in 4-inch containers. We planted each of these either level with the soil surface or buried an additional 6 inches below the surface. We expected that larger plants would grow faster and more deeply planted plants would have better access to water and thus less likely to die from drought.

We were partially right. We observed the plants over three months of the dry season and



FGCU students experiment with planting depths and specimens of varying sizes at Lee County's Bunche Beach. Photo by Jeannine Richards

found that more deeply planted plants were less likely to die, especially when they were bigger at the time of planting. However, even though larger plants are better at surviving, they did not grow as quickly as the smaller plants. For both species, the 2-inch plants grew almost twice as much in the first three months after planting as the 4-inch plants did! We plan to continue monitoring these plants and see if these initial results are maintained over time.



If they are, starting with smaller plants would be a win-win because they are also more cost effective, take less time to grow, and are easier to plant.



## Finding the best dune builder

**A**t their most basic, beach dunes are piles of sand held in place by plants. But how do dunes get to be dunes? Beach dune plants have a particular ability to capture blowing sand and form it into a dune. As the plant becomes buried, it grows more to keep up, and captures even more sand, accordingly. Over time, this process builds protective dune structures that help to safeguard our coastlines from flooding during storms.



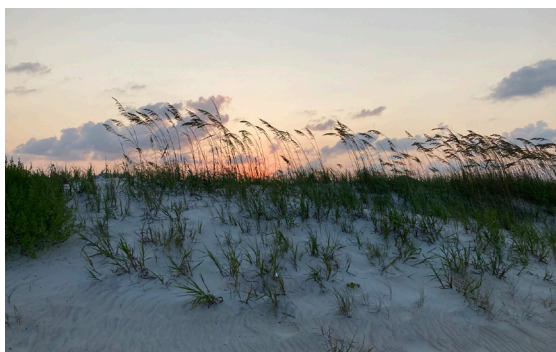
FGCU student Tristan Dumas installs a metal spike that will track how much sand plants accumulate.

We know this process is important to maintaining beach dunes, but we didn't know all the mechanics behind it. How much sand do plants really trap over time? Are all plants equally good at building dunes? Over the last year, we have been measuring how much sand is trapped by plants of different common dune species. We implanted metal fence posts within



Beach elder (*Iva imbricata*)  
Photo by Jason Sharp, iNaturalist

clumps of vegetation of various species to track the rise of sand. Each month, we measured the length of the post above the ground. As the dunes grew, the posts shrank.



Sea oats (*Uniola paniculata*)  
Photo by Lauren Gillett, iNaturalist

From the measurements we collected, we now know that plants build up approximately five times as much sand as would accumulate in a bare patch with no plants. And some species seem to be particularly good at building dunes. Based on our measurements, beach elder (*Iva imbricata*) was the clear winner, capturing twice as much sand as any other species. Second place went to sea oats (*Uniola paniculata*), a favorite for use in restoration projects. Although these two species emerged as the best dune builders, it is important to include a variety of species in plantings for the different roles they each play on our beaches.

*Jeannine Richards is an Assistant Professor of Restoration Ecology at Florida Gulf Coast University.*



# From Grocery Lines to Firelines

## A journey into conservation

By Cody Weber

Some people find peace in silence. I find it in the crackle of pine needles, the hum of cicadas, and the quiet thrill of spotting a gopher tortoise vanish into its burrow. As part of the Natural Resources team at Naples Botanical Garden, I work in a living, breathing ecosystem—and every day reminds me that conservation is as much about listening as it is about action.

I didn't start my career in this field. For over a decade, I was a manager at Publix. The pace was fast, the responsibilities real, and the lessons in leadership ones I still use. But something was missing. I'd always felt a pull toward the natural world, and eventually, I



Photos by John Eder

realized I wanted a career that reflected that. So, I followed that pull—into the woods, the swamps, and fire. Along the way, I began to understand the inner workings of Southwest Florida's ecosystems and how conservation specialists can help them heal and thrive.

## Fire That Brings Life

Of all the lessons I learned, one still catches people off guard: To protect the land, sometimes you have to burn it.

Fire can look like destruction to the untrained eye. But in Florida's ecosystems, prescribed burns are essential. They renew the landscape, clear out invasive growth, and make space for native species to thrive. I've stood in smoldering pinelands as smoke curled skyward, only to return days later and find deer grazing on green shoots. I've seen frogs reclaim burned wetlands and red-shouldered hawks scanning the ground for prey. One morning, while surveying the charred ground after a recent





Out of this prescribed burn, new life will soon flourish.

burn, a powerful scene unfolded: two freshly shed, thick-bodied Eastern diamondback rattlesnakes engaged in courtship at the edge of a gopher tortoise burrow. It was a striking reminder of how deeply connected these species are, the tortoise providing shelter, the snakes courting in the cleared understory, and all of it made possible by fire.

These moments are wild, raw, and unforgettable. Fire doesn't just reset the land—it reveals it.

## When the Invaders Take Root

But not everything that grows back belongs.

Invasive species—both animal and plant—are constant battles. During my internship with the Conservancy of Southwest Florida, I worked with researchers removing Burmese pythons from the wild. Holding a 14-foot predator is sobering. It's not just one snake, it's what that snake represents: vanishing rabbits, missing bobcats, food webs out of balance. I've been

fortunate to apply what I learned, most recently helping our team remove four invasive pythons from Southwest Florida natural areas this year.

Invasive plants pose a quieter threat. Brazilian pepper (*Schinus terebinthifolia*) and air potato vines (*Dioscorea bulbifera*) may look lush, but they smother native plants, alter fire regimes by changing how often and how intensely fires burn, and create monocultures—areas dominated by a single species where native biodiversity can't thrive. One of the most eye-opening parts of working at the Garden has been learning to read the vegetation. Seeing not just green, but what that green means.

Through hands-on experience, I've come to understand how native plants like saw



Saw palmetto (*Serenoa repens*)



Conservation isn't just about wildlife.  
It's about wholeness.  
The plants, the fire, the reptiles, the rain—  
all of it is connected.  
When one part suffers,  
the whole system feels it.

palmetto (*Serenoa repens*), sawgrass (*Cladium jamaicense*), and scrub oaks (*Quercus* spp.) form the backbone of the ecosystem. They feed pollinators, shelter wildlife, influence fire behavior, and hold habitats together. Protecting wildlife starts with protecting plants.

### Learning from the Land

My journey into conservation didn't begin at the Garden—it passed through classrooms, swamps, and even a beach in Costa Rica.

As a student at Florida SouthWestern State College, I studied freshwater turtles under the mentorship of biology professor Jordan Donini. We tracked Florida box turtles, Florida mud turtles, three-striped mud turtles, and diamondback terrapins across Southwest Florida. Before joining the staff, I was even part of a study tracking mud turtles released here at



Box turtle. Photo by Cody Weber

the Garden. That work led me to the Sanibel-Captiva Conservation Foundation, where I helped monitor Eastern indigo snakes and more turtle populations. Later, I studied abroad with





Cody Weber uses an antenna and receiver to pinpoint the locations of turtles that have been tagged for long-term study. *Photo by John Eder*

Turtle Love in Costa Rica, assisting with sea turtle research—under stars, by red headlamp, seeing conservation at a global scale.

Each place taught me something different: how to listen, how to wait, how to respect the unpredictability of nature. Together, they grounded me in the science that supports what I do now.

