WETLANDS, WATER, AND THE WILL TO CHANGE

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Orange County Environmental Protection Division

Florida Stormwater Association – 2025 Winter Conference

DRUMMOND CARPENTER

ORANGE COUNTY FLORIDA

APPLIED ECOLOGY

BACKGROUND

Project Effort

- State of the Wetlands Study
  - Acreage
  - Distribution
  - Community Types
  - Fragmentation
  - Vulnerabilities
- Regulatory Framework Study
  - Review current practices of other agencies and governments

Project Objectives

- Update and revise Orange County's wetland regulations and permitting processes based on scientific approach
- Protect remaining wetland resources
- Promote sustainable development

PROJECT DRIVERS

- Reflect BCC-directed policy and current regulatory climate
- Make permitting processes and outcomes more streamlined, predictable, and consistent
- Balance protection and sustainable growth
- Preserve wetland function
  - Increase wetland buffer widths
  - Improve mitigation success

TIMELINE

FALL/WINTER 2022

Regulatory Framework Study

Wetland Tours

SEPTEMBER 2023

BCC Work Session

Draft Ordinance

STATE OF THE WETLANDS STUDY

WETLAND MAPPING

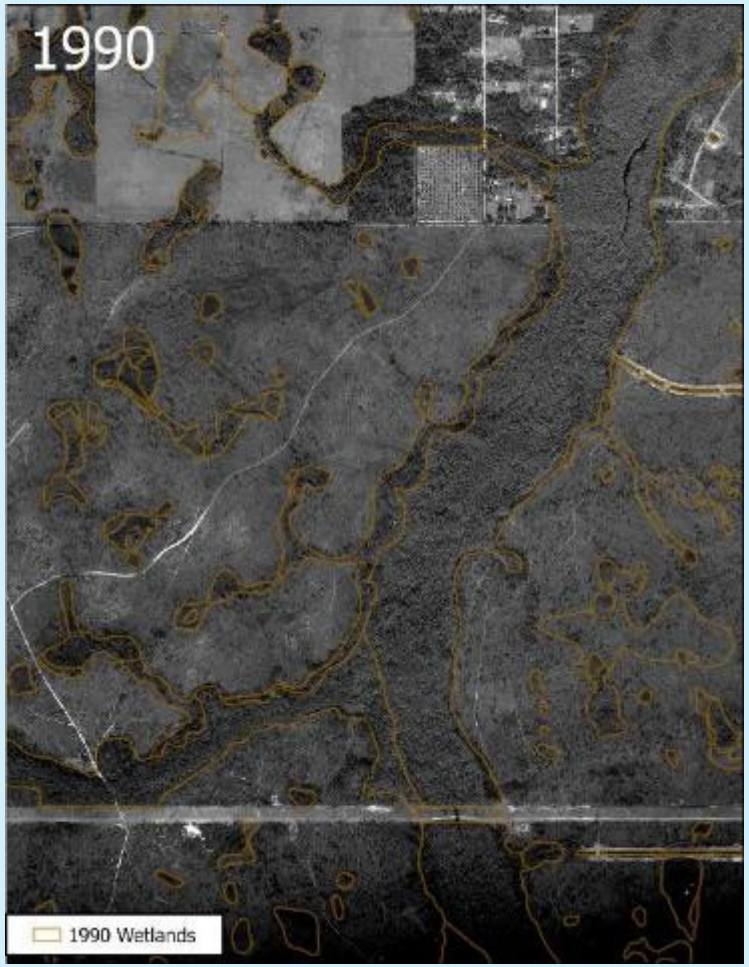
WETLAND FRAGMENTATION

FUNCTIONAL CHANGE

WETLAND VULNERABILITY

WETLAND MAPPING

- Aerial Photointerpretation (API)
- Wetland signatures
  - Vegetation
  - Soil Types
- Decadal Mapping:
  - 1990
  - 2000
  - 2010
  - 2020



