Expanding the Pine Rockland Footprint
To Protect We Must Restore

Pine Rockland Working Group Conference
November 1, 2018

SER SOCIETY FOR ECOLOGICAL RESTORATION

George D. Gann
www.regionalconservation.org
www.ser.org

Institute for Regional Conservation

Acknowledgments

Concepts: Kevin Kalasz, Jennifer Possley, Janet Gil, Robin Gray-Urgelles, Dallas Hazelton, Tim Joyner, Joy Klein, Kirk Linaje, Jimmy Lange, Naqqi Manco, Michelle Smith, Cristina Stocking & Luis Moreno, Jonathan Taylor, Alicie Warren

Images: Shirley Denton, Roger Hammer, James Johnson, Suzanne Koptur, Jimmy Lange, Natural Areas Management, Jennifer Possley, Frank Ridgley, Mark & Holly Salvato, Al Sunshine, Alicie Warren, Steve Woodmansee

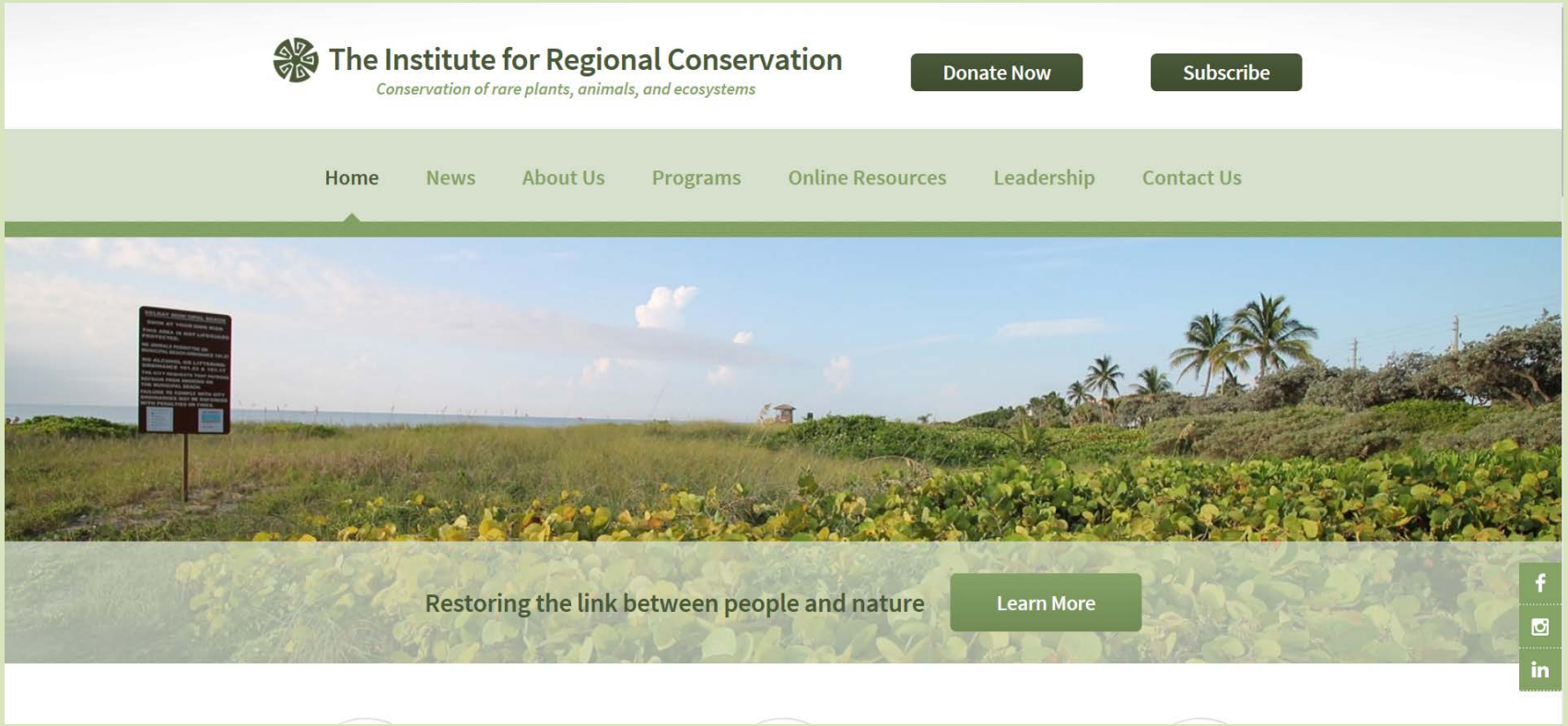
Funding: US Fish & Wildlife Service Coastal Program

George Washington Turner

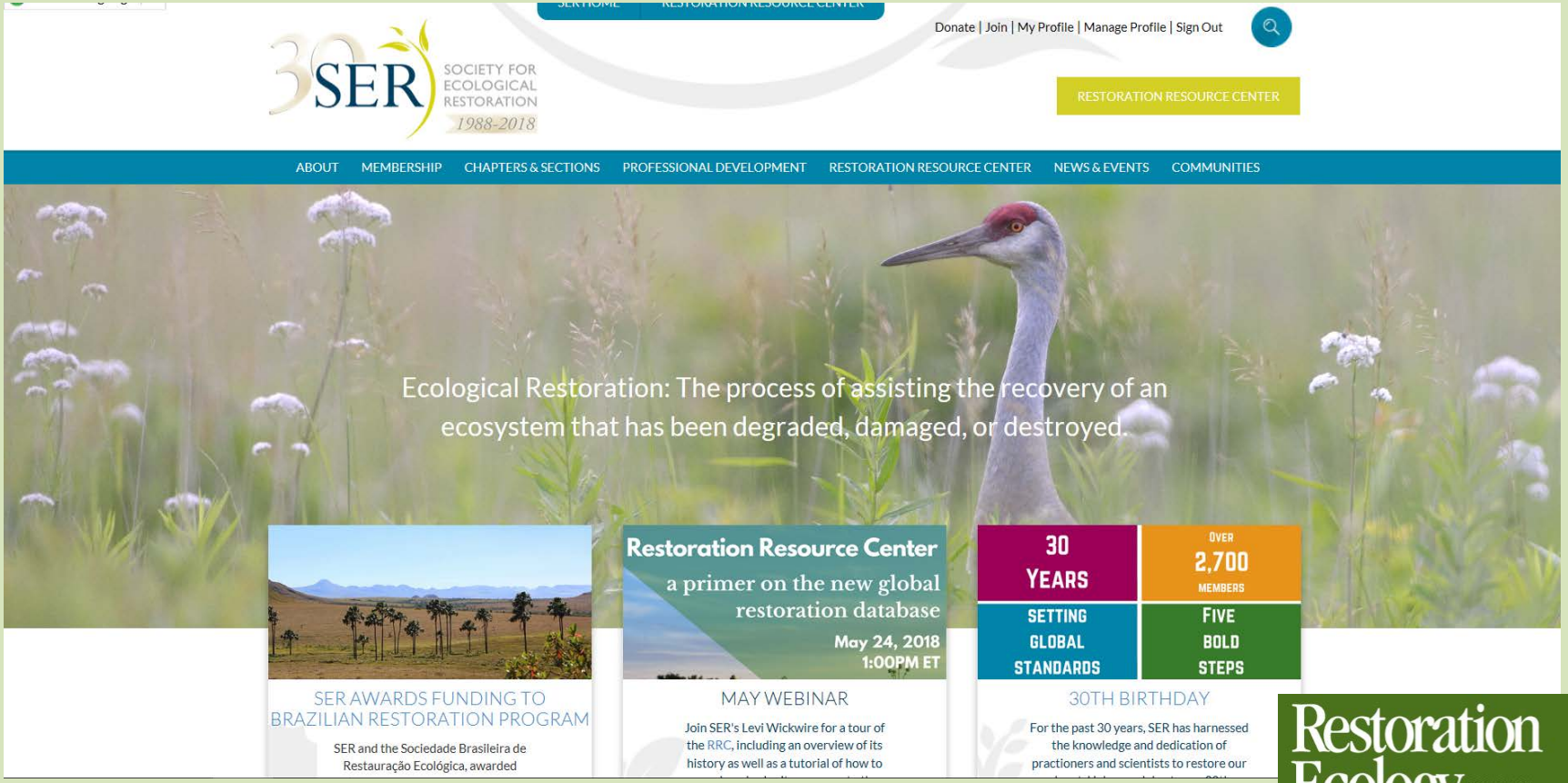
Thelma Turner

Hedwig Rutzke birthplace

My ancestors arrived in 1910 as agricultural pioneers.
Miami-Dade had just 11,933 residents.



Rather than focusing on charismatic animals or plants with narrow global ranges, IRC seeks to protect, restore and manage all biodiversity on a regional basis, and to **prevent regional extinctions of rare plants, animals and ecosystems**. All conservation is ultimately local.