## From Management to Mission

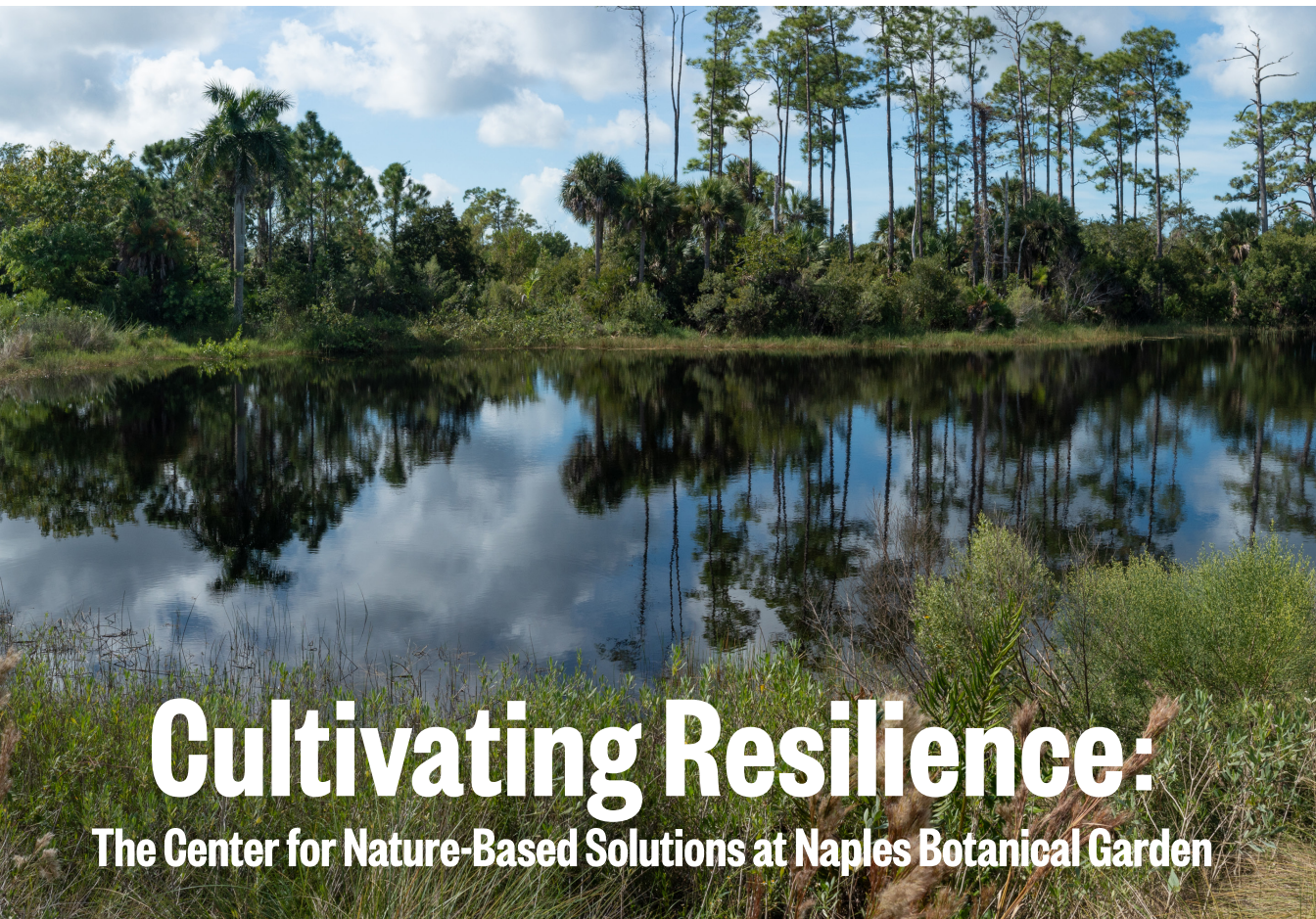
I don't regret my years in retail. They taught me how to lead, adapt, and stay calm under pressure. Patience under fluorescent lights turned into composure on a fire line; teamwork shifted from managing inventory to coordinating invasive species removal. But where I once tread across a polished floor, now I walk muddy trails. I'm not just learning the landscape. I'm helping shape it. With every

gopher tortoise I spot, every native plant I protect, I see how fire, water, soil, and wildlife are woven together in ways I'm still learning to read.

Conservation isn't just about saving what's rare. It's about restoring relationships. The Garden has become more than a workplace. It's a living lab, a refuge, a reminder that healing the land can also heal something in ourselves. And, if you listen closely, beneath the crackle of pine needles and the hum of cicadas, you'll hear it too: the wild calling back.

*Cody Weber is a Natural Resources Associate at the Garden.*





# Cultivating Resilience:

## The Center for Nature-Based Solutions at Naples Botanical Garden

**F**loodwater gushed throughout Southwest Florida during 2022's Hurricane Milton. In the Garden, though, the Preserve stored some 30 million gallons of it, minimizing water damage to our buildings and cultivated gardens. What lessons might developers and policymakers glean from our property's design?

Wildfires, fueled by drought and heat, rage throughout the United States, displacing thousands of people who live near forested land. Can prescribed fire—even in densely populated areas—lessen the chance of an unintended blaze? The Garden is working to find out.

Naples Botanical Garden opened its doors in 2009 as a showcase of tropical horticulture and artful design. Since then, the Garden has developed an expansive environmental education program, grown a world-class botanical collection, and established itself as

a leader in plant conservation and ecological restoration. Now, we're pleased to announce the **Center for Nature-Based Solutions at Naples Botanical Garden**.

This research, education, and applied science program seeks to harness the power of nature to improve ecosystem health, support biodiversity, improve economic conditions, and enhance human well-being. The Center advances our research into climate adaptation and considers how plants can help us build resilience in a changing world.

"The past 12 months in Southwest Florida have brought many challenges, from hurricanes to storm surge to flooding to severe drought and wildfires," says Vice President of Conservation Chad Washburn, who oversees the Center. "The Center for Nature-Based Solutions continues to work using natural principles to adapt to life in a changing climate."



## Our undertakings include:



### Stormwater Management

We're investigating how undeveloped land can mitigate flood damage by monitoring how our site, with its 90-acre Preserve, responds to storms.



### Beach Dune Restoration

Armed with extensive research on how natural coastal ecosystems fortify shorelines, the Garden has developed a dune restoration strategy using an array of native plants that capture and accumulate sand, recover quickly after storms, and provide wildlife habitat.



### Prescribed Fire

Naples Botanical Garden is a statewide leader in conducting prescribed fires in urban settings, demonstrating how small, carefully managed fires can reduce accumulated horticultural debris and lessen the chances of a wildfire igniting and burning out of control.



