

# Land Use: A Key to Resource Protection

Peggy Carr

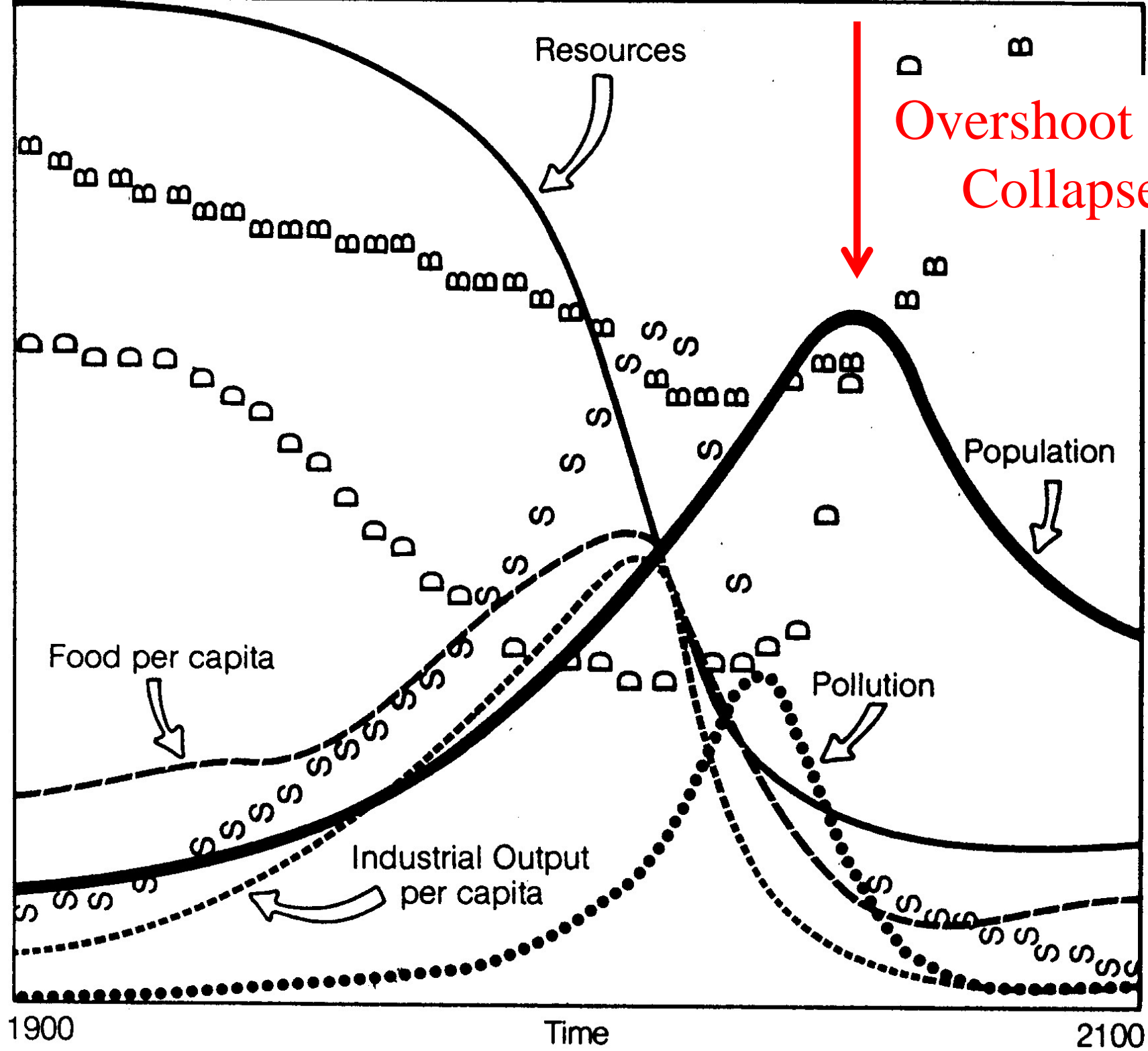
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Overshoot and Collapse

# Ecosystem Services from Costanza et al, Science 1997

## Ecosystem service

## Examples

Gas regulation

CO<sub>2</sub>/O<sub>2</sub> balance

Climate regulation

greenhouse gas regulation

Disturbance regulation

storm protection/flood control

Water regulation

provisioning of water for ag/industry

Water supply

provisioning of water by  
watersheds and aquifers, “drinking water”

Erosion control/sediment retention

prevention of soil loss

Food production

fish, game, crops

# Protecting Green Infrastructure

natural support system that maintains  
native species, and  
natural ecological services,  
sustains air and water resources, and  
contributes to the health and quality of life for  
human communities

(Benedict 2000)

## A Green Strategy

# the Florida Statewide Greenways Project

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# 1990 - 2008

Florida  
Greenways  
Program and  
the Florida  
Greenways  
Commission

Initial  
Greenways  
Legislation -  
DEP Lead  
State  
Agency &  
Florida  
Greenways  
Coordinating  
Council

GIS  
Decision  
Support  
Model and  
Period of  
Public  
Comment

Legislative  
Adoption  
of Initial 5  
Year Plan

Adopt  
Priorities  
and  
Critical  
Linkages  
and  
Updates

1990 - 1994

1995

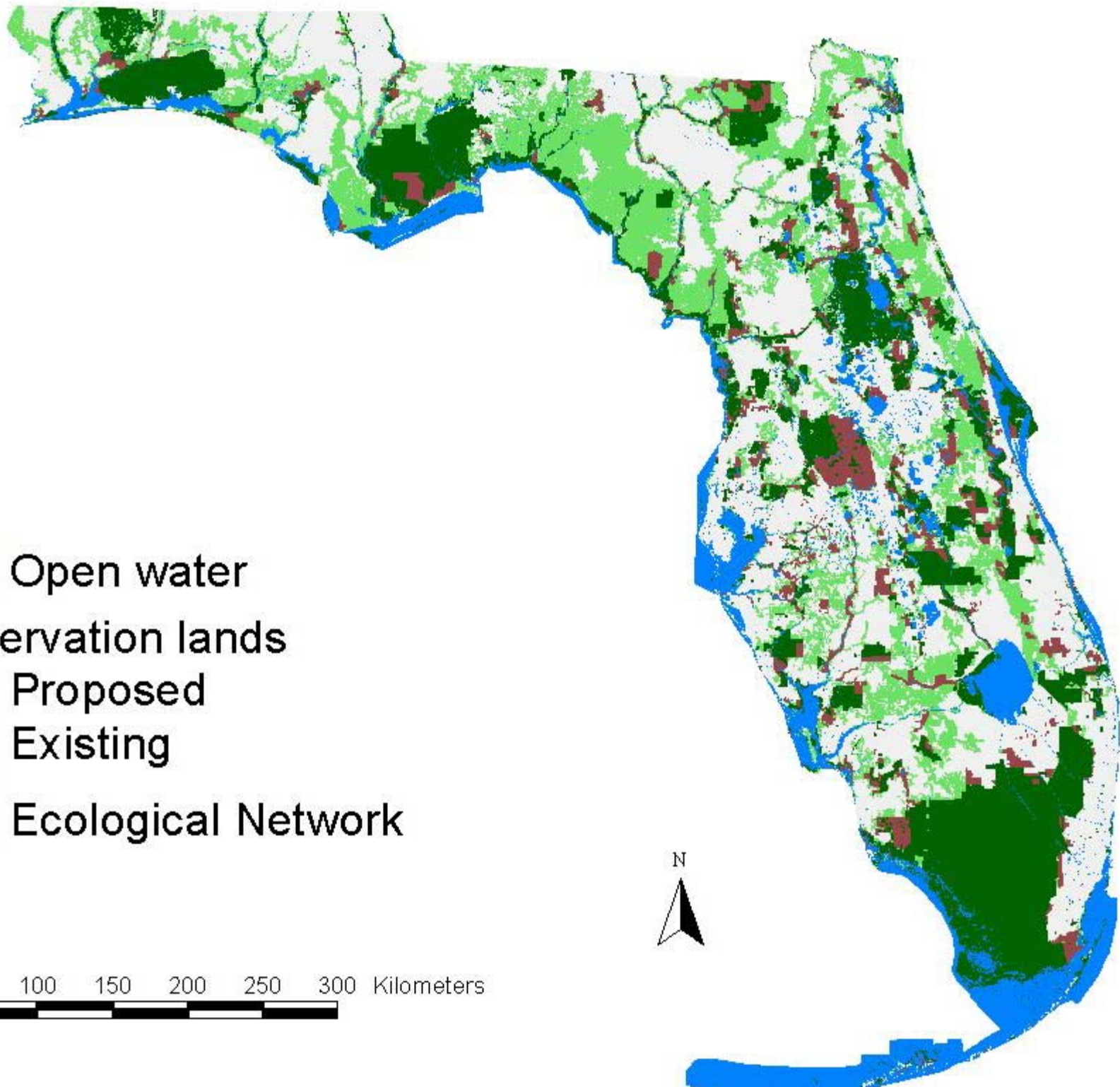
1996 - 1998

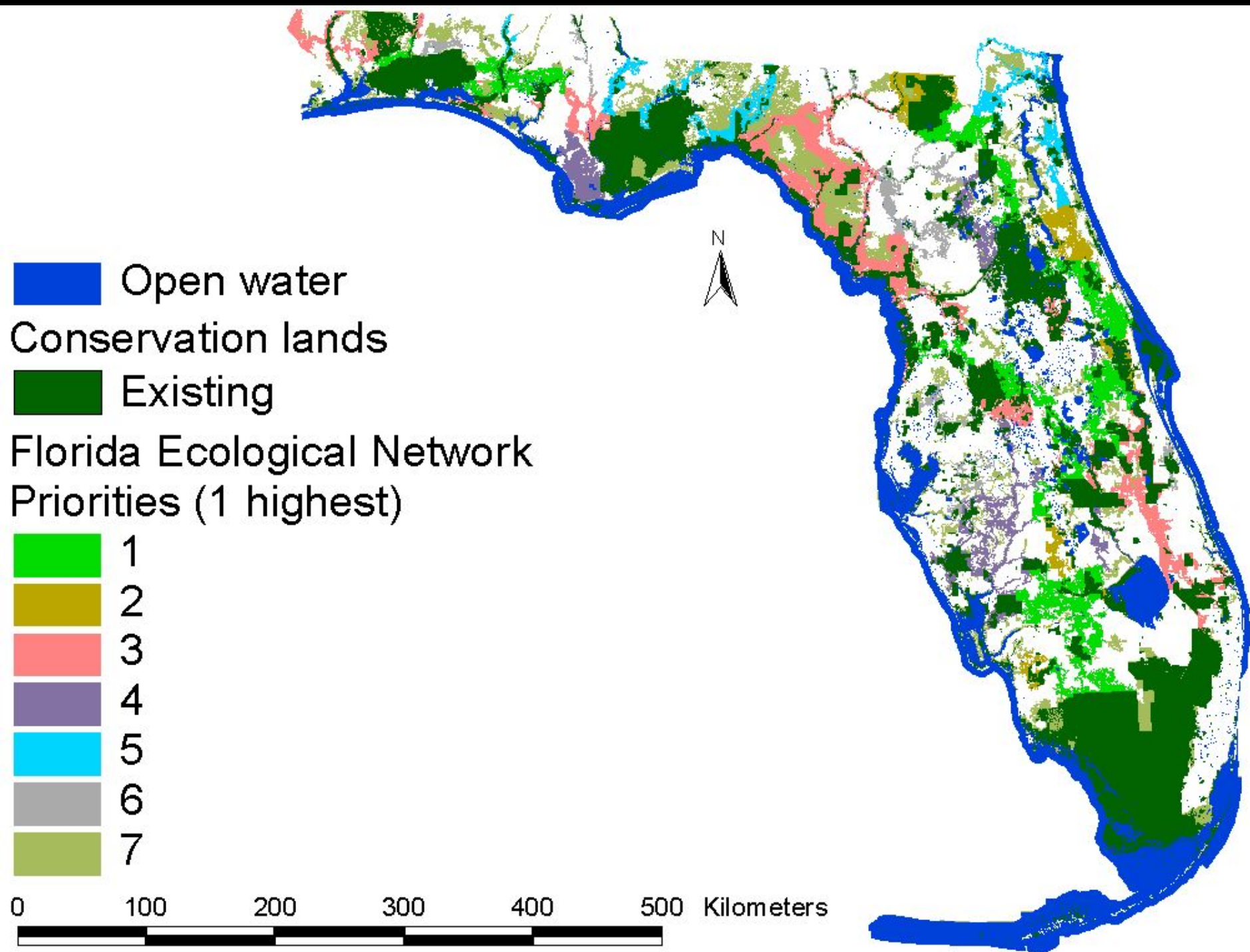
1999

2000-2008

-  Open water
- Conservation lands
  -  Proposed
  -  Existing
  -  Ecological Network

0 50 100 150 200 250 300 Kilometers







# Ecological-based Prioritization

Low

Medium

High

Low

Low

Low

Medium

Medium

Low

Medium

High

High

Medium

High

High

Vulnerability

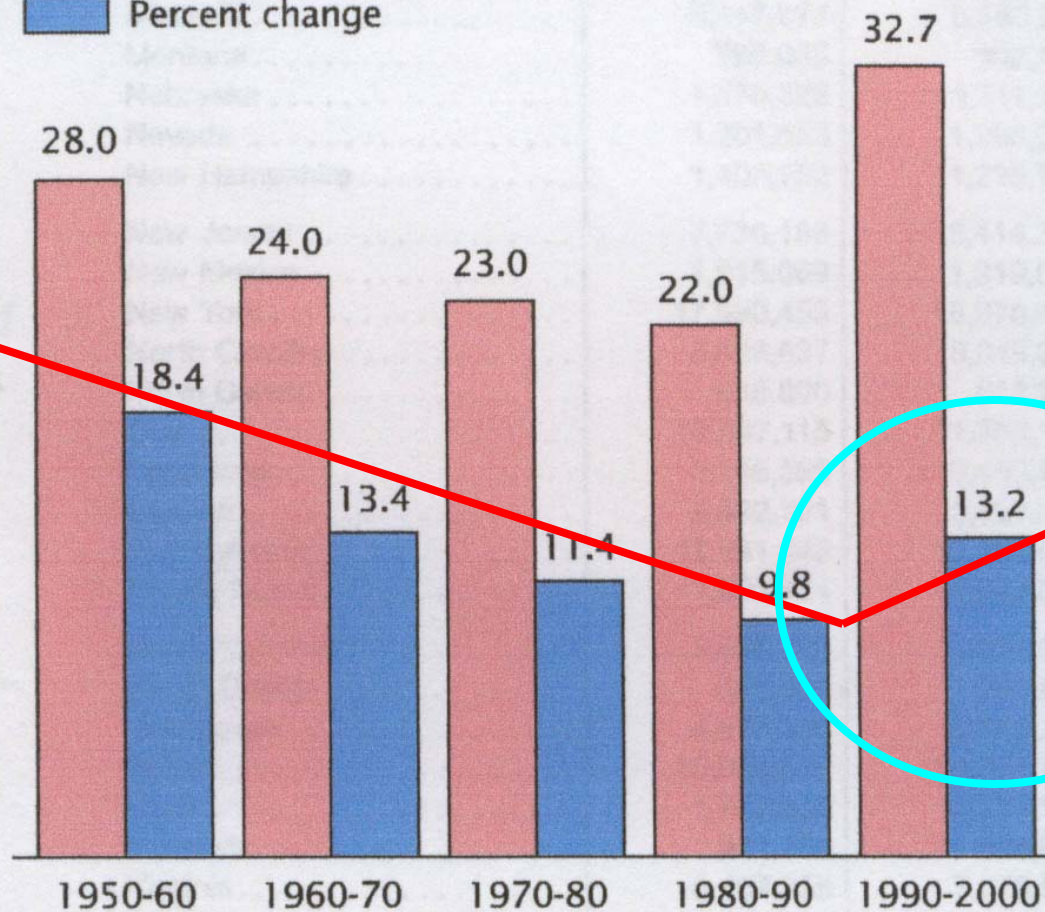


Figure 1.

