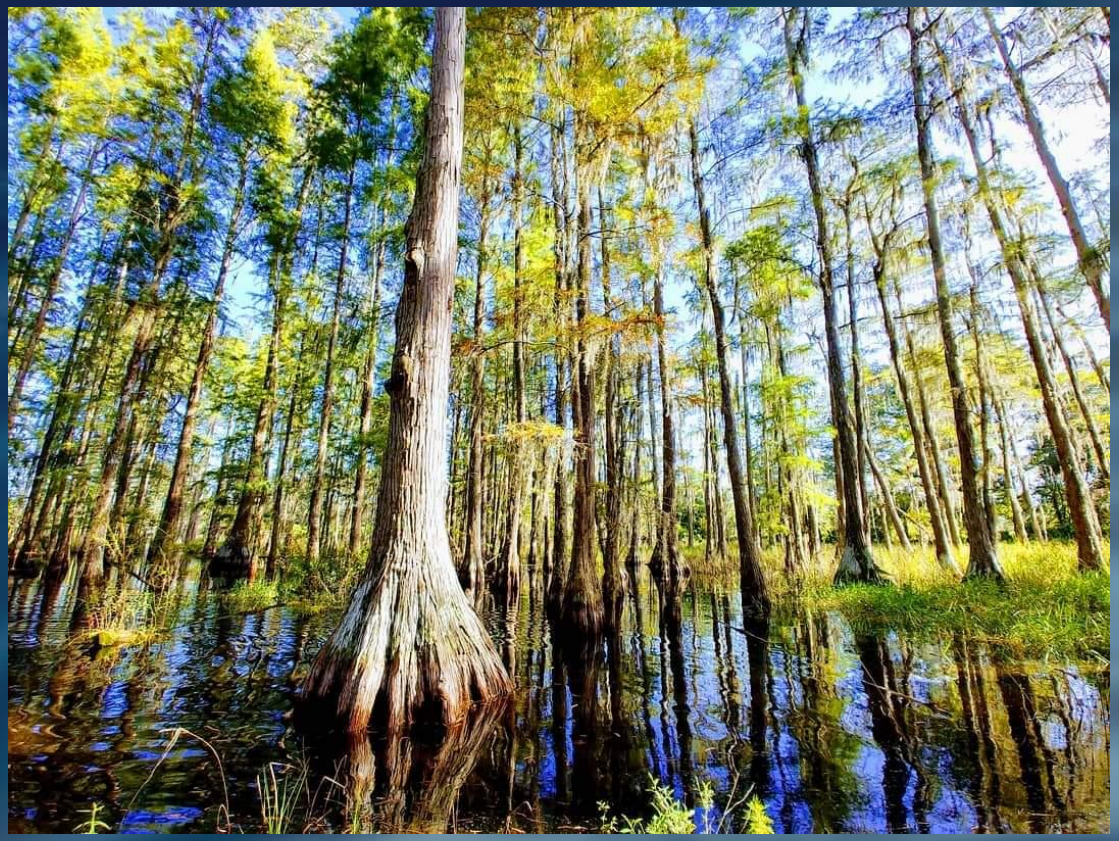
# Welcome to the 18th Annual Wetland Assessment Procedure (WAP) Workshop 2022



# Instructors:

**District:**

Madison Frazier
Tammy Plazak
TJ Venning

**GPI:**

Diane Willis

# Agenda

| | |
|---|---|
| 8:30 – 8:40 | Welcome and Schedule |
| 8:40 – 9:45 | **Session 1 - WAP Background and Basics** |
| 9:45 – 10:00 | Break |
| 10:00 – 12:00 | **Session 2 - Part 1 (WAP Form)** |
| 12:00 – 1:00 | Lunch |
| 1:00 – 2:00 | **Session 3 - Part 2 (Additional Considerations)** |
| 2:00 – 2:15 | Break |
| 2:15 – 3:15 | **Session 4 - Plant ID (PowerPoint)** |
| 3:15 – 3:30 | Wrap Up and Information |

