

# Biodiversity Conservation Planning in Florida

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Florida Fish and Wildlife Conservation Commission



# Biodiversity in Florida

Upland



Wetland



Freshwater Aquatic



Estuarine/Marine



82 Natural Communities

126 Freshwater  
Fishes



57 Amphibians



127 Reptiles



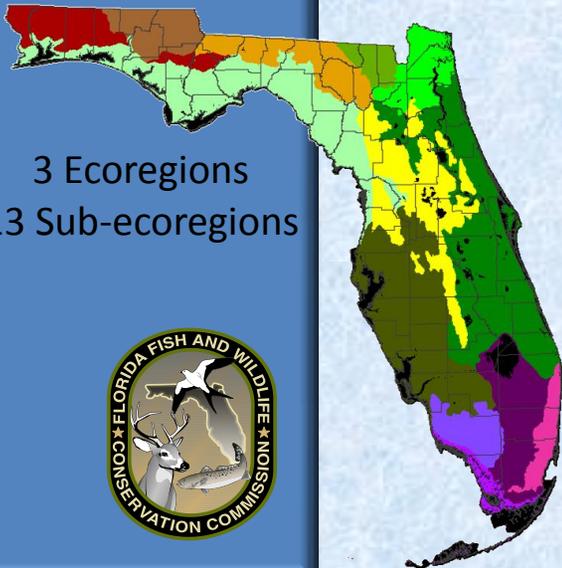
283 Birds



75 Mammals



3 Ecoregions  
13 Sub-ecoregions



≈3500 Vascular  
Plants



Unknown Number  
of Invertebrates



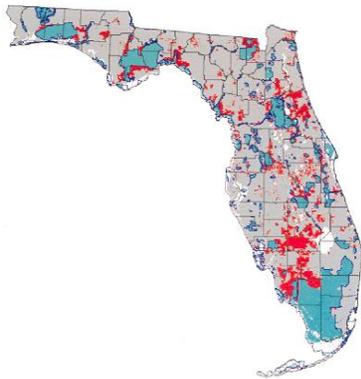
>1000 Estuarine  
and Marine Fishes

# Closing the Gaps

“To identify lands in Florida that, at a minimum, must be conserved and managed in order to ensure the long-term survival of key components of Florida’s biological diversity.”

## CLOSING THE GAPS IN FLORIDA’S WILDLIFE HABITAT CONSERVATION SYSTEM

*Recommendations to meet minimum conservation goals for  
declining wildlife species and rare plant and animal communities.*



James Cox, Randy Kautz, Maureen MacLaughlin, and Terry Gilbert

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620 South Meridian Street  
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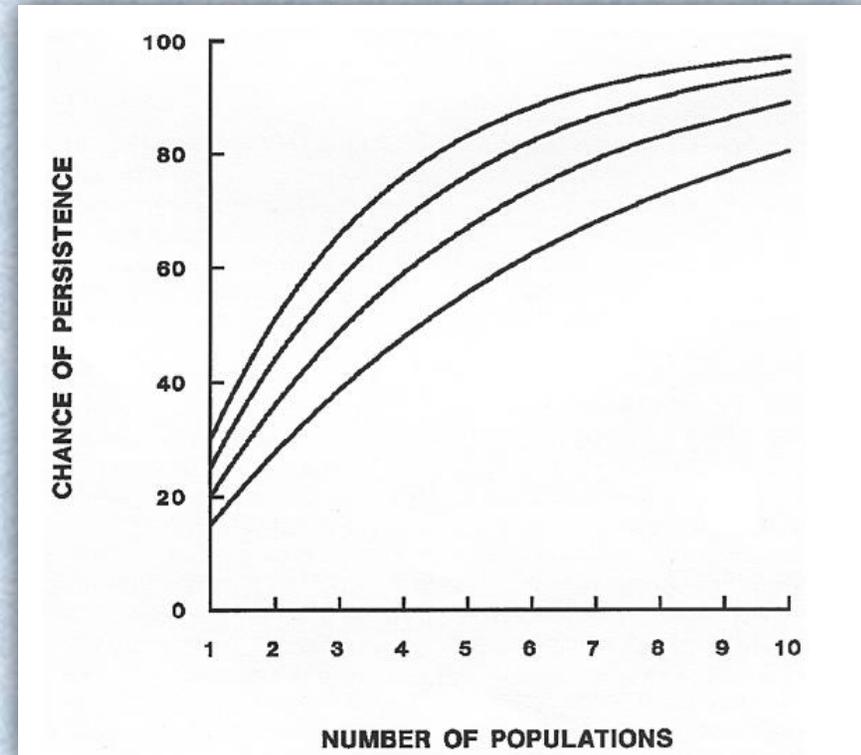
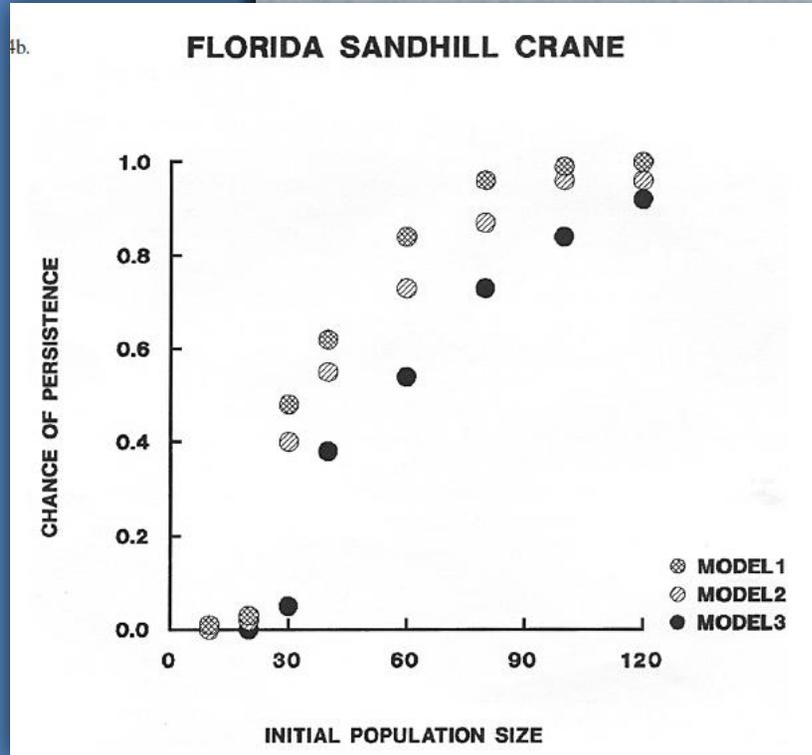
1994

- Assess degree of security
- Identify important habitat not currently protected
- Provide guidance to:
  - Public land acquisition
  - Land use planning
  - Development regulation
  - Land conservation efforts



# Assessing Species Security

- Generalized population model
  - 11 species
- Multiplicity
  - Increase chance of persistence



# Closing the Gaps

- **Question:** “How many focal species have 10 populations of 200 breeding adults on the current system of public lands?”
- **Technique:** Overlay public land boundaries on focal species maps and estimate population sizes.

“To identify lands in Florida that, at a minimum, must be conserved and managed in order to ensure the long-term survival of key components of Florida’s biological diversity.”



# Species Selection Criteria

- Habitat mapping capability
  - Estimated using GIS
- Available occurrence and life history information
- Large home range size and/or
- Links to specific rare plant communities



# Selected Species

- 542 terrestrial vertebrate taxa in Florida
  - 44 “focal species”
- Communal species
  - Bat Maternity and winter roost caves (2)
  - Wetlands important to wading birds (8)
  - Coastal communities
- Prairie bird communities
- Gap analysis of 120 species
  - Generalized models
- Priority natural communities (5)
- Rare Plants (105)



