







What is biodiversity?

- *Habitat diversity*
- *Species diversity*
- *Genetic diversity*



Barn Owl Photo: UF/IFAS

Biodiversity conservation focuses on native and endemic species (vs. species richness)

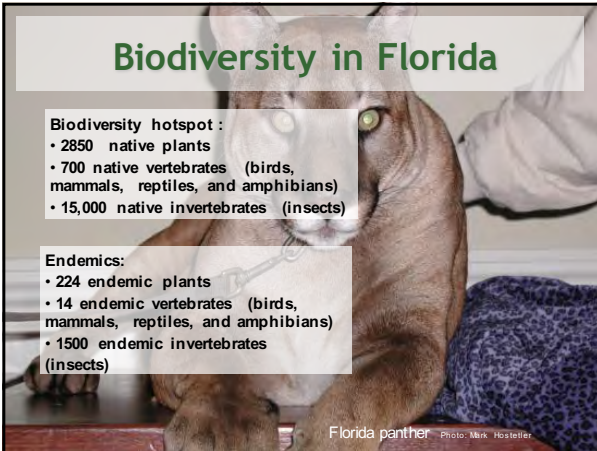
Biodiversity in Florida

Biodiversity hotspot :

- 2850 native plants
- 700 native vertebrates (birds, mammals, reptiles, and amphibians)
- 15,000 native invertebrates (insects)

Endemics:

- 224 endemic plants
- 14 endemic vertebrates (birds, mammals, reptiles, and amphibians)
- 1500 endemic invertebrates (insects)



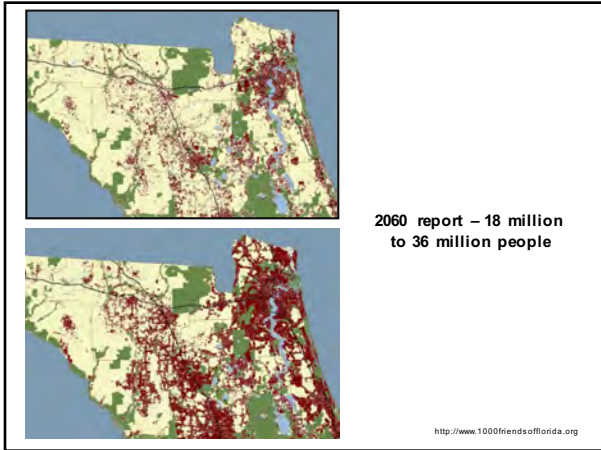
Florida panther Photo: Mark Hostetler

Why Conserve Urban Biodiversity?

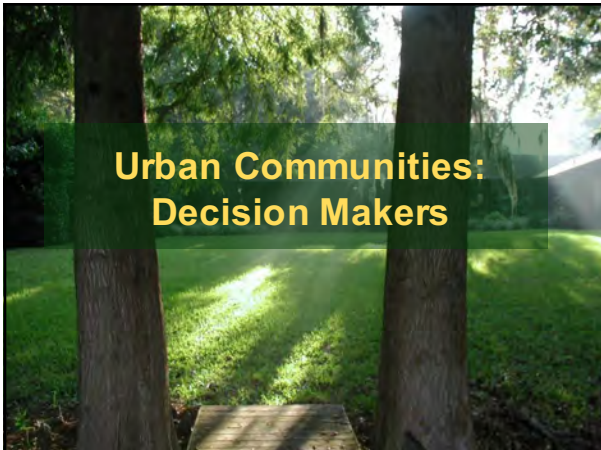
- Many social and economic benefits (e.g., home prices are higher)
- Urban landscapes are the primary areas where many people interact with local plants and animals
- Urban areas impact surrounding natural ecosystems