### Restoration Seed Bank

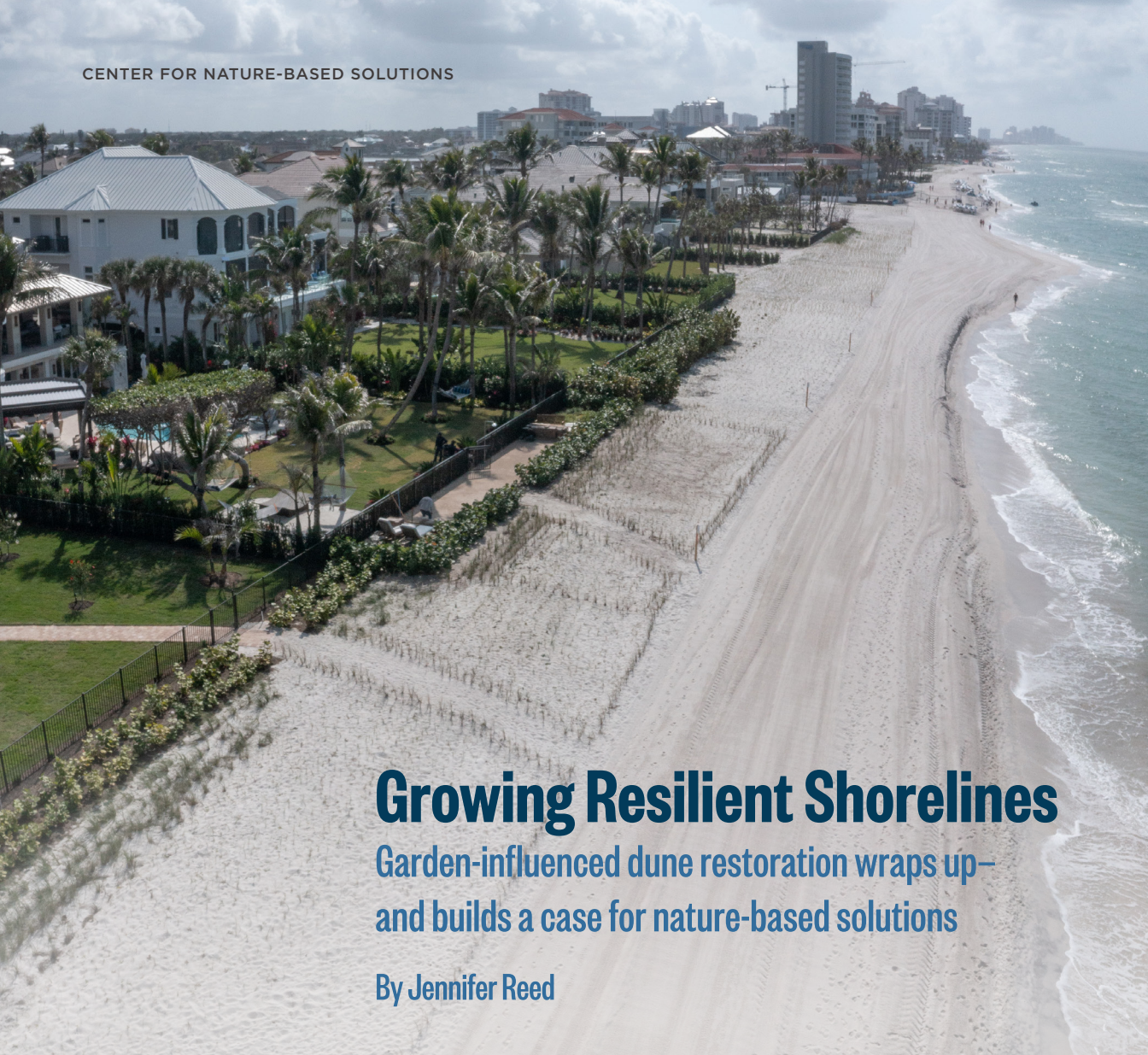
The United States suffers from a vast shortage of native plant seed available for restoration following hurricanes, floods, fires, and other natural disasters. Naples Botanical Garden is amassing and storing locally collected, genetically diverse seeds for future ecosystem restoration projects.



### Water Quality

Garden experts help residents, homeowner associations, policymakers, landscapers, and pond management firms understand how to plant retention pond shorelines and install bioswales. These plants filter runoff and improve the health of Southwest Florida's water.





# Growing Resilient Shorelines

Garden-influenced dune restoration wraps up—  
and builds a case for nature-based solutions

By Jennifer Reed

**C**ollier County's beaches, mostly devoid of plants since 2022's Hurricane Ian, are flecked with green again.

A massive replanting project, from Marco Island through North Naples, is complete, and the plants are rooting in, spreading wide, growing tall, and, most critically, building dunes.

Beach dunes help protect shorelines by breaking up wind and wave energy and lessening the impact of storms.

"I was blown away by how everything is doing," says Vice President of Conservation Chad Washburn, following a visit to Naples' Vanderbilt Beach in spring 2025. "The success



Photos by John Eder



has been phenomenal. The plants are doing their job, trapping sand, holding sand in place, and preventing erosion.”

The Garden’s Center for Nature-Based Solutions contributed to the project by offering Collier County its research into dune ecosystems, recommending a diverse palette of plants to use, and promoting the use of local genetics. Because native dune species—especially local ones adapted to Southwest Florida’s climate and growing conditions—are hard to find in commercial nurseries, the Garden also amassed seeds and cuttings that partnering growers multiplied.

The Garden began testing its research-backed dune restoration approach in spring 2021 with three pilot sites along Naples Beach in collaboration with the City of Naples. They differed from more typical revegetation projects with the number of species types used, the local origins of the plants, and an overall effort to replicate the way in which coastal plants appear on natural beaches.



in 2024. “Nature-based solutions are difficult for people who are used to built environments to embrace or consider,” Hardman says. “They’re kind of outside the box—we usually think about building a structure to fix a problem and looking for ways to change Mother Nature to fit our paradigm.”

In reality, though, the two approaches can work together, she adds. “By seeing the ways in which nature-based solutions can be incorporated into the built environment and how they enhance each other encourages future ideas, research, and integration.”

Florida Gulf Coast University, which has a satellite campus at the Garden, is building on the Garden’s initial research (see page 12).

“Restoration is really going to be the key moving forward,” says Jeannine Richards, Assistant Professor of Restoration Ecology. Coastal ecosystems simply can’t rebound on their own when major storms wallop them every year or two. She and her students intend to monitor Collier County’s beaches to understand how these manually restored shorelines hold up against future storms and to improve upon planting strategies.

“We’re living in a changing environment, and we need to adapt our practices to the challenges we face,” she says.

*Jennifer Reed is the Garden’s Editorial Director.*

**“We’re living in a changing environment, and we need to adapt our practices to the challenges we face.”**

**—Jeannine Richards**

Natalie Hardman, the City’s Natural Resources Manager, watched those sites rebound after Hurricane Ian.

“A lot of vegetation didn’t survive Ian,” Hardman says. But the plants at the trial site resprouted and began rebuilding the barrier between the Gulf and the developments lining it. “It was obviously different in the vicinity of the trial plants than it was in other areas,” she adds.

The dune project may entice local governments to consider other nature-based solutions, Hardman says. The City of Naples, for example, endorsed the incorporation of nature-based solutions in its adaptation plan, released





# Persuading the flames

Practitioners reveal the science—  
and art—of redirecting nature’s  
sometimes deadly force for good

By Jennifer Reed

Photos by John Eder

**A** flamethrower inches along the Garden’s southern border, spewing an orange flame into a stand of pine trees. Fallen needles and leaves ignite instantly. Within seconds, flames climb the trunks ... 1 foot, 5 feet, 10 .... until a fiery wall marches into the forest.

Thaddeus Penfield, the burn boss and owner of Willowcreek Fire Company, grins. “This is a full-on wildfire right here,” he exclaims, defining the blaze’s look and feel. It is not, of course. Penfield instructs the 17-member crew to temper flames that grow too intense and intensify those that struggle to gain traction—a little like an orchestral conductor hushing brazen trumpets and urging more oomph from delicate violins.



On that same January day in California, an actual wildfire forced tens of thousands of people from their homes. Hurricane-force winds pushed a blaze out of the Santa Monica Mountains and into Los Angeles County, where it—and several concurrent fires—would burn for weeks, causing an estimated \$250 billion in damage. The three biggest blazes would scorch some 48,000 acres, consume more than 16,000 structures, and kill 30 people. Images were horrific: homes engulfed in flames, exploding cars, residents standing dazed amid the ruins.

Amid those two oppositional fires, I wanted to understand how a force so brutal could be tamed and tapped for good.

I turn to Penfield: “How do you control fire?”

He looks away from the blaze. “We don’t,” he answers. “We persuaded it.”

Over the next few hours, he’ll show exactly how.

## **FIRE IS SYNONYMOUS WITH FLORIDA.**

From the grasslands to the pinewoods, ecosystems have evolved to depend on periodic purges. People learned to harness fire, too. Indigenous cultures burned to clear land for crops, facilitate hunting, and promote the rejuvenation of native plants. European settlers followed suit.

Attitudes toward fire, however, changed around the start of the 20th century. Devastating blazes such as the Great Fire of 1910, which consumed 3 million acres in the Rocky Mountains, led to a nationwide policy of fire suppression.

In fire’s absence, plant debris, such as fallen leaves, pine needles, and branches, accumulated on the forest floors. Sparse understories grew thick. This buildup is what fuels wildfire.



Director of Natural Resources Erio Foht maintains constant contact with the crew.