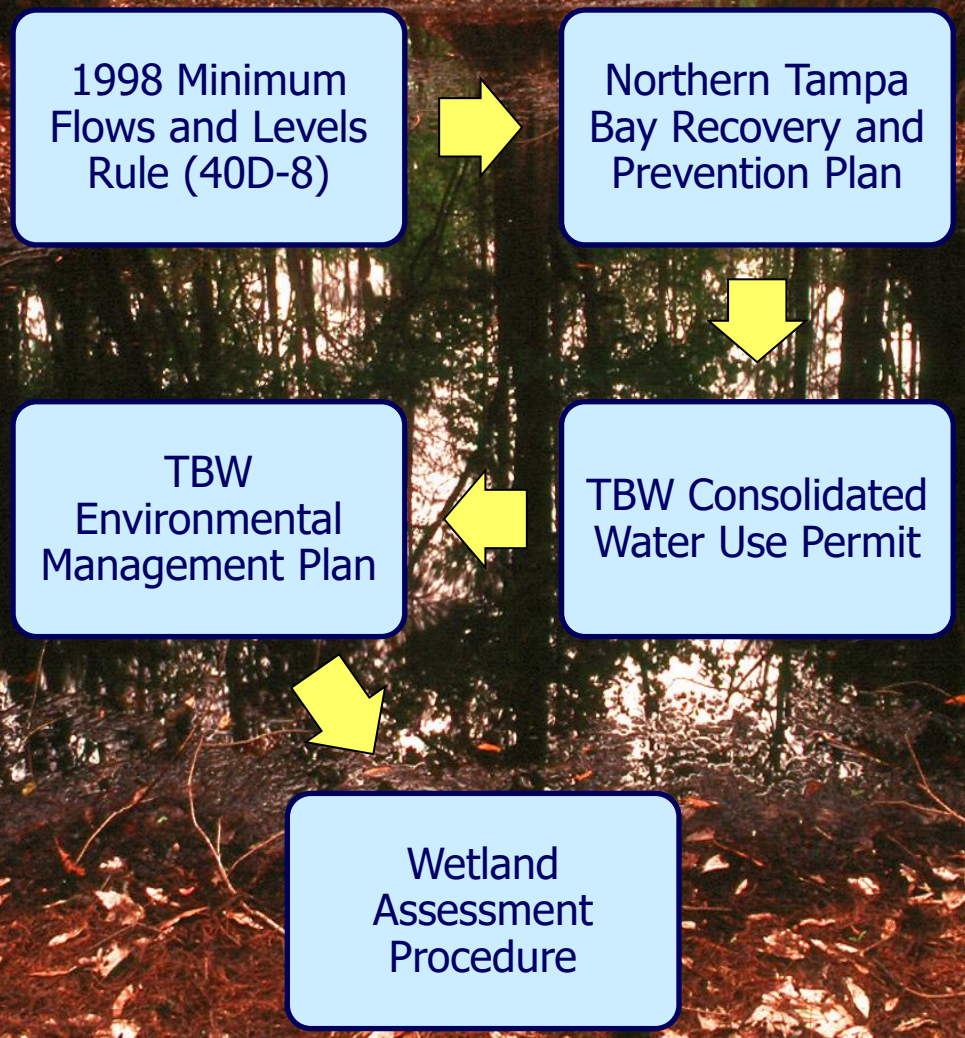
# General Information

- All WAP materials are available at WaterMatters.org/WAP
- Practice WAPs will be at Flatwoods Conservation Park
  - Wetland location maps posted on the webpage
  - There are 3 wetlands available for assessment, a minimum of 2 must be completed
- Plant ID video with Diane Willis can also be found on the webpage and should be reviewed prior to WAPs
- Follow-up session will be April 28, 2pm-4pm to review practice WAPs

| | |
|---|---|
| LOCATION | 14302 Morris Bridge Rd.<br>Thonotosassa, FL 33592 |
| HOURS | Fall / Winter 7 AM to 6 PM<br>Spring / Summer 7 AM to 8 PM |
| CONTACT | (813) 987-6211 / Trail Emergency (813) 426-5583 |


Objective: Collect information on vegetation, hydrology, soils, etc. in monitored wetlands to accurately characterize ongoing biological condition & health of each wetland

# Brief History: Wetland Assessment Procedure



# Original WAP Methodology (2000-2004)

- TBW evaluated 360 wetlands in Northern Tampa Bay
- District evaluated 150 wetlands
- 57 wetlands were assessed by both
- Assessments in the Spring and Fall each year

# WAP Methodology Assessment (2002)

- Data collected from 2000 to 2002 was evaluated
- Results were compared from the 57 sites assessed by both TBW and the District
- Several inconsistencies were identified:
  - Variable transect set ups
  - Wetland plant zonation variable between assessors
  - Scoring system applied differently
  - Understanding of wetland history variable between assessors
  - Soil monitoring instructions interpreted differently

# Revised WAP Methodology (2004)

## Key changes included:

- Written wetland history required
- Transect set-up instructions clarified
- More simplistic soils method required every 5 years
- Emphasized importance of explanations and comments
- Zonation scores changed from a 3-point to a 5-point scale
- Scores for weedy and exotic species and vines discontinued
- Vegetation on hummocks, floating vegetation, and vegetation rooted in the upland are excluded
- Stress scores added for shrubs and divided into appropriate and inappropriate species for both trees and shrubs

