

Invasive Exotic Species

South Florida Ecosystem Restoration Task Force

Dec 7, 2012

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Task Force's 3 Strategic Goals

Goal 1: Get the Water Right

Goal 2: Restore, Preserve, and Protect
Natural Habitats and Species

Goal 3: Foster Compatibility of the Built and
Natural Systems

Dealing with Invasive Exotics are a Goal 2
Activity

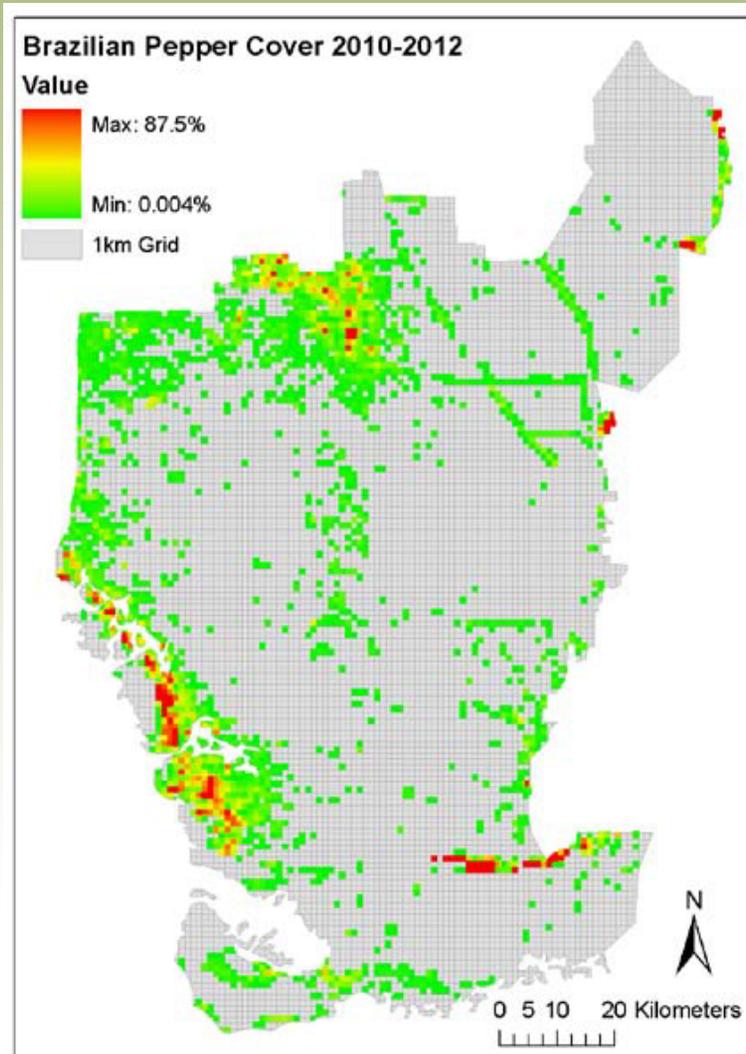
Everglades Non-Native Species

- 77 Plants (Category I Invasive)
- 34 Invertebrates
- 12 Mammals
- 4 Amphibians
- 43 Reptiles
- 11 Birds
- 20 Fishes



*Pictured above**Feral Hog (Pig) Sus scrofa, The Purple Swamphen (Porphyrio porphyrio), Cuban Treefrog Osteopilus septentrionalis, Catfish Pterygoplichthys disjunctivus, Sailfin , The Redbay Ambrosia Beetle, Xyleborus glabratus ,), Nile Monitor - Varanus niloticus*

