

GreenLinks

**A TOOL TO INTEGRATE TRANSPORTATION
AND CONSERVATION PLANNING**

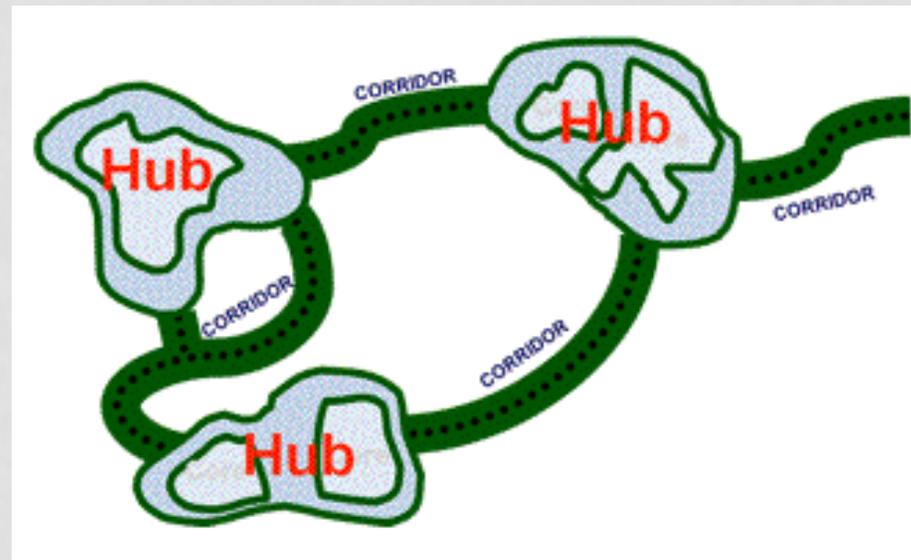
A NORTHWEST FLORIDA INITIATIVE



Mary Mittiga
US Fish and Wildlife Service
April 9, 2014

BASED ON GREEN INFRASTRUCTURE

- A **strategically planned and managed network** of natural lands, working landscapes, and other open spaces that conserve ecosystem values and functions, and provide associated benefits to human populations.



STRATEGIC PLANNING HELPS PROTECT MANY THINGS WE VALUE

Clean, abundant water

Beaches

Historic sites

Hiking

Sense of place

Heritage

Native plants

Traditional values

Quiet

Water sports

Hunting

Natural beauty

Fishing

Military lands

Working landscapes

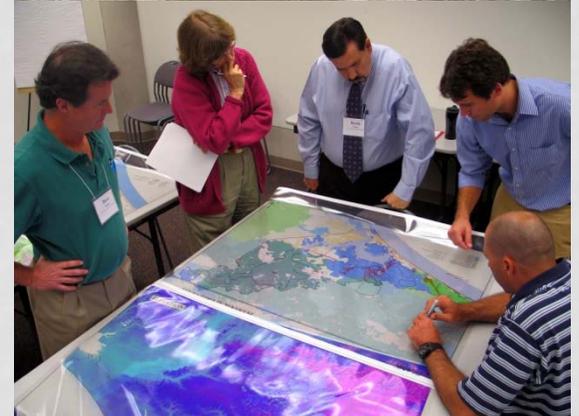
Diverse wildlife

Bird watching



WHAT IS GREENLINKS?

- A landscape-level approach
- A shared vision among partners
- Objective, science-based process
- Identifies conservation priorities
- A tool for better planning
 - Consistent with TRB's SHRP2 C06 - "Integrated Ecological Framework"



WHAT IT ISN'T...

- A land acquisition plan
- A regulatory requirement
- It's not "perfect". On-the-ground resource knowledge and survey data are always important!



PARTNERSHIP

- Funded by U.S. Fish and Wildlife Service
- Conducted by Dr. Tom Hoctor, University of Florida, with support from Jon Oetting, Florida Natural Areas Inventory
- Technical advisory group:
 - Florida Department of Transportation
 - Florida Fish and Wildlife Conservation Commission
 - Florida Forest Service
 - National Marine Fisheries Service
 - U.S. Army Corps of Engineers
 - U.S. Fish and Wildlife Service
 - & others



US Army Corps
of Engineers®

GOALS

- Strategically protect and manage a network of conservation lands essential for sustaining the area's diverse ecological functions and values into the future;
- Provide a framework for planning land development activities, including transportation projects; and
- Identify opportunities for locating parks, trails, and other green space to benefit human use.

PROJECT HISTORY

- 2006 – Federal framework for melding infrastructure and ecological planning (*Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects*)
- 2010 – USFWS hosts local training (*Strategic Conservation Planning Using A Green Infrastructure Approach*)
- 2011 – USFWS contracts with Dr. Hoctor, UF Center for Conservation Planning, to develop regional green infrastructure plan
- 2013 – GreenLinks project completed. Further information at:

<http://www.fws.gov/PanamaCity/greenlinks.html>



Photo by Carlton Ward

PROJECT EXTENT

- Ten counties west of the Apalachicola River



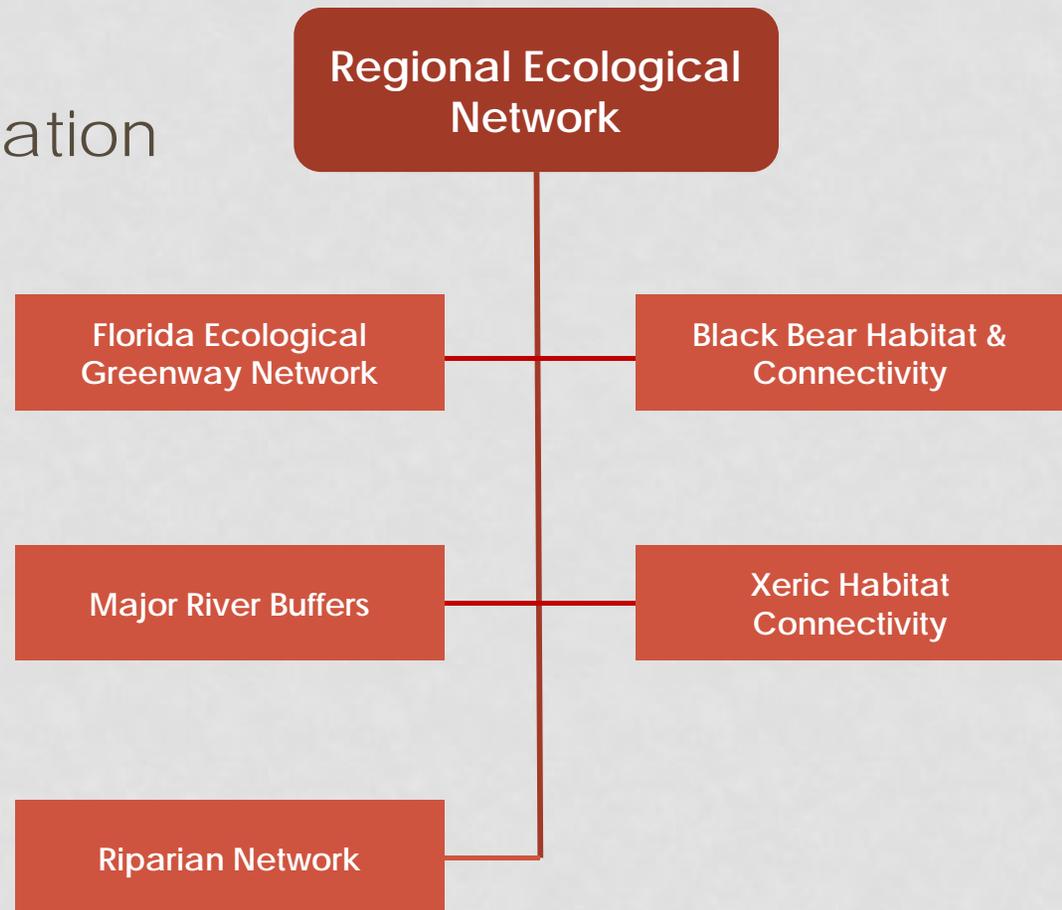
GREENLINKS PRODUCTS

- **Conservation Priority Database**
 - 3 sub-databases
 - 50 data layers
- **Models**
 - Regional Ecological Network (REN)
 - CLIP & Regional Ecological Data Synthesis (CRES)
 - ✓ **Regional CLIP Model** (REN + CRES)
 - Regional Overlay Model
 - ✓ **GreenLinks Priority Model** (Regional CLIP P1 Overlay Model)



REGIONAL ECOLOGICAL NETWORK (REN)

- Rules-based model
- Aggregated prioritization
- Five data layers



REGIONAL ECOLOGICAL NETWORK

Combination of Florida Ecological Greenways Network (FEGN), Florida Black Bear Habitat and Corridor Analysis, Major River Buffers, Xeric Habitat Connectivity, and the Riparian Network.

