

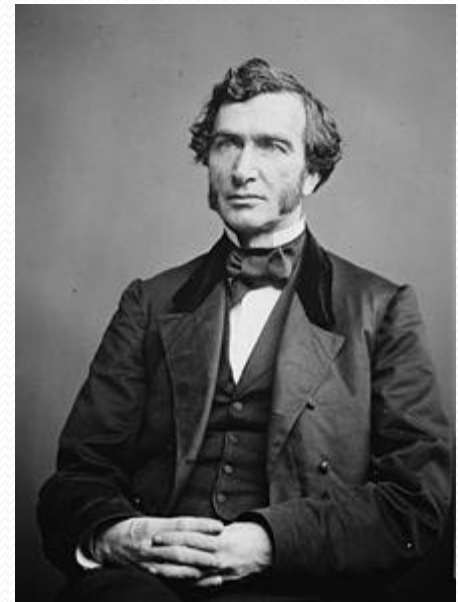
Taking Your Science to the Public: The Extension Model

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Morrill Land-Grant Act and Smith-Lever Act

- Morrill Land-Grant Act (1862)
 - Granted lands to state for the purpose of establishing institutes of learning principally focused on agriculture and “the mechanic arts ... in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life”
- Smith-Lever Act (1914)
 - Established a system of cooperative extension services, connected to the land-grant universities, to inform people about current developments in a range of subject areas.



Justin Smith Morrill

Land Grant Universities mission = Research, Teaching and Extension

Cooperative Extension Service

- A non-formal educational program designed to help people use research-based knowledge in decision making and to improve their lives.
- Extension works in six major areas
 - 4-H Youth Development
 - Agriculture
 - Leadership Development
 - Natural Resources
 - Family and Consumer Sciences
 - Community and Economic Development
- Extension Specialist– usually commodity oriented with research responsibility
- County Extension Agents – more region oriented with area focus

Extension uses multiple mechanisms to translate science for application

- Fact Sheets
 - EDIS Publications
- Electronic media
- Presentations and programs
- Field Days
- Workshops
- Demonstration projects
- Direct consultation with stakeholder

- Extension Specialist and County Agents are also often well networked and have established a level of trust and credibility among stakeholders.