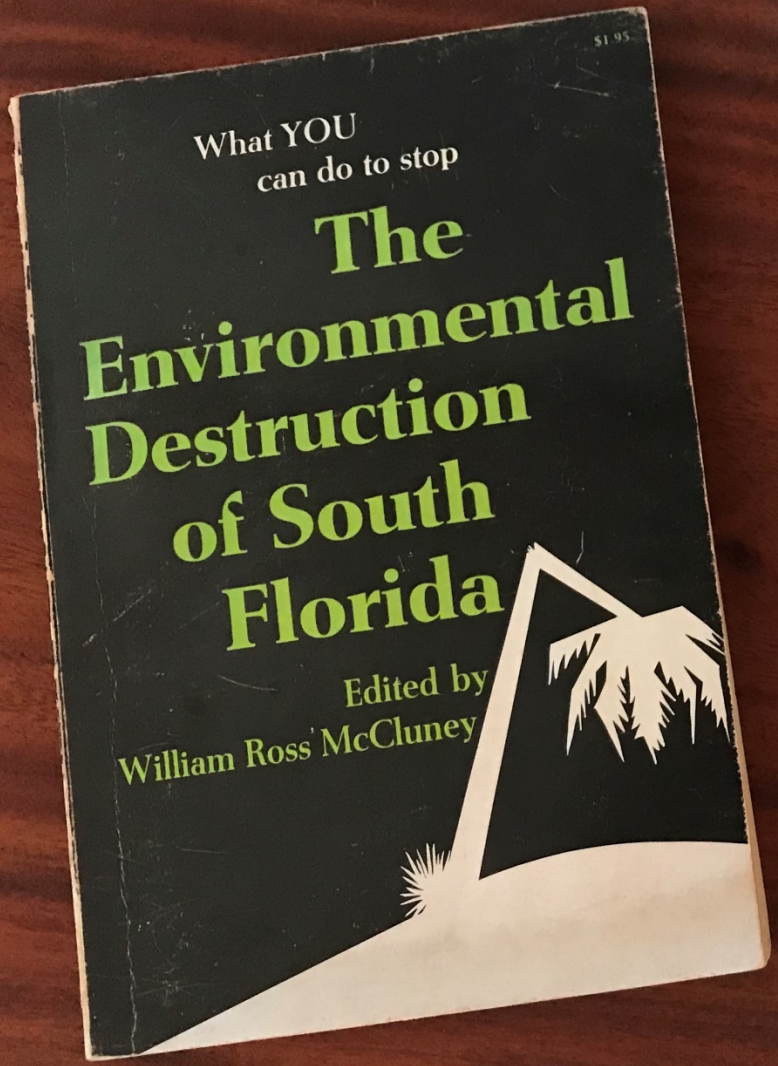
SER advances **the science, practice and policy of ecological restoration to sustain biodiversity**, improve resilience in a changing climate, and re-establish an ecologically healthy relationship between nature and culture. All conservation is also global.

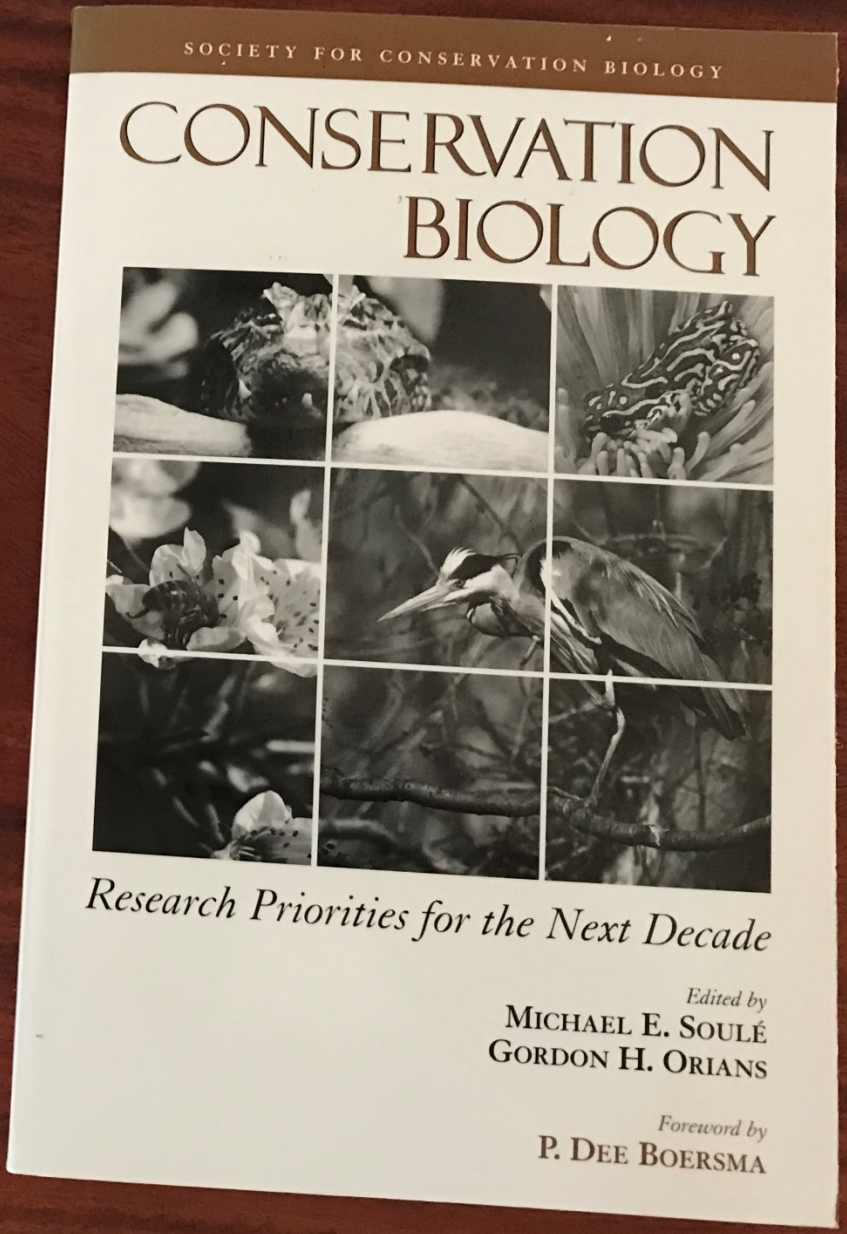
My Aim

To introduce the “Expanding The Footprint” concept, and explain why we must aspire to more pine rocklands, not less, and why “Business as Usual” leads inevitably to loss.

Habitat Destruction, Fragmentation and Extinctions

In one sense, there is nothing new here.





Habitat destruction causes most extinctions, especially in the early stage of habitat fragmentation and degradation.

Here are two examples of pine rockland extinctions in South Florida, one regional, one global.

Varronia bahamensis (t)
Tephrosia angustissima (r)

But fragmentation leads to more 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'

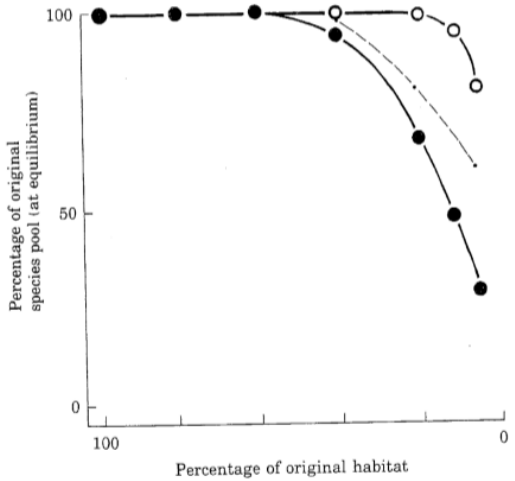


FIGURE 4. The number of species remaining in each species pool as fragmentation proceeds. Closed circles show the pool of species with large area requirements and low vagility. Open circles show the species with less stringent area requirements. The small dots connected by the dashed line depict the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

Wilcove 1986

Extinction Debt

refers to the time delay between the impact of environmental changes and the time species go extinct.

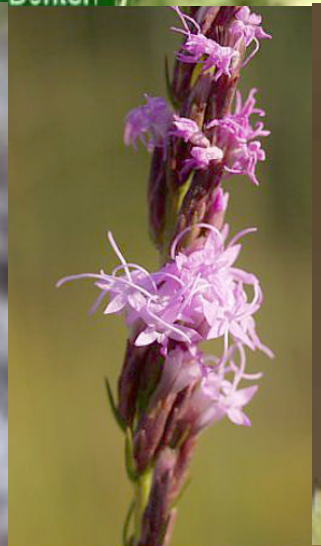
(from Tilman et al. 1994)

Following Habitat Destruction The Debt Must be Paid

Some species and groups go faster.


©Shirley Denton


Some go slower.



Other Stressors Contributing to Degradation and Additional Loss

- Collecting and poaching
- Alteration of natural hydrology
- Urbanization
- Coastal erosion
- Invasive species
- Fire suppression, change
- Loss of pollinators and dispersers
- Climate change
- Sea level rise
- Extreme weather
- Ignorance
- Apathy
- Greed

Dark Diversity

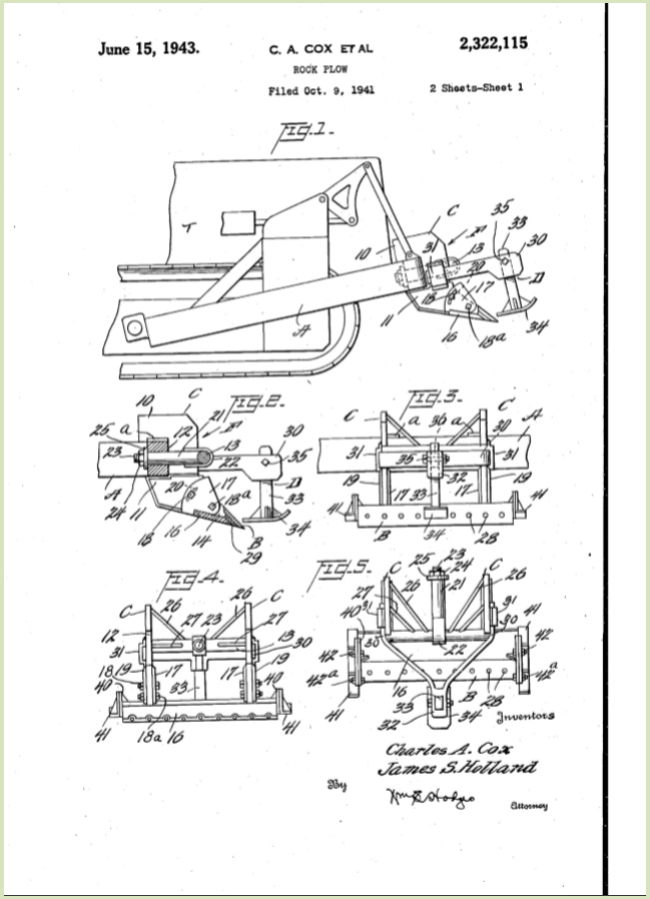
refers to the missing portion of a species pool for a given habitat in a given region.

