Institute for Regional Conservation

Invitation to
Pine Rockland Landowners Workshop
An IRC Pine Rockland Initiative Activity
April 20, 2022 from 7:00pm - 8:30pm

Mark your calendars for the next Pine Rockland Landowner Workshop on April 20 at 7:00pm

With support from

NATIONAL PARKS CONSERVATION ASSOCIATION

EST 1919

and private donors through

Give Miami Day

Pine Rockland Initiative

What is a Pine Rockland?

Pine Rocklands comprise a globally imperiled ecosystem that exists only in southern Florida and parts of the Bahamas. In South Florida, they are home to many rare plant and animal species, including 11 federally listed animals and 16 federally listed plants. Dozens of state-listed plants and regionally rare plants designated by IRC are also present. A typical pine rockland is characterized by limestone outcroppings, sometimes covered with sand, a canopy of South Florida Slash Pine, and diverse understory and groundcover layers including temperate, tropical, and endemic plants. In South Florida, intact pine rocklands have all but disappeared outside of Everglades National Park (ENP) in Miami-Dade County and parts of National Key Deer Refuge in the Florida Keys. Outside of ENP in Miami-Dade County, small patches, representing perhaps 2% of the original extent of pine rocklands within Miami-Dade County's urban corridor, are all that remain. Threats to remnant pine rockland patches include destruction, invasive plants and animals, fire suppression, and dumping.

OUR PARTNERS

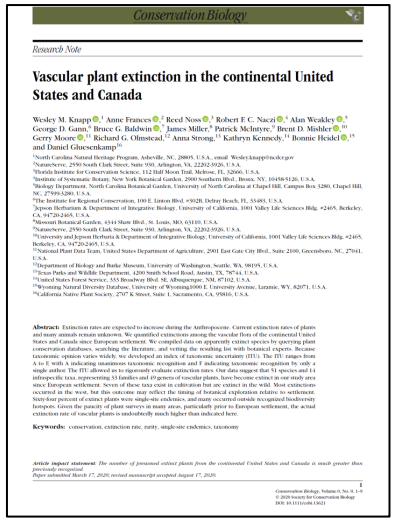
U.S. Fish & Wildlife Service

Miami-Dade County Environmentally Endangered Lands Program

National Parks Conservation Association

Fairchild Tropical Botanic Garden and their Connect to Protect Network

The Institute for Regional Conservation
Uniting Global Thinking with Local Expertise



Conservation Biology

Research Note

Vascular plant extinction in the continental United States and Canada

Wesley M. Knapp, Anne Frances, Reed Noss, Robert F. C. Naczi, Alan Weakley, George D. Gann, Bruce G. Baldwin, James Miller, Patrick McIntyre, Brent D. Mishler, Gerry Moore, Richard G. Olmstead, Anna Strong, Kathryn Kennedy, Bonnie Heidel, and Daniel Ghesenkamp

Abstract: Extinction rates are expected to increase during the Anthropocene. Current extinction rates of plants and many animals remain unknown. We quantified extinctions among the vascular flora of the continental United States and Canada since European settlement. We compiled data on apparently extinct species by querying plant conservation databases, searching the literature, and vetting the resulting list with botanical experts. Because taxonomic opinion varies widely, we developed an index of taxonomic uncertainty (ITU). The ITU ranges from A to F with A indicating unanimous taxonomic recognition and F indicating taxonomic recognition by only a single author. The ITU allowed us to rigorously evaluate extinction rates. Our data suggest that 51 species and 14 infraspecific taxa, representing 53 families and 19 genera of vascular plants, have become extinct in our study area since European settlement. Seven of these taxa exist in cultivation but are extinct in the wild. Most extinctions occurred in the west, but this outcome may reflect the timing of botanical exploration relative to settlement. Sixty-four percent of extinct plants were single-site endemics, and many occurred outside recognized biodiversity hotspots. Given the paucity of plant surveys in many areas, particularly prior to European settlement, the actual extinction rate of vascular plants is undoubtedly much higher than indicated here.

Keywords: conservation, extinction rate, rarity, single-site endemics, taxonomy

Article impact statement: *The number of presumed extinct plants from the continental United States and Canada is much greater than previously recognized.*

Paper submitted March 17, 2020; revised manuscript accepted August 17, 2020.

Conservation Biology, Volume 0, No. 0, 1–9
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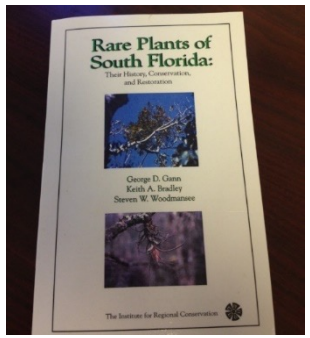
DOI: 10.1111/cobi.13621



South Florida

The Floristic Inventory of South Florida
Conservation of rare plants, animals, and ecosystems

GUIDELINES FOR PLANTING A PINE ROCKLAND IN MIAMI-DADE COUNTY, FLORIDA

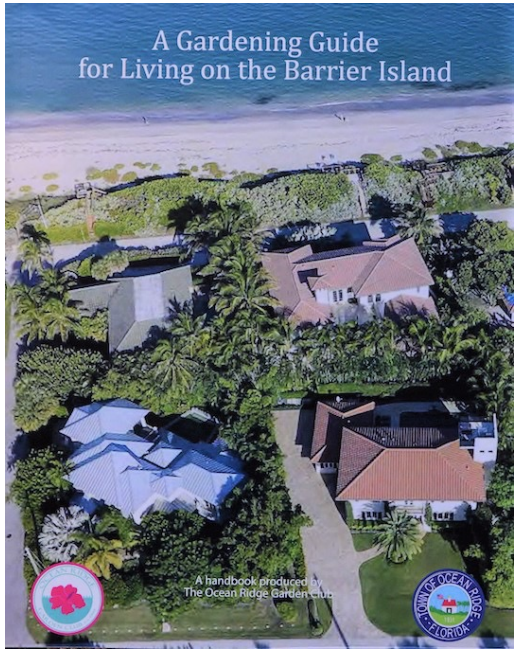
George D. Gann, Jennifer Possley, Steven W. Woodmansee

Version 2.0
October 2020

Why plant a pine rockland? Pine rockland is a critically imperiled ecosystem that has been heavily impacted by urban development and agriculture. Found only in South Florida and the Bahama Archipelago, less than 2% of the original pine rocklands remain in Miami-Dade County outside of Everglades National Park. Pine rocklands of the lower Florida Keys have also been heavily impacted by development, sea level rise, and flooding from hurricanes and tropical storms. Creating a pine rockland is not easy or simple, but it can be extremely rewarding. Pine rocklands provide wonderful habitats for native plants and wildlife, including many species of very rare plants, butterflies, bees and other pollinators, and songbirds. If well-planned and managed they can also be aesthetically pleasing.

Photo courtesy of Haniel Pulido Jr.

Plantas de la Isla de / *Plants of the Island of* **Puerto Rico**
Un servicio para la conservación de flora / *A conservation service for the flora*
The Institute for Regional Conservation



native gardening -
THE POWERFUL CONSERVATION TOOL OF MANY
By George Gann

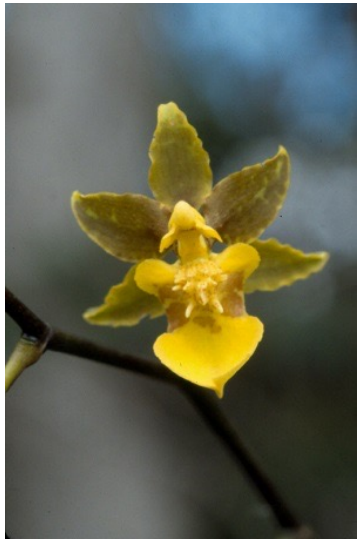
Native plant gardening and ecological restoration may be more closely linked than you think. A coastal garden at a dune in Ocean Ridge, Florida, uses local native plants to restore a coastal shrub land. It is both beautiful and restorative. Photo by George Gann.