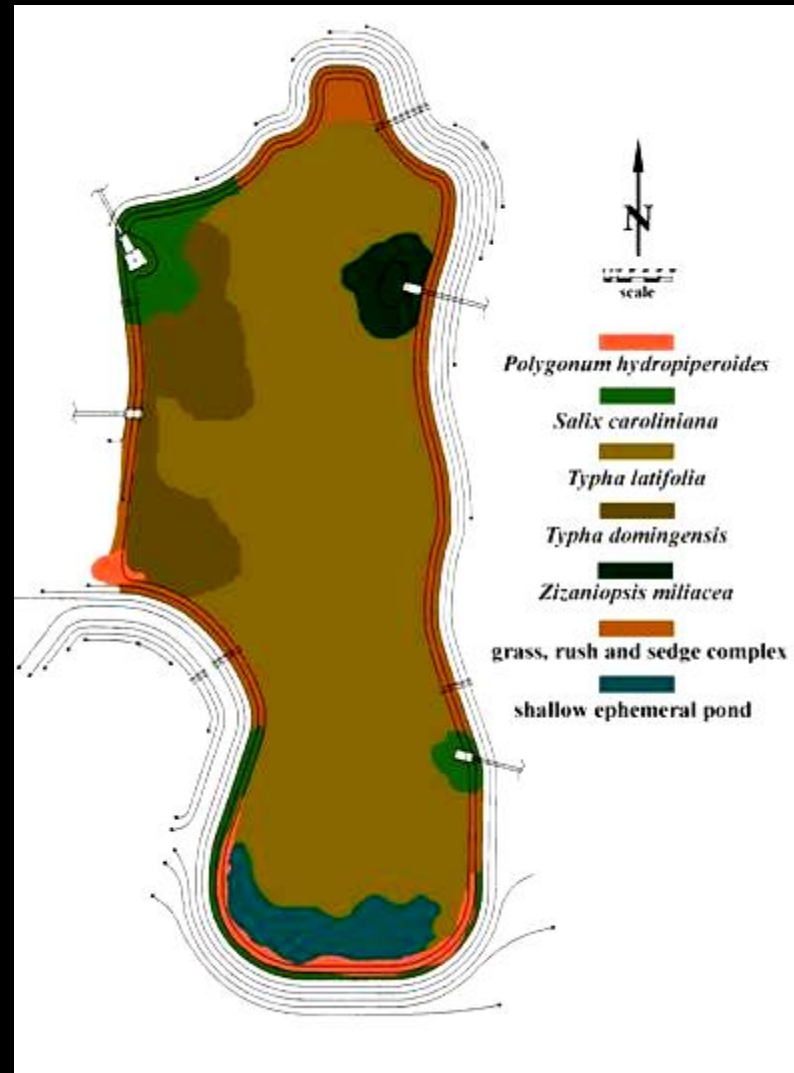
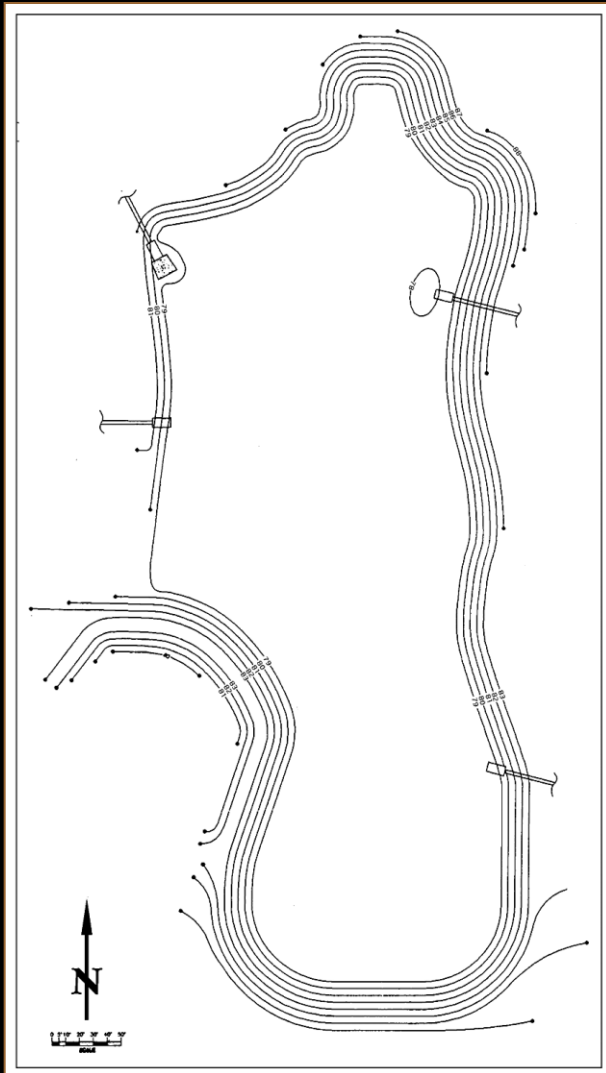
- ***How can graduate students use and benefit from this model?***

Case Study: (SEEP)

Stormwater Ecological Enhancement Project

- Designed by graduate students between 1995-1997
- Implemented with graduate student oversight in 1998
- Managed by the University of Florida Wetlands Club
- Used by many entities including Extension