(from Pärtel et al. 2011)

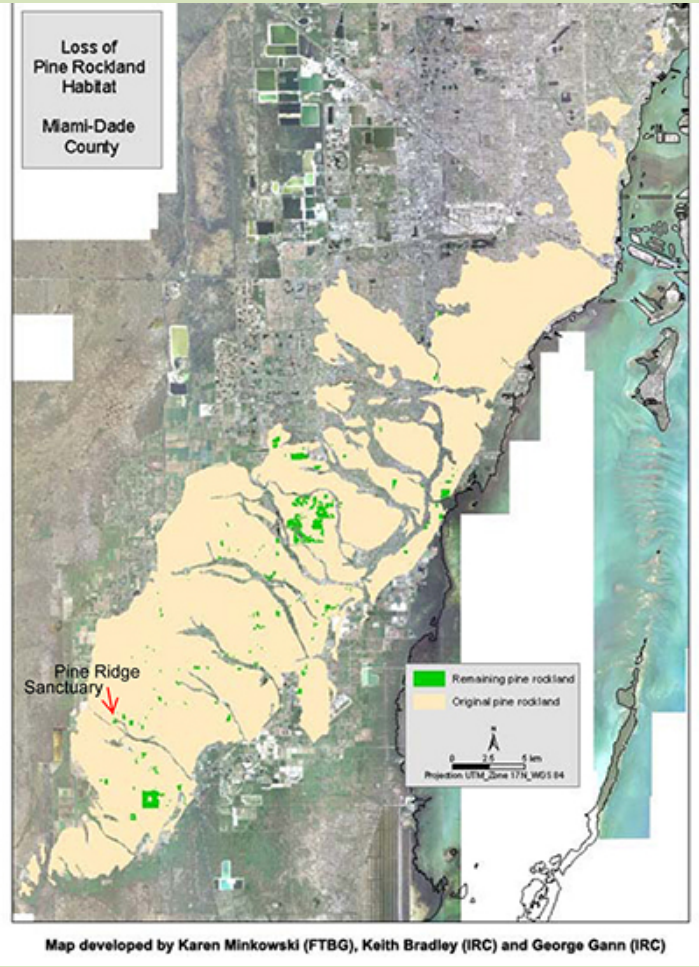
Following Extinction The Debt Paid Should be Measured

History of Pine Rocklands in Miami-Dade County

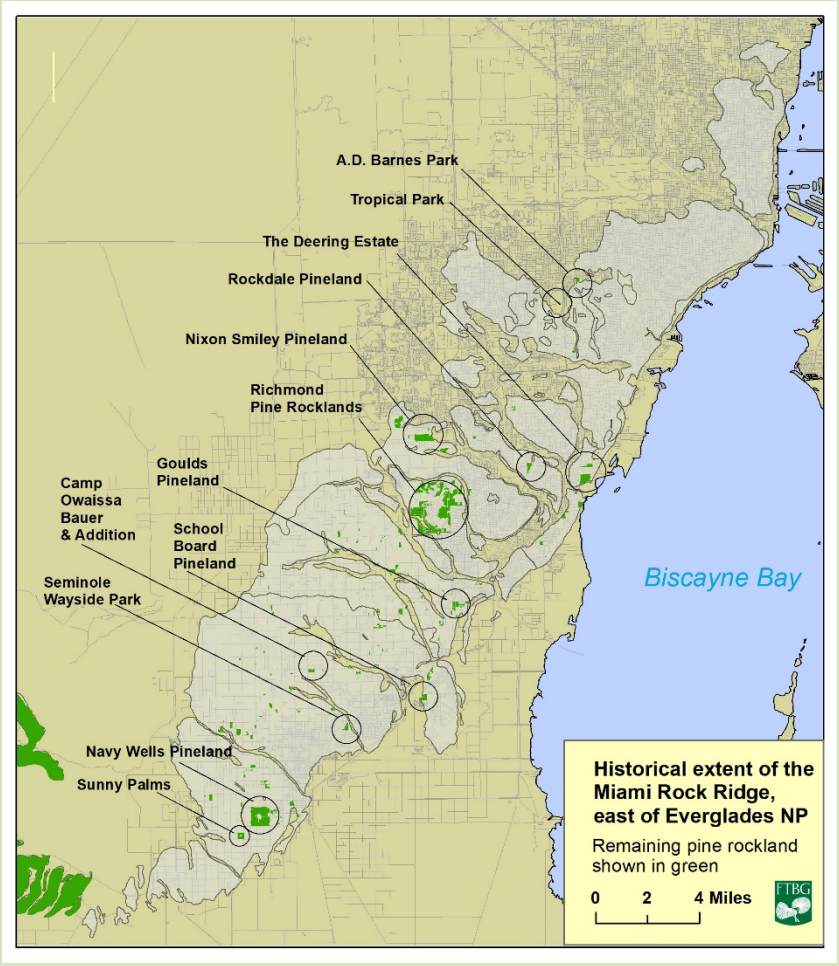
Let the Clearing Begin



Coral Gables, 1922. https://www.floridamemory.com



Courtesy of Barbara and Terry Glancy via the www



Courtesy of Jennifer Possley, FTBG

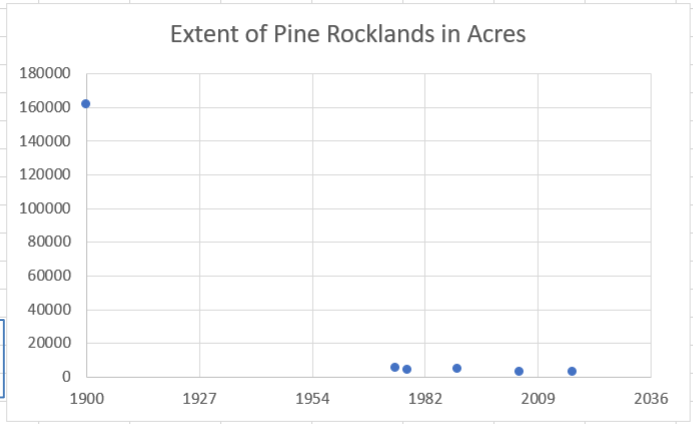
The Maps

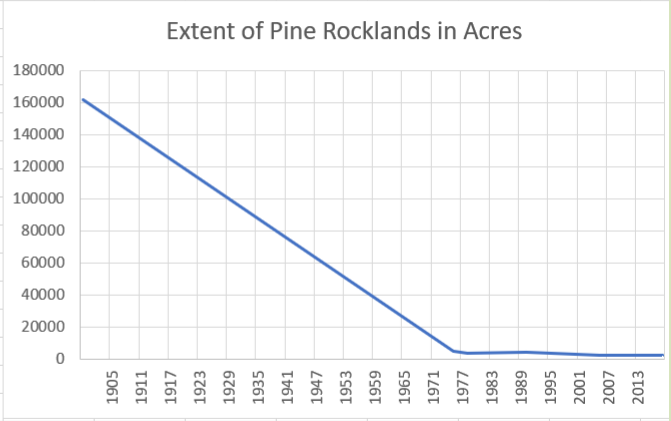
Extent of Pine Rocklands outside of Everglades National Park
From Loope et al. (1979) and subsequent

Raw data points

Date	Acres	
1900	161660	NPS
1975	5268	Shaw
1978	3977	Daugherty
1990	4400	DERM
2005	2950	IRC
2018	3017	DERM