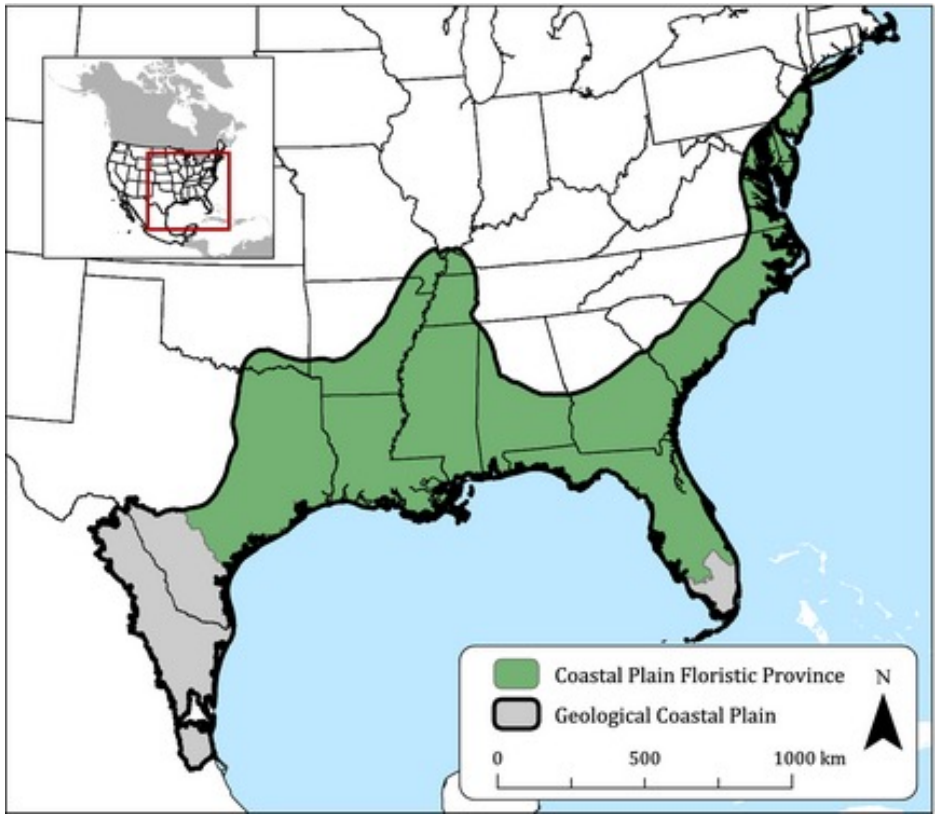
Looking at the many woes of the world, from COVID-19 to climate change, it is understandable to feel overwhelmed. Yet, we know from ample evidence that the sum of individual actions is as important as those of government, large businesses or big conservation organizations. This is especially true in urban and suburban areas, where our collective individual actions may make the difference between conservation success – or the lack thereof. This need for individual action has never been more urgent, no matter where you live, and is embraced by Plant America with Trees, an emphasis of National Garden Clubs Inc.

At the international level, there is tremendous work being done to address not one, but three global environmental challenges: countering climate change, preventing the extinction crisis and providing adequate ecosystem services to meet the needs of a sustainable world. Meeting these challenges requires transformational change; business as usual just won't work. We know that traditional conservation alone, what we think of as "protection" or "preservation," is insufficient to meet these challenges. Instead, we need

Photo by Kimberlee Duke Pompeo

Ecological Restoration and Community Outreach

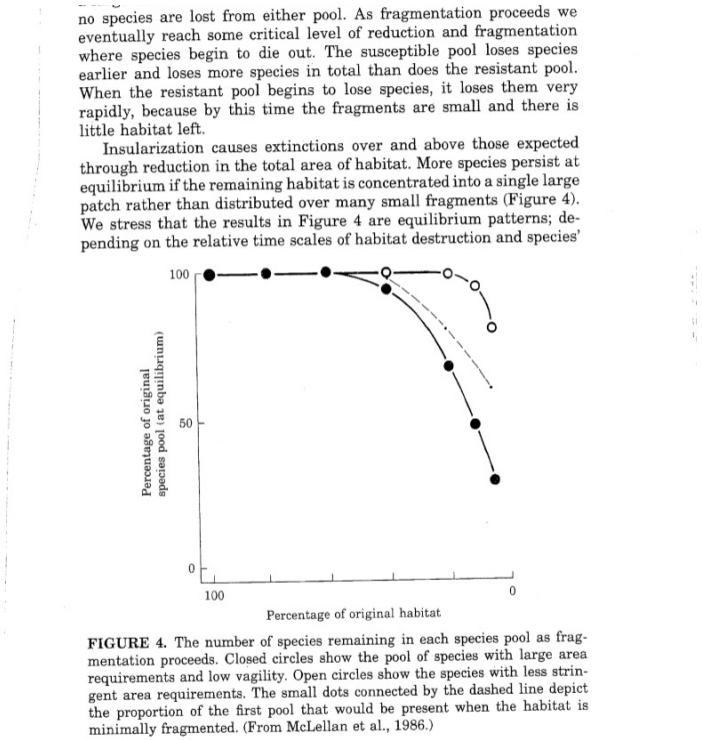




North American Coastal Plain Global Biodiversity Hotspot

Noss et al. 2014

Fragmentation leads to inexorable loss



no species are lost from either pool. As fragmentation proceeds we eventually reach some critical level of reduction and fragmentation where species begin to die out. The susceptible pool loses species earlier and loses more species in total than does the resistant pool. When the resistant pool begins to lose species, it loses them very rapidly, because by this time the fragments are small and there is little habitat left.

Insularization causes extinctions over and above those expected through reduction in the total area of habitat. More species persist at equilibrium if the remaining habitat is concentrated into a single large patch rather than distributed over many small fragments (Figure 4). We stress that the results in Figure 4 are equilibrium patterns; depending on the relative time scales of habitat destruction and species'

FIGURE 4. The number of species remaining in each species pool as fragmentation proceeds. Closed circles show the pool of species with large area requirements and low vagility. Open circles show the species with less stringent area requirements. The small dots connected by the dashed line depict the proportion of the first pool that would be present when the habitat is minimally fragmented. (From McLellan et al., 1986.)

Wilcove 1986

Some species and groups go faster, some slower

What are Pine Rocklands?

- Found on limestone substrate in South Florida and Bahamas.
- In the north the limestone is mostly covered by sand; in the south it is exposed
- In Redland, there are reddish claylike pockets
- South Florida slash pine is the only tree in the canopy
- A wide variety of shrubs and palms, many of tropical origin, are found the understory
- The groundcover is where the biodiversity is, with dozens of species grasses, wildflowers, creeping vines, and ferns in a typical pineland
- Pine rocklands evolved with and are dependent on fire
- It is a globally-imperiled ecosystem (FNAI), with a large number of endemic plants and animals and a large number of rare species listed by the US Fish and Wildlife Service, the State of Florida, IRC, and others

The Institute for Regional Conservation

Pine Rockland Initiative

The Pine Rockland Initiative is a key program of the Institute for Regional Conservation (IRC) in Miami-Dade and Monroe counties, Florida. The goal of the IRC Pine Rockland Initiative program is to help protect, restore, and manage the remaining pine rockland fragments and the species that occur within them. We also advocate for "Expanding the Footprint", to increase the total pine rockland area. The program is especially designed to assist landowners and land managers through applied conservation science and research, education and outreach, volunteer opportunities, and on-the-ground activities such as invasive plant control, hardwood reduction, and the protection and recovery of rare species. This is a collaborative program with significant funding from the U.S. Fish and Wildlife Service, and in partnership with Miami-Dade County, Fairchild Tropical Botanic Garden, and many others.

