

The Everglades | Prioritizing Conservation Efforts

Introduction

Located at the southern tip of Florida, the Everglades is a network of coastal marshes, low grasslands, mangroves and tropical forests. Considered a biodiversity hot-spot the region is home to over twenty endangered or threatened species and is a major breeding ground for birds. Unfortunately, over the past 75 years, the Everglades have lost more than 50% of its original extent, with the remaining land in significant degradation. This project intends to find land in the Everglade's Southern Florida Watershed located above, that should be prioritized for conservation, considering areas that are most at risk and areas with large natural benefits.

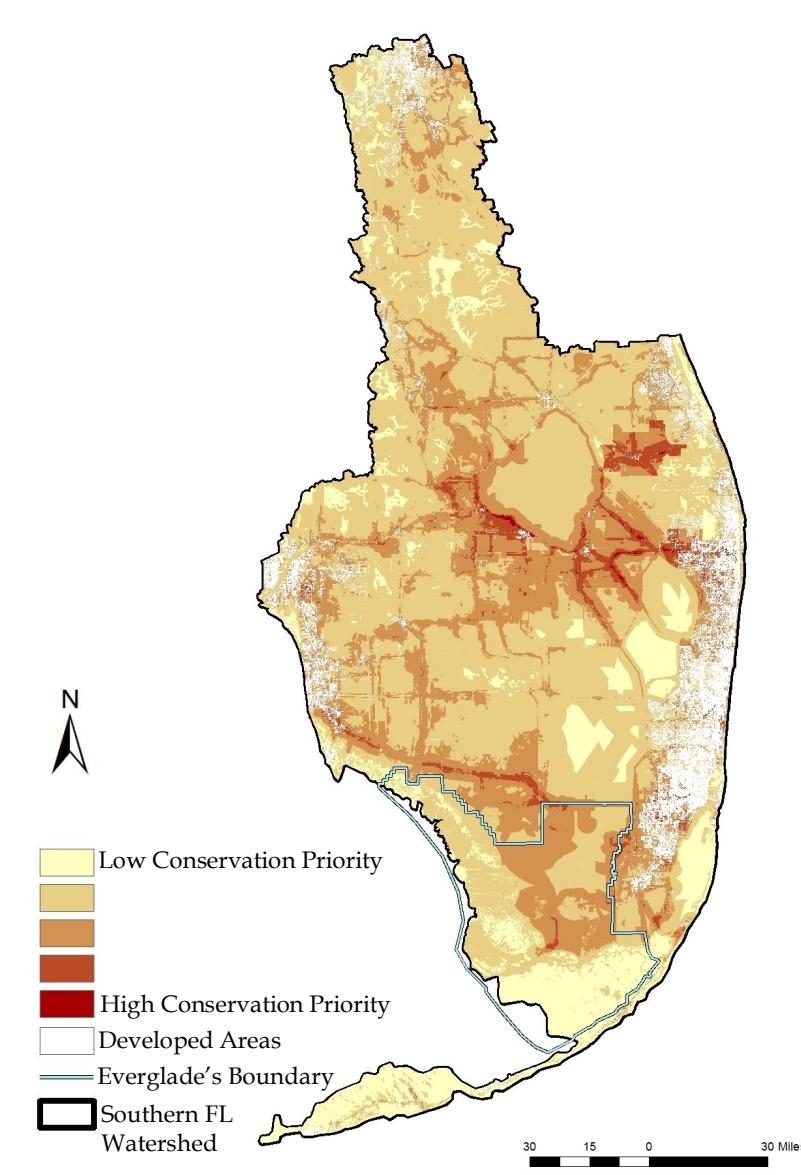


Methodology

The Southern Florida Watershed has three main threats: agricultural and residential development, invasive species and climate change. To assess these risks, this project created a principle threat map considering the eight risk factors shown on the right. Three additional maps were then created considering weighted significance for different conservation priorities: climate change, development and biodiversity. The first map tells us what priorities environmentalists would have, being most concerned with climate change. The second expresses weighted concern for areas most at risk of being developed, likely priorities for planners or city governments. The third map weights concern biologists would have, prioritizing areas high in biodiversity and habitat importance for at-risk animals.

The climate change map considers elevation data to assess areas most at risk to sea-level rise and areas best at absorbing water back into the Biscayne Aquifer. Something important to maintain Southern Florida's freshwater supply. The development map considered areas nearest to existing development, as those locations are most at-risk for future development. The biodiversity map considered habitats unique to endangered or threatened species, areas that would create or improve contiguous greenways, and areas high in vegetation and animal biodiversity.

