



## **A.R.M. Loxahatchee NWR**

### ***Status of Priority Invasive Plants***

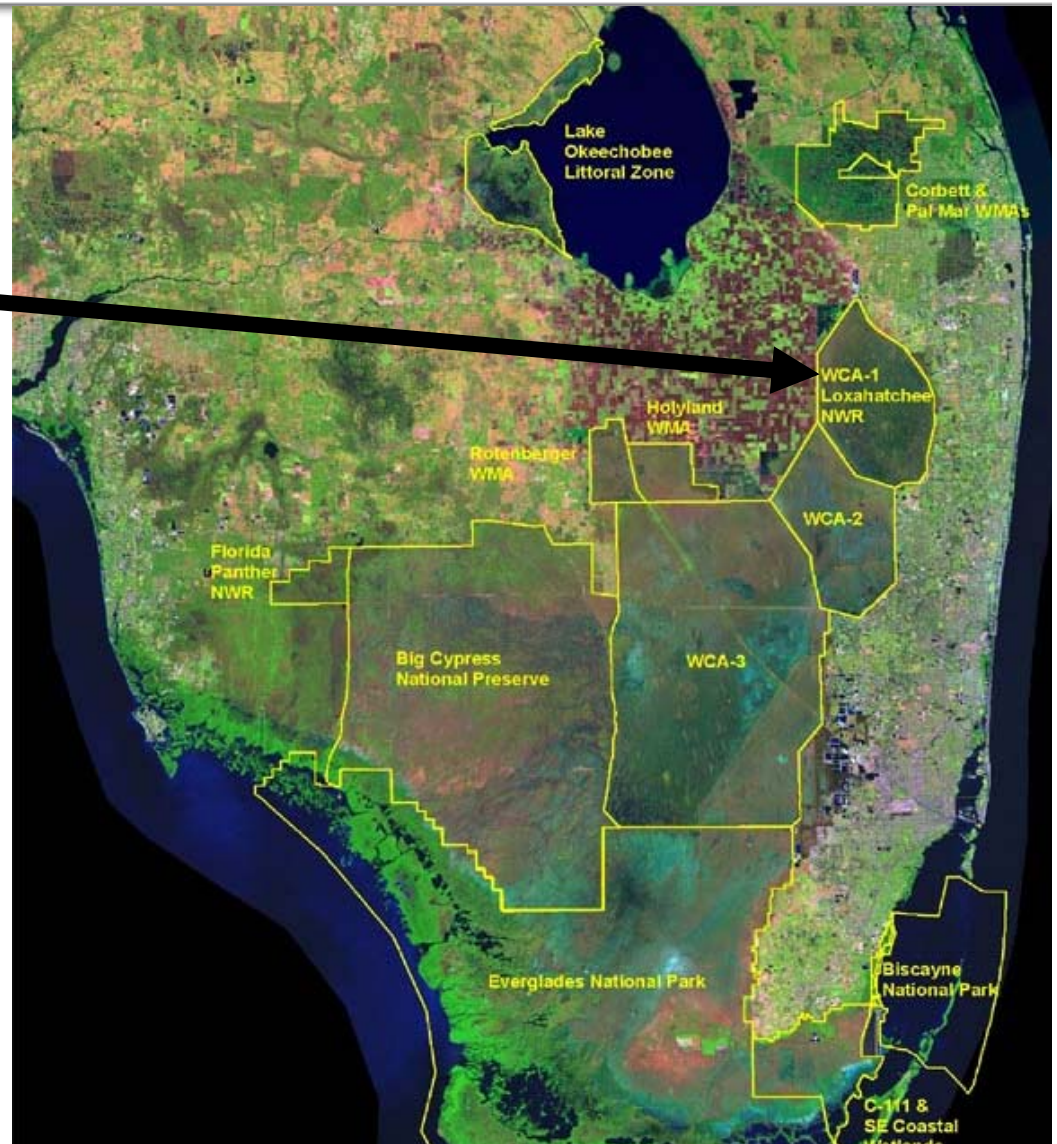
LeRoy Rodgers  
Invasive Species Biologist  
Land Resources Bureau

Abe Cooper  
Senior Practice Expert  
Office of Counsel



# Loxahatchee National Wildlife Refuge

- Also known as Water Conservation Area 1, or WCA-1
- Located in south-central Palm Beach County
- 221 square miles
- 144,000 acres







# Old World Climbing Fern and Melaleuca

## Severe impacts to ecosystem function and wildlife habitat

- Reduced native species richness
- Degraded wildlife habitat
- Altered ecosystem processes