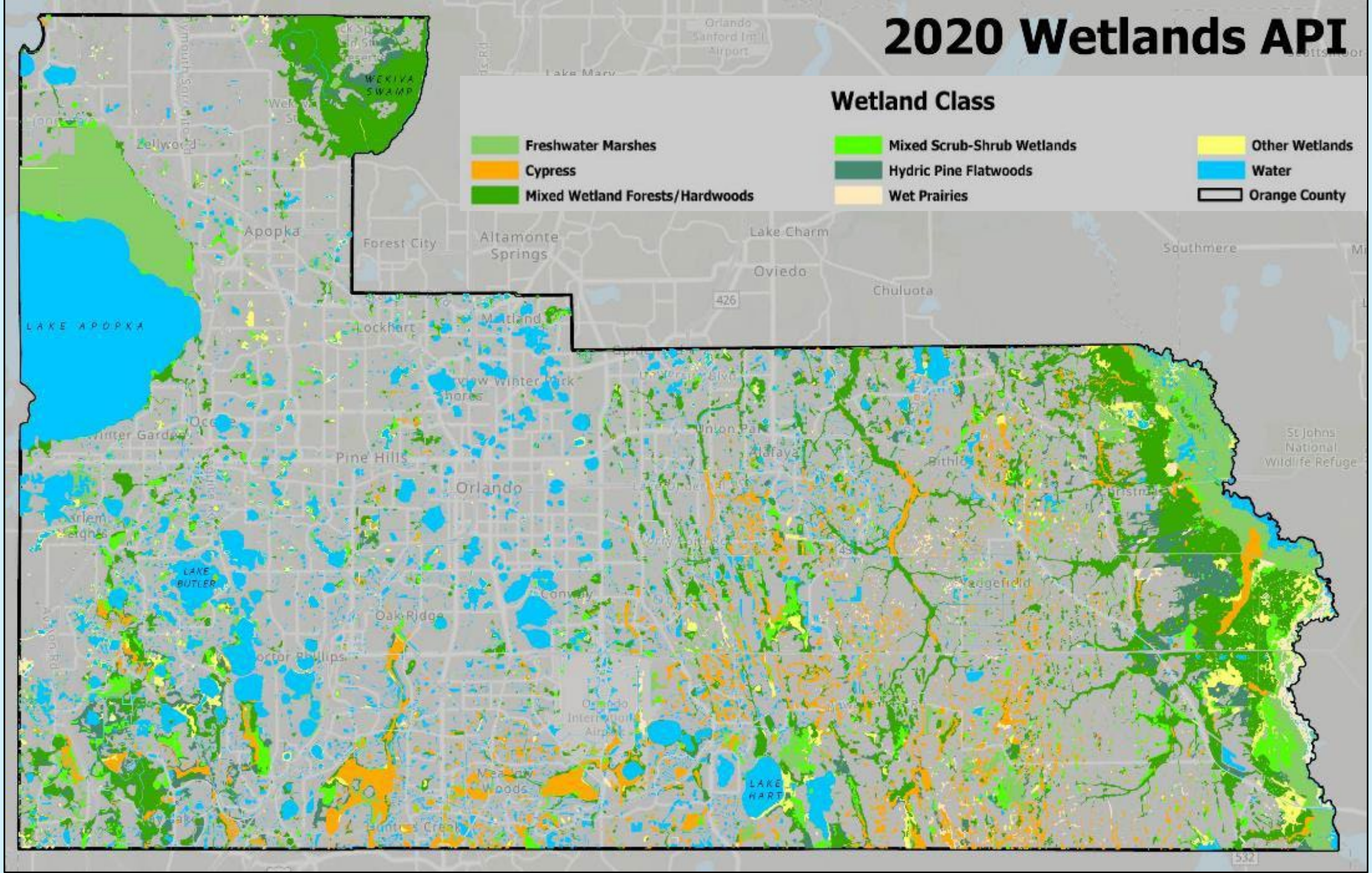
WETLAND MAPPING

MIXED HARDWOODS

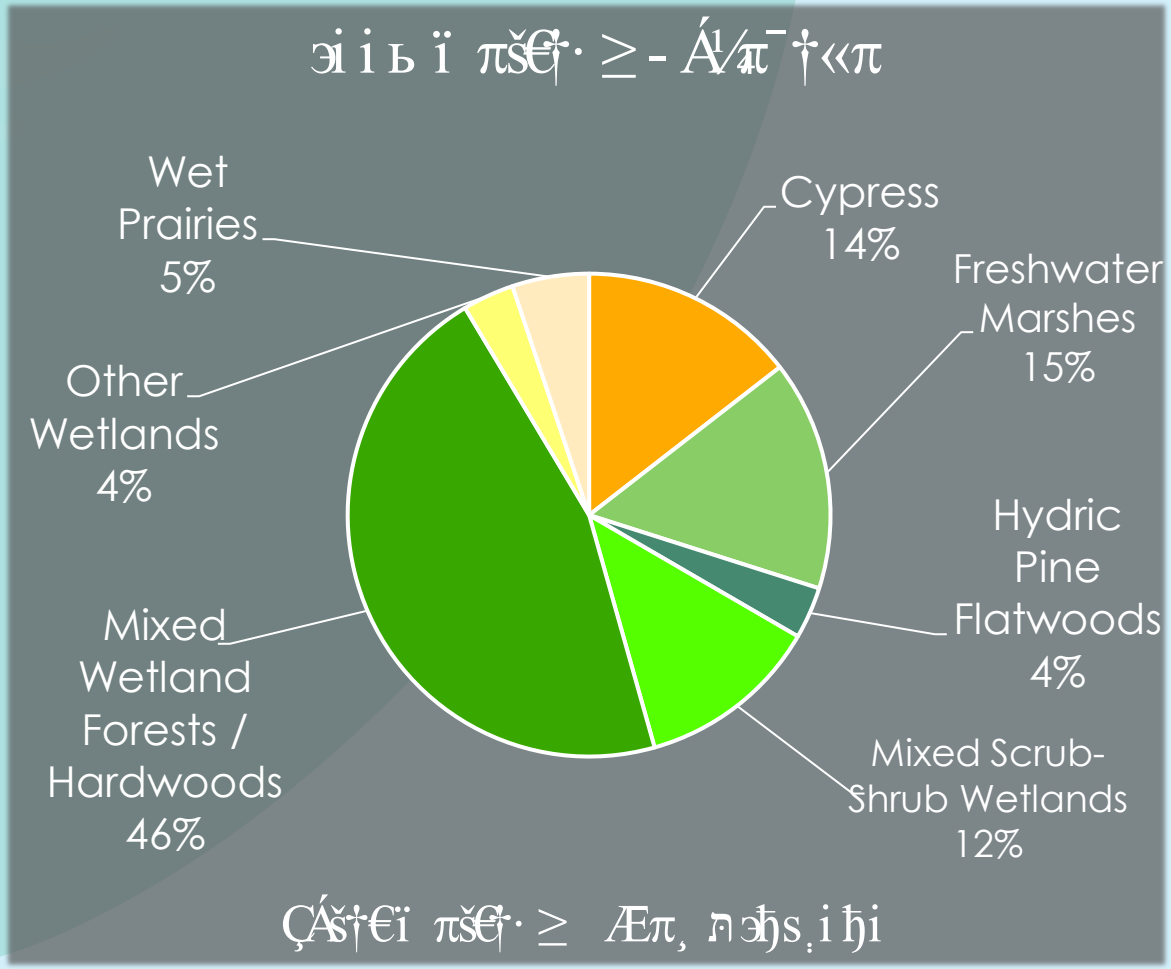
CYPRESS DOMES

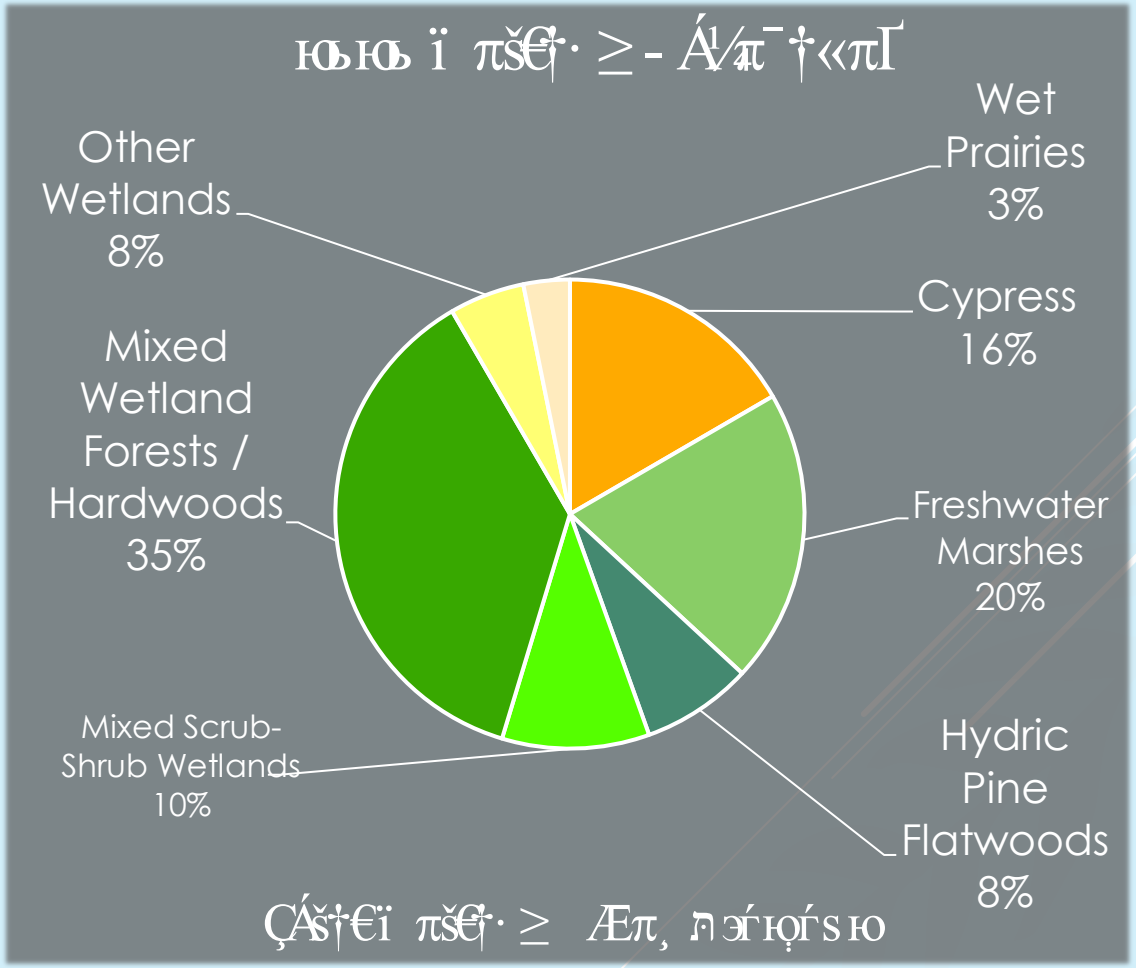
HYDRIC PINE FLATWOODS

FRESHWATER MARSH


2020 Wetlands API
Wetland Class
Freshwater Marshes
Cypress
Mixed Wetland Forests/Hardwoods
Mixed Scrub-Shrub Wetlands
Hydric Pine Flatwoods
Wet Prairies
Other Wetlands
Water
Orange County
WEKIVA SWAMP
LAKE APOPKA
LAKE BUTLER
LAKE HART
Zellwood
Apopka
Forest City
Altamonte Springs
Lake Charm
Oviedo
Chuluota
Southmere
Lockhart
Maitland
Winter Park
Winter Garden
Pine Hills
Orlando
Union Park
Alafaya
Bithlo
Oak Ridge
Conway
Ridgefield
St Johns National Wildlife Refuge
426
532