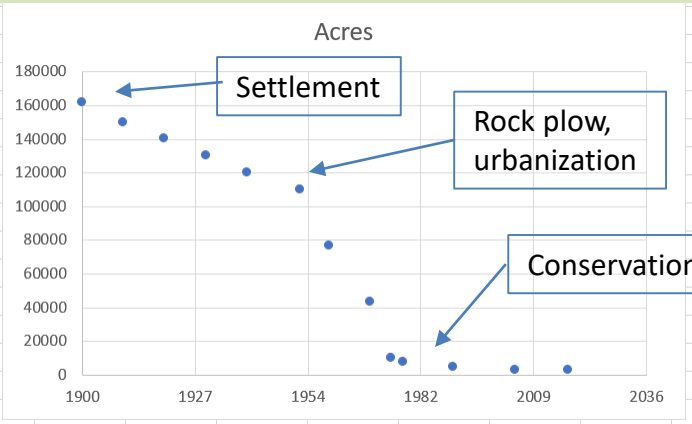
<2% remaining

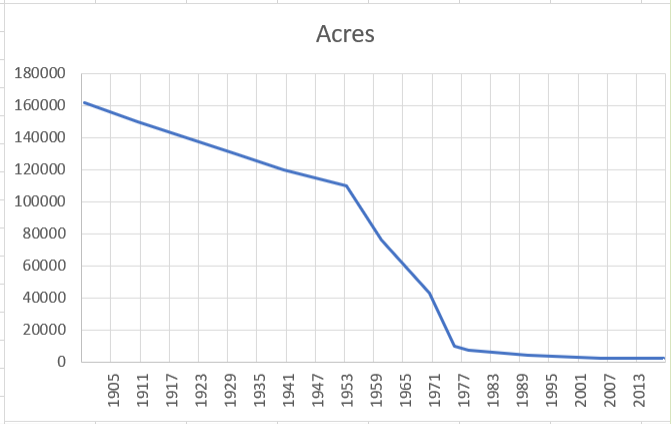




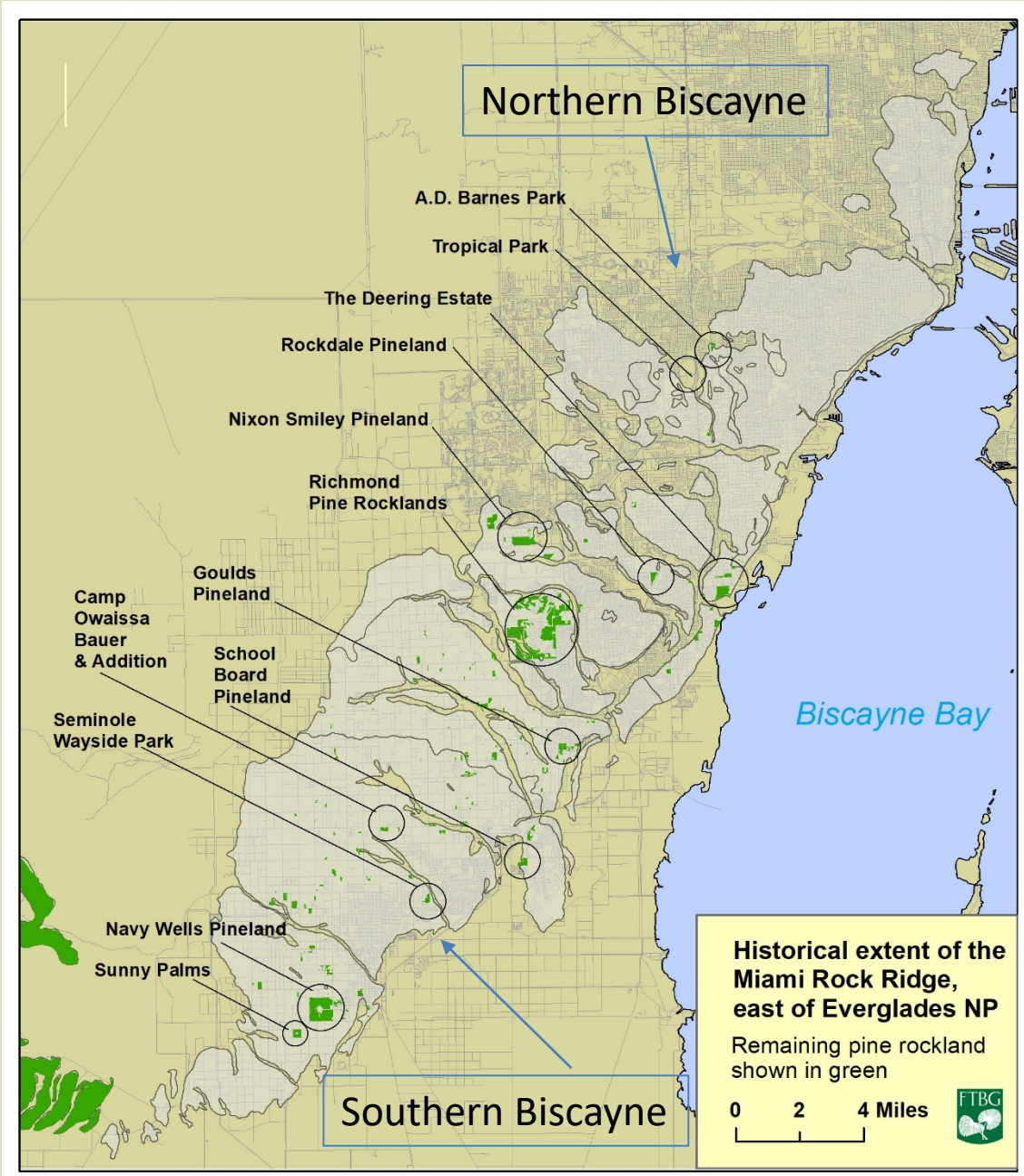
Fuzzy estimates of actual impact

Date	Acres
1900	161660
1910	150000
1920	140000
1930	130000
1940	120000
1953	110000
1960	76667
1970	43334
1975	10000
1978	7500
1990	4400
2005	2950
2018	3017





Network of Public and Private Conservation Areas



Adapted from FTBG

Vascular Plant Taxa (Gann unpublished)

MRR Pine Rocklands

Estimated native taxa – 420

Unique Taxa

Long Pine Key – 4
Biscayne Pinelands - 119
Southern Biscayne – 5
Northern Biscayne – 52

S FL Endemics

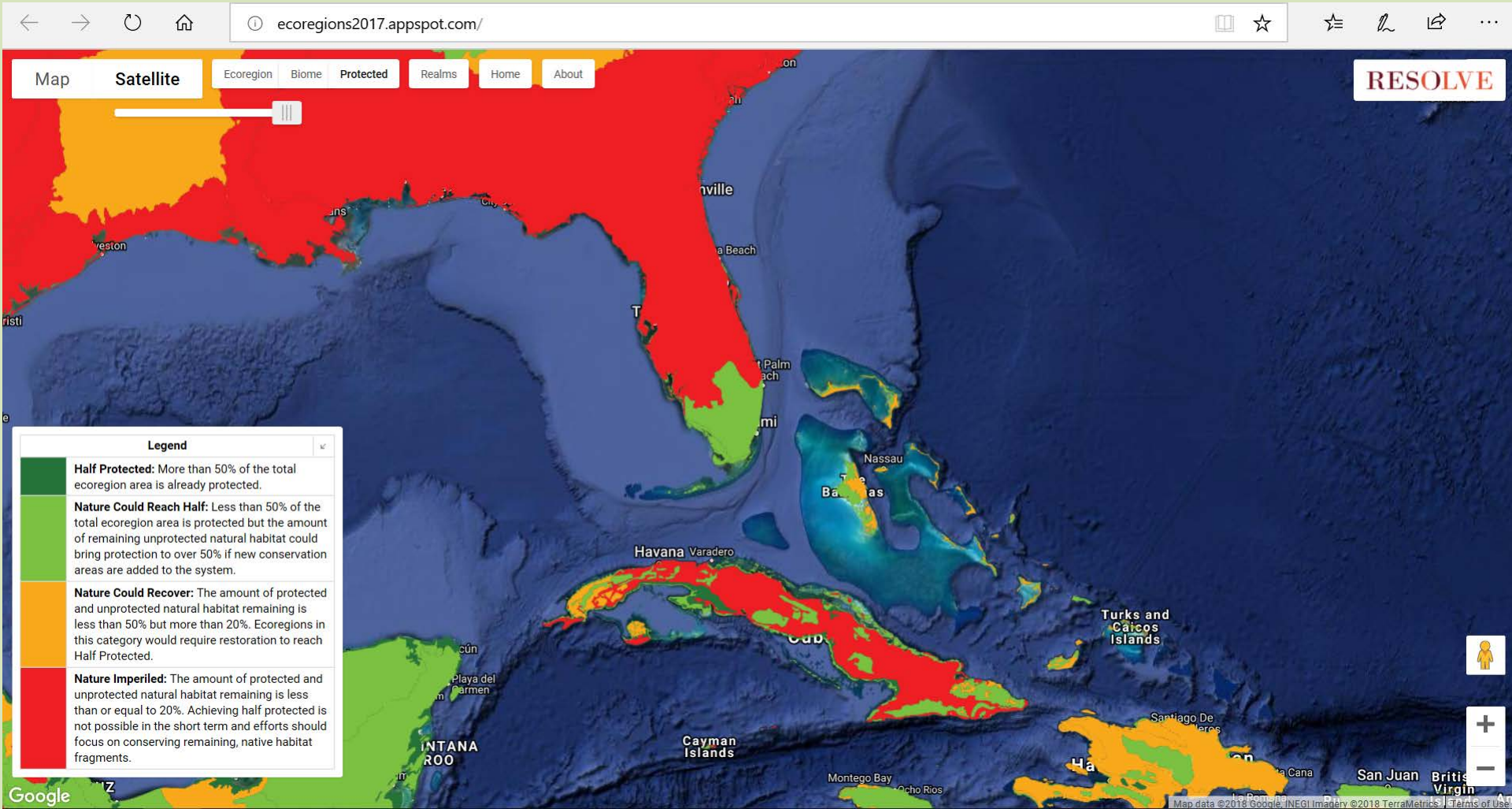
In Pine Rocklands – 28
On MRR only – 11
Outside LPK only - 7
Southern Biscayne only – 2
Northern Biscayne only – 2

>50% of region in conservation; CBD 2020 Protected Areas Target = 17%.