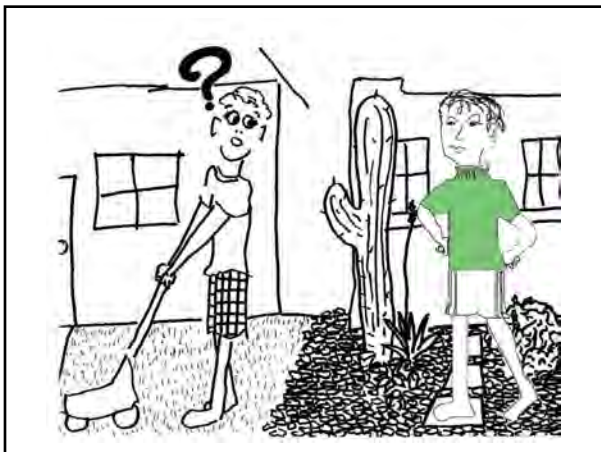
67.8 million people in the U.S observe wildlife around the home

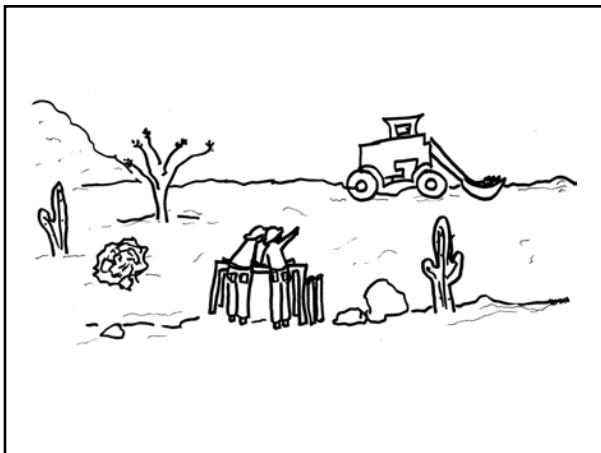




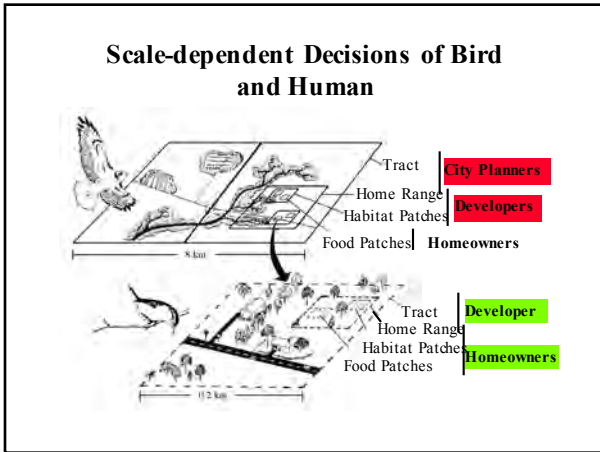












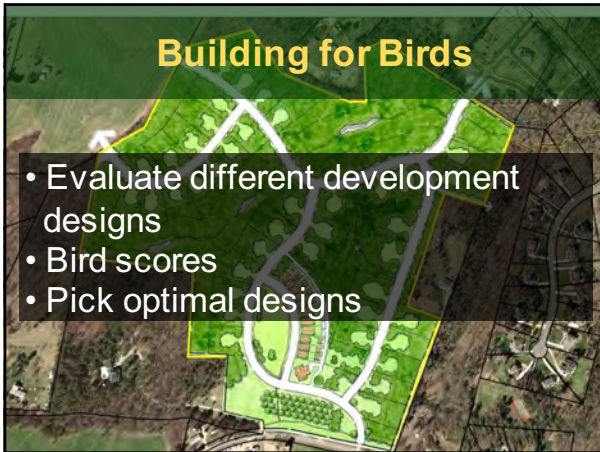
Forest Fragments: Stopover Sites

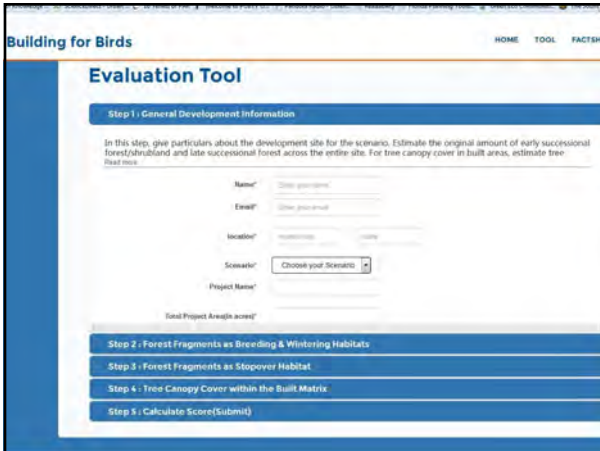
- Migrants (short and long distance)
- Yes, interior forest species
- Many species use urban forests to refuel

