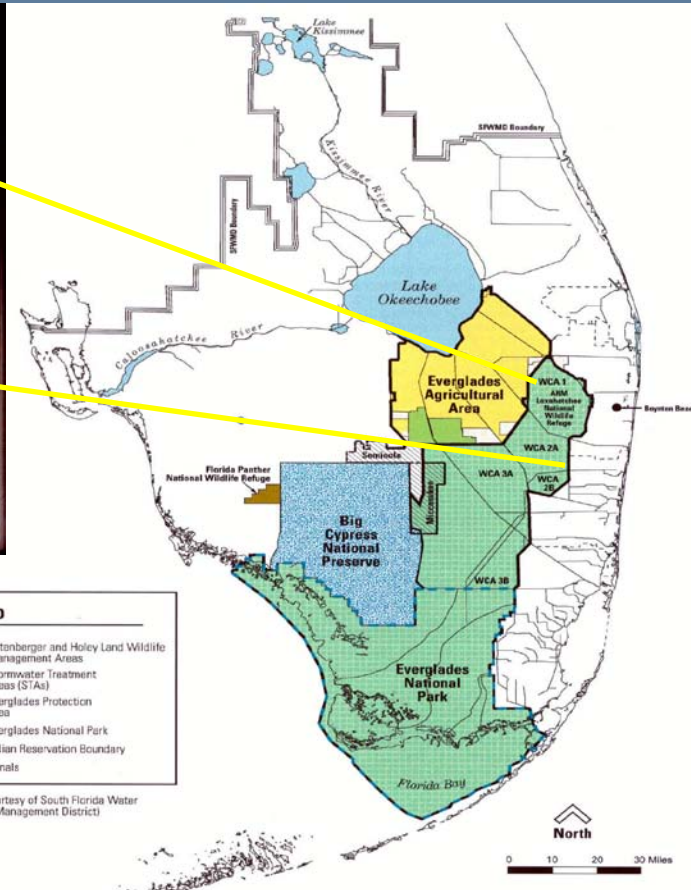
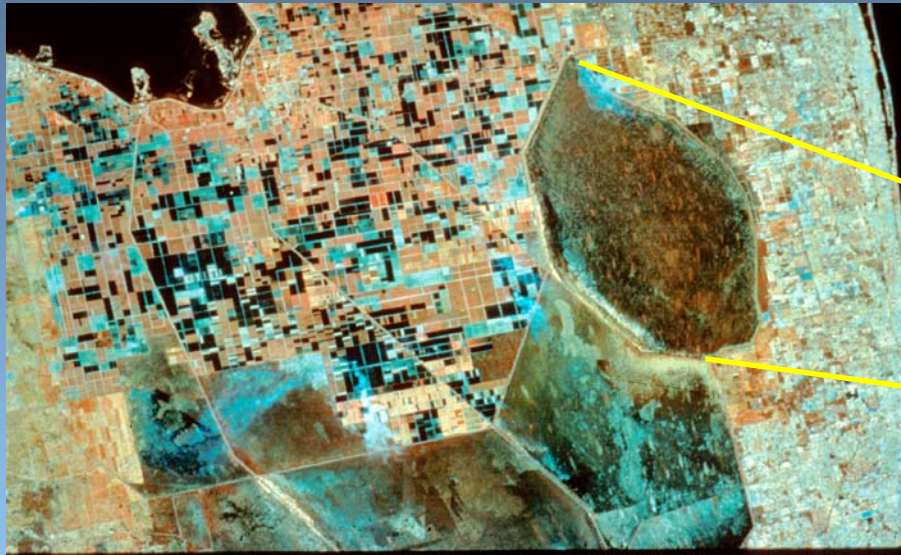


Arthur R. Marshall Loxahatchee National Wildlife Refuge



Lisa Jameson
United States
Fish and Wildlife Service



History/Background

The Refuge(WCA1) was established in 1951 under a 50 year license agreement with South Florida Water Management District under the Migratory Bird Conservation Act.