# 44 Focal Species



Black bear



Florida panther

Wide-ranging species

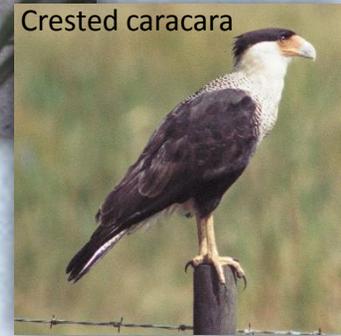


Wood stork



Beach mice

Listed species



Crested caracara



Florida scrub jay

Community indicators



Snail kite

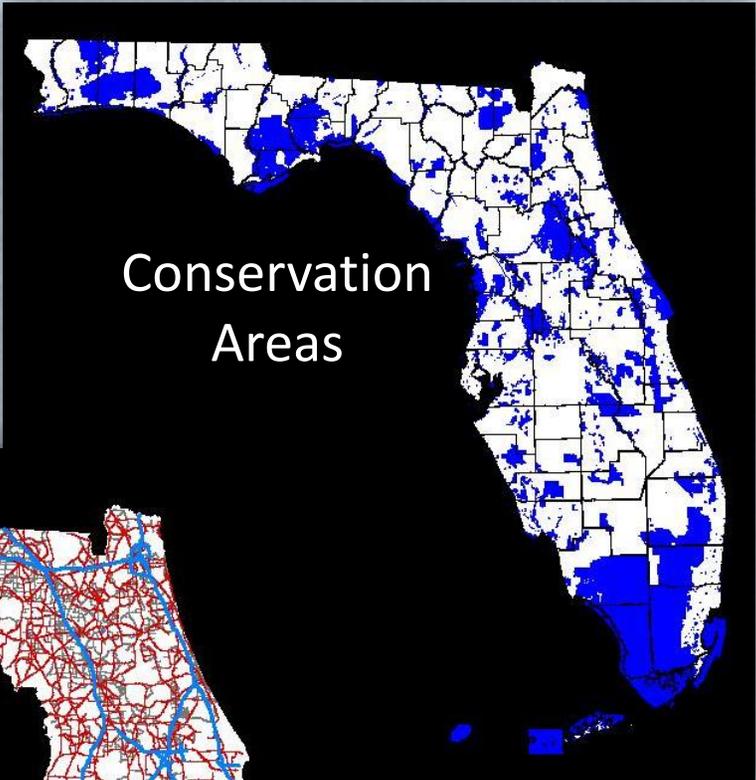
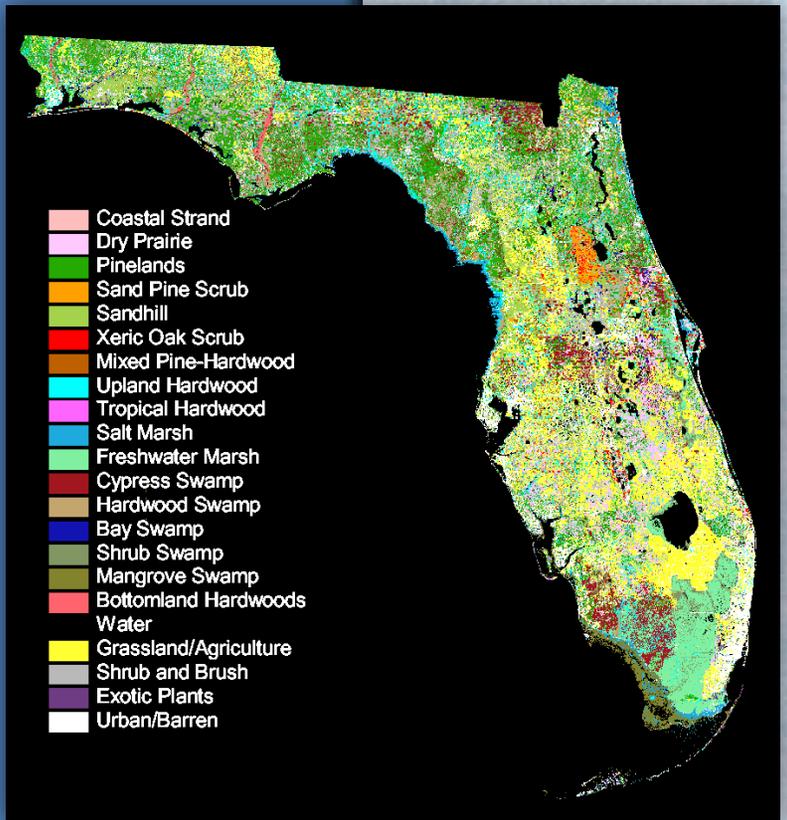


Gopher tortoise

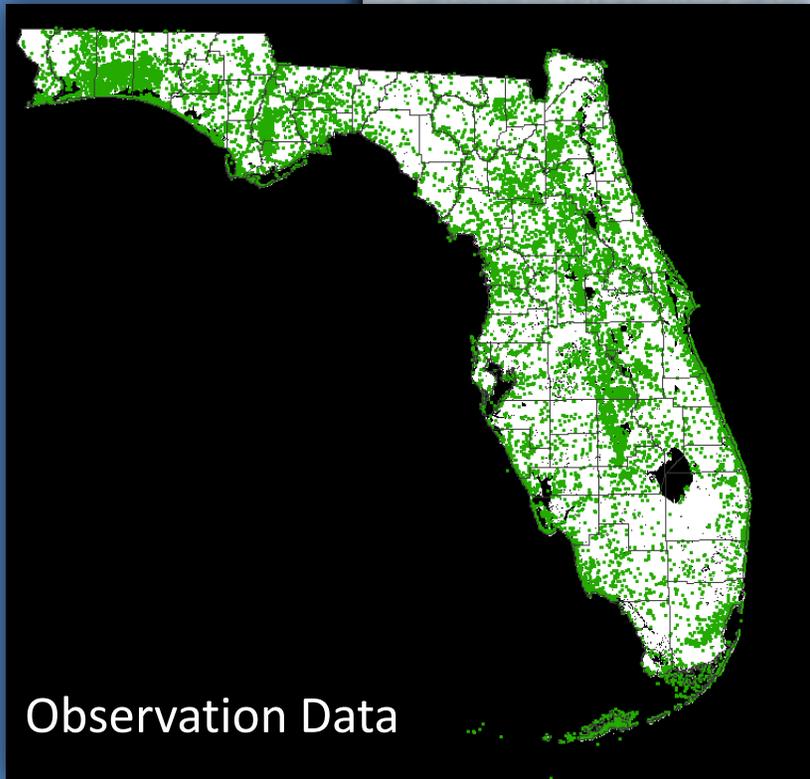
Keystone species



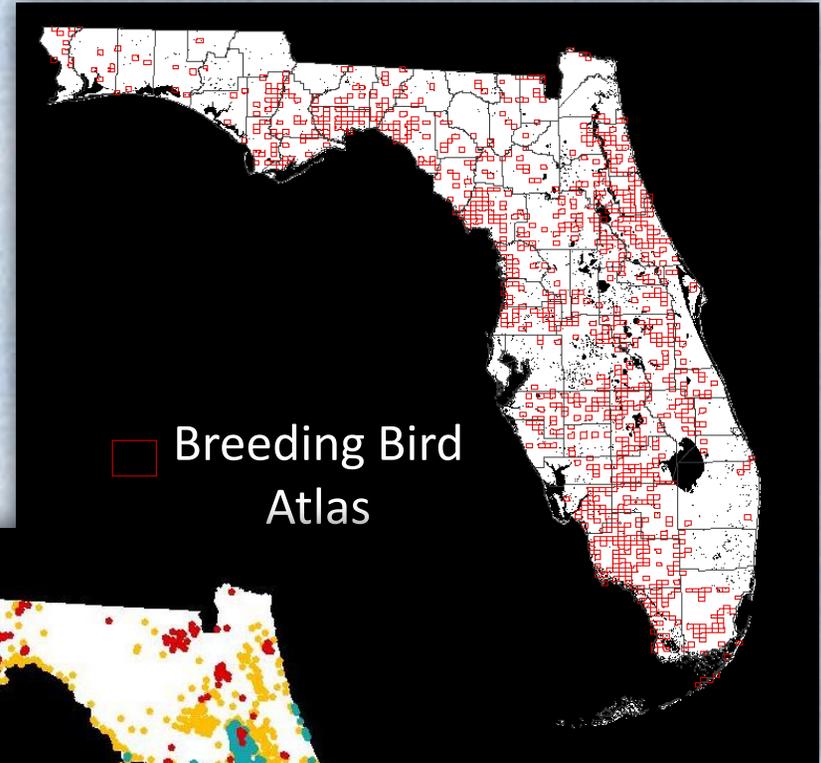
# GIS Data Sets



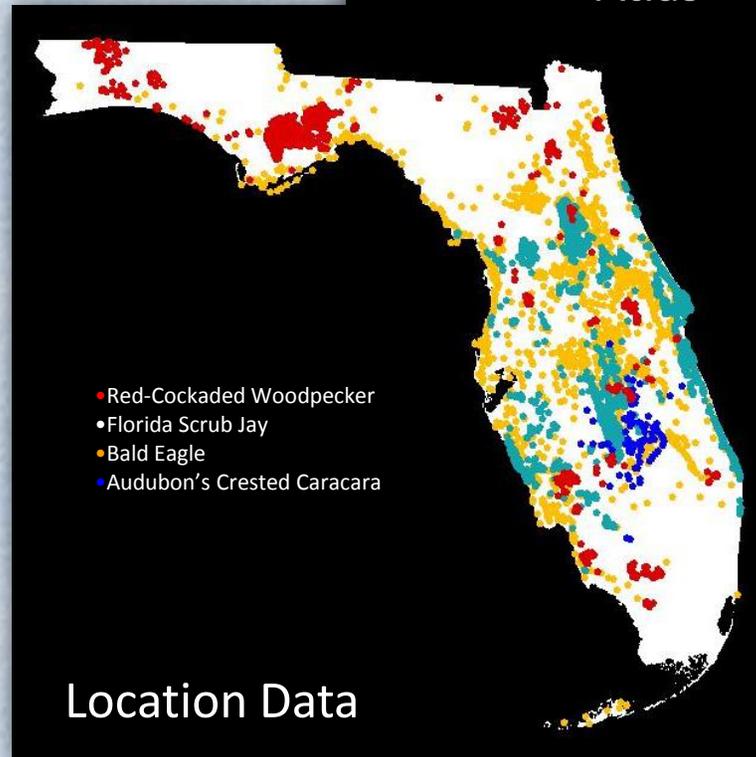
# Species GIS Data Sets



Observation Data



□ Breeding Bird Atlas



- Red-Cockaded Woodpecker
- Florida Scrub Jay
- Bald Eagle
- Audubon's Crested Caracara

