

Minimizing Ecological Impacts During the Siting of CERP Projects

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Acknowledgements

- Robert Pace
- Steve Schubert
- Tylan Dean

The Lake Okeechobee Watershed Project

- Reduce Phosphorus loading to the lake
- Store water to help manage lake levels
- Restore 3500 acres of wetlands



Project Footprint

1. North of Lake Storage:

- 17,500 ac reservoir + 2500 ac STA

2. Taylor Creek/Nubbin Slough Storage and Treatment:

- 5,000 ac reservoir + 5,000 ac STA

3. Water Quality Treatment Facilities:

- 1,775 ac RASTA, 2,600 ac RASTA

TOTAL = ~ 35,000 ac or 54 m²

Objective

- Develop a **tool** to aid in siting reservoirs and STAs in locations that minimize impacts to the ecological integrity of the project area.

The sub-objectives of our analysis are to:

1) Minimize impacts on **GENERAL FISH and WILDLIFE HABITATS** to maintain biodiversity

2) Minimize impacts to: **IMPERILED HABITATS**

3) Minimize impacts to **THREATENED and ENDANGERED SPECIES** and their habitats

Development of a tool – **the Ecological Value Surface Model**

We developed a model, for planning purposes, that accounts for a wide range of ecological criteria

- Not used to analyze impacts to threatened and endangered species.
- Helps identify lands that are of low ecological value.
- Can be used to “tweak” the location of project features in later planning stages.

Multiple criteria planning approach using a GIS analysis

ADVANTAGES

- Desktop analysis/inexpensive
- Inaccessible/private lands
- Powerful
- Consistency and repeatability for decisions
- Quantitative basis for planning decisions; limits subjectivity.
- Quick responsiveness to altered plans
- Output is easily communicable.

DISADVANTAGES

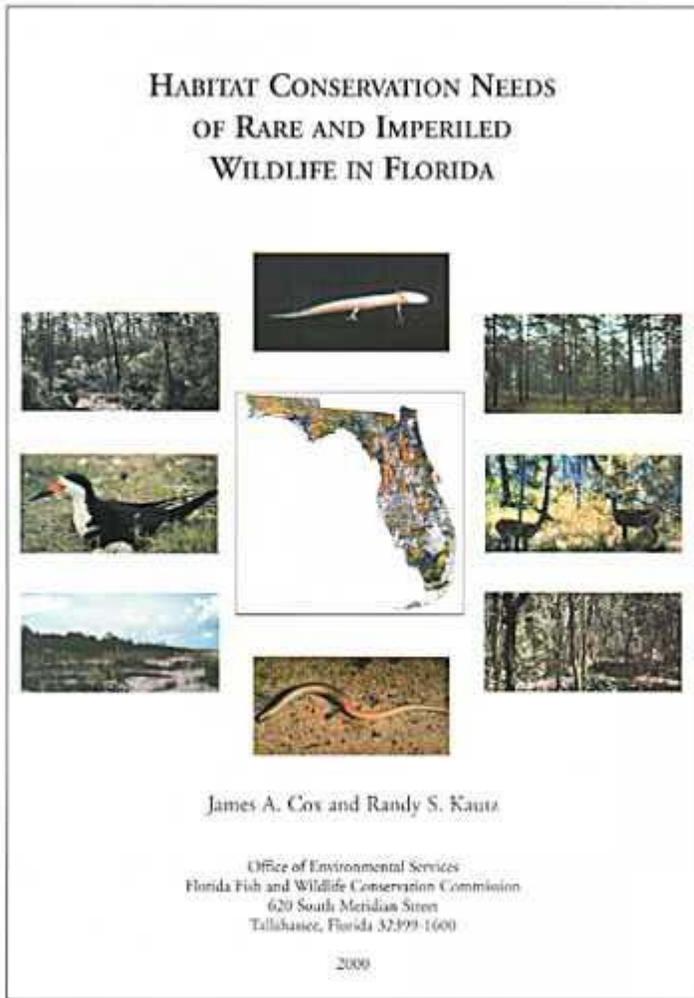
- Quality/quantity of data
- Some subjectivity of criteria and rankings, HOWEVER, the model organizes and documents the thought process.
- Multiple criteria dilute the value of each individual criteria

Habitat in the Project Area

- ~ 100 land use/cover types as fish and wildlife habitat throughout the project area.
- Some areas are natural, while others are disturbed areas.
- ~ 1/3 of the project area has native cover remaining.

General Fish and Wildlife Habitat

1. Cox and Kautz 2002

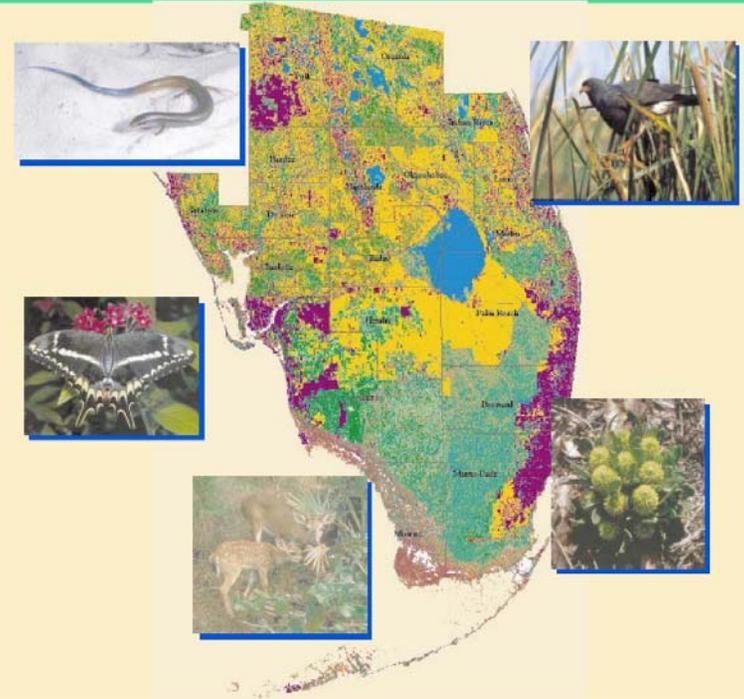


1 - 10

2. MSRP

SOUTH FLORIDA MULTI-SPECIES RECOVERY PLAN

A Species Plan...
an Ecosystem Approach



U.S. Fish & Wildlife Service
Southeast Region

MSRP Rankings

2	6	5
2	8	5
2		

-1 to -3 values
assigned to urban
cells

2	6	5
2	8	5
2	-3	-3

*NEIGHBORHOOD
ANALYSIS*

2	6	5
2	6	5
2		

Area of influence = ~350 meters or 12 cells

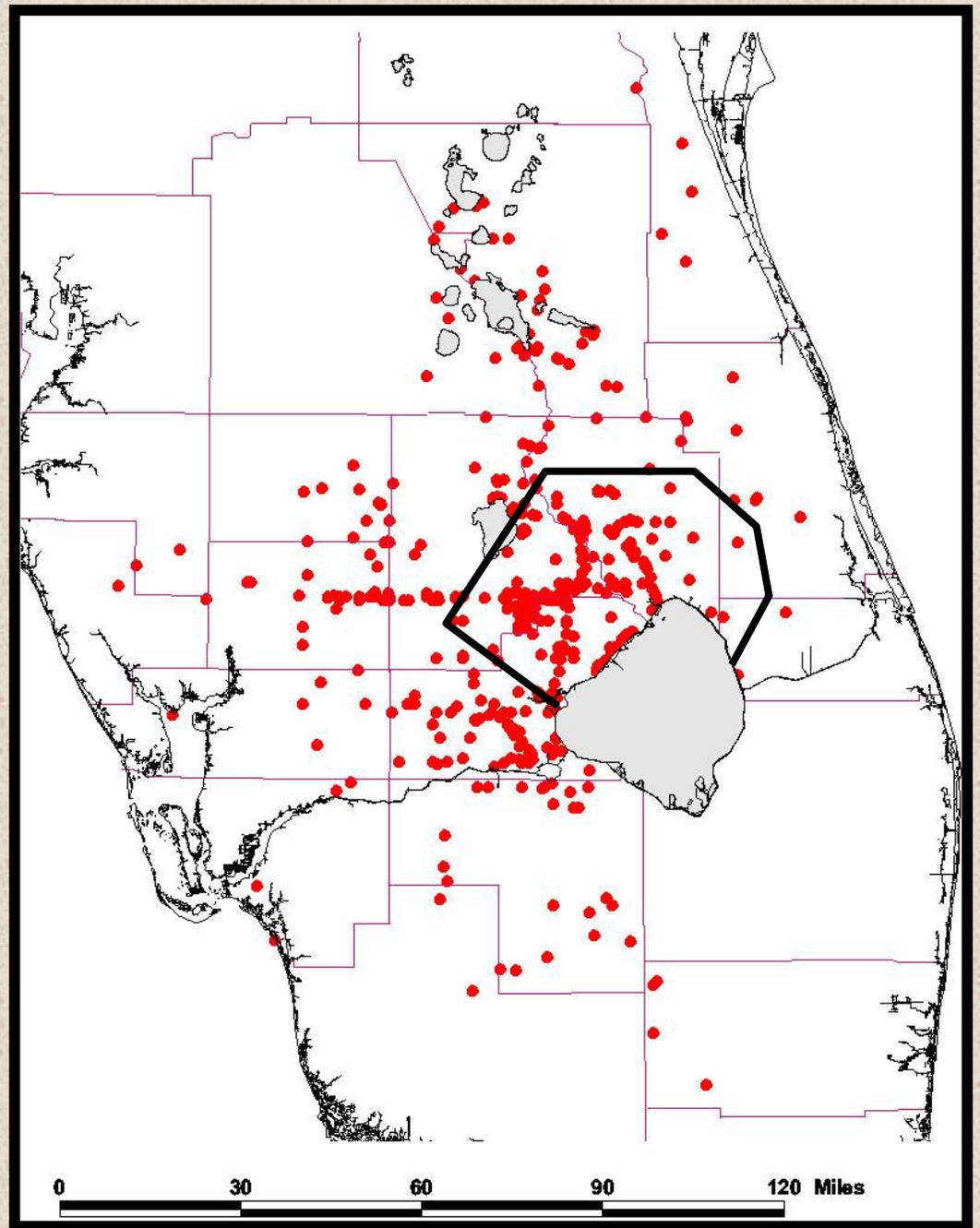
Ranking habitat based on rarity.

- The Florida Natural Areas Inventory's (FNAI) compilation state and globally imperiled rankings.
- Cross walked FNAI community types to the MSRP's ecological communities and to the FLUCCS.
- The product of the G1-G5 and S1-S5 were rescaled from 1-10.