– Objective

To achieve maintenance control of all exotic plant species present within the Refuge



Priority Plant Species

- **Priority Plants**

Old World Climbing Fern (*Lygodium microphyllum*)

Melaleuca (*Melaleuca quinquenervia*)

Brazilian pepper (*Schinus terebinthifolius*)

Under maintenance control.

Australian pine (*Casuarina equisetifolia*)

Under maintenance control.

- **Secondary Plants**

Hydrilla

Water Lettuce

Water Hyacinth

Carrotwood

Shoebutt on ardisia

Earleaf Acacia

Papaya

Java Plum



Priority Animal Species

- **Priority Animals:**

Sacred ibis: unconfirmed reports in Wood Stork nesting colonies

Purple swamp hen: none reported but anticipate they can utilize interior

Pythons: unconfirmed reports in the interior and along levee

Nile monitor lizard: unconfirmed report in compartment D

Iguanas: there here and being watched

- **Currently trapping for:**

Redbay Ambrosia Beetle
(*Xyleborus glabratus*)

Bromeliad Weevil
(*Metamasius callizona*)



Aerial Treatments

To achieve maintenance control of Brazilian pepper, Melaleuca and Old World Climbing Fern within the Refuge

September 2008

**Brazilian pepper –
377 acres - \$ 69,368- Completed**

**Melaleuca –
300 acres- \$65,700 - Completed**

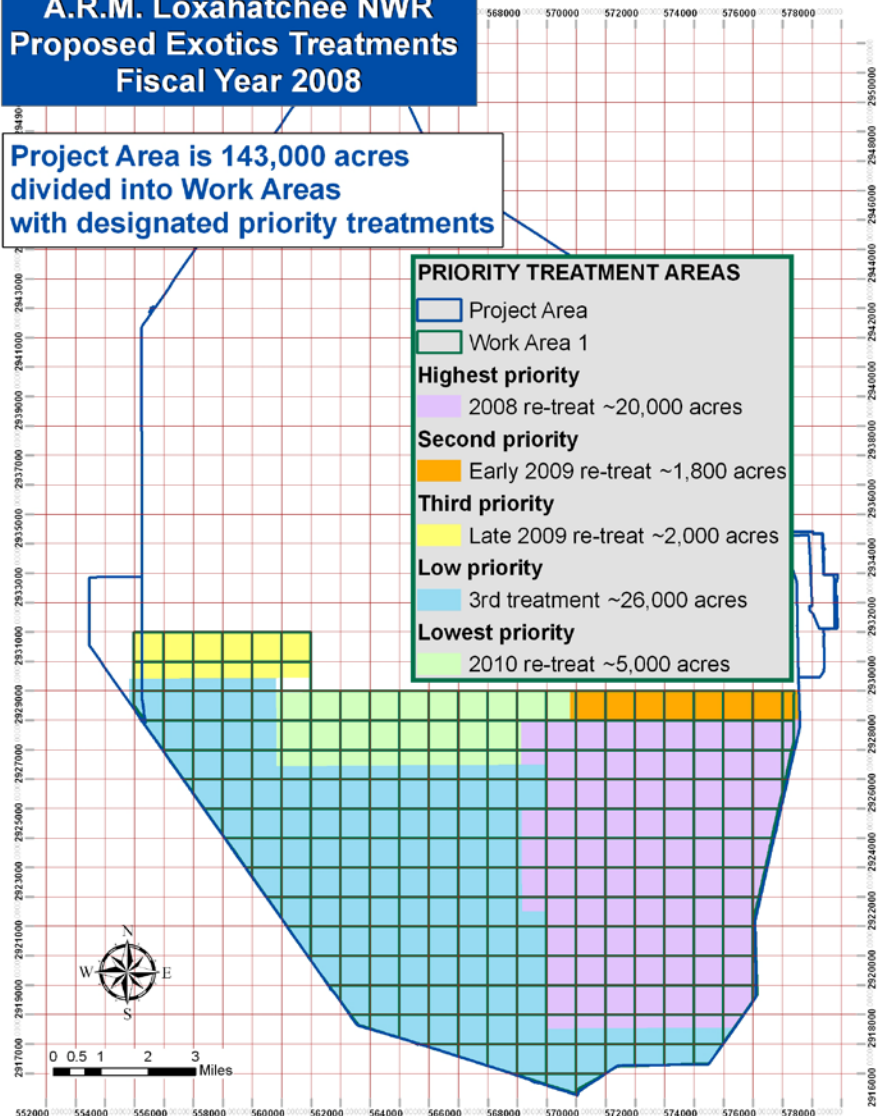
**Old World Climbing Fern-
6,040 acres- \$899,960.00-Completed**