## U.S. Population Growth: 1950-60 to 1990-2000

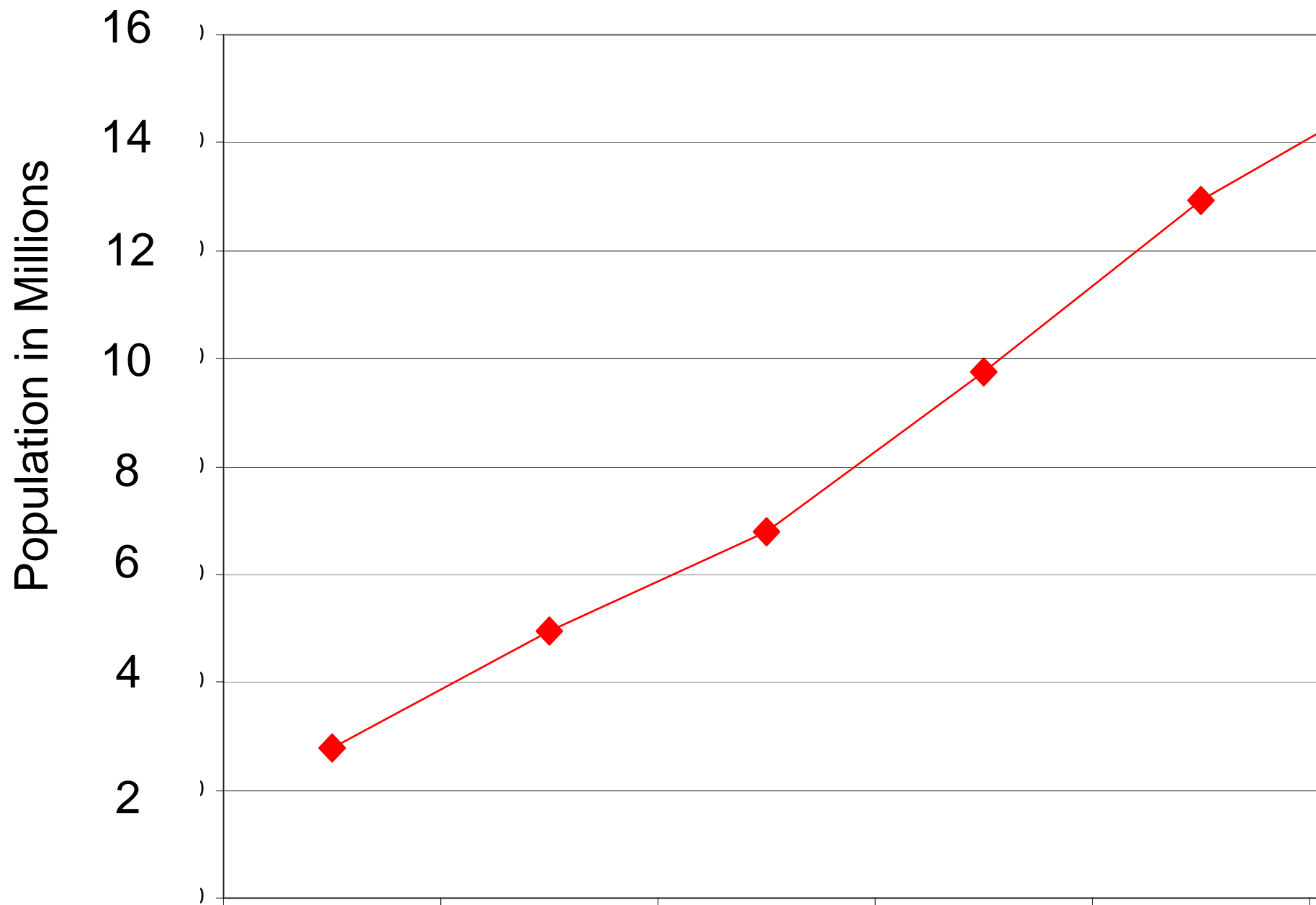
(For information on confidentiality protection, nonsampling error, and definitions, see [www.census.gov/prod/cen2000/doc/pl94-171.pdf](http://www.census.gov/prod/cen2000/doc/pl94-171.pdf))

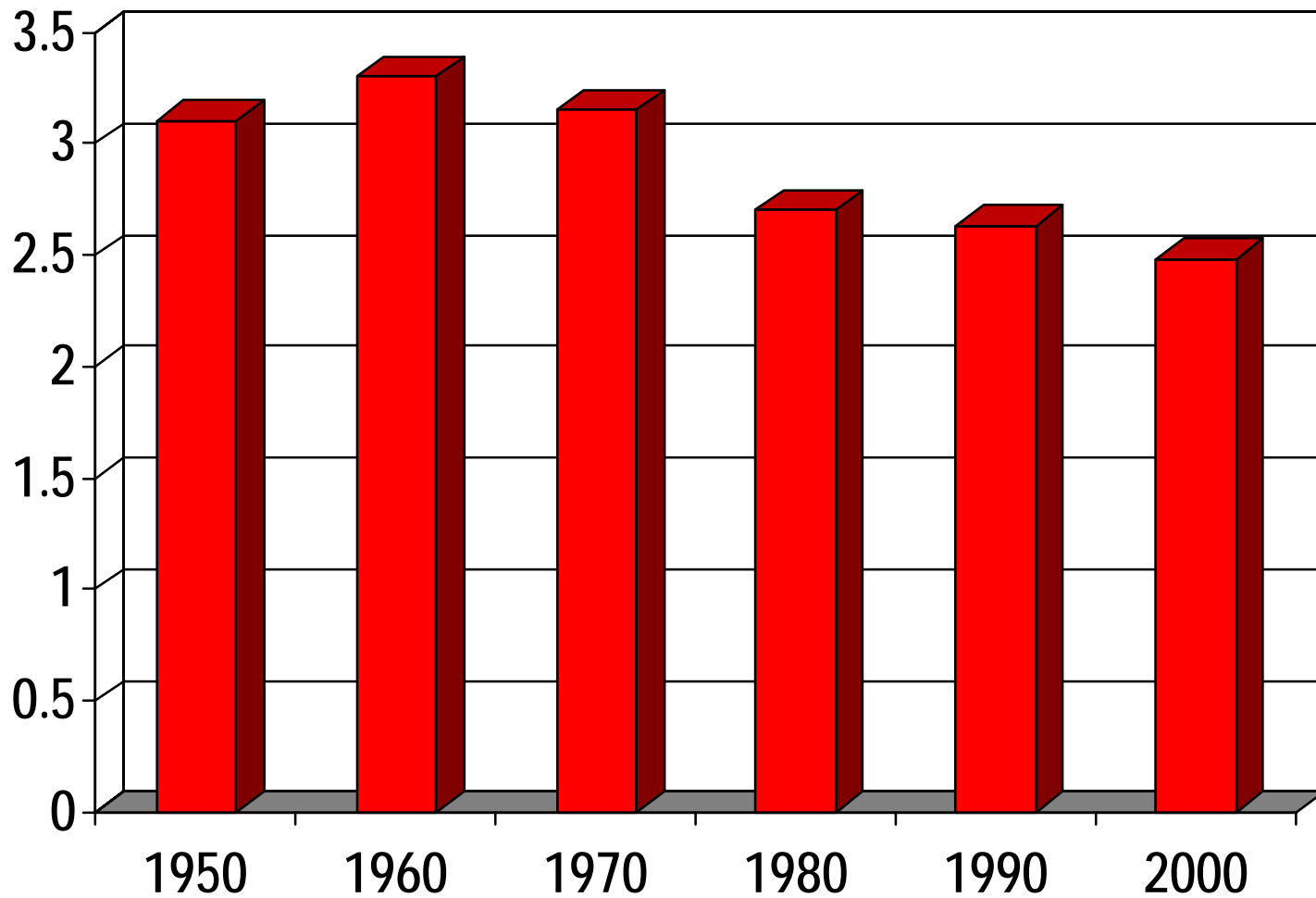
■ Growth (in millions)  
■ Percent change



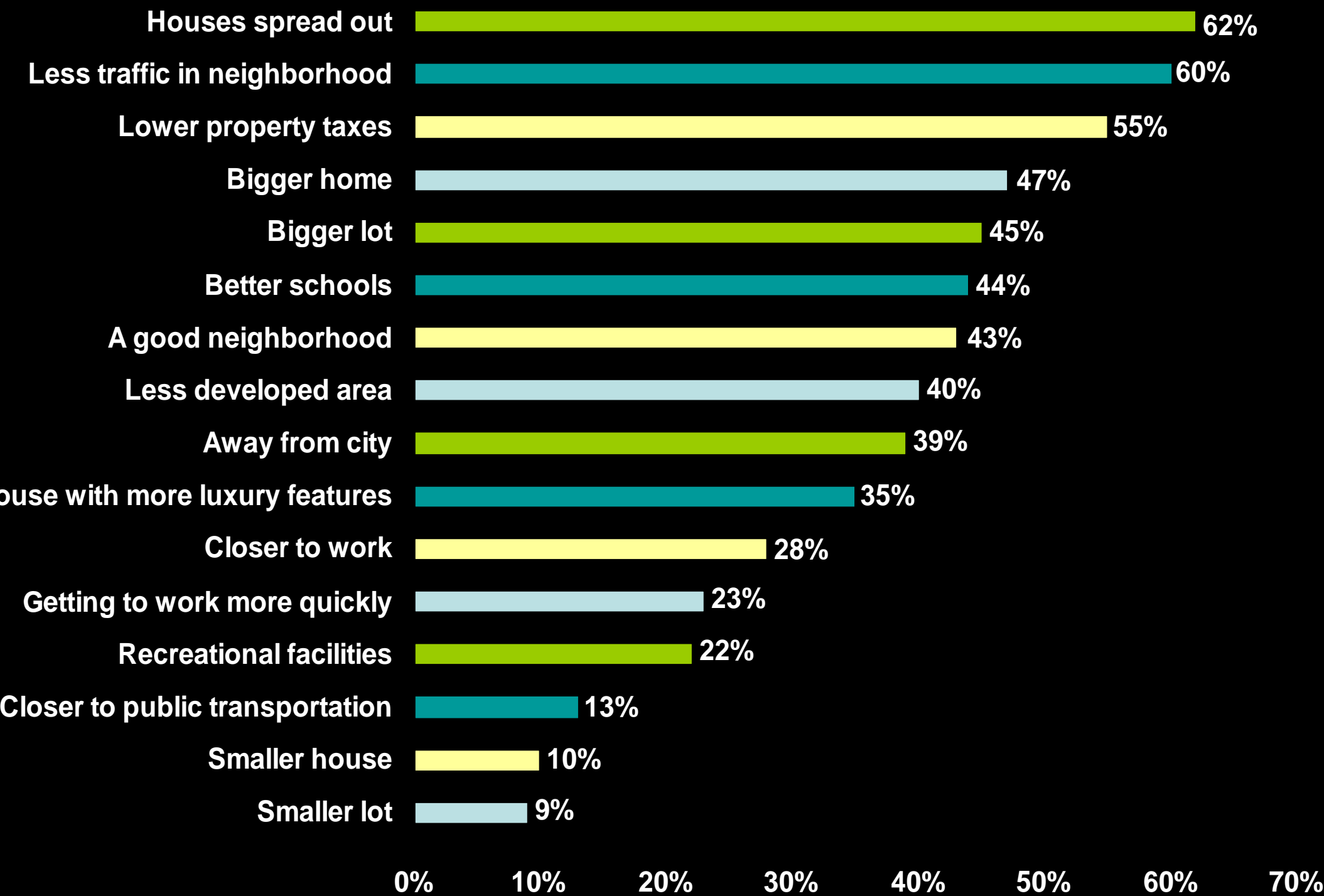
Source: U.S. Census Bureau, Census 2000; 1990 Census, *Population and Housing Unit Counts, United States* (1990 CPH-2-1).