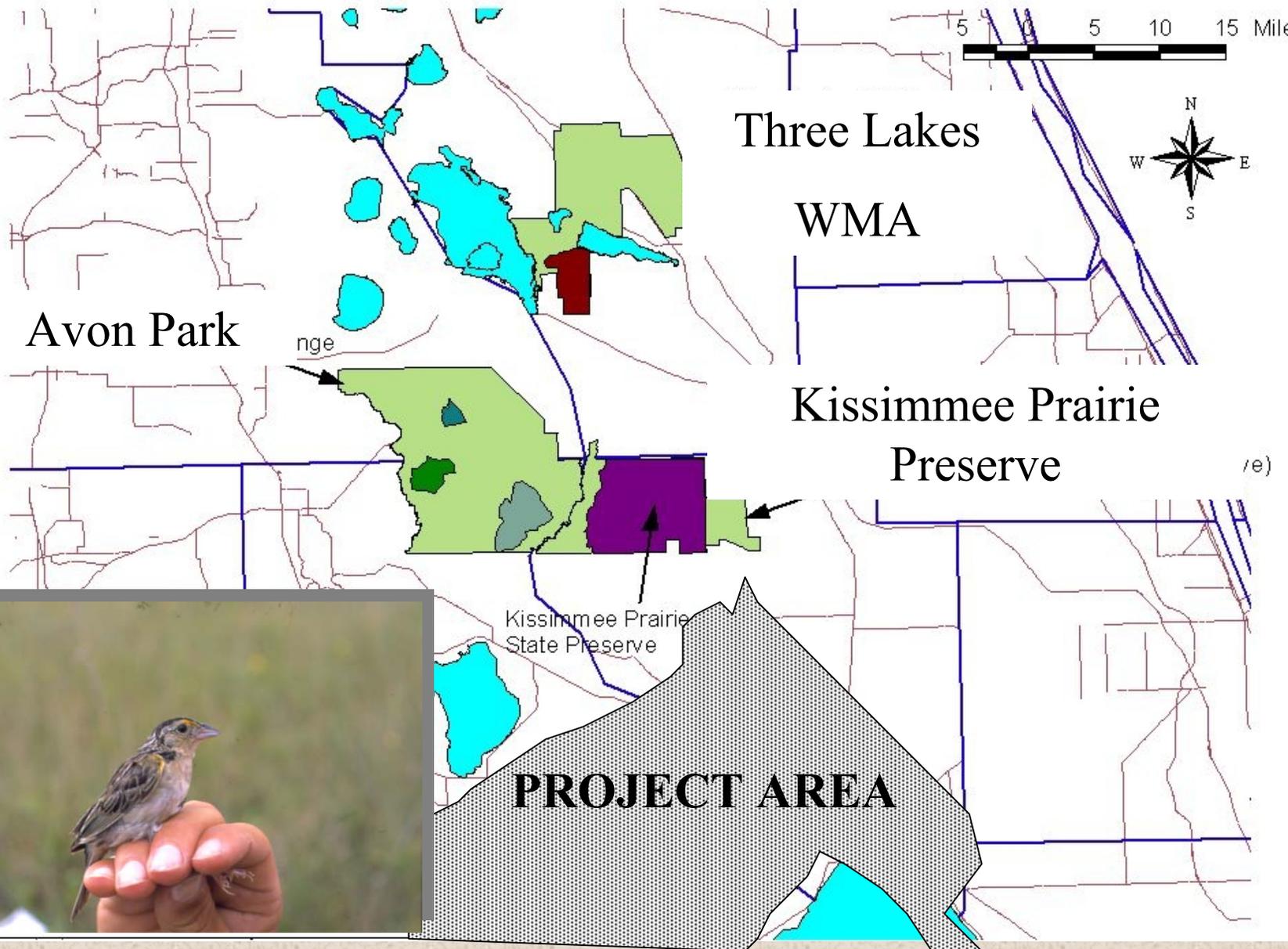
Threatened and Endangered Species



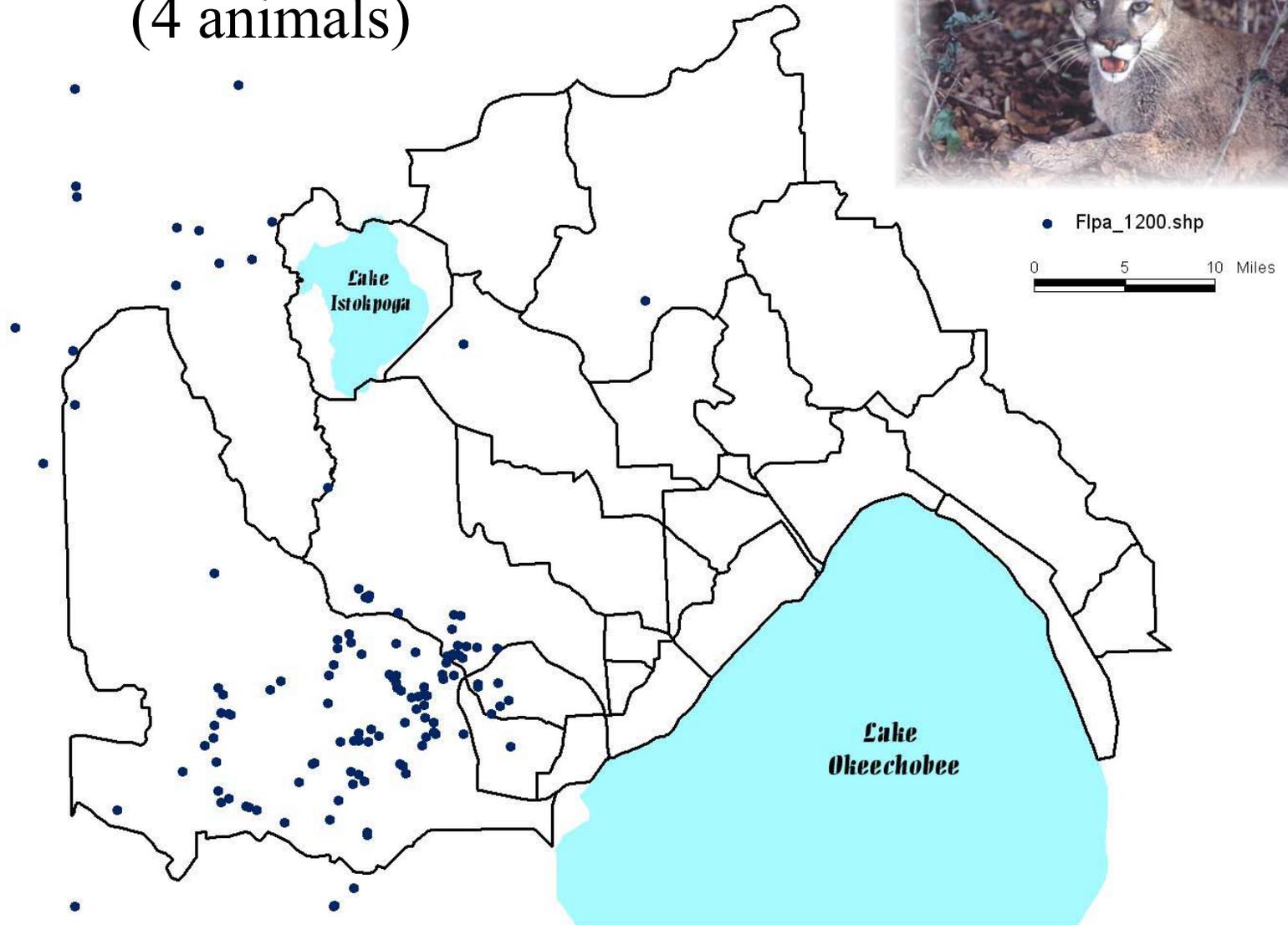
Caracara



Protected Lands and Primary Florida Grasshopper Sparrow Populations in Central Florida



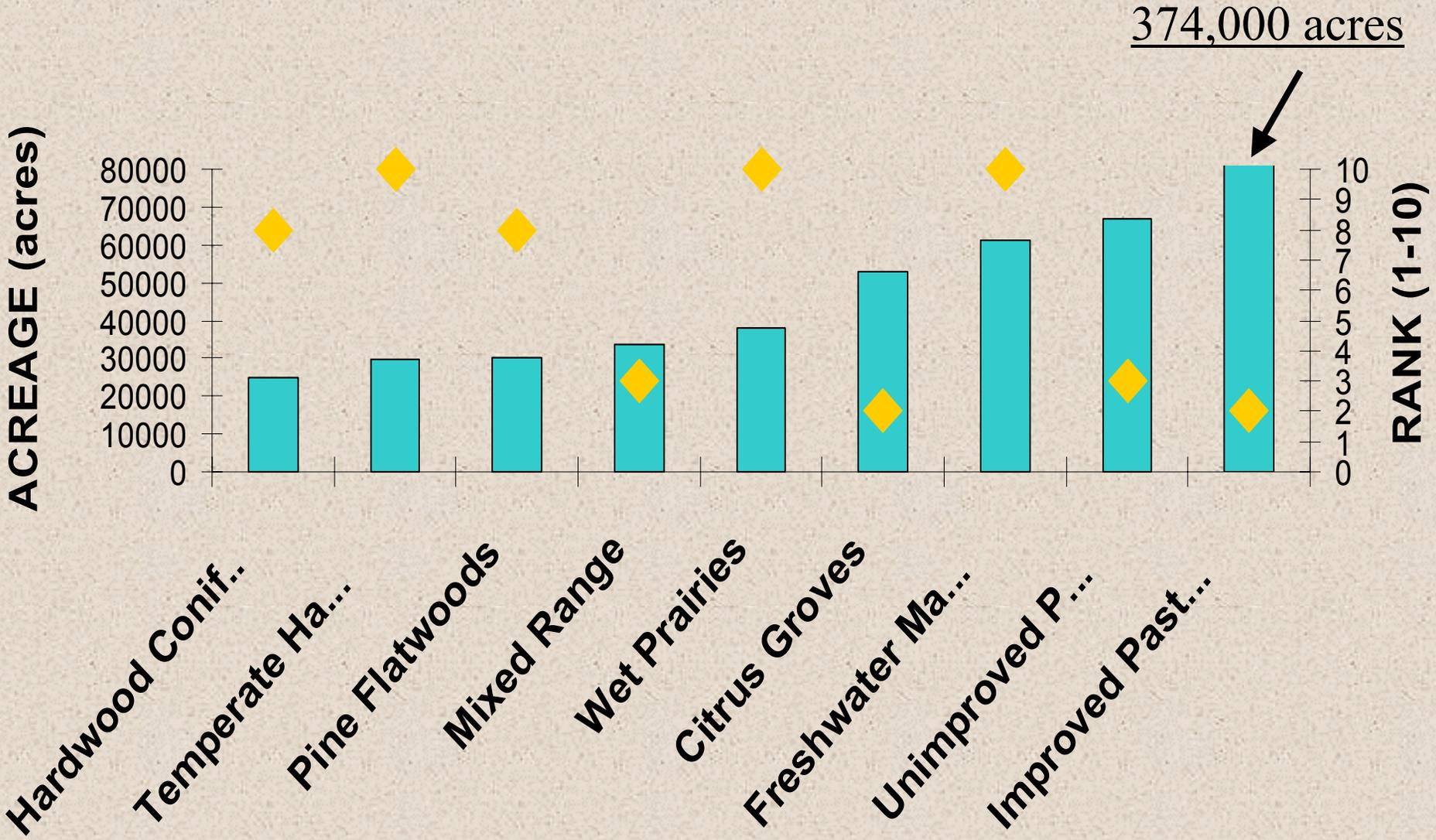
Panther telemetry points (4 animals)