Meanwhile, ecosystems—even those that looked verdant—deteriorated. Plants were snuffed out by their own debris. Sun-loving species faltered because canopies thickened and blocked light. In Florida, plants that depend on fire to reproduce, such as Florida rosemary (*Ceratiola ericoides*) and longleaf pine (*Pinus palustris*), couldn't do so. Once-prevalent species, like wiregrass (*Aristida stricta*) and cutthroat grass (*Coleataenia abscissa*), mostly disappeared. Insects and wildlife that utilized those species suffered.

In recent years, though, land managers have reintroduced fire for human safety and ecological health. Wildfires burn an average of 1 million acres per year in the United States. They're becoming more prevalent. By May, the nation had already hit that mark, according to the National Interagency Fire Center. Increasingly, public officials are trying to figure out how to burn plots of forested land near residential areas so that an unintended blaze doesn't consume a neighborhood.

The Garden's Natural Resources Director, Eric Foht, started campaigning for a prescribed fire regimen about a decade ago and, with his team, spent several years preparing themselves and our property. This January blaze is our eighth burn since 2022, making the Garden one of the few private entities in Florida to conduct "urban interface burns" (see

sidebar for more detail). Today's fire illustrates the practice's complexity—a private home is adjacent to the 8-acre designated burn unit. The entire operation has been planned to ensure its safety.

Seventeen people, including fire-certified staff from the Garden, partnering conservation groups, and personnel from the East Naples Fire Department, are here to manage the fire. Early this morning, they laid hoses the length of the fire break and parked a fire engine, reassuringly, along Bayshore Drive.

Penfield outlines what to expect: The pine flatwoods section will ignite easily and spectacularly. The soggy marsh will not, so the crew will approach it from two fronts. Patches of fire are like magnets, drawn to each other.

"We'll have this big show at the corner, and then everything will be tranquil again, and then we'll spend the rest of the day pushing her to eat, pushing her to move," he says.

To Penfield, each fire is a "living, breathing personality" with its own characteristics, mood swings, movement patterns, and behaviors. Its handlers coax it toward its intended target, hoping it'll cooperate, ready to take action if it doesn't.

"We have to plan for the worst-case scenario," Penfield says. "Every fire you go into, you need to be anticipating you're gonna fight it."





Certified burn manager Thaddeus Penfield monitors the blaze. Flames in the pine flatwoods, ignited by a flamethrower (below), are intense but relatively brief.



**THE SCIENCE OF FIRE** is really the science of weather. To encourage a blaze into submission requires complex calculations involving temperature, humidity, wind speed and direction, dew point, time of day, cloud cover, and a host of other atmospheric conditions.

Today's forecast predicts a low of 48 and a high of 72. The cool temperatures will calm the blaze. Clear skies, however, will encourage it to climb, as if trying to reunite with the sun, Penfield explains. Knowing this behavior helps the crew keep the flames in check. Several members, overseen by Natural Resources Manager Mike Cox, position themselves along the line of hoses and stand at the ready. Among other things, Penfield instructs them to watch for embers that could float into the underbrush and flare up.

One of the biggest considerations in planning a burn is the "mixing height," the atmospheric level at which smoke rises and disperses. Today's, 3,400 feet, is well above the minimum threshold but low enough that smoke potentially could linger and impact Garden guests, pedestrians, and motorists. Penfield directs everyone to watch the billows of gray and white and ensure they don't create a problem.

The wind blows from the southeast, a direction more typical in summer than winter, and it carries welcome moisture. If humidity levels are too low, a fire will rage out of control, if too high, plant matter simply won't ignite. Today's is a mid-range sweet spot.

Wind direction is predicted to shift sometime around midday, and the crew will have to adjust their strategies accordingly. In truth, winds can change at any time. Foht grew up along the Gulf, fascinated with sailing and weather, and is so attuned to the region's meteorological nuances that he can sense shifts in wind patterns.

"If you know a place well enough and have spent enough time reading the forecasts and then comparing those to what actually happens, you can get a sense of what to be prepared for," he says. That kind of intuition makes prescribed burning as much an art as it is a science.





Staff saturate pine roots to protect the trees.

**THERE ARE THREE TYPES OF FIRES** that practitioners can set, and they weigh factors such as topography, moisture levels, plant types, and objectives in deciding which to ignite. A head fire moves with the wind and marches quickly and intensely across the landscape; a slower-paced backing fire pushes against the wind; and a flanking fire starts out along the designated area's side and then splits into a head fire and a backing fire.

Today calls for head fire. The sawgrass marsh, with standing water, will need the wind's force to urge the flames along. The highly flammable pine flatwoods section needs wind energy for a different reason. Over the years, some 15 inches of fallen leaves, pine needles, sticks and branches, known as "duff," have accumulated. Reducing it requires a fast-moving blaze to skim the ground's surface. When duff is that thick, trees mistake it for soil and send roots into it. Penfield and Foht intend to shave the layer a few inches at a time, giving the pines a chance to adjust and pull their roots underground.

"Over time, we'll get this ecosystem back into some semblance of health," Penfield says.

The marsh, as predicted, is tricky. The crew first sets it ablaze from the south and later, as the wind shifts and the temperature rises, attacks it from the north.

Penfield turns to Foht. "You can be as reckless as you like!" He's teasing, though Foht knew he could be somewhat aggressive. Two months earlier, the Garden had burned an adjacent parcel, depleting dead plant matter to limit the chance of this fire spreading beyond its designated boundaries.

The blaze eats through dry patches of sawgrass and fizzles in wet ones. Foht and Penfield had contemplated waiting for more favorable conditions, but their primary concern is the neighbor's house, and today's wind direction is ideal for its safety.

"You only get one shot," Penfield says. "If we have a bad fire, that's all anybody is ever going to talk about. They're not going to remember the seven fires we conducted flawlessly."

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# Wildlife After a Burn: A New Beginning

By Cody Weber

Prescribed fire is a natural reset button for the land—and wildlife knows it. Within just a few days after a burn, life comes rushing back. Lush green shoots pop up, drawing deer to graze on the fresh, nutritious growth. Birds return in numbers, with hawks and eagles scanning the newly opened space for prey, and songbirds fluttering about in search of insects.

Fire helps clear away old, dead vegetation and allows sunlight to reach the ground again. This jumpstarts new plant growth and opens habitat for all kinds of animals. Even rattlesnakes, often misunderstood, use these warm, open areas to breed and bask in the sun.

What looks like destruction is actually a carefully planned act of renewal. Every burn sets the stage for a healthier, more diverse landscape—one teeming with life—in ways that are easy to see and truly amazing to experience.

*Cody Weber is a Natural Resources Associate.*



Photos by Cody Weber





## Big Fires, Small Fires: Which are More Complicated?

Naples Botanical Garden specializes in wildland urban interface prescribed fires, the practice of burning natural land adjacent to developed areas. Just like prescribed burns in large natural areas, such as Big Cypress National Preserve, these small fires are designed to reduce the risk of wildfires by consuming excess debris (leaves, pine needles, sticks, etc.). But the considerations and procedures differ in many ways.



### WILDLAND URBAN INTERFACE

- **Size/acreage:** Usually 10 acres or fewer
- **Smoke:** Can reach populated areas because of the burn site's proximity to homes
- **Mop up (the process of extinguishing a fire):** All smoking areas are extinguished to prevent further smoke and reduce the risk of flare-ups
- **Water resources:** Use of fire hydrants and structural hoses with more water pressure and a higher flow rate than wildland hoses
- **Cost & crew:** Generally, the cost and number of firefighters needed per acre is significantly higher
- **Local fire department:** Invited to help manage hydrants and water pressure
- **Notification:** Websites, media announcements, meetings with homeowner associations, direct mail, community newsletters
- **Ignition:** Varies. Hand-held trip torch is most common
- **Challenges:** Proximity to homes and businesses, potential smoke impacts, less flexibility with weather conditions



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**SIX MONTHS LATER, FRESH GREEN** ferns carpet the ground. If not for the charred bark, you might not know a fire had ever happened. The speed at which tropical plants grow is why periodic fires are important to keep them in check. Wildlife appreciates the new growth and the rebalanced ecosystem (see sidebar), and we've documented numerous instances of rare native plants flourishing after blazes like this one.