# Historic Florida Population Change

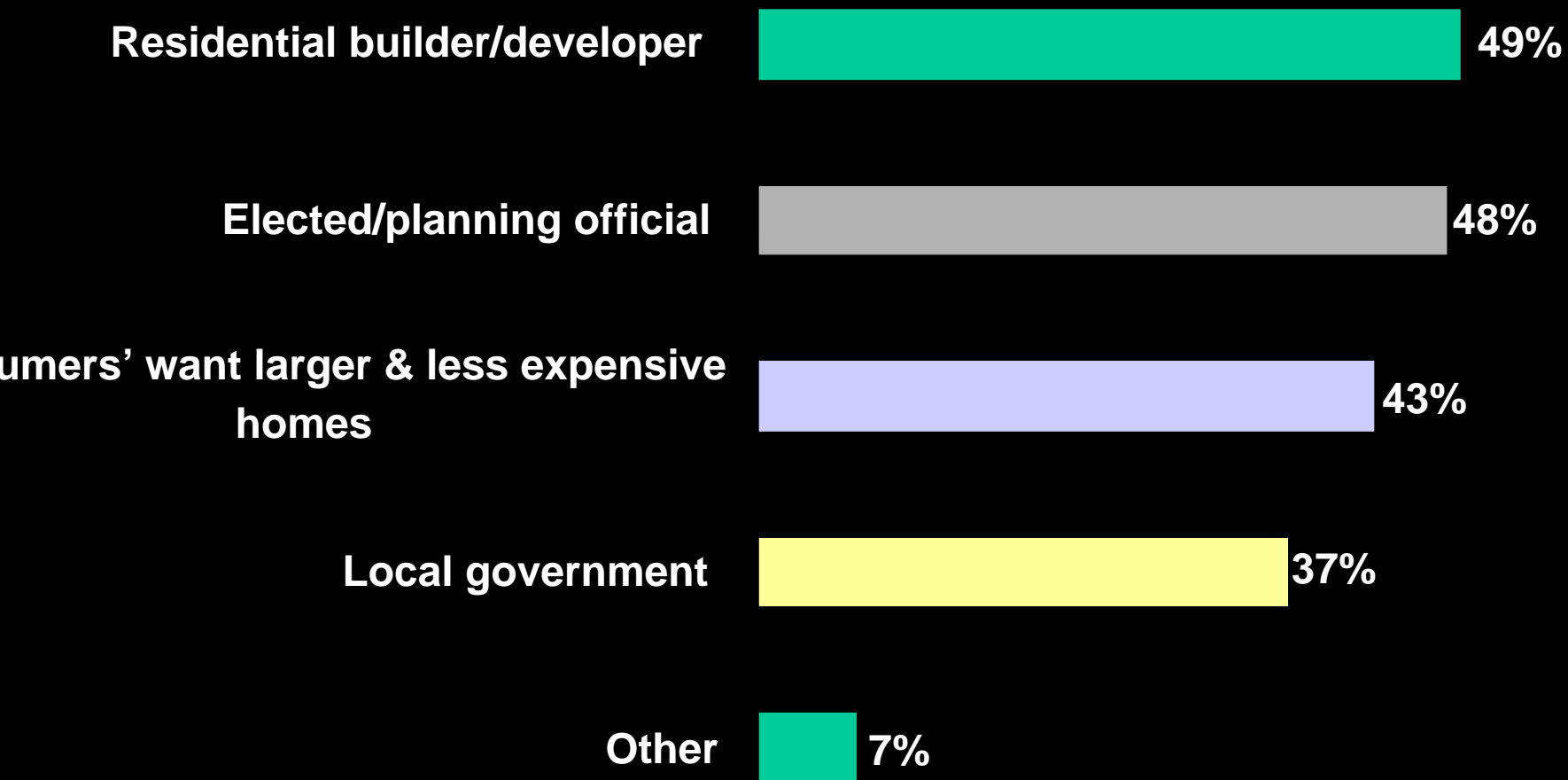




Average  
US  
Household  
Size



# Who is responsible for urban sprawl?



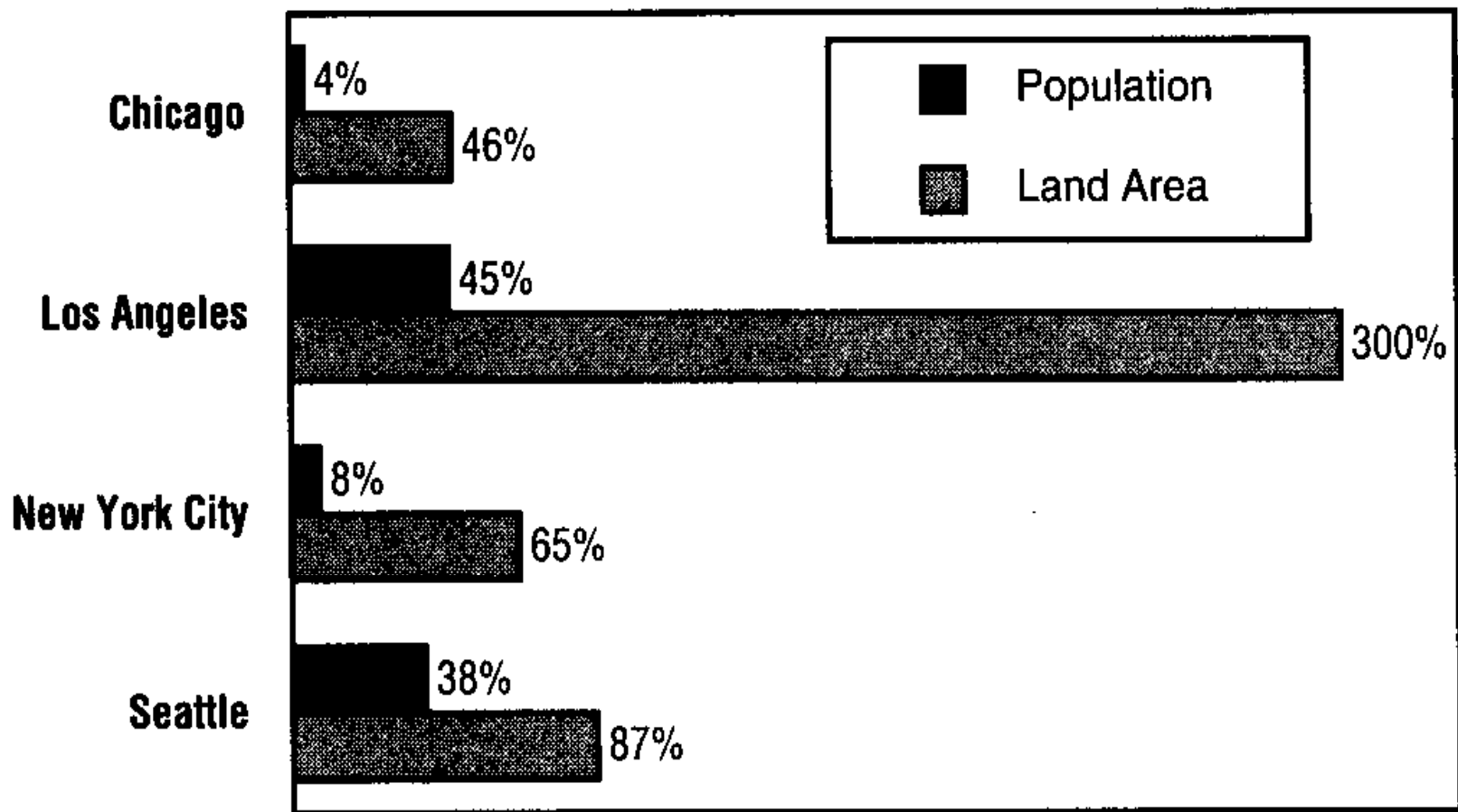
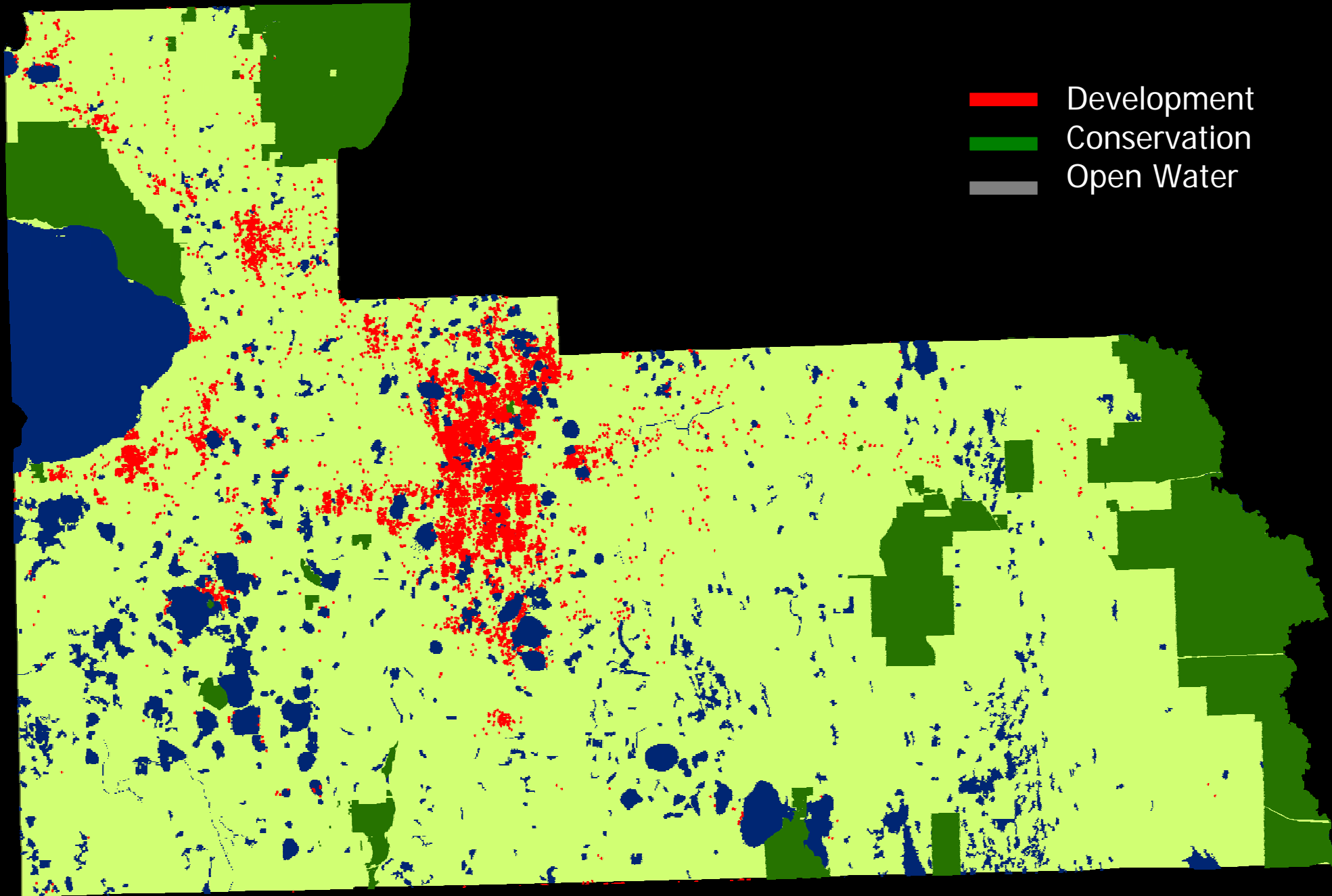


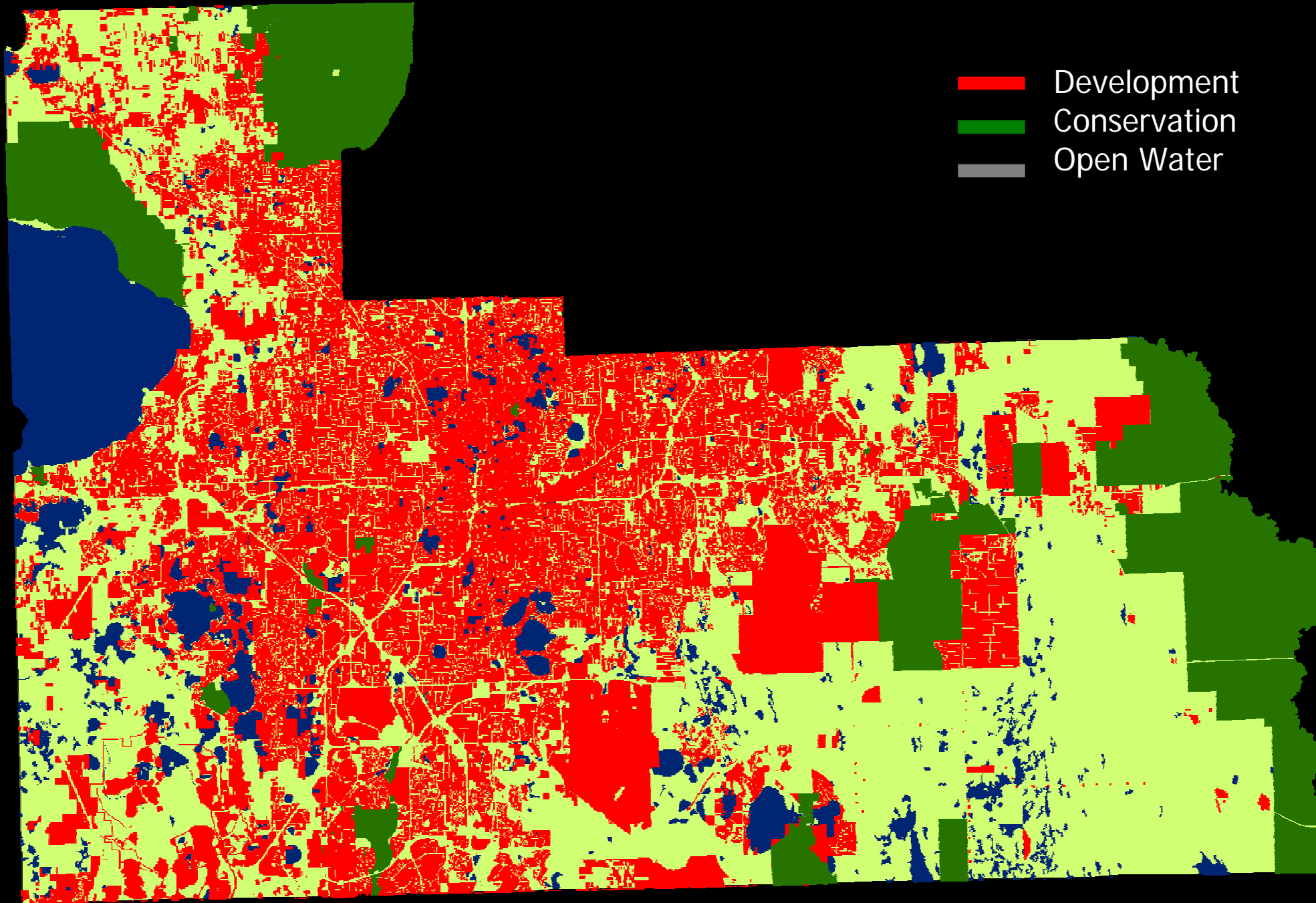
FIGURE 3 Expansion in Population and Land Area for Selected Metropolitan Areas, 1970 to 1990. *Source: Planning and Zoning News*, January 1993; Leinberger, Christopher B., "Metropolitan Development Trends of the Late 1990s: Social and Environmental Implications" (1995).