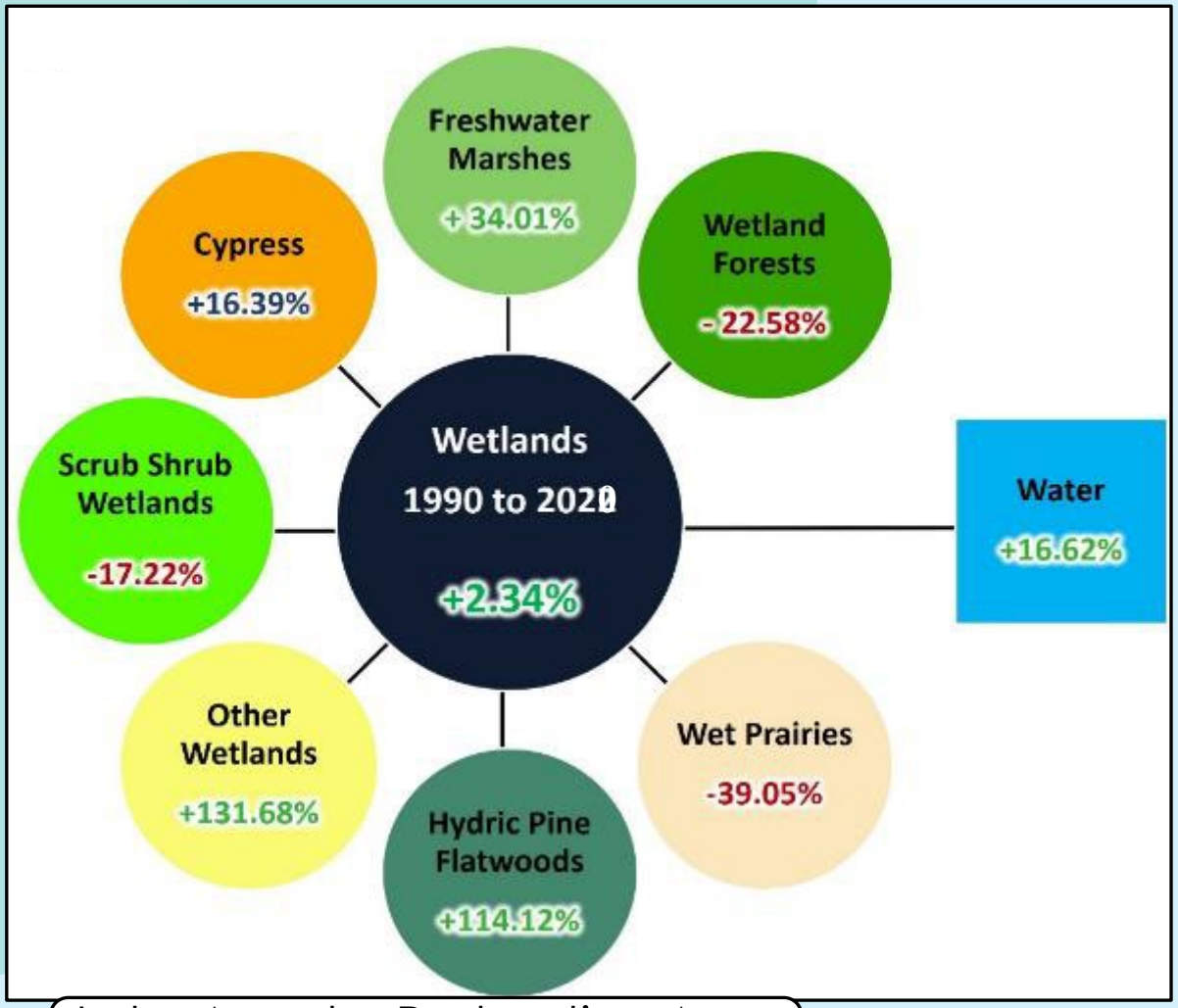
WETLAND MAPPING



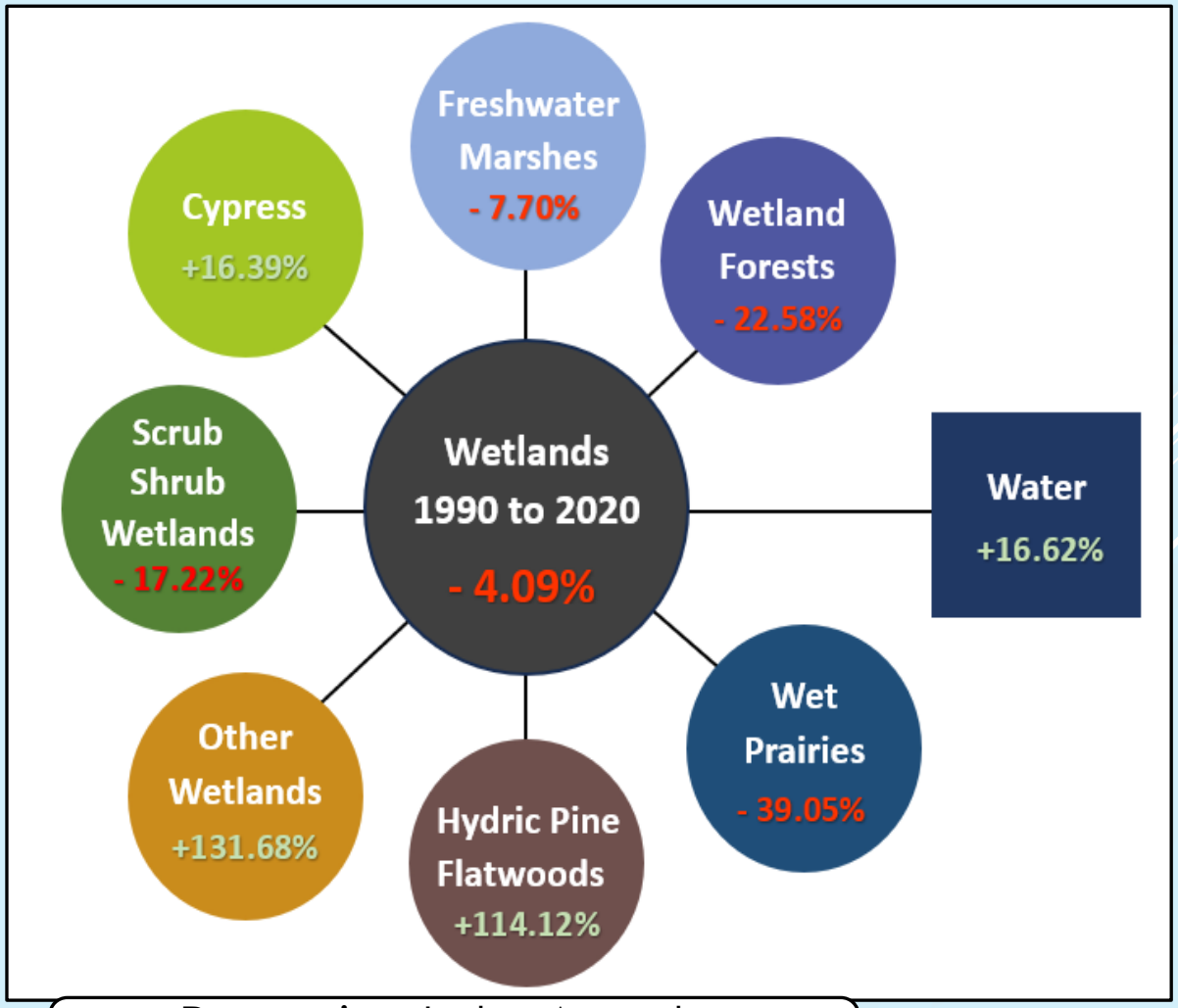


**2020 coverage includes Lake Apopka Restoration Area (+10,000 acres of new freshwater marsh)*

WETLAND MAPPING



Lake Apopka Restoration Area (10,231 acres)



Removing Lake Apopka Restoration Area (10,231 acres)

WETLAND FRAGMENTATION

Breakdown in wetland connectivity over time

- Decadal wetland data (1990-2020) run through FRAGSTATS spatial analysis program

- Spatial metrics:
  - Edge: Wetland Perimeter
  - Shape Index: Perimeter/√Patch Area
  - Contiguity: Spatial connectivity

- Most Fragmentation:
  - Freshwater Marsh
  - Wet Prairie

- Least Fragmentation:
  - Cypress
  - Hydric Pine Flatwoods

FUNCTIONAL CHANGE