Priority 1

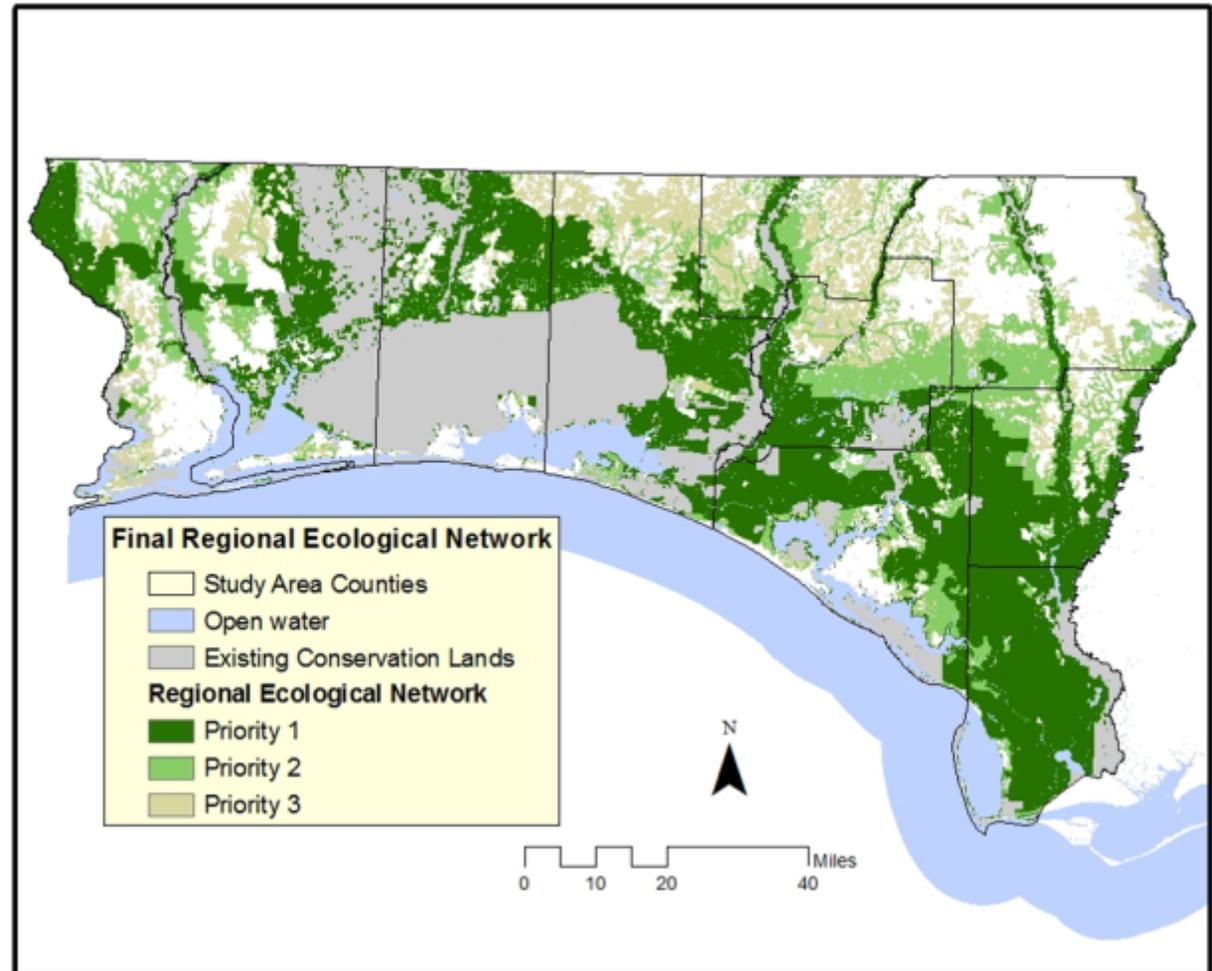
- FEGN Critical Linkages
- Florida black bear PPCAs and SHCAs bear corridor
- Major River buffers
- P1 Riparian Network

Priority 2

- FEGN P1-P5
- Other bear habitat priorities
- Xeric Connectivity patches 5,000 acres or larger
- P2 Riparian Network

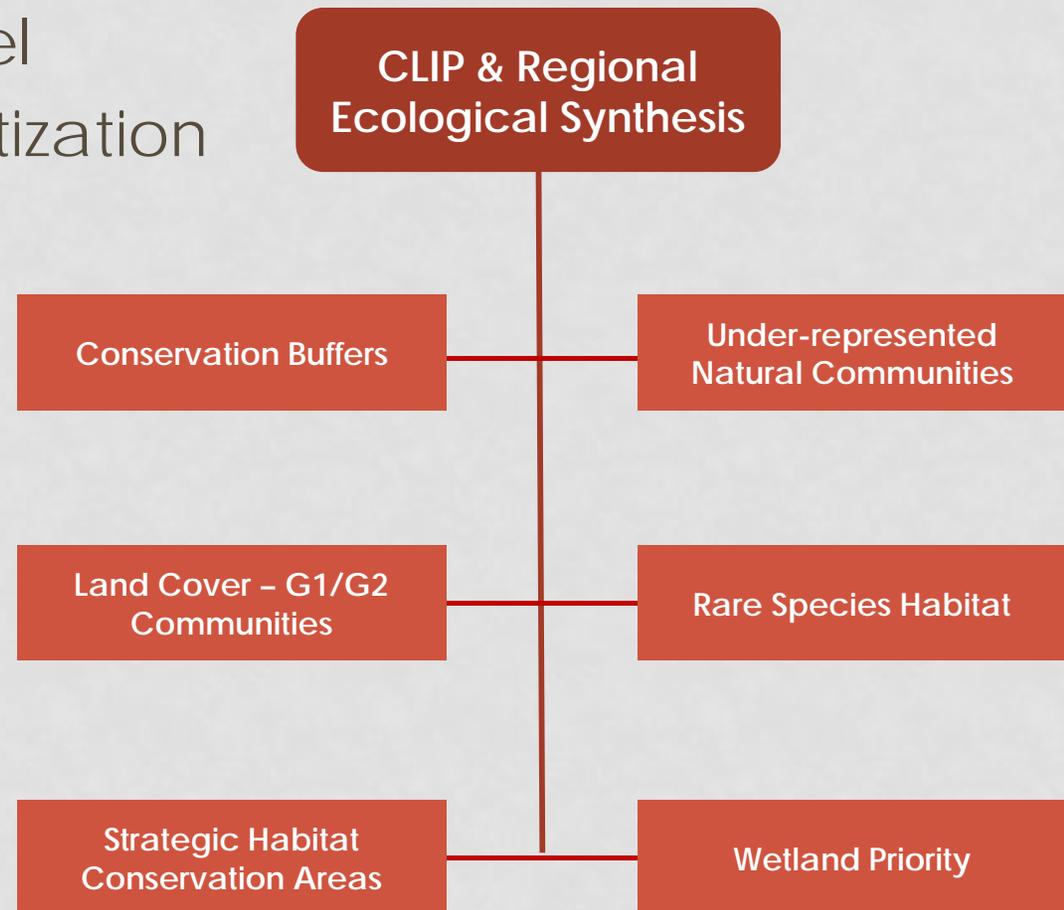
Priority 3

- FEGN P6
- Xeric Connectivity patches 1,000 - 4,999 acres
- P3 Riparian Network



CLIP & REGIONAL ECOLOGICAL DATA SYNTHESIS (CRES)

- Rules-based model
- Aggregated prioritization
- Six data layers



CLIP & REGIONAL ECOLOGICAL DATA SYNTHESIS (CRES)

Combination of GL Conservation Buffers, CLIP Under-represented Natural Communities, GL Cooperative Land Cover (CLC) based G1-G2 Natural Communities, CLIP FNAI Rare Species Habitat, CLIP FWC Strategic Habitat Conservation Areas, and CLIP FNAI Wetland Priorities.