*Tree island overtaken by Old World Climbing Fern*



*Marsh transformed to melaleuca forest*

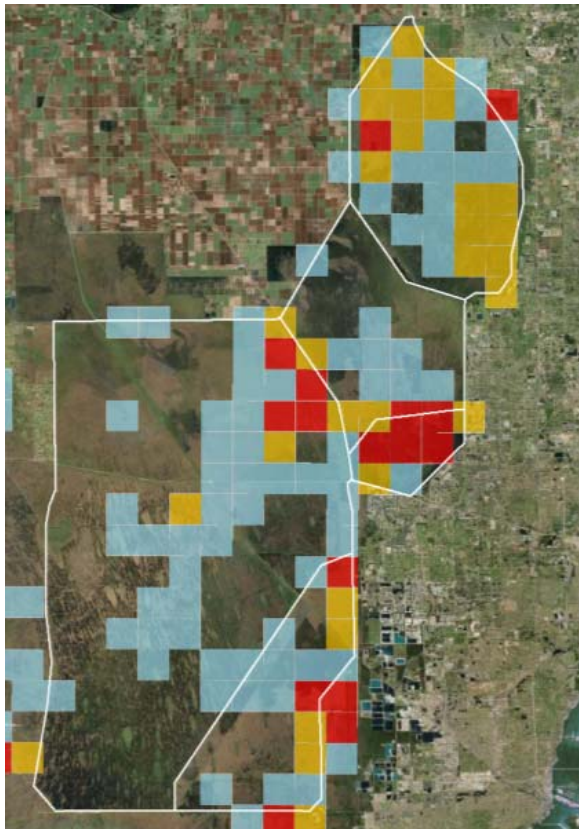
UGA1299147



# Melaleuca Changes, 1995 – 2015

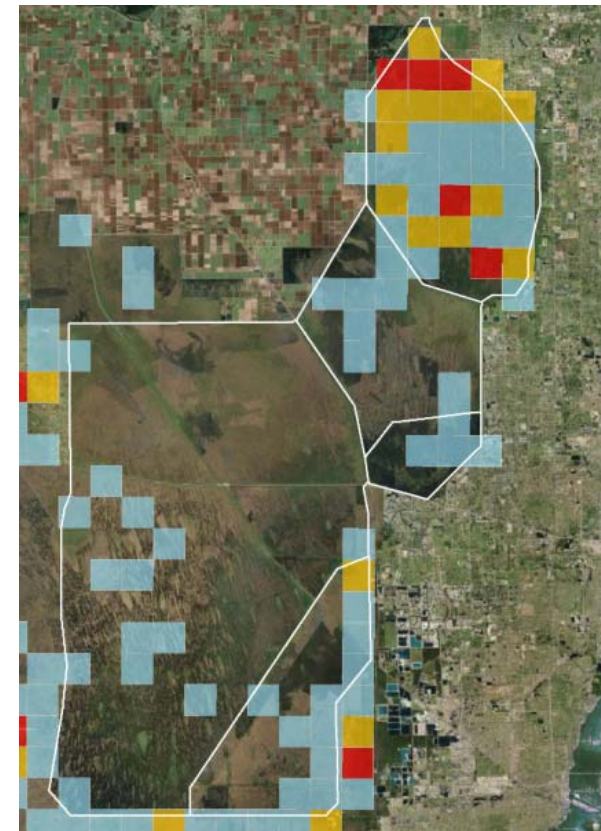
**Melaleuca controls have been effective in WCA-2 and WCA-3**

1995



20 YEARS

2015







# Old World Climbing Fern Changes, 1995 – 2015

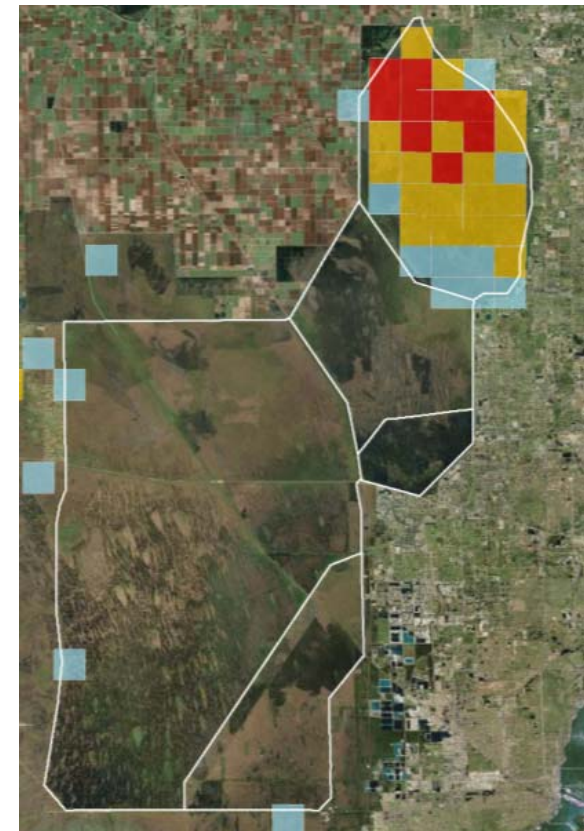
**Minimal infestations in WCA-2 and WCA-3; Increases in WCA-1**