Ground Treatments

A.R.M. Loxahatchee NWR
Proposed Exotics Treatments
Fiscal Year 2008

Project Area is 143,000 acres
divided into Work Areas
with designated priority treatments



Work Area I

Awarded to :
**Aquatic Vegetation Control Inc.
(AVC)**

Start Date: December, 2008

6- Airboats

6- Supervisors

36- Crewmembers

End Date: On going

Completed: 20,783 acres

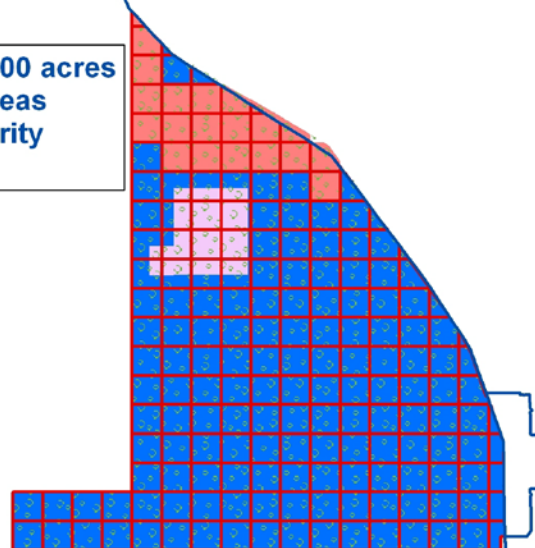
Spent: \$1,012,432.82



Ground Treatments

A.R.M. LOXAHATCHEE NWR PROPOSED EXOTICS TREATMENTS FISCAL YEAR 2008

Project Area is 143,000 acres
divided into Work Areas
with designated priority
treatment areas



Priority Treatment Areas

- Project Area
- Work Area 2
- Highest priority**
 - 2008 re-treat Lygodium
- Second priority**
 - Aerially treated Lygodium islands
- Third priority**
 - 2008 re-treat
- Lowest priority**
 - 2009 initial treatment



0 0.5 1 2 3 Miles

Work Area II

Awarded to:

**Southeastern Chemtreat Inc.
(SECT)**

Start Date: October , 2008

4-Airboats

2- Supervisors

16-Crewmembers

End Date: On-going

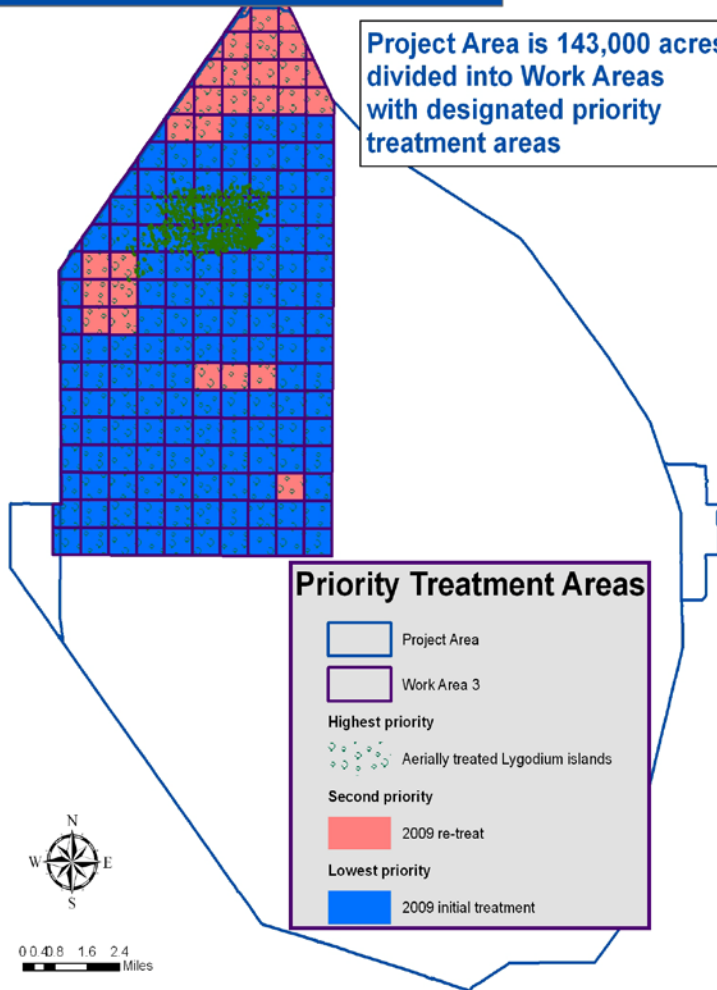
Completed: 2,411 acres

Spent: \$614,118.83

Ground Treatments

A.R.M. LOXAHATCHEE NWR
PROPOSED EXOTICS TREATMENTS
FISCAL YEAR 2008

Project Area is 143,000 acres
divided into Work Areas
with designated priority
treatment areas



Work Area III

Awarded to:
Applied Aquatic
Management Inc.
(AAM)

Start Date: September, 2008

12-Airboats

12-Supervisors

60-Crewmembers

End Date: On -going

Completed: 8,266 acres

Spent: \$ 1,035,467.82



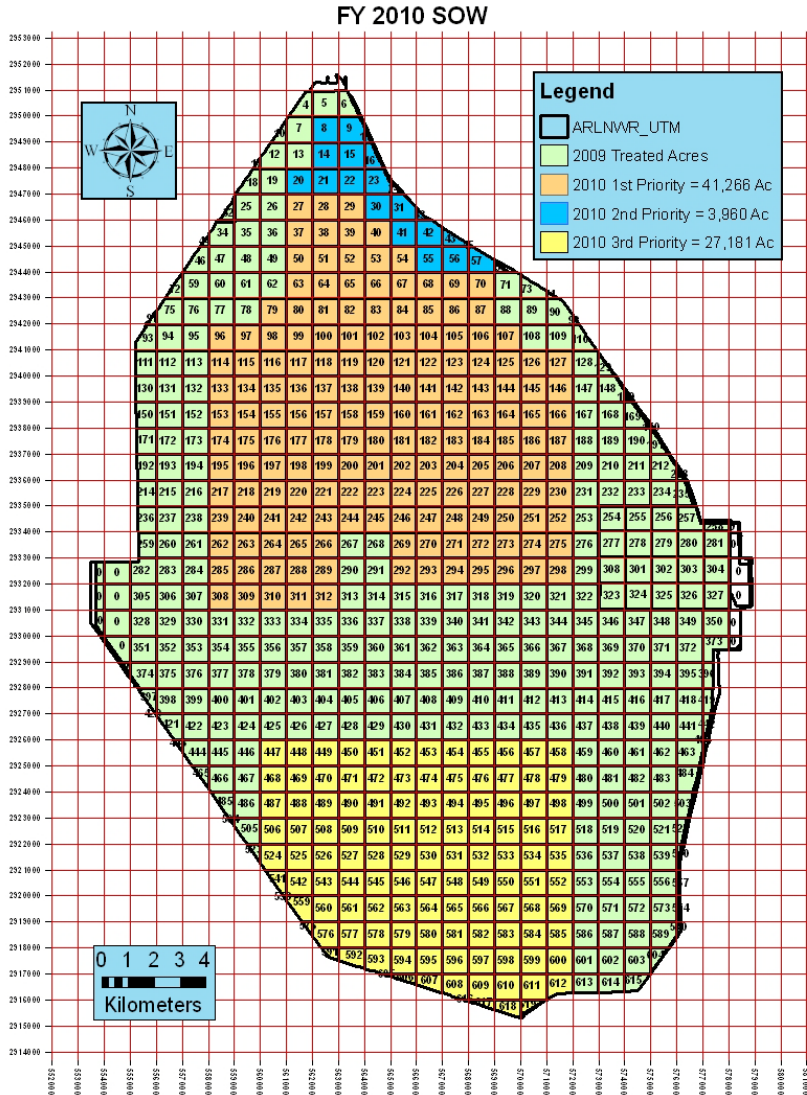
Ground Treatments



Compartment D
Awarded to: NaturChem
Start Date: May, 2009
End Date: Completed
Completed: acres 300
Spent: \$ 123,348