- Understanding wetland changes beyond acreage and fragmentation
- Mitigation Site Analysis
  - 51 on-site mitigation sites permitted > 10 years ago
  - Include all wetland types studied in mapping
  - Previous functional assessment data (qualitative or quantitative)
  - Rescore current function:
    - UMAM
    - % Invasive Coverage
  - Review of buffers

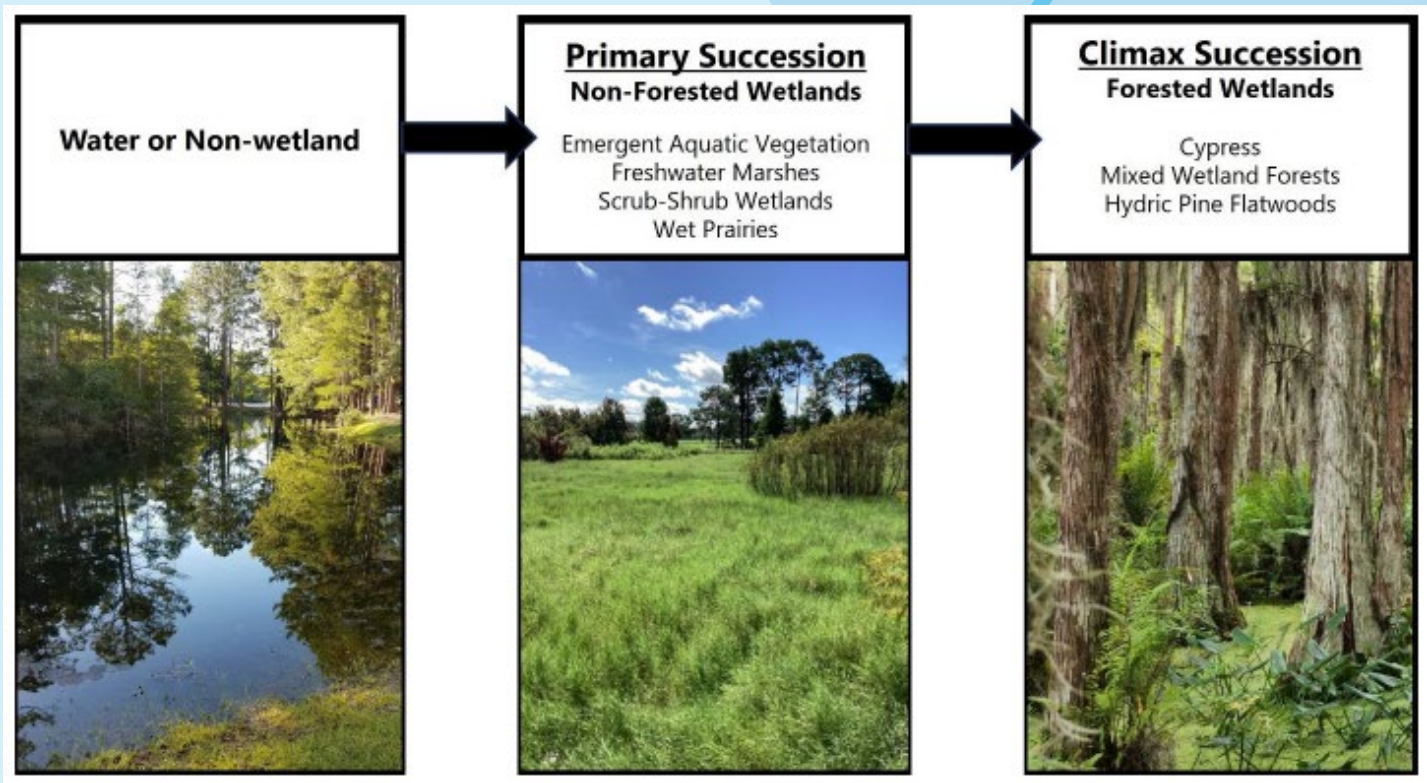
FUNCTIONAL CHANGE

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	10	0.77	0.77	1%	6	4	2.70
[illegible]	20	0.77	0.71	-7%	6	14	2.70
[illegible]	12	0.83	0.74	-10%	1	11	2.60
[illegible]	2	0.70	0.83	19%	2	0	1.00
[illegible]	4	0.79	0.85	8%	3	1	1.25
[illegible]	3	0.74	0.64	-12%	0	3	3.30
[illegible]	**51**	**0.78**	**0.74**	**-4%**	**18**	**33**	2.51