The wetland hadn't burned as much as Foht would have liked, but it cleared enough to make an upcoming planned fire, a 2-acre parcel near the James and Linda White Birding Tower, possible. That marsh is one of the Garden's biggest accomplishments; years ago, founding staff members rid it of invasive melaleuca trees, reintroduced native grasses, and restored the land to health. A prescribed burn will help ensure the ecosystem continues to function as nature intended.

But that's not the only reason for planning this blaze. A neighborhood overlooks the grassland, a reminder of the Garden's responsibility to maintain our land for the well-being of people, too.

Gazing at this intersection of natural land and residential development, Foht says, "We want to show, quite literally, that it is possible to live alongside fire with careful planning, expert practitioners, and a community that is educated about the benefits of prescribed fire and willing to support this process."

*Jennifer Reed is the Garden's Editorial Director.*

## LARGE NATURAL AREA

- **Size/acreage:** Hundreds to thousands of acres
- **Smoke:** Generally rises and disperses over large land masses before reaching populated areas
- **Mop up (the process of extinguishing a fire):** Generally occurs along critical perimeters, not the interior
- **Water resources:** Brush trucks, swamp buggies, off-road utility vehicles, helicopters with water buckets
- **Cost & crew:** Generally, burning a large area costs less and requires fewer personnel per acre than an urban interface burn
- **Local fire department:** May or may not be present
- **Notification:** Websites, media announcements
- **Ignition:** Varies. Helicopters or drones may be used
- **Challenges:** Large size, scale of planning, inability to mop up all areas, lingering smoke







# Before They Disappear

Conservationists comb the wilds of Rookery Bay gathering native seeds threatened by rising seas and rampant storms.

By Jennifer Reed

Photos by John Eder





From left: Jared Franklin and Dan Osborne of Rookery Bay; Jonathan Farquhar, Grace McCoy, and Katie Luttrell of the Garden

**P**ine tree skeletons loom over Rookery Bay National Estuarine Research Reserve. Once hard as nails and tufted with green needles, today they are bare branched and deteriorating from within.

At their base, the understory is sparse, thinned by the same saltwater that had killed the pines. Several common flatwoods species, such as gallberry (*Ilex glabra*) and staggerbush (*Lyonia fruticosa*), have vanished. Others, including saw palmetto (*Serenoa repens*) and live oaks (*Quercus virginiana*) persist. But among the survivors, an odd mix of things—golden leather fern (*Acrostichum aureum*) and white mangrove (*Laguncularia racemosa*)—have sprouted. These are coastal species that rode inland on floodwater and took root in storm-altered ecosystems.

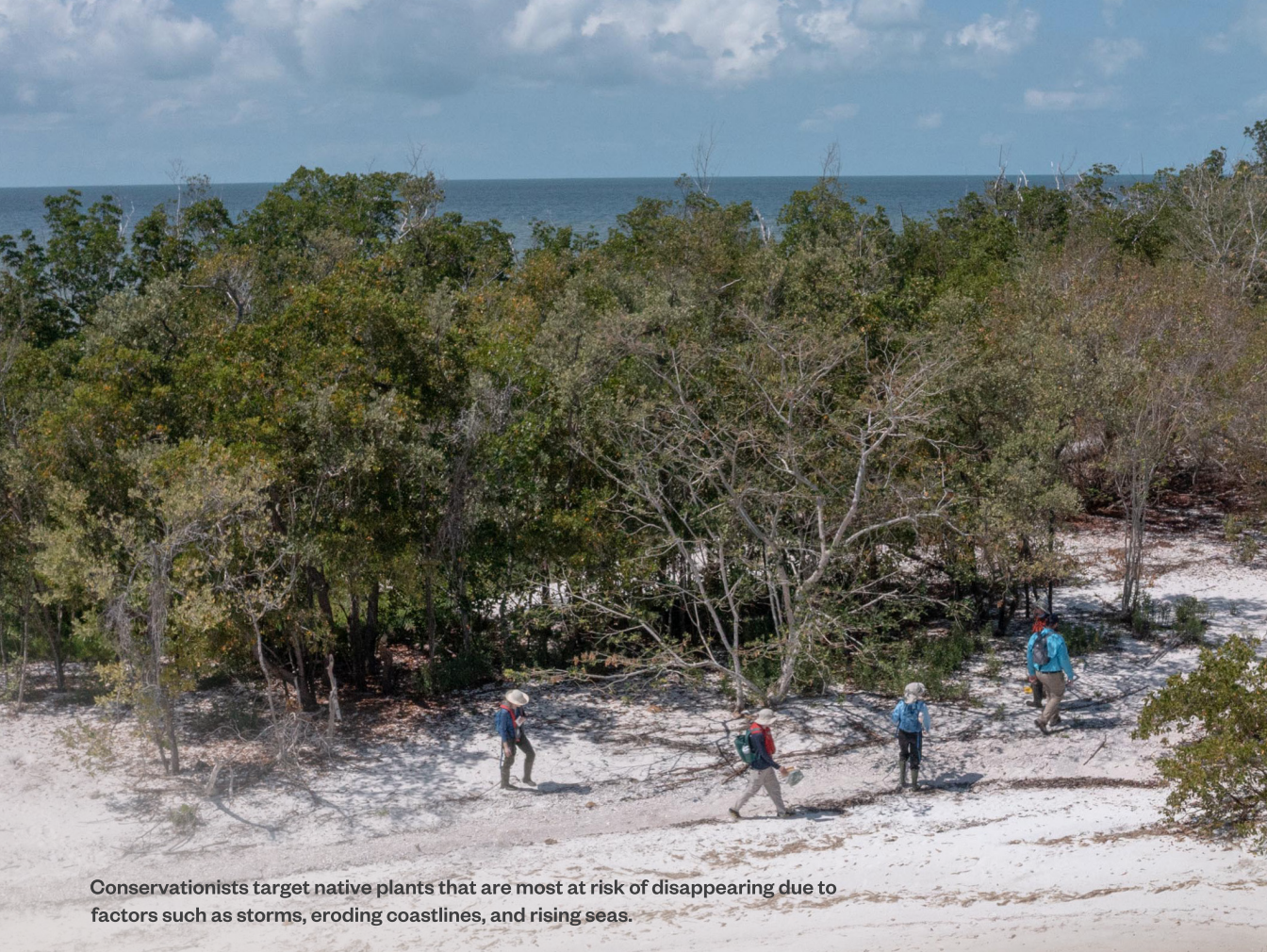
A team from Naples Botanical Garden and the Reserve stands amid the wounded landscape.

“It’s shocking,” says Grace McCoy, the Garden’s former Conservation Horticulture Manager, who oversaw the processing of the seeds and cuttings during these summer 2025 trips.

Floods from Hurricanes Ian, Helene, and Milton in 2022 and 2024 inundated this flatwoods habitat of Rookery Bay. Elsewhere within the Reserve, rising seas threaten to shrink or swallow islands—one, Round Key, is already submerged (see page 36). Other risks include the not-yet-understood ramifications of shifting habitats. Mangroves are taking over marshes, and marsh species are creeping into uplands.

The conservationists can’t suppress these climatic changes, so they’re focusing on what they can do: save plants.





Conservationists target native plants that are most at risk of disappearing due to factors such as storms, eroding coastlines, and rising seas.

Every few weeks, Garden and Reserve specialists venture into Rookery Bay, gathering seeds and cuttings of native species from the most imperiled portions of the 110,000-acre Reserve. The genetics will be stored at the Garden to ensure they are not lost as their habitats morph—or disappear. The collection can be tapped for future restoration projects, reintroduced to areas where they’ve declined or used for other climate adaptation strategies.

The Garden and Reserve have worked together on similar collecting projects, most recently, a beach dune restoration effort (see page 20). But a new urgency underpins this venture.


The United States’ East and Gulf Coasts are experiencing some of the world’s fastest and most pronounced changes in sea level, putting Florida at the epicenter of flooding, erosion, habitat loss, and the associated decline of plants.