Fiscal Year Treatments: 2009



- Aerial = 6,717
- Ground = 31,760
- Prescribe Fire = 17,300

Total 55,530

Biological Control Needs



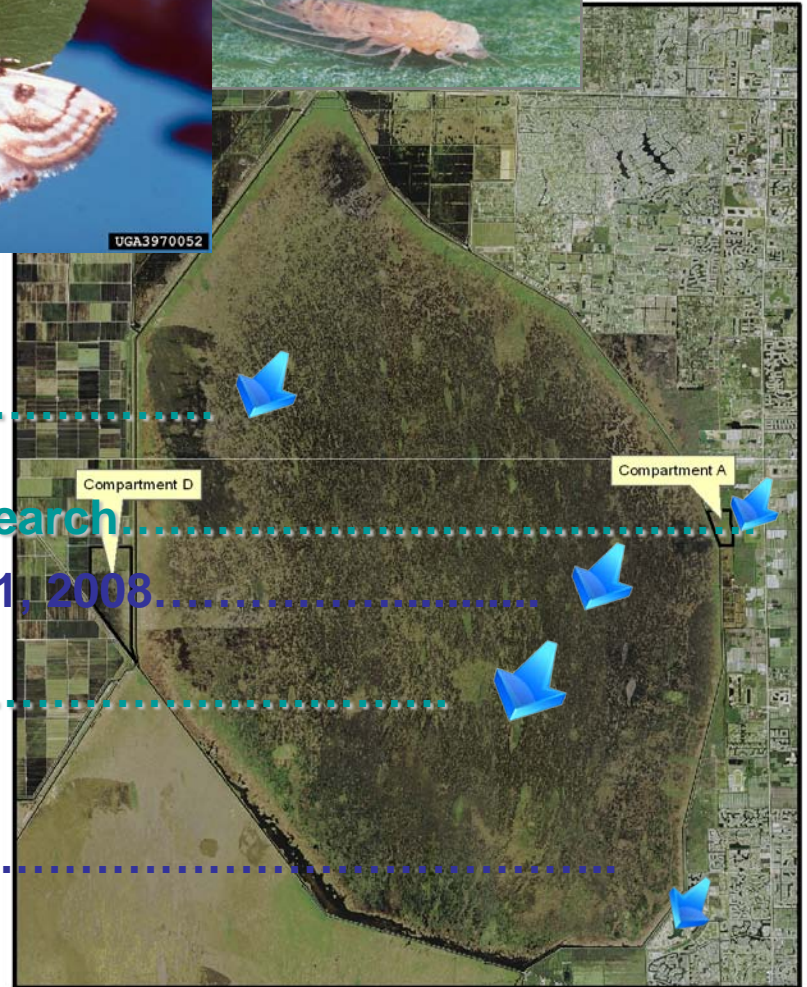
Brown Lygodium Moth :
March 2009 – 8800 larva

Water Lettuce native bio-control research.....

Melaleuca psyllid: 17,000 adults 2001, 2008.....

October 2008 – 4400 larva.....