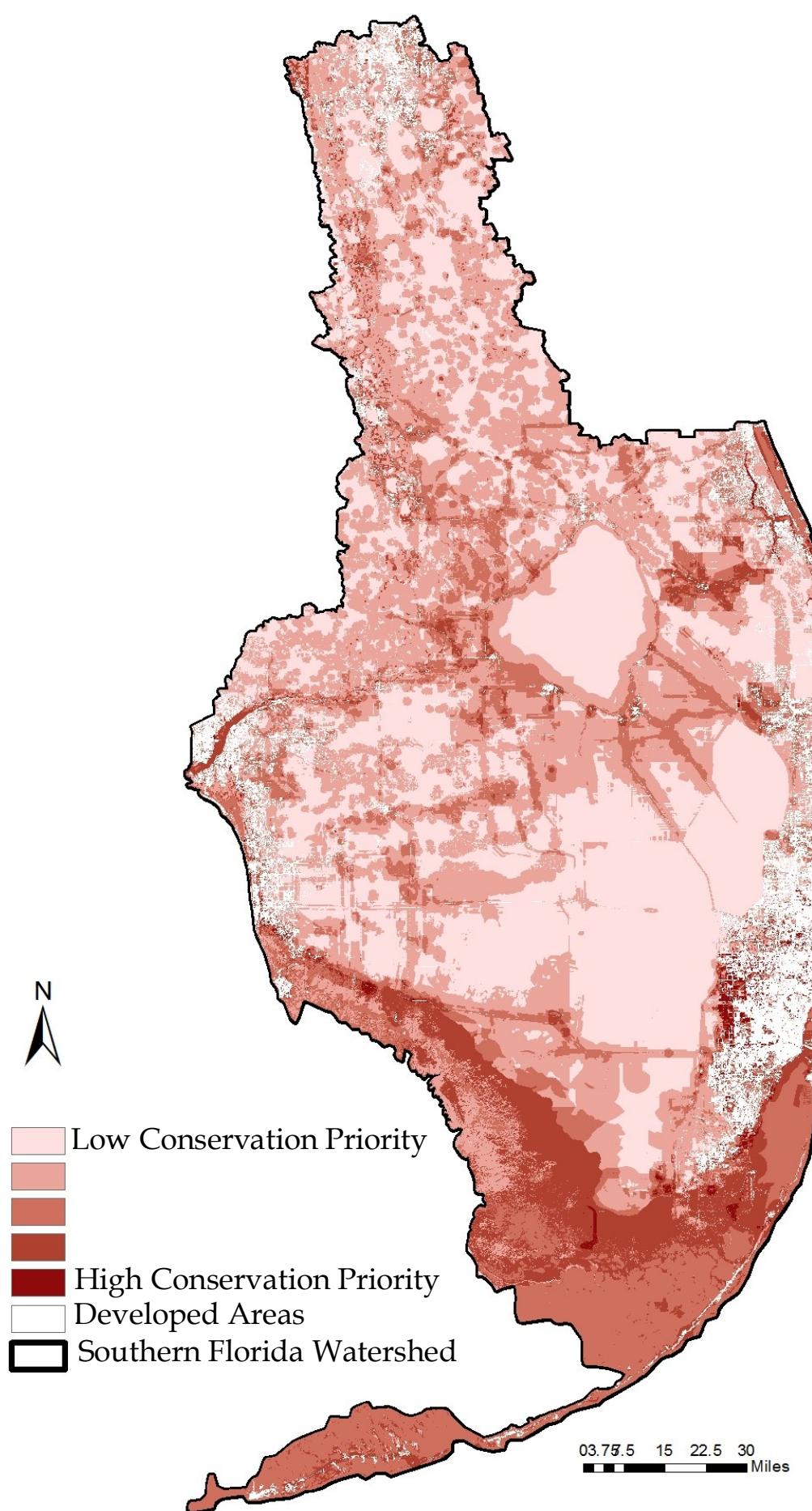
Principle Threat Map



Principle Threat Map Layers

Prox. to Phosphorus Sites	Surface Water Withdrawal
Proximity to Major Roads	Water Quality
Prox. To Dams and Canals	Invasive Plants & Animals
Prox. to Oil & Gas Permits	Storm Surge

Weighted Concern of Climate Change



Considering

Elevation Data	Aquifer Recharge Ability
----------------	--------------------------

Discussion

Finally, an overall conservation priority map was generated, considering all principle risk and climate change, development and biodiversity conservation priorities; assessing fourteen risk factors in total. Already developed areas are indicated in white on each map, and for the development map areas that are already under conservation are displayed.