Basis for Evaluating Potential T&E Species Habitat

1. Nest locations and buffers
2. Species density data
3. Specific field studies
4. Potential Habitat – dry prairie

Habitat Types



Ecological Value Surface Model



Ecological Value Surface Model

(1-10)

T&E Species

(33%)
(1-10)

Caracara
(1-10)

Grass. Sparrow
(1-10)

Florida Panther
(1-10)

General F&W Habitat

(33%)
(1-10)

FFWCC Sp. Div.
(1-10)

Proximity to
Disturbed
neighborhood analysis
(-1 -- -3)

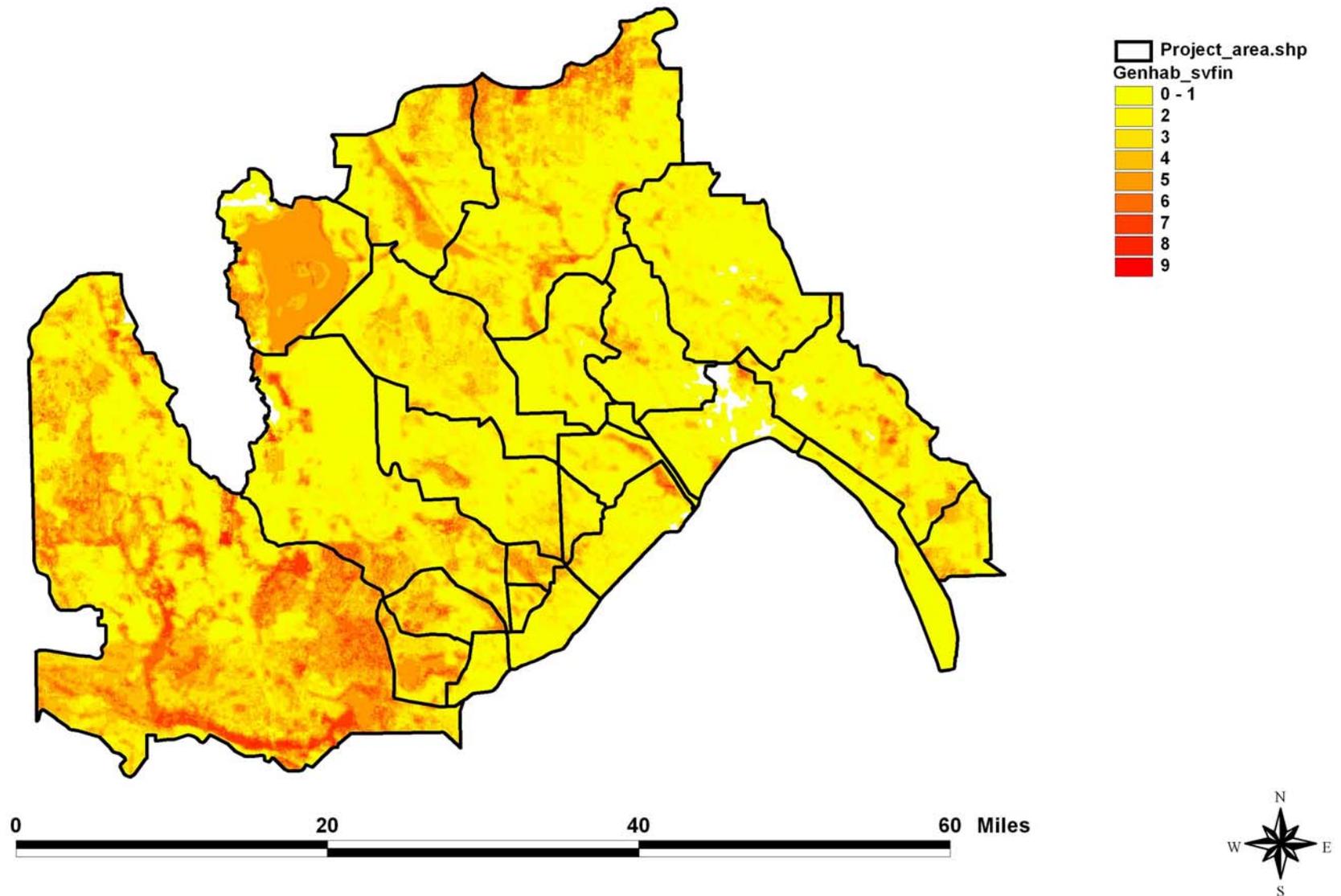
MSRP
Interpretation
BPJ
(1-10)

Imperiled Habitat

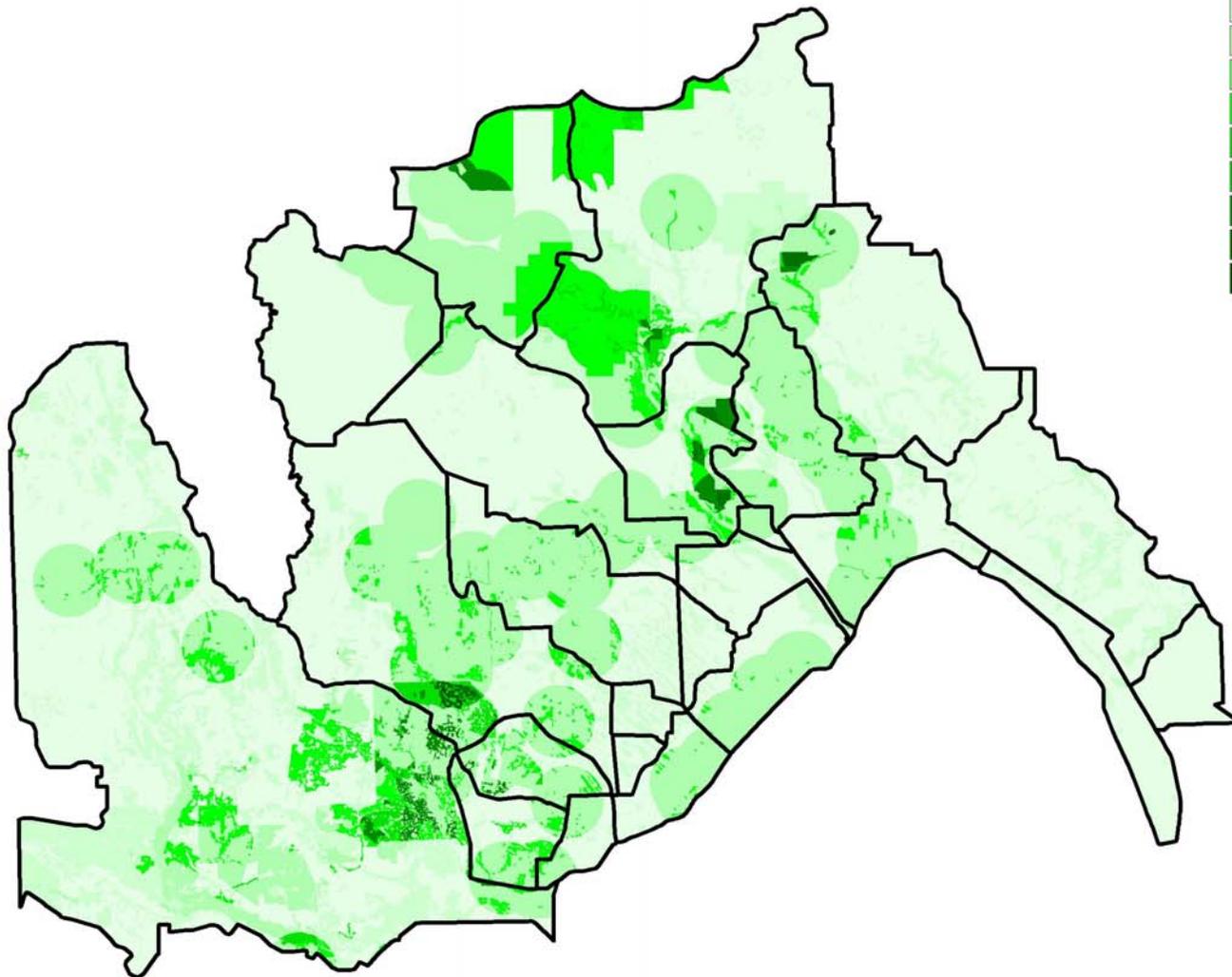
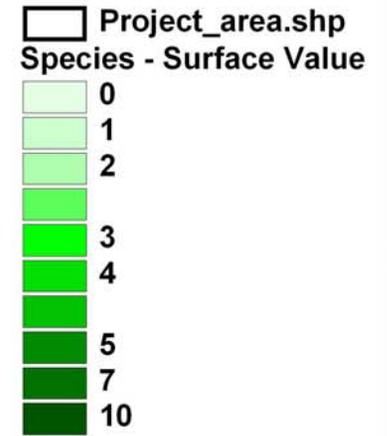
(33%)
(1-10)

FNAI G-S
Rankings
(1-10)