Location Data



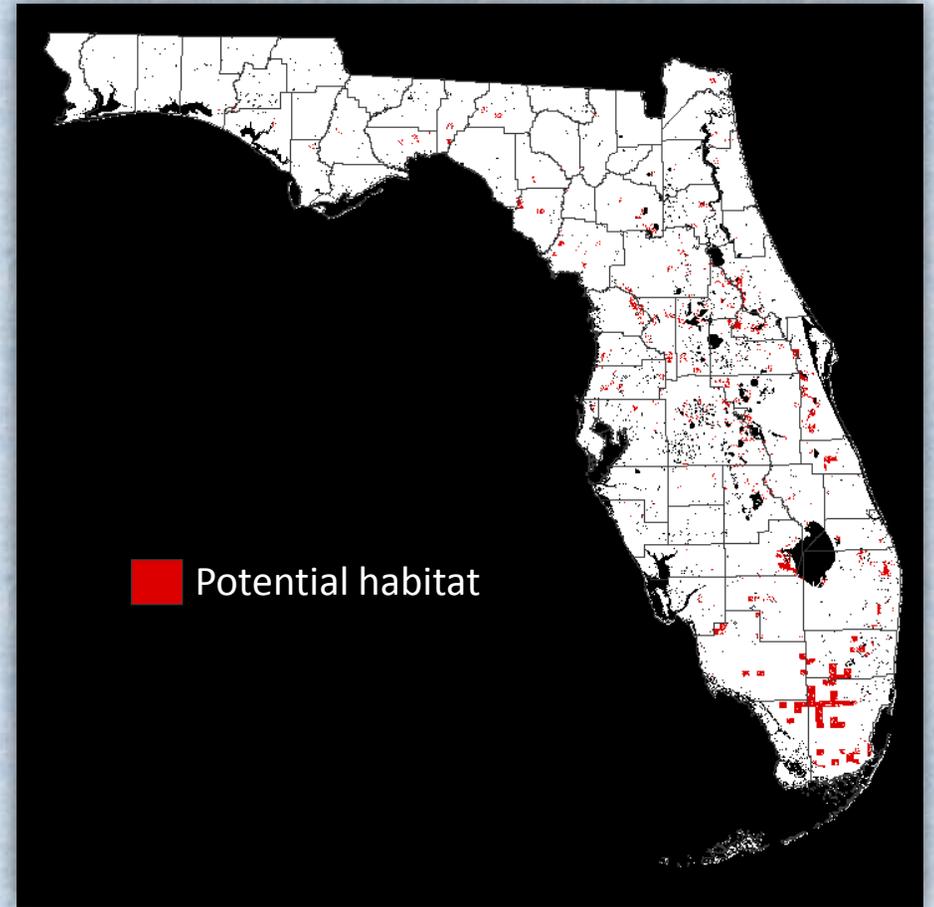


# Development of Distribution Maps

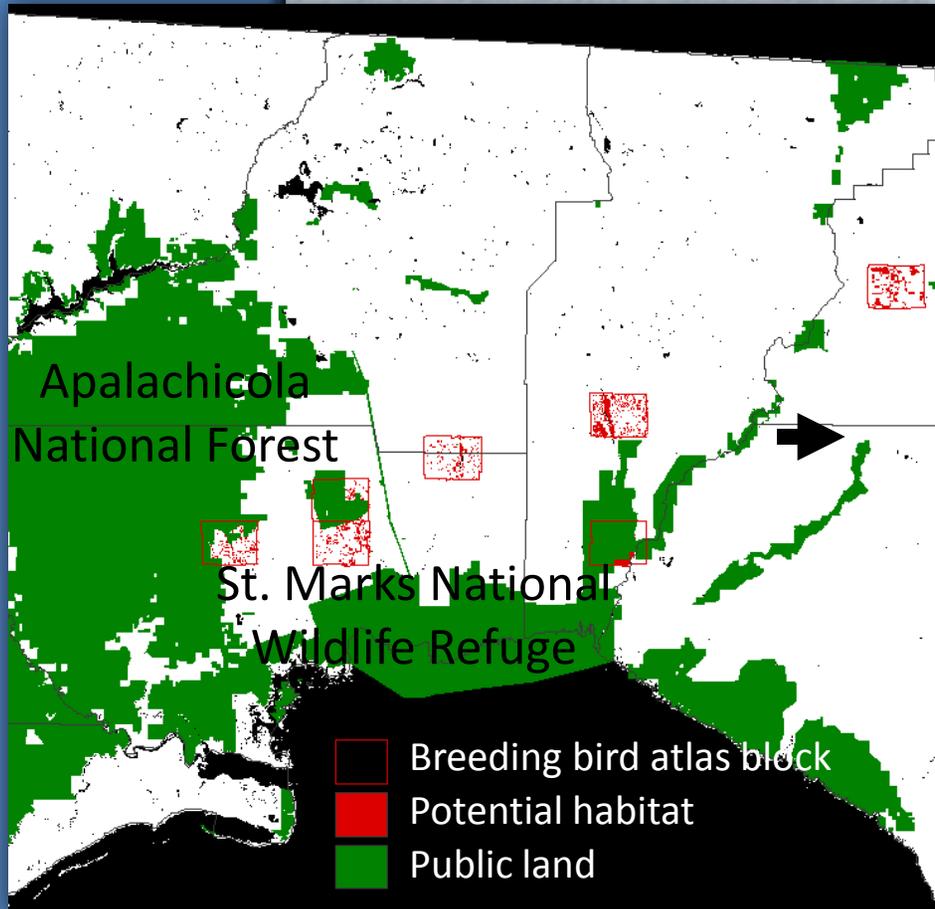
- Land Cover:
  - Selection of suitable land cover
  - Primary and Secondary types
  - Distance from unsuitable land use/land cover
  - Habitat measures
    - Patch size (roadless areas)
    - Habitat diversity
- Occurrence Data:
  - Known locations, Nest sites, Roost sites, Breeding Bird Atlas
- Buffer Zones
  - Core Habitat, Foraging Areas, Territory Size, Dispersal Distances



