

**Everglades
Restoration
Swamped by
Invasives**

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U.S. Army Corps of Engineers

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)

Invasive Species Impacts

Financial

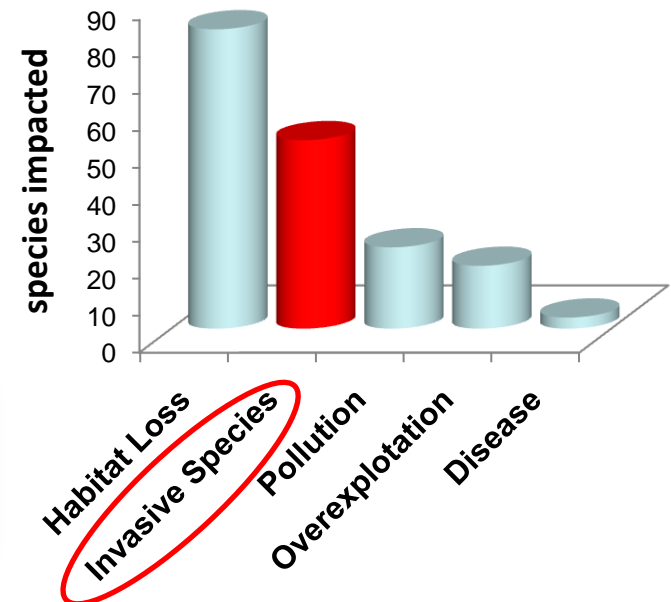
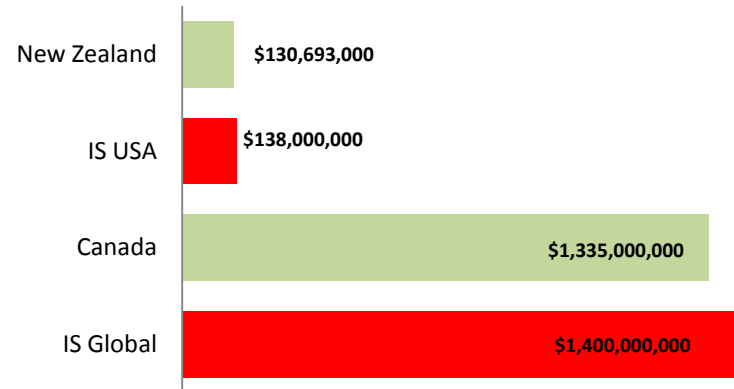
- **International** – \$1,400,000,000,000 in damages (2008 – GISP/Cornell Univ.)
- **National** – \$138,000,000,000 in damages (2006 - Cornell Univ.)