What is a Pine Rockland?

Pine Rocklands are a globally imperiled ecosystem that exists only in southern Florida and parts of the Bahamas. They are home to many rare plant and animal species, including more than a dozen Federally endangered plants and animals. A typical pine rockland is characterized by limestone outcroppings, a canopy of Florida Slash Pine, and a diverse, shrub and herbaceous understory. In South Florida, pine rocklands have all but disappeared outside of Everglades National Park.

Perhaps 2% of the original pine rocklands within Miami-Dade County's urban corridor and in the lower Florida Keys remain. Existing fragments are threatened by habitat destruction, invasive species, fire suppression, and sea level rise.

Pine Rockland Initiatve Activities:

Reintroduction of the Natural Fire Cycle

Removal of Invasive Species

Planting of Native Species

The Institute for Regional Conservation

Pine Rockland Initiative

Why Get Involved?

You can help conserve and restore a critically imperiled ecosystem unique to South Florida and the Bahamas that is home to many rare and endangered species.

How Can I Get Involved?

Private landowners, public land managers, students, educators, scientists, nature enthusiasts, and other conservation stewards can get involved in a variety of ways. Contact us for more information about conservation and restoration activities, workshops, and volunteer opportunities.

305-247-6547
pri@regionalconservation.org
www.regionalconservation.org/PRI.asp

Can I Donate to the Pine Rockland Iniative?

Tax deductible donations can be made specifically to the Pine Rockland Initiative on the IRC website at: www.regionalconservation.org or mailed to: 100 E. Linton Blvd. Suite 302B, Delray Beach, FL 33483. IRC is a 501(c)3 non-profit organization.

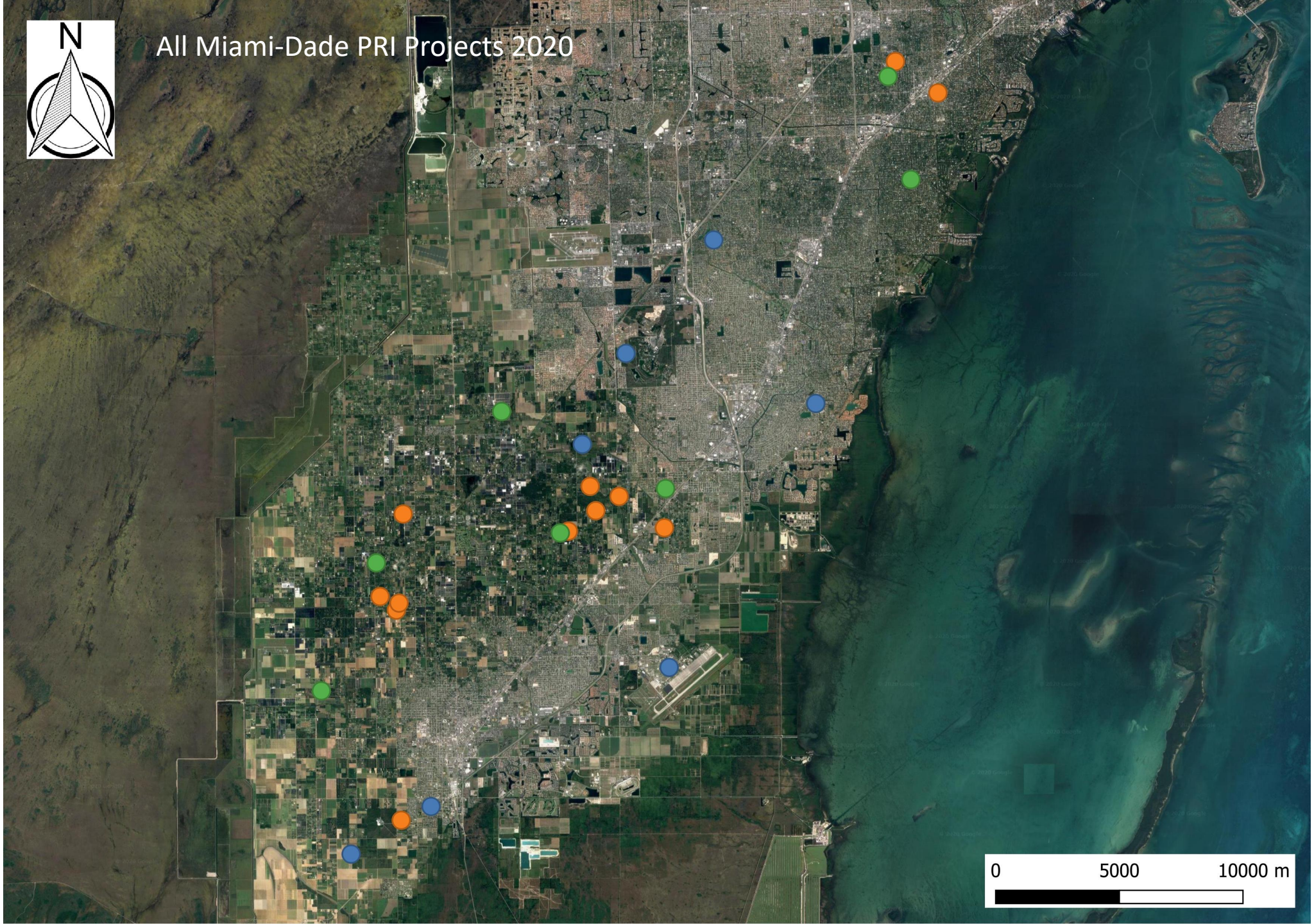
We Thank You For Your Support!

Initiated in 2005, to provide management support for private owners of pine rocklands, specifically invasive species control.

Expanded over the years to include management of any pine rockland, as well as supporting activities, such as rare species surveys, mapping, ecological restoration design, and outreach.

Primary funding has come from US Fish and Wildlife Service, Partners, and Coastal Programs.

Collaborators include Miami-Dade County, Fairchild Tropical Botanic Garden and others.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All Miami-Dade PRI Projects 2020
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Expanding the Pine Rockland Footprint Workshop

1 May 2018
Fairchild Tropical Botanic Garden
10:00 am – 12:00 noon

Organized by The Institute for Regional Conservation, Miami-Dade County,
U.S. Fish & Wildlife Service and Fairchild Tropical Botanic Garden

Draft Agenda

IRC's Pine Rockland Initiative
Private Pine Rockland Owners' Summit, October 2018

Pine Rockland Business Plan
Team Kickoff Meeting
7.2.19



US Fish and Wildlife Service, TNC, IRC, Miami-Dade County, FTBG +

Prescribed Fire

There are never enough resources or support
so we are continuously losing ground

Expanding Exotics and Native Vines

Native Hardwoods and Palms

Slash Pine Density and Cover

Pine Rocklands Are Resilient

Cleared, c. 1970 or earlier

Firebreaks & Restored Scraped Sites

Figure 91. Bruce Holst of Marie Selby Botanical Gardens and EVER Botanist Jimi Sadle showing length of *Sporobolus clandestinus* inflorescence near Osteen Hammock in EVER, 2012.