# Revised WAP Methodology Assessment (May 2004)

- Field test of 10 wetlands to be assessed by TBW, District, and Consultants (21 wetland biologists in total)
- Inconsistencies persisted:
  - Plant ID issues, even among experienced biologists
  - Differences in zone scores resulted from different assessment areas around the transect
  - Stress scores were highly variable
  - Few comments included
  - Hummocks and shallow areas difficult to assess
  - Scoring difficult for narrow transition zone

# Revised WAP Methodology (October 2004)

- Replaced FDEP plant designation with one more suitable for wetland interiors
  - Plant zonation within the wetland is more useful
    - Transition (T), Outer Deep (OD), Deep (D), and Adaptive (AD) species zonation assigned to 111 plants, creating the WAP plant list
- Zonation scoring system updated to include new plant classifications
- Assessors encouraged to stay within 5 meters on either side of transect
- Percent cover and stress estimates further refined

# Revised WAP Methodology Assessment (October 2004)

- Field test of 10 wetlands to be assessed by TBW, District, and Consultants who participated in May 2004 field test (10 biologists in total)
- Variability between assessors still existed but was much less compared to May field test
  - The variability in scoring was now attributed to errors by individual assessor rather than problems with the methodology
- The participants and reviewers agreed that the updated zonation scoring methodology was now more logical, and the results seemed representative of the hydrologic/biologic health of the wetland

# Review of Original Wetland Assessment Procedure (WAP - March 2000) and Test Results of a Proposed Revision to the WAP, May 2004

Prepared by:

Michael C. Hancock, P.E.
Ted Rochow, Ph.D.
Jill Hood, P.G.

December 2005

# Test Results of a Proposed Revision to the Wetland Assessment Procedure (WAP), October 2004 and Development of the Final WAP Methodology Adopted in April 2005

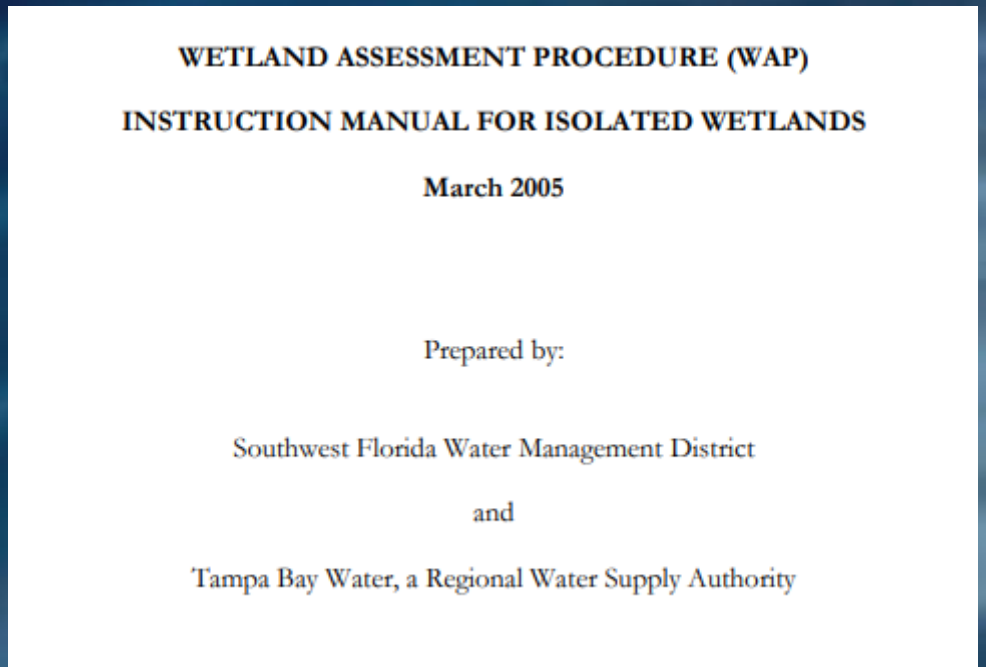
Prepared by:

Michael C. Hancock, P.E.
Ted Rochow, Ph.D.
Jill Hood, P.G.