Environmental

- **T&E Species** – 2nd 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

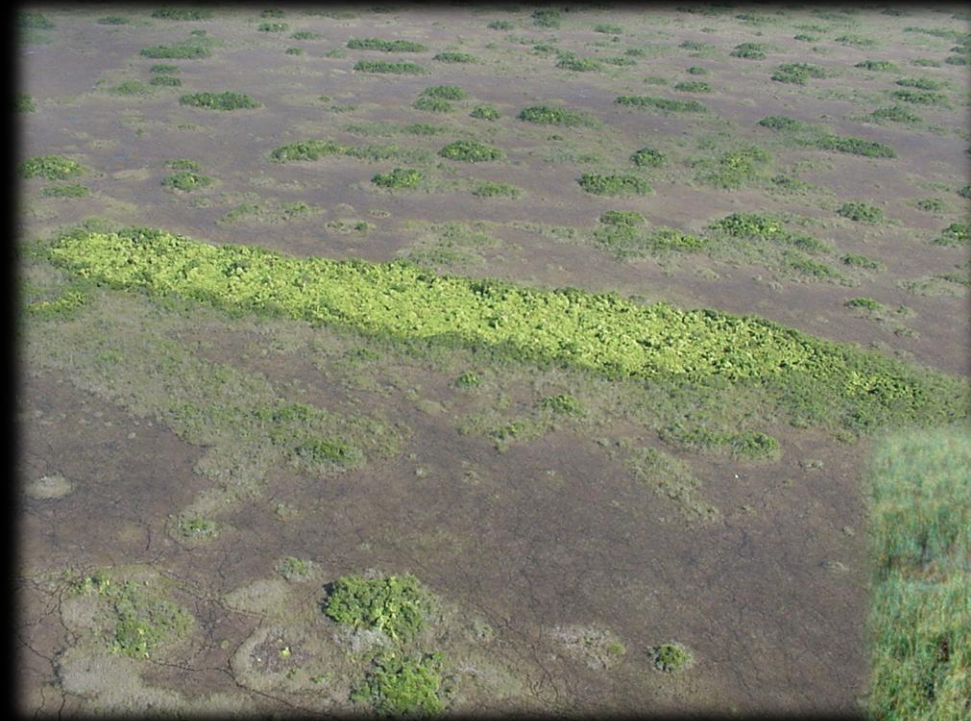


Cost-vs-GDP



Impacts of Invasive Species in the Everglades

Replace Native Species and Communities (Changing grasslands into forests)



Lygodium covering tree island-
Loxahatchee

Melalueca after a chemical treatment - WCA



Alter Soil Type and Accretion Rates (e.g. Raise elevation)