153

Long Pine Key, Everglades National Park

Former Scraped Site, SOCSOUTH

SOCSOUTH

7-2018

1-2019

1-2020

1-2022

Moreno Pineland

May 2019 versus November 2021

New Tools and Methods

Skid Steer with Forestry Mulcher

Billy Goat Brush Cutter

Direct Seeding Trials and Applied Nucleation Concepts

Spring 2019

Spring 2020

Palmetto Bay planting

In collaboration with Connect to Protect

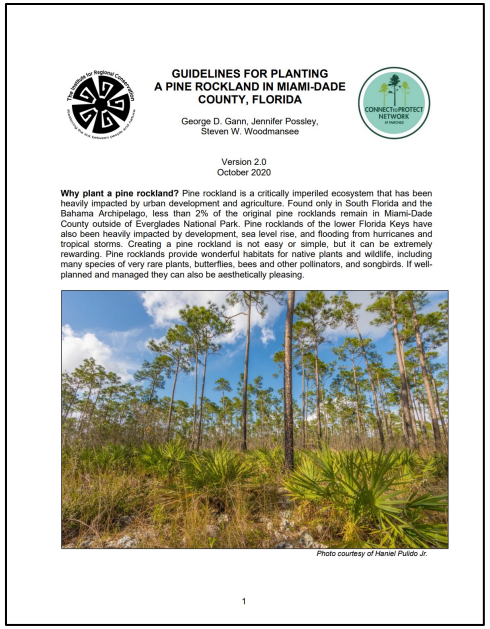

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Photo courtesy of Haniel Pulido Jr.

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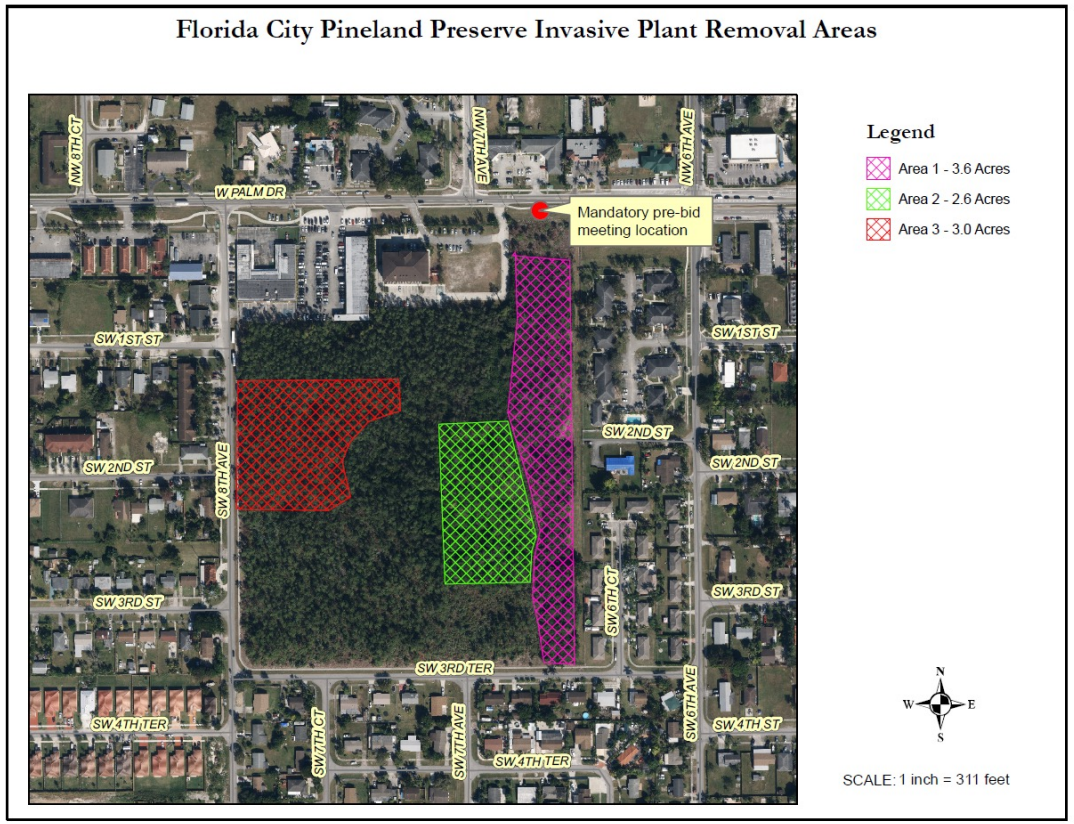
Collaborations with Miami-Dade County Environmentally Endangered Lands Program



NFYN Updates

Pineland croton, Grannybush

Croton linearis

Euphorbiaceae

General Landscape Uses: Primarily recommended for natural landscapes and habitat restorations. Also butterfly gardens.

Ecological Restoration Notes: Common in pine rocklands in southerm Miami-Dade County; rare elsewhere.

Availability: Grown by enthusiasts and occasionally by native plant nurseries. Available in Lake Worth at **Amelia's SmartyPlants** (561-540-6296) and in Miami at **Pro Native Consulting** (786-488-3101).

Description: Small shrub. Leaves dark green above and silvery or coppery below.

Dimensions: Typically 1-3 feet in height. Often as broad as tall.

Growth Rate: Moderate to fast.

Range: Monroe County Keys north along the east coast to St. Lucie County, where presumed exirpated in the wild; West Indies. In the Monroe County Keys, apparently disjunct from Miami-Dade County to the pine rocklands of Big Pine Key and Little Pine Key.

Map of select IRC data from peninsular Florida.

Map of suggested ZIP codes north to Indian River and Manatee counties.

Map of ZIP codes with habitat recommendations north to Martin and Charlotte counties.

Habitats: Pine rocklands, scrub and coastal thickets.

Soils: Moist, well-drained sandy or limestone soils, without humus.

Nutritional Requirements: Low; it grows in nutrient poor soils.

Salt Water Tolerance: Low; does not tolerate long-term flooding by salt or brackish water.

Salt Wind Tolerance: Moderate; grows near salt water, but is protected from direct salt spray by other vegetation.

Drought Tolerance: High; does not require any supplemental water once established.

Light Requirements: Full sun.

Flower Color: White.

Flower Characteristics: Semi-showy.

Flowering Season: All year.

Fruit: Inconspicuous capsule with yellowish pubescence.

Copyright by: James Johnson, 2014
In habitat, Everglades National Park, Florida
Expand

Wildlife and Ecology: Sole **larval host plant** for Bartram's scrub-hairstreak (*Strymon acis*) and Florida leafwing (*Anaea troglodyta floridalis*) butterflies in South Florida. **Nectar** plant for baracoa skipper (*Polites baracoa*), Bartram's scrub-hairstreak, cassius blue (*Leptotes cassius*), Florida duskywing (*Ephyriades brunneus*) and other butterflies.

Horticultural Notes: Can be grown from seed or cuttings. Soak seeds in water overnight andd sprinkle into a community pot, scattering a thin layer of soil over the seeds. Place in full sun. For excellent and detailed information on pineland croton propagation, see Fairchild Tropical Garden's **Connect To Protect** fact sheet.

References: Miami-Dade County Landscape Manual **(2005)**.

