Everglades Restoration Swamped by Invasives

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Outline

• Invasives Species Overview
• Invasives Species in the Everglades
• ‘The Plan’ Everglades Restoration (CERP)
• Invasive Species, Everglades and CERP
• Closing Thoughts
Invasive Species

**Definition** - an alien (or non-native) species whose introduction does, or is likely to cause economic or environmental harm or harm to human health

- Executive Order 13112
Invasive Species

• **WORLD WIDE**
  • **700,000 to 3 MILLION SPECIES INTRODUCED** (total species on earth estimates between 7 and 30 million; that’s ~10-30% of all the species on earth)

• **UNITED STATES**
  • **OVER 80,000 SPECIES INTRODUCED** (that’s ~40% of all native species in the continental US)

• **FLORIDA**
  • **OVER 32,000 SPECIES** (25,000 plants) INTRODUCED (that’s ~800% of all native species in Florida)
  • **OVER 1,800 EXOTIC PLANT SPECIES ARE DOCUMENTED TO BE INVADING NATURAL AREAS IN FLORIDA** (That’s 33% of all plants in Florida)

Sources: IUCN ISSG Global Invasive Species Database and Precious Heritage: The Status of Biodiversity in the United States, The Nature Conservancy, SFWMD SRF Survey Data
Invasive Species Impacts

Financial

- **International** – $1,400,000,000,000 in damages (2008 – GISP/Cornell Univ.)
- **National** – $138,000,000,000 in damages (2006 - Cornell Univ.)

Environmental

- **T&E Species** – 2\textsuperscript{nd} leading cause of decline (USFWS)
  - The *Brown Tree Snake* in Guam has lead 9 of the 11 native birds to extinction
  - *Zebra Mussels* are threatening thirty freshwater mussel species with extinction
  - *Lamprey Eels* – three endemic fish species

![Graph showing cost versus GDP for different regions]
Impacts of Invasive Species in the Everglades
Replace Native Species and Communities
(Changing grasslands into forests)

Lygodium covering tree island-
Loxahatchee

Melaleuca after a chemical treatment - WCA
Alter Soil Type and Accretion Rates (e.g. Raise elevation)

Lygodium roots on tree island- Loxahatchee
Alter Light Levels

Lygodium covering tree island - Loxahatchee

Melaleuca in WCA
Alter Nutrients, Microbiota and Chemistry in Soil and Water
Alter Environmental Processes Like Fire Regime

Lygodium climbing into canopy – causing crown fires
A hypothetical diet necessary for a hatchling Burmese python to reach 13 feet in the Florida Everglades (approx. 5 to 7 years) (Source: Dr. Stephen Secor, Univ. of Alabama and Skip Snow, Everglades National Park)

- 1 raccoon
- 1 opossum
- 4 5ft alligators
- 5 American coots
- 6 little blue herons
- 8 ibises
- 10 squirrels
- 15 rabbits
- 15 wrens
- 30 cotton rats
- 72 mice

Multiply by # of Pythons
The Plan
Comprehensive Everglades Restoration Project (CERP)

“The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem *while* providing for other water-related needs of the region, including water supply and flood protection” (WRDA 2000)
CERP - “Comprehensive”? 

Getting The Water Right

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Quantity  
Quality  
Timing  
Distribution

67 projects
The recommended Comprehensive Plan does not include measures to directly combat exotic plant infestation. The CERP plan would improve conditions for native plant communities by restoring more natural sheet flow and hydroperiods throughout much of the system, improving water quality, and restoring more natural timing and distribution of flows, hydrologic and life stages of others. Although the plan would improve hydrologic conditions in the area, invasive plant management would be a challenging problem. Management strategies are being developed by the NEWTT for current invasive plants and it would be the task of the operational elements to develop plans to execute these strategies.

…the issue of invasive exotic animals in south Florida reaches beyond the scope of the Restudy…
Setting Conditions for Invasion

Hydrologic Restoration Causes Change and Disturbance which leads to an Increase in Invasive Plants

Hydrologic Project

Hydrologic Change

Disturbance

Less Water

More Water

Upland

Complete Inundation

Australian Pine  Brazilian Pepper  Lygodium  Melaleuca  Hyacinth  Hydrilla
So While We Are ‘Getting the Water Right’....
New Species in Everglades National Park Since CERP
Potential Impacts

African Jewel Fish → Outcompeting and reducing abundance of native Mosquito Fish

IMPACTS
- Potential increase in Mosquitoes
- Reduced fish prey abundance

Ambrosia Beetle → Dead Swamp Bays

Gaps in Tree Islands

Potential Tree Island Collapse

Invasives Fills the Voids
Why do we continue to have these invasions....
Different Agencies with Different Mandates

Not Invasive Species Management

- 9 Counties
- 5 State Agencies
- 5 Federal Agencies
- 2 Tribes
Constant Source of Re-infestation

8 Million People
Resources are Focus on Control

We need to focus here
We concentrate too much on ‘getting the water right’*

(* My Opinion)
Future w/o Increased Action

Number of Species

Environmental Impacts

Cost to Control

Time
QUESTIONS?

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