General Fish & Wildlife Habitat



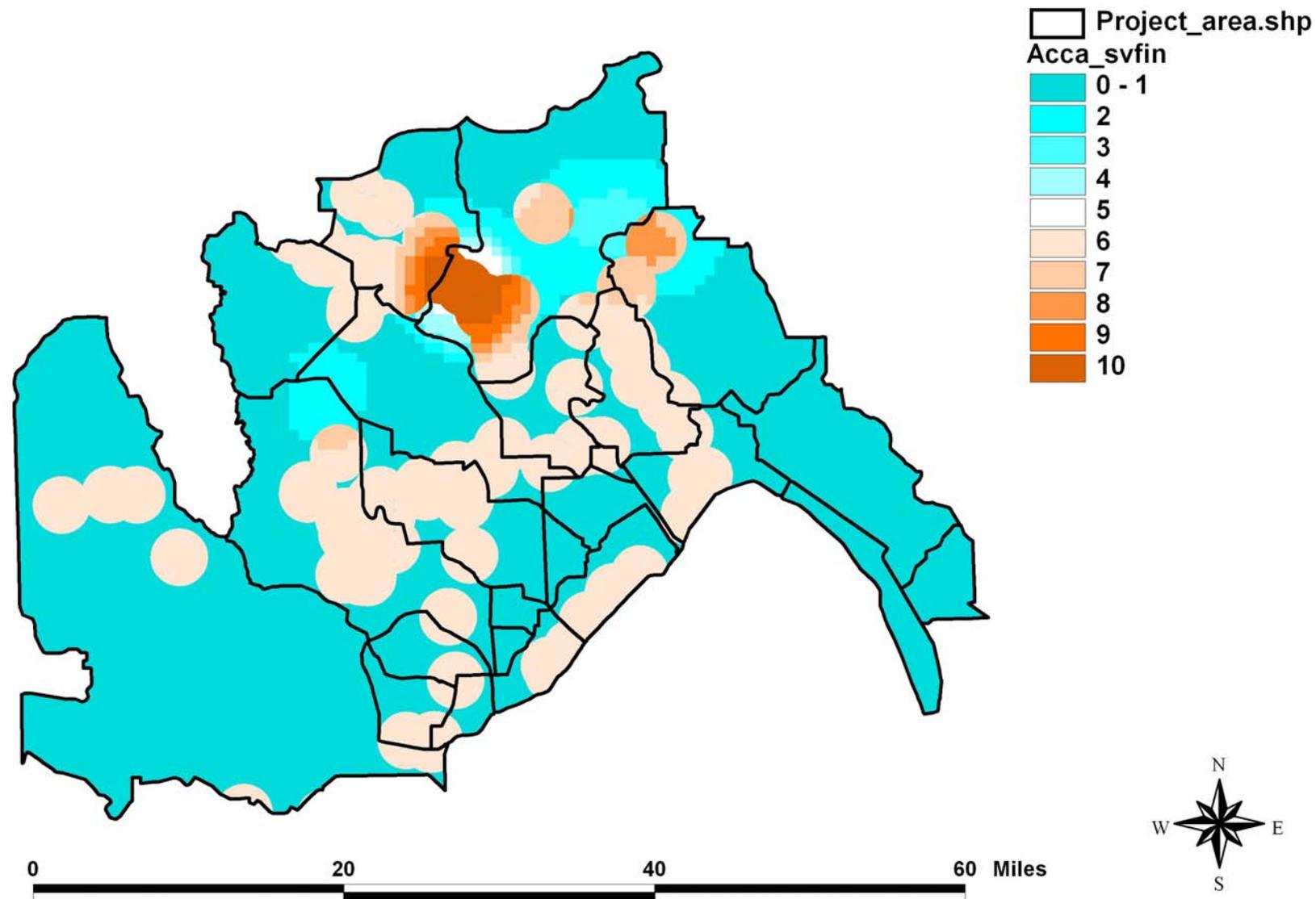
T&E Species



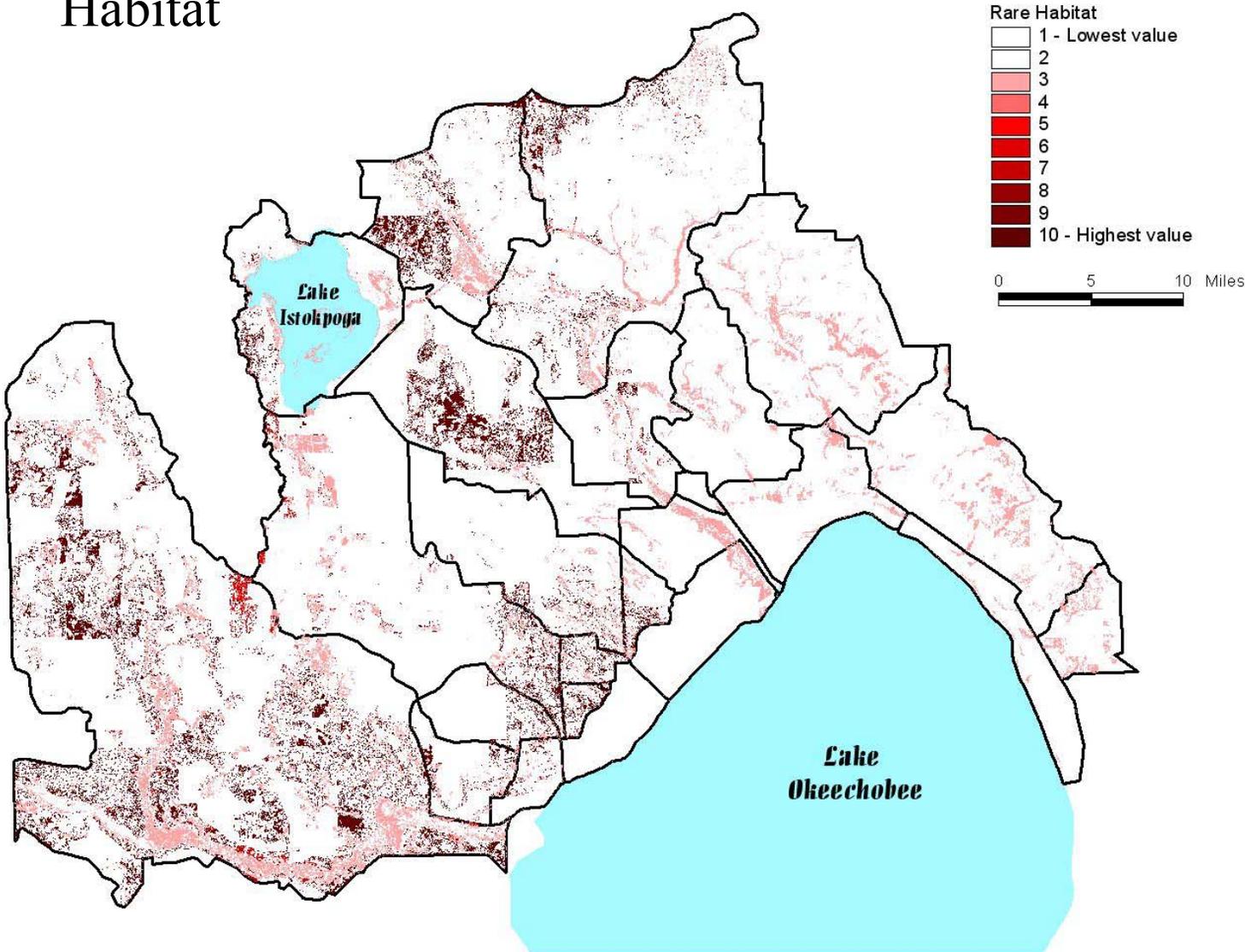
0 20 40 60 Miles



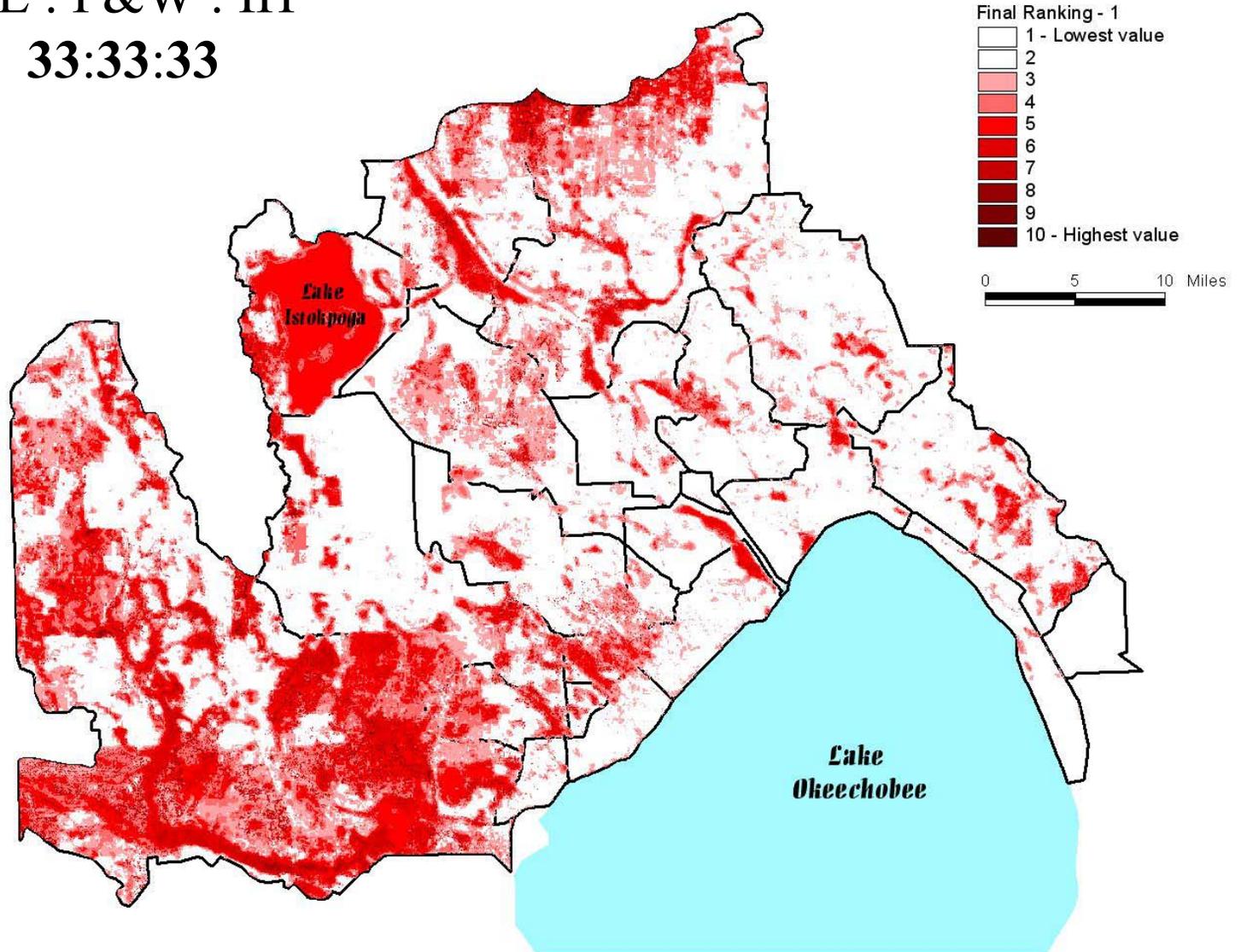
Caracara Submodel



Rare/Imperiled Habitat



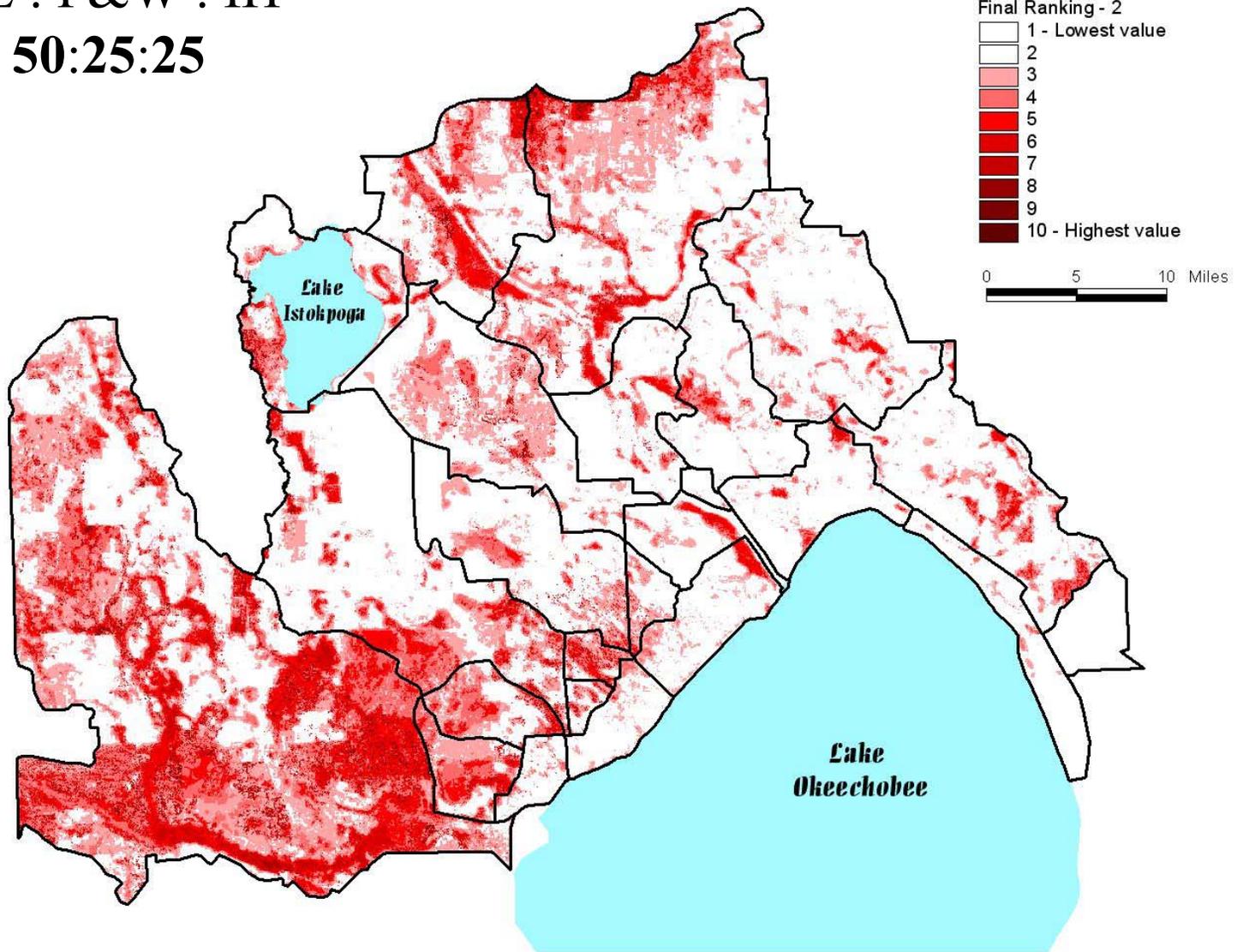