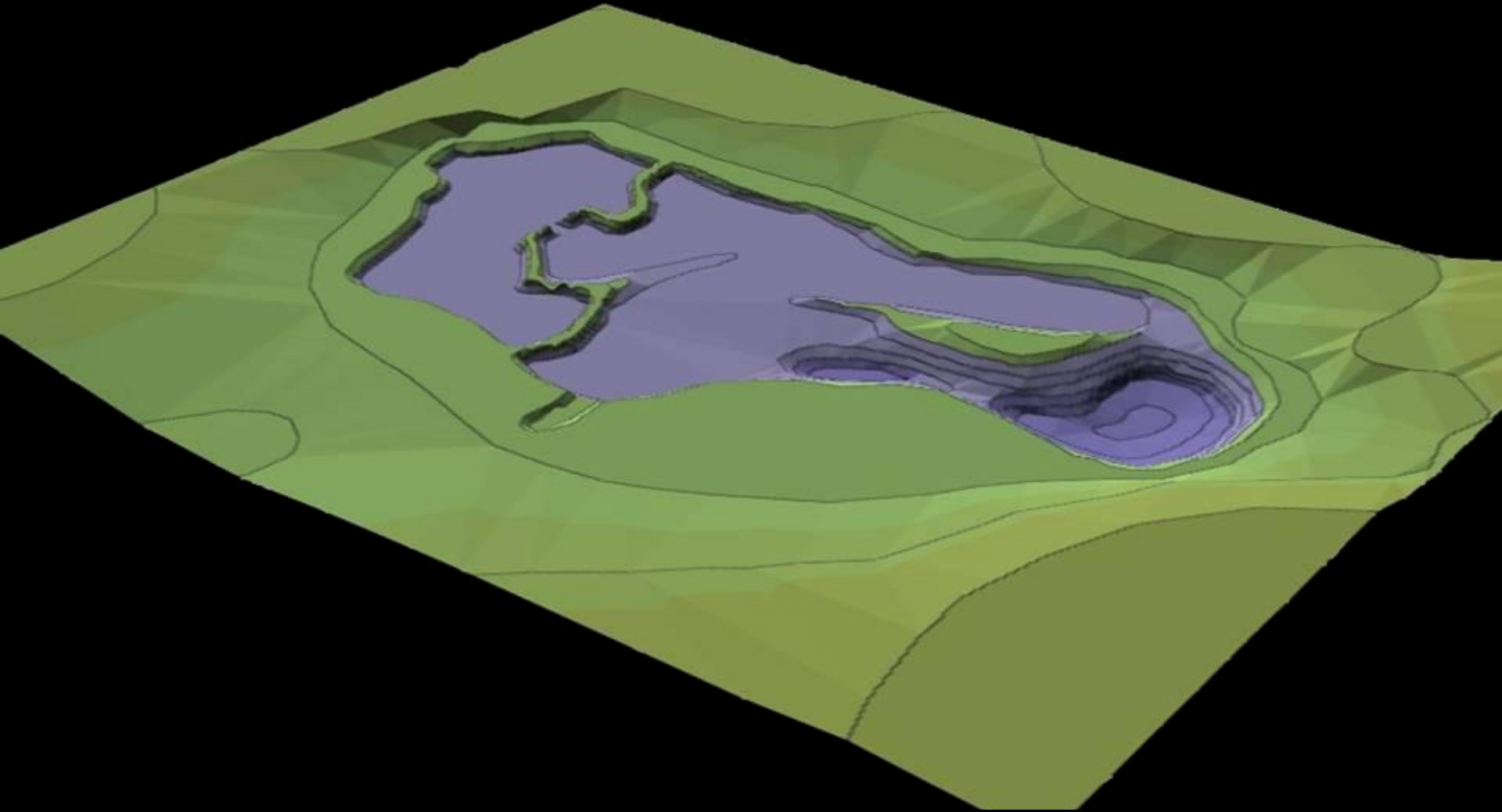
Pre-Enhancement Contour and Vegetation



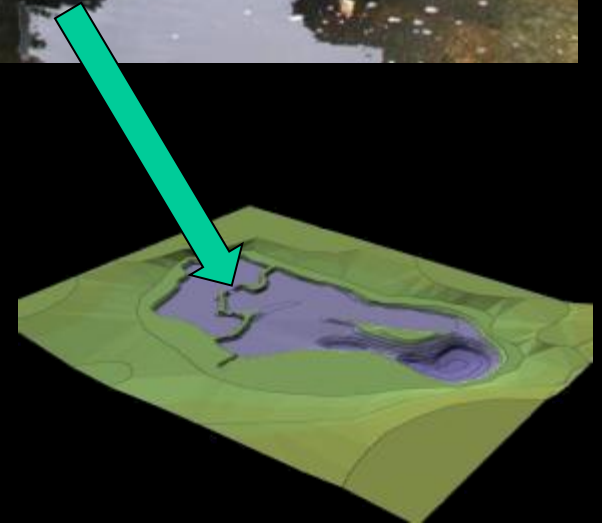
Prior to Recontour



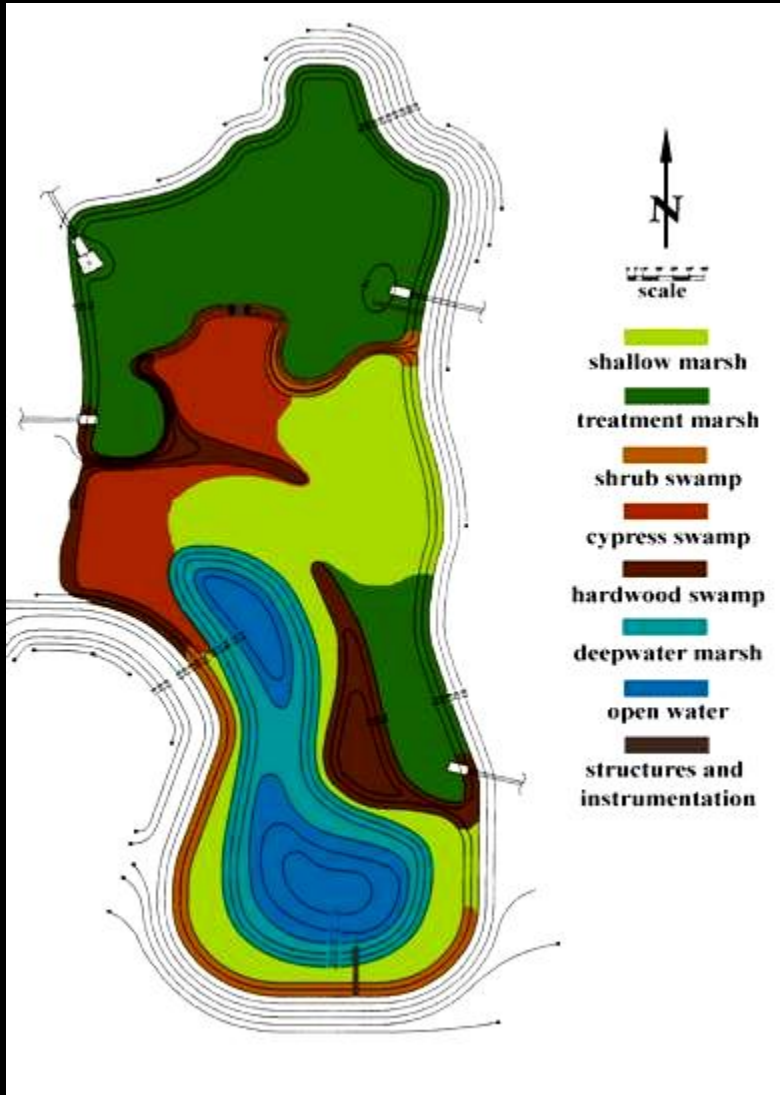
After Recontour



Internal Weir



Vegetation Planted



1997: 32 initial species

1998: 53 species, 1370 individuals planted.
(85 species)

2000



2007



1998



2007



2000



2007



1998



2002



17 5:14 PM

2007





After Initial recontouring and planting, Wetland Club activities in conjunction with Extension focused on education and outreach including:

- Integration of a boardwalk
- Interpretive signs and Kiosks
- Integration with Florida Museum of Natural History

Explore next door!