Comments: Recruits readily in the garden from seed, b[illegible]

wildlife interactions

Copyright by: James Johnson, 2014
In habitat, Everglades National Park, Florida

Copyright by: Roger L. Hammer

Copyright by: Kristen Finch, 2013
In cultivation, Palm Beach County, Florida

Plant-Wildlife Interactions

Animal Associates of

Pineland croton, Grannybush

Sort By: Scientific Name | Common Name

PRINTER FRIENDLY VERSION

Common Name	Scientific Name	Plant Uses
Bartram's Scrub-Hairstreak	Strymon acis bartramii	Larval host and nectar source.
Cassius Blue	Leptotes cassius theonus	Nectar source.
Florida Duskywing	Ephyriades brunneus	Nectar source.
Florida Leafwing	Anaea troglodyta floridalis	Larval host.
Nickerbean Blue	Cyclargus ammon	Larval host and Nectar source.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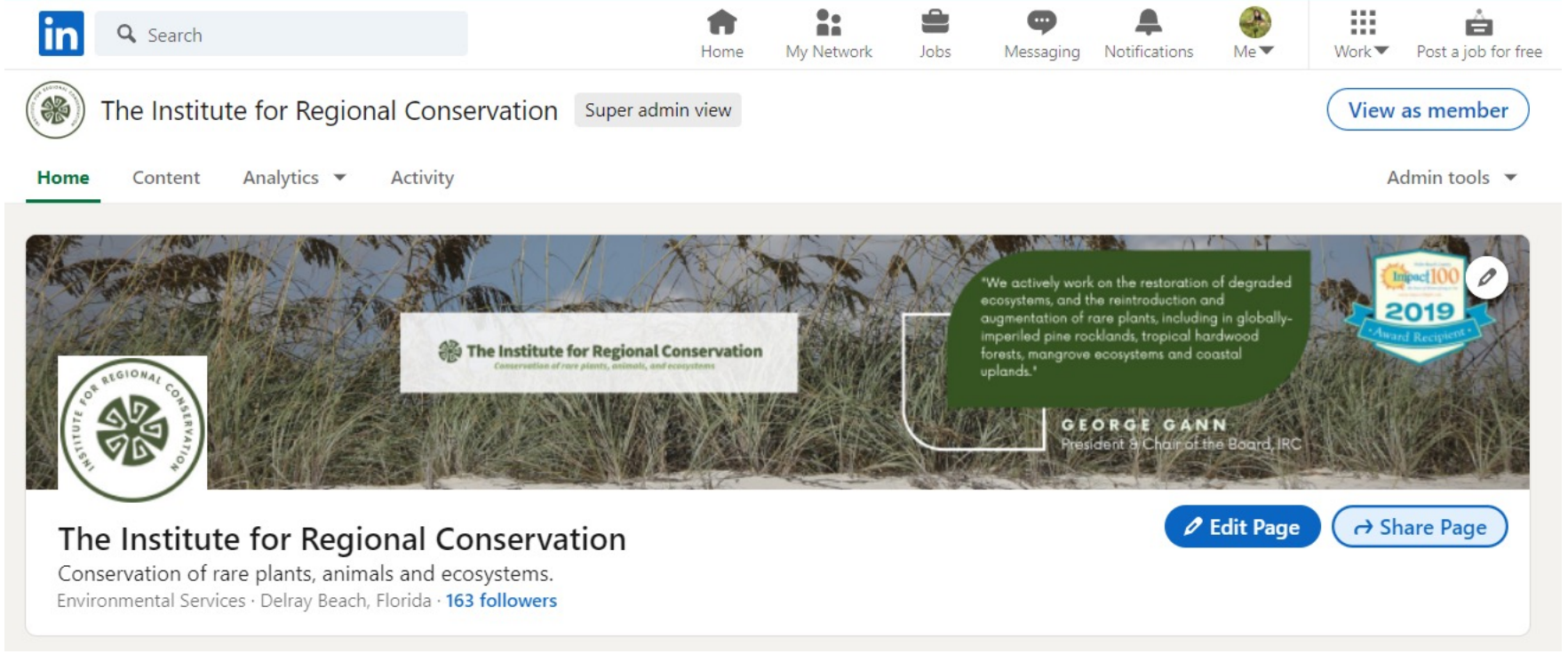
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Jobs
Messaging
Notifications
Me
Work
Post a job for free
The Institute for Regional Conservation
Super admin view
View as member
Home
Content
Analytics
Activity
Admin tools
"We actively work on the restoration of degraded ecosystems, and the reintroduction and augmentation of rare plants, including in globally-imperiled pine rocklands, tropical hardwood forests, mangrove ecosystems and coastal uplands."
GEORGE GANN
President & Chair of the Board, IRC
Impact100
2019
Award Recipient
The Institute for Regional Conservation
Conservation of rare plants, animals, and ecosystems
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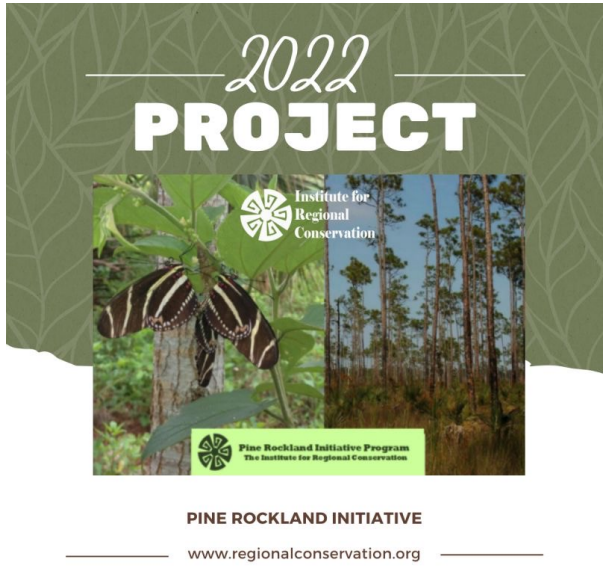
The Institute for Regional Conservation
Conservation of rare plants, animals and ecosystems.
Environmental Services · Delray Beach, Florida · 163 followers


2022
PROJECT
Institute for Regional Conservation
Pine Rockland Initiative Program
The Institute for Regional Conservation
PINE ROCKLAND INITIATIVE
www.regionalconservation.org


Institute for Regional Conservation
FORKED BLUECURLS
Trichostema dichotomum
Forked bluecurls are known for their beautiful bluish-purple blooms. It also has a particularly long flowering season, typically beginning in late summer and lasting through late fall.
www.regionalconservation.org


WEDGE SANDMAT
Euphorbia deltoidea subsp. deltoidea
This is another plant species that is endemic to the pine rockland ecosystem.
Institute for Regional Conservation


RABBITBELLS
Institute for Regional Conservation
Crotalaria rotundifolia

Pine Rockland Initiative Team

Alex Seasholtz, Ecological Restoration Team Leader

Cara Abbott, MSc, Education & Outreach Coordinator

Supporting Staff

Celeste Boncompte, Field Technician

Celeste Boncompte joined our Ecological Restoration Team in February 2022! Celeste is a South Florida native and Florida International University graduate. She obtained her B.S. in Environmental Science as well as Natural & Applied Sciences, focusing mainly on botany and South Florida ecology. A passionate conservationist, she is very excited to have joined the IRC team and do her part in restoring Florida's endemic habitats. **Email.**

Alex Crow, Field Technician

Alex Crow joined our Ecological Restoration team in January 2022. Born and raised in Miami, he has always had a love for the natural world. He received his B.S. in Environmental Studies from FIU in 2019 and has worked for various organizations and across different disciplines including botany, plant and insect ecology, pine timber and restoration, GIS, and environmental education. He is especially passionate about botany and loves learning more about plants. **Email.**

George Guillen, Field Technician

George Guillen joined our Ecological Restoration Team in September 2021. George is a South Florida native and FIU Alumni with a major in Environmental Studies driven by childhood fascination with the Everglades and Upland Flora. While finalizing research with Texas A&M University based on the Modeling of Tropical Enhanced Weathering efficiency, George is committed to expanding his understanding of the Ecology of South Florida and hopes to experience as much of it as he can. **Email.**

Michelle Smith, Field Biologist

Michelle Smith joined IRC in 2018 as a Field Biologist. She assisted in many aspects of the Pine Rockland Initiative Program, contributed logistics for the Restoring the Gold Coast Program, and helped with volunteer events. She became a Certified Ecological Restoration Practitioner In-Training CERPIT) through the Society for Ecological Restoration in 2020. In June 2021 Michelle explored an opportunity to work for the Florida Department of Environmental Protection. Now as of March 2022 she is back helping IRC share important program related information on social media.