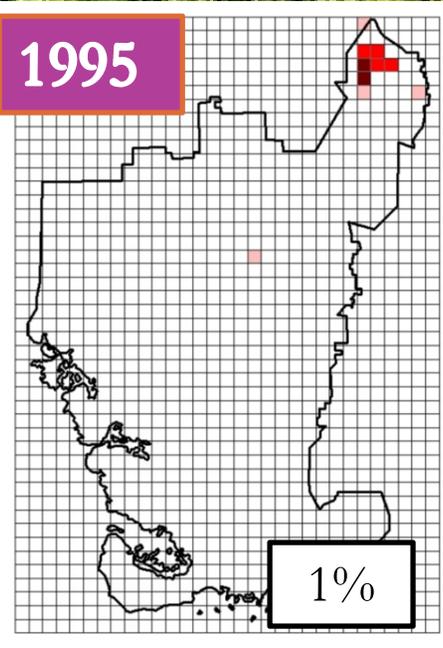
Brazilian Pepper



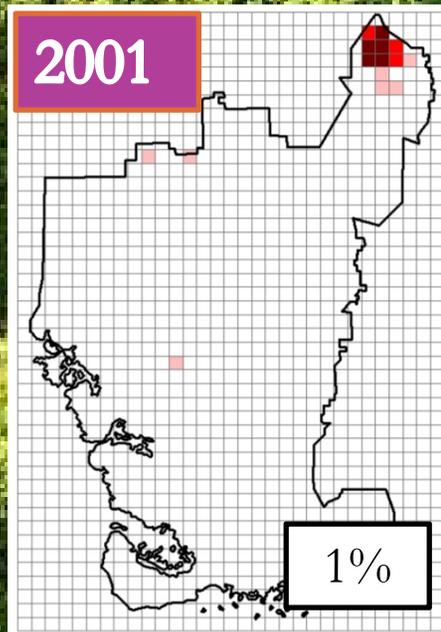
- Brazilian pepper is widely distributed with an estimated infestation area of **30,477 ha (75,310 ac)**
- Brazilian pepper was detected on small tree islands throughout the central Everglades region. In many cases, this species is dominant or co-dominant in the canopy.
- Ground-based observations of tree islands infested with Brazilian pepper revealed that little to no understory native vegetation remains beneath the canopy.
- Other widely scattered but dense infestations occur in the western Everglades hardwood hammocks within Big Cypress National Preserve (Draft 2013 SFER,SFWMD)