Gulf waters near Naples rose 7.1 inches between 1970 and 2022, with most of that change happening since 2000, according to [earth.gov](https://www.eearth.org), a federal website. If the current trajectory holds, local Gulf waters could rise another foot between 2020 and 2050.

Scientists expect that about a quarter of the native species examined in a 2017 Florida Climate Institute report will lose at least half their habitat due to sea-level rise. The figure is likely higher today. The projected loss has significant implications for Rookery Bay, home to more than 760 plant species and the hundreds of bird and wildlife species that depend on them.

“We likely won’t get another chance to collect these plants,” says Chad Washburn, the Garden’s Vice President of Conservation. “We are seeing them disappear, or seeing their habitats change faster than we can keep up with them.”





**“We likely won’t get another chance to collect these plants. We are seeing them disappear, or seeing their habitats change faster than we can keep up with them.”**

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



Jared Franklin, Rookery Bay's Stewardship Coordinator, examines native plants on Cannon Island.





The team records data and collects seeds along the shores of Camp Lulu Key.

## ON A SULTRY MORNING, THE TEAM

anchors at Cannon Island, north of Marco Island, and clambers over mangrove roots to reach dry ground.

At about 180 acres, Cannon Island is the Reserve's largest maritime hammock. Hardwoods like gumbo limbo (*Bursera simaruba*), live oak, and false mastic (*Sideroxylon foetidissimum*) loom over the landscape.

Although the mainland dock is a mere 20 minutes away, the excursion feels like an exploration. The underbrush is so thick in places that Jared Franklin, the Reserve's Stewardship Coordinator and leader of these expeditions, unsheathes his machete. The group treks through various habitats, each with its own mystique and set of plants inviting examination.

To the Garden team, first-time visitors, the landscape looks vibrant. Franklin knows better. He points out scraggly twigs, once lush beautyberry (*Callicarpa americana*), and the absence of wild coffee (*Psychotria nervosa*).

Hurricanes Helene and Milton thwarted the shrubs' post-land comeback.

The team is armed with a list of more than 250 target species. Most have little to no presence in botanical collections, meaning if they're lost in the wild, they may be gone for good.

A few dozen targets have more immediate applications: They could be multiplied and used to revegetate beaches, buttress eroded landscapes, or adapt communities to changing conditions. Washburn, for example, is interested in floodable parks, designed to take on water during storms or floods.

"But to do that," he says, "we need the building blocks." Those are water-absorbing native plants.

On Cannon Island, the team continues its search.

Garden Conservation Associate Jonathan Farquhar finds a tuft of lacey green stalks. It's sea blite (*Suaeda linearis*), useful for stabilizing coastal areas. The team crouches to examine them and take cuttings.

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Summer 2025 intern Katie Luttrell takes a cutting.

Conservationists from the Garden and Rookery Bay National Estuarine Research Reserve are working to collect seeds and cuttings from more than 250 native plants. Some are commonly found—for now—but not genetically backed up in botanical collections. Others are quite rare in the wild. The targeted species include:

***Vachellia tortuosa*:** Known as poponax or twisted acacia, the entire range of this small tree is limited to shell mounds in the Ten Thousand Islands. At last count, 20 were known to exist in this region, though they are prevalent in Central and South America.

***Schoepfia schreberi*:** The team observed this tree, known as Gulf graytwig, on Cannon Island, though it was not in fruit. They hope to eventually gather the seeds of this state-endangered tree, used in native landscapes and ecosystem restorations. Currently, it is protected in only one botanical collection in the Caribbean island of Montserrat.

***Celtis iguanaea*:** Though this small tree, iguana hackberry, is common in Central and South America, its range in the United States is limited to Rookery Bay and the Ten Thousand Islands where it grows on shell mounds. Fewer than 100 are known to exist.





*Andy Owen*



## Round Key V

A pastel light fills the sky,  
green, rose, violet,  
layered one upon another,  
marking the end of day.

Nothing is left but the near horizon,  
its endless acres of sawgrass,  
ibis and egret overhead,  
beating steadily onward.

The great shadows they once knew—  
jungle islands  
shaped like teardrops—  
now clouds upon the water.

One day, a column,  
the next a crackling wind—  
water once more.

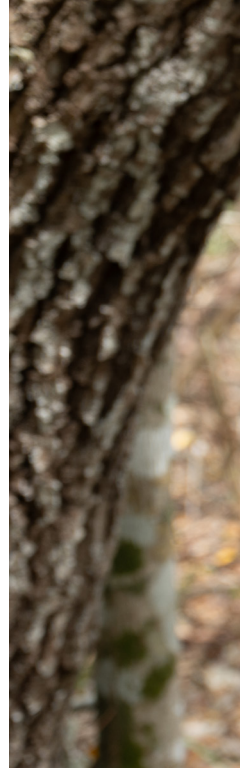
—Chanda Jamieson

The late Naples artist Andy Owen and Fort Myers poet Chanda Jamieson collaborated on *Ghost Horizons*, their 2024 exhibition celebrating Southwest Florida's coastal beauty. Their works included an homage to Round Key, a small mangrove island, swallowed by rising seas.





Franklin demonstrates the differences between Florida's three mangrove species.



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They push deeper into the interior where they encounter the state-threatened Florida Keys blackbead (*Pithecellobium keyense*) tree. It is not in fruit, so they take a few cuttings, hoping they'll sprout roots.

This kind of trial and error is common; there's little existing research on Southwest Florida native plants to guide them. In their first three trips, the team collected seeds and cuttings from 12 species. Some sprouted. Others withered. Each outcome helps them understand the plants a little better. The Garden conservationists intend to make what they learn publicly available—a how-to manual for growing Southwest Florida natives.

"There just aren't a lot of researchers doing this kind of work," McCoy says.

**FEW UNDERSTAND BOTANICAL GARDENS'** conservation imperative. These institutions are best known as community gathering spots and horticultural showcases. But quietly, botanical gardens lead the monumental task of saving the world's plants. Some 40% of plant species worldwide are at risk of extinction.

Gardens and related institutions, such as

universities, hold at least 105,634 plant species, representing a third of all known land-based plant types. A 2025 study published in the journal *Nature Ecology and Evolution* suggested that's not nearly enough. The researchers analyzed a century's worth of records from 50 of the world's biggest botanic gardens and arboreta. They warned that these institutions are not keeping pace with biodiversity loss. In 40 years, for example, the proportion of threatened species in living collections grew by just 1%.

"This study points to a collective failure of leadership," Paul Smith, the Secretary General of Botanic Gardens Conservation International, wrote. He hopes the findings rally his industry and catalyze "long overdue" changes to conservation practices and priorities.

The study didn't surprise Washburn. In a way, he's heartened by the attention it drew to botanical gardens and their outsized importance in climate adaptation and resilience.

"So many of the challenges that we face—whether they're economic or whether they are environmental or whether they impact people—can be addressed by using plants and botanical gardens," he says.





Conservationists mist the plant cuttings to protect them on their journey back to the Garden.



## AMID THE STORM DAMAGE AND CLIMATE

change concerns are moments of hope.

During a late-spring trip to Camp Lulu, near the Reserve's boundary with Everglades National Park, a population of seven-year apple (*Casasia clusiifolia*)—the only known in the Reserve—is intact and in fruit despite the jarringly eroded coast.

The morning they'd surveilled the devastated pine flatwoods, the team also saw this: tiny pinkish-purple flowers sprouting alongside a nearby trail. They gathered its ripe seeds.

This plant, pineland twinflower (*Dyschoriste angusta*), is among the first species Garden conservationists collected at Rookery Bay several years ago. The conservation group NatureServe ranks it as "Imperiled"; the Center for Plant Conservation included it in its Florida Plant Rescue, focused on conserving the state's 200 most at-risk native plants.

Farquhar considers the contrast between the flowers' rebound—they'd not been spotted since Hurricane Ian—and the loss of the pine trees and other upland species.