(just to get to 17% of MRR pinelands we need an additional 8,000 acres)

Nature Needs Half

(the discrepancy)



Management

Wikipedia commons

Preserves in the Age of Expiration Dates

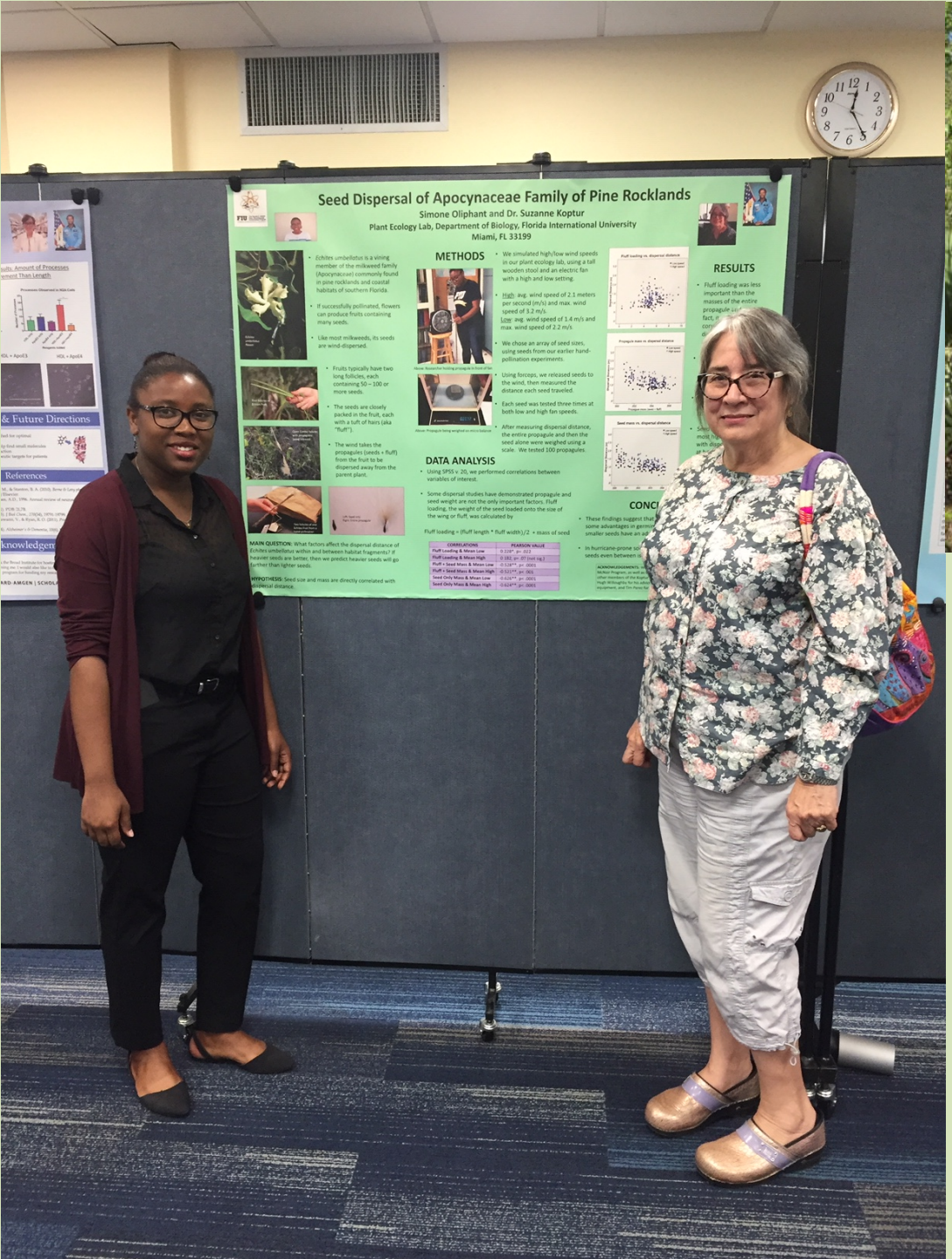
(Protected areas are not preserves, even if we call them that)

We Know We Have to Manage !

Management Challenges: Native Hardwoods and Palms

Management Challenges: Slash Pine Density and Cover

Management Challenges: Expanding Exotics and Native Vines



Management Challenges: Integrating Research and Management Around Key Issues: e.g., Dispersal, Pollination, Species Rarity and Loss

Miami-Dade County restored overgrown pine rockland at Larry and Penny Thompson Park. Patrick Farrell - Miami Herald Staff

OP-ED

Miami-Dade Commission should not betray our environmental legacy by destroying pine rocklands

BY JAESON CLAYBORN
jclay010@fiu.edu

Miami Pine Rockland Coalition founder Al Sunshine photographed a bulldozer on Friday, Dec. 8, 2017, clearing trees and brush on pine rockland targeted for a shopping mall and 900 apartments. Courtesy Al Sunshine

ENVIRONMENT

Judge orders emergency halt to clearing of rare Miami forest targeted for Walmart

BY JENNY STALETOVICH
jstaletovich@miamiherald.com

Continuing Issues: Pine Rockland Loss and Community Response

Continuing Issues: Pine Rockland Degradation

Florida City, 2018

Expanding the Footprint

We continue to lose species

There Are Never Enough Resources or Support
(including for key activities, so we are continuously losing ground)

But Pine Rocklands Are Resilient

Cleared, c. 1970 or earlier

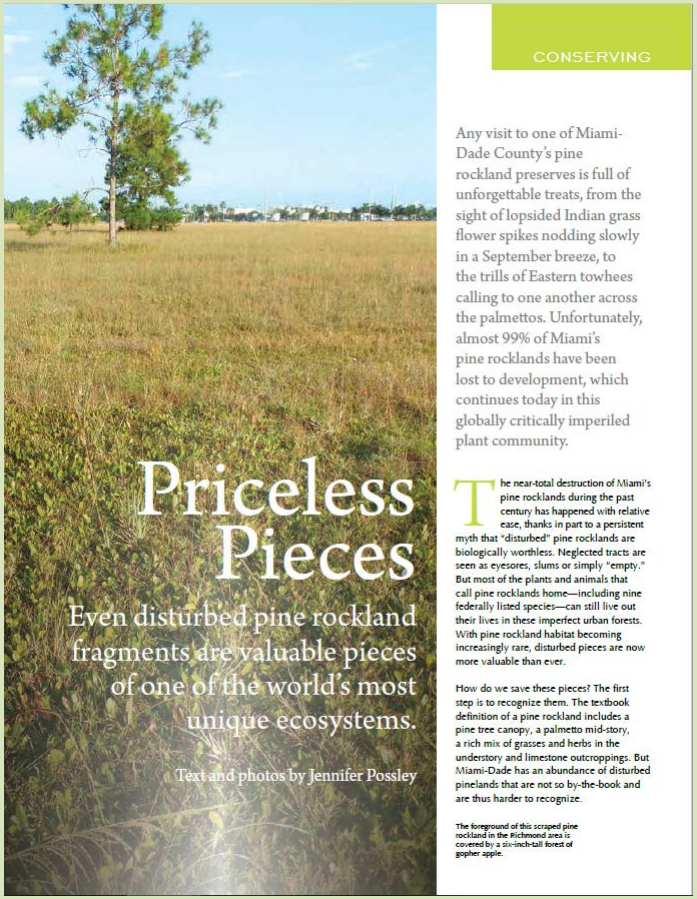
Expanding the Pine Rockland Footprint Workshop

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

To Give Credit Where It Is Due



CONSERVING

Priceless Pieces

Even disturbed pine rockland fragments are valuable pieces of one of the world's most unique ecosystems.

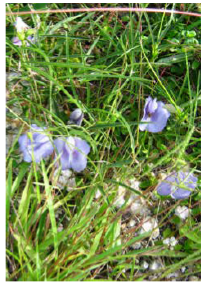
Text and photos by Jennifer Possley

Any visit to one of Miami-Dade County's pine rockland preserves is full of unforgettable treats, from the sight of lopsided Indian grass flower spikes nodding slowly in a September breeze, to the trills of Eastern towhees calling to one another across the palmettos. Unfortunately, almost 99% of Miami's pine rocklands have been lost to development, which continues today in this globally critically imperiled plant community.

The near-total destruction of Miami's pine rocklands during the past century has happened with relative ease, thanks in part to a persistent myth that "disturbed" pine rocklands are biologically worthless. Neglected tracts are seen as eyesores, slums or simply "empty." But most of the plants and animals that call pine rocklands home—including nine federally listed species—can still live out their lives in these imperfect urban forests. With pine rockland habitat becoming increasingly rare, disturbed pieces are now more valuable than ever.

How do we save these pieces? The first step is to recognize them. The textbook definition of a pine rockland includes a pine tree canopy, a palmetto mid-story, a rich mix of grasses and herbs in the understory and limestone outcroppings. But Miami-Dade has an abundance of disturbed pinelands that are not so by-the-book and are thus harder to recognize.

The foreground of this scraped pine rockland in the Richmond area is covered by a six-inch-tall forest of gopher apple.



Today, with frequently burned pinelands so rare, these long-ago scraped pinelands can be important refuges for flora and fauna that require sunny, open habitat.

TOP
Native pine rockland species can persist for decades in disturbed pine rocklands. At least four native species are pictured here in this scraped area underneath power lines: butterfly pea, mouse pineapple, blue paspalum and three-seeded mercury.
Photo by Jane Woodhouse.