Lygodium on the Rise

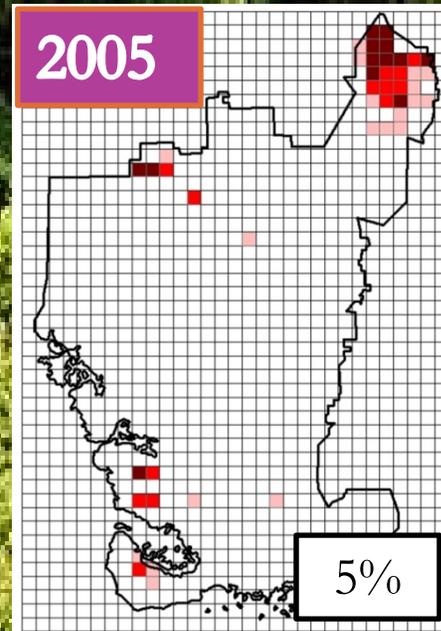
1995



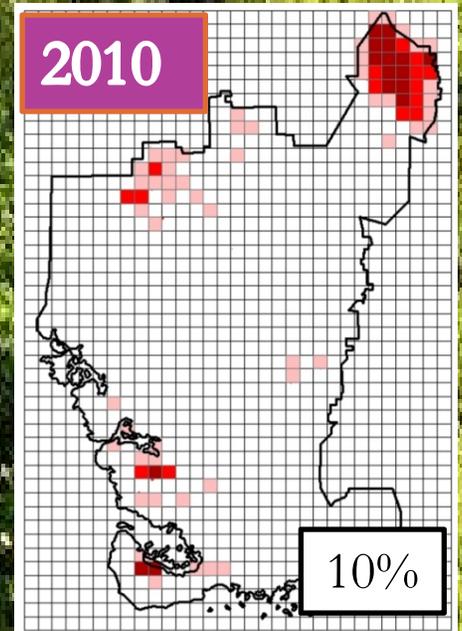
2001



2005



2010



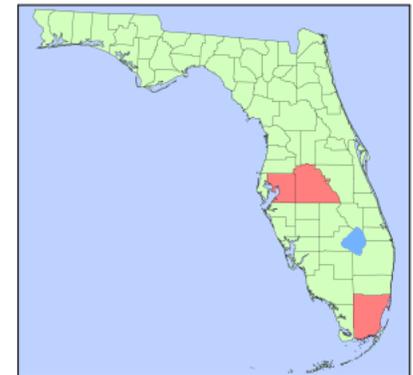
Examples of Invasive Exotic Animal Species



Argentine Black and White Tegu (*Tupinambis merrianae*)

The spread of this species has the potential to impact Everglades restoration efforts by increasing predation on threatened and endangered species, including the American crocodile (*Crocodylus acutus*) and the Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*) (Kevin Enge, FWC, unpublished data), as well as all other ground nesting birds and reptiles.

Distribution: Two established populations are known—Hillsborough and Polk counties (Engel et al., 2006), and southern Miami-Dade County. Data from monitoring efforts and reported sightings in the last year suggest that the south Florida population is expanding (Bob Reed, USGS, personal communication).

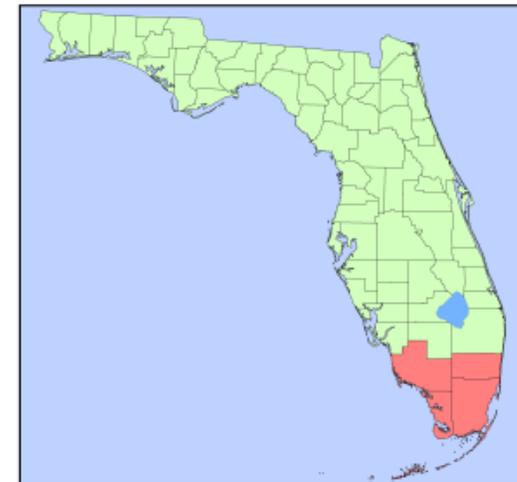


Burmese Python (*Python molurus bivittatus*)



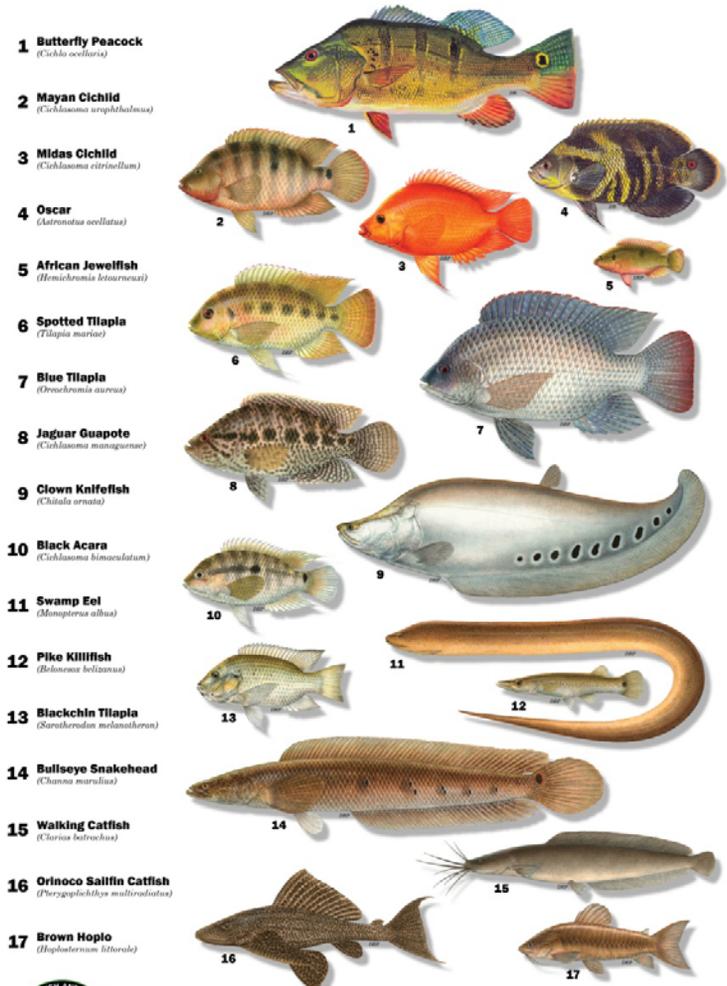
This large constrictor is a top predator known to prey upon more than 20 native Florida species (Snow et al., 2007), including the federally endangered Key Largo wood rat and wood stork. Control of this species is a top priority among agencies and policy makers. A federal importation and interstate movement ban became effective March 2012 for this species.