"It could be a good research opportunity," he says, thinking about what these altered ecosystems could reveal about plant and landscape adaptation.

Katie Luttrell, a Florida Gulf Coast University environmental studies major and summer 2025 Garden intern, also reflects on the changed landscapes and the urgency for action.

"This mission is rooted in hope," she says. "That's what gives me hope."

*Jennifer Reed is the Garden's Editorial Director.*





# Conserving the Past

The Garden's Preserve protects  
native plants—and native heritage

By Jennifer Reed and Eric Foht


Photos by John Eder





## Did ancient people traverse the Garden's grounds?

A chance conversation spurred Director of Natural Resources Eric Foht to find out. A public records request turned up baseline archaeological surveys and the discovery of scattered artifacts in our coastal scrub habitat. Armed with the reports, Foht invited Editorial Director Jennifer Reed and Multimedia Coordinator John Eder on a journey to discover what secrets the Garden holds and what they reveal about Florida's history. Along the way, they discovered that "conservation" goes well beyond protecting plants.



**T**o the curious, an archaeological survey report seems designed to tease. It tosses out key words that pique the attention and beg for further explanation. "Worked shell." "Campsite." "Pre-Columbian." "Midden."

We pored through the documents after obtaining them in spring 2025. The surveys were conducted in 2002, before the inaugural landscape designers started work, and long before any of us had joined the staff.

Archaeologists had identified four areas to examine, chosen because their elevation and habitat type were likely to attract our region's earliest known inhabitants. Three of them did, yielding oyster shells and pottery sherds.

We were intrigued. But, to us—plant people, not historians—the details were like little dots that we couldn't connect.

Luckily, we found the man who could. Bob Carr, co-founder of the Archaeological and Historical Conservancy, the firm contracted to do our surveys, arrived just after lunch one afternoon, along with archaeological technician Clay Gordon.

The archaeologist seemed as eager for an audience as we were for a storyteller. We set off for the Preserve to learn about the history hidden within it.

**COASTAL SCRUB HABITATS ARE TOUGH** environments. The sun hits you from above and reflects off the sand from below. Even with

the use of a golf cart, we're mindful of heat and exposure.

"This is not the place you want to hang out, right?" says Carr, though with some five decades of archaeological study in South Florida, he appears perfectly at home. "So, what were people doing here?"

Archaeology starts with a question. Early indigenous people didn't leave written records, Carr explains, and those left by the Spaniards considered tribal communities through their own cultural biases. For a more complete account, you must piece together their story, artifact by artifact.

Our relics reveal the Garden didn't house a full-time settlement or attract large traveling groups. The recovered items were scant, and excavations elsewhere in Southwest Florida—places like Marco Island, Pine Island, and Mound Key—show that early people lived closer to coast, sustained by the sea.

What, then, brought them here?

We discuss the possibilities, including hunting, foraging, and ceremony. The scrub's flora would have met many of their needs. Early people used the fronds of saw palmetto (*Serenoa repens*) for cordage, ate wild-growing foods like cocoplum (*Chrysobalanus icaco*), and brewed tea from yaupon holly (*Ilex vomitoria*), used in a cleansing ritual.

Whatever their journey's purpose, the travelers brought oysters with them to eat, Carr says. That accounts for the shells unearthed



during the 2002 survey—as well as the one that Foht stumbles across during our trek, tucked beneath a saw palmetto.

This gives us pause. We'd noticed shells in the past and theorized that they'd washed in during hurricanes or were remnants of an ancient seafloor.

Neither was true, Carr says. The physics of water movement doesn't support our flood theory, and the Preserve's sand type does not match that of an ocean bottom. They were almost certainly carried in by people.

The archaeologist then shatters another preconceived idea.

"Everybody in Naples assumes that the native people here, the indigenous people, were Calusa," Carr says. "Interestingly enough, that's not true."

The Calusa were an ancient society, headquartered on Mound Key in Estero Bay. They were the ancestors of the Seminole and Miccosukee people (see sidebar).

The pottery sherds recovered at our site are roughly 1,000 years old, from South Florida's Glades period, 500 B.C. to 1500 A.D. While that period overlapped with the Calusa, the ceramics found here were not of that tribe.

"We realized right away that that was not what the Calusa pottery looks like," says Carr. "We were in a very different indigenous tribal area, and you see a distinctive pottery all through the Ten Thousand Islands and through Marco."

The Calusa's pottery was plain, Carr explains. The Glades-era, South Florida ceramics were decorated. Carr and his colleague, John

Beriault, published a significant paper about this distinction in the 1980s, upending common notions about Florida's early inhabitants.

We don't know the names of these tribes, Carr says. We do know

that eventually, they came under the political control of the Calusa. Artifacts helped piece together that story, too.

"It's always exciting to find an artifact, but it's more important to remember that it's an articulation of human behavior," Carr says. "It's about people. It's about culture. It's not about the objects."

## WE WERE NOT ABLE TO DETERMINE

where the Garden artifacts might be housed. Lucky for us, Collier County Museums have well-curated collections and staff historians who could fill in the gaps.

We started at the Collier Museum at Government Center. Elaina Gyure, the Curator of Education, greets us brightly, armed with the very thing we'd hoped to see: artifacts



comparable in age and geographic origin to what was

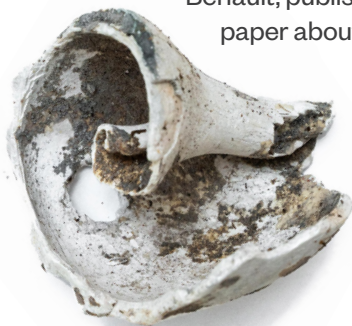
recovered at the Garden. (Those are the relics you see pictured throughout this article.)

She lets us run our fingers along the gritty surfaces, stoking our imaginations about their makers and their lives.

She also shows us a punctured oyster shell, used as a net weight, and a pick-like columella, the central pillar of a spiraled shell. We think about how Florida's early people used natural resources.

"Our history is intertwined in how people lived in those habitats," Gyure says.

We tell Gyure about another type of relic we'd noticed in our Preserve—old pine stumps that we believe date back to the early 1900s, when early Neapolitans established a thriving timber industry. She leads us to a 1926





cottage. Its floorboards, still gleaming, are made from pine.

At Gyure's encouragement, we call on Rebecca Mazerowski and Heather Otis, the Museum Manager and Curator of Collections, respectively, at the Marco Island Historical Museum, which houses the county's most extensive collection of indigenous artifacts.

Marco Island was home to the Muspa people, whose presence on Marco dates back 2,500 years and who came under the control of the Calusa around 1300 A.D. The island is a renowned archaeological site. In 1896, an expedition led by archaeologist Frank Hamilton Cushing unearthed a trove of artifacts, including the Key Marco Cat, a 6-inch-tall carved wooden sculpture considered one of the finest pieces of pre-Columbian native art ever discovered. (The cat is on a special, long-term loan from the Smithsonian Institution, on display until April 2026).



Replica tool, on display at the Collier County Museum

"What we're taught in school is really a snapshot of when the Europeans showed up," Mazerowski says, as she and Otis lead us through the exhibition hall.

We paused by a pottery display. These pieces show the incisions Carr described—dots, dashes, waves, and diagonal lines. The ceramics, made from baked clay and sand, circulated throughout South Florida via ancient trade routes.

It seems curious to us that the Calusa, who succeeded the Glades people, would use less detail rather than grow progressively more ornate.

"It's not a regression," Mazerowski says. "It was likely a decision." The Calusa, she says, were a warrior culture.



## A Word from Our Contemporaries

While ancient relics and archaeological surveys inspired this report, we wanted the perspective of our present-day tribal communities regarding what we'd learned of the Garden's past.

We reached William Locascio, Research Supervisor, and David Scheidecker, Senior Researcher, in the Seminole Tribal Historic Preservation Office.

The Seminole, they explain, regard the Calusa and related tribes as their ancestors. By the mid-1700s, most Calusa had perished from exposure to European diseases or were driven out of Florida. But survivors joined with the indigenous people migrating south through Florida, who came to be known as the Seminoles. (The Miccosukees broke away from the Seminoles for political reasons in the 1960s.)