Neotropical Migrants

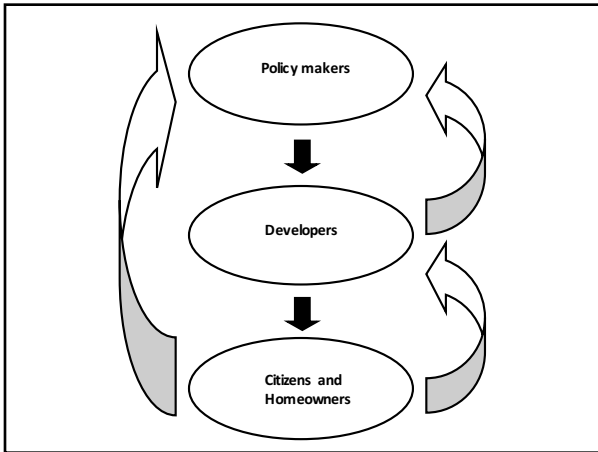
Yellow Warbler
Yellow-throated Vireo
Black-throated Green Warbler

allaboutbirds.com/ell.edu









If a goal is to conserve urban biodiversity and to minimize impacts on surrounding lands, then more developments need to incorporate green infrastructure into their design and green practices into their management plans.



Conservation Development



Site design



Construction



Post-Construction

Site Design Issues

- Large percentage of impervious surfaces
- No sensitivity to surrounding land (e.g., no buffers)
- Fragmented design
- Improper inventory of natural areas (critical habitat not conserved)
- Road placement impedes wildlife movement

Construction Issues

- Improper protection of waterbodies (contaminants going off site)
- Improper treatment of stormwater
- Improper protection of conserved trees
- Improper use of earthwork machines
- Use of invasive exotics
- Large percentage of turf
- Impacts on wildlife (e.g., nearby nesting species)
- Untrained contractors (no buy-in or understanding)
- Unshielded lights



Post-construction Issues

- Drawing down water table
- Spread of invasive plants and animals
- Funding for long-term management
- ATVs and foot traffic into preserved areas
- Nutrient runoff from lawns and impervious surfaces
- Underground seepage from septic tanks
- Management of stormwater systems
- Improper pesticide use
- Feeding wildlife and other human/wildlife conflicts
- Management of built and conserved areas
- No environmental covenants



Engagement!

- Trained and motivated developers, architects, environmental consultants, etc. (Site layout)
- Trained and motivated contractors, civil engineers landscaping companies, etc. (construction)
- Educated and motivated homeowners (Post-construction)



UNIVERSITY OF FLORIDA
Dept. of Wildlife Ecology & Conservation wec.ufl.edu Program for Resource Efficient Communities resbuildgreen.ufl.edu

Most residents are not green

- 1) Homeowners score low in terms of environmental attitudes, knowledge, or behaviors (no difference between conventional and green developments)
- 2) Homeowners do not have appropriate information to manage homes, yards, and neighborhoods
- 3) Sale office information not adequate; homeowners forget the information
- 4) Homeowners desire local environmental information

Youngentob & Hostetler 2005; Hostetler and Drake 2009; Hostetler and Noiseux 2008

Conservation Developments

- 1) Many conservation subdivisions have not been adequately managed and are not much better than conventional
- 2) A study in Colorado found limited biodiversity in conserved open space
- 3) Very few open space regulations address long-term management for biodiversity

Lenth et al. 2006; Hostetler and Drake 2009; Wald and Hostetler 2010

Why Failed?