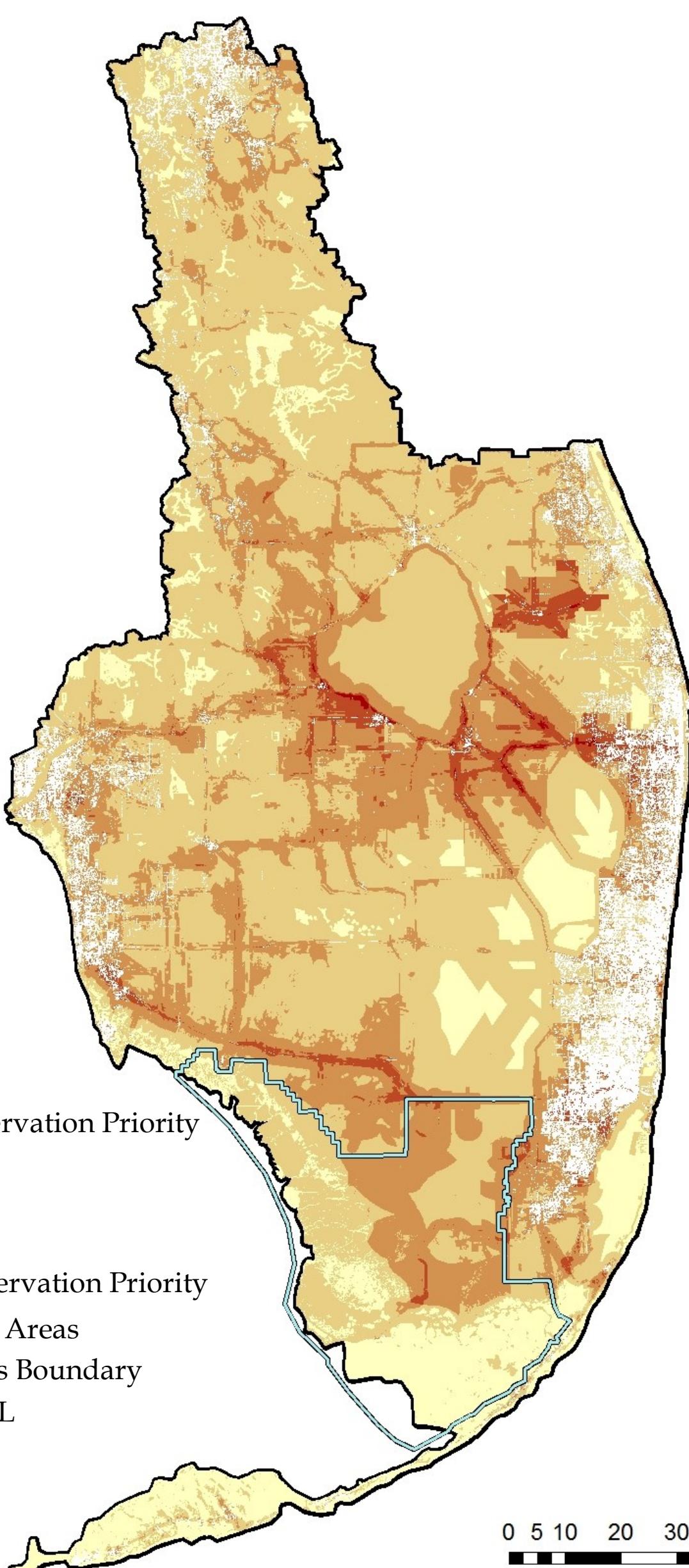
Each map tells a different story, making it clear that the way risks or importance of conservation factors are weighted can dramatically effect map results. If these maps were to inform conservation initiatives, and were considered separately, organizations would prioritize areas of the watershed differently. The climate change map indicates conservation efforts should be focused along the coast, the development map along the southern boarder of Lake Okeechobee, and along the edges of towns and roads. The biodiversity map suggests conservation and mitigation efforts are needed in the central region of the Everglades, and along the boarders of the Everglade's National Park.