# Orange County 1950





# Orange County 2005



- **Florida 2060**  
January 2007  
*1000 Friends of Florida*
- **Alternative Scenarios for Southwest Florida**  
December 2006  
*Southwest Florida Regional Stewardship Alliance*
- **MyRegion – Alternative Scenarios**  
February 2007  
*East Central Florida Regional Planning Council and MyRegion*
- **Lake County – Alternative Scenarios**  
August 2007  
*Lake County Planning Department*
- **Hamilton County – Alternative Scenarios**  
January 2008  
*Private Donor thru IFAS*

# Fundamental Land Use Equation

**Population x gross density = acres of  
land use  
needed  
to support  
human  
settlement**

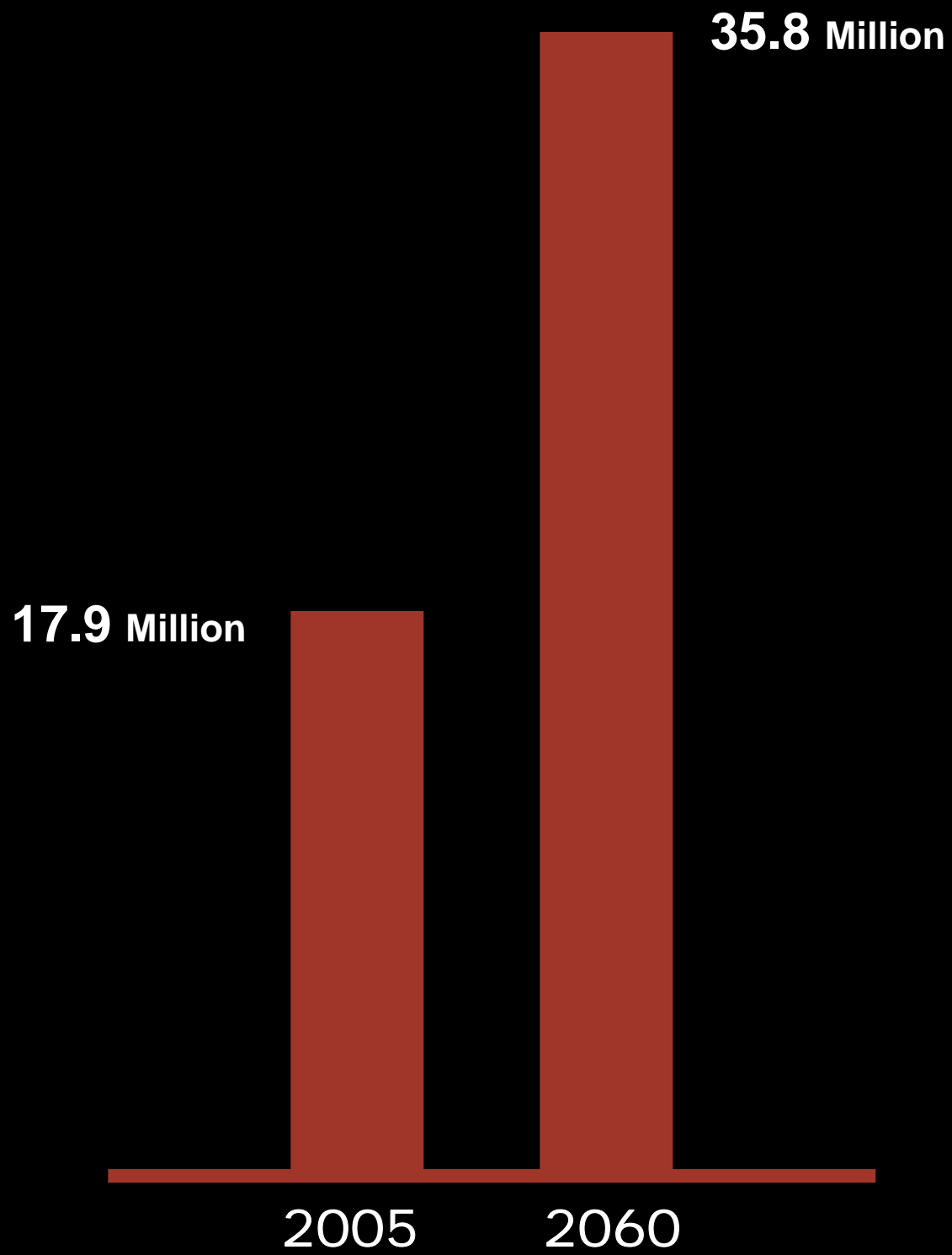


# FLORENDA 2060

**A Research Project of 1000 Friends of Florida**

# Assumptions

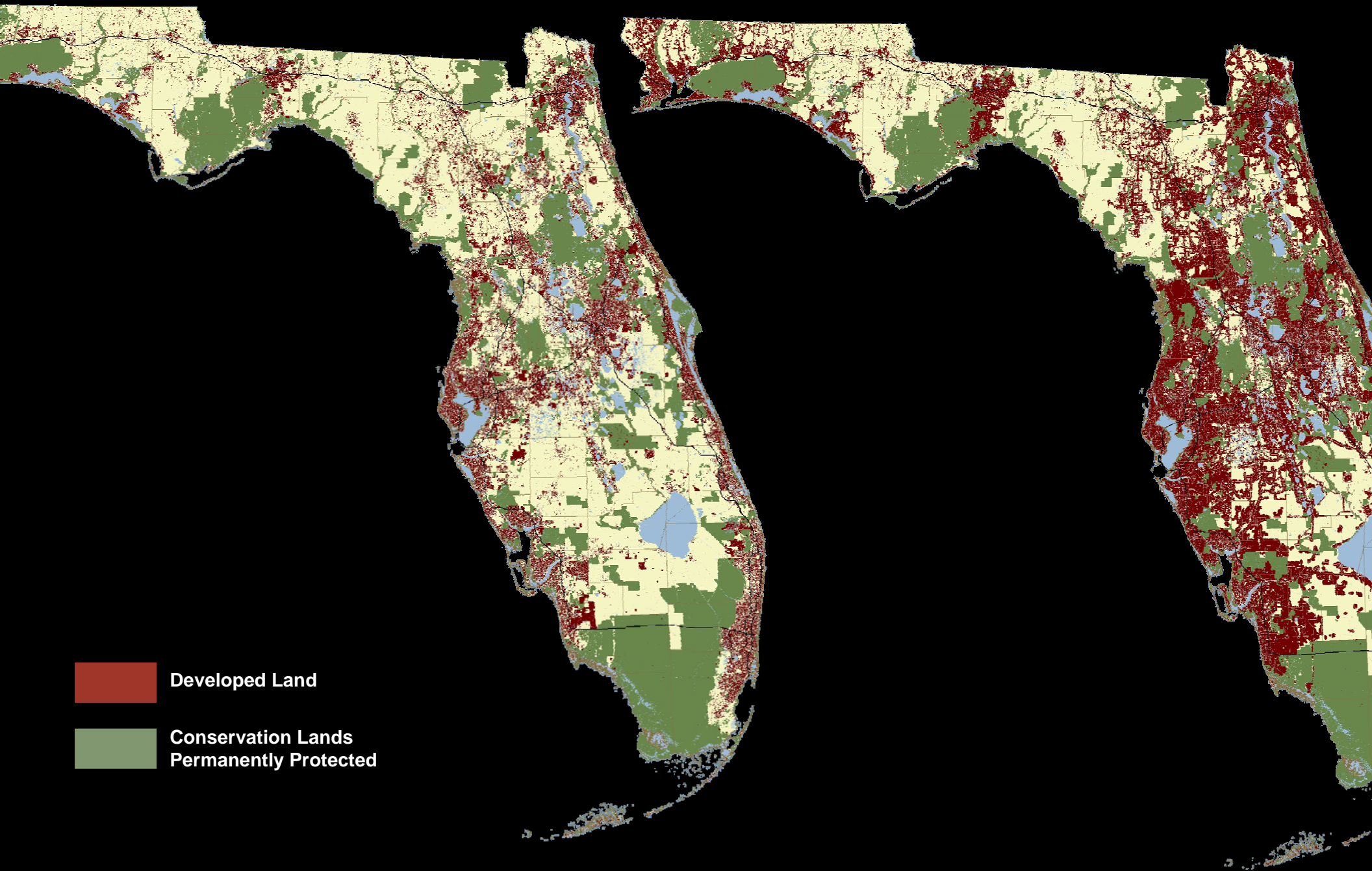
1. Moderate Population Growth (BEBR trend line)
2. New population consumes land at same density as existing development, by County
3. New population distributed geographically based on land suitability (existing urban, roadways, water, coastline, wetlands)
4. No new conservation lands



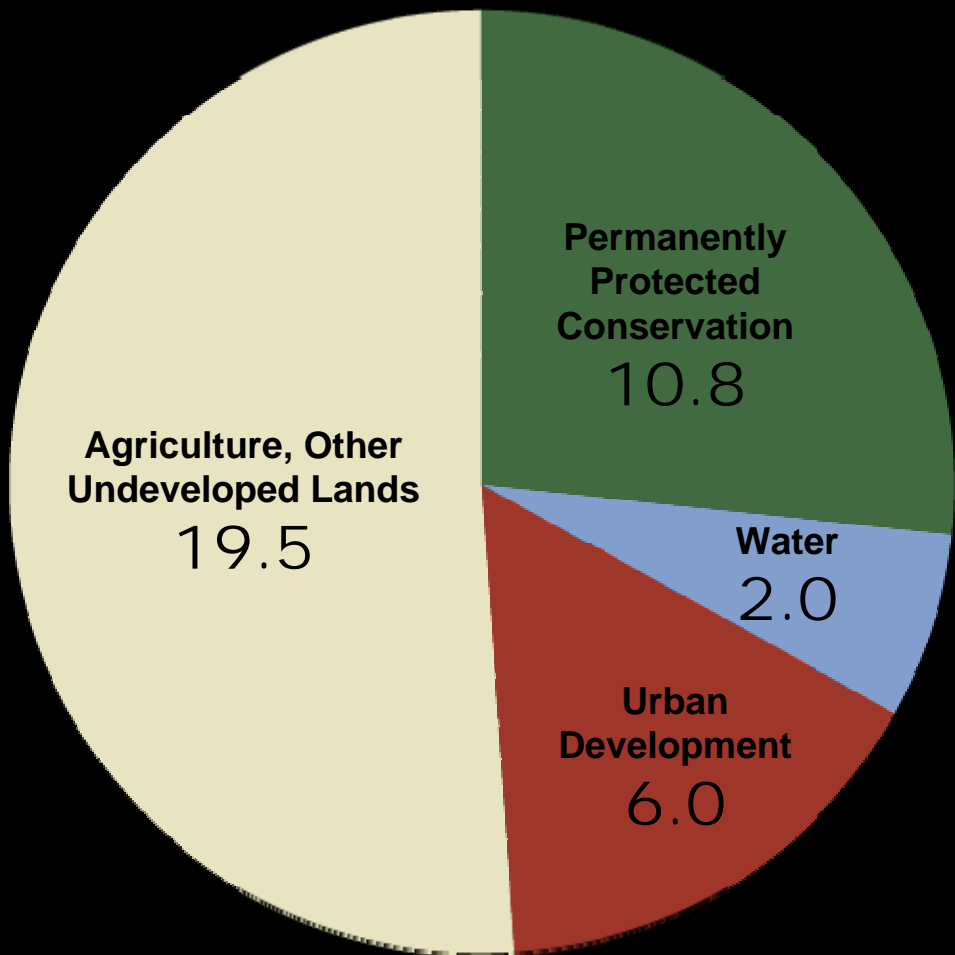
County	2005 Density in People/Acre	County	2005 Density in People/Acre	County	2005 Density in People/Acre
ALACHUA	1.73	GILCHRIST	0.45	ORANGE	4
ALBANY	1.32	HERNANDO	1.82	OSCEOLA	2
ALBUQUERQUE	11.03	HILLSBOROUGH	3.56	PASCO	2
ALCOA	1.12	HOLMES	0.97	PINELLAS	7
ALDAMORE	15.45	LEE	2.48	ST. JOHNS	2
ALFONSO	1.79	LEON	2.42	ST. LUCIE	3