Priority 1

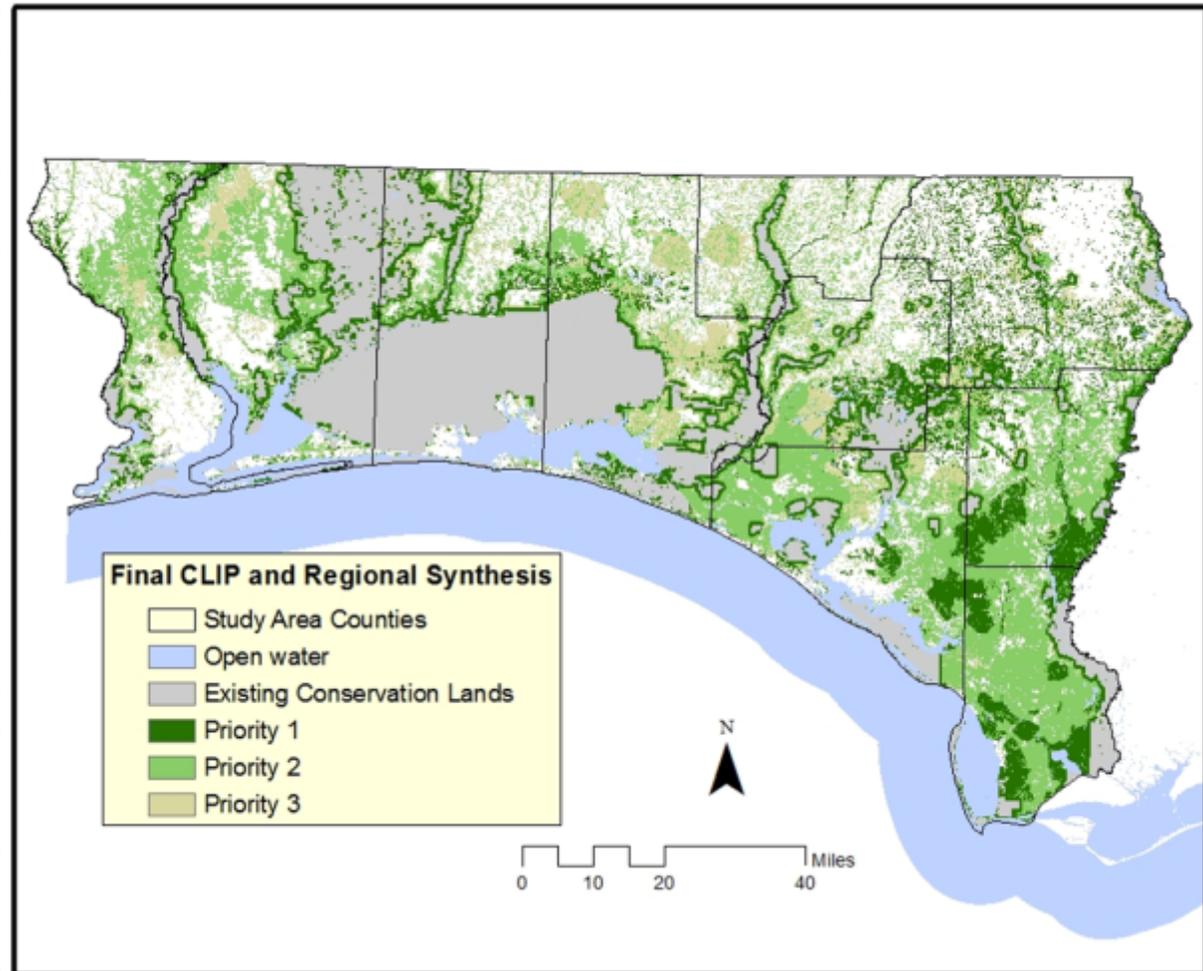
- CLIP FNAIHAB P1-P2
- CLIP SHCA P1
- CLIP Natural Communities: G1-G3
- CLIP Wetlands P1
- Conservation Buffers P1-P2

Priority 2

- CLIP FNAIHAB P3
- CLIP SHCA P2-P3
- CLIP NC: G4
- CLIP Wetlands P2-P4
- Conservation Buffers P3

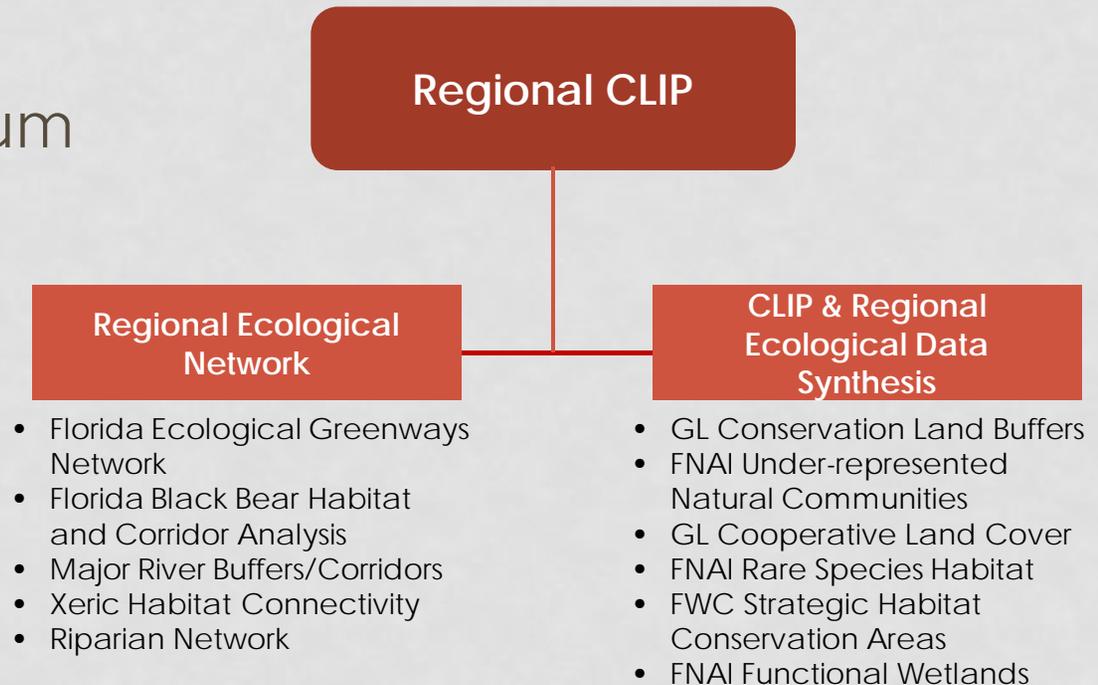
Priority 3

- CLIP FNAIHAB P4-P6
- CLIP SHCA P4-P5
- CLIP NC: G5 rare + all other regional natural communities ranked G1-G2
- CLIP Wetlands P5-P6
- Conservation Buffers P4-P5



REGIONAL CLIP

- Combination of REN and CRES
- Rules-based, maximum
- Aggregate model



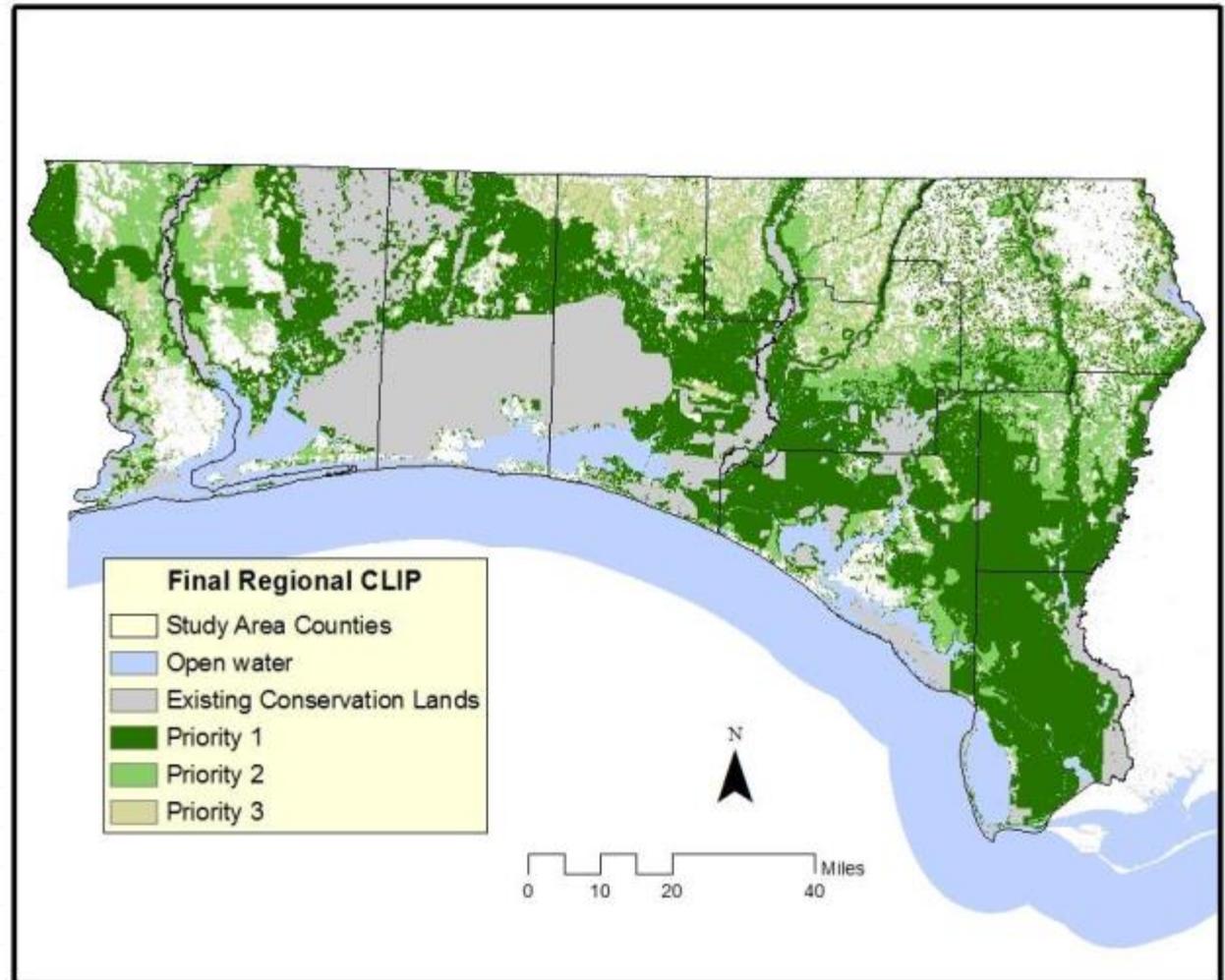
REGIONAL CLIP

- Final aggregated priorities data layer for the GreenLinks study area.
- Combines the REN and CRES models.
- Rules-based maximum approach. Each cell is given the highest priority rank from either of the two layers that occurs at that location. The values are:

Value 1 = Priority 1

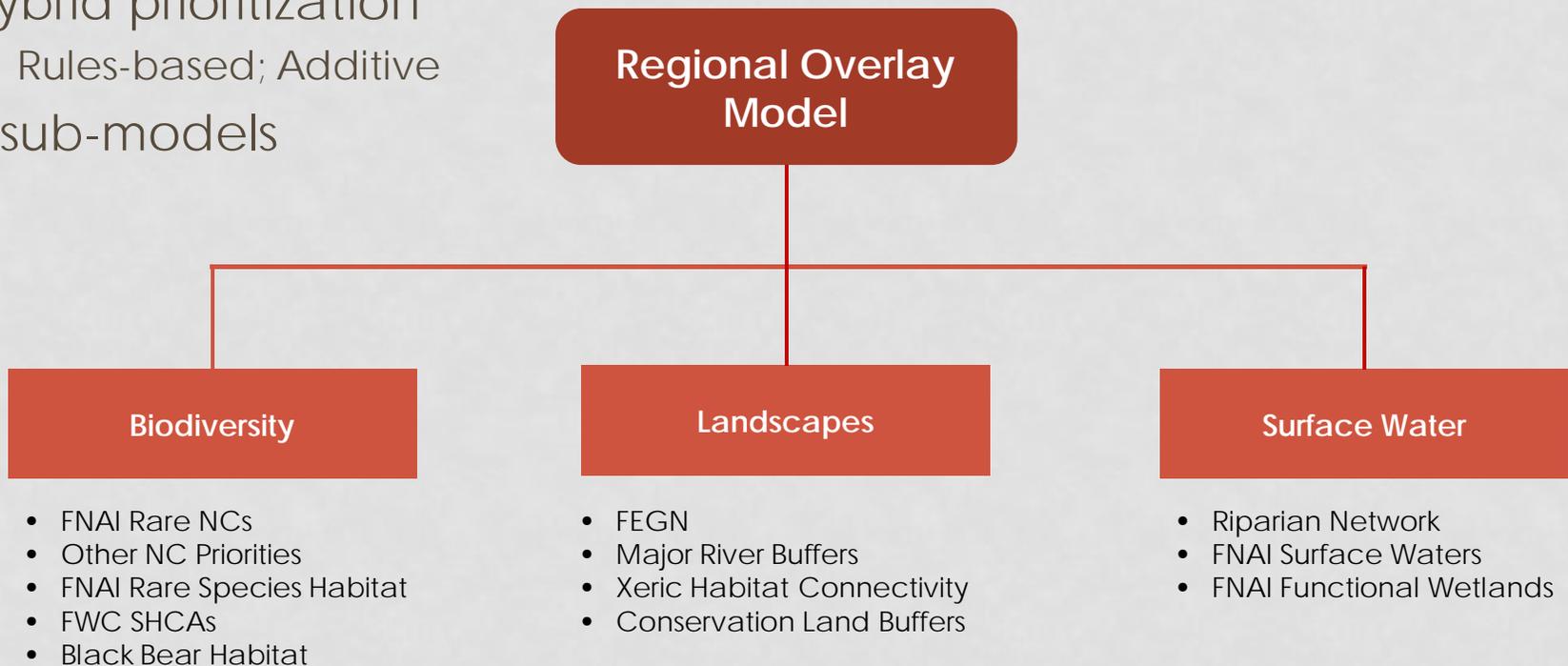
Value 2 = Priority 2

Value 3 = Priority 3



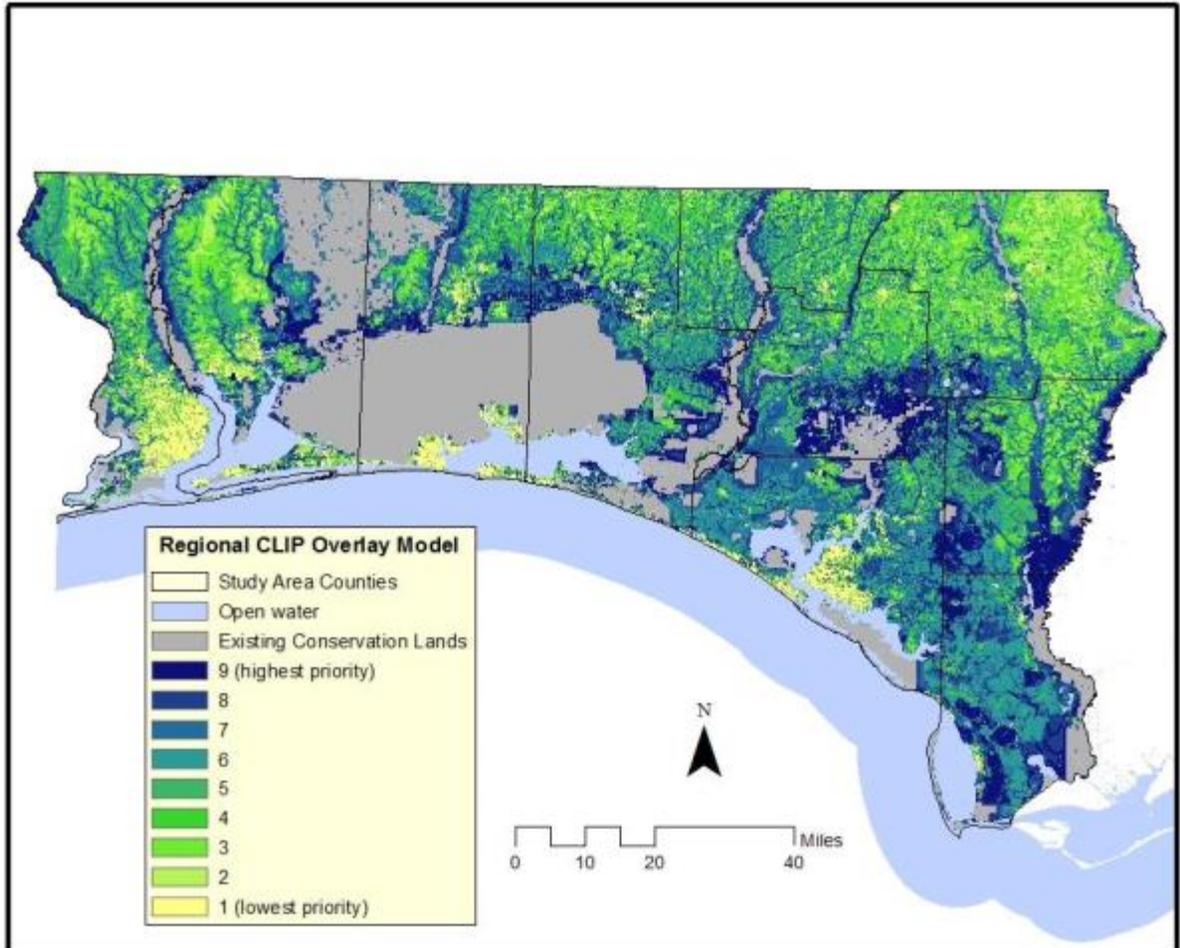
REGIONAL OVERLAY MODEL

- To define finer classes within basic priorities
- Hybrid prioritization
 - Rules-based; Additive
- 3 sub-models



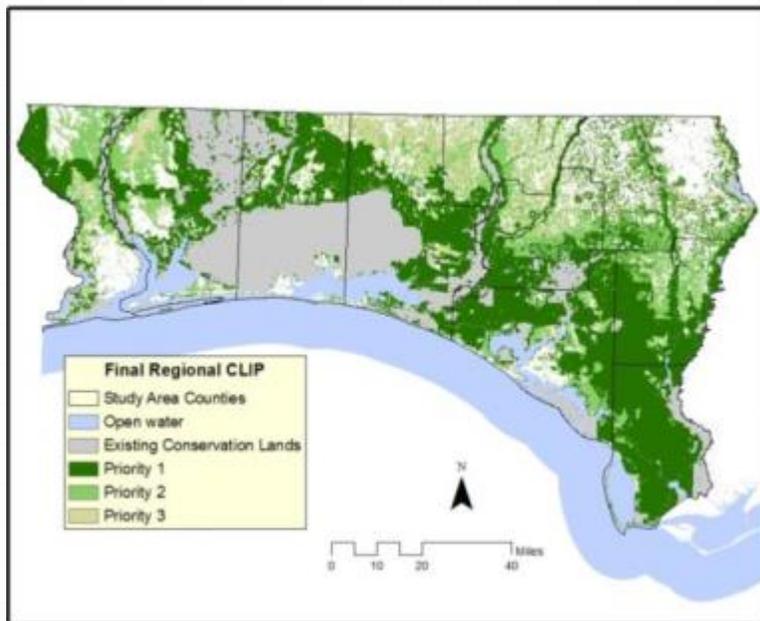
REGIONAL OVERLAY

This is the layer was created by combining the Biodiversity, Landscape, and Surface Water overlay models using a rules-based maximum approach. The values in the layer range from 1-9, where a 1 is the lowest rank and 9 is the highest

