Planning for Transformational Change in Florida

2012 National LCC Workshop
Denver, Colorado

Thomas H. Eason
March 27, 2012
Florida Planning Tools

- Many, many excellent efforts, will focus on:
  - Florida 2060
  - Wildlife 2060
  - Critical Lands and Waters Identification Project
  - MIT Scenario Planning
  - Florida Wildlife Action Plan
FLORIDA 2060
A Research Project of 1000 Friends of Florida
Florida 2060

- Trend analysis of urban development
- Results of incremental decisions
- Question of legacy leadership

Prepared by:

GeoPlan Center of UF and CQG&RD at Georgia Tech
Assumptions

1. Moderate Population Growth (BEBS 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)
Population Forecast

- 2005: 17.9 Million
- 2060: 35.8 Million
Current Situation

- Developed Land
- Conservation Lands
  Permanently Protected
Statewide Land Use Allocation
(millions of acres)

Agriculture, Other Undeveloped Lands: 19.5
Permanently Protected Conservation: 10.8
Water: 2.0
Urban Development: 6.0

Agriculture, Other Undeveloped Lands: 12.5
Permanently Protected Conservation: 10.8
Water: 2.0
Urban Development: 13.0

Total: 38.3 Million Acres
Additional Land Converted to Urban Development 2005-2060

Total: 7 Million Acres

- Native Habitat: 2.7 Million Acres
- Agriculture: 2.7 Million Acres
- Other: 1.5 Million Acres
Wildlife 2060:
• What’s at stake for Florida?
What future do we want?

Florida now

Possible Florida in 2060
Habitat loss

- 2.3 million acres of black bear habitat
- 2.1 million acres of wild turkey habitat
- 700,000 acres of gopher tortoise habitat

How important are fish and wildlife species to you?
Habitat isolation

How do you burn when you are surrounded by a sea of development?
Coastal challenges

What happens to our coasts if sea level rises?
The future is up to us

Wildlife 2060: what’s at stake for Florida?
Get Involved Now!
Critical Lands & Waters Identification Project (CLIP)

- Derived from and updates existing data sources
- Prioritizes biodiversity, landscapes, water
- Multi-agency technical advisory group
CLIP Data Structure

- Combined Model
  - Biodiversity
    - Strategic Habitat Conservation Areas
    - Under-Protected Natural Communities
    - Biodiversity Hotspots
    - Rare Species Habitat Conservation Priorities
  - Landscape
    - Florida Ecological Greenways Network
    - Landscape Integrity
  - Surface Water
    - Significant Surface Waters
    - Natural Floodplain
    - Wetlands
  - Ground Water
    - Surficial Aquifer Vulnerability
    - Floridan Aquifer Vulnerability
    - Intermediate Aquifer Vulnerability
  - Marine
    - Shoreline Complexity Index
    - Hard Bottom/Coral Habitat
    - Seagrass Habitat
Consensus Priority 1 & 2

This map represents the P1 and P2 priority levels of the aggregated CLIP priorities with existing conservation lands included on top of the CLIP priorities. The current version of the CLIP priorities are based on rules-based selections from each of the 9 core data layers within the Biodiversity, Surface Water, and Landscape Resource Categories and overlap between the Biodiversity, Surface Water, and Landscape Resource Categories.

CLIP P1 and P2 Priorities with Existing Conservation Lands
- Existing conservation lands
- P1
- P2
- P1 in submerged lands/state waters
- P2 in submerged lands/state waters
1 & 2 Priorities Overlay Agriculture and Silviculture
Addressing the Challenges of Climate Change in Southern Florida’s Everglades Landscape

Massachusetts Institute of Technology
MIT Research Team

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Dr. Michael Flaxman

Christopher Horne

Stephen Lloyd

Vanessa Ng

Other Primary Contributors:

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- Holly Moeller
- Allison Lassiter
- Aaron Thom
- Linda Ciesielski
- Gates Gooding
- Kelsie Baker
Approach

1. Stakeholder-based participatory planning
   1. Stakeholders from federal, state and local agencies
   2. MIT facilitates, develops, and analyzes alternative futures

2. Scenario-based simulation modeling
   1. Multiple futures rather than one (master plan)
   2. Simulation not Prediction (educated assumptions by local experts)
   3. Set of possible futures to better inform decision-makers

3. Landscape-scale Conservation
   1. Better Inform decision makers of landscape scale conservation.
   2. Model and evaluate different approaches and futures.
Drivers of Change