1995



20 YEARS

2015

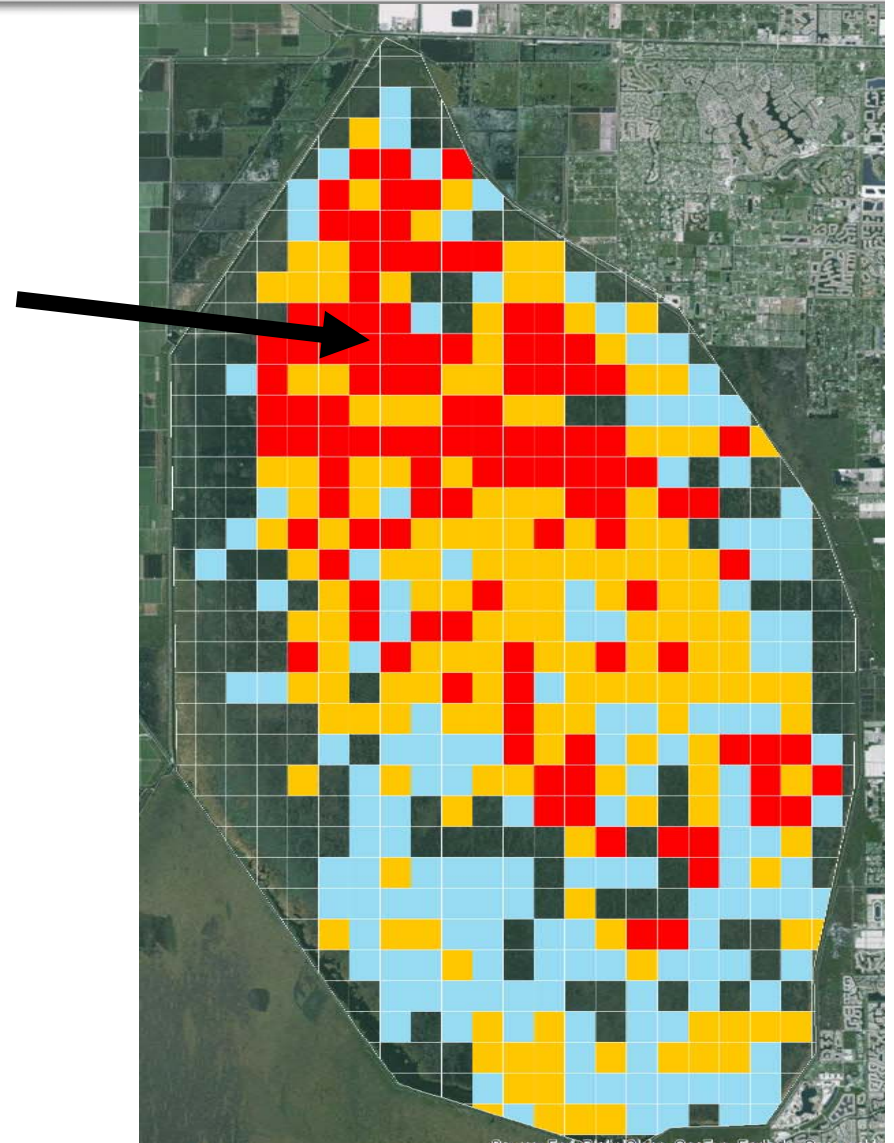




# Old World Climbing Fern (August 2015)



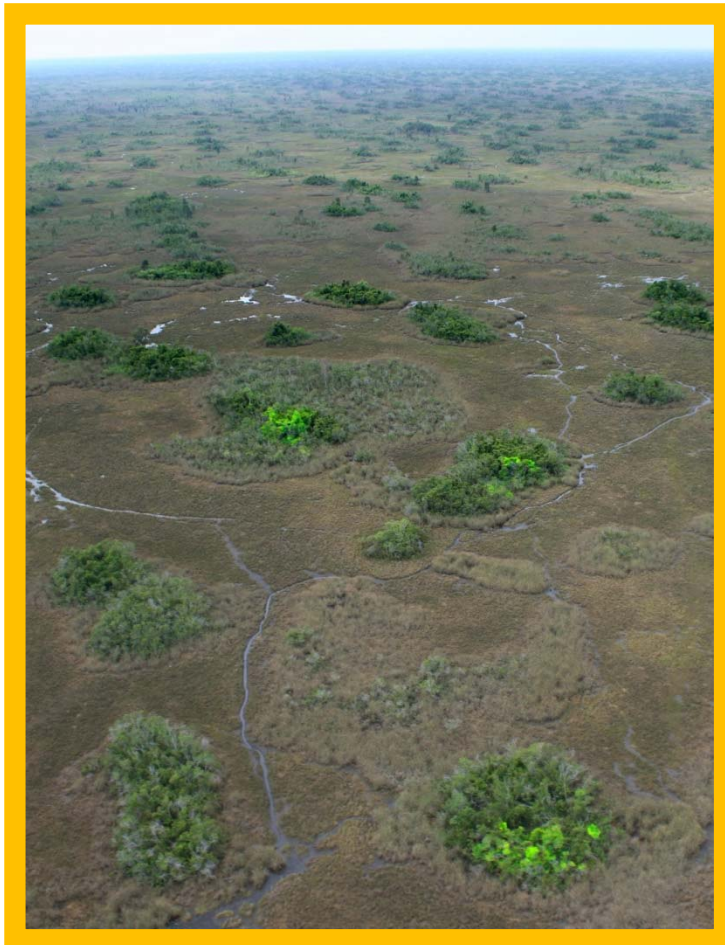
**High Abundance**



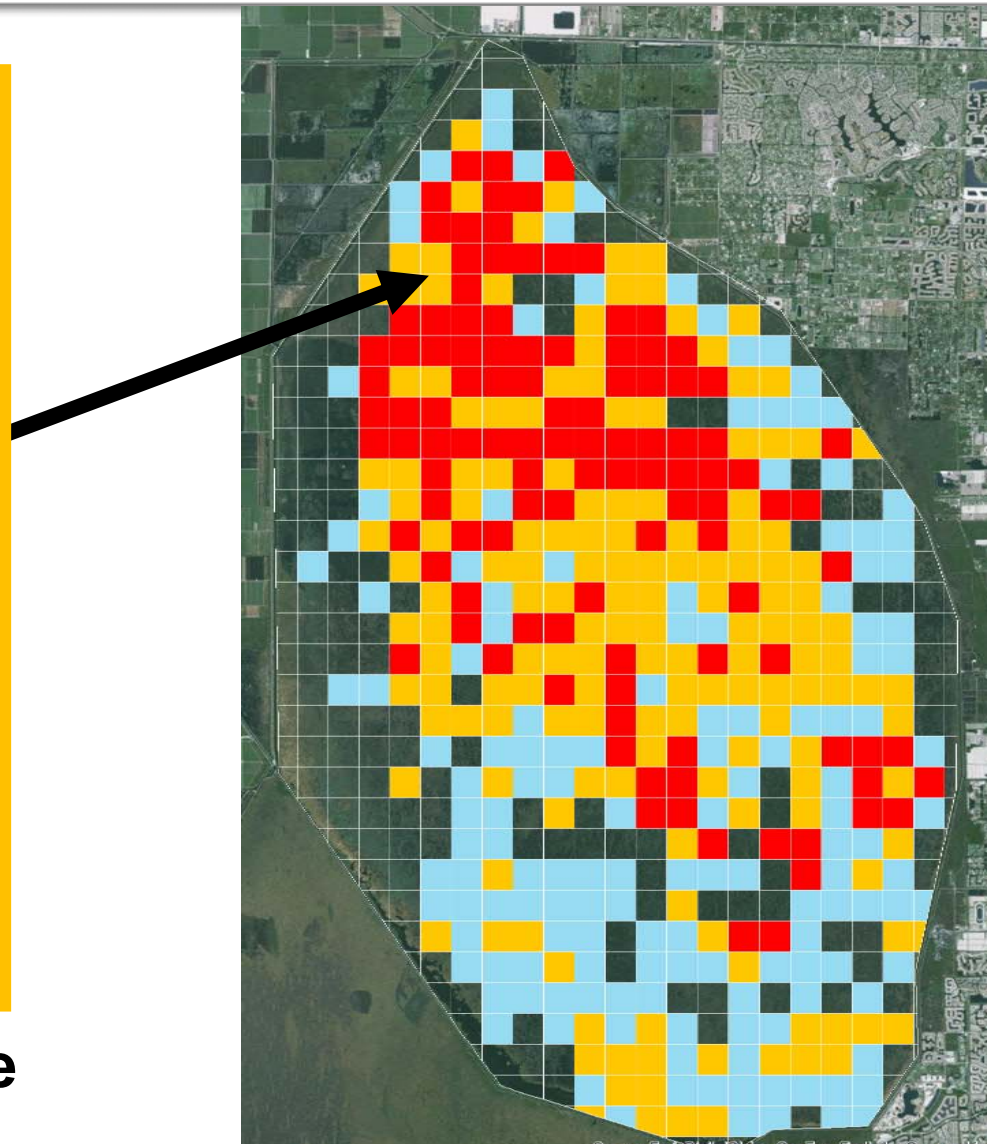




# Old World Climbing Fern (August 2015)



**Intermediate Abundance**



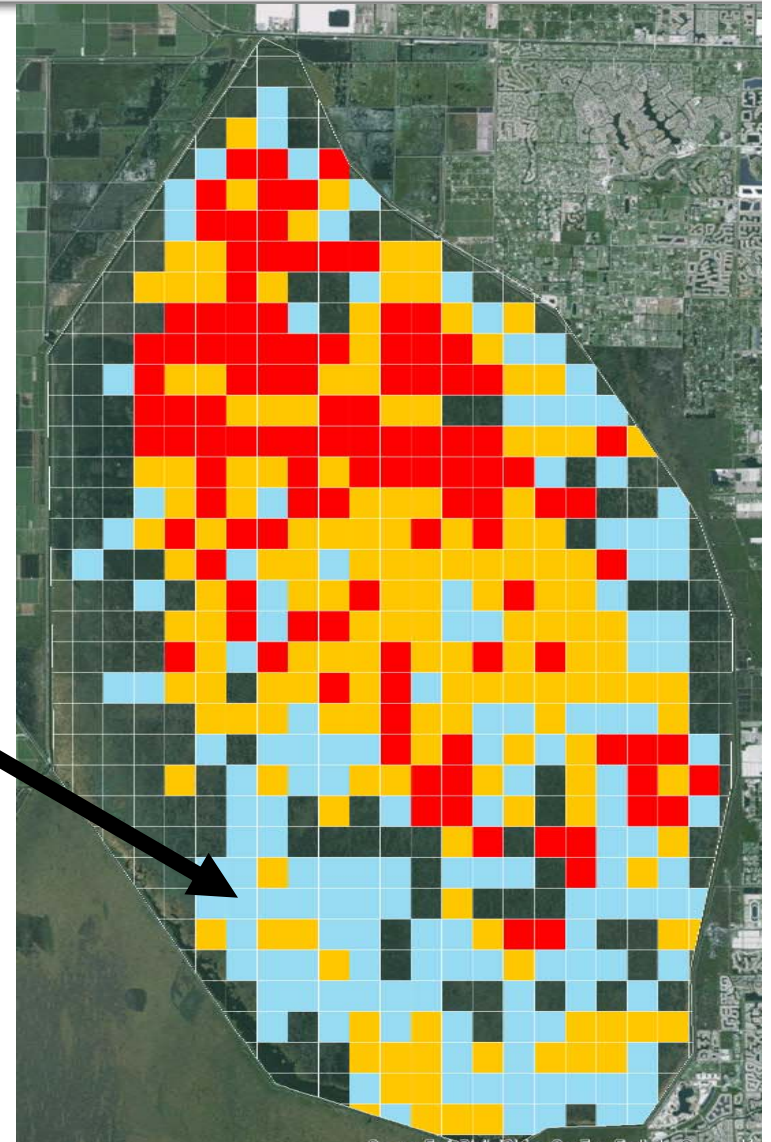