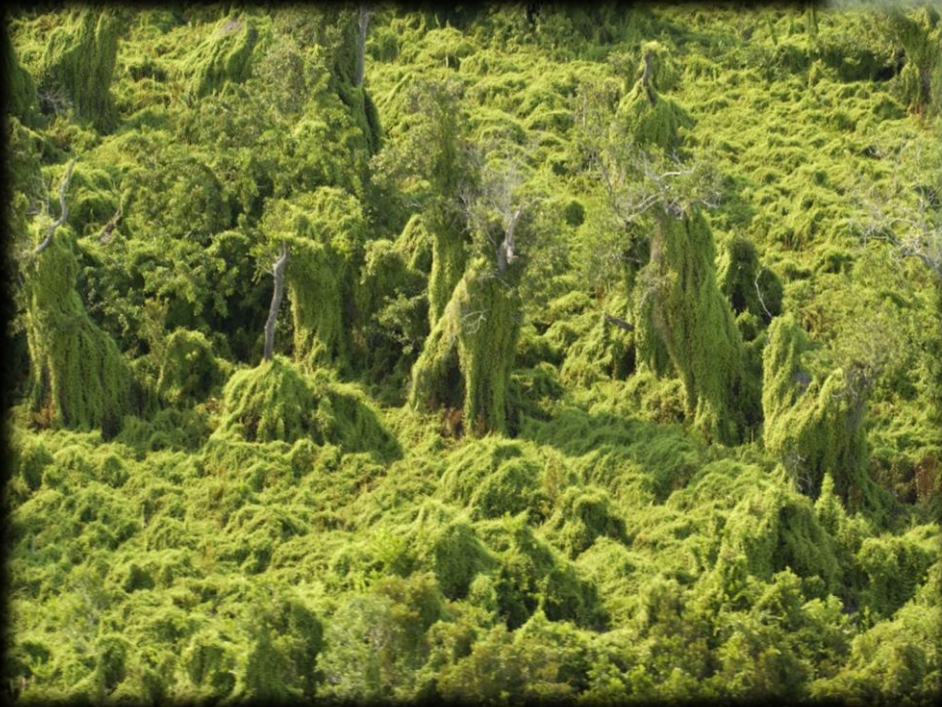


Lygodium roots on tree island- Loxahatchee

Alter Light Levels



Melalueca in WCA



Lygodium covering tree
island- Loxahatchee

Alter Nutrients, Microbiota and Chemistry in Soil and Water



Melaleuca

Melaleuca



Alter Environmental Processes Like Fire Regime











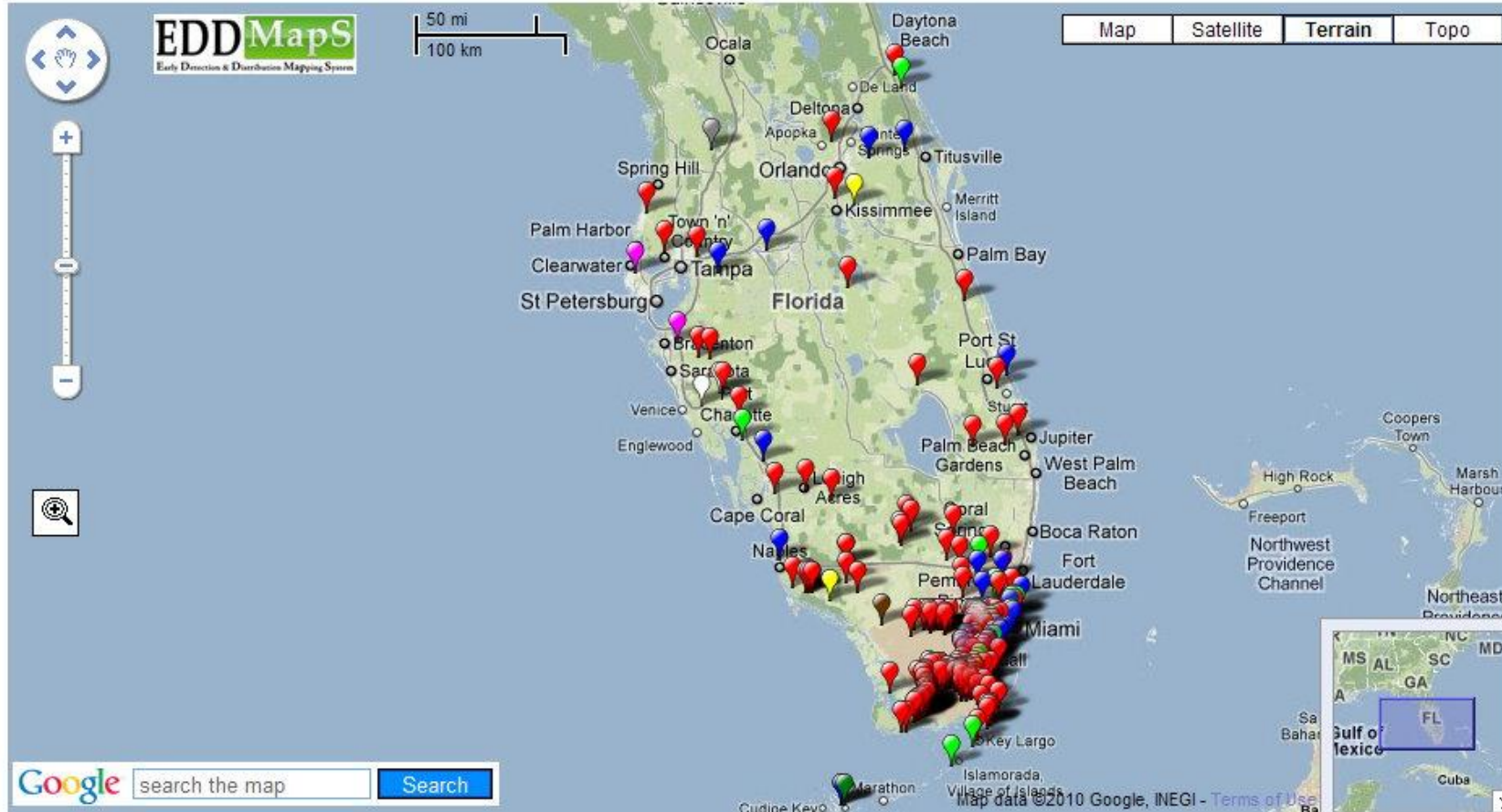
Lygodium climbing into canopy – causing crown fires