Distribution: The Burmese python is found throughout the southern Everglades, particularly in the ENP and adjacent lands (e.g., East Coast Buffer Lands; north ENP boundary along Tamiami Trail).



FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

SOME OF FLORIDA'S
EXOTIC FRESHWATER FISHES



Help Protect Our Natural Resources
Don't Release Exotic Pets!

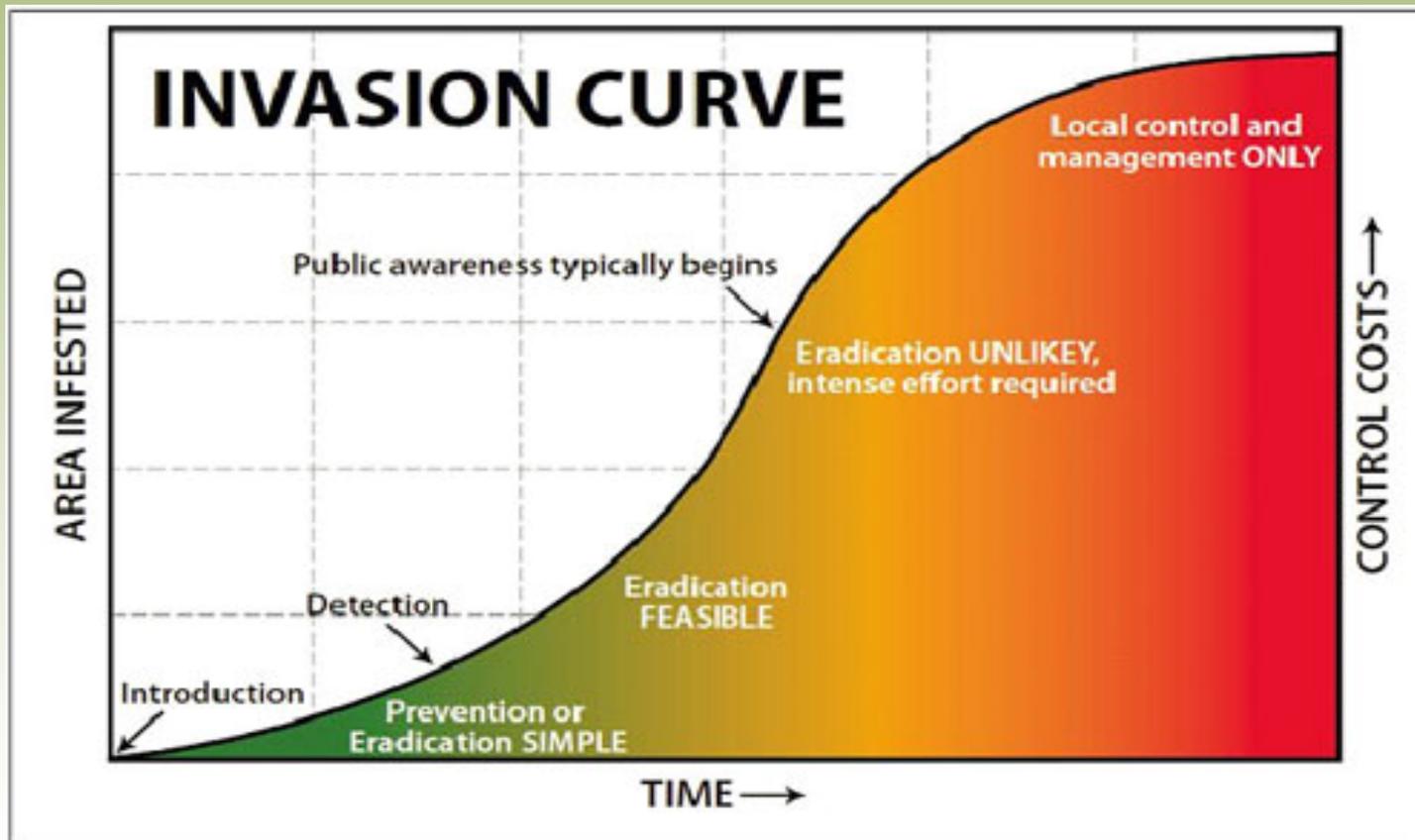


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Art by D. R. Peebles and D. Borer

Invasive Exotic Freshwater Fish