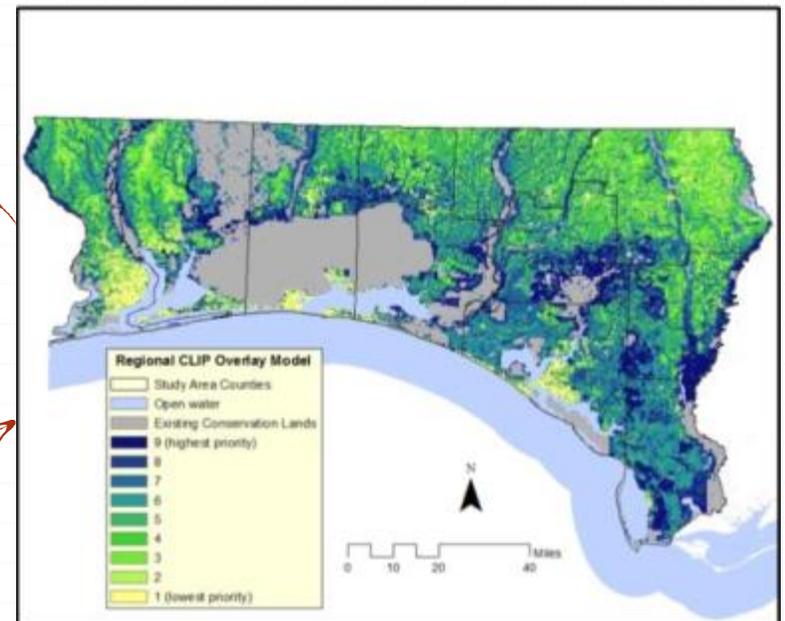


Developing the GreenLinks Priority Model

Regional CLIP



Regional Overlay



GREENLINKS PRIORITY MODEL

(REGIONAL CLIP P1 OVERLAY MODEL)

This layer combines the Priority 1 areas from the GL Regional CLIP layer with the Final Overlay Model described below in Section IV. This was done by taking the original 9 priority levels in the Final Overlay Model, clipping them to the Regional CLIP P1 boundary, and then reclassifying them into 3 priority levels using the Natural Breaks reclassification method in ArcGIS. Natural Breaks reclassification resulted in these groupings:

Overlay Model values 1-5 = low (L3)

Overlay Model values 6-7 = moderate (L2)

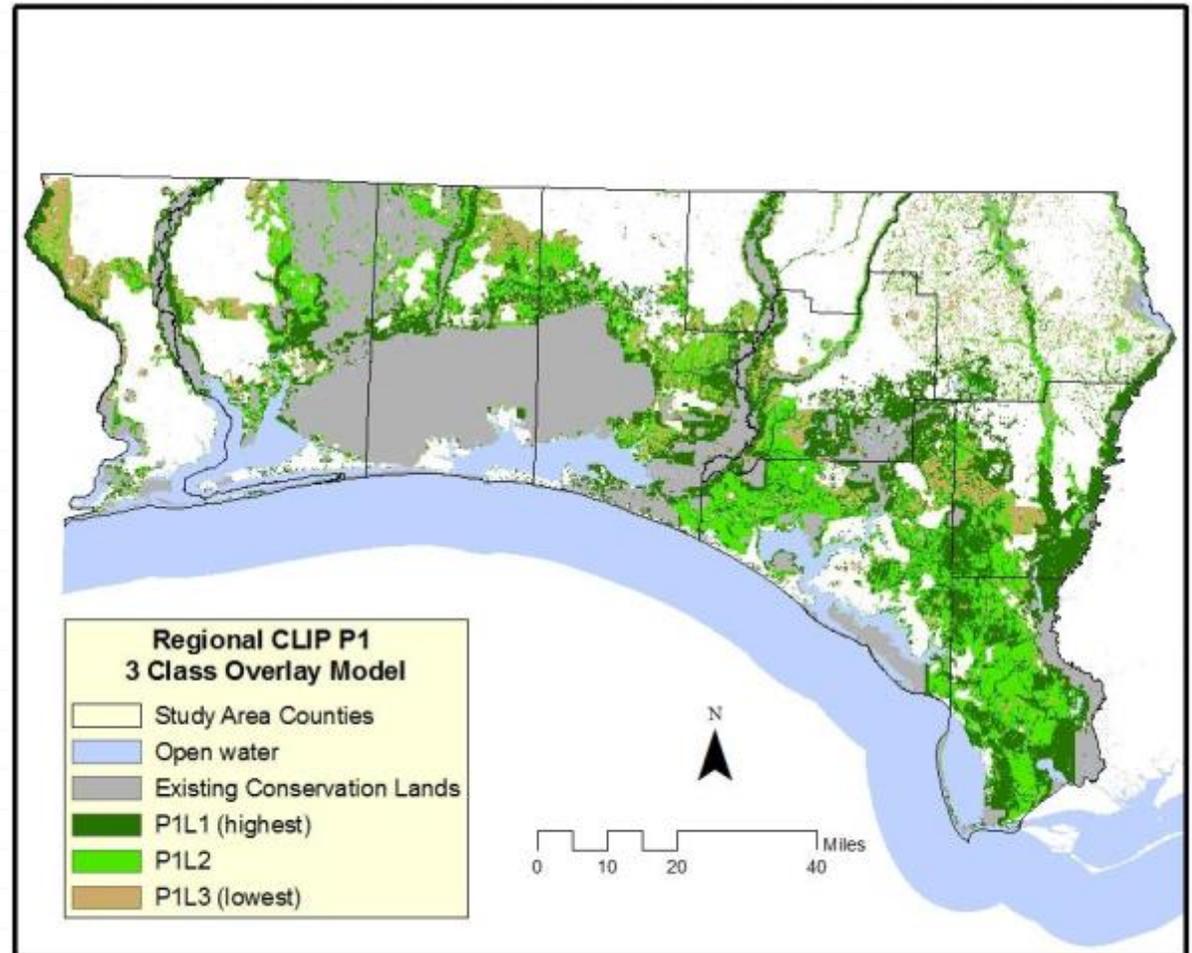
Overlay Model values 8-9 = high (L1)

These Overlay Model priority levels were then combined with the Regional CLIP P1 in a second level of priority with CLIP P1 areas in a raster layer with the following values:

Value 1 = Priority 1 = P1L1

Value 2 = Priority 2 = P1L2

Value 3 = Priority 3 = P1L3



USES

- Can use any of the models
- **Regional CLIP** provides top three priority levels
- **GreenLinks Priority Model** provides information on the “best of the best” within the highest priority area
 - Forms the “green infrastructure” or ecological framework
 - One model for multiple metrics (wetlands, connectivity, habitat, rare species, etc.)