# Potential Habitat Model



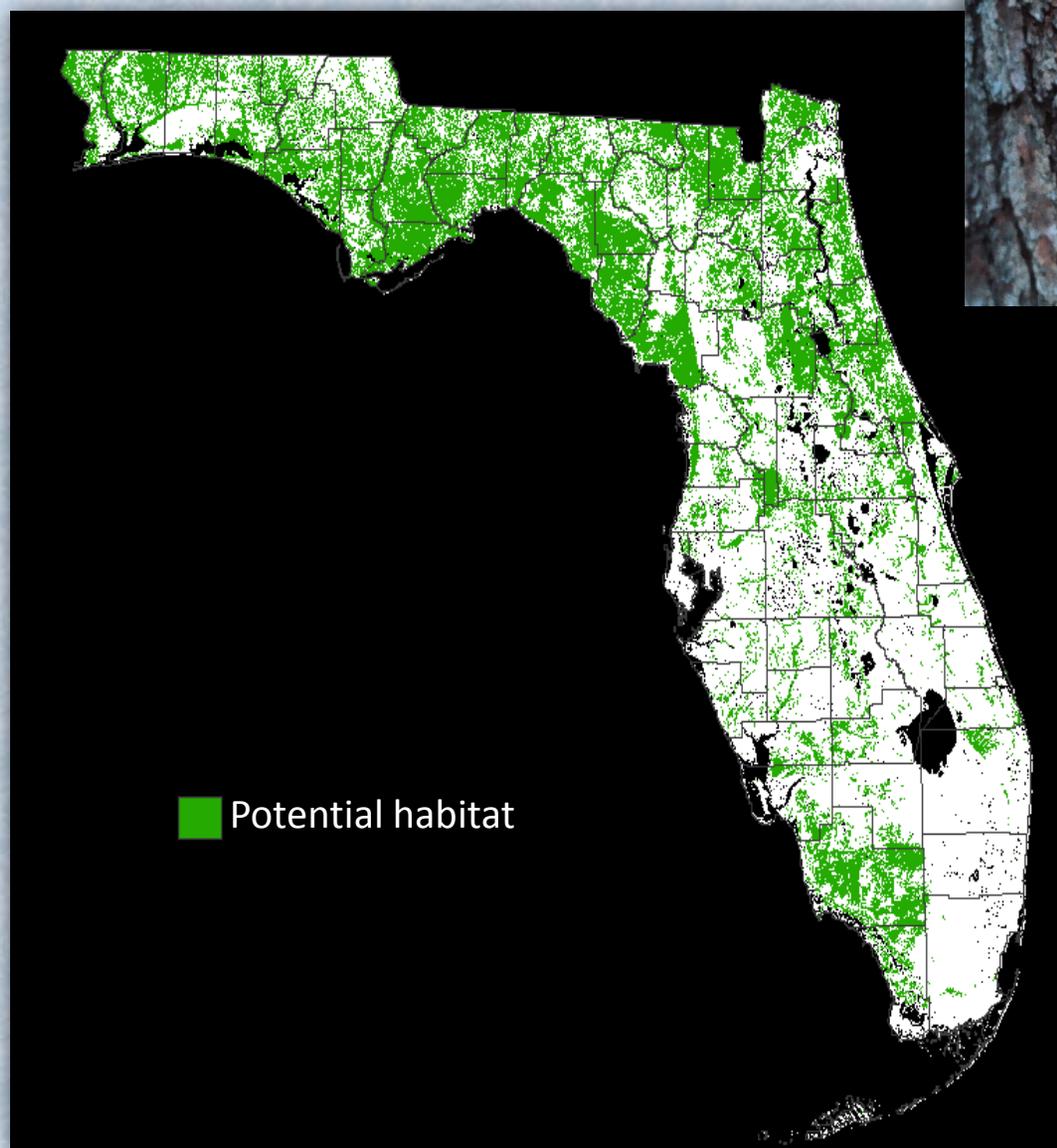
■ Potential habitat



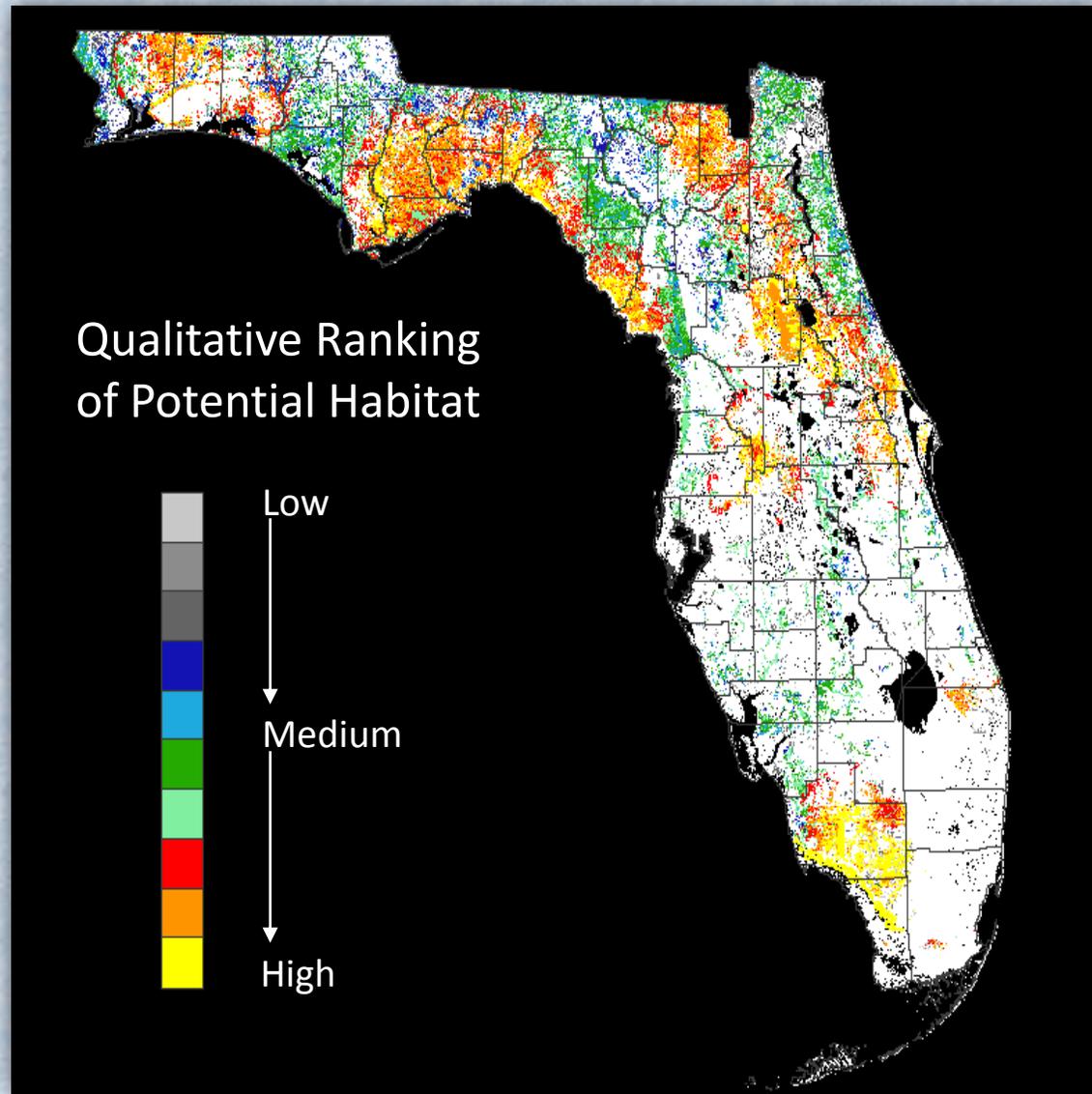
Limpkin



# Potential Habitat Model



# Qualitative Ranking





# Strategic Habitat Conservation Areas

- **Answer:** 30 of the 54 focal species were not adequately protected on public lands.
  - 30 focal species
  - 4 rare plant communities
  - Bat caves
  - Wading bird wetlands
  - Globally rare plants





# Identification of Strategic Habitat Conservation Areas

- Identify lands with the best chances of significantly increasing long-term survival
  - Based on a set of criteria
- Locate enough habitat to support 10 populations of 200 individuals
- Private lands





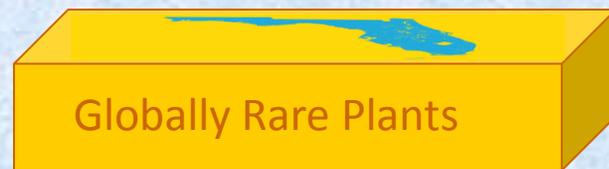
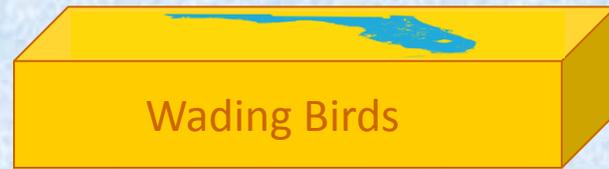
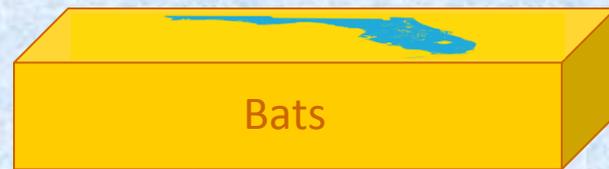
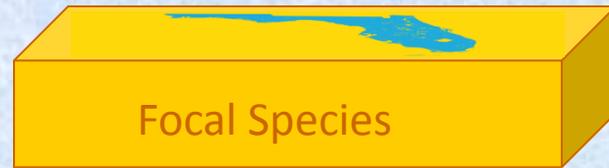
# Strategic Habitats Selection Criteria

- Likelihood of protecting other species
- Habitat patch size
- Distance between habitat patches
- Proximity to public lands
- Habitat suitability
- Highway density