Large Constrictors



Constrictor Snake Sightings/Removals

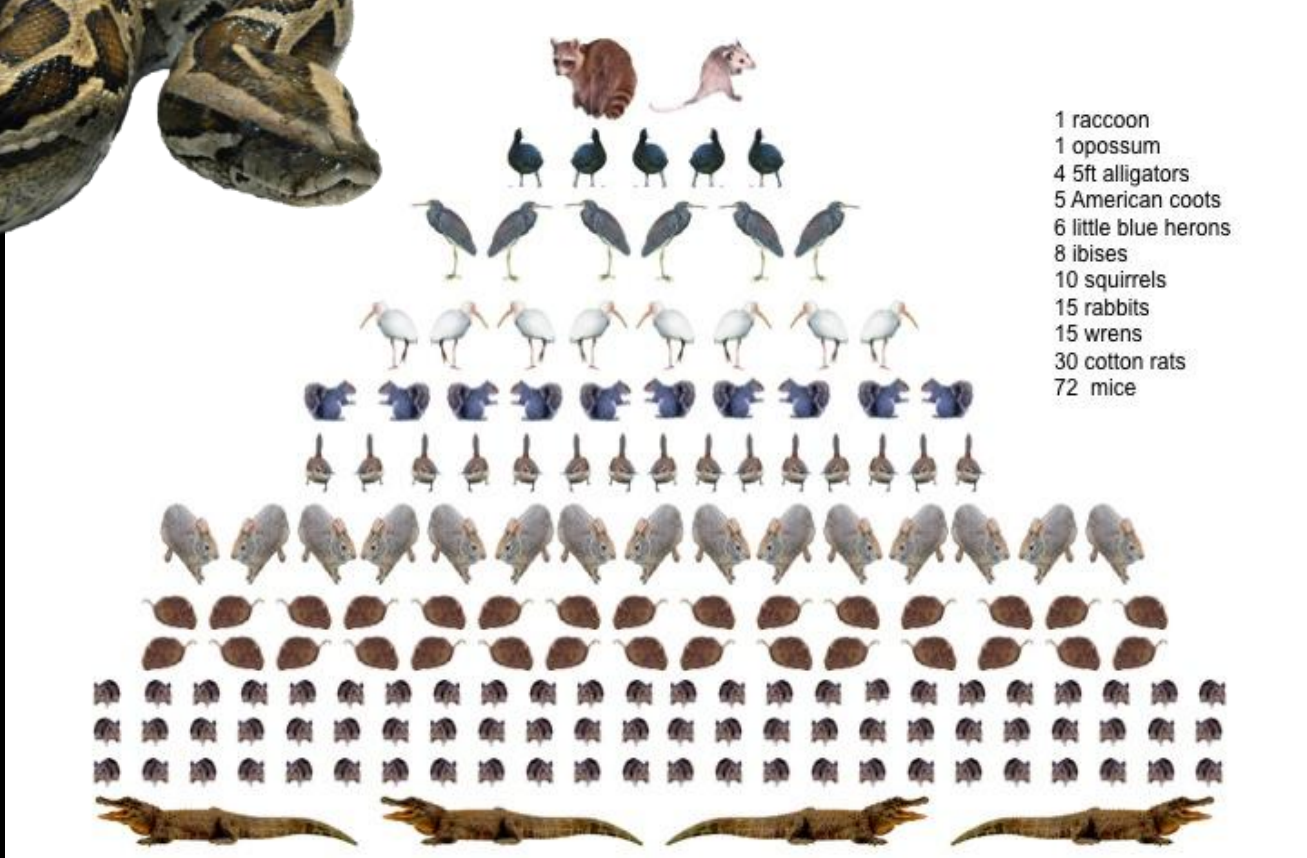
-  Burmese python
-  African rock python
-  green anaconda
-  common boa
-  Reticulated Python
-  Colombian Rainbow Boa
-  ball python
-  yellow anaconda
-  Kenyan sand boa





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)



Multiply by # of Pythons

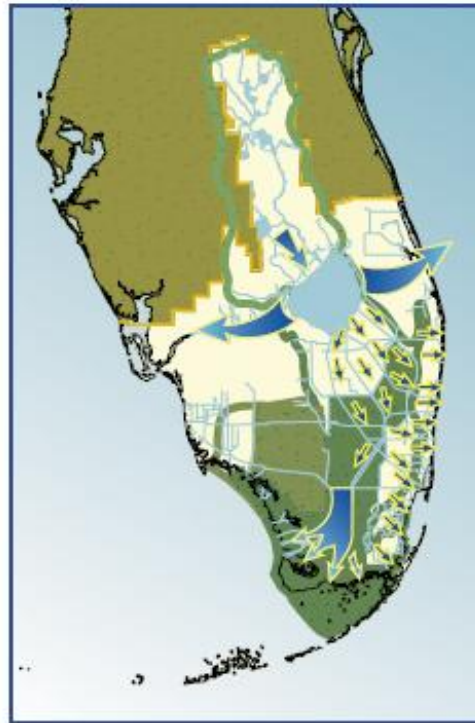
The Plan

Comprehensive Everglades Restoration Project (CERP)

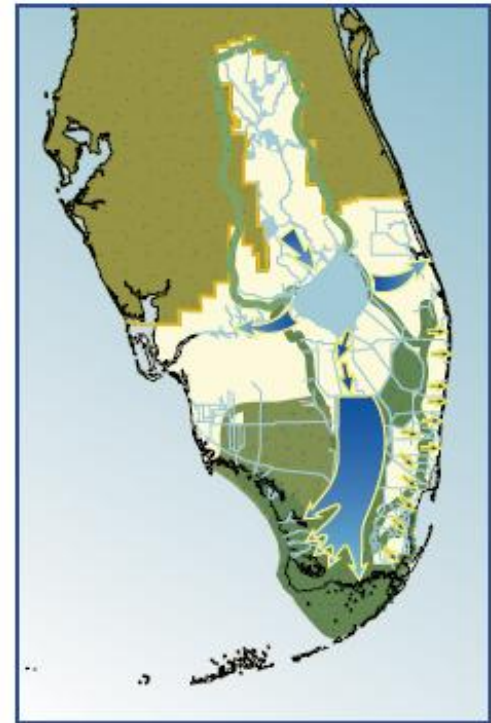
“The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem *while* providing for other water-related needs of the region, including water supply and flood protection” (WRDA 2000)