1. Alter energy flow through fish communities
2. Introduction of parasites and diseases
3. Unpredictable
4. May compete with native fishes for food, shelter, or space

A Helpful Way to Organize Our Thinking About a Complex Problem:



Strategic Approaches

Prevention
/Screening



Early Detection
and Rapid
Response



Control

- Pre-Import Regulations (e.g. Lacey Act)
- Education & Outreach
- Interception
- Most cost effective

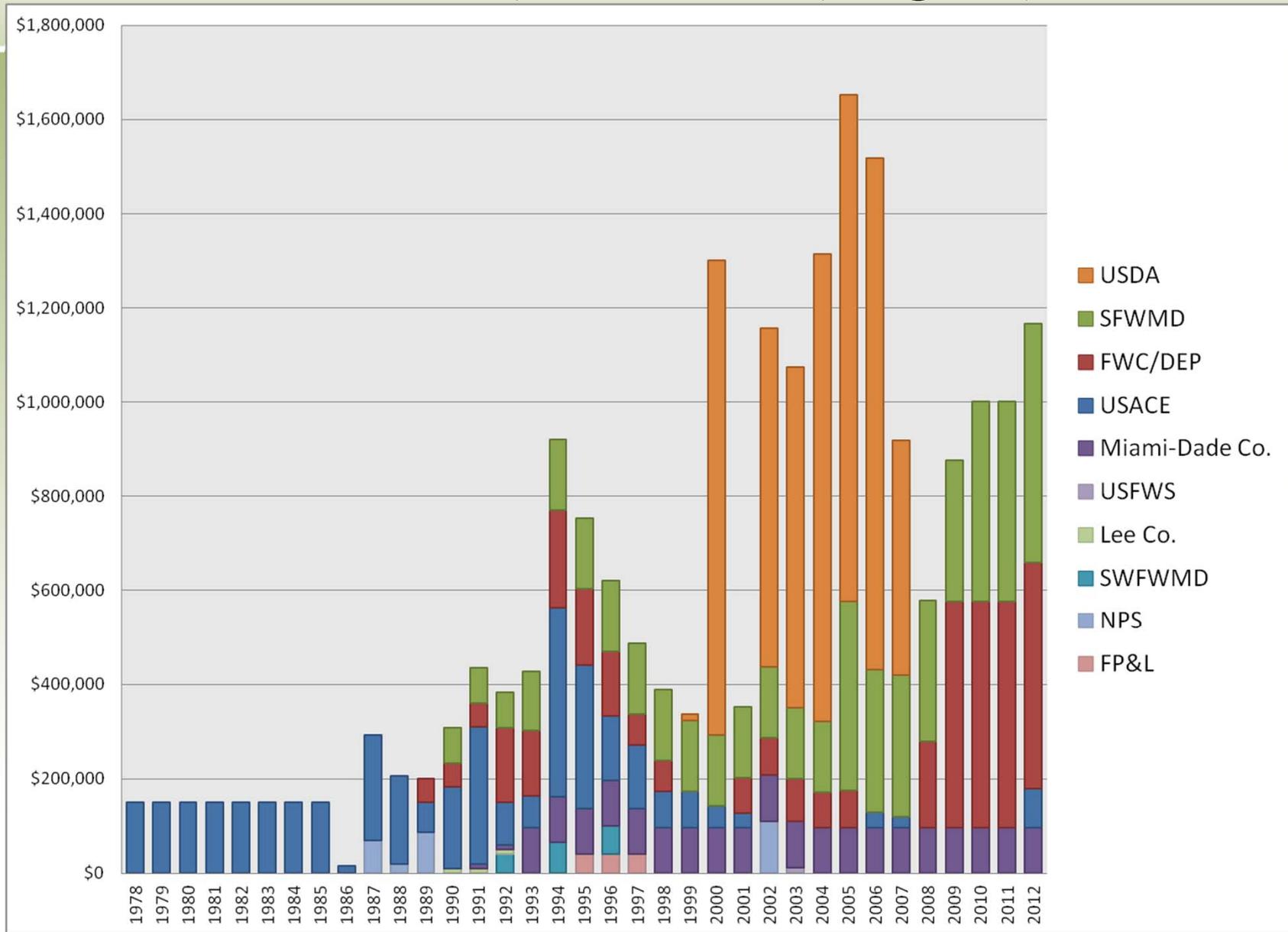
- Attempt to eradicate or contain
- Moderate cost, low impact, short term