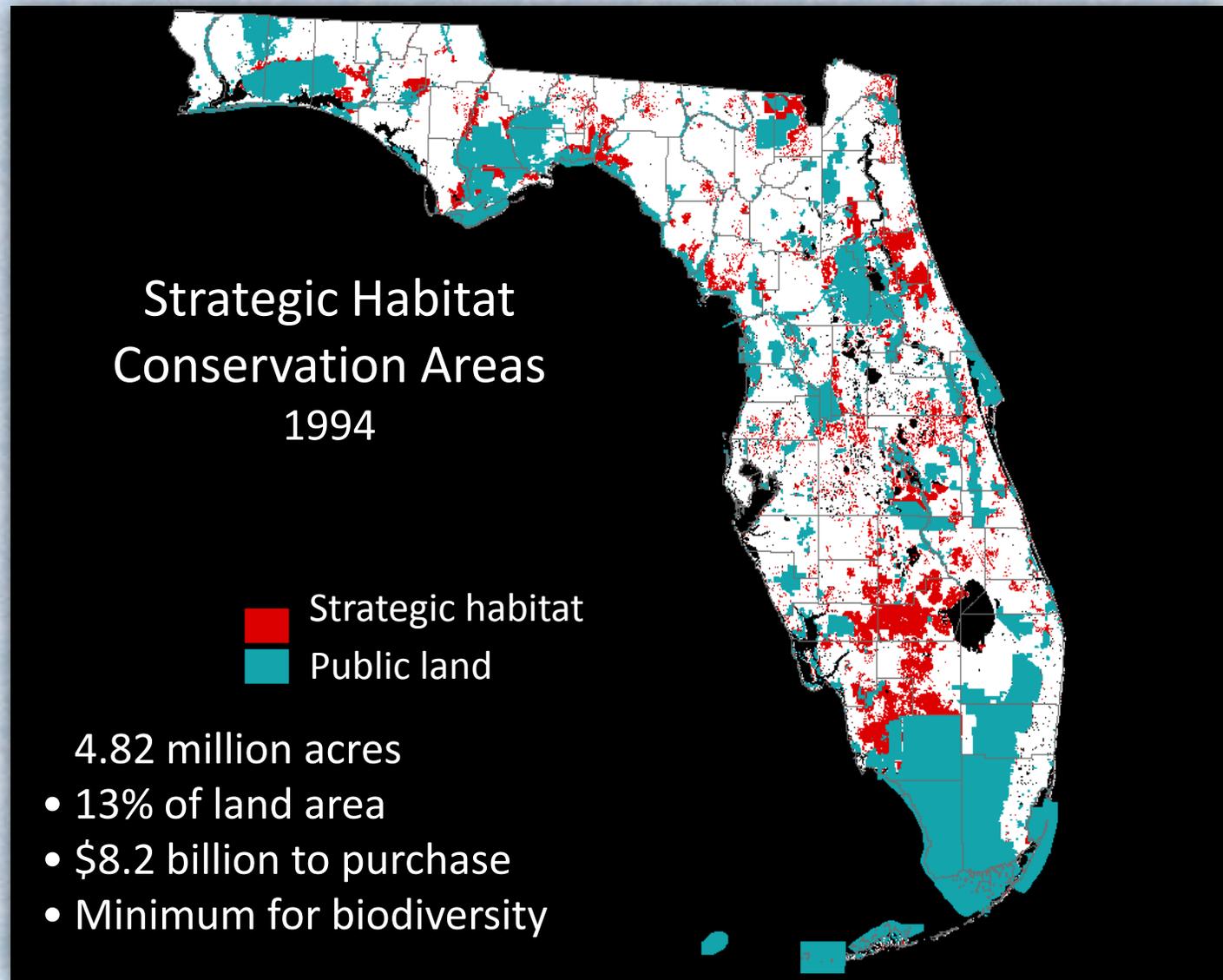




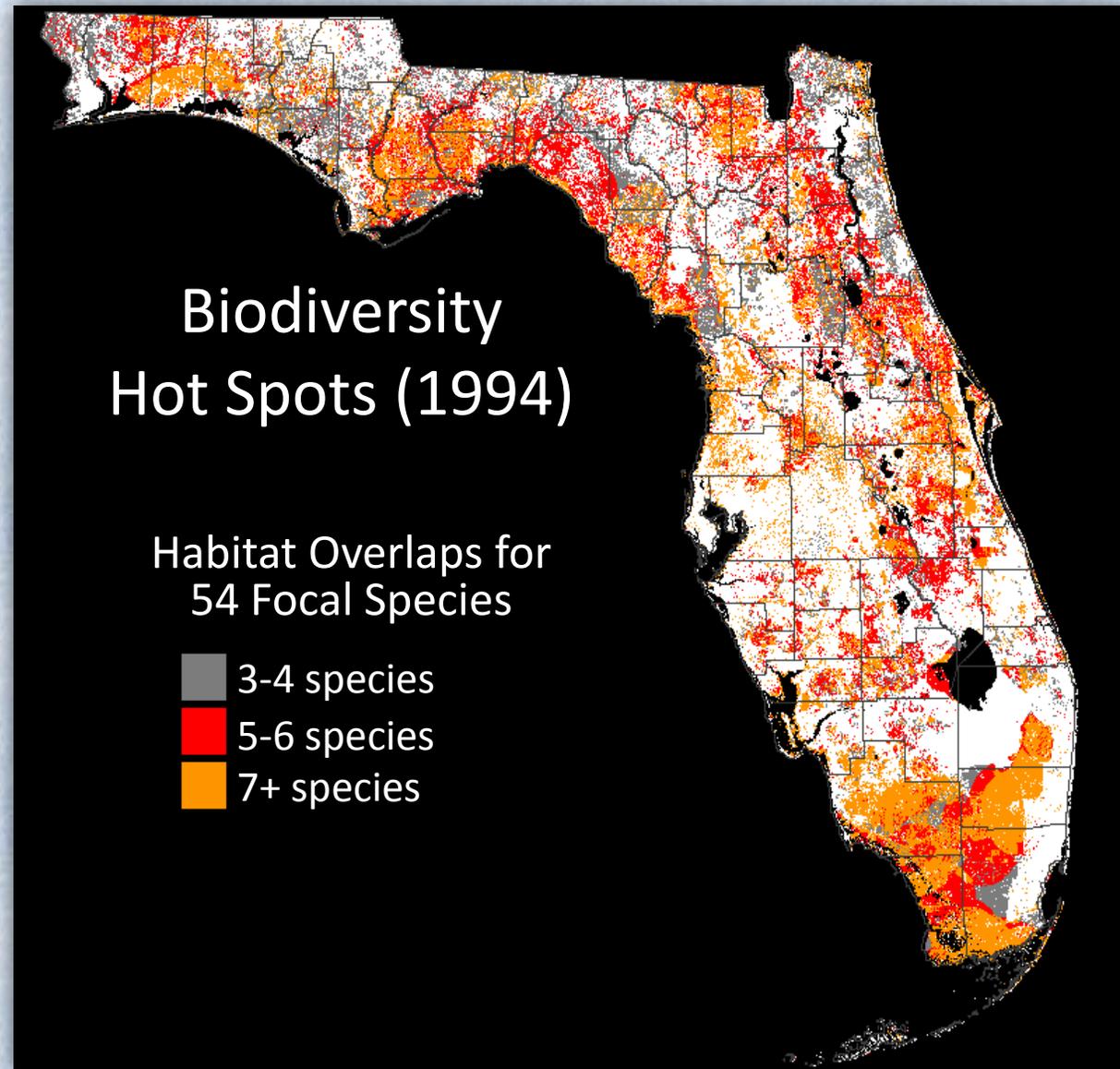
# Strategic Habitat Conservation Areas



# Strategic Habitat Conservation Areas



# Species Richness (Biodiversity Hot Spots)





# HABITAT CONSERVATION NEEDS OF RARE AND IMPERILED WILDLIFE IN FLORIDA



James A. Cox and Randy S. Kautz

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Florida Fish and Wildlife Conservation Commission  
620 South Meridian Street  
Tallahassee, Florida 32399-1600

2000





# Testing the Effectiveness of selected focal species

- All listed vertebrates
  - Not in the 1994 report
  - Except fishes, sea turtles and marine mammals
- Imperiled species
  - Literature and expert opinion
- Protection status
  - Public land
  - Strategic Habitat Conservation Areas



# Habitat Conservation Needs Report Assessment

- 124 species of wildlife
- Habitat models
  - 76 species
- Model accuracy
  - Expert opinion
- Population evaluation
  - 28 species
  - Occurrence records



# Habitat Needs Report - Results

- 17 species not secure
- No new strategic habitat
  - Small, restricted ranges

**Seal salamander**

Georgia blind salamander

Four-toed salamander

**Keys mud turtle**

**Florida Keys mole skink**

**Cedar Key mole skink**

**Rimrock crowned snake**

**Louisiana waterthrush**

**Cooper's hawk**

**Black skimmer**

**Painted bunting**

**Lower keys marsh rabbit**

**Southeastern bat**

**Silver rice rat**

**Sanibel Island rice rat**

**Salt marsh vole**

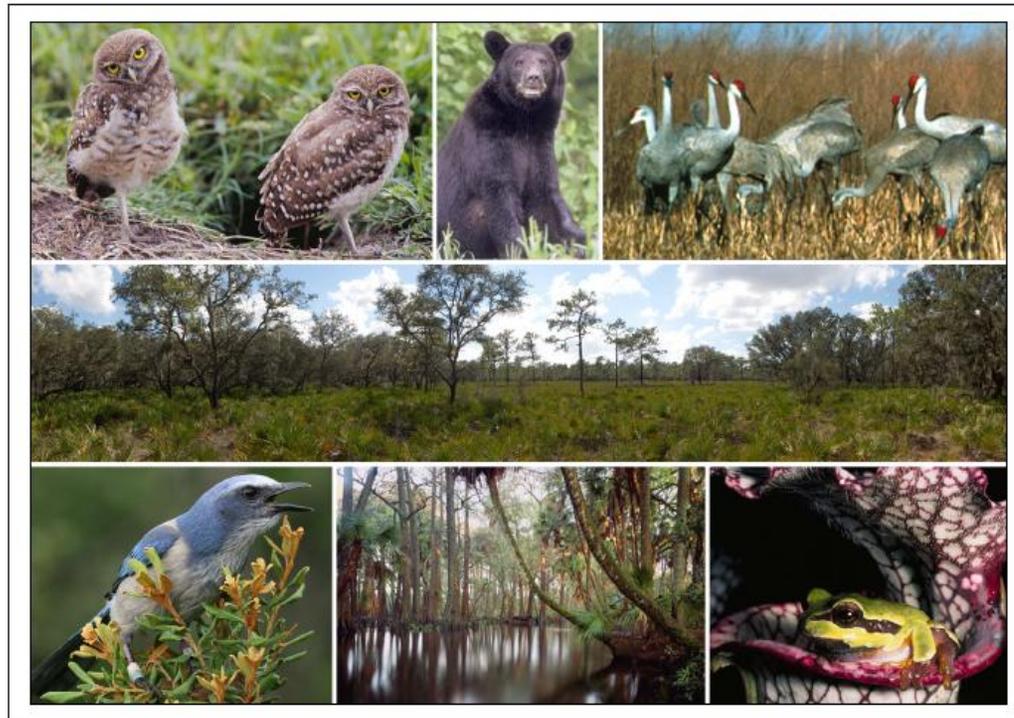
**Key deer**



# FISH AND WILDLIFE RESEARCH INSTITUTE TECHNICAL REPORTS

## Wildlife Habitat Conservation Needs in Florida Updated Recommendations for Strategic Habitat Conservation Areas

Mark Endries, Beth Stys, Gary Mohr, Georgia Kratimenos,  
Susan Langley, Karen Root, Randy Kautz