ABOVE
This fire-suppressed pine rockland is gaining shrubby hardwoods at the expense of understory grasses and herbs.

There are two major types of disturbed pine rocklands. First are **scraped** areas, where heavy equipment was used decades ago to scrape away vegetation and jagged limestone. These often look like old fields and can be found under power lines, alongside railroad tracks or canals and in vacant lots. Many of these scraped areas likely will never again support saw palmetto, pine rockland's most common shrub species. However, because pine rocklands hold most of their plant diversity in the understory—more than 300 species—the loss of one species is not catastrophic. In fact, most of the diverse plants that make pine rocklands special are still present in scraped pinelands. This includes some of the rarest plants, such as deltoid spurge and Carter's sand flax. Today, with frequently burned pinelands so rare, these long-ago scraped pinelands can be important refuges for flora and fauna that require sunny, open habitat.

The second type of disturbed pine rocklands are those that are **fire-suppressed**, meaning that fires have not been allowed to burn in the area for years. Pine rocklands are dependent on, and thrive with, fire—so without fire every three to seven years, a parcel can begin to transition to a hardwood-dominated forest or to a stand of exotic plants such as Burma reed or Brazilian pepper. But fire-suppressed parcels are far from doomed. Like scraped pinelands, they also provide critical habitat for native plants and animals. Some understory plant species can persist for decades without fire (though they will rarely reproduce). Even dense weeds can be conquered, and the combination of chainsaws and fire can release the soil seed bank and diverse herbaceous layer from the smothering pressure of overgrown hardwoods. When partners like Miami-Dade County's Natural Areas Management Division, the Florida Forest Service or The Institute for Regional Conservation work together to remove exotic vegetation and reintroduce fire to a preserve, a pine rockland can be reborn, seemingly overnight, through a process known as ecological restoration. In short, fire-suppressed pine rocklands can almost always make a complete recovery.

Possley 2015

Stipulation –
We can’t fix everything
(e.g., sea level rise).

Opportunities: Scraped Sites

Richmond Pine Rocklands

National Key Deer Refuge

Opportunities: Highly Fire-suppressed or “Transitional” Pinelands

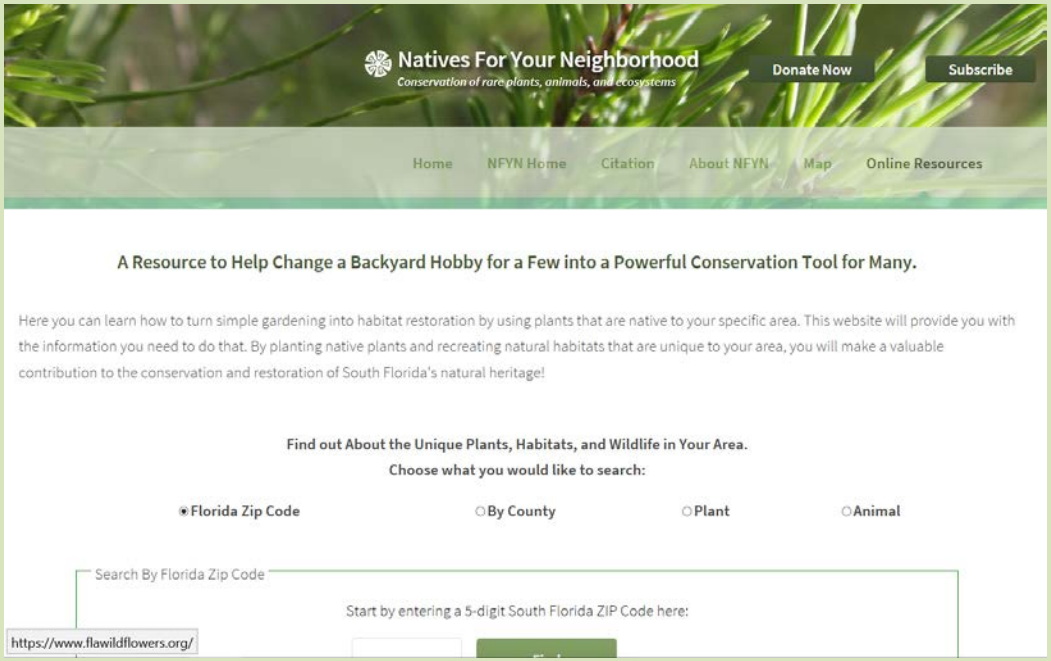
National Key Deer Refuge

Florida City Pineland

Opportunities: Other Highly Degraded Sites

North Edge, Sunny Palms

Opportunities: Urban Sites



Knowledge: 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


CAT

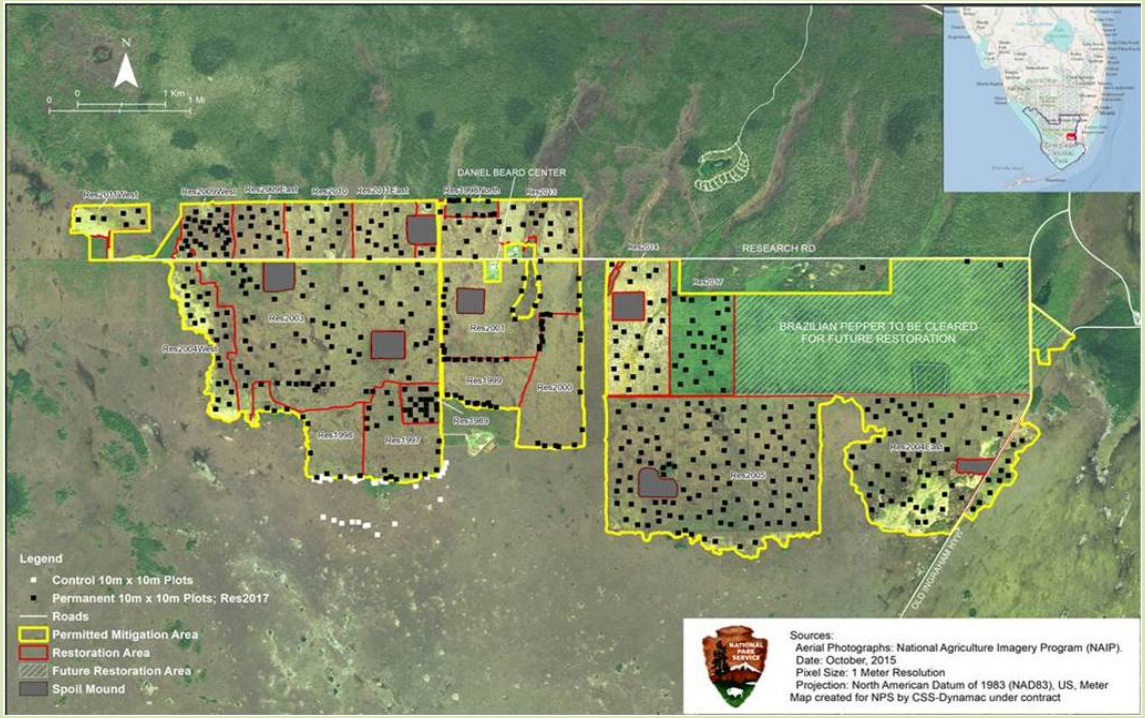

This restoration site of
critically endangered
Pine Rocklands
was made possible by
the efforts of:

Zoo Miami

Nixon Smiley Pineland Preserve

Figure 1. 10 X 10 m plots at different stages during the Nixon Smiley restoration study. a) Applying seed treatments within a control plot July 14, 2010. b) NAM staff removing dead vegetation from an herbicide plot July 14, 2010, 16 days following the application of the herbicide treatment. c) A plot following a mechanical scrape on June 10, 2010. d) A control plot Feb. 4, 2011. e) An herbicide plot Feb. 4, 2011. f) A scrape plot Feb. 4, 2011. g) Control plot on July 17, 2012 showing tall Napier grass. h) An herbicide plot July 13, 2012 showing heavy West Indian dropseed and woody species cover. i) A scrape plot April 24, 2012.