# Florida 2005

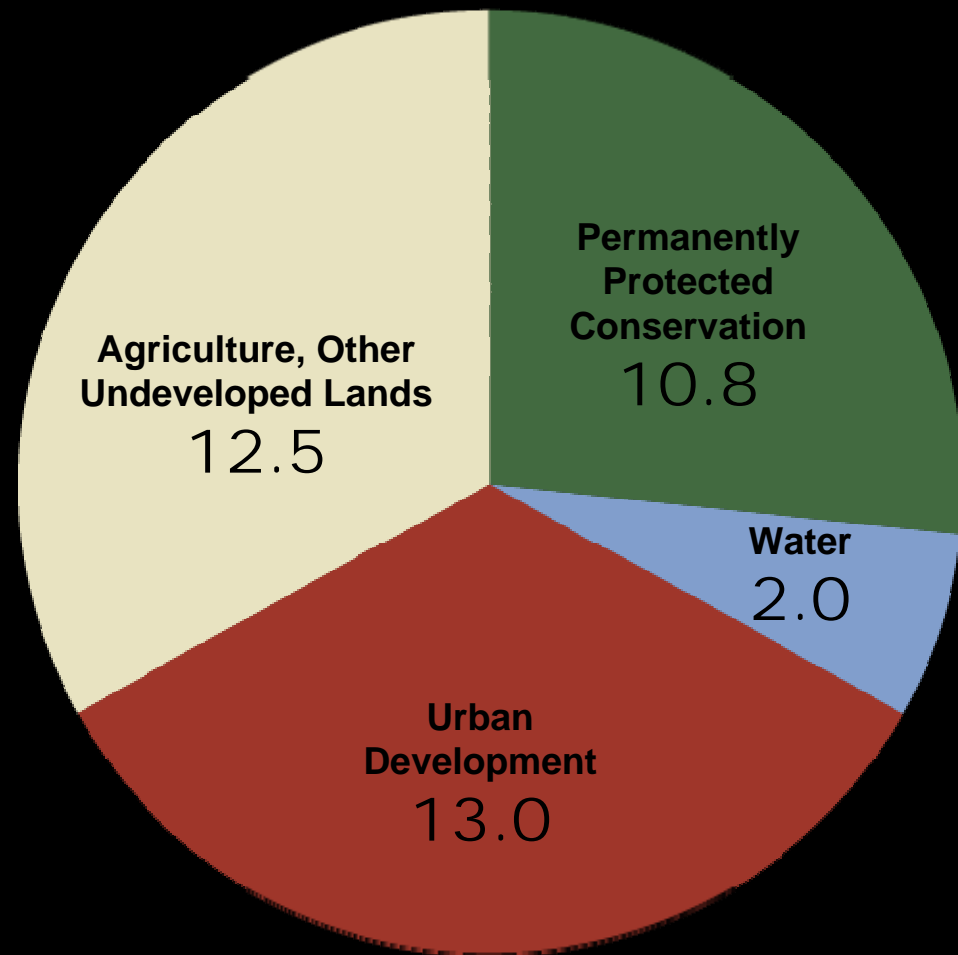
# Florida 2060







2005



2060

**Total: 38.3 Million Acres**



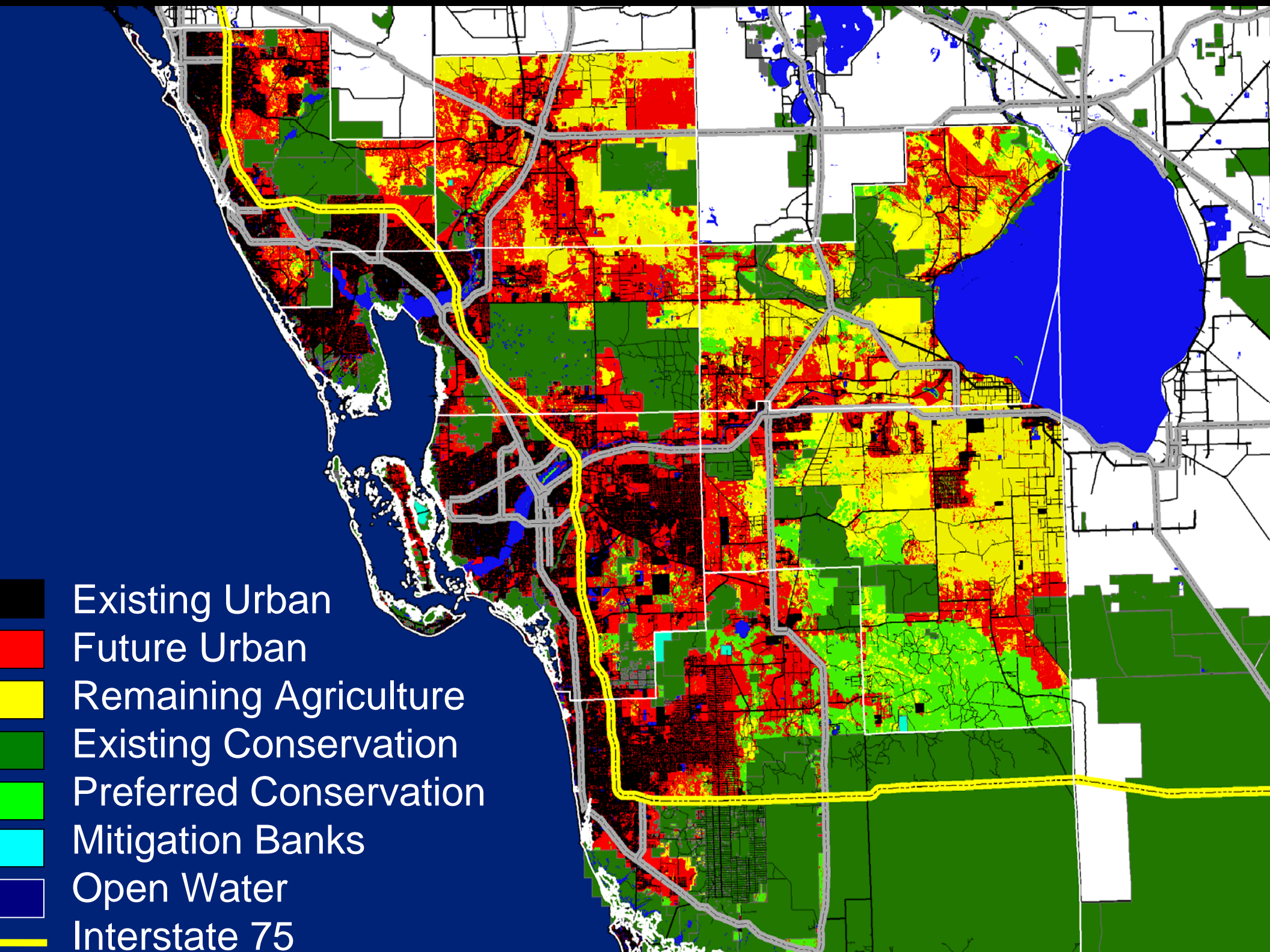
# Future Land Use Scenarios for the Southwest Florida Region

Sarasota, Desoto, Glades, Hendry, Charlotte, Lee and Collier

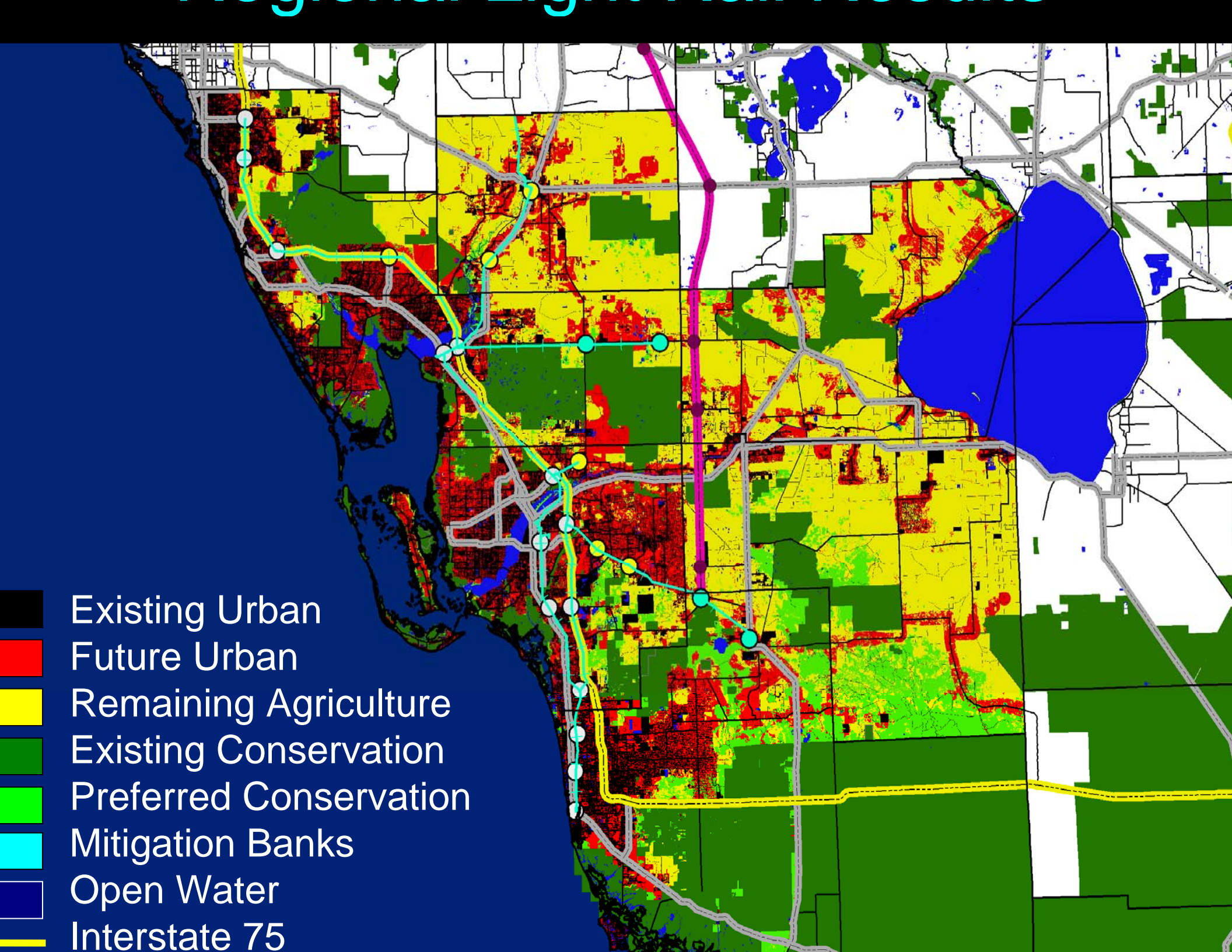
*Geoplan Center*

*College of Design, Construction and Planning*

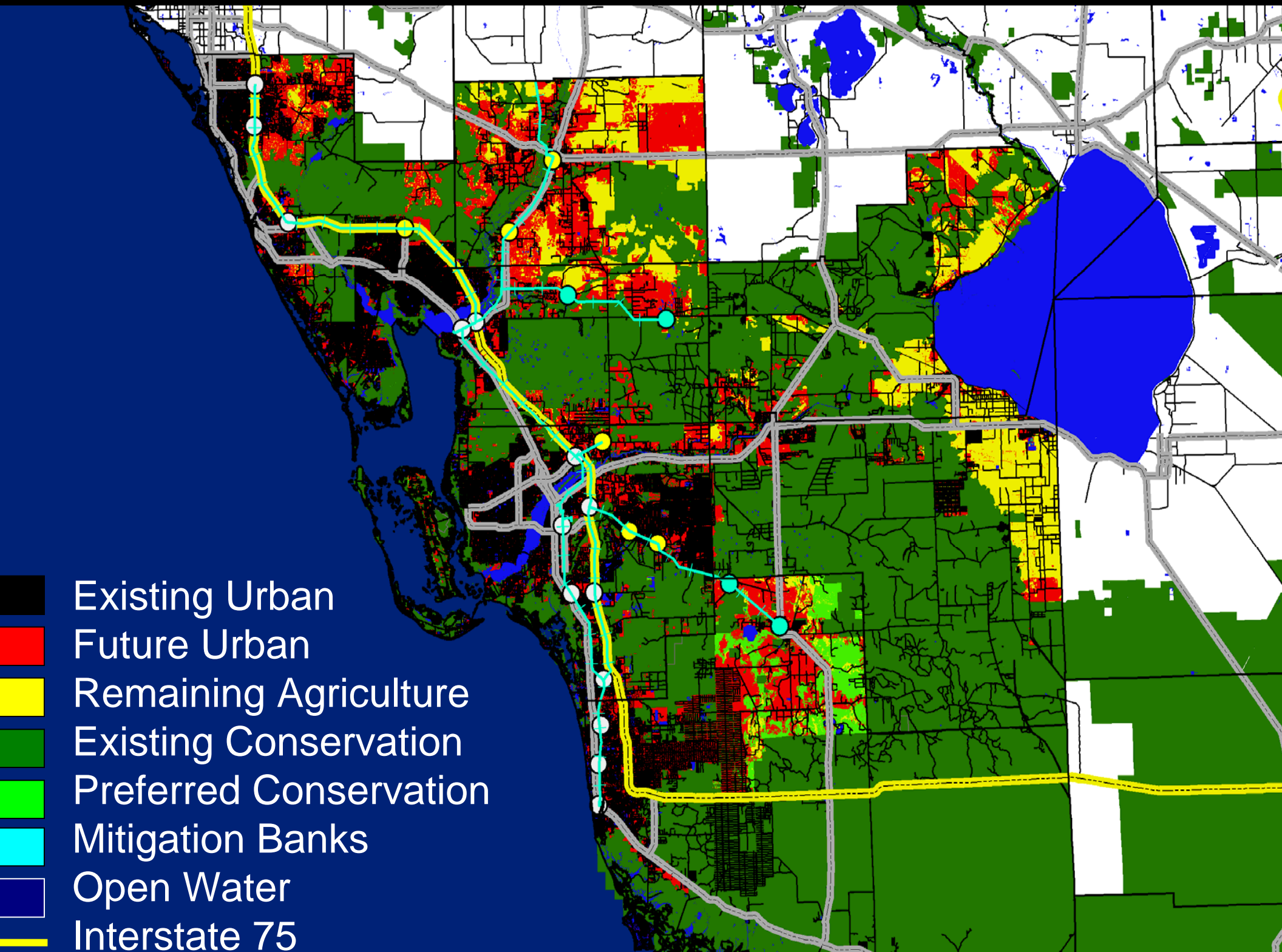
# Regional Baseline Results



- Existing Urban
- Future Urban
- Remaining Agriculture
- Existing Conservation
- Preferred Conservation
- Mitigation Banks
- Open Water
- Interstate 75

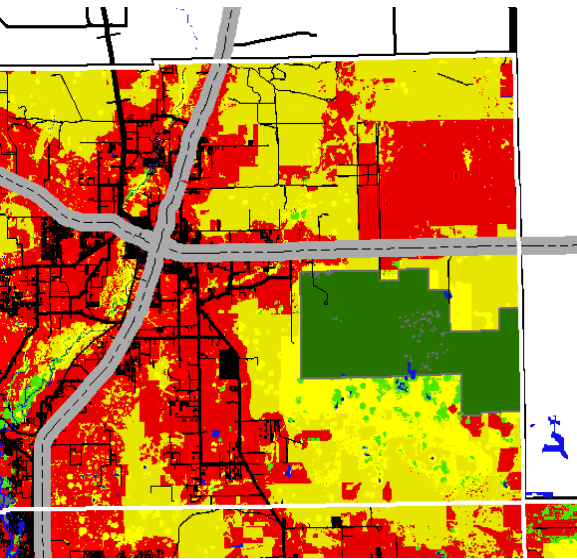


# Regional Components Report

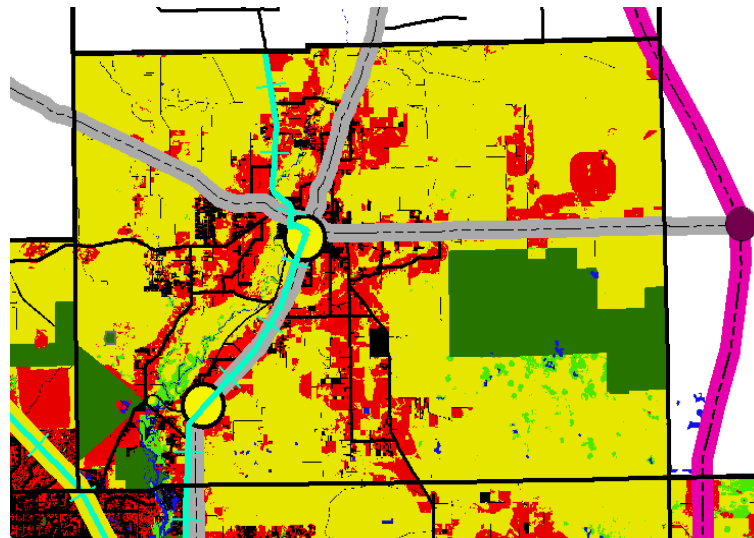


- Existing Urban
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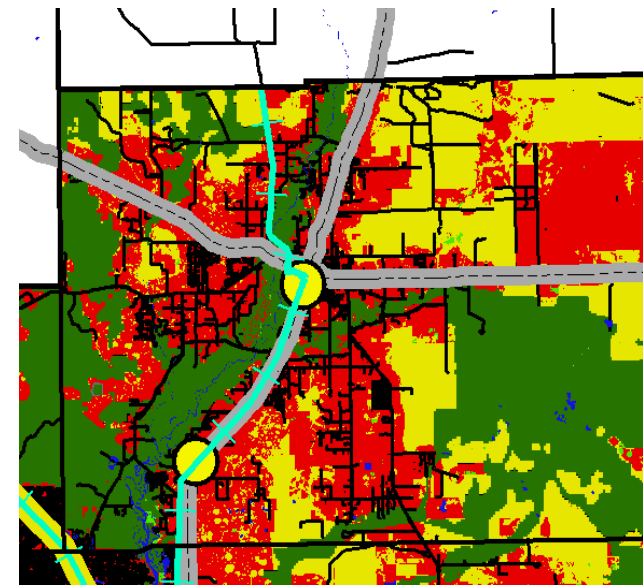
Baseline