Florida Fish and Wildlife  
Conservation Commission

FWRI Technical Report TR-15

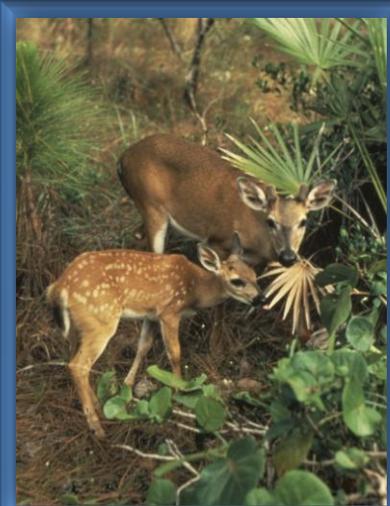


2009



# Why Update?

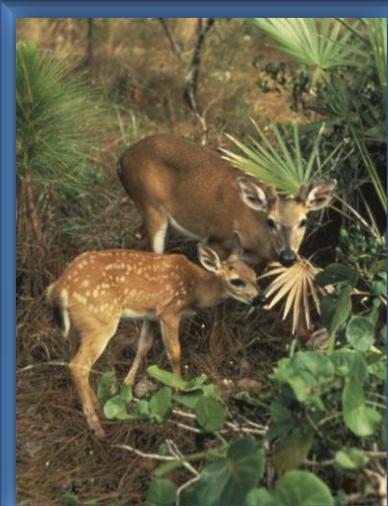
- Land use/Land cover changes
  - Conversion to Agriculture/Developed
  - Fragmentation
- Data
  - Species location
  - Land cover
  - Life history
- Technology
  - Hardware
  - Software
- ❖ Secure, Lost, Refocus



# Species Selection

- SHCA species (1994) (38 species)
- Species not secure (2000) (15 of the 17 identified)
- Species with declining populations and threatened habitats or possible change in listing status (9 species)
- 62 species selected
  - 14 amphibians and reptiles
  - 32 birds
    - 8 species of wading birds – as a group
  - 16 mammals



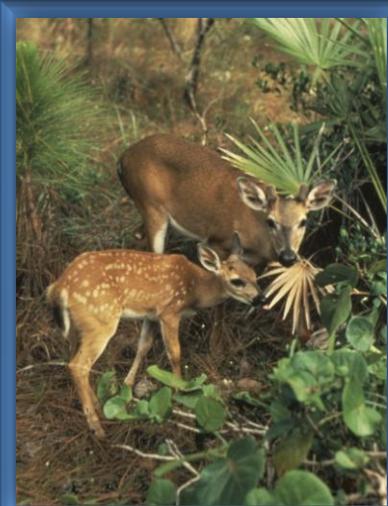


# Potential Habitat Mapping

- All potential habitat available statewide
  - Occupied and unoccupied
  - No qualitative measure
- Sources of information
  - Species location
  - Land cover
  - Other GIS data
    - Soils, NHD, physiographic



# Potential Habitat Mapping



*Figure 46 Potential-habitat map for Limpkin.*

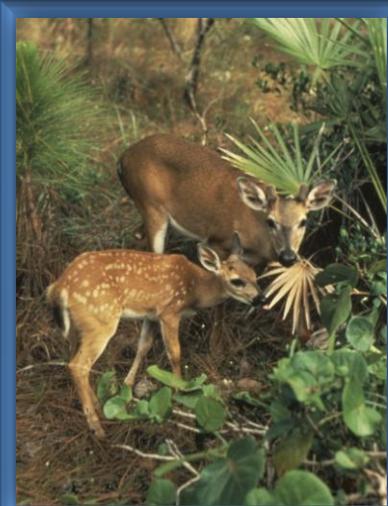


# Spatially Explicit PVA

- Combine population models with habitat maps
  - Incorporates potential habitat map
  - Considers:
    - Species-habitat relationship
    - Spatial distribution of habitat

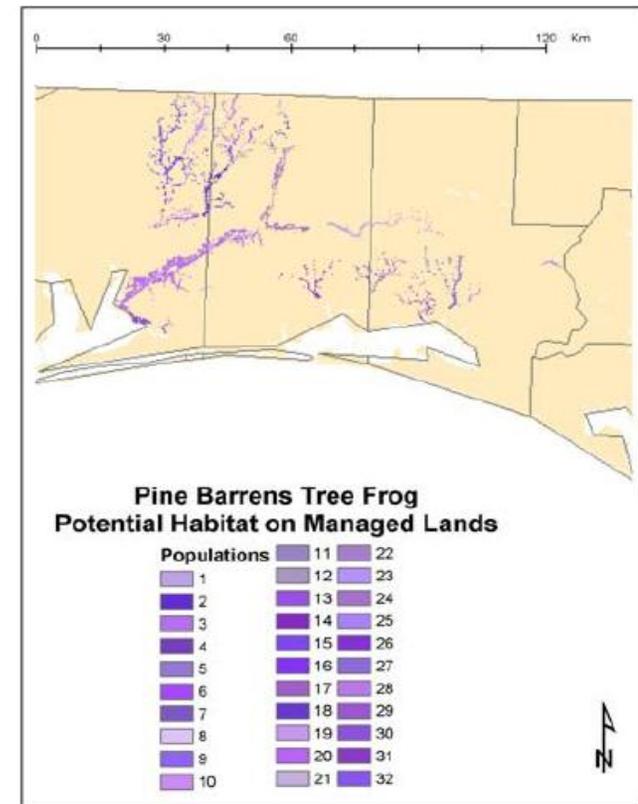
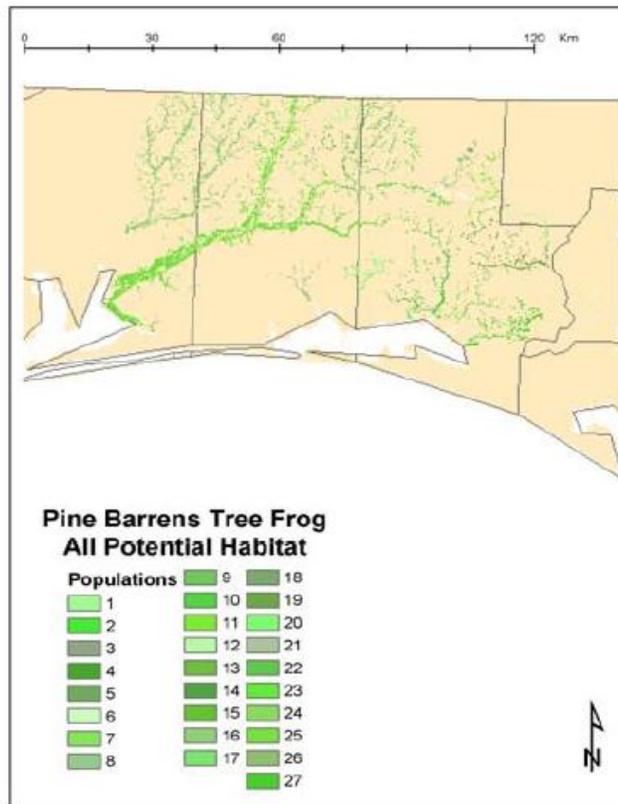


# Spatially Explicit PVA - Maps



FWC Contract No. 03111

Final Report



Populations, numbered individually, are depicted for the Pine Barrens Tree Frog including:

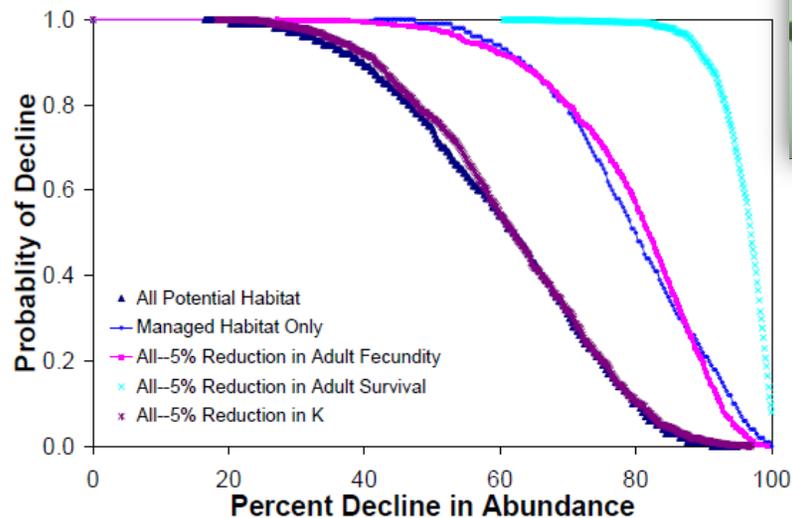
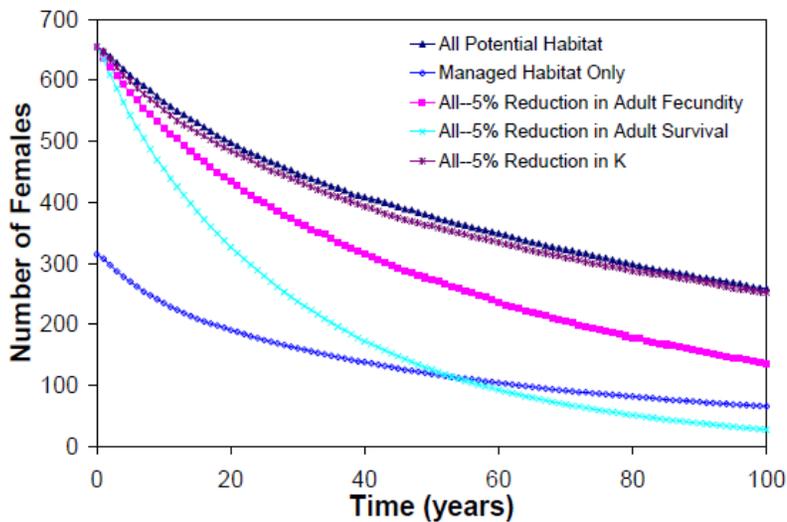
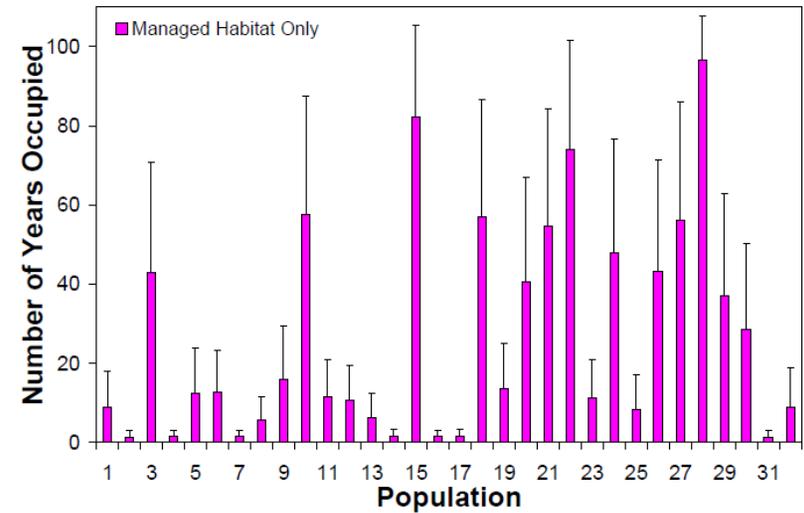
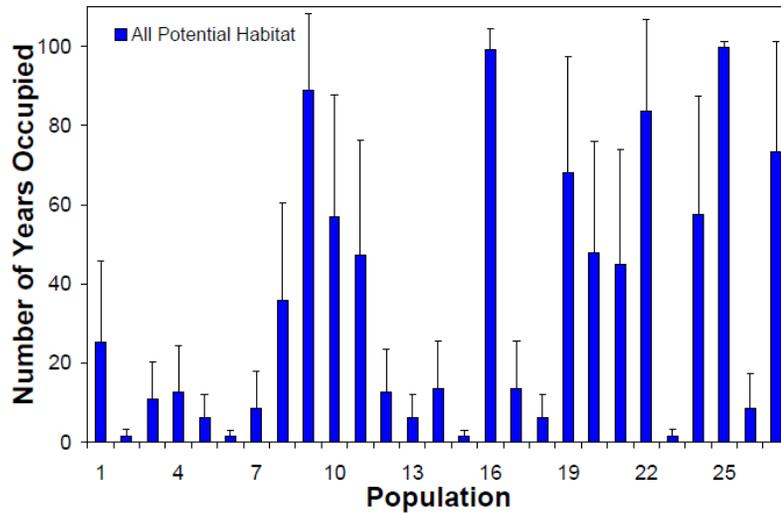
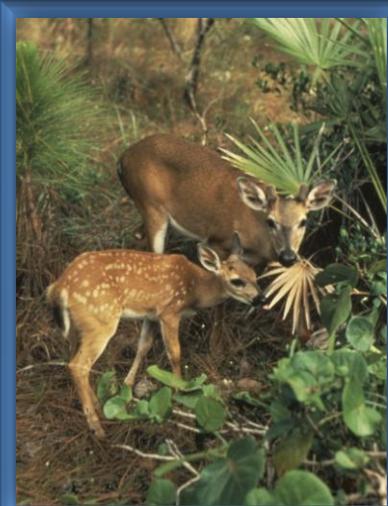
(a) all potential habitat

(b) only habitat on managed (public) lands

Risk Assessment for a Focal Set of Rare and Imperiled Wildlife in Florida

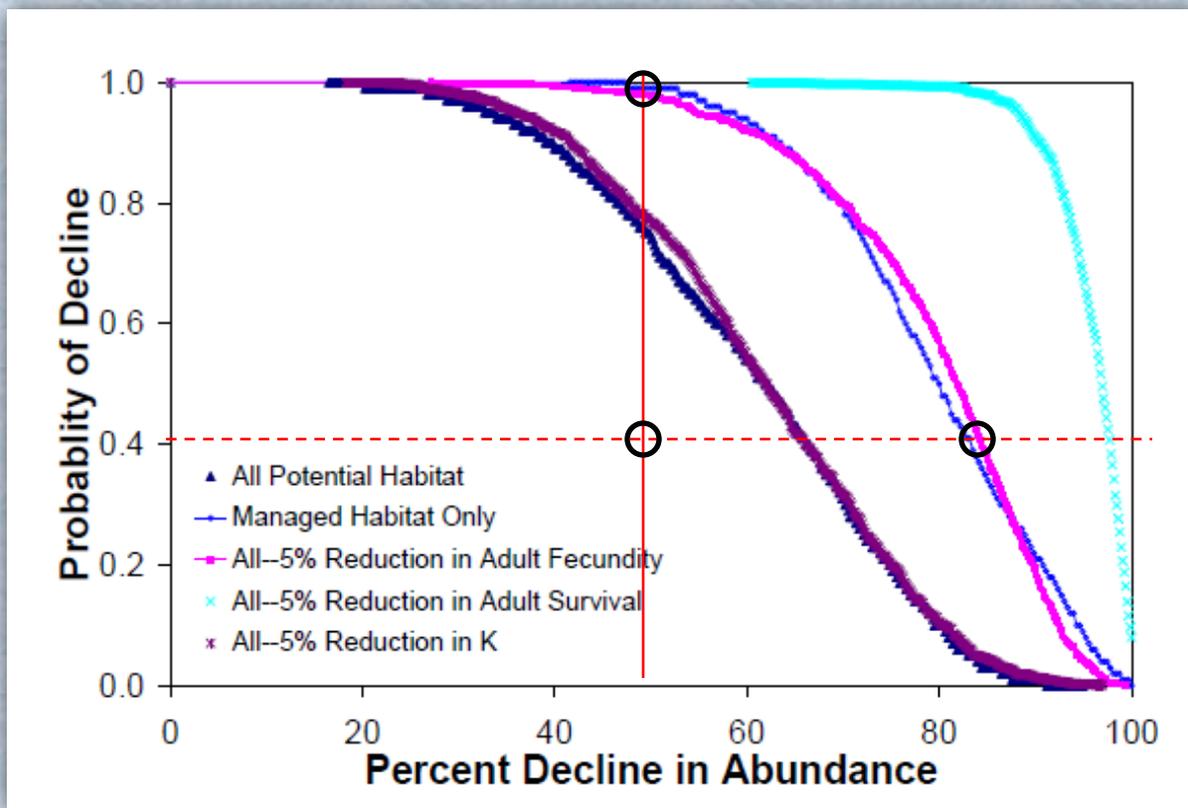


# Spatially Explicit PVA - Data



# Species Security Assessment

- Criteria:
  - Threshold value of 40% probability of a 50% decline in abundance
  - Number of stable populations



# Results

- 34 species
  - 7 amphibians and reptiles
  - 13 birds
  - 14 mammals
- 21 species
  - SHCA in 1994 AND 2009
- 8 species no longer need SHCA
  - SHCA in 1994 and 2009
- 5 species new in 2009



# Species Security Assessment

- Determination of SHCA
  - ALL potential habitat needed
  - ALL 34 species
- Approximately 8.6 million acres
- Several key drivers (species)
  - Swallow-tailed kite
  - Cooper's hawk