From Krueger, unpublished



Hole-in-the-Donut
Everglades National Park

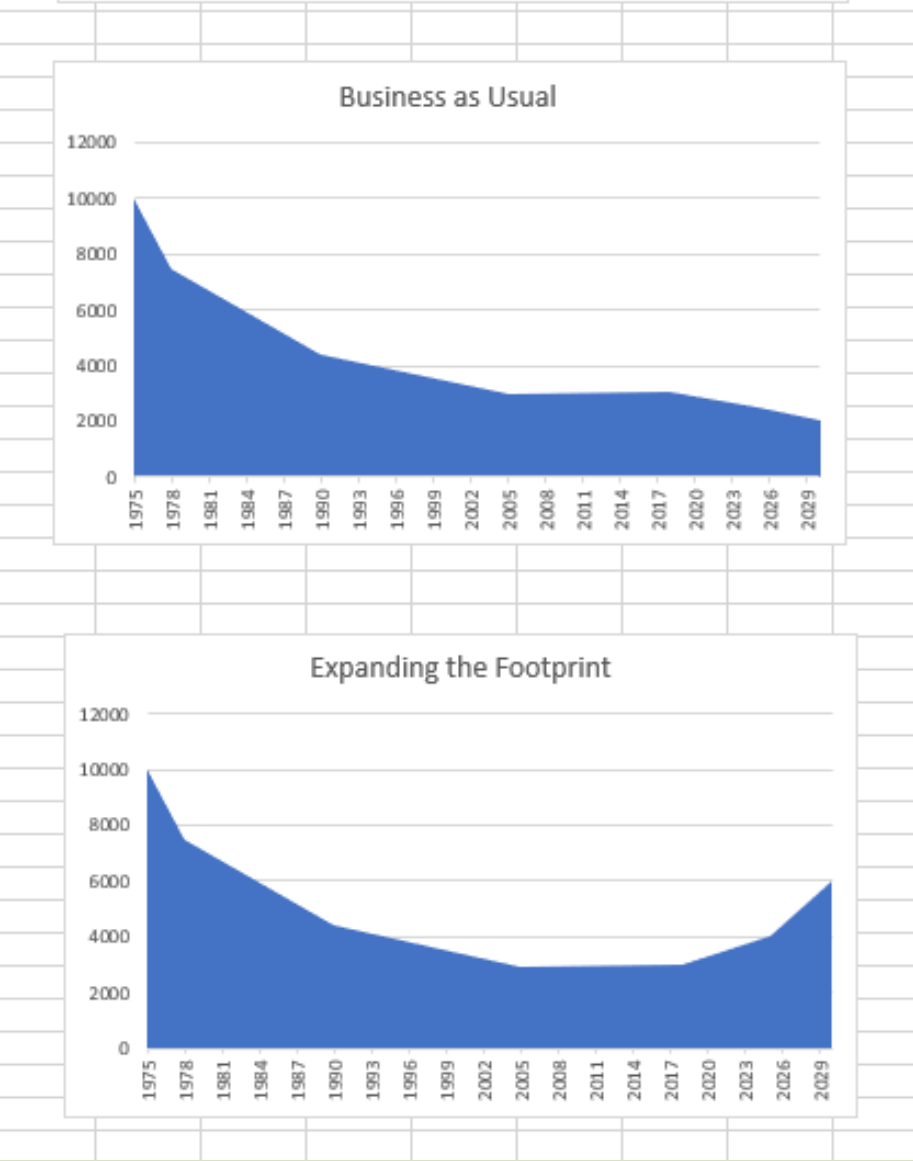
Restoration Opportunities

refers to the restoration of both the extent and the quality (e.g., integrity) of pine rocklands, including degraded or “transitional” pinelands not currently measured.

What do we really have?

If We Don’t Ask For
What We Need
We Won’t Get It

The Choice


Business as Usual
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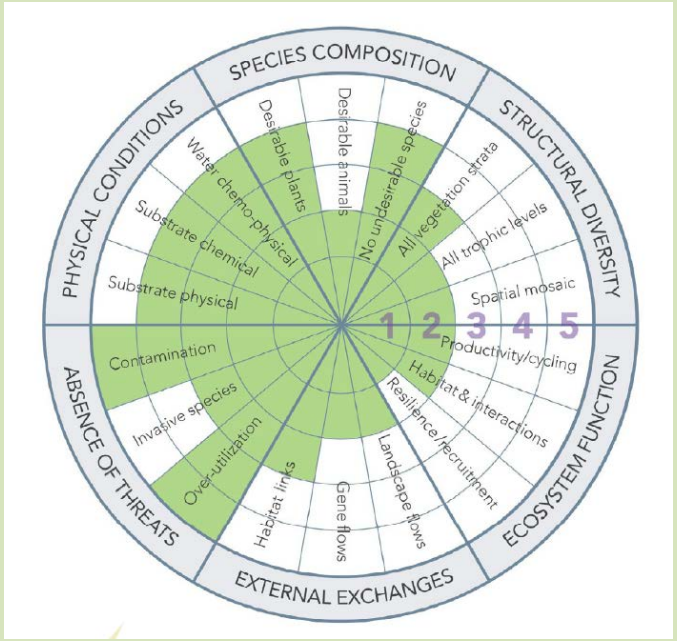
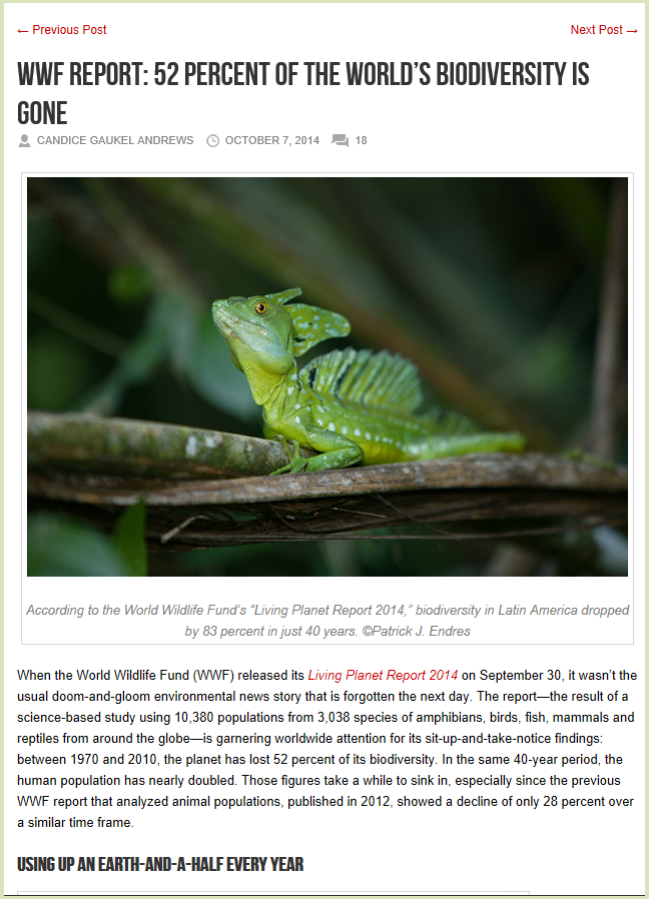
TARGETS & GOALS
Reference Ecosystems, Ecosystem Attributes & The Recovery Wheel



From McDonald et al. 2016.
International Standards for the Practice of Ecological Restoration.

Global Restoration and Political Will

The News Feed



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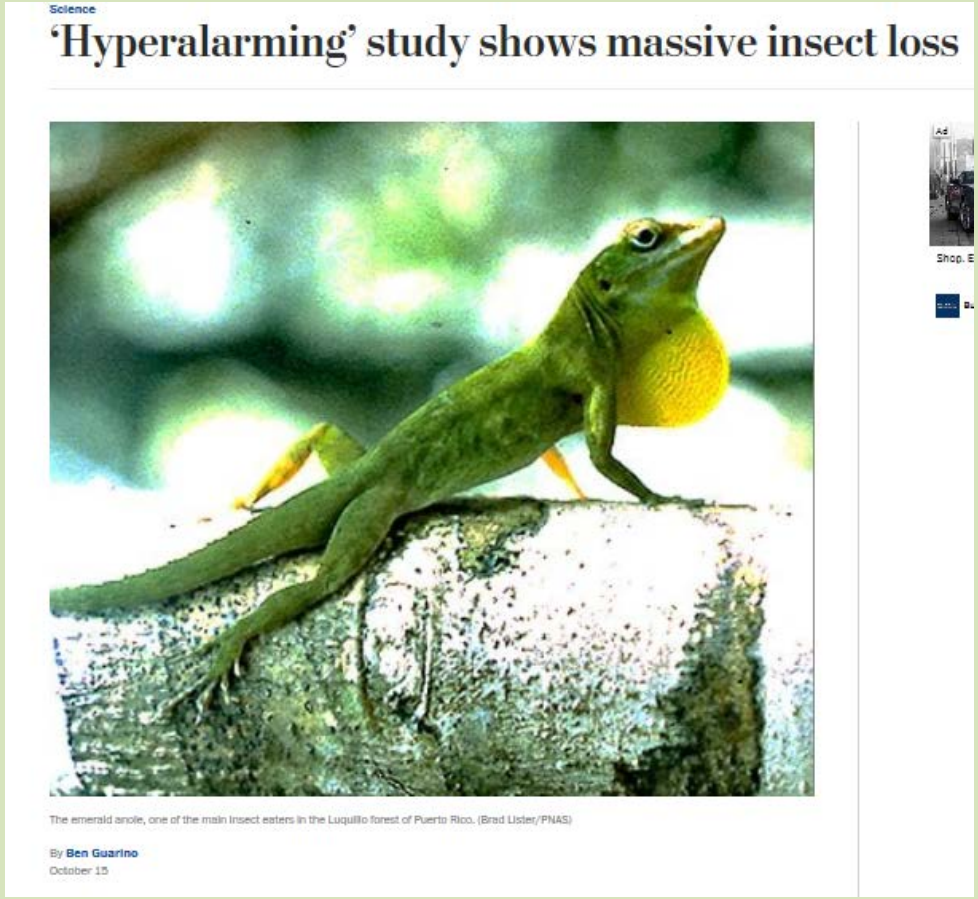
WWF REPORT: 52 PERCENT OF THE WORLD'S BIODIVERSITY IS GONE

CANDICE GAUKEL ANDREWS OCTOBER 7, 2014 18

According to the World Wildlife Fund's "Living Planet Report 2014," biodiversity in Latin America dropped by 83 percent in just 40 years. ©Patrick J. Endres

When the World Wildlife Fund (WWF) released its *Living Planet Report 2014* on September 30, it wasn't the usual doom-and-gloom environmental news story that is forgotten the next day. The report—the result of a science-based study using 10,380 populations from 3,038 species of amphibians, birds, fish, mammals and reptiles from around the globe—is garnering worldwide attention for its sit-up-and-take-notice findings: between 1970 and 2010, the planet has lost 52 percent of its biodiversity. In the same 40-year period, the human population has nearly doubled. Those figures take a while to sink in, especially since the previous WWF report that analyzed animal populations, published in 2012, showed a decline of only 28 percent over a similar time frame.