Option 1
T&E : F&W : IH
33:33:33



Option 2

T&E : F&W : IH

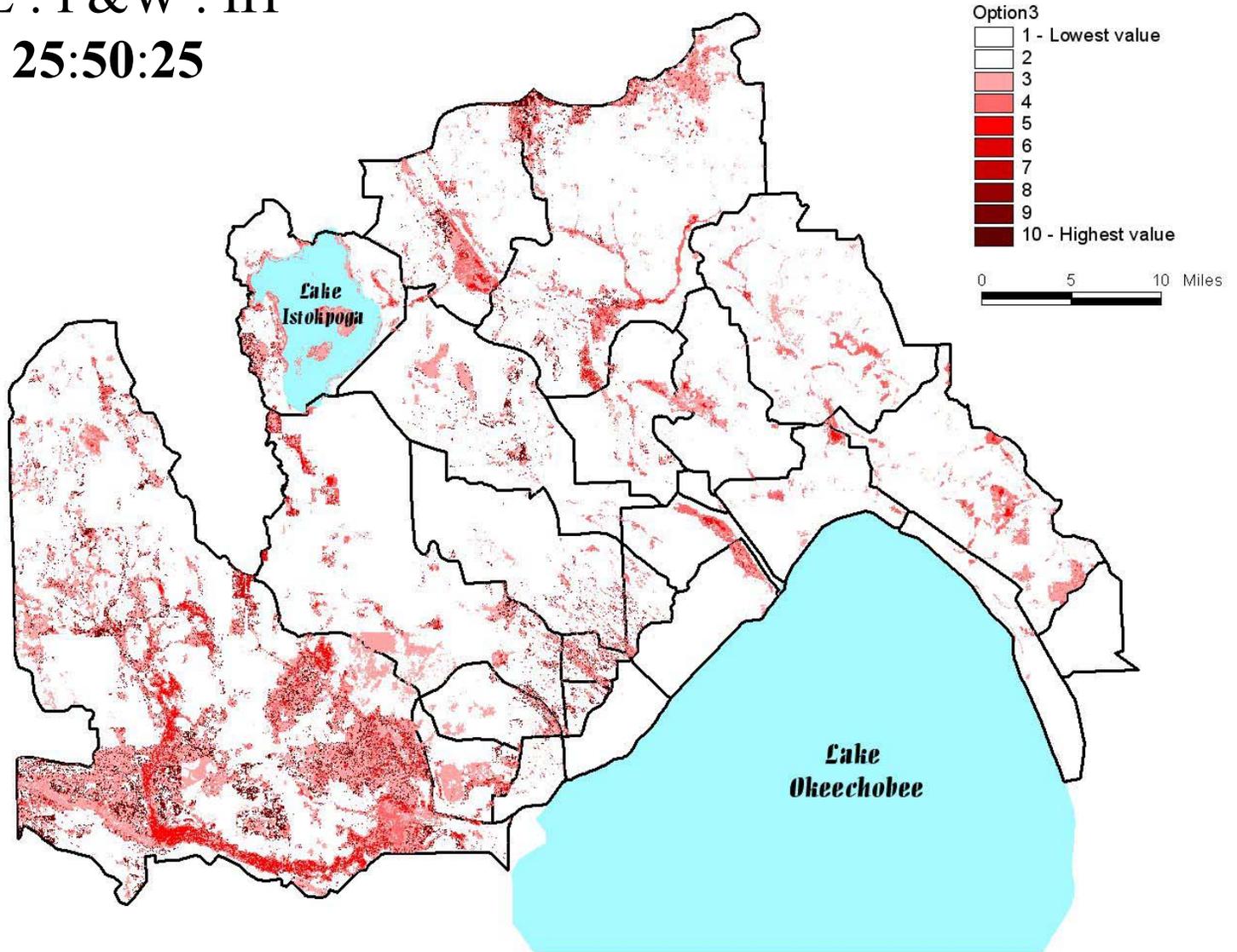
50:25:25



Option 3

T&E : F&W : IH

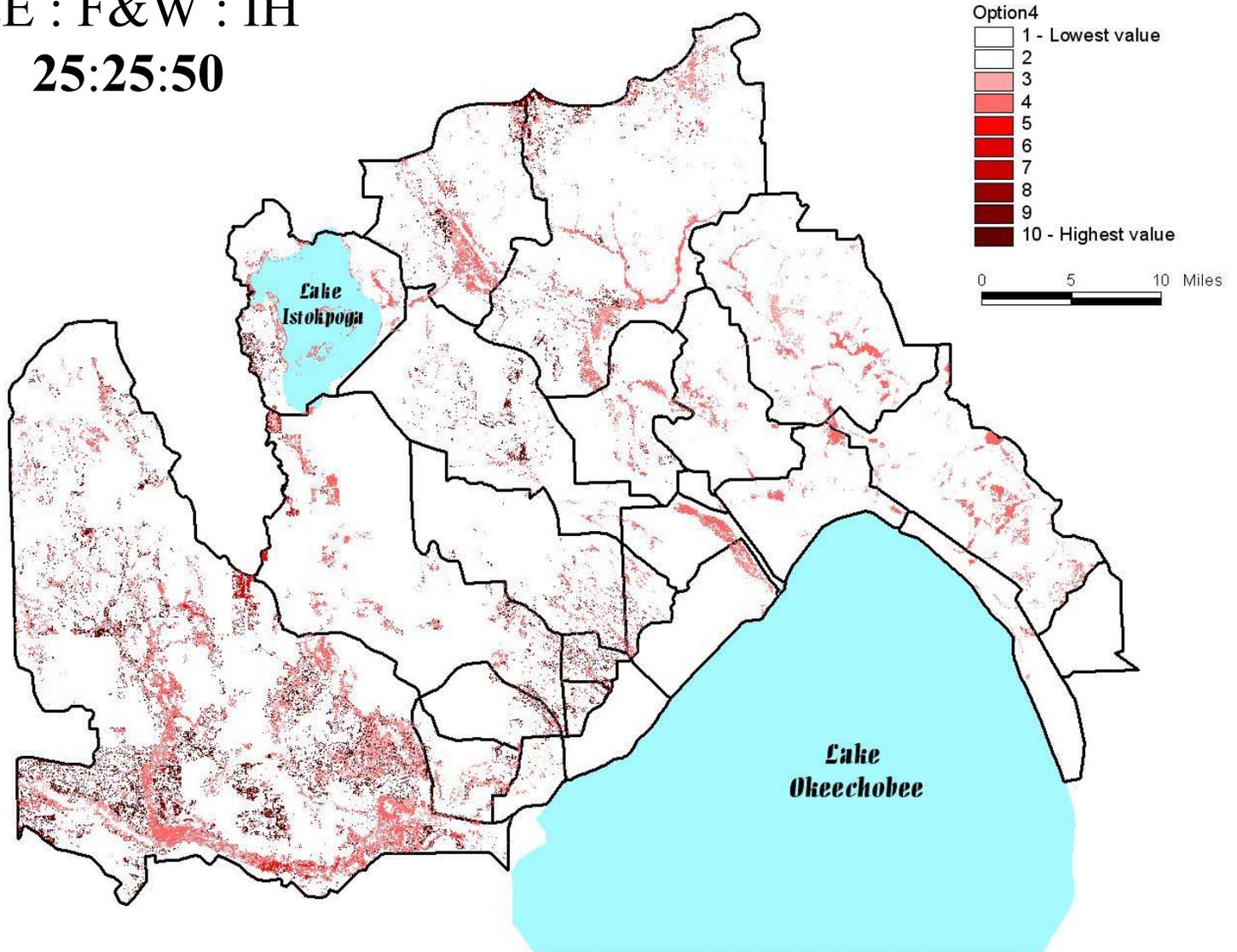
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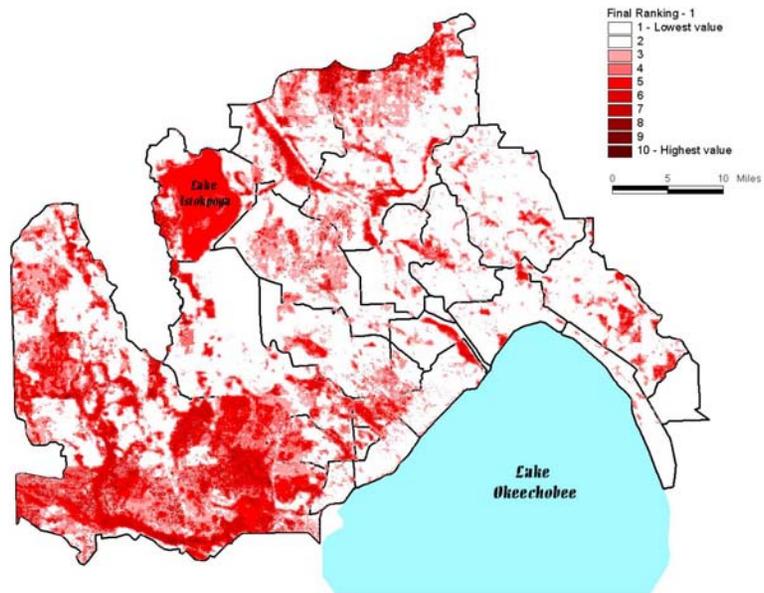
Option 4