The tribe, therefore, considers the ceramics found on our site to be evidence of ancient Seminole activity, Locascio and Scheidecker say.

Their bigger point, however, was this: Most Americans have a singular snapshot of Native Americans as they might have appeared in the 1800s. Thanks to archaeology, we have a more complete story, showing the evolution of cultural practices, religion, lifestyle, and environmental adaptation over the millennia.

Indigenous communities, Scheidecker says, "are still here, and still adapting and changing with the world now."



Scan the QR code to discover where you can learn more about Southwest Florida's indigenous heritage.





Archaeologist Bob Carr discusses the historical significance of the Garden's Preserve with Director of Natural Resources Eric Foht. Below: a piece of ironstone.

Even though Marco Island is considered among Florida's most important archaeological sites, Otis and Mazeroski say even the smallest of undisturbed parcels can add to the story.

"Archaeology is about patience and perseverance," Otis says. "And it's not just about a singular site ... Every piece of knowledge that an archaeologist can gain or uncover is an archaeological record, and we're able to build on that and study it, not just now but in the future."

The Marco Island Historical Society, she adds, has almost 5,000 bags of material in its collection, catalogued and available for research.

**BACK ON OUR TOUR WITH CARR**, we notice that Gordon has fallen behind. Carr suspects his sharp-eyed associate has found something.

We find him stooped in the sand, examining a fragmented object that the rest of us had overlooked. Partially buried, it looks like a flat-surfaced rock.



Carr picks it up, runs his fingers along it, flips it over. It has a crackled finish and reddish hue.

"Ironstone," Carr declares. It was probably a pot, crafted before 1910. And, just like the ancient relics, it prompts questions about who might have left it behind.

Some 90% of archaeological sites on private land in Florida are gone, Carr says. That's when it really hits home for us: In conserving our 90-acre Preserve, we're conserving a piece of Florida's history, too.

Undoubtedly, more clues to the past lie in the sand, Carr says. Could ancient clam shells tell us about environmental health? How did early people adapt to changing climate conditions? What might we learn about their use of native plants? And how might this knowledge guide the way we live today?

The answers depend on the questions you ask, Carr says. "And there are infinite numbers of questions."

*Jennifer Reed is the Garden's Editorial Director.  
Eric Foht is Director of Natural Resources.*



# Digging into the Garden's Archaeological History

By Eric Foht

I had always enjoyed reading *National Geographic* growing up. I was drawn to the rich photos and stories and to learning about present-day cultures around the world, as well as the ones of the past. That curiosity led me to enroll in a summer course on Southwest Florida archeology through Florida Gulf Coast University, where I majored in environmental studies.



Even though the class was years ago, it stayed with me. We participated in an archaeological dig on Galt Island, near Pine Island. We meticulously dug centimeter by centimeter through the sand, shell, and organic soil, collecting and sifting the material through a fine mesh and seeing what was within it. I can still remember the first sherd of pottery I found. I picked it up, somewhat in disbelief, as I was holding something another human made long before. I was hooked. I wanted to learn everything I could about these people—who they were, how they lived, how they adapted the “tools” available to them to survive on the region’s islands and coast.

I didn’t know it then, but around the time I took the course, the Garden’s founders had ordered a “phase 1” study at our not-yet-developed site, a baseline survey to determine whether it had archaeological significance. I joined the Garden in 2009 but didn’t learn about the survey’s existence until a few months ago

during a chance conversation with Jared Franklin, the Stewardship Coordinator at Rookery Bay National Estuarine Research Reserve. I was curious about Rookery Bay’s archaeological sites. He’d heard that the Garden had its own records and handed me a phone number to the state’s Division of Historical Records to find out. So began my quest.

Looking back at my college elective course selections, such as environmental philosophy, I realize that I’ve always wanted to understand how humans relate to and use nature. This journey did help me understand those things.

It also reminded me of something that perhaps I’d forgotten—that humans have been part of South Florida’s ecosystem for a very long time. Their survival was dependent on the plants and animals of this place, that are still with us today, that we can see firsthand in the natural areas of the Garden.

As Director of Natural Resources, my team and I are charged with managing our Preserve. With my new understanding of our land’s history, I will walk with a new perspective, looking for remnants from the past while conducting our work protecting the plants. We have a new responsibility now preserving the history embedded in the very soil that these plants are growing within.







# A Wild Sketchbook

Garden's Nature Journaling program introduces students to Florida's wilderness, teaching environmental stewardship along with artistic fundamentals

By Joe Fagnano

Photos by Kaitlyn Handley

As the warm sun beams down and a cooling breeze drifts across the landscape, two women, sketchbooks in hand, intently observe a patch of Florida coreopsis. These are simple yellow flowers that resemble a common daisy. The women had most likely seen them before, since they are Florida's state flower, though they study them as if they were the most exotic of blooms.

The women are students of the Garden's long-running nature journaling program. Our course originated in the cultivated gardens, but, recently, I have been introducing Nature Journaling students and alumni to the wonders of wild Florida in our Preserve, using art to inspire new environmental advocates.

Students tell me whether they're in a manicured garden or an untamed preserve, a nature journal sparks a heightened awareness of their surroundings and turns a passive walk into an ecosystem study.

"When doing a simple walk, I feel that I am focused more on the pathway, direction, and distance," says Nature Journaling student Kathy Tobin. She notices her surroundings

when she's bare-handed, of course, but not with the same scrutiny. "As I'm looking at the foliage, I'm noticing everything in more detail—distinctive shapes and forms, different color shades and details."

Students report discovering previously unnoticed natural treasures as they attempt to capture scenes in sketchbooks.

"I believe that in the natural spaces you find more surprises like birds, insects, movement—is that a snake?" says Karen Baldwin, another student. "More of the whole picture of nature's interplay comes into what you are seeing."

She enjoys journaling in designed gardens, too, though she finds fewer "surprises" in a managed landscape.

Venturing into the Preserve can be intimidating, especially to those who are not familiar with Florida's many plant and animal species. It raises curiosities like: Could that thicket of saw palmetto (*Serenoa repens*) be concealing a panther, or could that fallen slash pine (*Pinus elliottii* var. *densa*) be the lair of a rattlesnake? Tobin says her senses are heightened while exploring the Preserve.





Kathy Tobin (left) and Karen Baldwin sketch Florida *Coreopsis* with instructor Joe Fagnano.





Tobin gets close to her subject to capture details; Baldwin shows off a field sketch that she'll later fill in with watercolor pencils.





"I felt a little more relaxed in the cultivated gardens than in the Preserve," she explains. "Things were more orderly in the cultivated gardens. The Preserve felt wilder. I think I was more aware of my surroundings wondering if an alligator may appear!"

As educators, we hope these artistic experiences help people feel more at ease in the Florida wilderness and, ultimately, encourage more actions toward its protection. Simple steps like landscaping with native plants, volunteering for local conservation-based organizations, and voting for environment-minded candidates can make a difference.

Enticing people to observe nature more intently, as done in Nature Journaling, is a superb way to open people's hearts to Florida's natural charm. As an instructor, watching this come to fruition is a fulfilling experience.

*Joe Fagnano is the Creative Programs Lead on the Education & Visitor Experience Team.*

## About Nature Journaling

We offer two Nature Journaling programs.

The first is an eight-week, virtual creative aging course for people aged 55 and older. Led by a Garden educator, students receive a complimentary nature journaling kit with all the tools they need to let their artistic side run free. Occasional class "meet-ups" are scheduled, allowing those in the Naples area to venture out of the virtual classroom and into the Garden. This course is once yearly in the spring. There is no charge.

We also offer 90-minute, in-person workshops for anyone aged 16 and older. Fees include materials.



For more information, visit [naplesgarden.org](https://naplesgarden.org)



Baldwin studies the artwork of previous students displayed at the Nature Journaling Invitational exhibition held during the 2024 – 2025 season.









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