EXAMPLES

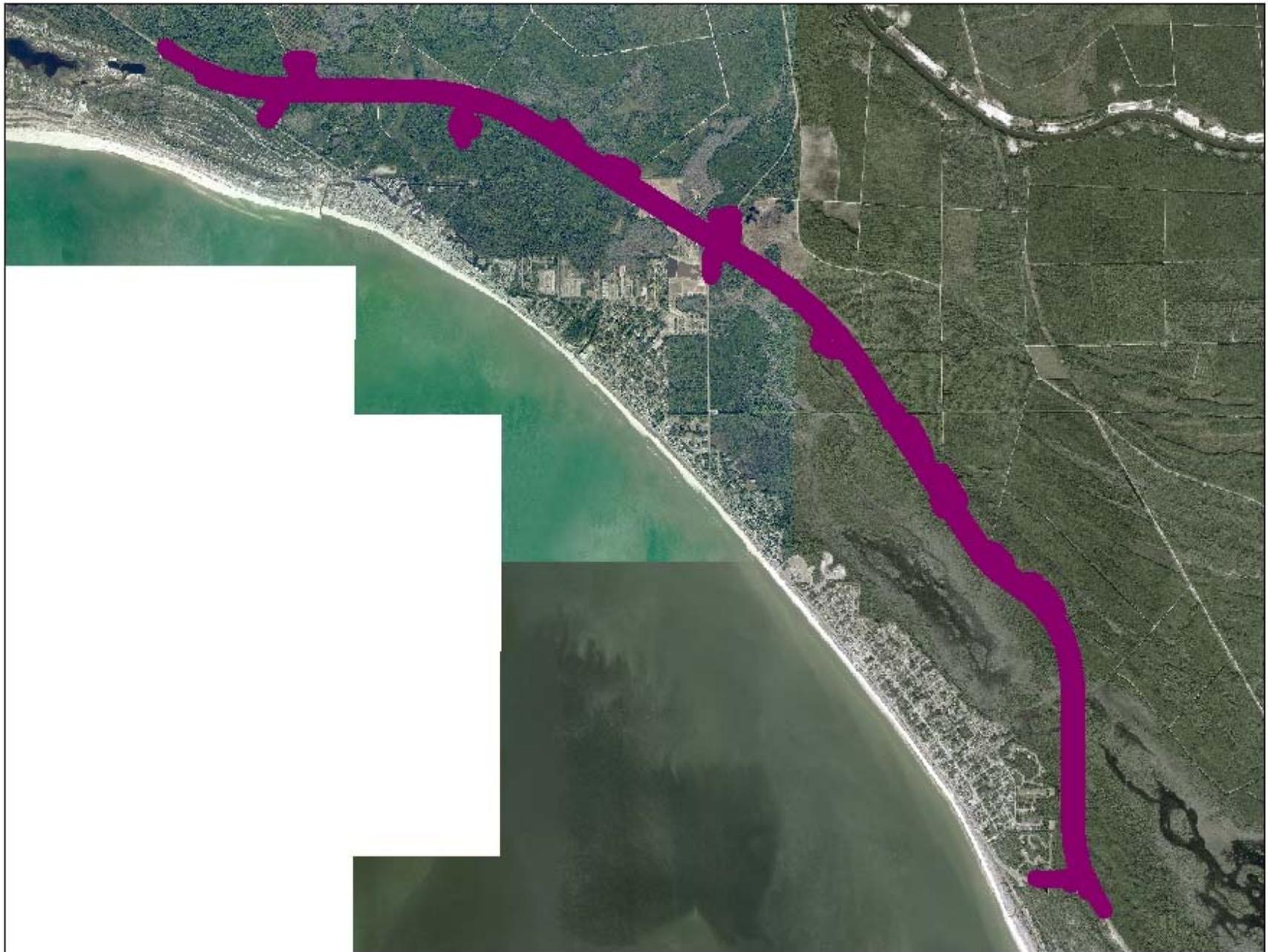


GREENLINKS - USES

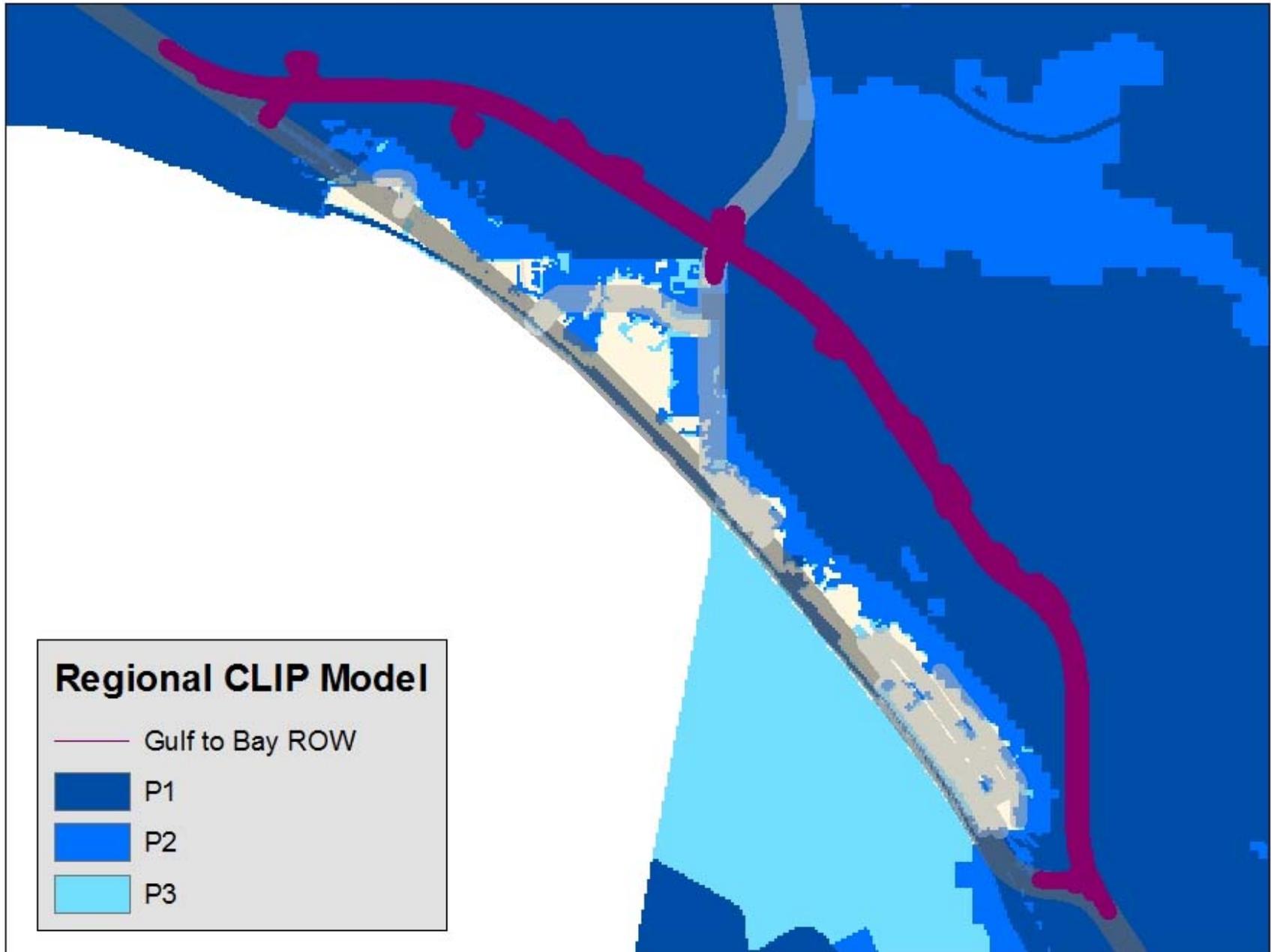
- Can use the **Regional CLIP Model** to:
 - Avoid high priority areas (Priority 1)
 - If unavoidable, then...
- Use **GreenLinks Priority Model** to “fine-tune” alignment to avoid and minimize impacts to highest priority areas (*i.e.* P1L1) within Priority 1
 - Example: Gulf-to-Bay Highway



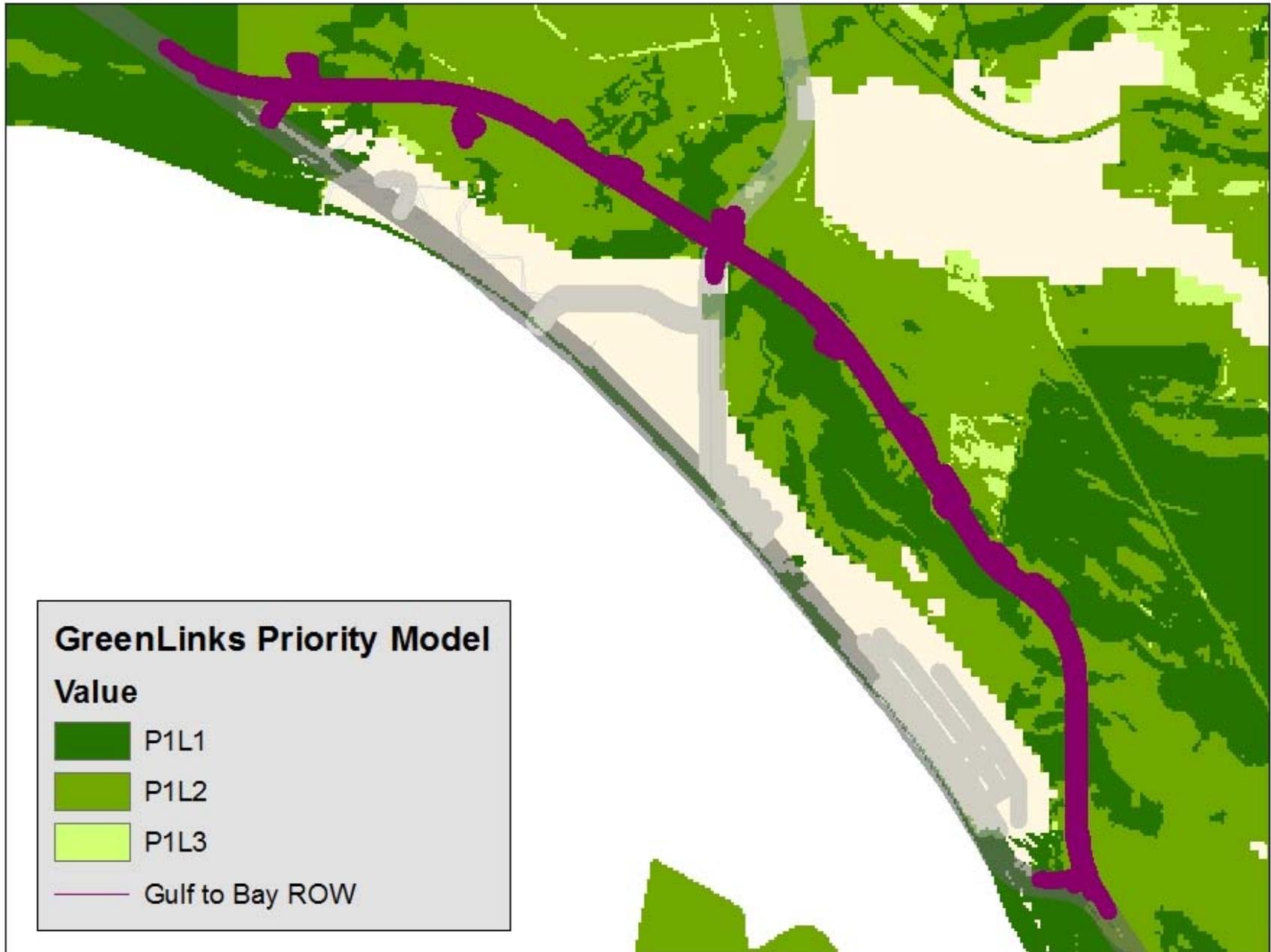
Gulf-to-Bay Highway, Bay & Gulf Counties, FL