Pre-Drainage Flow

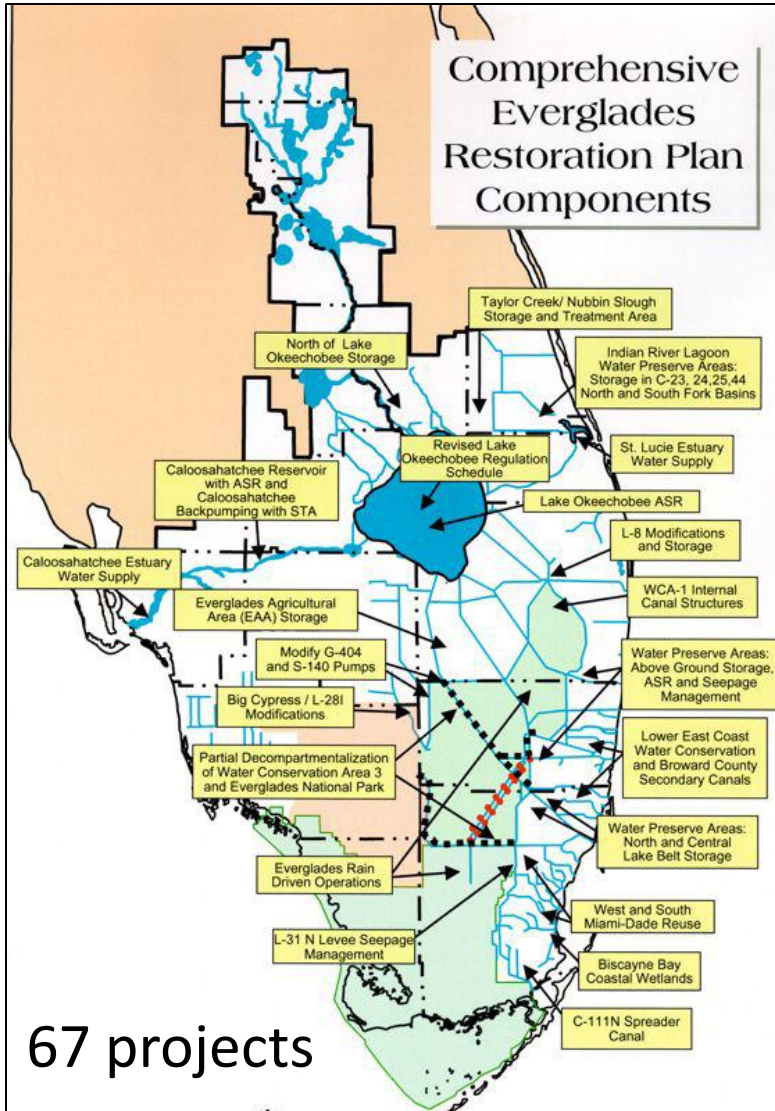


Current Flow

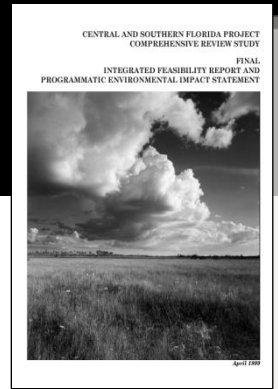


Restored Flow

CERP - "Comprehensive" ?