# Old World Climbing Fern (August 2015)



**Low Abundance**



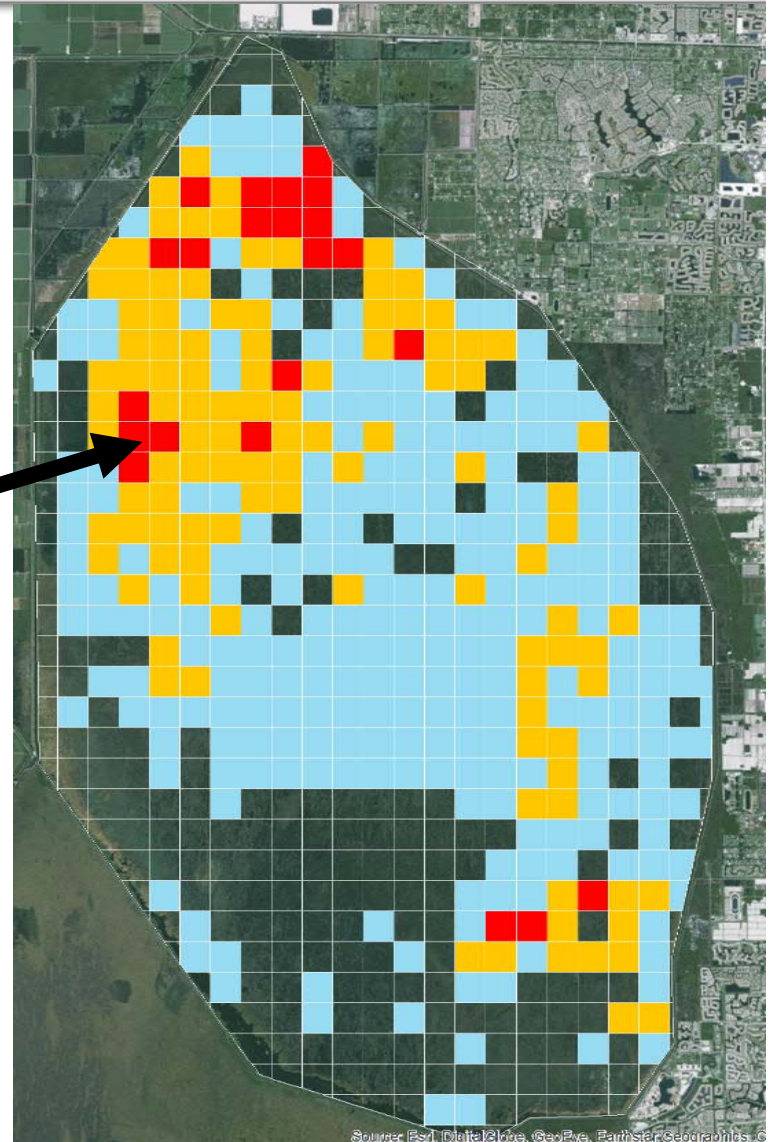




# Melaleuca (August 2015)



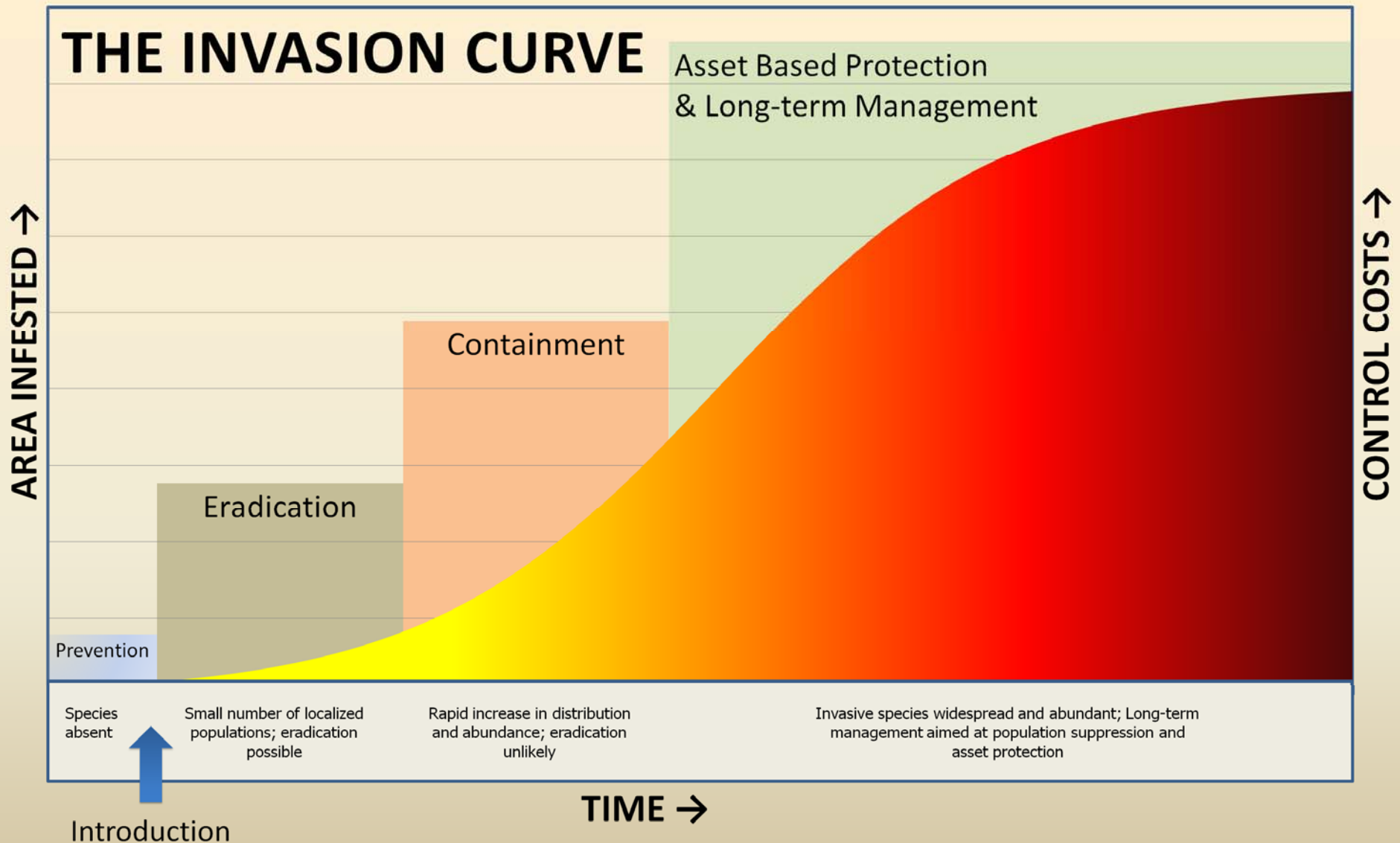
**High Abundance**





# Deferment Increases Management Cost

## THE INVASION CURVE

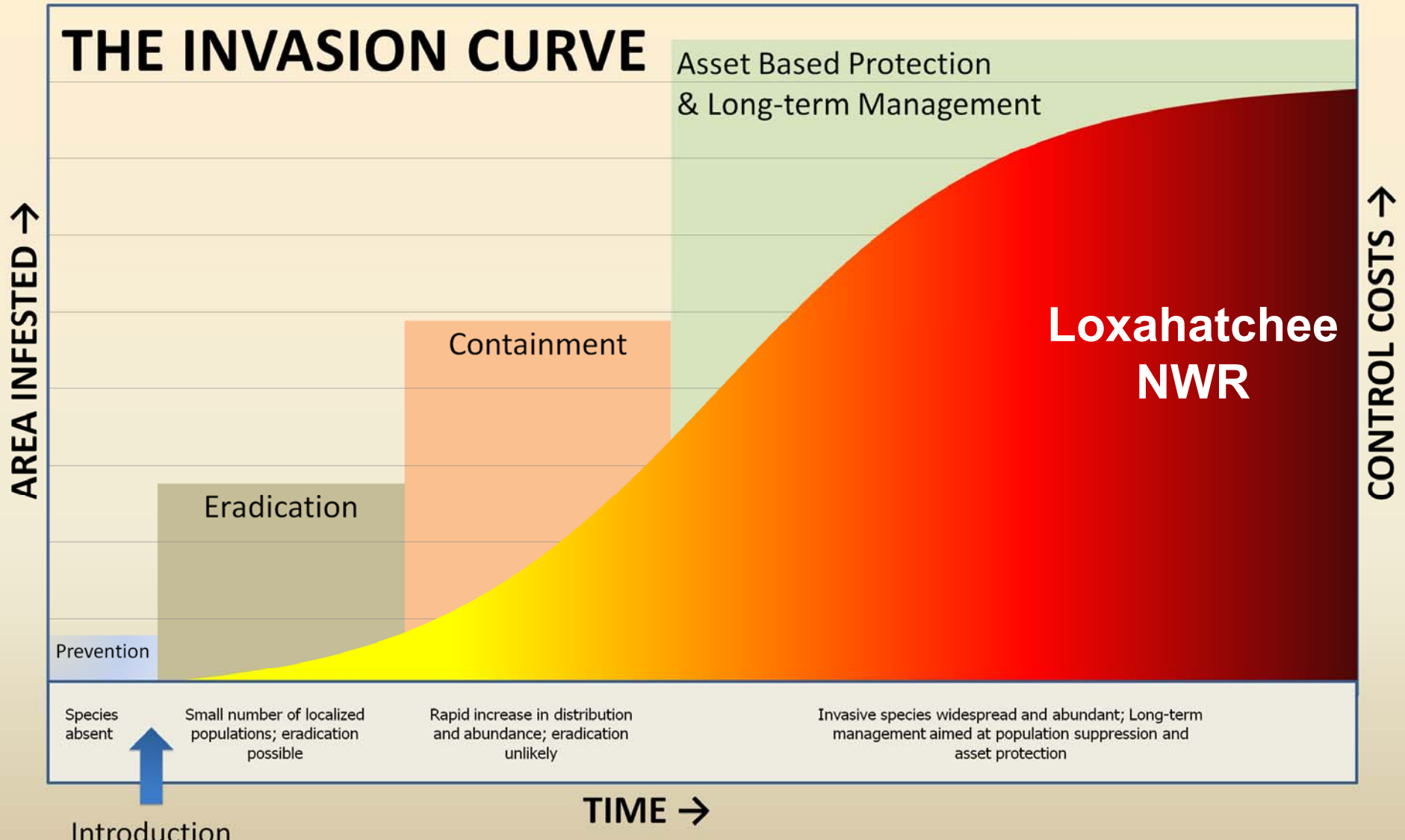






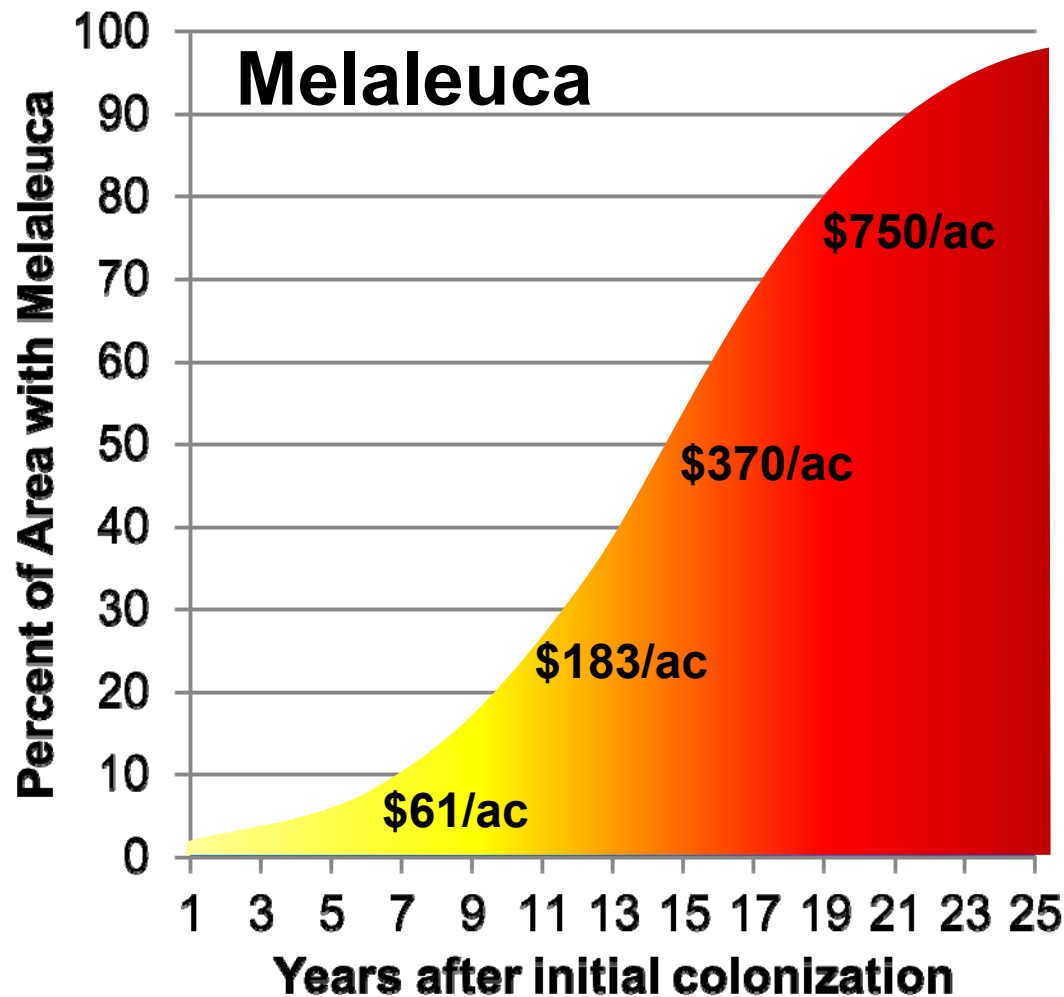