- Impacts coming from built areas (invasive exotics)
- People did not know how their behaviors can negatively impact nearby natural areas (pets off leash, ATV motorized traffic)
- Management is lacking



Solution? Install neighborhood educational programs

- Educational signs installed along sidewalks



Education Program

- *Dynamic Educational Signs*
- *A Web site*
- *Covenants & brochure for homeowners*



www.wec.ufl.edu/extension/gc

LIVING IN HARMONY

Water Energy Waste Landscaping Wildlife Local History

Harmony is designed with the idea that people and nature can coexist. Residents have many opportunities to learn about and explore their environment. For example, with lakes and natural areas nearby, one can hear and see a variety of wildlife species. The connection between nature and culture is an important one. Our ancient culture and green spaces are closely tied to the environment. Many Floridians wish to preserve our natural heritage and conserve natural resources for future generations, and each person can make a difference.

The goal of this website is to provide environmental information so that each homeowner can make informed decisions and take action. Many features in Harmony make it one step closer to becoming a community that conserves natural resources (e.g., water, energy, and wildlife). Construction of energy efficient homes and buildings, preservation of open space, landscaping with natives, and conservation of natural areas and wildlife are just a few ways the town of Harmony is built a sustainable place.

However, in order for Harmony to function as a "green" community, each resident must make a conscious effort to environmentally manage their homes, yards, and neighborhoods. We invite you to learn more - please click on the subjects below.

Live sustainably in Harmony

- Water-Saver Signs**
Improve your water use practices and save money by following some water conservation tips.
- Energy Efficient Signs**
Benefit from positive cash flow, improved comfort, better indoor air quality, and reduced moisture problems.
- Landscaping for the Environment**
Landscaping for a Florida yard provides habitat for wildlife and helps to reduce your water and energy bills.
- Harmony's Wildlife Habitat**
Florida's wildlife species include 65 "native" species and diverse ecosystems.

Harmony Highlight

Visit the award-winning sign that is highlighted on the previous slide to learn more about getting an environmental tour around the community. It's important to conserve wildlife for high times.

Living in Harmony Partners

Department of Wildlife Ecology and Conservation
University of Florida Extension
FLA Harmony Association
U.S. Program for Resource Efficient Communities

Dept. of Wildlife Ecology & Conservation | www.wec.ufl.edu | Program for Resource Efficient Communities | www.buildgreen.ufl.edu

Longitudinal Study

- **With Education Program (Results)**
 - Increased capability to apply environmental practices
 - Improved environmental attitudes, knowledge, and behaviors
 - Most residents used the dynamic signs

Hostettler et al., 2008
Source: Harmony, FL

How can governments support conservation development initiatives that actually conserve biodiversity?

Conservation Development



Design Construction

Post-Construction

POLICY

Density Bonuses for Stewardship Practices

- Native landscaping
- Environmental CC&Rs
- Biodiversity conservation and restoration management plan
- Signage in neighborhood
- Funding mechanism through HOA dues or property taxes

Steps to Successful Incentive-based Policies (research):

- Develop incentives with stakeholder input
- Good marketing and education campaign
- Built government capacity (all departments are engaged)

Romero and Hostetler 2004

How can built environment professionals help to conserve biodiversity?

Build Model Developments!

- Harmony, FL
- Madera, FL
- Woodlands at Davidson , NC

• www.wec.ufl.edu/extension/gc/



Organize Tours of the Model Developments

- Provides local examples for people to see with their own eyes!



Details on How to Create Conservation Developments?

Online Course on Conserving Biodiversity in Subdivision Development



Qualifies for 4 GBCI-approved CE hours and 4 AIA LU|HSW|SD

Participants receive a 126 page resource manual

www.gbrionline.org

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Course Objectives

After completing this course you will be able to:

- Describe three stakeholders that impact biodiversity conservation in urban development
- Describe what biodiversity is and functional habitat for plants and animals
- Prioritize design and management practices for the three phases of development:
 - Phase 1: Design
 - Phase 2: Construction (retrofit)
 - Phase 3: Post-construction (retrofit)




Photo: Harmony Development Co.



Summary

- Conservation development – must address decisions by citizens, developers, policymakers
- Design is not enough – address construction and post-construction phases
- Continuing Education Course (register at www.gbrionline.org)

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