Transit + Heartland

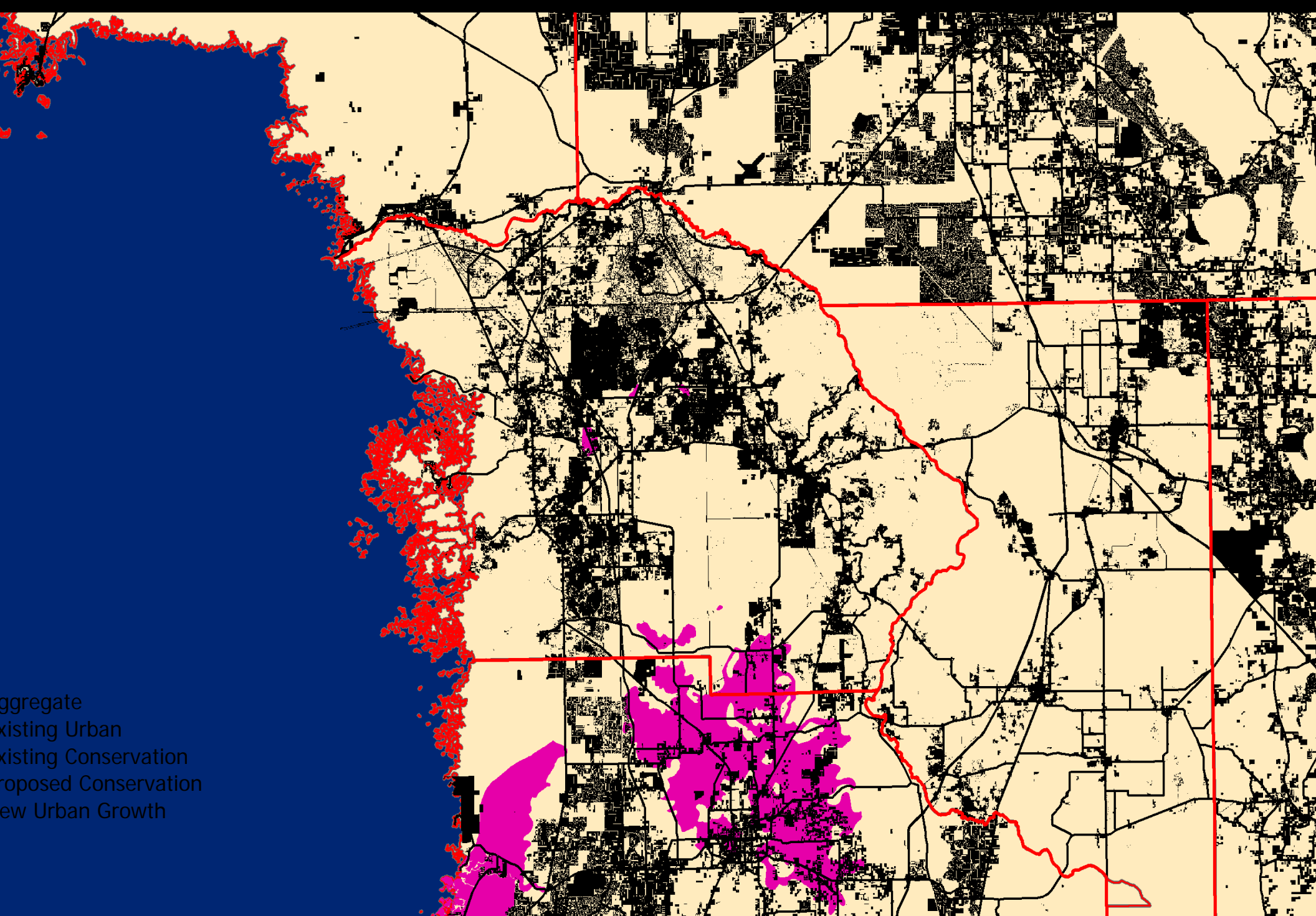


Composite



# Comparing Resources to Future Land Use Scenarios

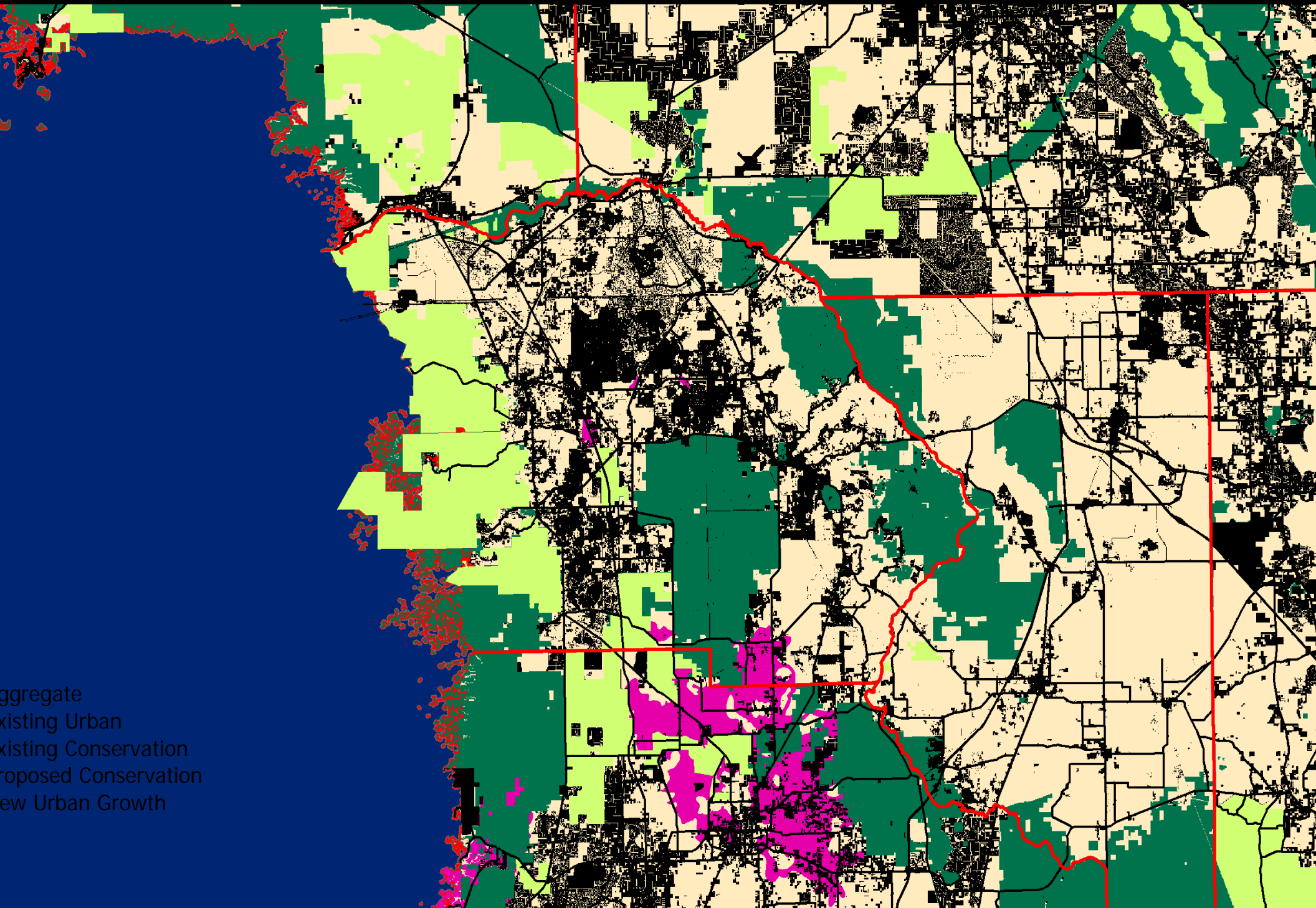
# Aggregate Land Use & Existing Urban Areas



Aggregate  
Existing Urban  
Existing Conservation  
Proposed Conservation  
New Urban Growth

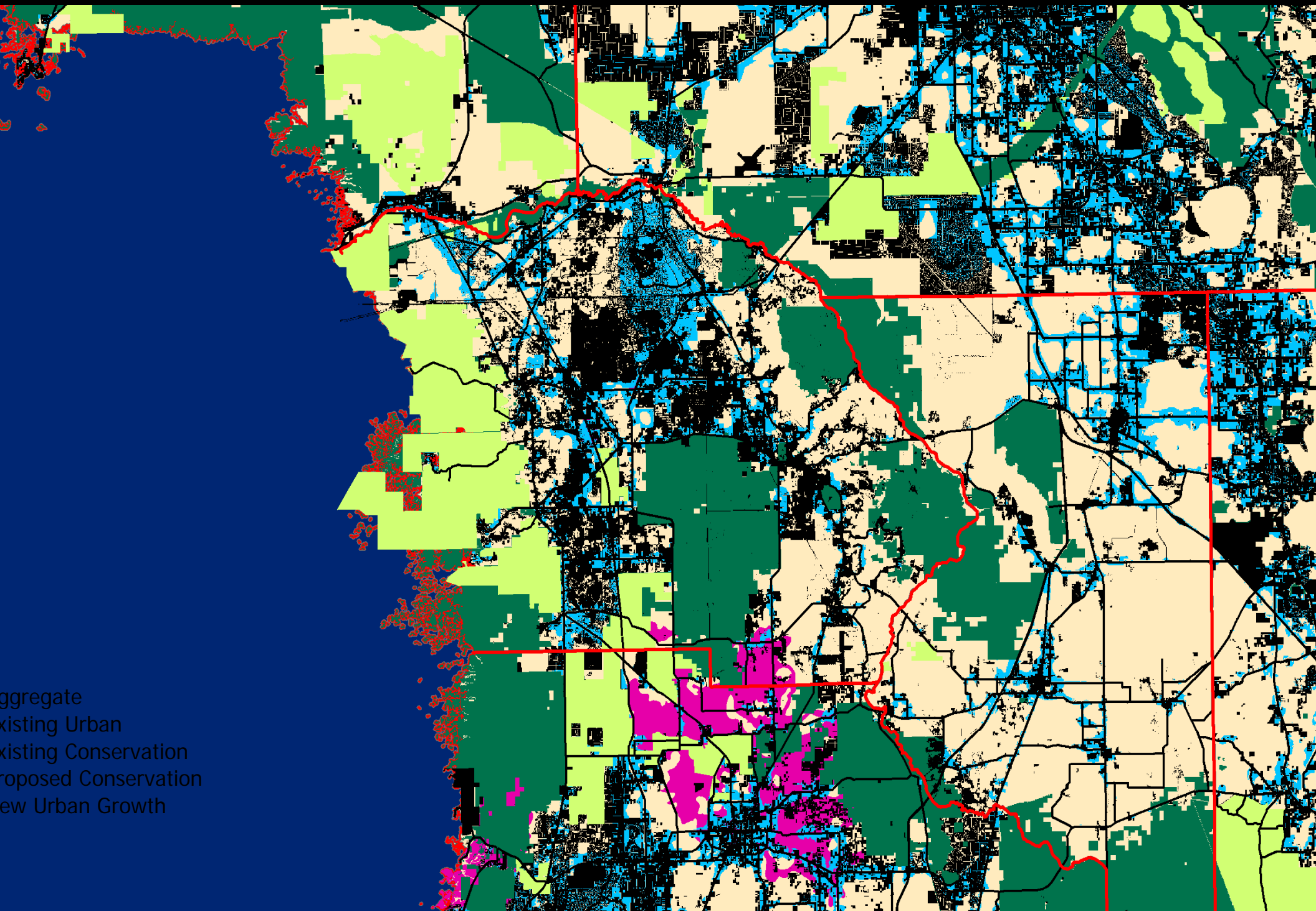


# Proposed & Existing Conservation Areas



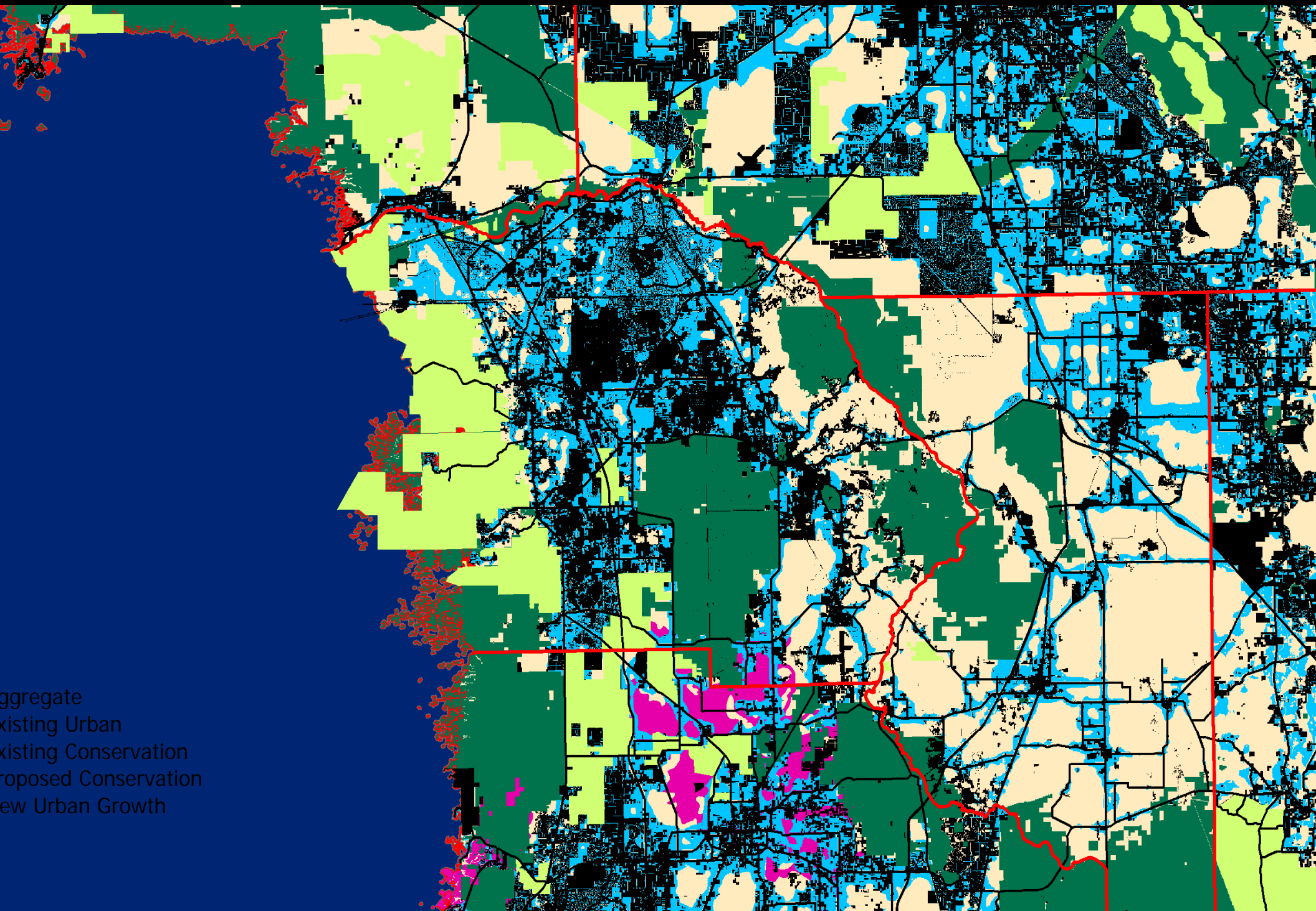
Aggregate  
Existing Urban  
Existing Conservation  
Proposed Conservation  
New Urban Growth