[illegible]	[illegible]
1	[redacted]
2	
3	
4	
5	

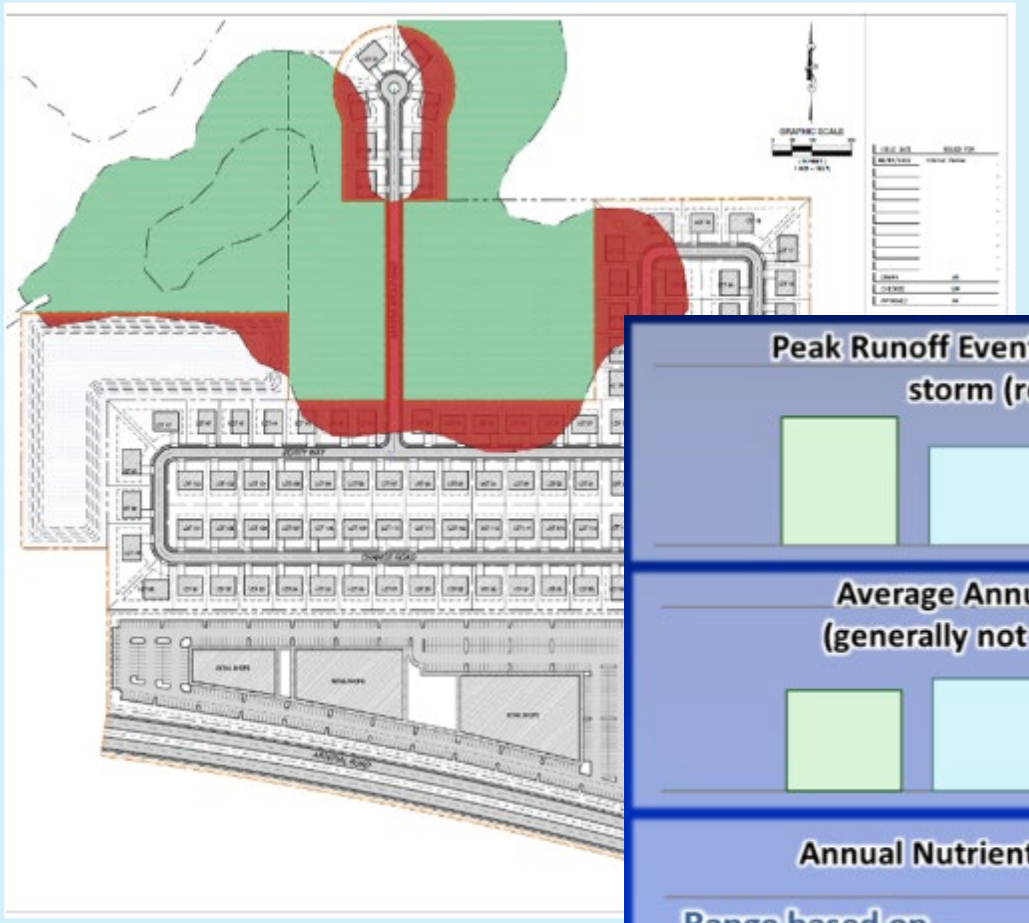
FUNCTIONAL CHANGE

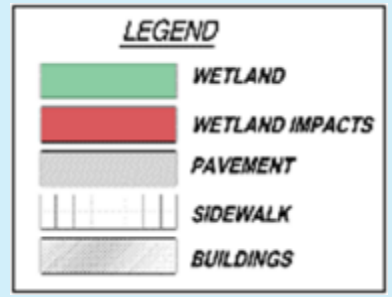
- Freshwater marsh > Scrub-shrub/Forested
- Hydrologic impacts lead to increased exotics (buffers < 25 ft)
- Significant functional loss in sites with limited or no buffers
- Greatest Loss:
  - Shrub systems
  - Freshwater marsh
  - Mixed hardwoods
- Greatest Gains:
  - Wet prairies
  - Hydric pine flatwoods

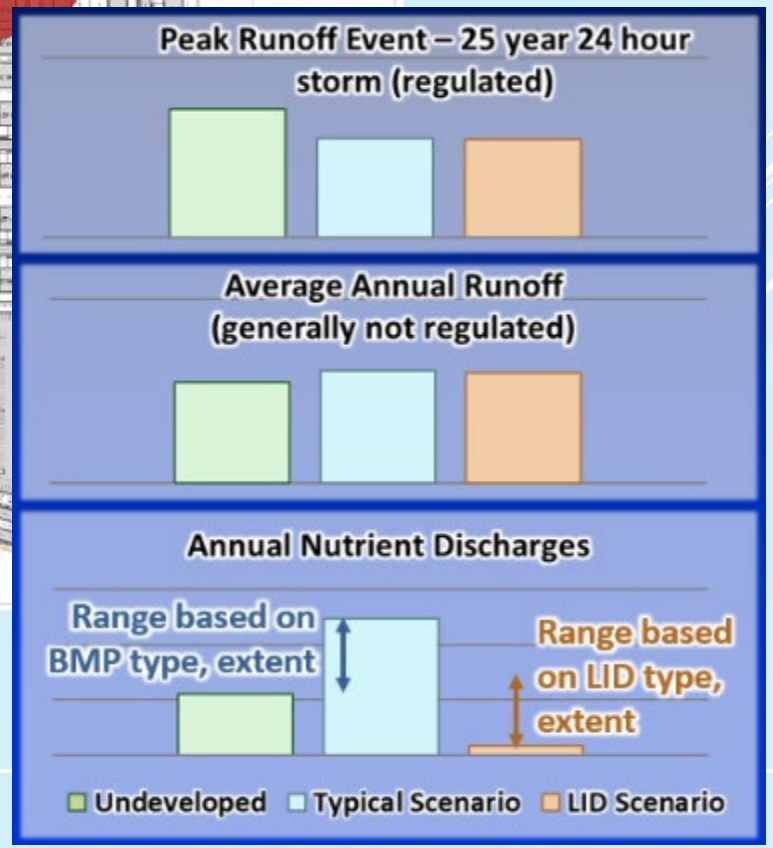


WETLAND VULNERABILITY

- Evaluation of wetland loss impacts for a conceptual development
  - Flooding
  - Water Quality
- Typical design vs. LID + Green infrastructure
- Current stormwater regulations generally protect against flooding
- Hydroperiod impacts can contribute to wetland change and functional decline
- Development meeting regulations can still increase offsite pollutant discharges
- Process changes:
  - Flow maps
  - Hydroperiod evaluation
  - Groundwater monitoring
  - LID permitting incentive