- Manage species at lowest feasible levels
- Long-term impact & highest cost financially and ecologically

A Costly Problem

- Since 2002, over \$31.5M has been obligated to initially treat and re-treat the infestation of four species in the Loxahatchee National Wildlife Refuge
- Everglades National Park invests \$2.4 M a year and 7 FTEs on invasive exotics
- Cost per acre to treat *Melaleuca* in sawgrass marsh: at 5% infestation = \$61/ac; compared to 50% infestation the cost = \$276/ac.
- The U.S. Fish and Wildlife Service (FWS) and its partners have spent nearly \$6 million since 2005 for managing and finding solutions to the growing problem of Burmese pythons and other large non-native invasive constrictor snakes in Florida.
- The USDA Wildlife Research Center -spent \$15,800 in 2008-2009 to research snake control technologies.
- The USGS along with UF spent more than \$1.5 million on research; radio telemetry; and the development, testing and implementation of nonnative constrictor snake traps.
- Miami-Dade County spent \$60,875 annually on constrictor snake issues including removal.

Biological Control Funding Going to USDA-ARS Facility in Davie by Agency



How do Invasive Exotics Impact Everglades Restoration?

Species	Potentially Impacted Performance Measures
Old World Climbing Fern Brazilian Pepper Melaleuca	<ul style="list-style-type: none"> •Freshwater Vegetation Mosaics •Ridge And Slough Community Sustainability
Water hyacinth, water lettuce	<ul style="list-style-type: none"> •Lake Okeechobee Vegetation Mosaic
Nile monitor	<ul style="list-style-type: none"> •Juvenile Crocodile Survivorship •Juvenile Alligator Survivorship
Invasive fishes	<ul style="list-style-type: none"> •Regional Populations Of Fishes, Crayfish, Grass Shrimp and Amphibians •Lake Okeechobee Fish Population Density, Age Structure and Conditions
Giant Constrictors	<ul style="list-style-type: none"> •Juvenile Crocodile Survivorship •American Alligator Distribution, Size, Nesting and Condition. •Wading Bird Survivorship