Self-guided nature trails

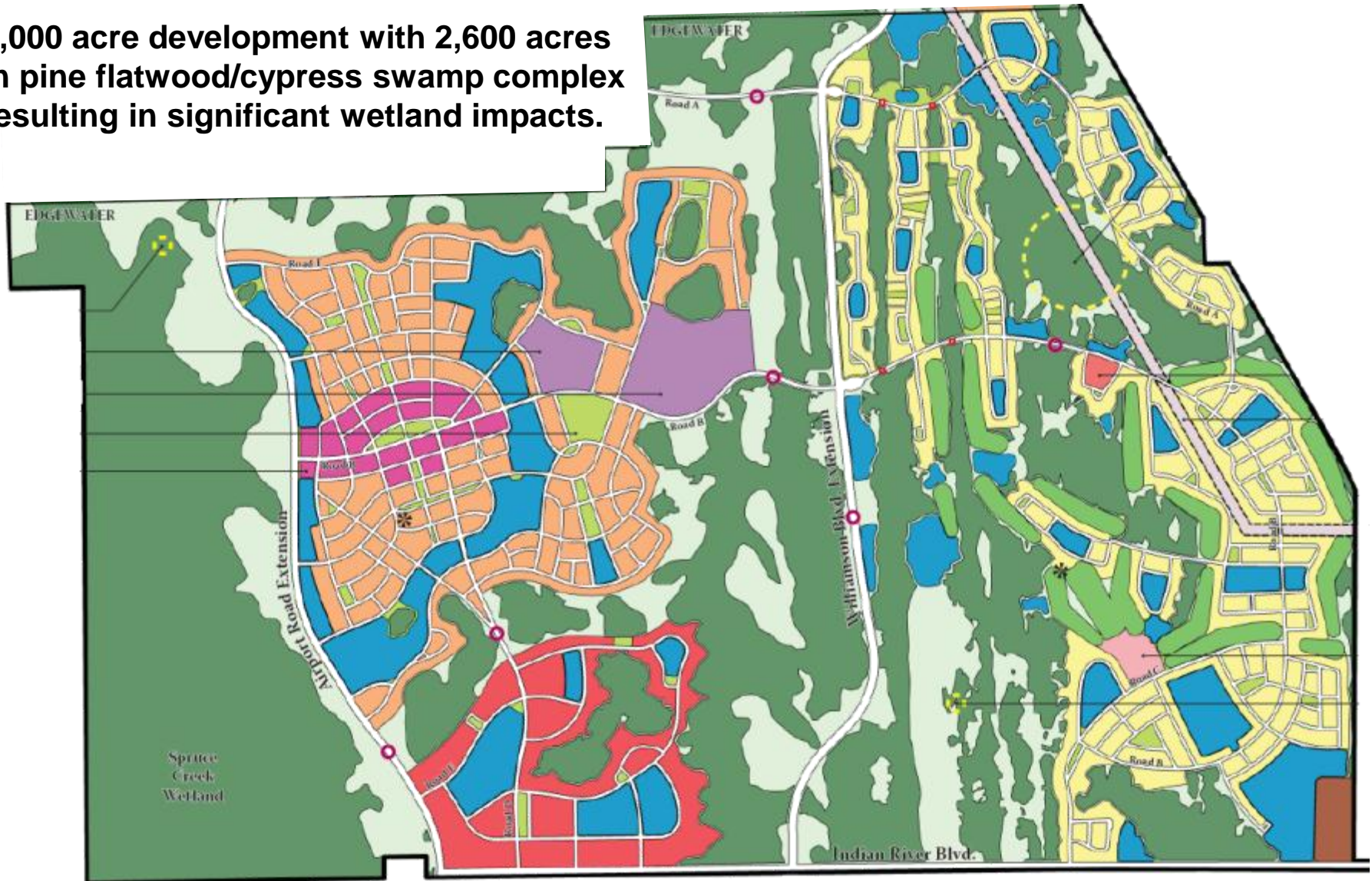
5 minute walk from museum
Over 1 1/2 miles of trails
4 different habitats
Ask sales associate for more info!