WETLAND ORDINANCE UPDATE

STAKEHOLDER ENGAGEMENT

PROCESS CHANGES

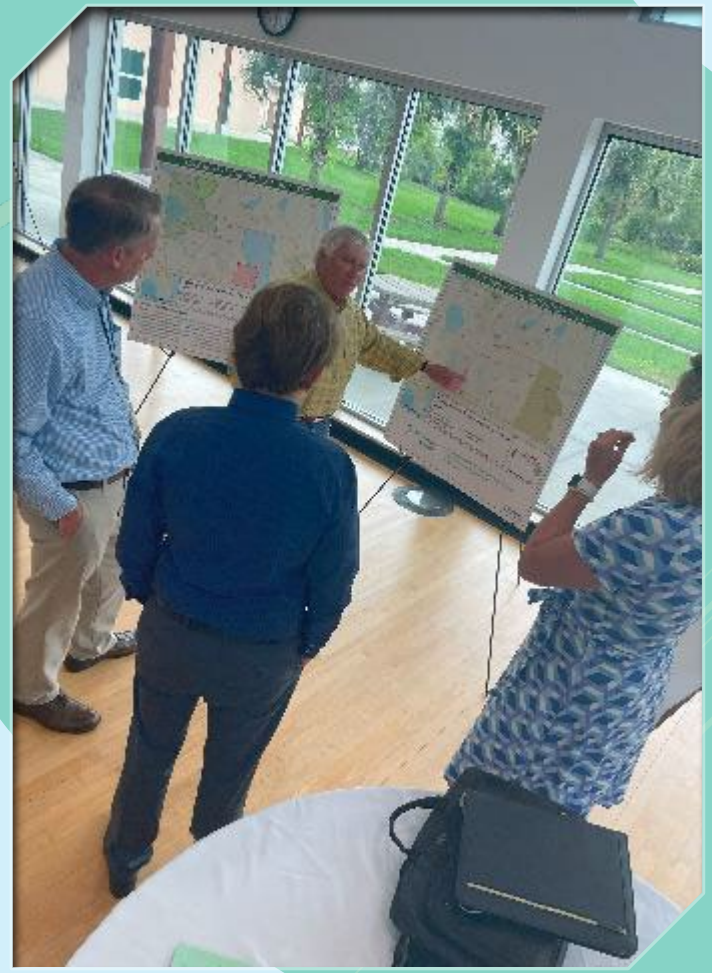
TIERED PERMITTING SYSTEM

UPLAND BUFFERS

MITIGATION

STAKEHOLDER ENGAGEMENT

- 6 BCC work sessions
- Wetland tours
- 6 stakeholder engagement sessions
  - Presentation
  - Poster sessions
- 12 advisory board sessions
  - Agricultural Advisory Board
  - Environmental Protection Commission
  - Sustainability Advisory Board
  - Development Advisory Board
  - Local Planning Agency



PROCESS CHANGES

- Change "conservation areas" to "wetlands and surface waters"
- Wetland evaluation
  - Previous: Class system (size & connectivity)
  - New: Functionality and modifiers
- Robust purpose and regulatory authority language
- New and clarified definitions
- Defined and streamlined staff review process
- BCC public hearing only for the highest quality and largest impacts

TIERED PERMITTING SYSTEM
NOTICED GENERAL PERMITS

NGP Impact

- Single Family Homesites*
- Isolated Artificial Surface Waters
- Upland Cut Ditches
- Commercial/Residential/Urban Infill*
- Commercial/Residential w/ Secondary Impacts only

*Minor impact only (<0.25 ac)

NGP Beneficial

- Maintenance Activities
- Invasive/Nonnative Removal
- Wetland/WQ Enhancement/Restoration
- Public Flood Protection Projects
- Utilities w/ Temporary Impacts
- Intake/Outfall Structures

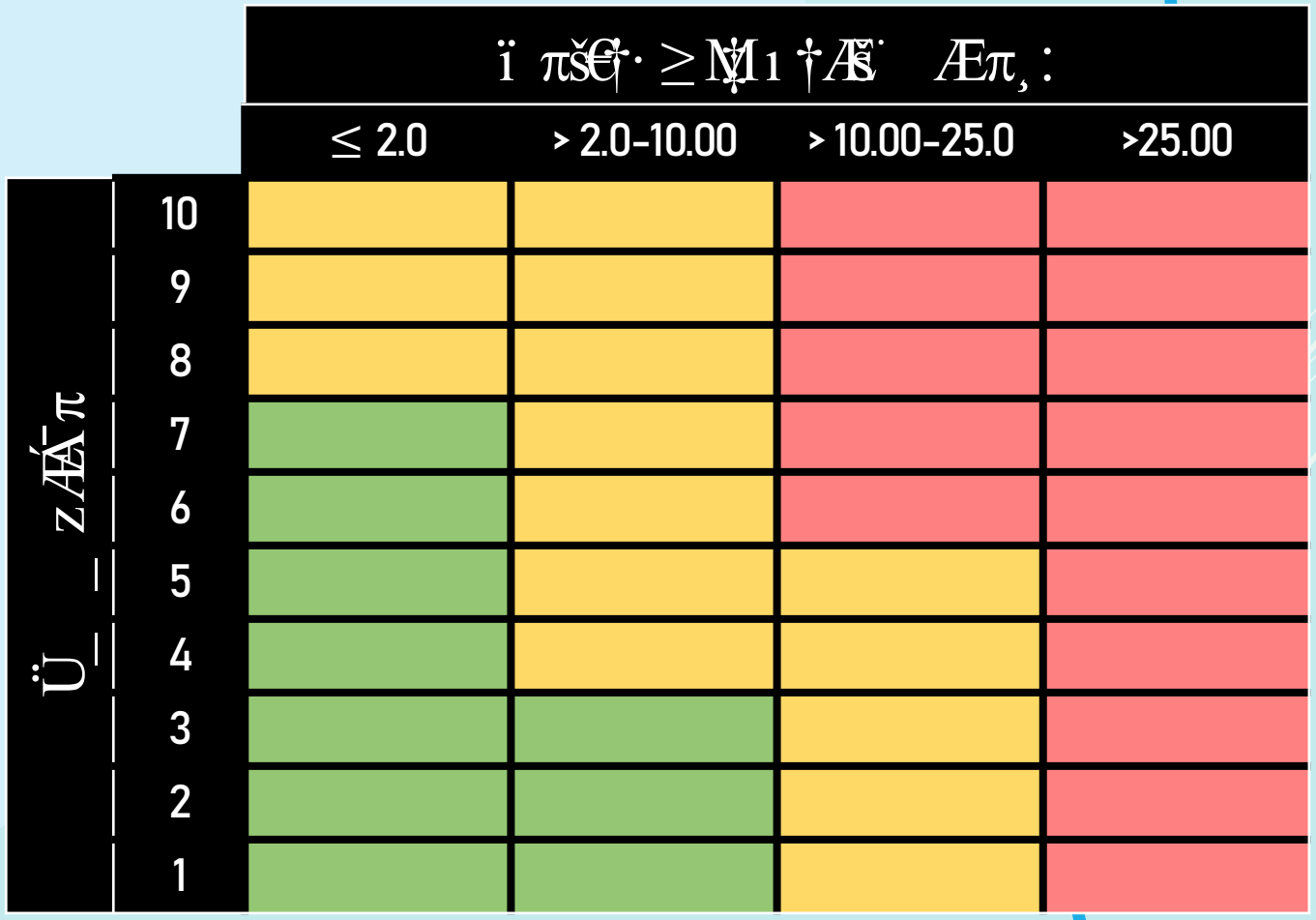
- Clear and transparent guidelines simplify the process and build trust
- Captures common activities typically approved by the County
- Simplified application process using a checklist
- Reduces Requests for Additional Information (RAIs)
- Staff resources dedicated to projects with more significant impacts

TIERED PERMITTING SYSTEM

STANDARD PERMITS

- Size of impact and wetland functionality determine level of review, type and depth of impact analyses, and approval requirements
- Other factors (modifiers) impact the permitting level

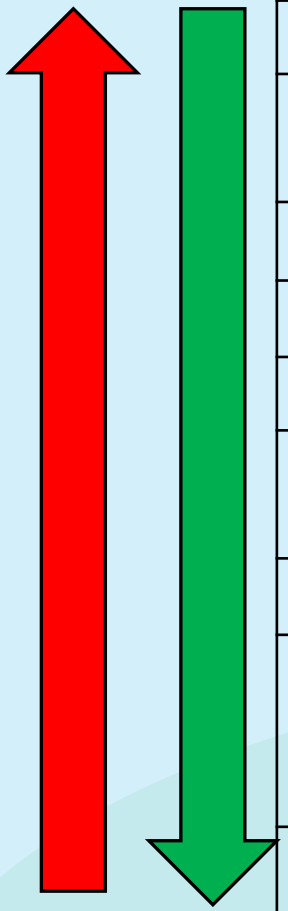
Permit Levels
SP Level 1
SP Level 2
SP Level 3