# Deferment Increases Management Cost

## THE INVASION CURVE





## Real World Example: WCA 2 & 3



**5% to 95% infestation in 25 yrs**

**Control costs also increase exponentially**

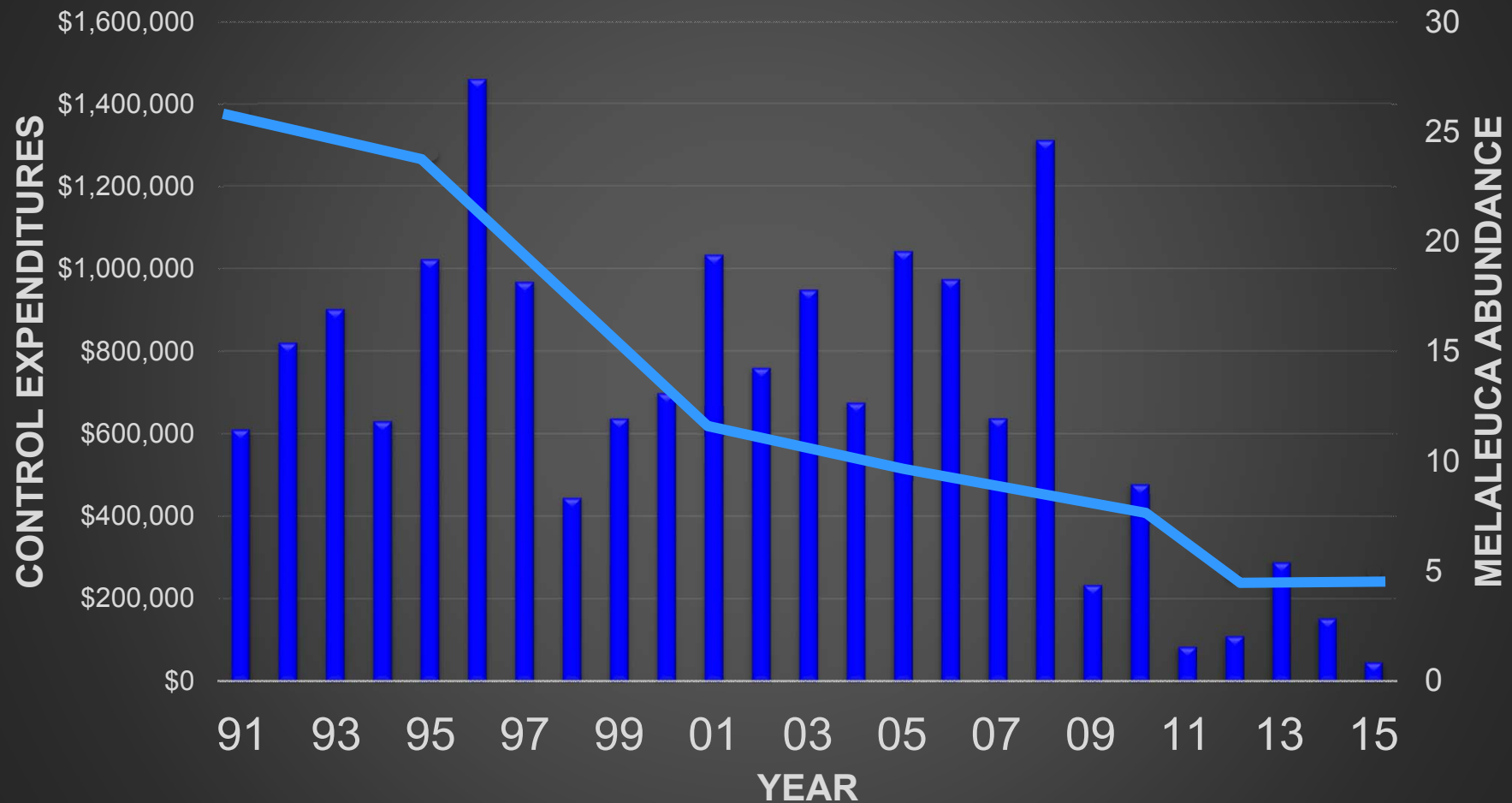
Source: F. Laroche & A. Ferriter 1992. *Journal of Aquatic Plant Management*. 30: 62-65





# Real World Example: WCA 2&3

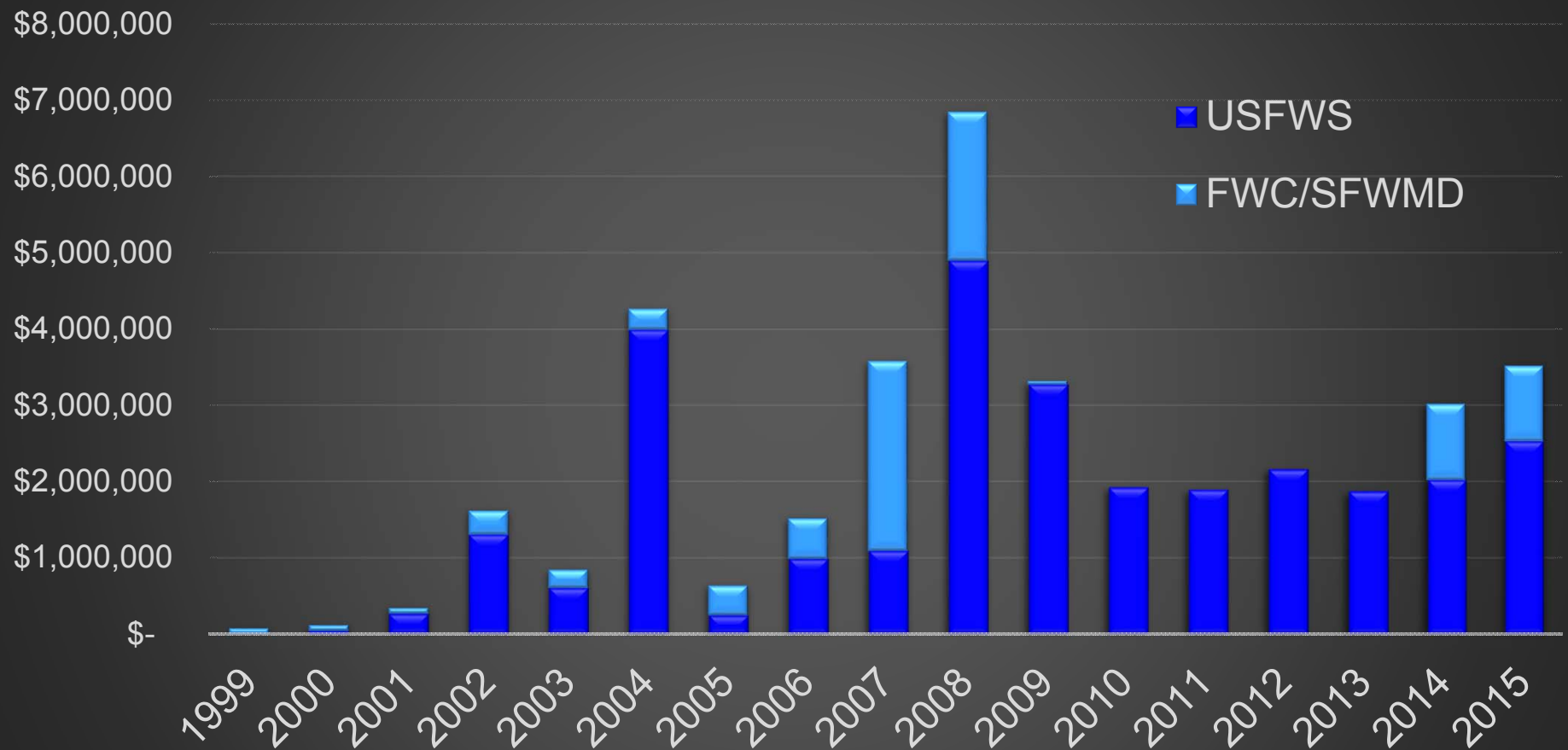
## Melaleuca





# Refuge Expenditures, 1999 – 2015

LWNR Exotic Plant Control Expenditures







# Loxahatchee National Wildlife Refuge License Agreement

## Background

**1951** SFWMD and U.S. Fish & Wildlife Service enter into a 50-year License Agreement for use of WCA-1 as the Loxahatchee National Wildlife Refuge

**2000** Service completes its Comprehensive Conservation Plan for the Refuge

**2002** District and Service enter into a new 50-year License Agreement





# Loxahatchee National Wildlife Refuge License Agreement

## **License Agreement Terms:**

- SFWMD retains Primary Use of WCA-1
- Refuge Management
- Performance Goals and Measures
- Federal Funding Availability
- Default Provision