How has this graduate student lead project in conjunction with Extension made a difference?

- Increased species vegetative richness from 32 to 122 species (2004).
- Used by 12 courses at UF and topic of two Masters thesis.
- Part of the Florida Natural History Museum's nature trail system visited by over 20,000 people per year.
- Focus of 19 Extension workshops on stormwater basin design.
- Used in 53 Extension presentations to county officials, staff, architects and engineers as part of Low Impact Development infrastructure.
- Used to educate over 1,000 elementary school children about wetlands and stormwater.
- Helped influence change in stormwater design code of three Florida counties.
- Significantly influenced the design of one large master plan development reducing wetland impacts after a developer visited the SEEP.

Restoration Development (PreSEEP)

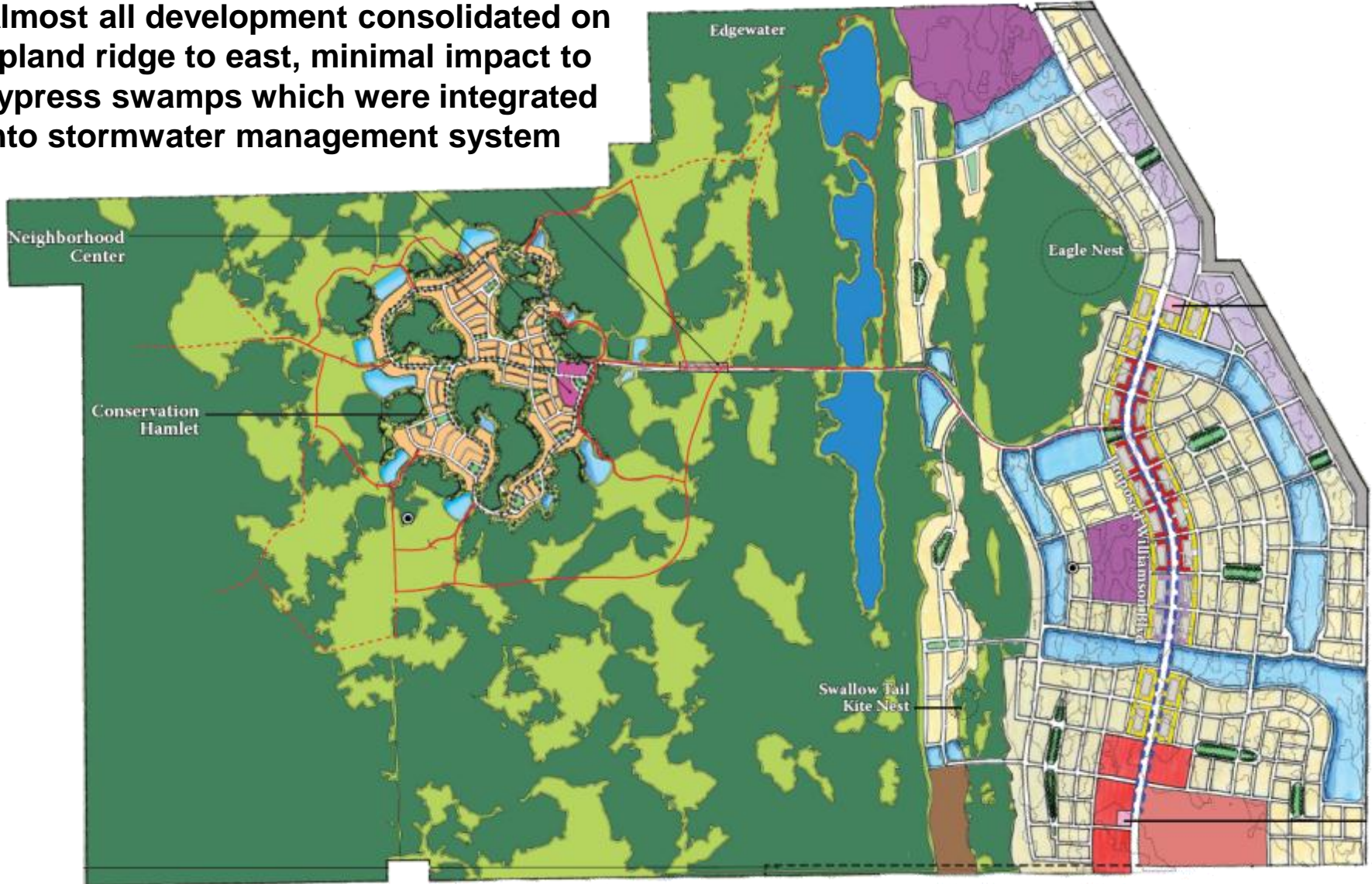
6,000 acre development with 2,600 acres in pine flatwood/cypress swamp complex resulting in significant wetland impacts.