TIERED PERMITTING SYSTEM

STANDARD PERMIT MODIFIERS

Deterrent Modifier	Score Delta
OFW within 150 feet	+0.5
SPA or Sensitive Area	+0.5
CE Impact (<3 acres)	+0.2
CE Impact (>3 acres)	+0.4
Imperiled wetland-dependent species nesting onsite	+0.4
Wildlife corridor impact	+0.3
Impact to Vulnerable Habitat (SOTW Study) or Important Wetlands & Surface Waters (Comp Plan)	+0.3

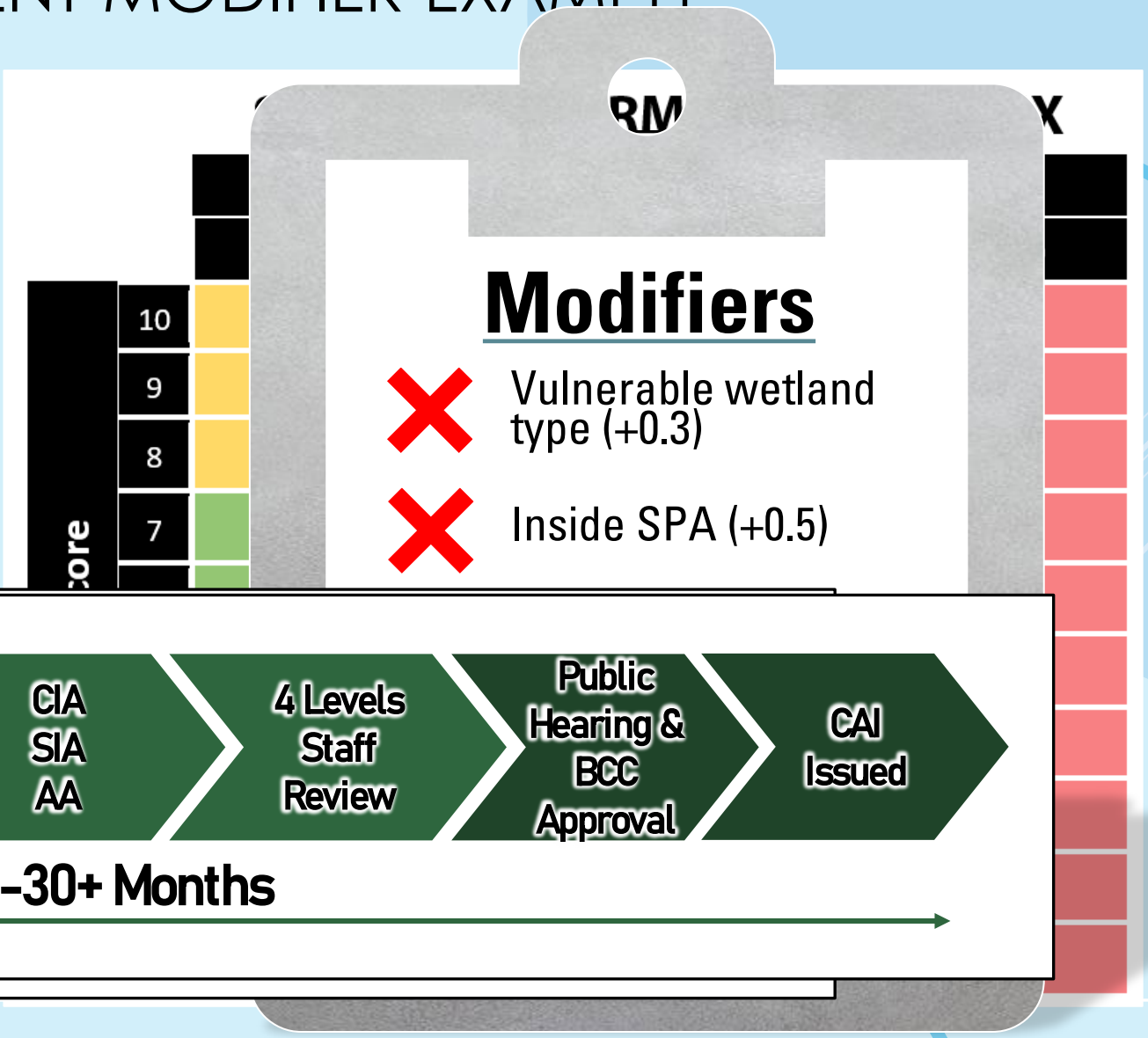


Incentive Modifier	Score Delta
Non-native/invasive removal	-0.3
Reduces fragmentation (bridge or infill)	-0.2 to -0.4
+25-75' upland buffer	-0.3
+75-150' upland buffer	-0.5
+150' or more upland buffer	-0.7
Sufficiently-sized in-County mitigation	-0.5
Demonstrated public benefit	-0.5
Wetland enhancement beyond mitigation requirements	-0.2
Stormwater treatment system – high nutrient reduction	**-0.5**

STANDARD PERMIT AND DETERRENT MODIFIER EXAMPLE

East Orlando Area Multifamily Residential

- Class II Impact
- 11.95 acres wetland impact
- Freshwater Marsh/Hydric Pine
- + 4.85 ac. RHPZ impact



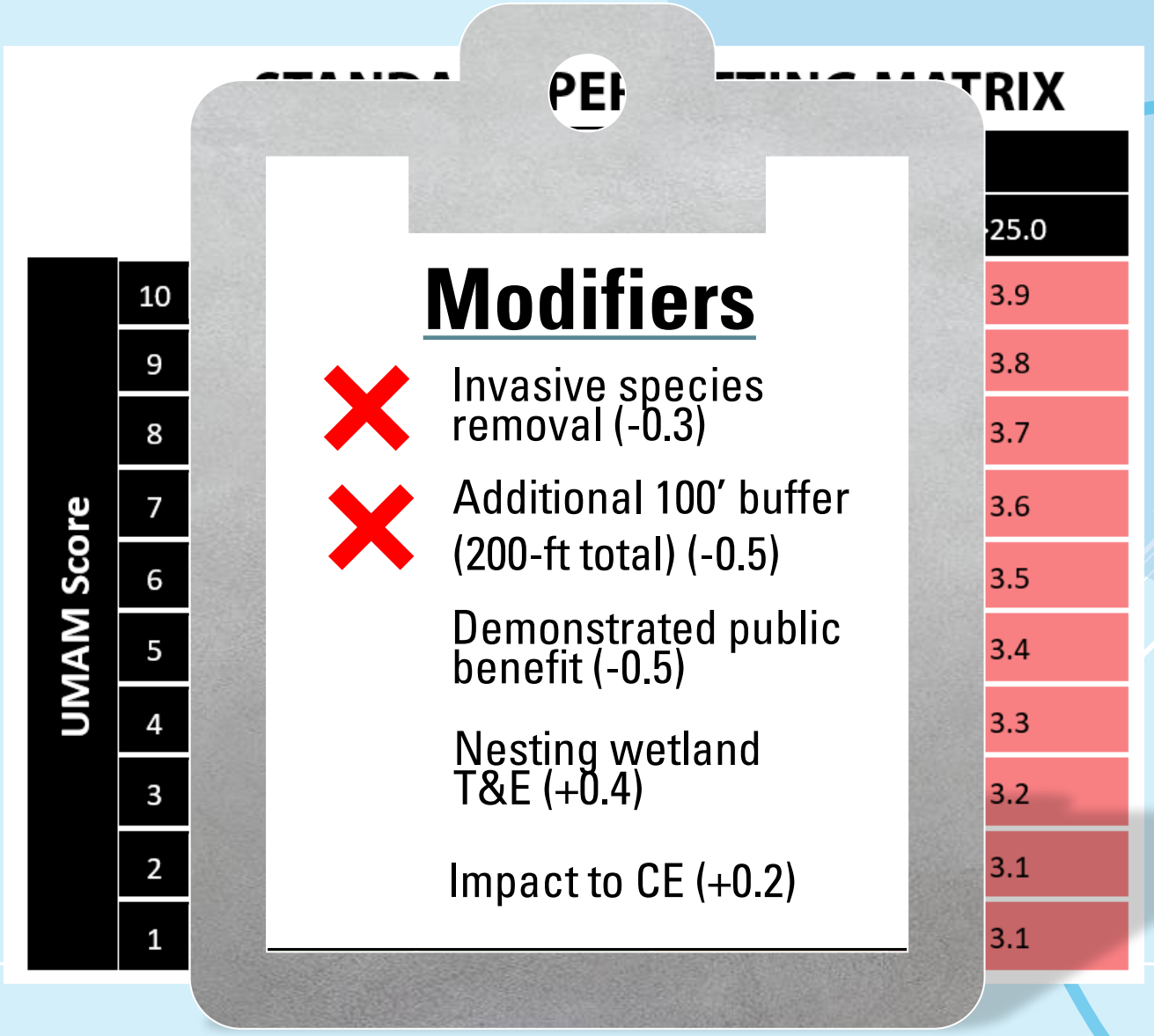
STANDARD PERMIT AND INCENTIVE MODIFIER EXAMPLE