# Public Lands Conservation Prioritization

- Request for SHCA-like assessment for FWC Wildlife Management Areas
- Purposes:
  - Identify critical areas within WMAs
  - Species richness
  - Prioritize resources
- Same habitat models
  - Added a few species





# Additional Uses of Information

- Unoccupied/Low Density Areas
  - Restoration
  - Restocking
- Identification of Data/Knowledge Gaps
- Performance Measure
  - Species no longer requiring SHCA
  - Use with caution



# Differences 1994 vs 2009

- Technology
- Data
  - Spatial
  - Life history
- Occurrence based vs. Potential
- Type of PVA
- Selection criteria





# Lessons Learned

- Species Selection
  - Not all fit
  - Habitat limited species
- Expect unexpected results
- Interpretation of Maps
  - Disclaimers
  - Regulatory implications
- Misuse of data/information





# Lessons Learned

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# Guidance on Use

- Comparison with 1994 report
- Assumptions
- Sources of Error
  - Base data layers
  - Positional accuracy
  - Temporal accuracy
  - Species-specific bias
    - Habitat quality
    - Population density
    - Availability of data
  - Error propagation
- Appropriate uses
- Inappropriate uses





# Inappropriate Uses

- Issues dealing with:
  - Scale
  - Area Measurements
  - Exact boundaries
  - Presence/Absence
  - Condition/health determination
  - Comparative accuracy



# Successes

- Public land acquisition
  - Florida Forever
    - Acres of SHCA – measurable goal in Florida Statute
  - Florida Communities Trust
  - Florida Forever Conservation Needs Assessment
- ❖ 1.6 million acres of SHCA acquired – Conservation lands system
  - 32% of acquired lands 1994 - 2012





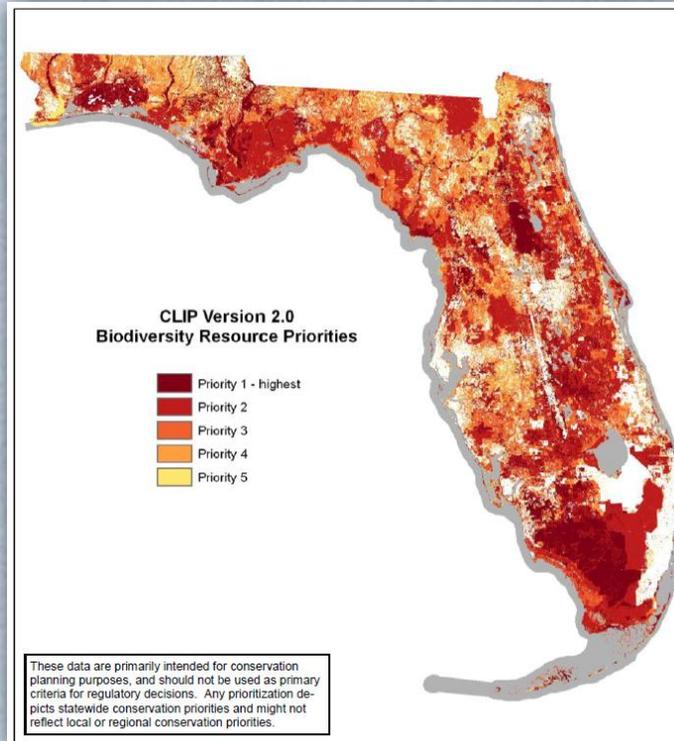
# How have the results been used

- Mitigation banks
  - 4,000 hectares of SHCA
- Land use/transportation planning
  - Route planning, wildlife underpasses
  - Integrated Wildlife Habitat Ranking System
- Private landowner conservation programs
- Development regulation
  - Development of Regional Impact
  - Regional Planning Councils
    - Strategic Regional Policy Plans
- Public land management
- International Use



# Statewide Planning Efforts

- *Critical Lands and Waters Identification Project (CLIP)*
- *Cooperative Conservation Blueprint (CCB)*



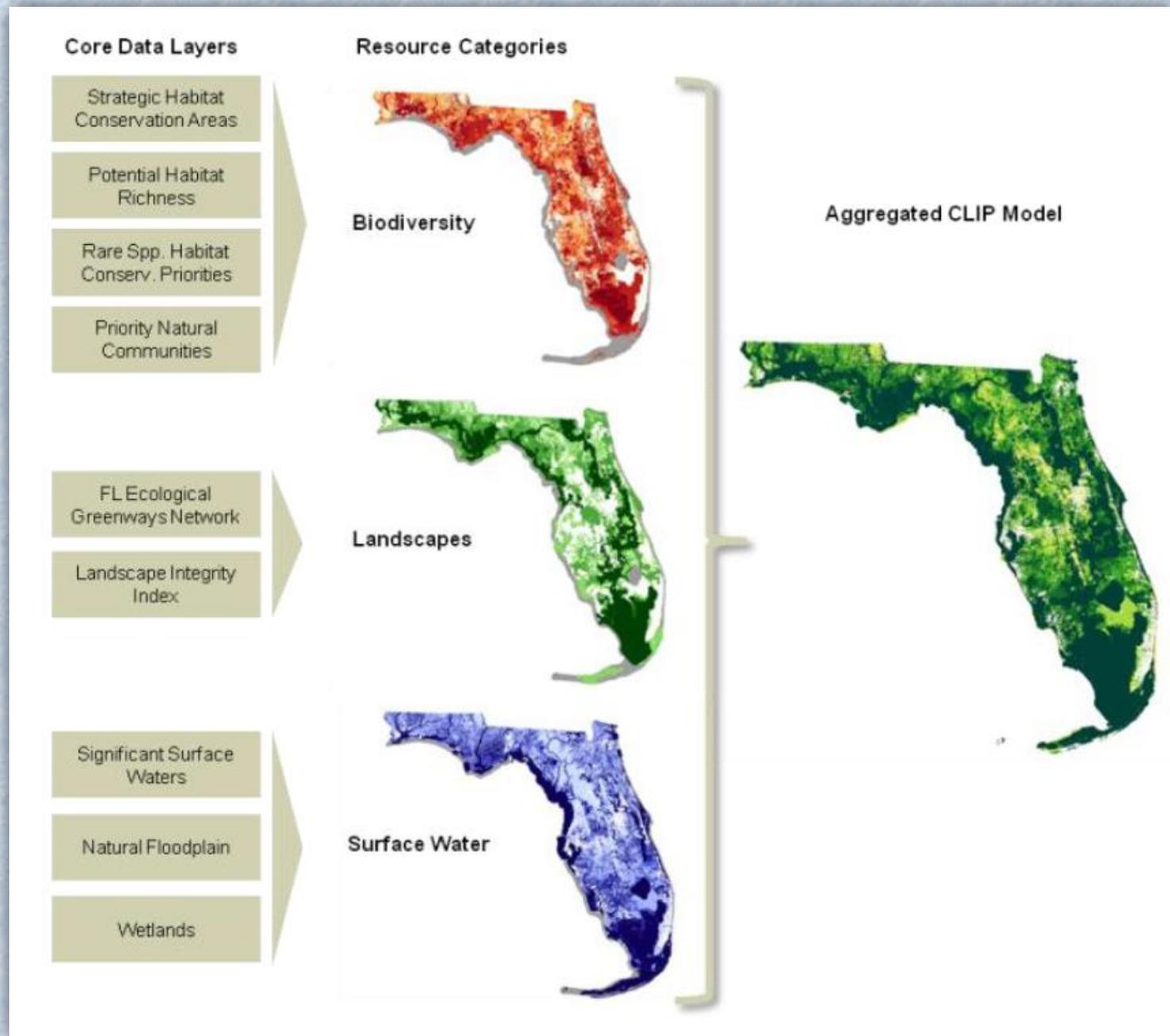


# Critical Lands and Waters Identification Project (CLIP)

- Century Commission for a Sustainable Florida – 2006
  - Florida Natural Areas Inventory
  - University of Florida GeoPlan Center
  - FL Fish and Wildlife Conservation Comm.
- GIS database
  - Biodiversity, Landscape function, Surface water, Groundwater, Marine resources
- SHCA and Species richness



# CLIP Model Structure





# Statewide Planning Efforts

- *Cooperative Conservation Blueprint (CCB)*
  - Florida Wildlife Legacy Initiative – FWC
    - Priority goal from SWAP
  - CLIP – science/data foundation
  - Multi-partner strategic planning effort
  - Linking conservation, community development and agriculture
  - Voluntary incentives
- ❖ Owning priority conservation land an economic asset



# Thank you.

## ?? Questions ??

Wildlife Habitat Conservation Needs in Florida 2009:

<http://www.myfwc.com/research/gis/data-maps/terrestrial/>

CLIP 2.0 Technical report: [http://www.fnai.org/pdf/CLIP\\_2\\_Tech\\_Report.pdf](http://www.fnai.org/pdf/CLIP_2_Tech_Report.pdf)

CCB Information: <http://myfwc.com/conservation/special-initiatives/fwli/archive/taking-action/blueprint/#>