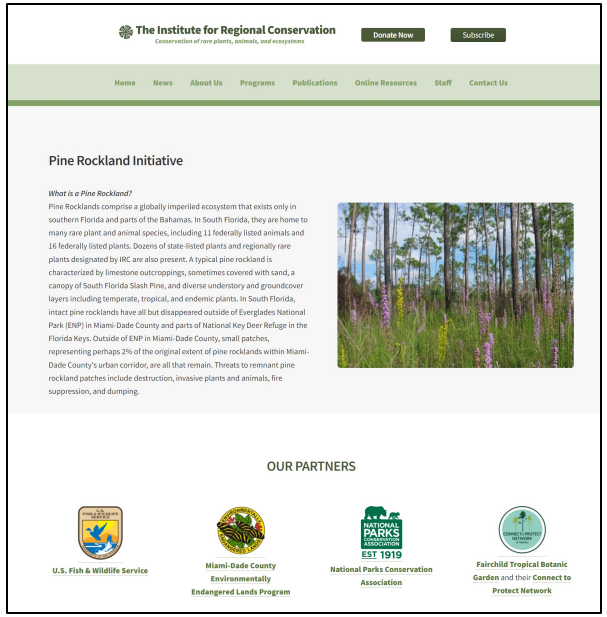
Michelle is a native south Floridian. She graduated from Florida State University with a Bachelor's in Environmental Studies and Biology and a minor in Chemistry. Her botanical experience ranges from the Florida panhandle to central and south Florida, the Rocky Mountains in Colorado, and the high-desert sagebrush steppe in eastern Oregon. She is recently a Certified Wetland Evaluator (CWE) from the Florida Department of Environmental Protection. **Email.**

Summary of Pine Rockland Initiative Services to Landowners

With support from US FWS Coastal and other donors

- Convene workshops and meetings
- Prepare educational materials and tools
- Site visits and technical support (donations requested)
- Services for fee and subsidized services for fee, including -
- Invasive species, hardwood, and palm reduction
- Weed whacking and brush cutting
- Direct seeding
- Restoration plantings

HOW BEST TO PROVIDE AND COORDINATE?



South Florida

The Floristic Inventory of South Florida
Conservation of rare plants, animals, and ecosystems

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7.2.19

CONNECT to PROTECT NETWORK AT FAIRCHILD

Connect to Protect Network

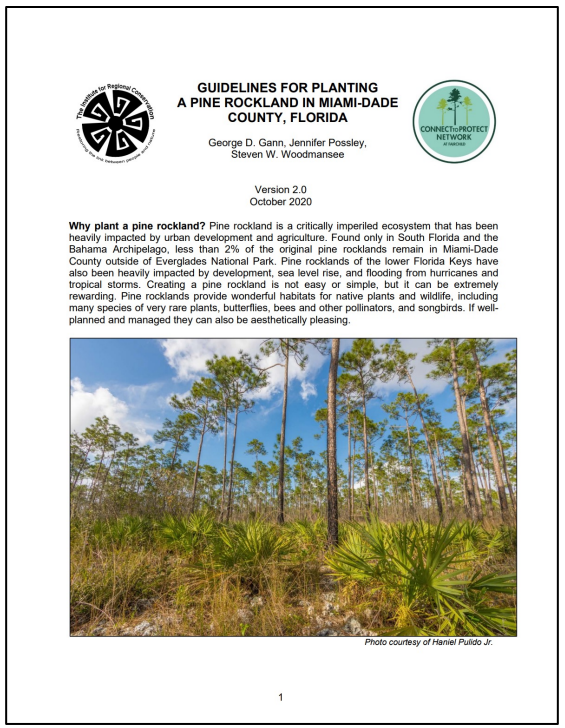

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Photo courtesy of Haniel Pulido Jr.

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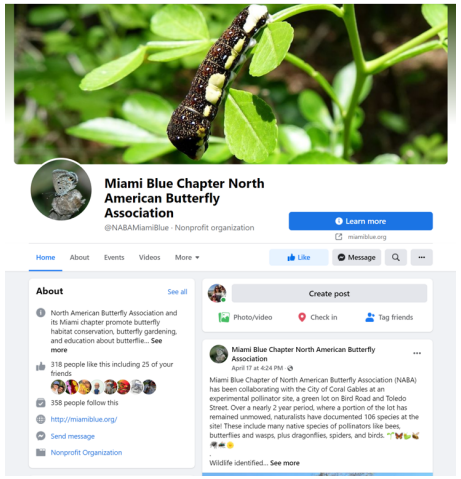
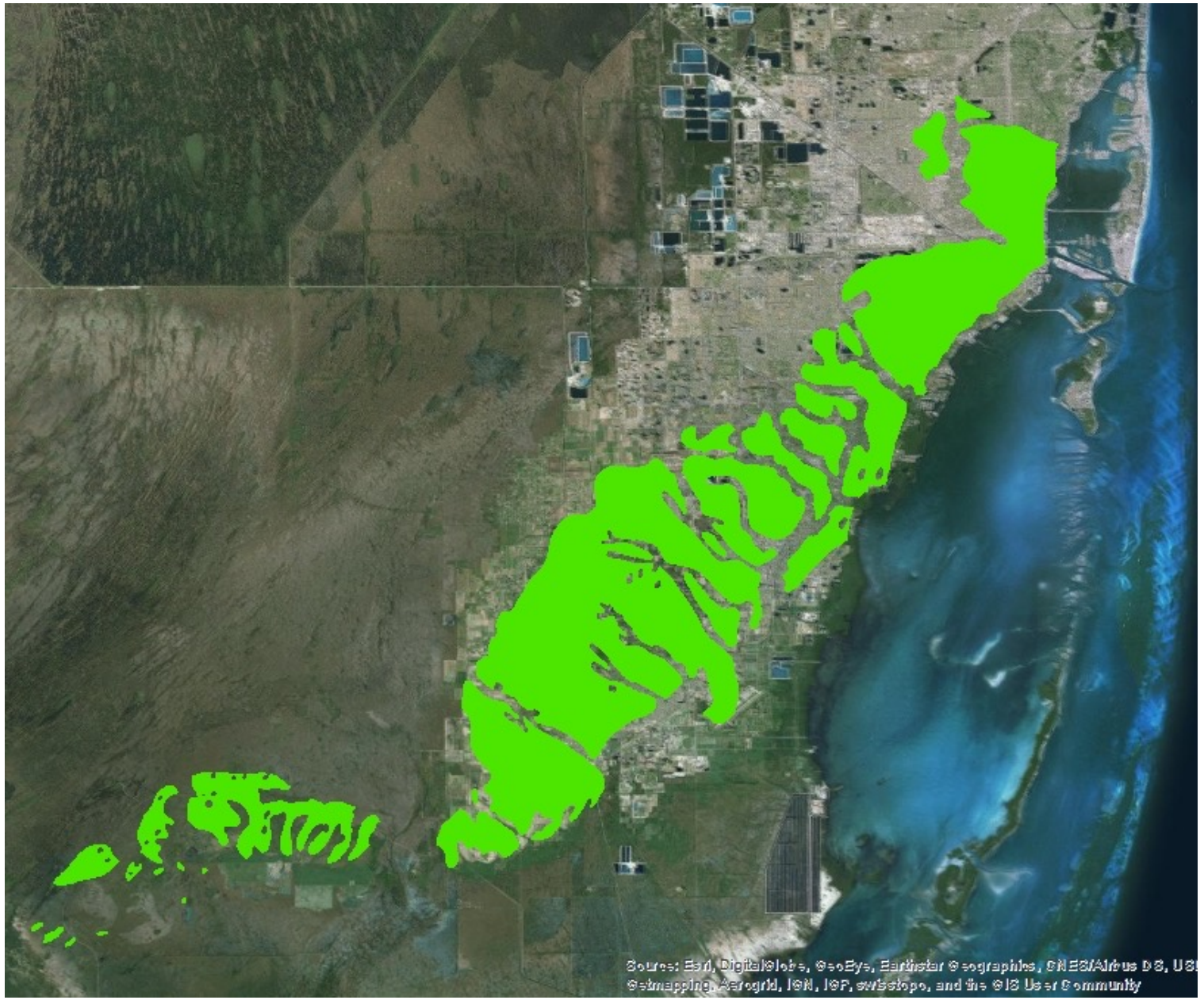