Gulf-to-Bay Highway, Bay & Gulf Counties, FL



Gulf-to-Bay Highway, Bay & Gulf Counties, FL

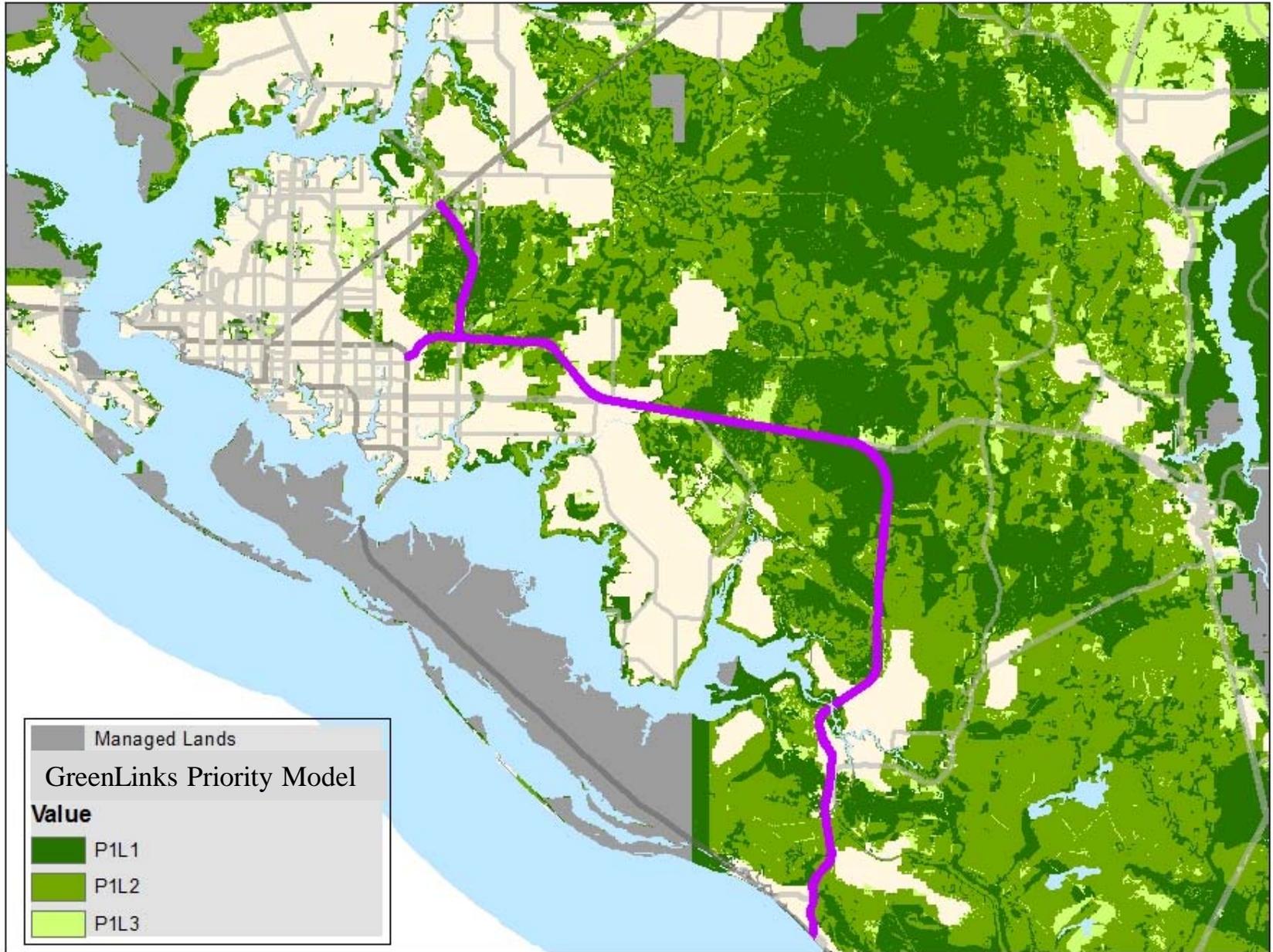


GREENLINKS - USES

- Can use the **GreenLinks Priority Model** to:
 - Compare corridor alignments to determine which has the least impacts to natural resources
 - Example: Gulf Coast Parkway



Gulf Coast Parkway Alignment 8



Gulf Coast Parkway Alignment 14



Gulf Coast Parkway Alignment 15



Gulf Coast Parkway Alignment 17



Gulf Coast Parkway Alignment 19



GREENLINKS - USES

- **GreenLinks Priority Model** can identify alignments with less impact to highest priority areas for multiple natural resource functions (wetlands, natural communities, rare species habitat, landscape connectivity, etc.)

Highest priority

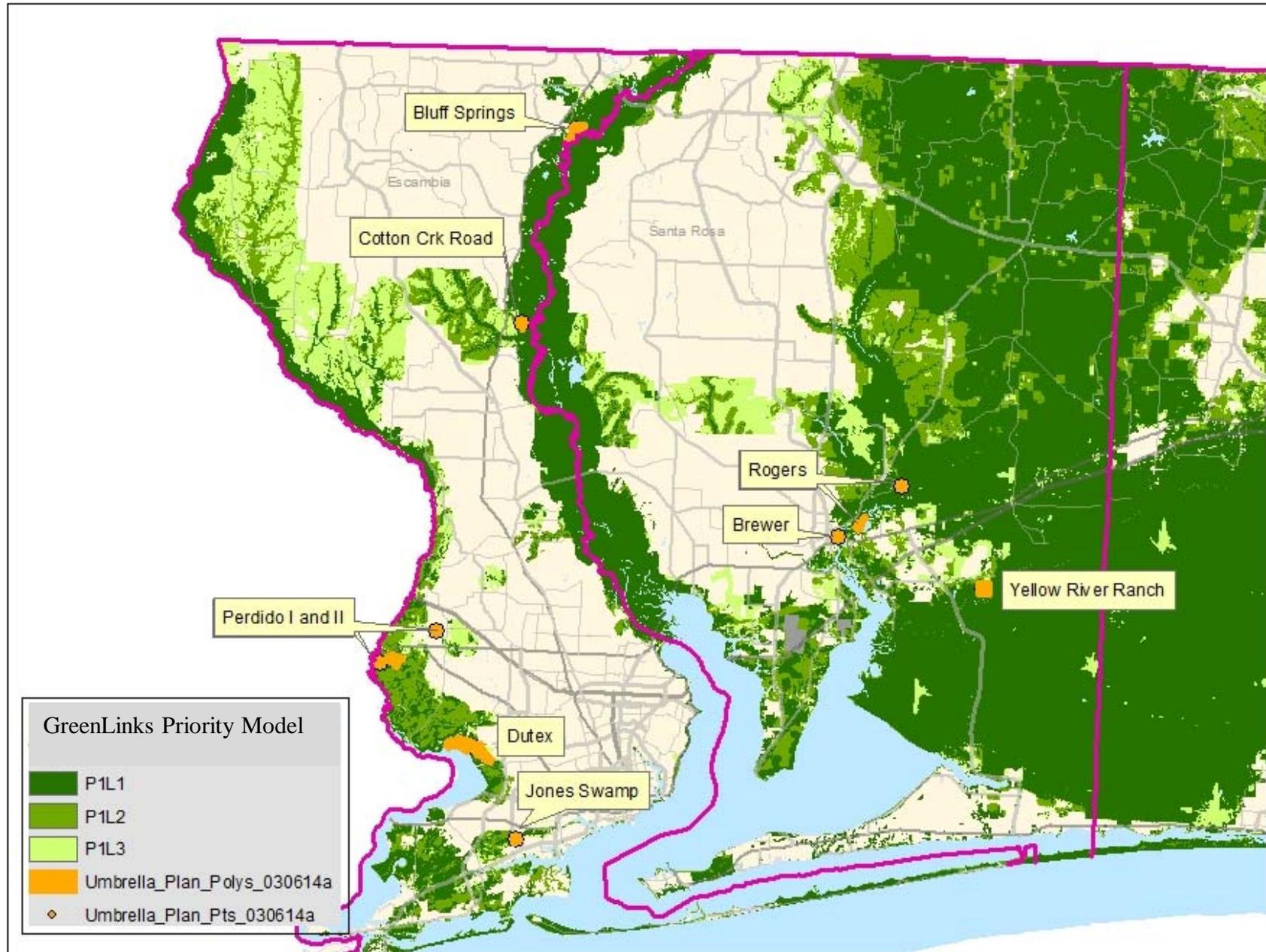
| GCP Alignment | P1L1 | | P1L2 | | P1L3 | | Total Area |
|---------------|-------|------|-------|------|------|-----|------------|
| | ac | % | ac | % | ac | % | ac |
| 8 | 286.6 | 29.9 | 386.9 | 40.3 | 42.0 | 4.4 | 959.8 |
| 14 | 378.2 | 31.4 | 495.9 | 41.2 | 51.4 | 4.3 | 1202.6 |
| 15 | 454.7 | 34.6 | 536.1 | 40.8 | 42.9 | 3.3 | 1312.5 |
| 17 | 119.3 | 14.3 | 358.9 | 43.0 | 29.4 | 3.5 | 834.5 |
| 19 | 189.3 | 18.3 | 452.0 | 43.7 | 33.6 | 3.2 | 1035.1 |