**Melaleuca psyllid: released on
FLEPPC test plots outside Refuge.....**



Wallace, Loxahatchee Fire Management



Monitoring

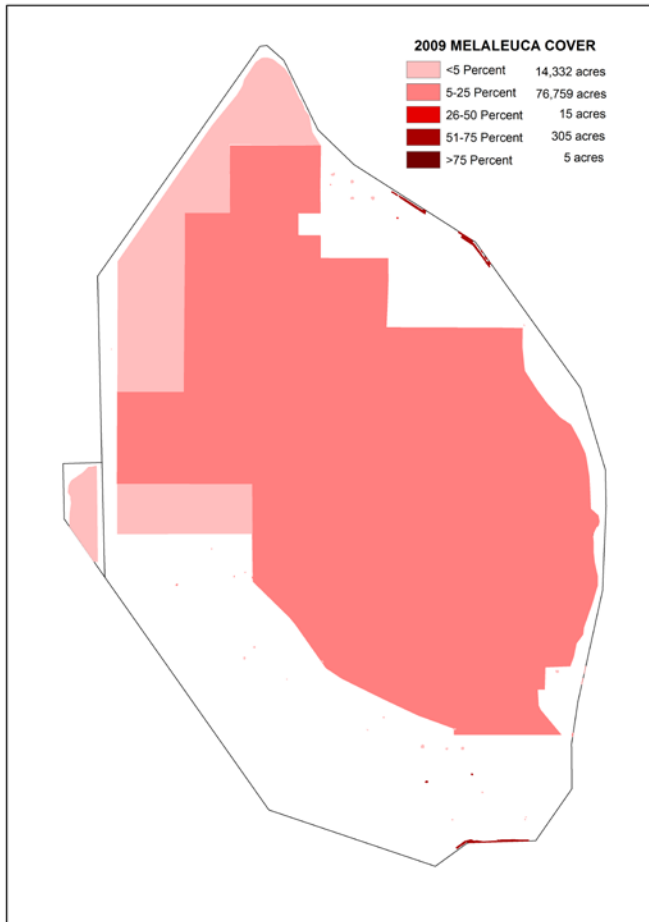
Systematic Reconnaissance Flights
2002, 2003, 2005

Digital Aerial Sketch Mapping
(SFWMD, NPS)
2005, 2007, 2008, 2009

Prescribed fire post-burn vegetation
2008, 2009



Digital Aerial Sketch Mapping



Arthur R. Marshall
Loxahatchee N.W.R.

2009 Melaleuca

Coverage Class	Acres
High	310
Medium	15
Low	91,091
Total	91,416

2008 Melaleuca

Coverage Class	Acres
High	669
Medium	90,217
Low	268
Total	91,154

Digital Aerial Sketch Mapping



Arthur R. Marshall
Loxahatchee N.W.R.

2009 Brazilian Pepper

Coverage Class	Acres
High	26
Medium	226
Low	168
Total	420

2008 - Brazilian Pepper

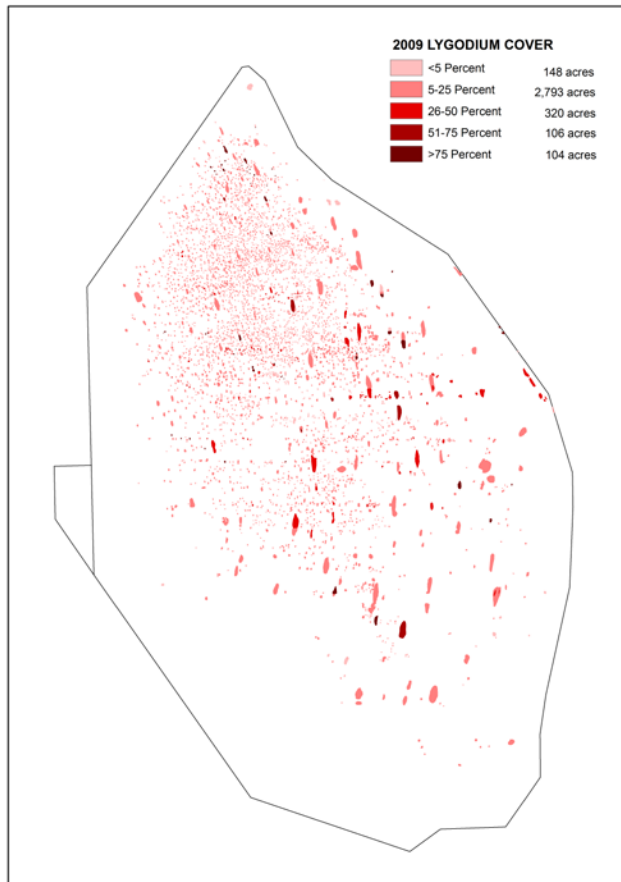
Coverage Class	Acres
High	245
Medium	436
Low	13
Total	694

Digital Aerial Sketch Mapping

Arthur R. Marshall
Loxahatchee N.W.R.