1. Population Change
   1. Effects of population change on urbanization

2. Planning Assumptions and Regulations (Land Use and Water)
   1. Urbanization as a cause of landscape fragmentation
   2. Unintended consequences of resource consumption

3. Climate Change
   1. Sea Level Rise
   2. Temperature Changes
   3. Precipitation Changes

4. Conservation Strategies
   1. Expert stakeholder driven
   2. Landscape scale approach (establishment of patterns and processes)
Project Area Definition

Area: 19.3 Million Acres
Protected: 23 Protected Areas
People: 15.3 Million Inhabitants
# MIT Scenario Dimensions

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Biophysical</th>
<th>Population</th>
<th>Water &amp; Land Use Plng. Assumptions</th>
<th>Financial Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Low</td>
<td>Double</td>
<td>B.A.U.</td>
<td>$</td>
</tr>
<tr>
<td>B</td>
<td>Low</td>
<td>Trend</td>
<td>Proactive</td>
<td>$SSS</td>
</tr>
<tr>
<td>C</td>
<td>High</td>
<td>Trend</td>
<td>B.A.U.</td>
<td>$</td>
</tr>
<tr>
<td>D</td>
<td>High</td>
<td>Trend</td>
<td>Proactive</td>
<td>$SSS</td>
</tr>
<tr>
<td>E</td>
<td>Mid</td>
<td>Double</td>
<td>B.A.U.</td>
<td>$SSS</td>
</tr>
<tr>
<td>F</td>
<td>Mid</td>
<td>Trend</td>
<td>B.A.U.</td>
<td>$</td>
</tr>
<tr>
<td>G</td>
<td>High (113&quot; SLR)</td>
<td>Less</td>
<td>Proactive</td>
<td>$SSS</td>
</tr>
<tr>
<td>I</td>
<td>High</td>
<td>Double</td>
<td>Proactive</td>
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<td>$</td>
</tr>
</tbody>
</table>
Why Model These Land Uses?

Species X

In present-day climate space

Species X
Species X

With 100 years of climate change

Species X
Species X
Why Model These Land Uses?

In present-day climate space:
- Species X
- Protected Area

With 100 years of climate change:
- Protected Area

With 100 years of climate change?
Why Model These Land Uses?

Species X

Protected Area

In present-day climate space

With 100 years of climate change

Species Xb
Why Model These Land Uses?

In present-day climate space

Protected Area

Species X

With 100 years of climate change

Species X_b
Why Model These Land Uses?

Reserve

Species X

In present-day climate space

Cropland

Species X

Housing

With 100 years of climate change and human-land use change

With 100 years of climate change and human-land use change
Why Model These Land Uses?

- Reserve
- Species X
- Housing
- Cropland

In present-day climate space

With 100 years of climate change and human-land use change
Why Model These Land Uses?

Business as Usual Scenario

- Cropland
- Species $X_b$
- Housing

Proactive Scenario

- Species $X_b$
- Species $X$

Why Model These Land Uses?
Why Model These Land Uses?

Business as Usual Scenario

Cropland

Species $X_b$

Housing

Proactive Scenario

New Protected Area

Species $X_b$
Why Model These Land Uses?

Business as Usual Scenario

- Cropland
- Species X
- Housing

Proactive Scenario

- Species X
- Climate Corridor

Business as Usual Scenario

- Cropland
- Species X
- Housing

Proactive Scenario

- Species X
- Climate Corridor
Why Model These Land Uses?

Anticipating movement enables increases future protection
Modeling Process

Planning
Assumptions & Regulations

DEMAND

• Residential
• Conservation
• Agriculture

ATTRACTION

• Residential
• Conservation
• Agriculture

ALTERNATIVE FUTURES (2020 -2040 -2060)
Scenario C

High Sea Level Rise – Low Financial Resources
Business as Usual – Double Population

Scenario B

Low Sea Level Rise – High Financial Resources
Proactive – Trend Population
Landscape Ecology Strategies

1. Critical Corridors
2. Interior Habitat Corridors
3. New and Additional Patches
4. Indentify Potential Conflict due to urban
5. Potential Urban Conflict Area
1. **Structural Corridors:**
   A 2km wide area that connects existing patches of conservation (based on CLIP, SHCA priority data, FEGN critical linkages as weighted by stakeholders).

2. **Interior Habitat Corridors:**
   Expansion of structural corridors to provide core habitat (includes all of top stakeholder-weighted priority area).

3. **Patches:**
   Adds largest remaining patches based on CLIP priority 1 data to expand existing conservation areas.