Hydrologic and Habitat Restoration Projects Include Invasive Exotics Costs

Project	Description	cost
Melalueca Biocontrol and Other Exotic Plants	<ul style="list-style-type: none"> An additional raise and rearing building built 20 years cost share operations to raise, rear, release and monitor biological agents for management of invasive species 	<ul style="list-style-type: none"> Operations \$600K annually for 20 years
Site 1	<ul style="list-style-type: none"> Removal of 462 acres of invasive plants in phase I Removal of 1337 acres phase 2 	<ul style="list-style-type: none"> \$1.4 M
8.5 Square Mile	<ul style="list-style-type: none"> Removal of Melalueca and Australian Pine to get the area back to pre-development conditions. 	<ul style="list-style-type: none"> \$1.7M
Picayune Strand	<ul style="list-style-type: none"> Treatment of invasive species in the 'construction footprint'. <p>*Note: treating only in construction footprint, ~58,000 acres untreated throughout the entire project area.</p>	<ul style="list-style-type: none"> \$400K to date, A total of \$7M has been allocated
CEPP	Beginning to implement Invasive Species into the planning process.	<ul style="list-style-type: none"> No cost estimate at this time
Lake Okeechobee	Manage aquatic invasive species on the lake.	\$1M annually

A Battle Worth Fighting



- Protecting Public Investments in Restoration
- Invasive Can Have Broader Economic Impacts in the Region
- The Problem Will Only Get Worse
- Some Species May Change the Ecosystem Irrevocably (Ambrosia Beetle, Python, OWCF, Lion Fish)
- Synergistic Effects Can Make Problems Worse

How are We Currently Fighting the Problem?



THERE IS A LOT GOING ON...

- Individual Agency/Government Efforts
- Intergovernmental Coordinated Efforts
- Non Governmental Efforts

Individual Agencies/Governments, NGOs and the Private Sector Battle Invasives for Many Reasons

SFWMD (e.g. land management, flood protection...)

FWC (e.g. public access, land management, fisheries...)

FDAC's (e.g. crop protection...)

NPS (e.g. land management, resource protection...)

FWS (e.g. land management, resource protection...)

Tribes (e.g. land management, resource protection...)

USACE (e.g. navigation, restoration)

FDOT (e.g. permit conditions, ROW maintenance...)

USDA (e.g. agriculture protection and research...)

USGS (e.g. research...)

Local Government (e.g. land management, regulatory compliance...)

Private sector (land management)

Universities (research)

NGO's (Resource protection, education and outreach...)

GOVERNMENT ALSO WORKS TOGETHER

Everglades CISMA -The Everglades CISMA partnership was formalized in 2008 with a MOU. Currently, the Everglades CISMA consists of 18 cooperators and partners, including tribal, federal, state, local, and nongovernmental conservation organizations. Much of the work is done ad hoc with in-kind services.

Cooperative Invasive Species Management Areas -In addition to Everglades CISMA, there are six other CISMAs either wholly or partially within the footprint of the Greater Everglades ecosystem; Southwest Florida CISMA, Treasure Coast CISMA, Heartland CISMA, Osceola County Cooperative Weed Management Area, and the Central Florida CISMA.

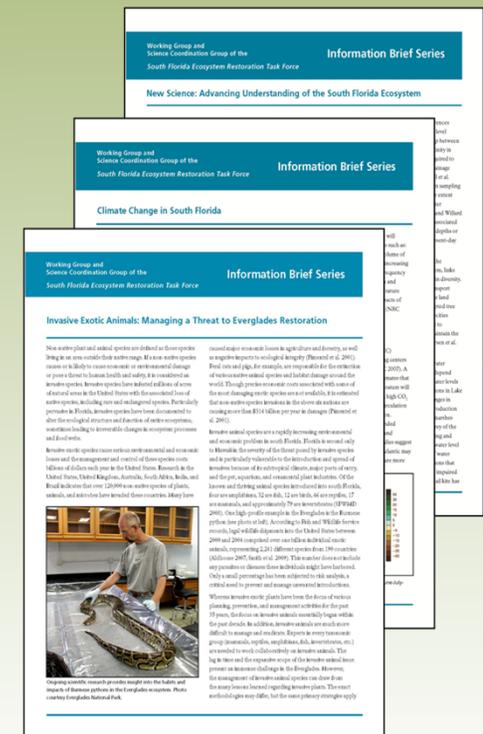
Lake Okeechobee Aquatic Plant Management Interagency Task Force -Invasive plant management on Lake Okeechobee is coordinated according to policy contained in a Lake Okeechobee Letter of Operating Procedures (1989) which was adopted by the involved agencies: USACE, SFWMD, Florida DNR, Florida DEP, and FWC.