WRDA 2000 - CERP

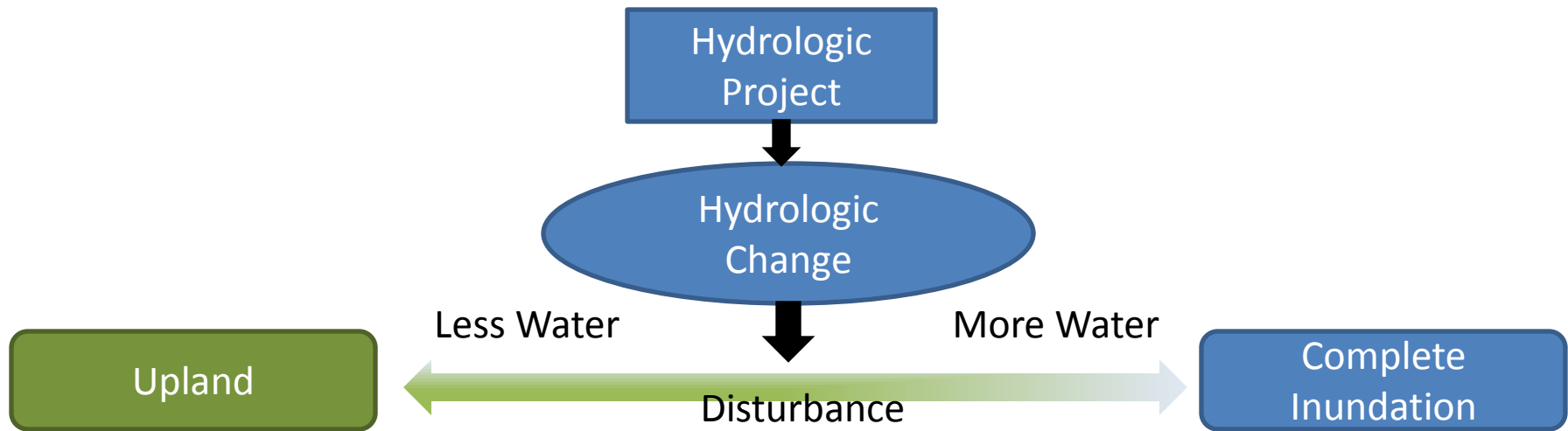


“...the issue of invasive exotic animals in south Florida reaches beyond the scope of the Restudy...”

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Setting Conditions for Invasion

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



Australian Pine

Brazilian Pepper

Lygodium

Melaleuca

Hyacinth

Hydrilla

So While We Are 'Getting the Water
Right'

New Species in Everglades National Park Since CERP



Restudy Begins

CERP Authorized



1996

1999

2000

2001

2002

2003

2004

2005

2006

2007

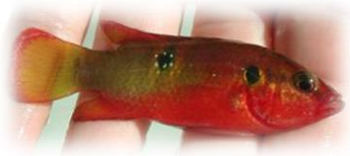
2008

2009

2010

2011

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



Invasives Fills the Voids



Potential Tree Island Collapse



Why do we continue to have these
invasions....