T&E : F&W : IH

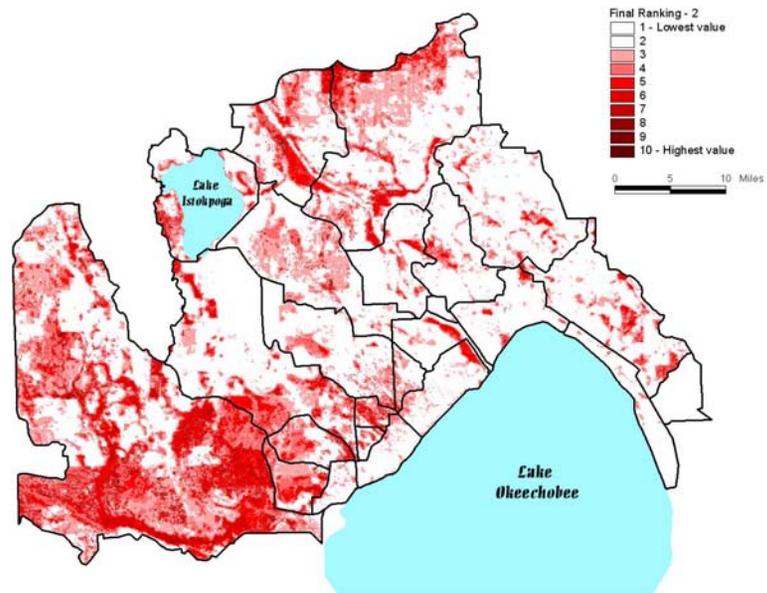
25:25:50



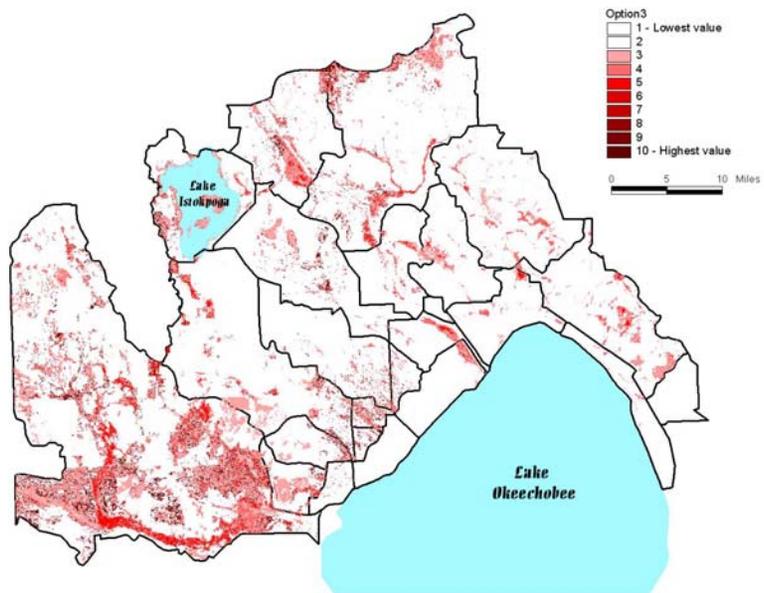
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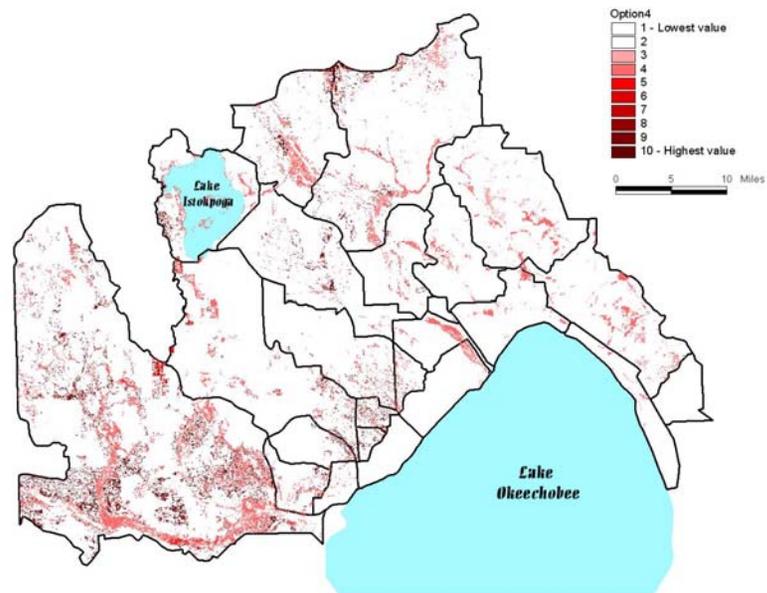
2



3



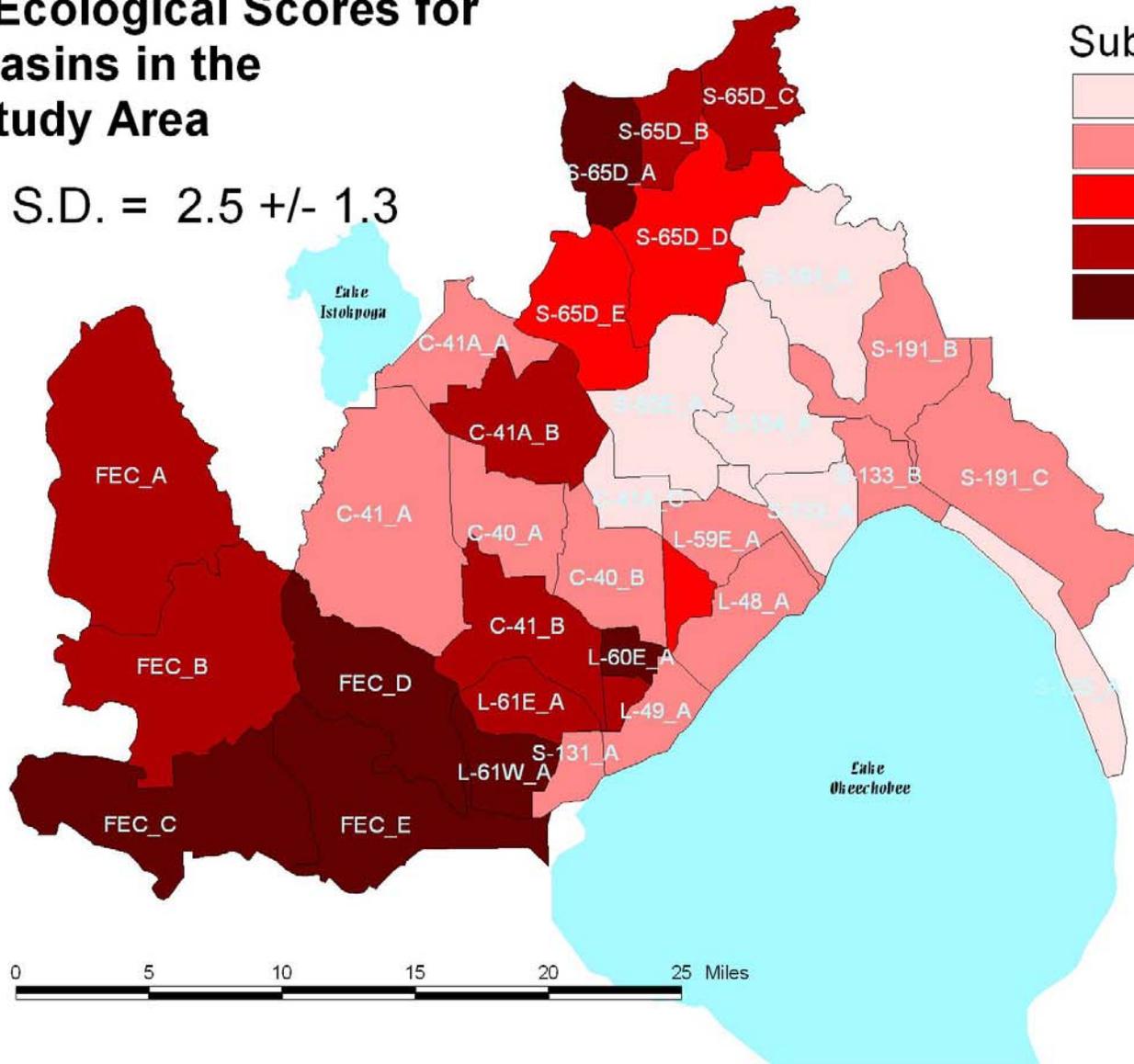
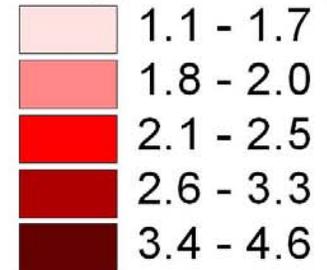
4