Kissimmee River and Chain of Lakes Coordination-Similar invasive plant treatment events are planned at interagency meetings for the Kissimmee River and Chain of Lakes, though these groups do not have a formal agreement such as the Letter of Operating Procedures. Funding from the Florida Aquatic Plant Management Trust Fund, administered by the FWC, is available for much of the work in these waters.

South Florida Ecosystem Restoration Task Force-The Task Force has coordinated reports for invasive exotic plants and animals, receives updates, has a system-wide indicator for exotics, a 2010 briefing document and recommendations to address more aspects of invasive exotics.

Several Plans Exist that Try to Coordinate and Prioritize Invasive Exotics Efforts

- Weeds Won't Wait (2003) (SFERTF)
- Draft Strategic Plan for Invasive Animals (SFERTF's FIATT)
- Strategy, Early Detection Rapid Response Plan (ECISMA)
- The Exotics Information Brief (SFERTF)
- System Wide Indicator (SFERTF)
- South Florida Ecosystem Report (SFWMD)
- Invasive Plant Species Management Plans (FLEPPC)



Education and Outreach Tools Have Been Developed

WANTED

GIANT AFRICAN SNAIL



LOOK FOR THEM! REPORT THEM!
888-397-1517

A major landscape and agricultural pest, even eats stucco on homes

Public health threat - known to carry rat lungworm that may cause meningitis in humans

Able to reproduce rapidly - one snail can lay 1,200 eggs in a year
Can grow to up to 8 inches in length - no natural enemies

We need your help to stop this pest!

www.freshfromflorida.com/pi

- Don't Let it Loose Campaign
- I've Got One! iPhone App
- A hotline 1-888-IVEGOT1 for instant reports of live exotic animals
- Twitter and Facebook
- Python Patrol
- Invasive Reptile Identification Decks
- Media Notices

We've had success:

- Sacred Ibis (ECISMA received a \$25,000 grant from Everglades Foundation)
- Asian exotic mangrove (*Lumnitzera racemosa*)-on track to eradicate
- An injurious wildlife evaluation and listing was conducted(4 constrictors) under the requirements of the Lacey Act (18 U.S.C. 42, as amended)
- *Melaleuca* bud gall midge was released in 2008 and Brown Lygodium Moth in 2009; populations well established
- LNWR reported that *Melaleuca* will be under maintenance control within 2 years in the Refuge.

Bottom Line

We are doing a lot of things with respect to exotic species management, but there are almost certainly ways to improve our efforts and boost our effectiveness, because an Everglades landscape, teeming with invasive exotics species, is not a restored Everglades.

What More Can Be Done?

2010 Working Group Recommendations to the SFERTF

- Promote federal prevention initiatives
- Establish Everglades Early Detection/Rapid Response (EDRR) Coordinator and dedicated EDRR funding
- Coordinate development of cross-cut budget
- Promote continued improvements to coordination

Staff Recommendation

The Task Force directs the OERI, WG and SCG to conduct a comprehensive review of current efforts to combat invasive exotics and, at the next regular meeting of the Task Force, present an updated set of recommendations for how to improve our efforts and boost our effectiveness.

Thank you

LeRoy Rodgers, SFWMD

Dan Kimball, ENP

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Larry Williams, U.S. FWS

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Chuck Collin, FWC

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Melissa Martin, LNWR

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Tony Pernas, ENP

Carrie Beeler, OERI