Different Agencies with Different Mandates

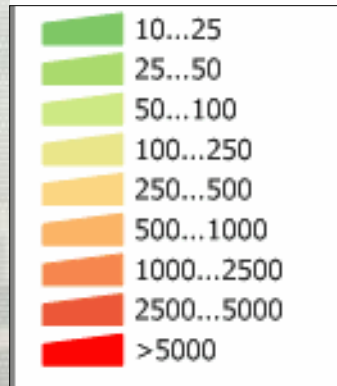
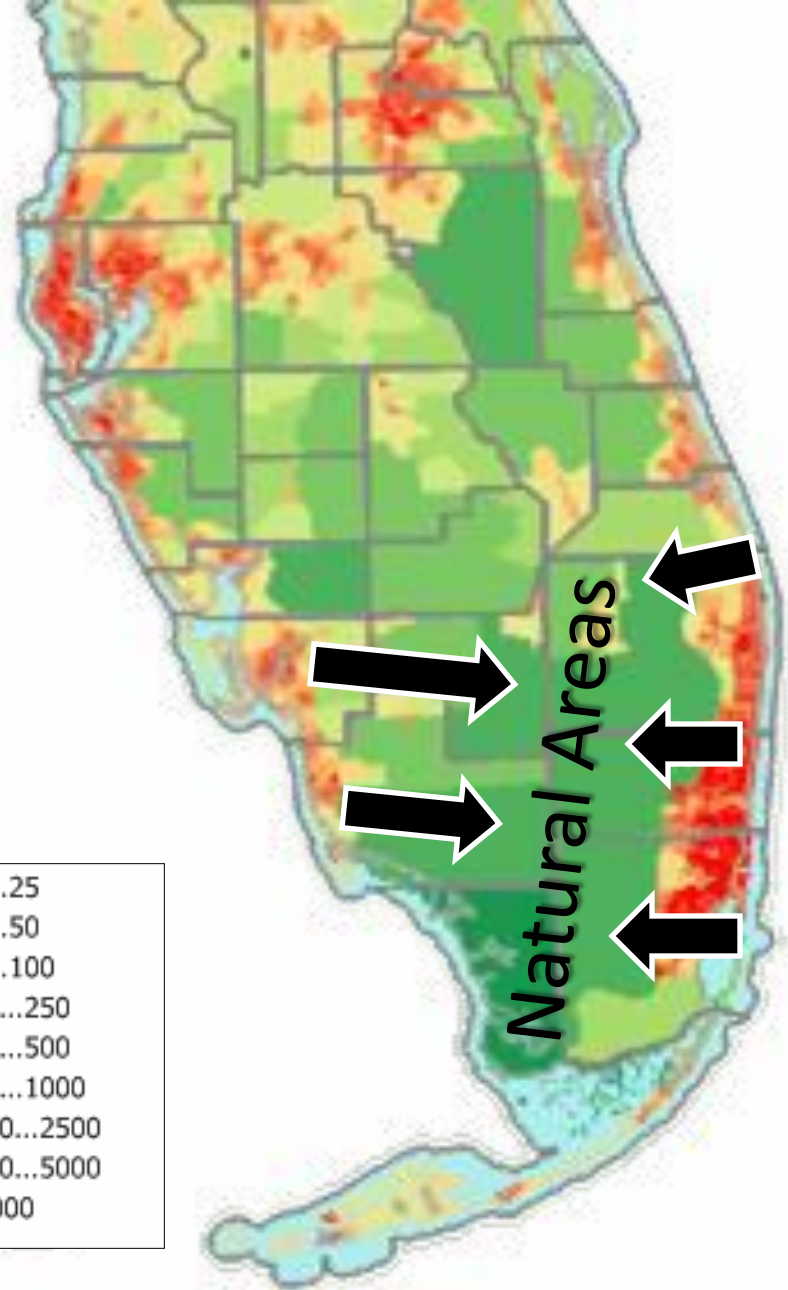
Not Invasive Species Management