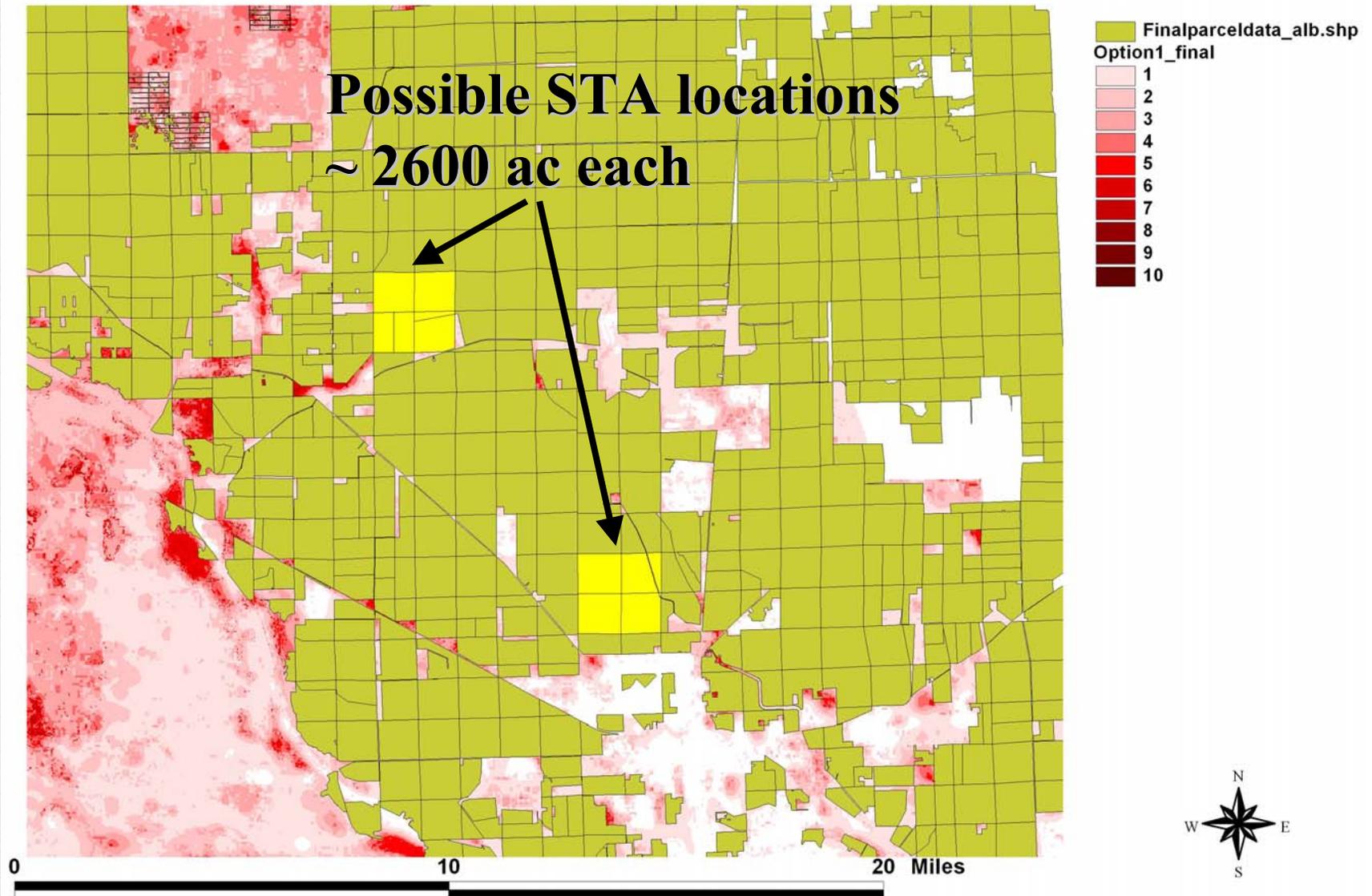
USFWS Ecological Scores for 35 sub-basins in the LOWP Study Area

Mean +/- S.D. = 2.5 +/- 1.3

Sub_basins.shp



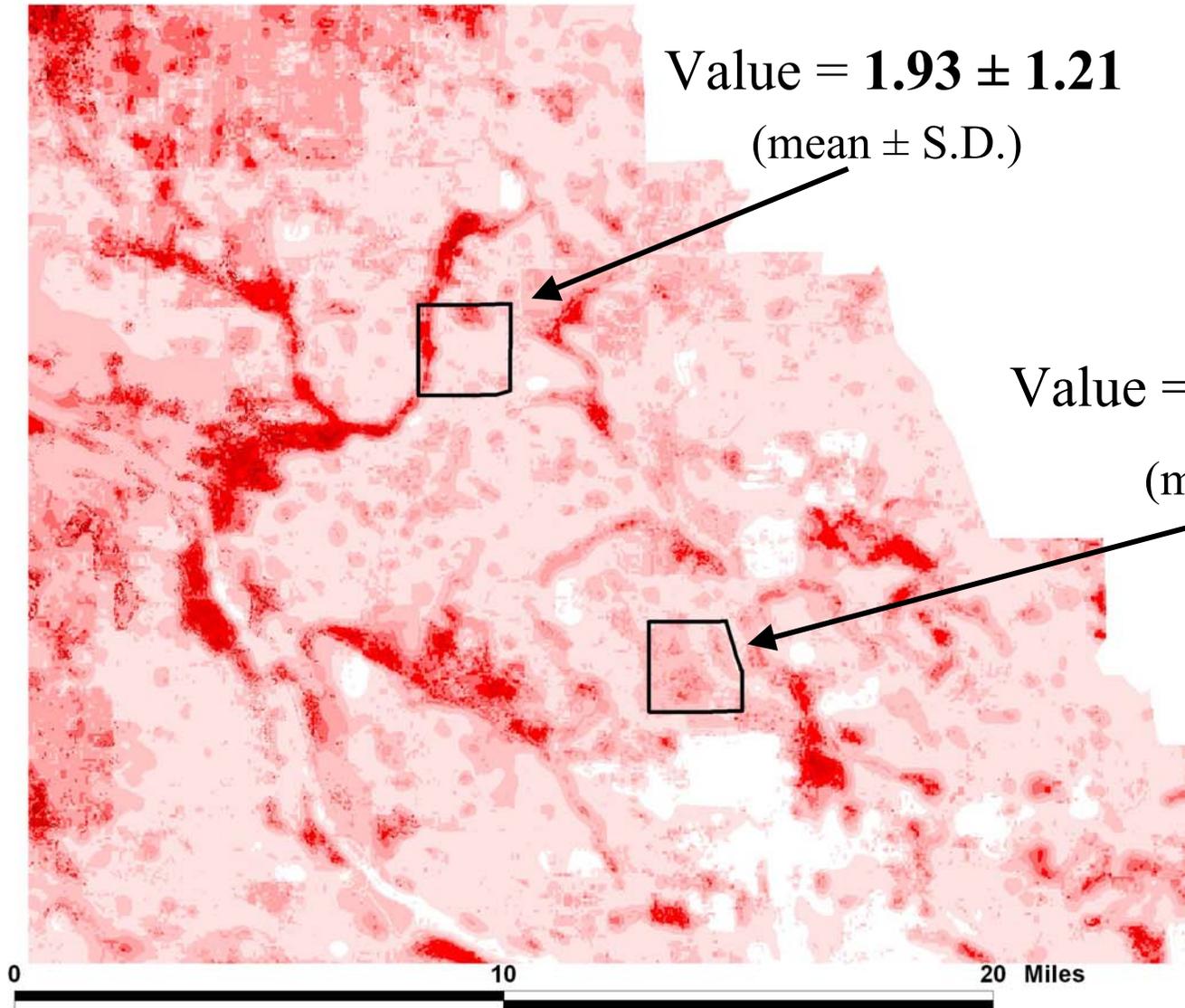
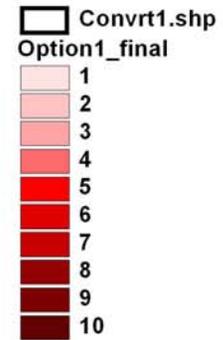
Okeechobee Parcel Data



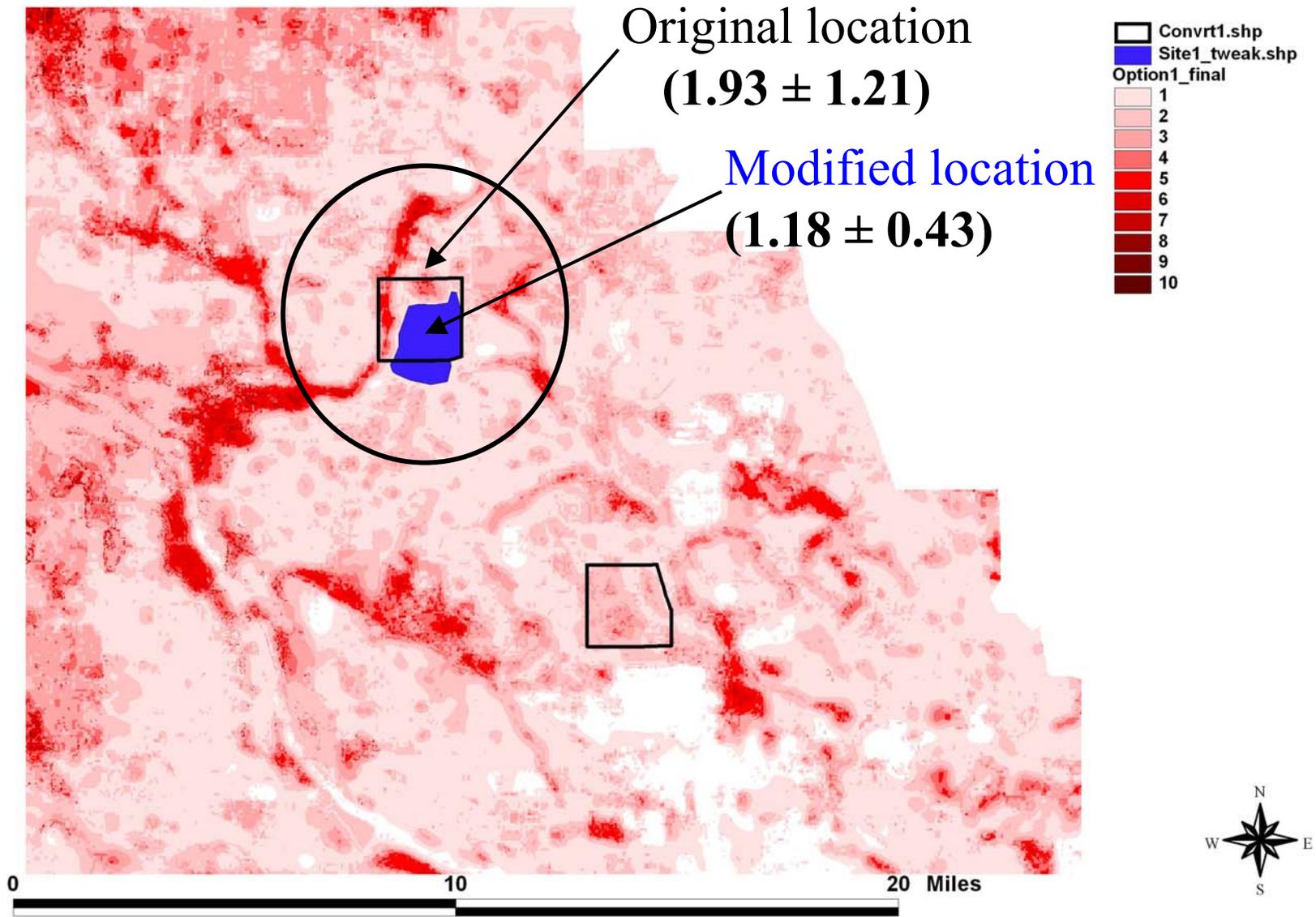
Okeechobee Parcel Data

Value = **1.93 ± 1.21**
(mean ± S.D.)

Value = **2.09 ± 0.72**
(mean ± S.D.)