2009

Old World Climbing Fern



Coverage Class	Acres
High	210
Medium	320
Low	2,941
Total	3,471

2008

Old World Climbing Fern

Coverage Class	Acres
High	614
Medium	2,189
Low	127
Total	2,931



Monitoring



Daily Monitoring:

Contractors:
Equipment
Personal
Chemicals
Time

Contractors work:
Inspections of completed
treatments
Safety

Innovations and Successes

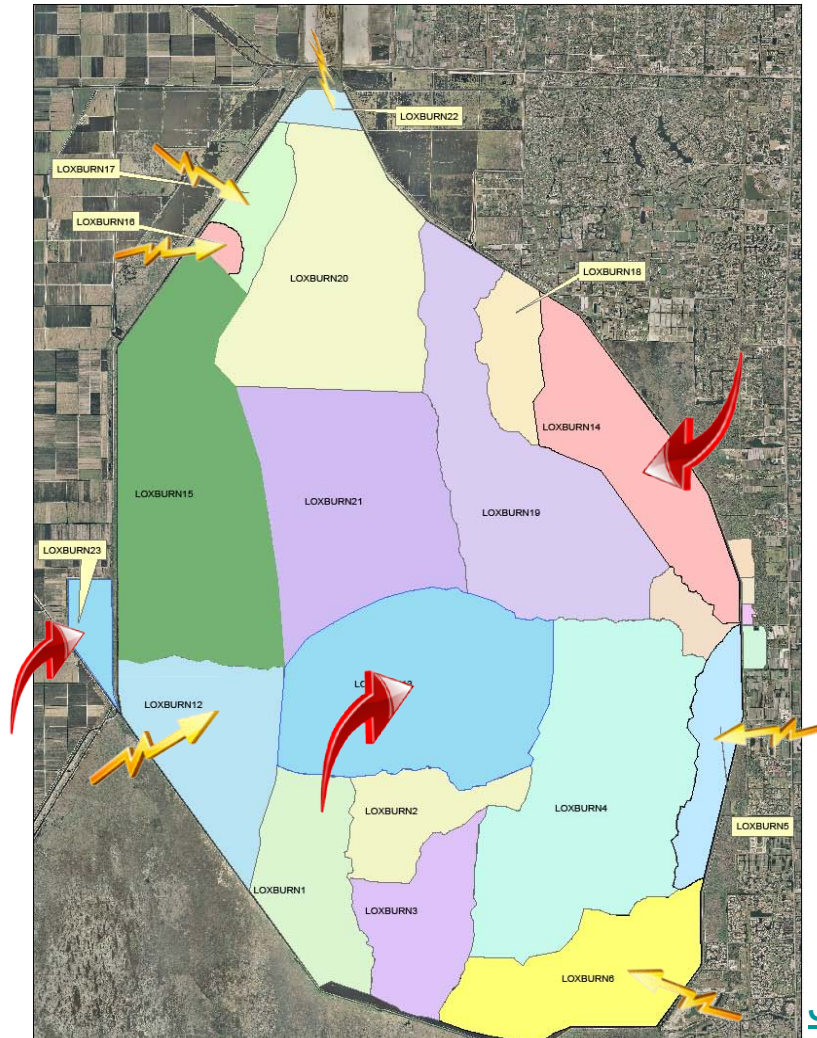
Broad Landscape Controls

Fire



17,300 acres¹¹ of¹⁴ prescribe fire treatments

2009 Prescribe Fire Treatments



Jon_Wallace@fws.gov
Prescribe Fire Specialist

Contractor Success

Pre-bid site visit

Standardized proposal requirements and evaluation

Daily monitoring and communication with contractor

Quarterly evaluation contractor

Final inspection and review at completion of work.



Lygodium biocontrol research



Dr. Krishnaswamy Jayachandran (Jay)
Department of Environmental Studies
Southeast Environmental Research Center
Florida International University

Questions???