The overall map illustrates the importance of conservation along transportation routes, and the area surrounding Lake Okeechobee, where drainage canals and agriculture are threatening the environment. Fortunately, there are few areas on the map, in fact only .16% showing the need for high conservation priority and 4.4% at a medium-high priority. Together those with medium to medium-low conservation needs equal the majority of the map at 82.5%.

Conclusion

GIS analysts need to heavily consider and research their methods of analysis, as maps are powerful tools that inform and facilitate decision making. As illustrated and discussed, the weight each risk factor was given in the map analysis process can change results, and is thus a source of error. This poster also does not assess all the risk factors or aspects that make an area in the Southern Florida Watershed important for conservation. Future analysis should consider factors such as rate of water flow, contiguous phosphorus content and temperature changes.

By Alexandra Purdy
Conservation Priority Considering All Factors



Sources

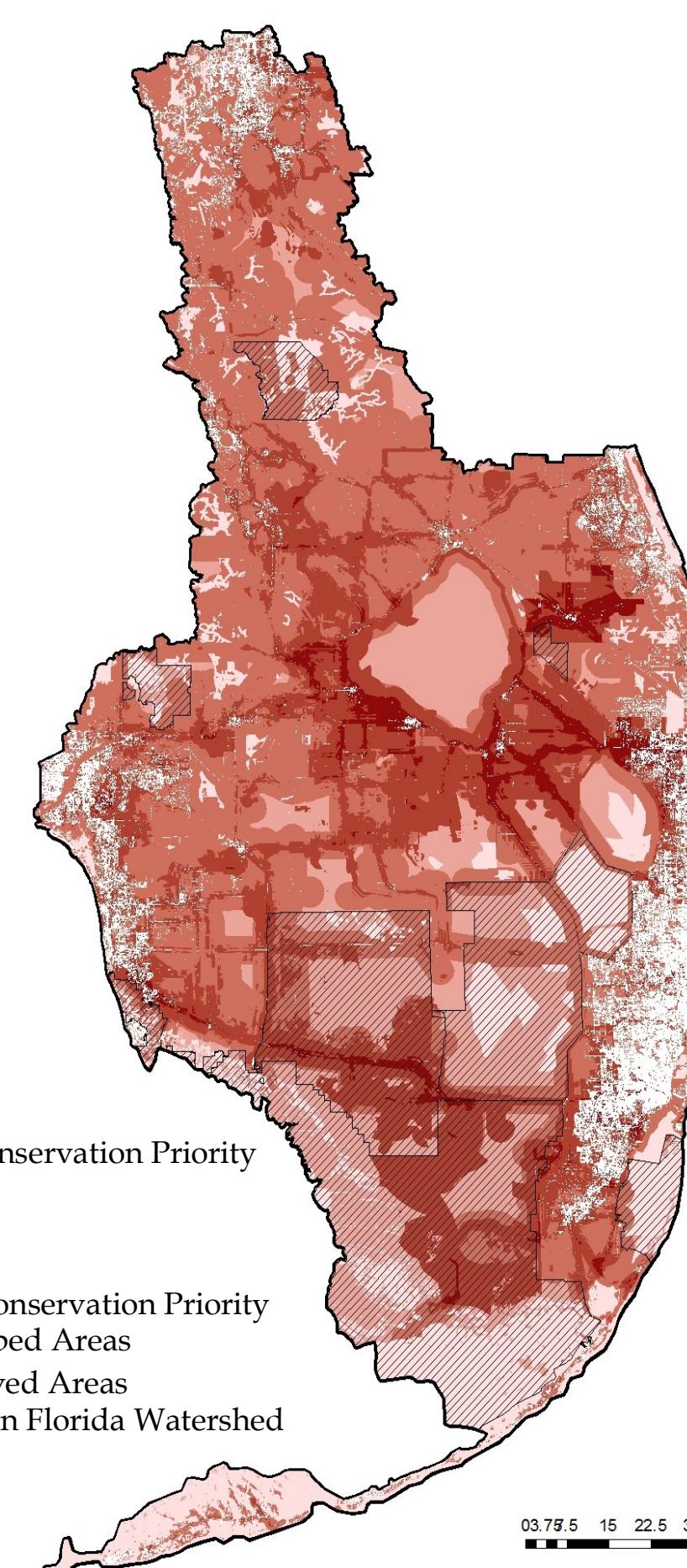
Data Sources: Florida Department of Environmental Protection, South Florida Water Management District, Florida Fish & Wildlife Conservation, ESRI Data, Florida Natural Areas Inventory.