GREENLINKS - USES

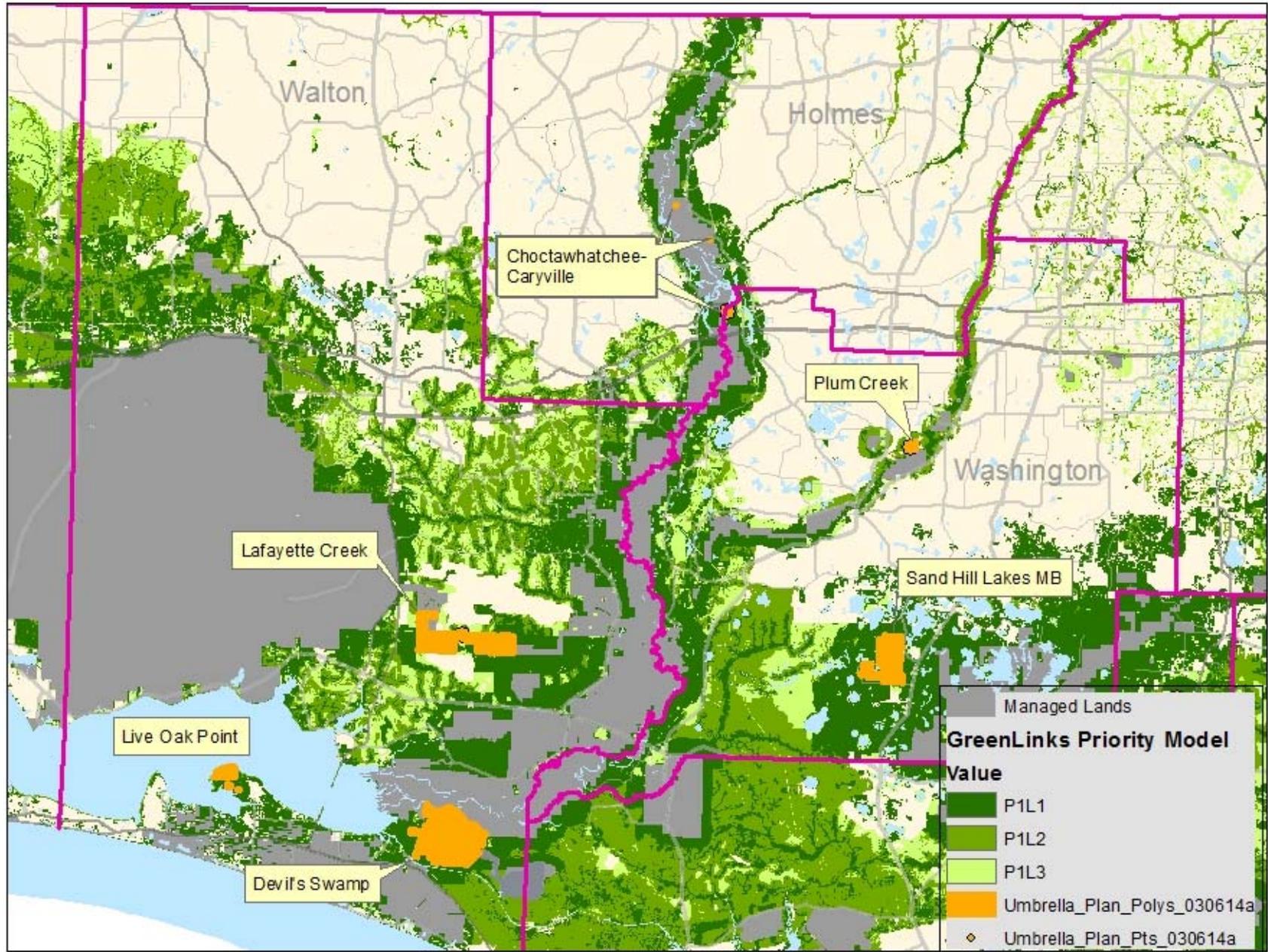
- Can use the **GreenLinks Priority Model** to:
 - Identify regionally significant target areas for mitigation
 - Acquisition, restoration, enhancement
 - Potential for advance mitigation
 - Validate the importance of known wetland & species mitigation sites
 - Example: NFWWMD Umbrella Plan sites



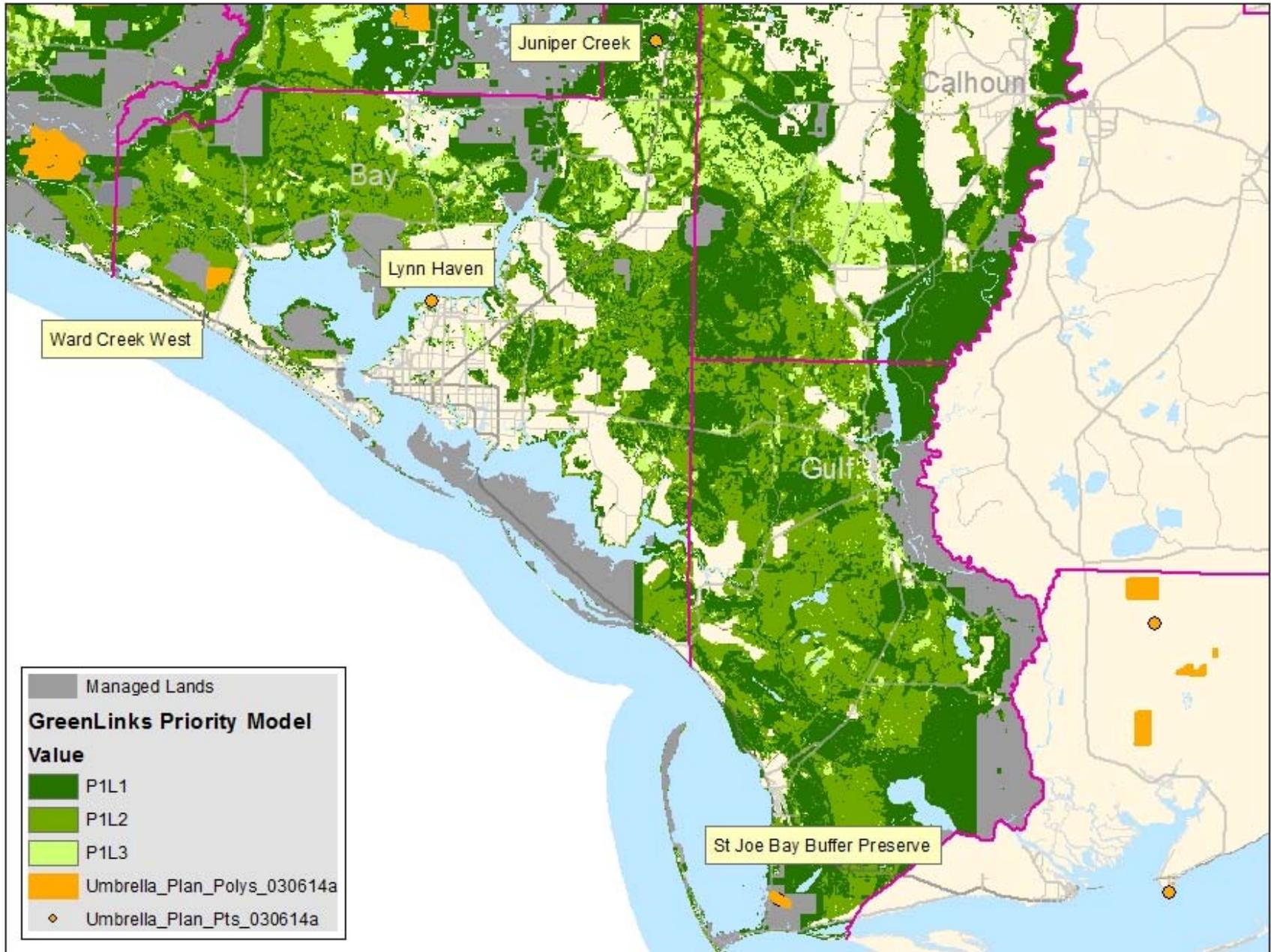
NWFWMD Umbrella Plan Mitigation Sites



NFWFWD Umbrella Plan Mitigation Sites



NWFWMD Umbrella Plan Mitigation Sites



GREENLINKS – POTENTIAL NEXT STEPS

- Add to the Environmental Screening Tool.
Let's use it!
- Expand to cover all 16 counties in District 3
- Maintain the database and keep it current
- Take to more stakeholders
 - Landscape Conservation Cooperatives
 - FWC Cooperative Conservation Blueprint
 - Counties



QUESTIONS?



Photo by Paul A. Lang FWG