- 9 Counties
- 5 State Agencies
- 5 Federal Agencies
- 2 Tribes

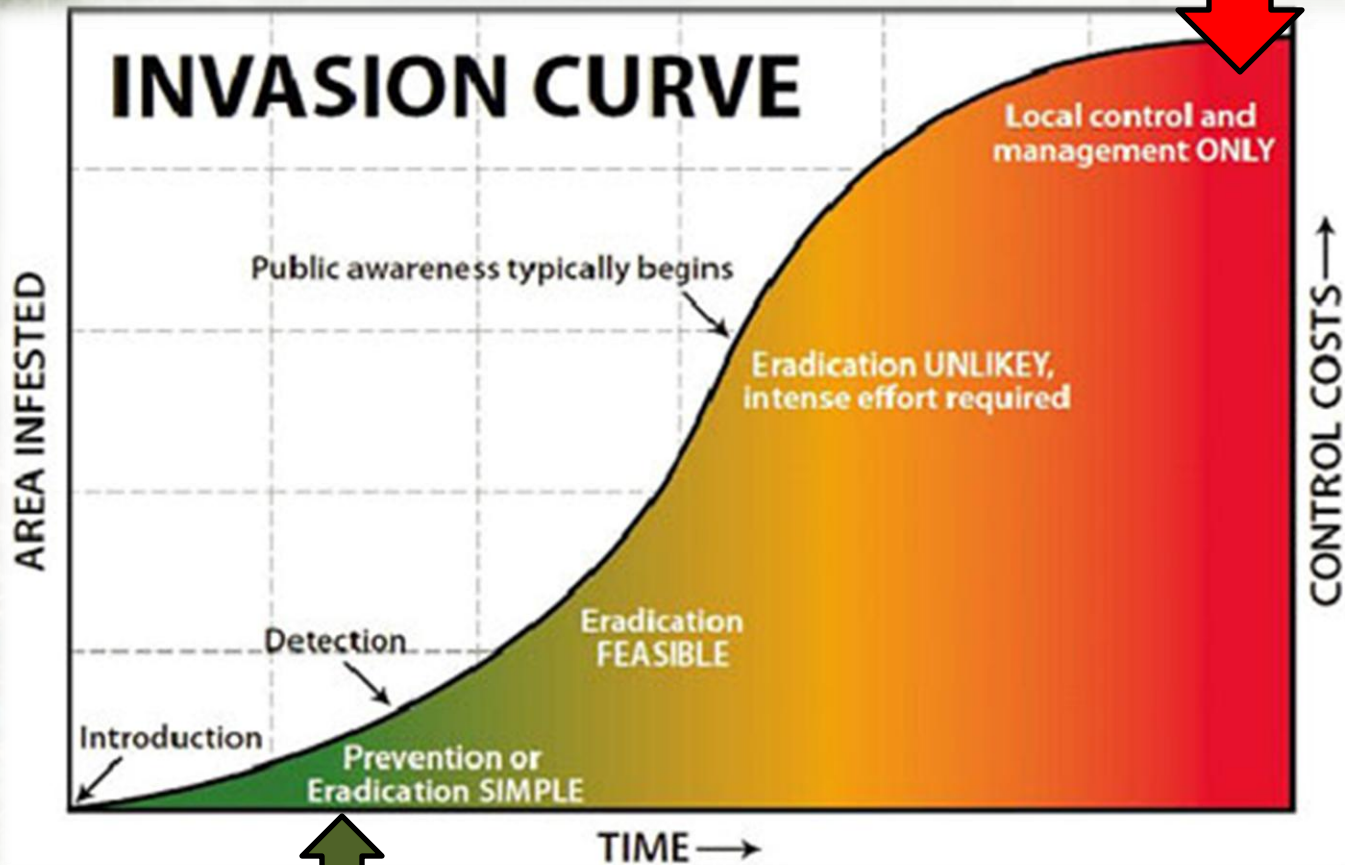


Constant Source of Re-infestation

8 Million People



Resources are Focus on Control



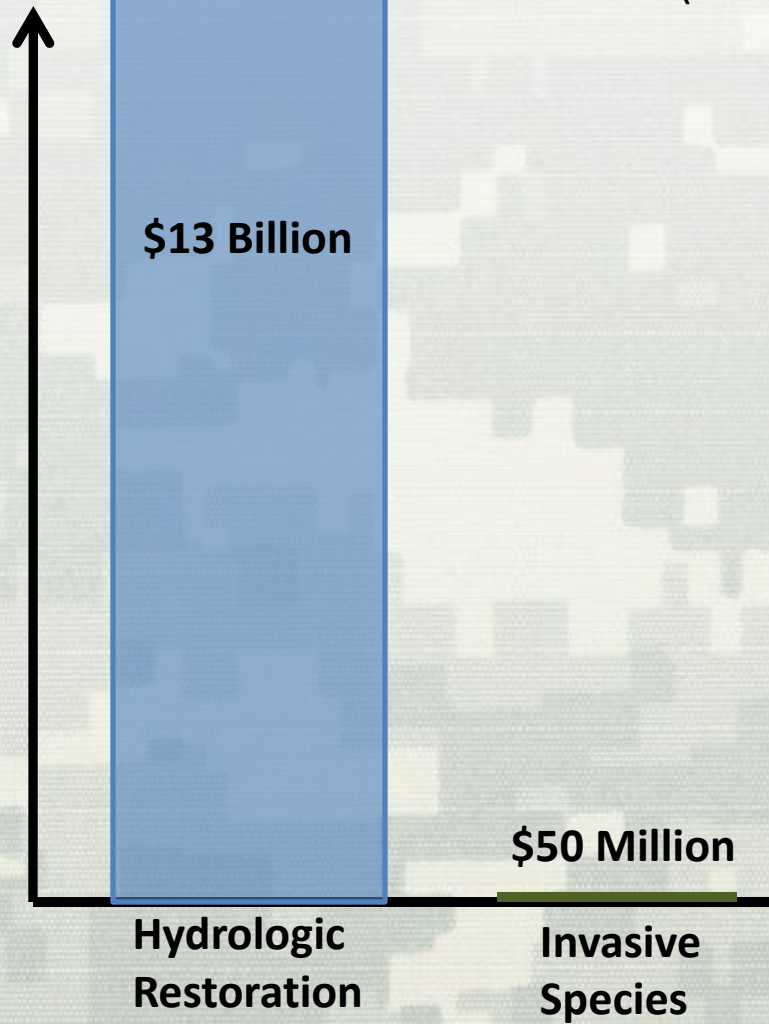
We need to focus here





We concentrate too much on 'getting the water right'*

(* My Opinion)



Future w/o Increased Action