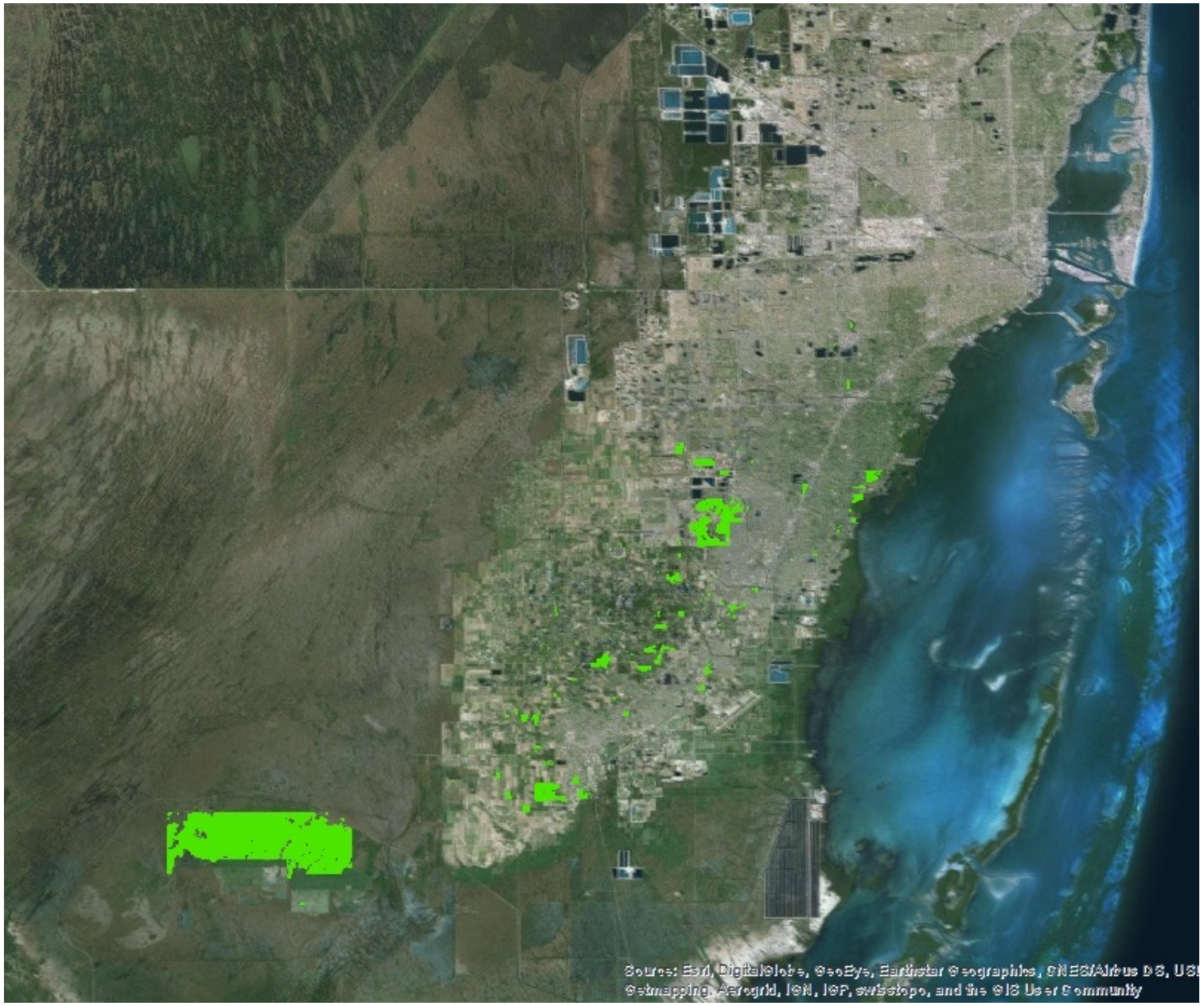
USFWS and Pine Rocklands Conservation: Imperiled Resources

Kevin Kalasz – Coastal Program Coordinator for South Florida and Everglades

Kevin_kalasz@fws.gov



Historical Range of Pine Rocklands in Miami Area (153,000 acres)



Remaining Pine Rocklands in Miami Rock Ridge

Less than 10% remaining!