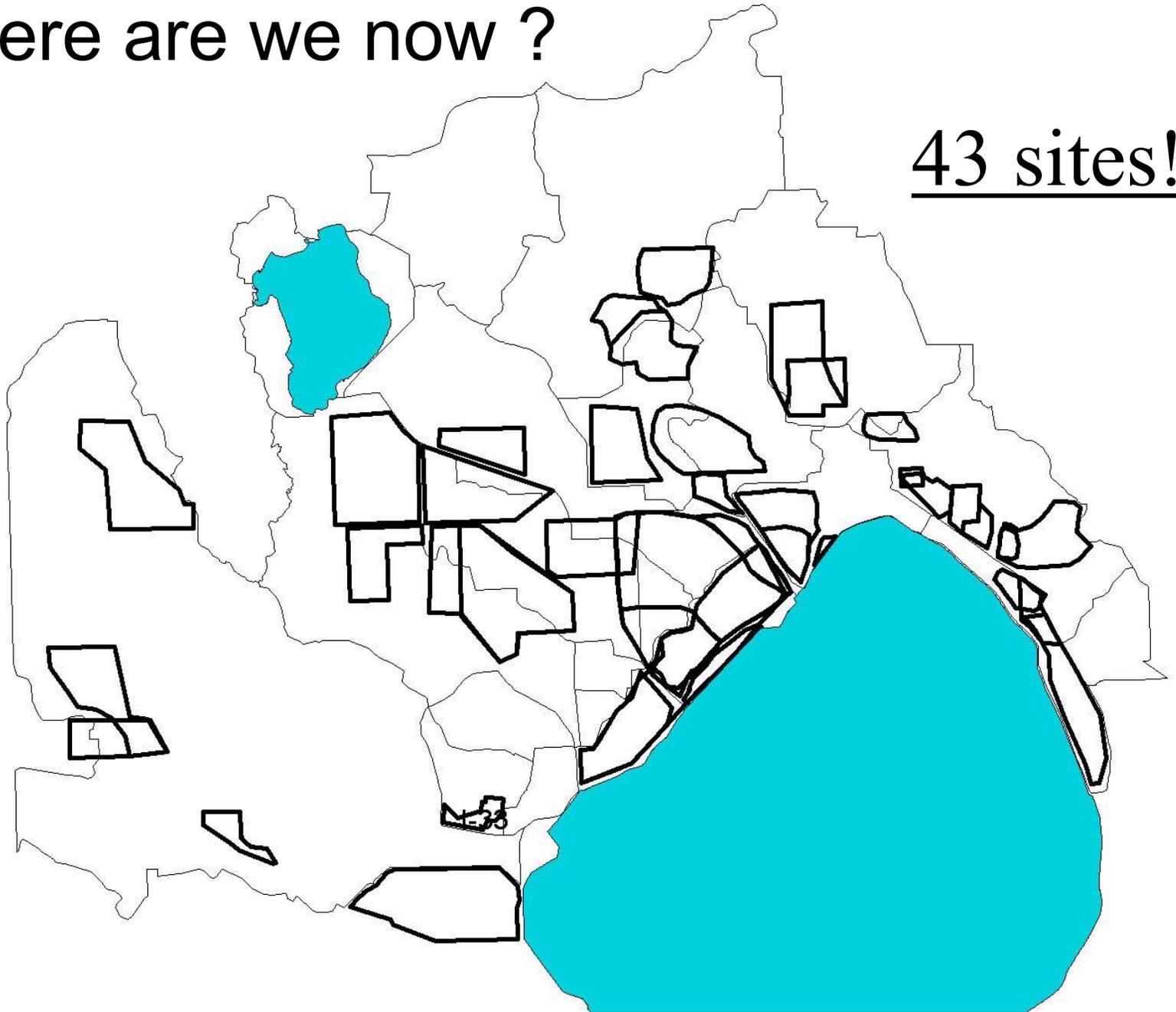


Okeechobee Parcel Data

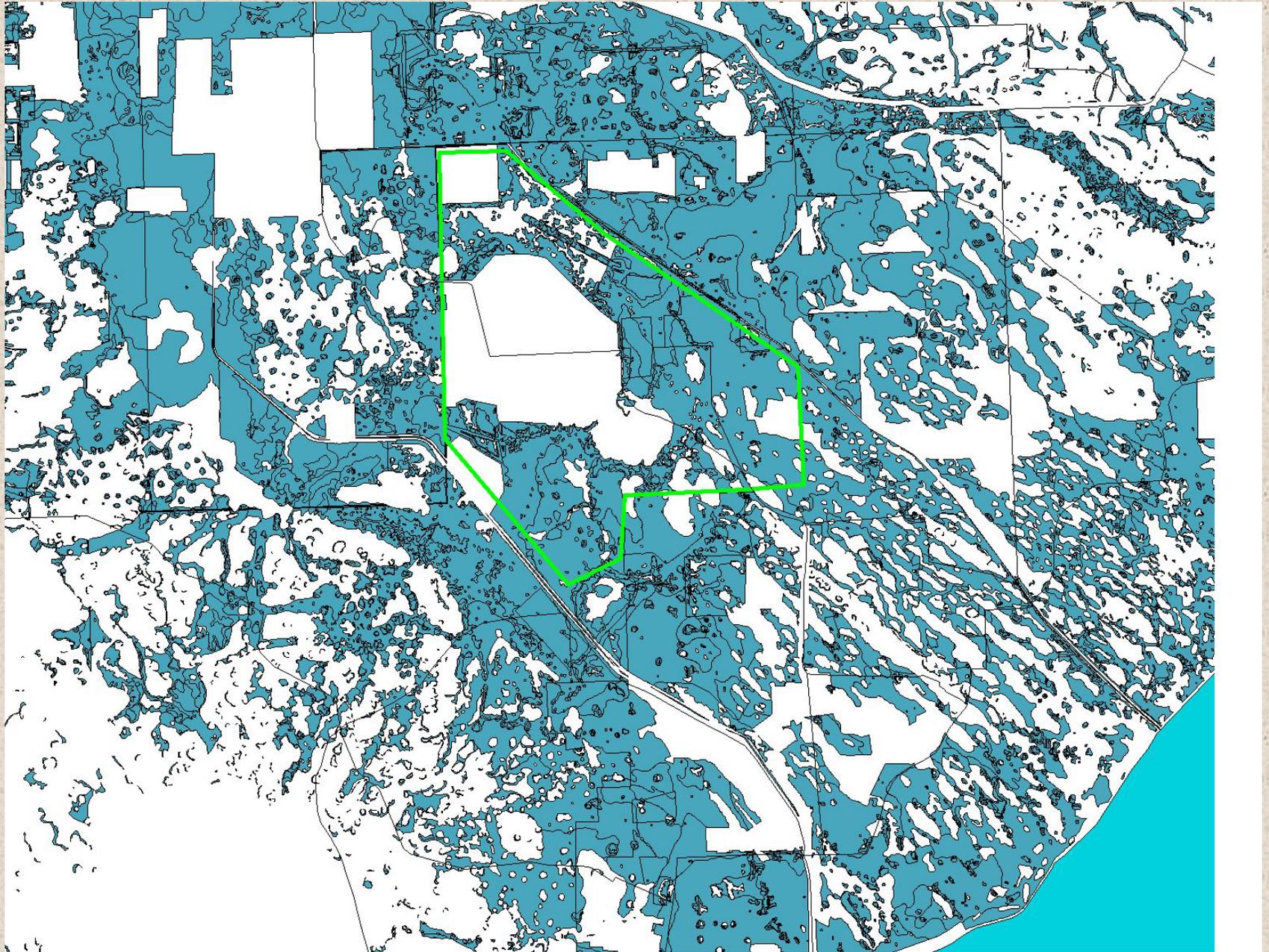


Where are we now ?

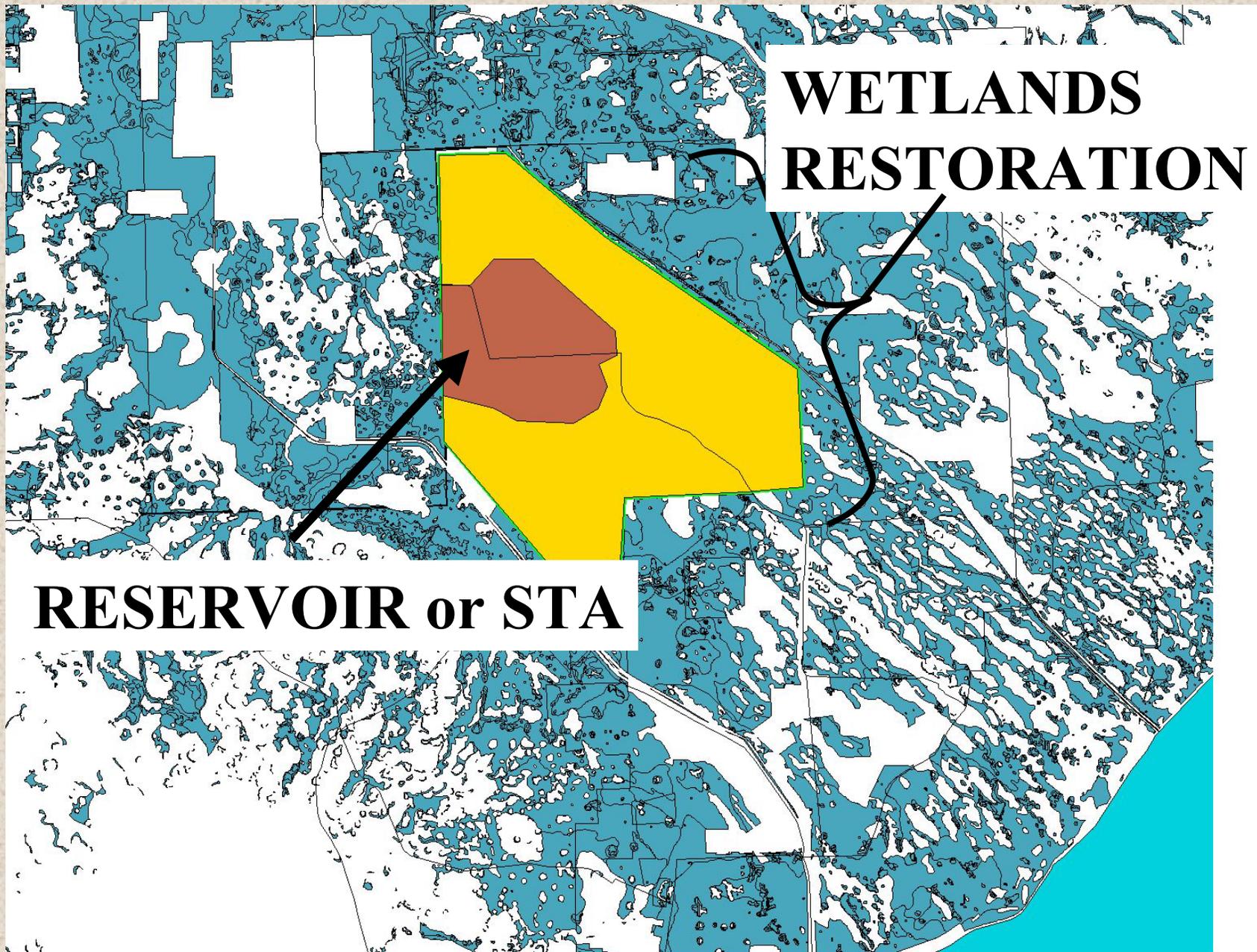
43 sites!



TNC and Wetland Restoration



TNC and Wetland Restoration



Summary

- Our model does not perform a T&E species evaluation
- The model uses ecological sensitivities to provide a quantitative basis for decision making during **project planning** – specifically, siting of reservoirs and STAs.
- It and may be applicable for other large restoration projects that have expansive siting requirements.