## SFWMD Retains Primary Use of WCA-1

- **U.S. Fish & Wildlife Service has only a license (a non-exclusive right of use)**
- **SFWMD reserves primary use of WCA-1 for its mission purposes**



# Refuge Management

**U.S. Fish & Wildlife Service manages the Loxahatchee Refuge as part of the National Wildlife Refuge System**

**GOAL:**

**Conservation, management and restoration of wildlife**

**Identified management practices:**

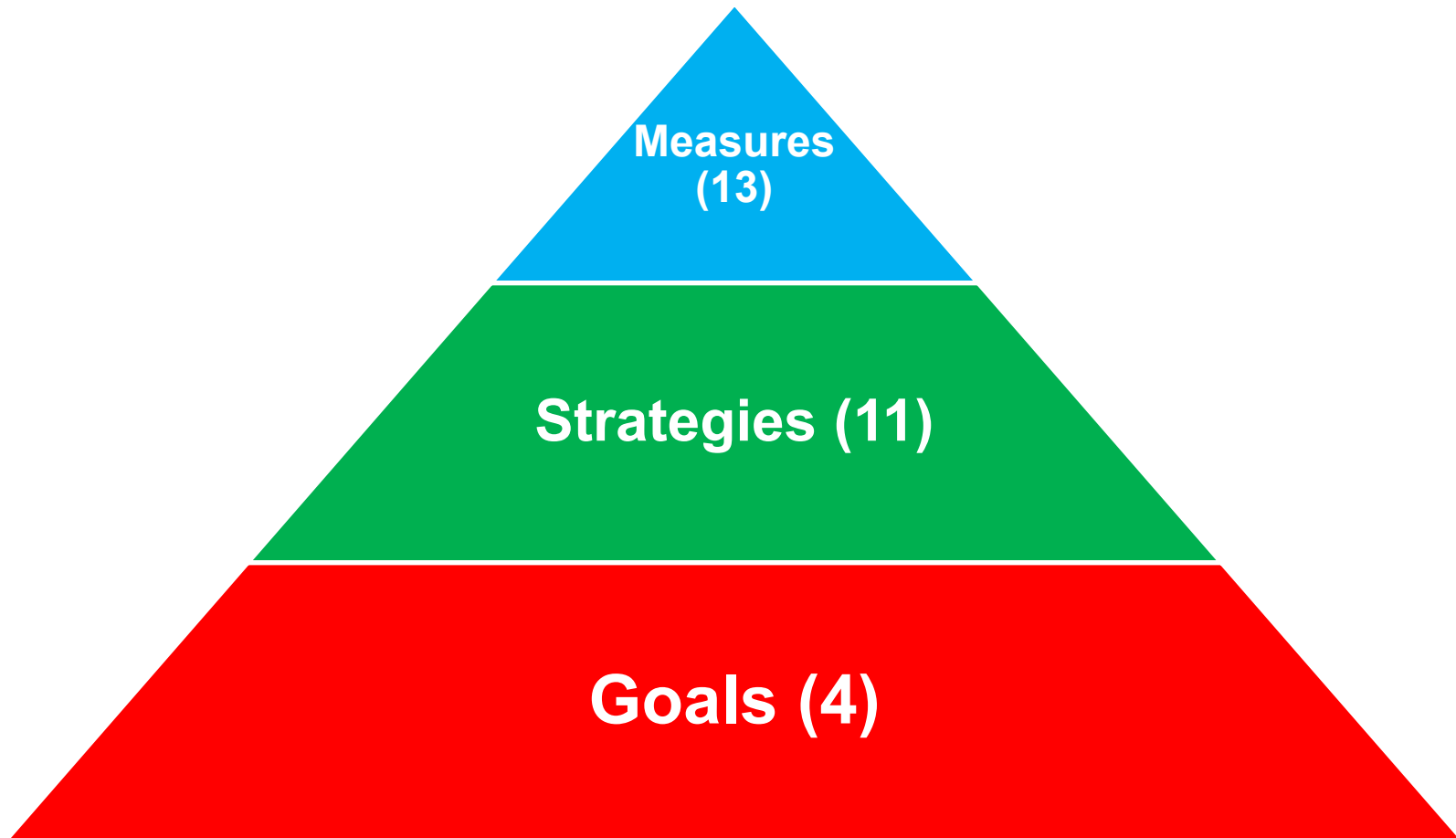
- Protecting habitats to ensure healthy wildlife populations
- Ecosystem monitoring and research
- Using prescribed burns
- Wildlife-dependent recreational uses
- Public education programs





# License Agreement

## Performance Goals, Strategies and Measures





# Goals, Strategies, Performance Measures



**Goal 2:** Maintain and restore integrity of Everglades Habitat with particular attention to control of invasive exotic plants and protection of tree islands.

**Strategy:** Achieve and sustain a maintenance level control of Melaleuca, Old World climbing fern, Brazilian Pepper, and Australian pine within 15 years.

**Measure:** Percentage of Infestation at sustain maintenance control will meet or exceed the following schedule:





# Performance Goals, Strategies and Measures

**Measure:** Percentage of infestation at sustain maintenance control will meet or exceed the following schedule:

Species	Year 2007	Year 2012	Year 2017
Melaleuca	20%	75%	100%
Old World climbing fern	10%	50%	100%
Brazilian pepper	20%	50%	100%
Australian pine	100%	100%	100%



## Federal Funding Availability

- Service's performance subject to availability of future appropriations
- Service will use best efforts to obtain appropriations adequate to support performance of its obligations.





## Memorandum of Understanding

- Three-party Memorandum of Understanding (MOU) was signed in April 2015

### **GOAL:**

### **Coordinate invasive plant management in the Refuge**

- Parties are SFWMD ~ FWC ~ USFWS
- 5-Year Term; may be renewed
- Establishes a coordinated treatment plan for exotic plants for FY2015 through FY2018



## Summary

- Refuge not currently projected to meet 2017 performance measures for melaleuca and Old World climbing fern
- Current funding insufficient to achieve maintenance control





## Options

- Send Notice of 2017 Deadline
- Extend and/or Amend Performance Measures
- Amend MOU or License
- Require Service to Develop a Recovery Plan
- Send Formal Notice of Default

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