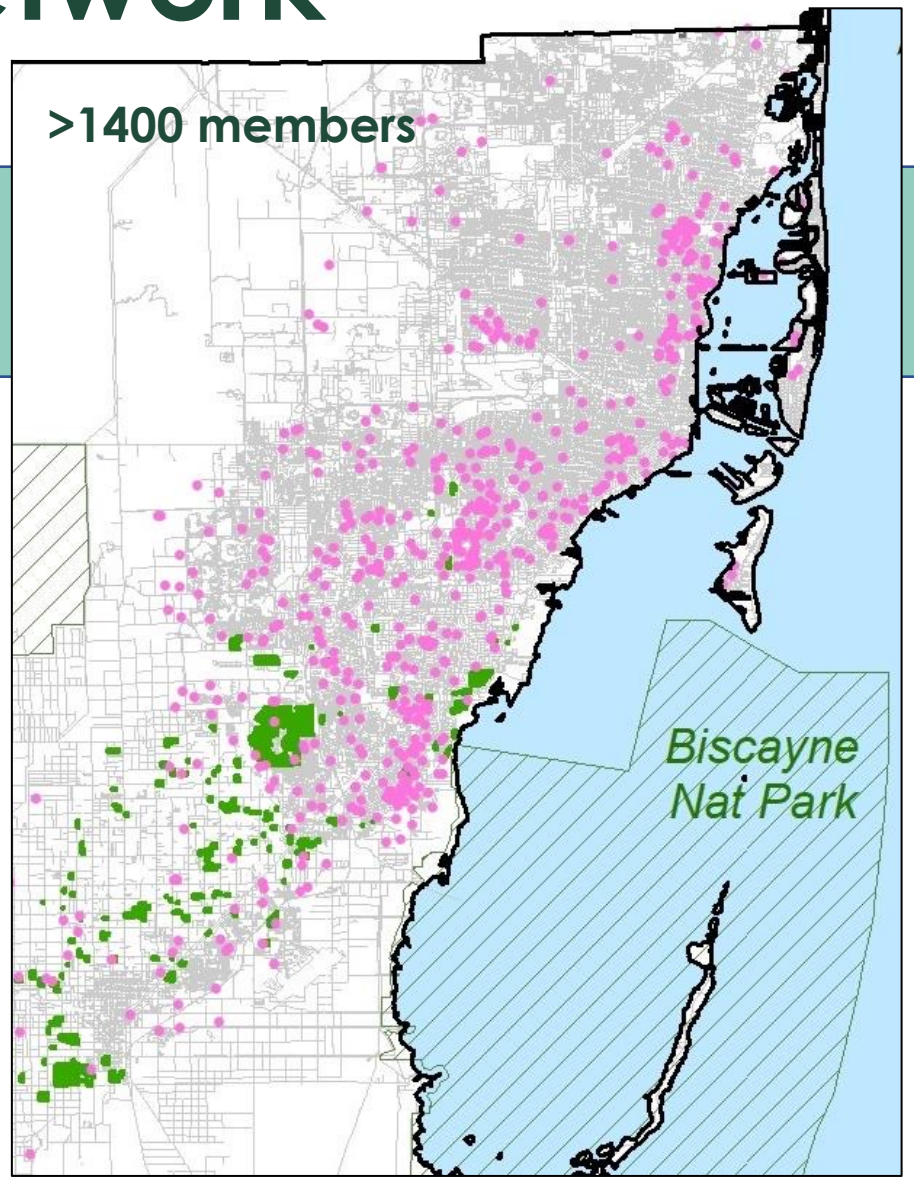
Impacts of Habitat Loss

- **18 Pine Rockland Obligate Species**
  - 15 plants
  - 3 invertebrates (2 butterflies, 1 beetle)
- **Pine Rockland Critical Habitat Designated**
  - 2 plants
  - 2 butterflies
  - 1 invertebrate (proposed)

Connect to Protect Network

www.fairchildgarden.org/CTPN

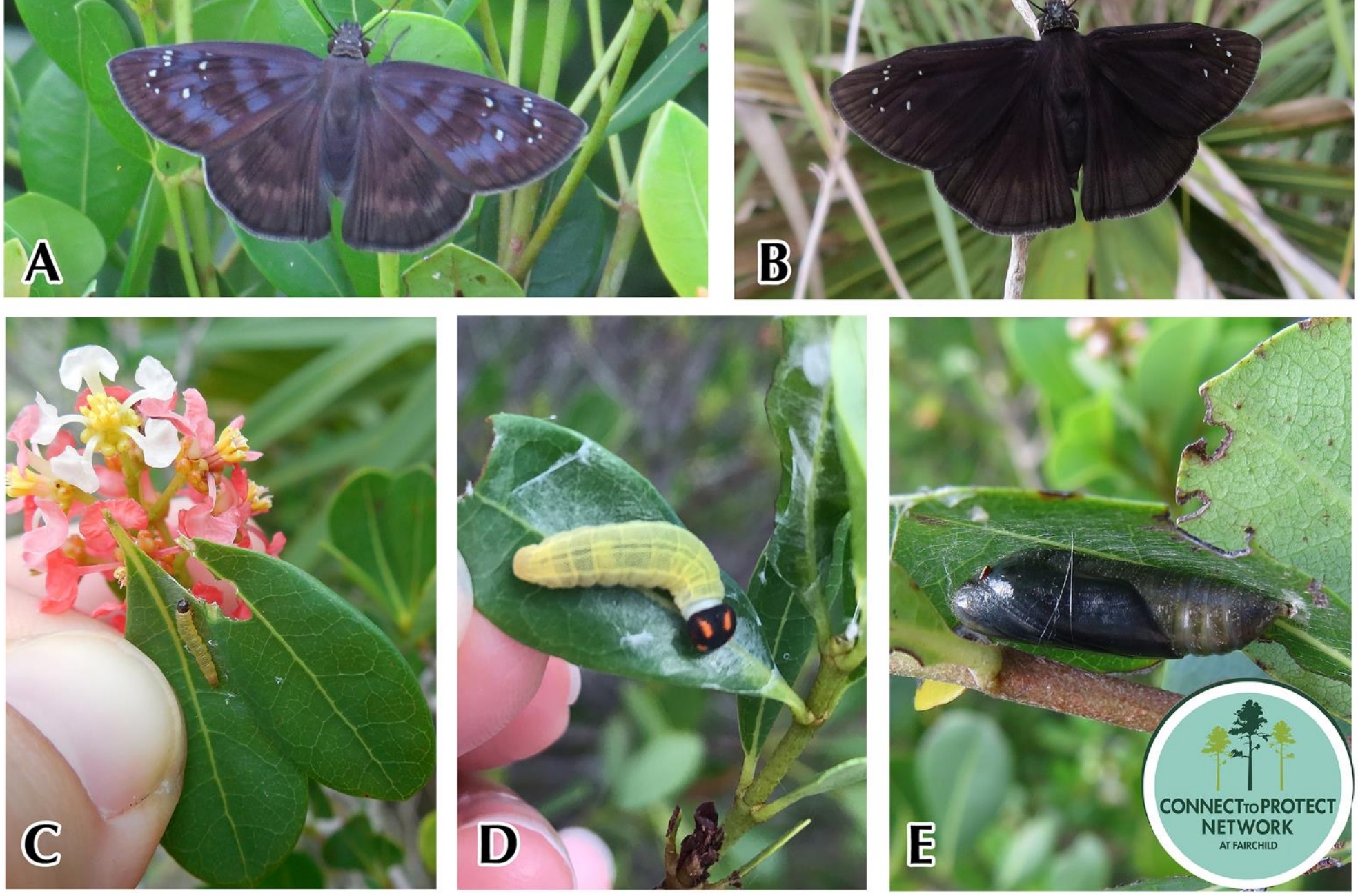
1. *Raise awareness about pine rocklands, native plants and wildlife*
2. *Connect South Florida's pine rocklands, one yard at a time*



Citizen Science: Members can give back by providing information and seed back to the network

Learn: Monthly newsletter, virtual lectures, group hikes, BioBlitzes, and more.

Starter Kit: Members can pick up a free "Pine Rockland Starter Kit," of 5 plants, and get advice on getting started with native gardening



ConnectToProtect@FAIRCHILDGARDEN.ORG

Reintroducing Federally Listed Plants to South Florida Pine Rocklands

Strategy: Fairchild will translocate populations of 14 species and associates to privately-owned* pine rocklands in maintenance condition or those undergoing restoration, with special emphasis on those where IRC is working

* Year 1 focus on private lands. Years 2-5 will include public lands

Summer 2022

- Augment *Linum arenicola* at **IRC's G.N. Avery Pineland**
- Augment *Croton linearis* and nectar species at **IRC's J.K. Small Pineland**
- Augment understory diversity at **Moreno pineland**
- Refine seed introduction methods at **Glancy pineland**
- Add flowering vines *Ipomoea microdactyla* and *Echites umbellata* to **Warren Pineland**
- **TBD!** Plans still in development, initial site visits still happeneing

Funding: 5 years of funding from USFWS Coastal Program, with $5000 budget for subcontracting each year, which could be used to improve conditions for listed plants

Dalea floridana
Florida prairie clover

Croton linearis
Pineland croton

Linum arenicola
sand flax

Argythamnia blodgettii
Blodgett's silverbush

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