Hypothetical Commercial Development

- 2.5 acres wetland impact
- Mixed hardwood wetland (not vulnerable habitat)
- UMAM functional score = 6
- Class III under existing code

Permit Levels
SP Level 1 (1.0 - 1.9)
SP Level 2 (2.0 - 2.9)
SP Level 3 (3.0 - 3.9)

2.5 - 0.3 - 0.5 = 1.7



UPLAND BUFFERS

- A minimum of 100-ft natural and undisturbed buffer for all sites (with limited exceptions)
  - Parcels < 5 acres
  - Parcels with > 90% wetlands
  - Urban infill developments
  - Upland cut ditches
- If buffer not possible, mitigation and other measures (e.g., wildlife-friendly fencing, signage) are required
- Additional buffer sizes based on modifiers:
  - OFW
  - SPAs
  - Vulnerable habitat
  - Protected species nesting onsite

MITIGATION

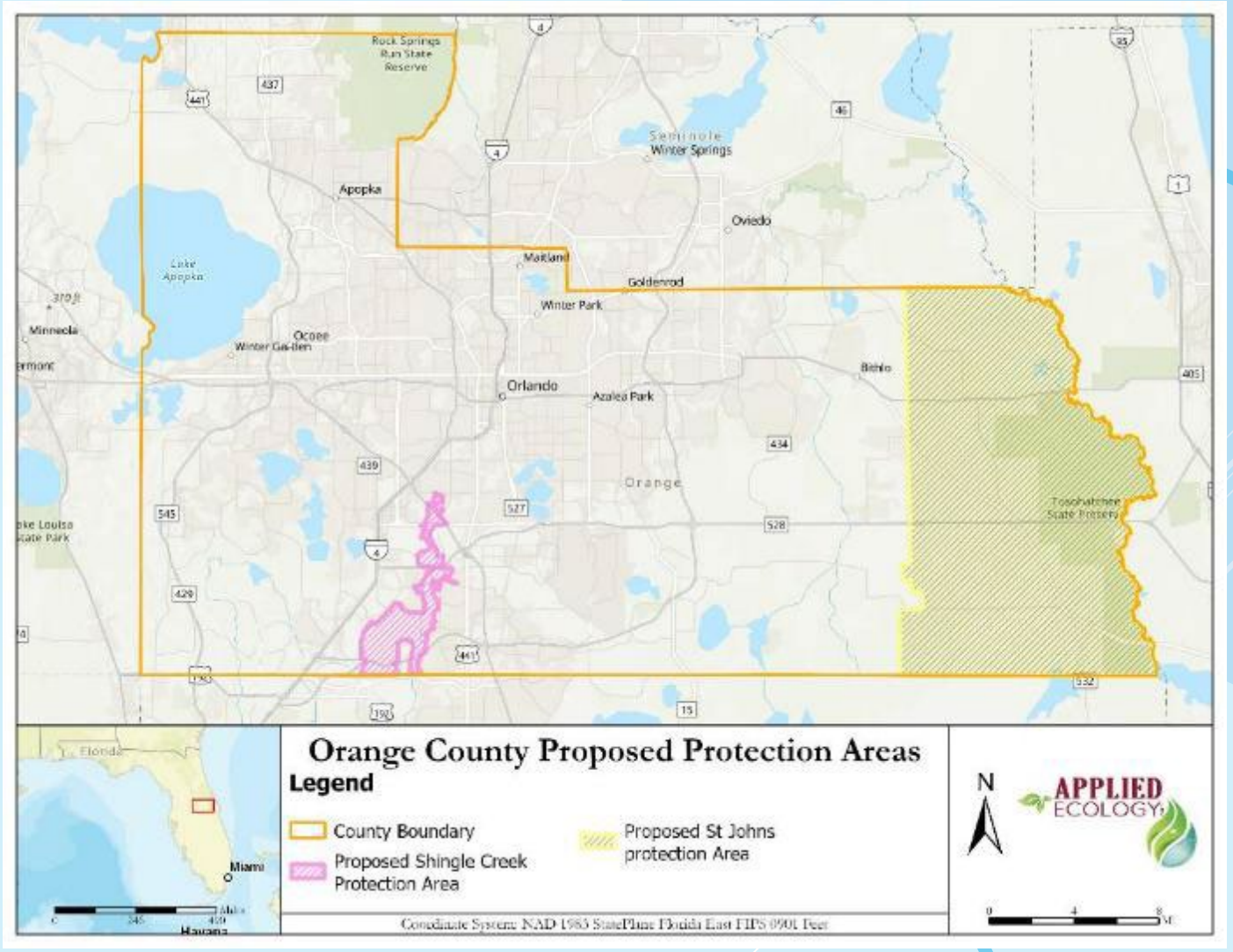
- On-site and off-site mitigation will require perpetual maintenance and monitoring
- Maintain <5% invasive exotic species
- Trash removal
- Reporting annually for 1st 5 years, and then once every 5 years
- Wildlife-friendly fencing/signage
- In-County mitigation permitting modifier (incentive)
- Conservation easements accepted only for valuable parcels

Perpetual Monitoring/Maintenance = Wetland Longevity

- Healthy vegetation community
- Native species recruitment
- Minimal invasive species (< 5%)
- Maintains ecological function

NEXT STEPS

- New SPAs under evaluation:
  - Shingle Creek
  - St. Johns River
- Ongoing staff and customer training
- Internal workflow updates
- New application forms and permit templates
- Applicant's Handbook update



THANK YOU

Tim Hull, PWS

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Ordinance Update Webpage

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APPLIED ECOLOGY