Initial Site Design

Restoration Development (PostSEEP)

Almost all development consolidated on upland ridge to east, minimal impact to cypress swamps which were integrated into stormwater management system



Reduced Impact Site Design

Take home messages

- Students application of knowledge and understanding has significant potential to make an impact and influence decision makers.
- Take the initiative, and apply what you know whenever and where ever you have an opportunity.
- Work with existing venues including Extension to maximize outreach objectives.
- All of the benefits of a project or your research are rarely realized at the beginning, and may never be fully predicted or recognized by the creator (you), but if useful will be incorporated by others.

Case Study:

Nitrate Load Reductions to the Santa Fe River

- Adrienne Frisbee (MS) investigated rates of denitrification along a tributary of the Santa Fe River to see if it could mitigate for agricultural nitrate loads.
- Denitrification in riparian zone was only partially effective at reducing loads, but research identified a major source of nitrate coming from a nursery with a subsurface vector to seepage wetlands.
- In collaboration with the nursery, Casey Schmidt (PhD) evaluated implementation of a denitrification wall bioreactor to reduce groundwater nitrate loads.
- Results showed a significant reduction in groundwater nitrate concentration flowing through experimental wall.
- Research and demonstration project are being evaluated as a BMP intervention to address shallow groundwater nitrate loading.

Installation of Denitrification Wall Bioreactor



Take home messages

- Initial research results do not always solve the problem, but could direct the next research area of focus.
- Working with Extension facilitates interaction with stakeholders, in this case the nursery owner.
- Working closely with stakeholders and building trust often yields significant benefits in cooperation, and typically future implementation of practices.



Case Study: Impacts in Tumblin Creek Floodplain

- Casey Schmidt (MS) investigated impacts of stormwater sediment loads, hydrologic changes and water quality on an urban floodplain – graduated in 2005.
- Recommendations to restore floodplain and mitigate loads were provided in a 2005 report to municipality and communicated to stakeholders through several extension workshops – no restoration efforts made at that time.
- In 2012 the Lake downstream of floodplain was listed as impaired
- Municipality is now interested in restoring floodplain to help improve water quality partially pressured by community stakeholders – looking at implementing restoration plan #3 proposed by student in 2005 report.

Take home messages

- Communicating your findings to local stakeholders will increase their knowledge and the likelihood that your findings will be considered by decision makers.
- An immediate response to findings should not necessarily be cause for defeat.

Work with extension to help communicate your science.

- Extension needs your science to improve their message.
- Extension provides a means to communicate your science beyond the scientific community.
- Extension often provides a linkage with stakeholders to identify research sites or facilitate implementation.
- There is increasing focus in proposals, especially from state and federal agencies, to include extension and outreach components to make sure research findings are distributed to the public.

Final Thought

“Anyone who thinks they are too small to make a difference, has never been in bed with a mosquito”

Mahatma Gandhi

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