# New Urban by 2020



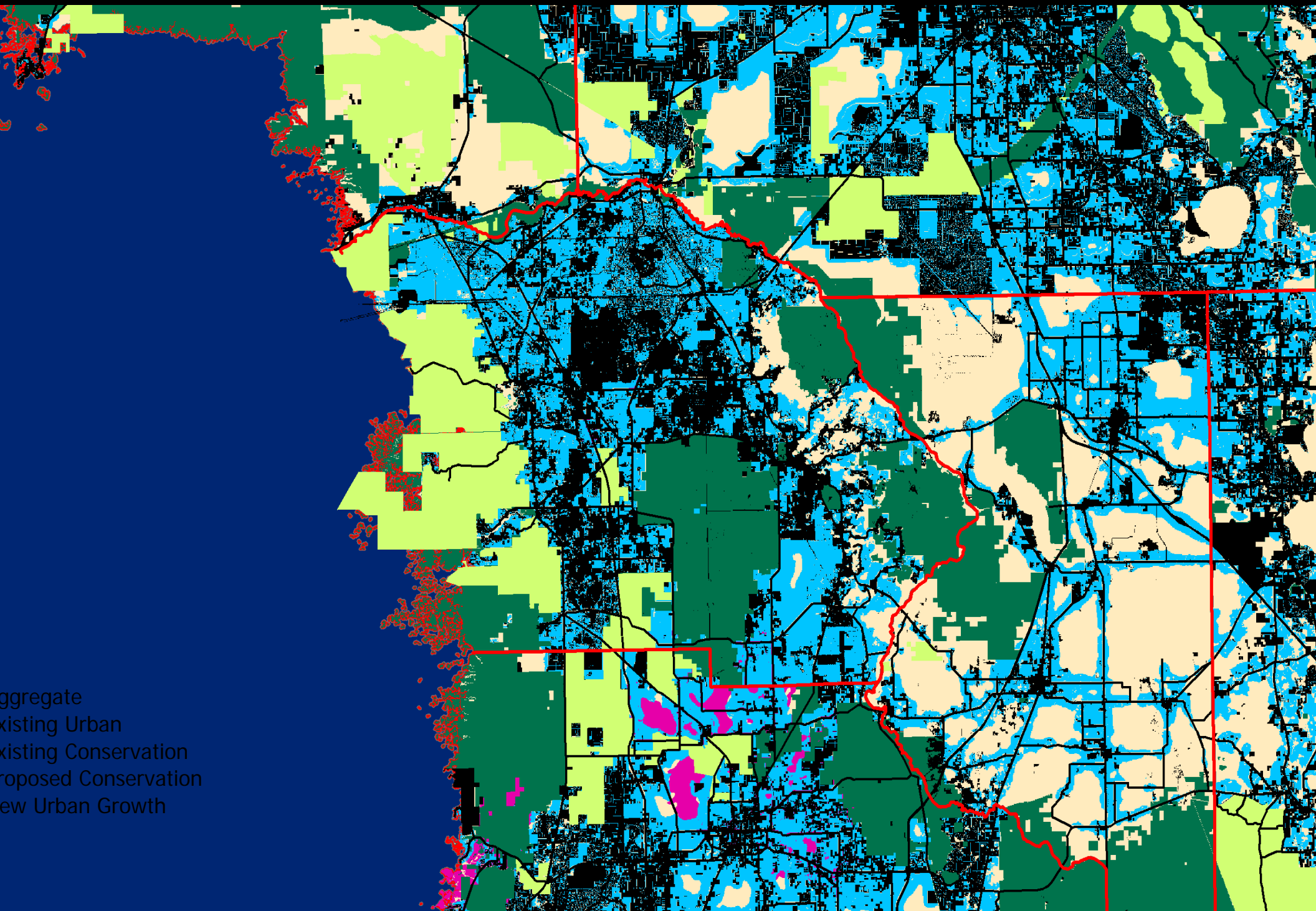
Aggregate  
Existing Urban  
Existing Conservation  
Proposed Conservation  
New Urban Growth

# New Urban by 2040



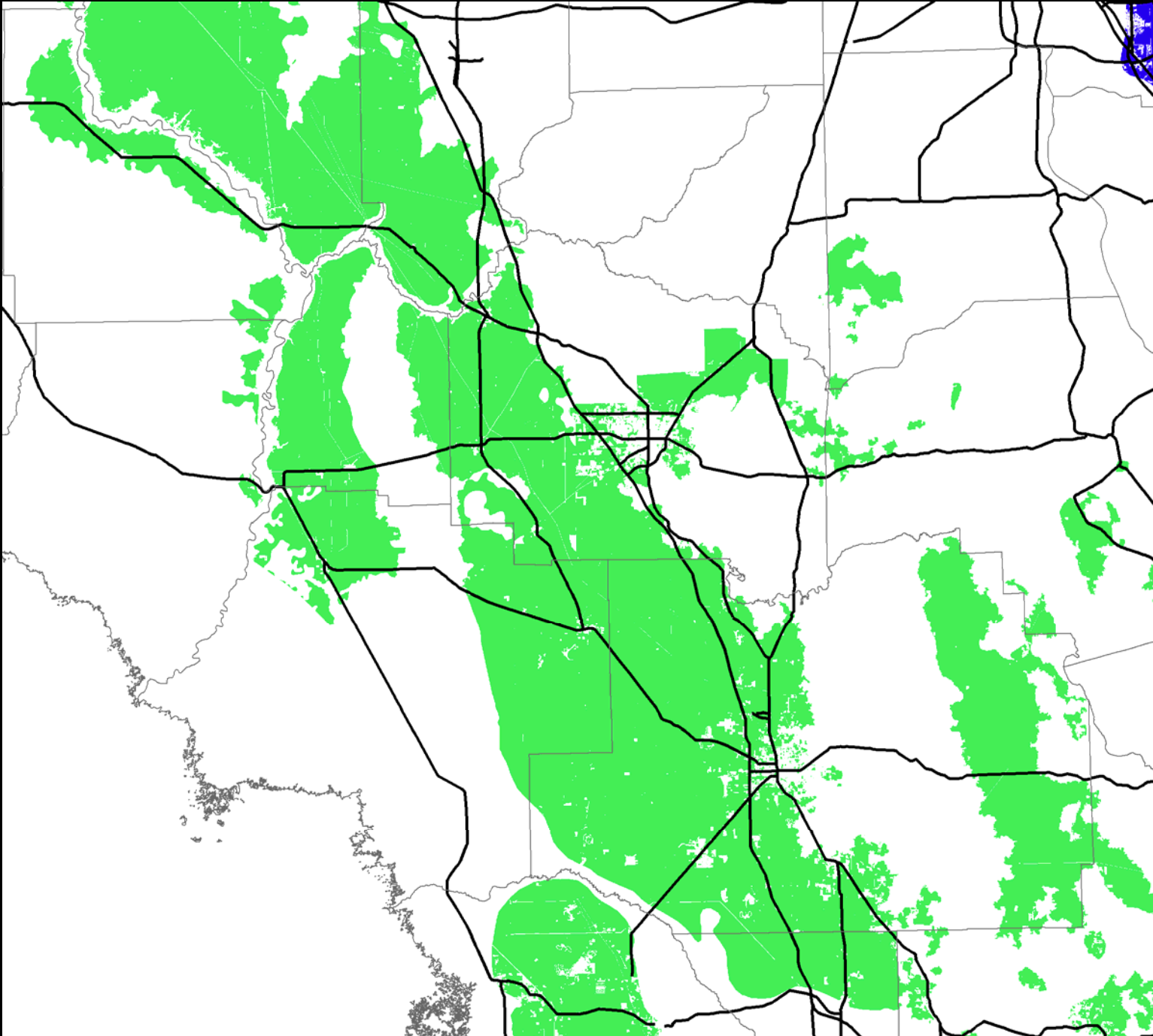
Aggregate  
Existing Urban  
Existing Conservation  
Proposed Conservation  
New Urban Growth

# New Urban by 2000

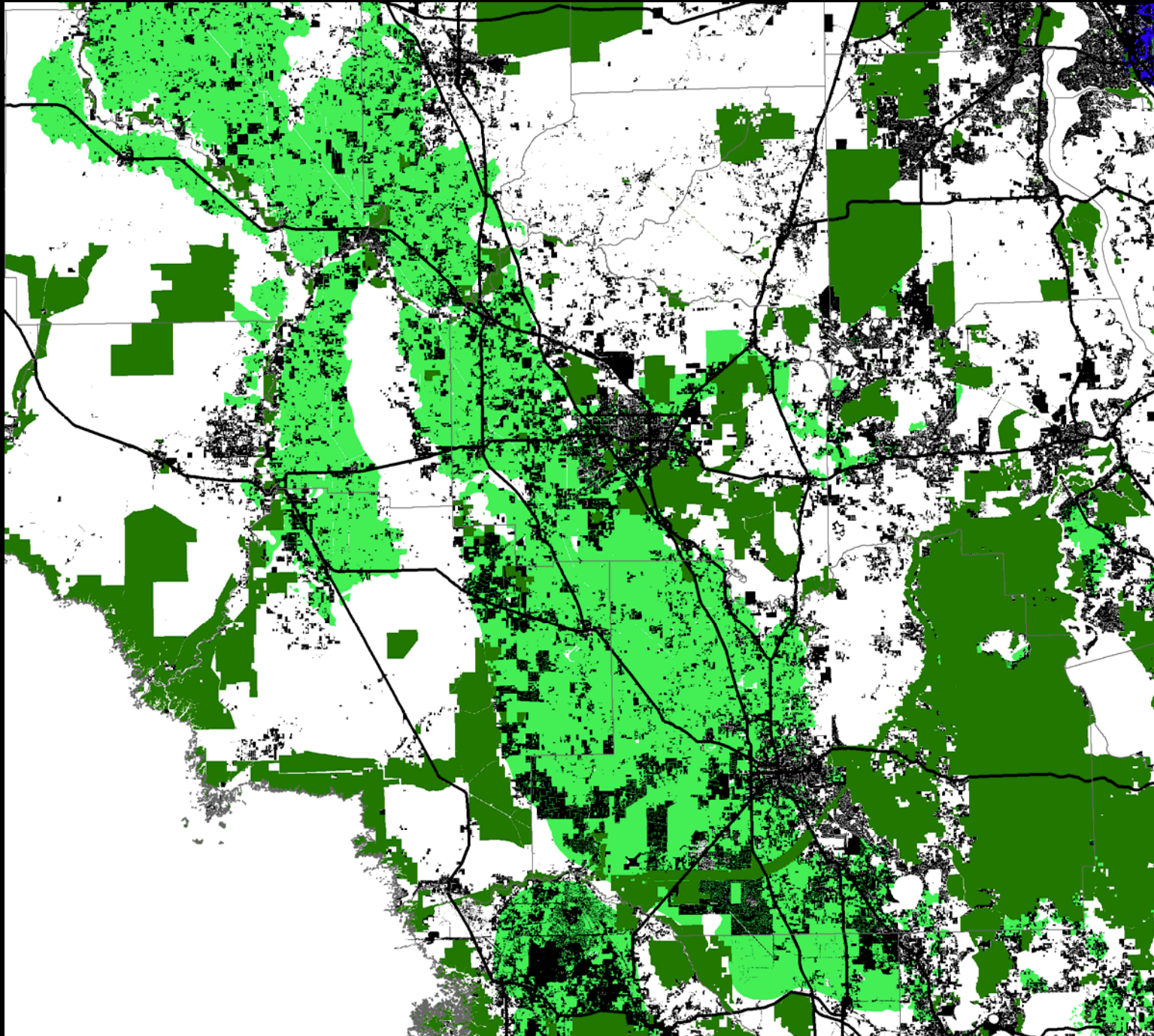


Aggregate  
Existing Urban  
Existing Conservation  
Proposed Conservation  
New Urban Growth