Projection: NAD1983_StatePlane_Florida_East_FIPS_0901_Feet

UEP 232: Intro to GIS for Urban Analysis

Date: December 19 2015

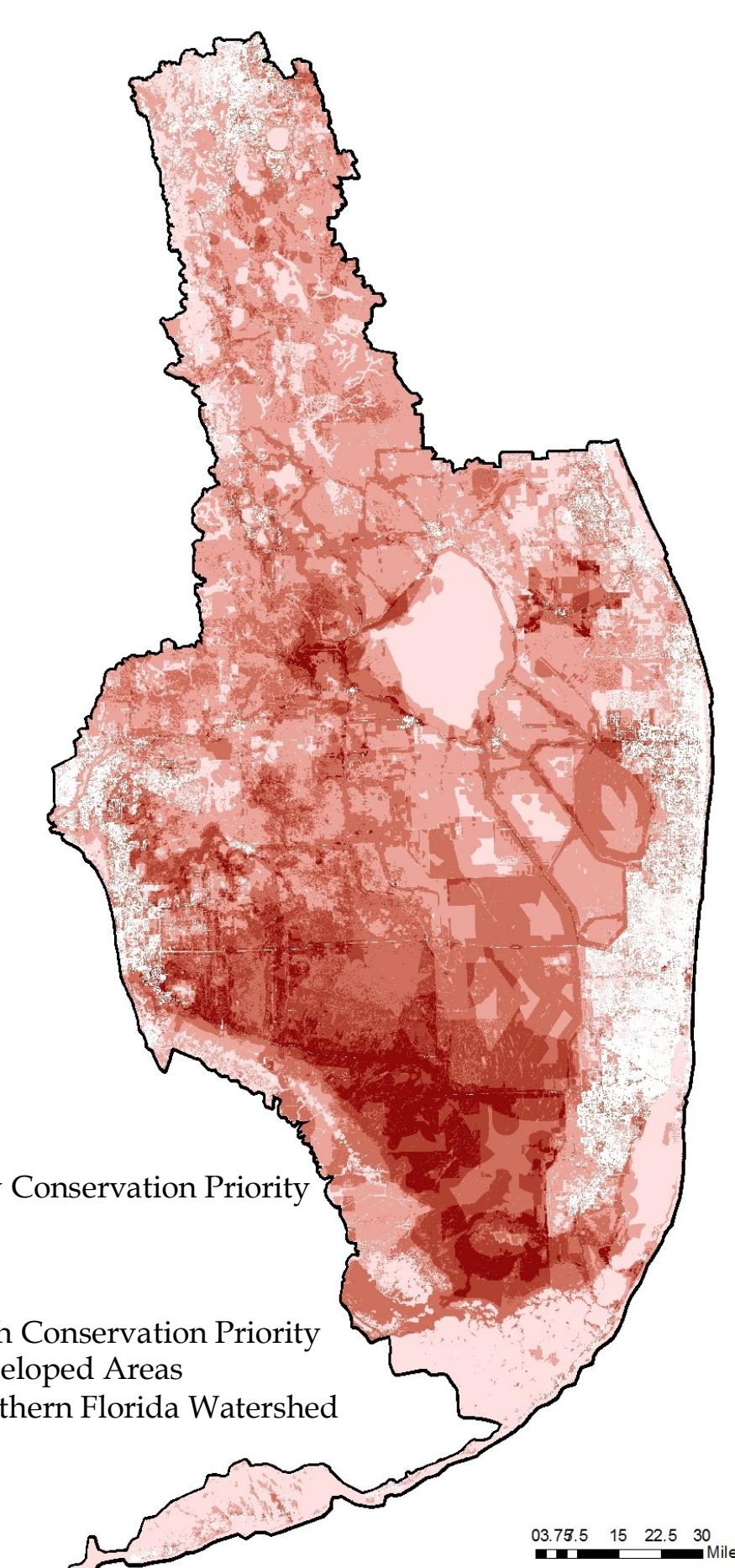
Weighted Concern of Land Likely to Be Developed



Considering

Proximity to Existing Development

Weighted Concern for Bio-Diversity



Considering

Habitat for at-risk species	Veg & Animal Biodiversity	Greenway Connection
-----------------------------	---------------------------	---------------------