4. **Potential Urban Conflict Area:**
   Areas within the potential conservation network that are vulnerable to development.
### Scenario C
- High Sea Level Rise – Low Financial Resources
- Business as Usual – Double Population

### Scenario B
- Low Sea Level Rise – High Financial Resources
- Proactive – Trend Population

#### Allocated Land Uses
- Residential
- Conservation
- Agriculture
- Transit Oriented Dev.

#### Current Land Uses
- Residential
- Conservation
- Agriculture
- Interstate Highways
- Major Lakes
- Major Rivers

#### Percent of Study Region Area

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Percent of Study Region Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>29.1% 16.7% 26.6% 27.7%</td>
</tr>
<tr>
<td><strong>Allocated</strong></td>
<td>23.5% 9.7% 22.7% 44.1%</td>
</tr>
</tbody>
</table>

Year: 2060
Only new area allocated

<table>
<thead>
<tr>
<th>Study Region Area</th>
<th>Scenario C</th>
<th>Scenario B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>29.1%</td>
<td>23.5%</td>
</tr>
<tr>
<td>Conservation</td>
<td>16.7%</td>
<td>9.7%</td>
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<tr>
<td>Transit Oriented Dev.</td>
<td>27.7%</td>
<td>44.1%</td>
</tr>
</tbody>
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The maps illustrate the potential future land use scenarios for the study region, with specific emphasis on the allocation of new areas and the impact of high and low sea level rise scenarios combined with financial resources and population growth strategies.
State Wildlife Action Plan

• Climate Change added as a Priority Goal
  – Incorporated into State Wildlife Grant (SWG) proposal review

• Interim Revision – Oct. 2011
  – Climate change chapter
  – Built on Summit findings
  – Focus on Sea level Rise (SLR)
  – Vulnerability Assessments
Adaptation Planning

- 3 Scenarios
- 6 Species
  - Panther
  - Key deer
  - Crocodile
  - Salt marsh snake
  - Least tern
  - Short-tailed hawk

- Expert input and review
Adaptation Planning

• Three Situations:
  – Room to move
  – Competing with the neighbors
  – Surrounded on all sides

Crocodile with high sea level rise
Cooperative Conservation Blueprint

A Bold vision of Florida’s future

- If we can envision our future we can create that future
- It’s a quilt, not a blanket
- Focus on people and incentives
Regional & National Connections

- State Wildlife Action Plans
- FWS Climate Change Strategy and Plan
- National Fish, Wildlife and Plants Climate Adaptation Strategy
- Landscape Cons. Cooperatives
- Climate Science Centers
- Florida Climate Institute
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Florida Panhandle- Current
Florida Panhandle- 2060
North Florida - Current
Reserve Network for Florida

Core Preserves
Buffer Zones and Corridors

Source: Noss & Cooperrider 1994
Issues to consider

- Habitat loss
- Habitat isolation
- Coastal challenges
- Water quality and quantity
- Wildlife/Human interactions
- Access to land and water
Water quality and quantity

How will our growing need for fresh water affect fish and wildlife?

Billions of gallons per day

<table>
<thead>
<tr>
<th>Year</th>
<th>Gallons (Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>6.5</td>
</tr>
<tr>
<td>2010</td>
<td>6.75</td>
</tr>
<tr>
<td>2015</td>
<td>7.5</td>
</tr>
<tr>
<td>2020</td>
<td>8.25</td>
</tr>
<tr>
<td>2025</td>
<td>9.0</td>
</tr>
</tbody>
</table>
Based on current trends, complaints about bears will increase dramatically:

- 1985: 8
- 2005: 1,334
- 2025: 5,900
- 2060: 33,800

Do you know how to live with a bear as your neighbor?
Access to land and water

How long will you wait in line to hunt or fish?
Working for wildlife

Landowner assistance helps folks get it right at Watermelon Pond
Some places to start

- Does your city or county have a local land acquisition program?
- Does your community view the management of its green infrastructure in the same way it does upkeep and management of roads, buildings, or bridges?
- Are you incorporating wildlife habitat conservation measures on your property?
- How is your community safeguarding your region’s water resources?
Scenario Dimensions

[Diagram showing the relationship between Climate Change, Population, Planning Assumptions, Financial Resources, and their respective trends (H, M, L, BAU, PRO).]

- Climate Change
- Population
- Planning Assumptions
- Financial Resources
- Trend (H, M, L, BAU, PRO)
Scenario Planning

- Scenarios varied across 4 dimensions:
  - Climate change
  - Human population change
  - Land & water planning policies
  - Availability of public resources
- 50 years into the future
  - 2010, 2040, and 2060