# Aquifer Recharge Areas in North Central Florida

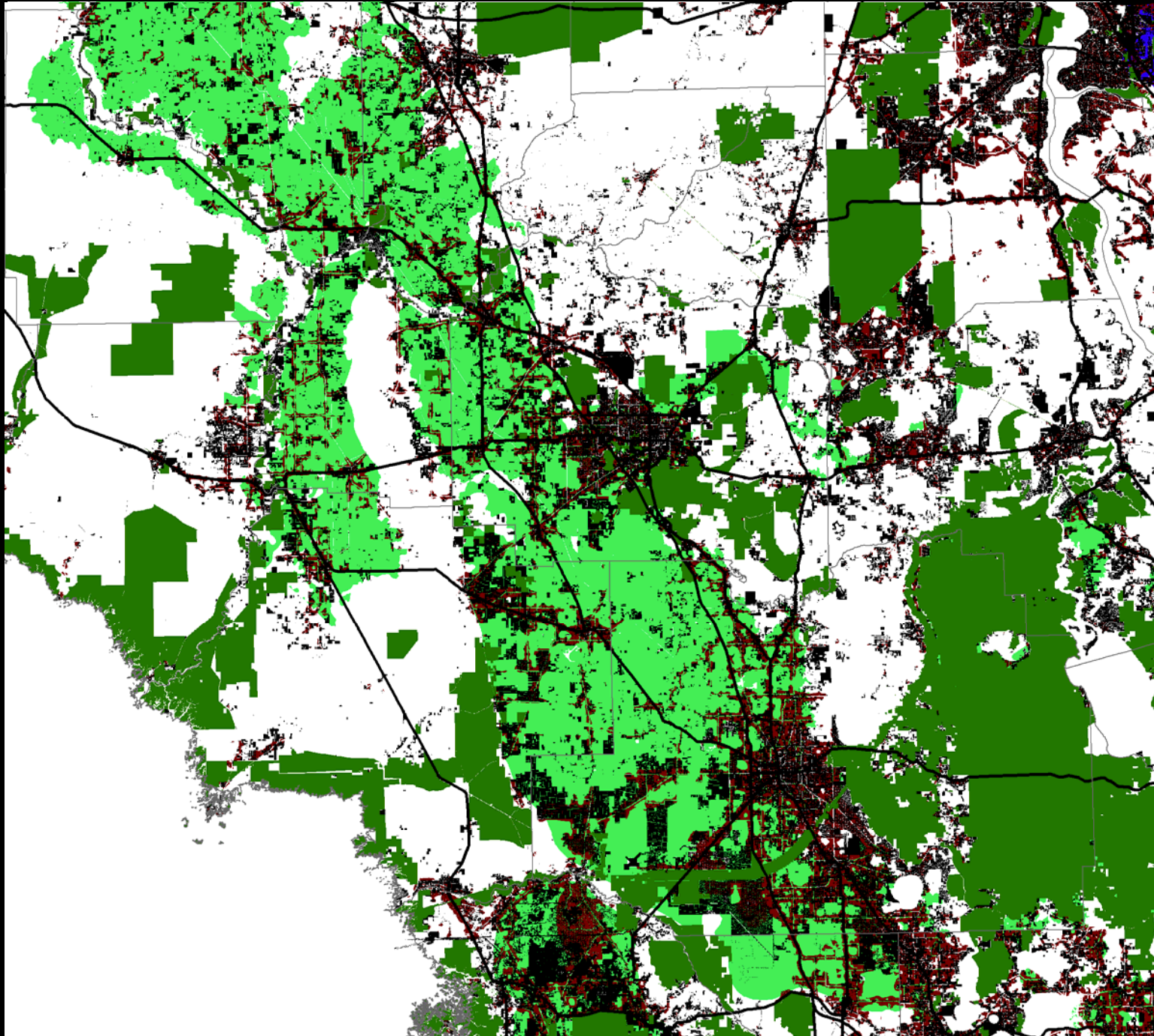


# Aquifer Recharge Areas in North Central Florida 2005 Urban and Conservation

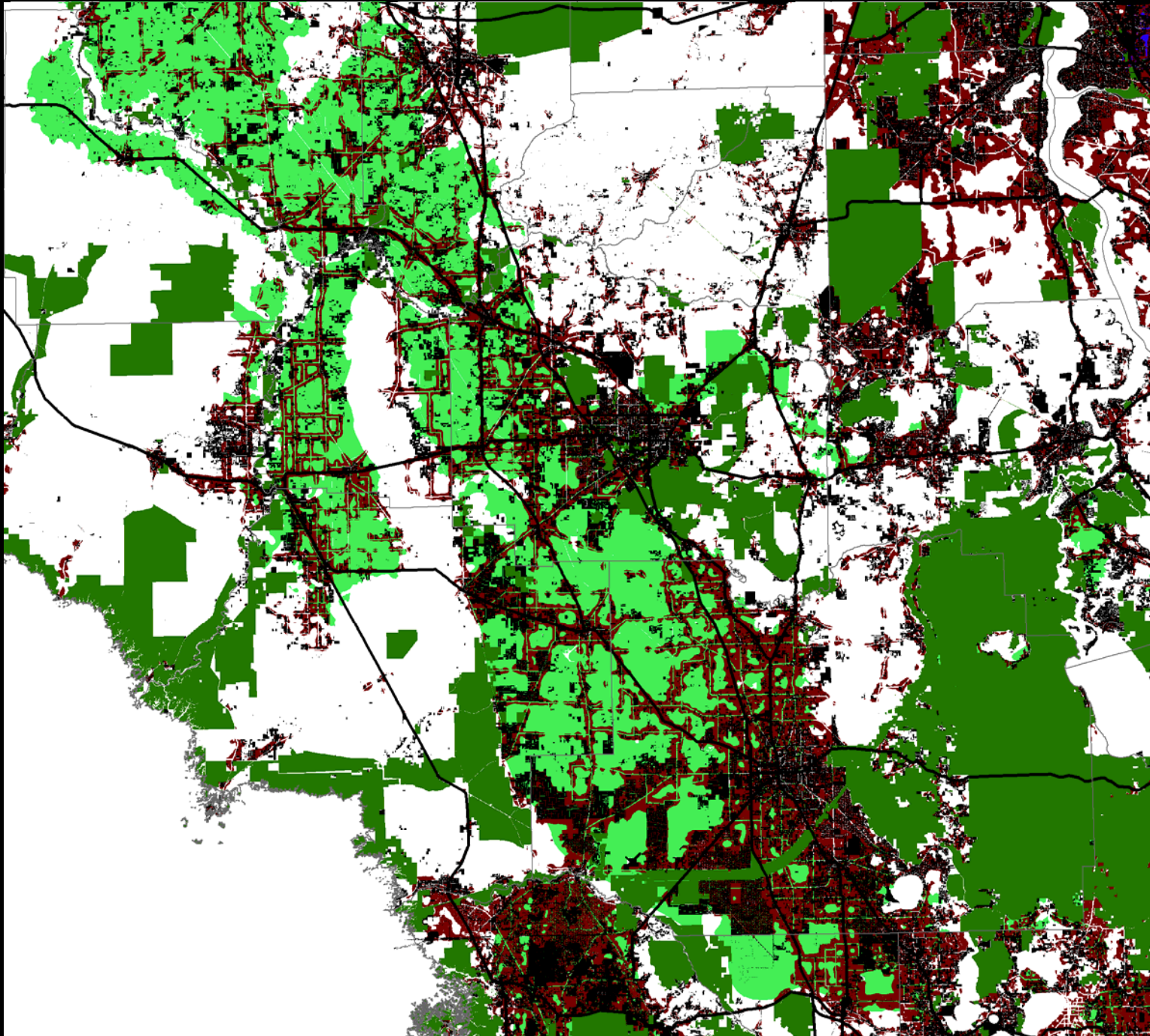


# Aquifer Recharge Areas in North Central Florida

## 2020 Urban and 2005 Conservation

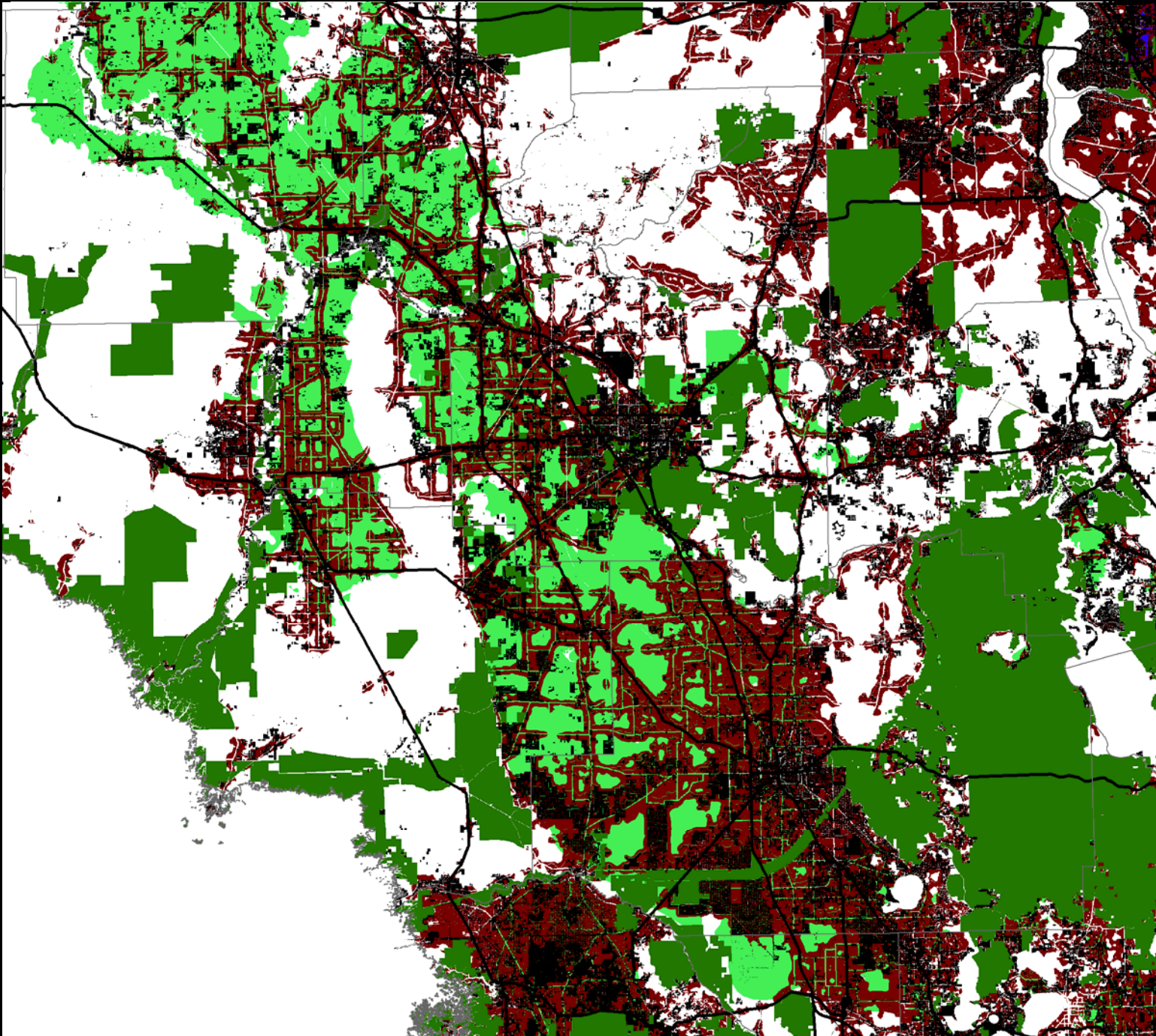


# 2040 Urban and 2005 Conservation

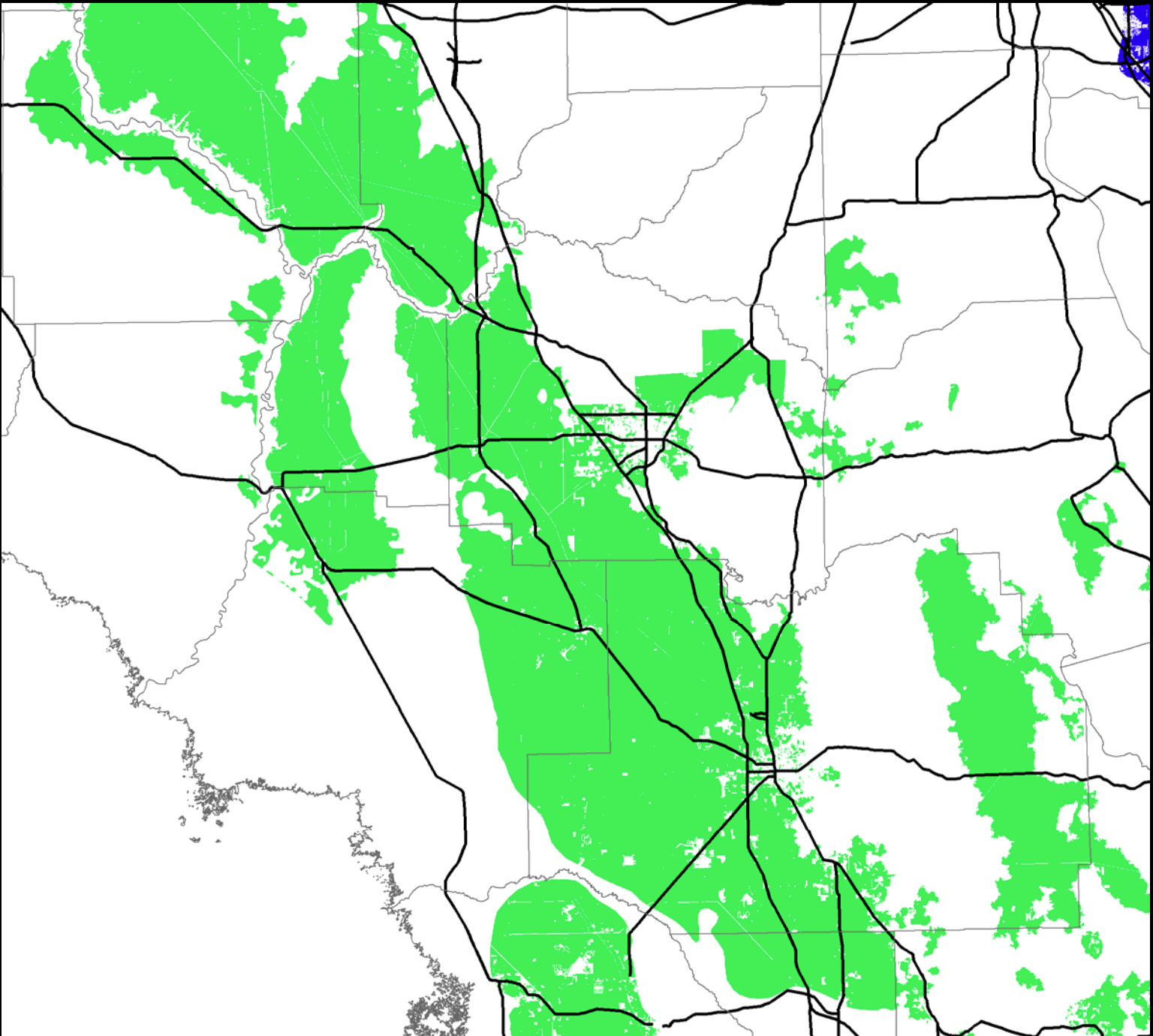




# Aquifer Recharge Areas in North Central Florida 2060 Urban and 2005 Conservation



# Aquifer Recharge Areas in North Central Florida



- Density – Land Consumption Relationship
- Density – Alternative Transportation Relationships
- Conservation Areas become Urban Growth Boundaries
- Threatened Resources are easily mapped
- Critical resource areas as part of our Green Infrastructure to protect ecosystem services