USING UP AN EARTH-AND-A-HALF EVERY YEAR



Science

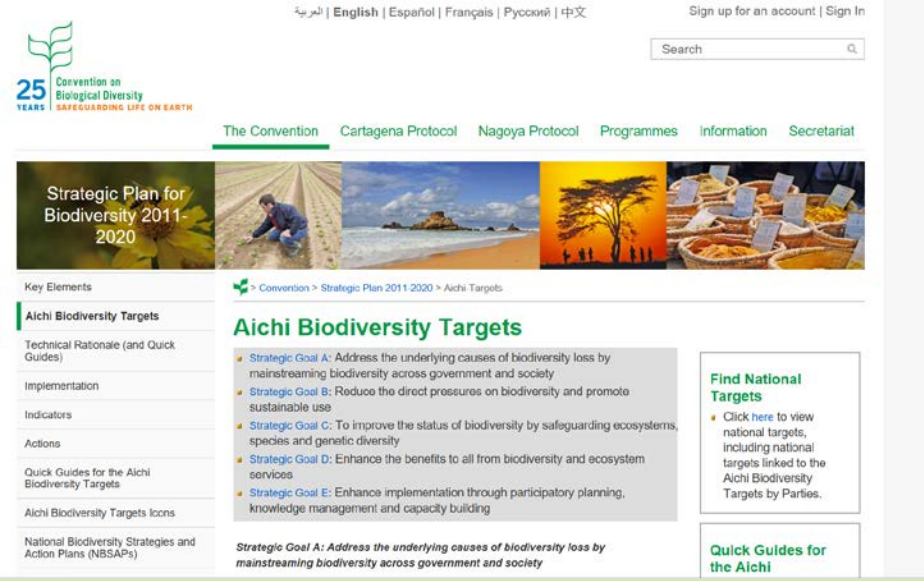
'Hyperalarming' study shows massive insect loss

The emerald anole, one of the main insect eaters in the Luquillo forest of Puerto Rico. (Brad Lister/PNAS)

By Ben Guarino
October 15

WWF 2014

Washington Post 2018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SAFEGUARDING LIFE ON EARTH
The Convention
Cartagena Protocol
Nagoya Protocol
Programmes
Information
Secretariat
Strategic Plan for Biodiversity 2011-2020
Key Elements
Aichi Biodiversity Targets
Technical Rationale (and Quick Guides)
Implementation
Indicators
Actions
Quick Guides for the Aichi Biodiversity Targets
Aichi Biodiversity Targets Icons
National Biodiversity Strategies and Action Plans (NBSAPs)
> Convention > Strategic Plan 2011-2020 > Aichi Targets
Aichi Biodiversity Targets
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
Find National Targets
Click here to view national targets, including national targets linked to the Aichi Biodiversity Targets by Parties.
Quick Guides for the Aichi


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The Paris Agreement
The Paris Agreement
Progress tracker: Work programme resulting from the relevant requests contained in decision 1/CP.21 (version of 22 October 2018)
Paris Agreement: essential elements


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New land degradation neutrality goal to accelerate global restoration efforts
By Dennis Garrity in Blog on November 30, 2015
The global community has set forth a new goal to tackle the scourge of land degradation and desertification. It could be real breakthrough.
The United Nations Convention to Combat Desertification (UNCCD) had a 'breakthrough moment' after two weeks of discussions and negotiations in Ankara, Turkey in October. The 195 parties to the Convention agreed to a global deal that set a new environmental target: Achieving "land degradation neutrality" by 2030, and thus maintaining the world's stock of healthy, productive land at a stable level.
Currently, 12 million hectares of land is being degraded annually via deforestation and forest degradation, the degradation and loss of agricultural land, and rampant infrastructural development. But the new deal at Ankara commits the UN's members, albeit on a voluntary basis, to restore or rehabilitate at least that much land area every year, which at least will keep things from getting worse. If that goal can be achieved by 2030, then the global community can look toward an even more ambitious target to gradually enable a major net increase in healthy land in future decades.
RECENT POSTS
Frontiers in alley cropping: Transformative solutions for temperate agriculture
WFP tackles root causes of hunger in Uganda
Bonn Challenge delegates: Commit globally, act locally on landscape restoration
Sustainable development goals progress


SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
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Partnerships
Take Action
News and Media
Social Media
Watch and Listen
SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS
On September 25th 2015, countries adopted a set of goals to end poverty, protect the planet and ensure prosperity for all as part of a new sustainable development agenda. Each goal has specific targets to be achieved over the next 15 years.
For the goals to be reached, everyone needs to do their part: governments, the private sector, civil society and people like you.
Do you want to get involved? You can start by telling everyone about them. We've also put together a list of actions that you can take in your everyday life to contribute to a sustainable future.

VIEWPOINT: Have your say

Concept for proposed U.N. decade of ecosystem restoration 2021-2030

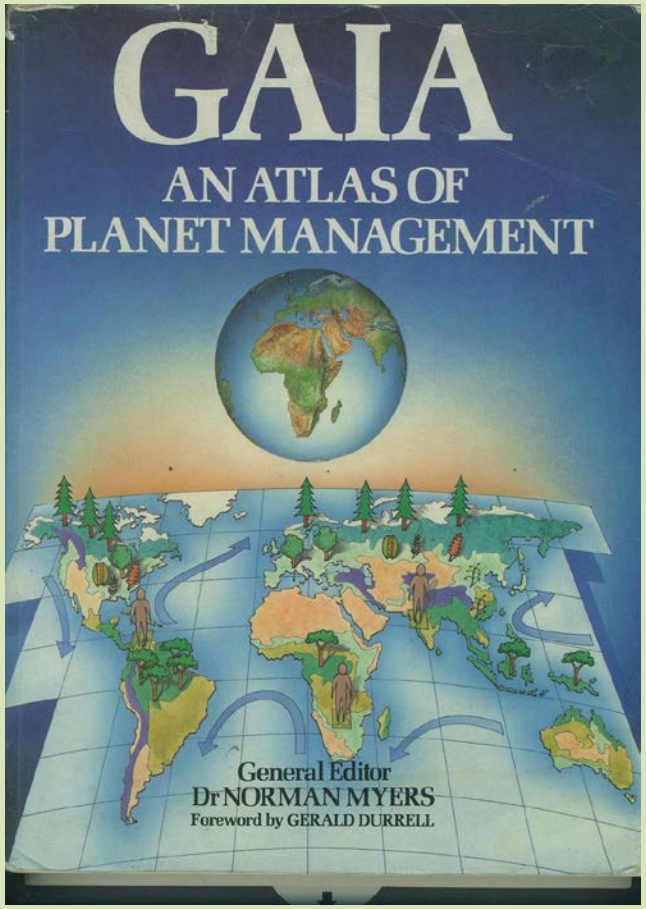
6 Sep 2018

El Salvador's proposal

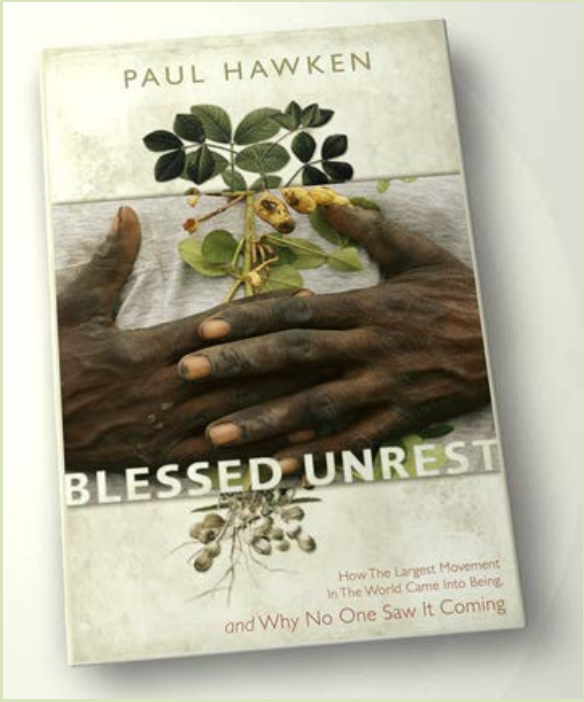
Flamingoes in the salt marshes near the mangroves in Doha, Qatar. CIAT/Neil Palmer

This post is also available in: Spanish

Renewed vigor and commitment is needed to achieve transformational ecosystem restoration… This will allow [society] to address the interdependencies of ecosystems, human needs and biodiversity holistically through a landscape approach of ecosystem restoration, triggering accelerated progress at the pace and scale that is needed to maintain and restore ecosystems, bringing greater balance between social well-being, life on Earth, and sustainable economic growth.



In 1984 **Norman Myers** estimated that there were 12,130 international non-profit groups (INGOS) worldwide, mostly dealing with environmental and social issues.



Power Through Collaboration

Paul Hawken 2007: estimated that there were more than 1,000,000 non-profit groups and community organizations dedicated to the “environmental and social justice movement”.

Miami Pine Rocklands Coalition

- We understand the need
- We have knowledge
- We have growing support
- We have the media
- Now we need a plan

Thanks!


Vote
Our
Planet
Defend Our Air, Our Water, Our Soil
74%
of U.S. adults said "the country should do whatever it takes to protect the environment."
73%
of registered voters believe that climate change is happening.