December 2005

# Today's WAP Methodology

- Completed in 2005
- This methodology has since been applied in 400+ wetlands



WETLAND ASSESSMENT PROCEDURE (WAP)

INSTRUCTION MANUAL FOR ISOLATED WETLANDS

March 2005

Prepared by:

Southwest Florida Water Management District

and

Tampa Bay Water, a Regional Water Supply Authority

# 2022 WAP Workshop Introduction

# Purpose of Wetland Assessment Procedure (WAP)

- Collect biologic data in wetlands to be used to monitor change (if any) due to hydrologic change (ground-water)
- WAP data *supplements* hydrologic data
- Uses for data include:
  - Water Use Permitting (part of EMP)
  - TBW Recovery Assessment

# Main Goal while completing the WAP

- Describe what you see on the day of your visit (snapshot)
- Data Collection
- Data Collection
- Data Collection
- Scores

# WAP Limitations

- Tested and developed for isolated systems
- Most consistent in flatwoods (mesic)
- Not consistent in sandhill (xeric)

# Annually

- May through June assessments
- Main components:
  - Species documentation
  - Zonation scoring
  - Explanations
  - Additional Information
    - Stress
    - Comments

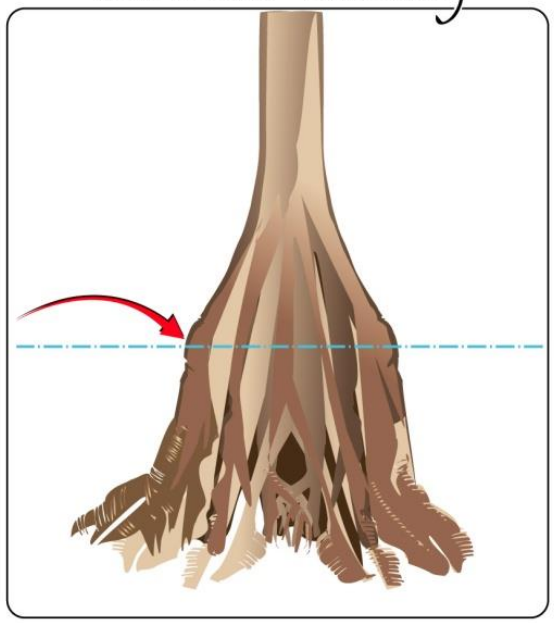
# Establishing WAP Zones

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

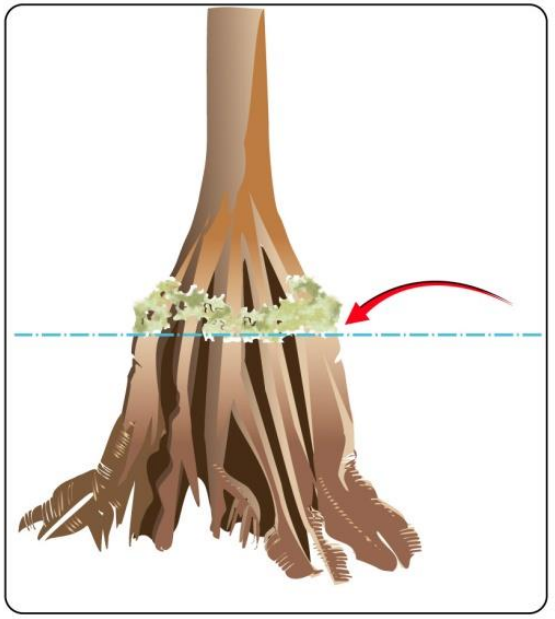
# WAP Zones:

# Horizontal Distance From Normal Pool

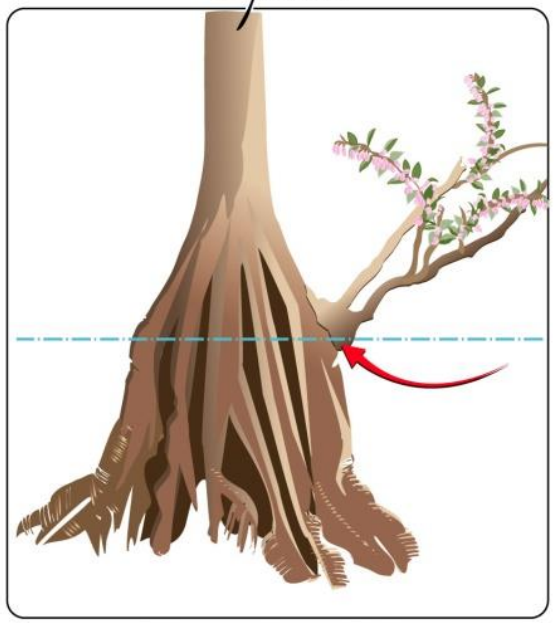
Buttress Swelling



Moss Collar

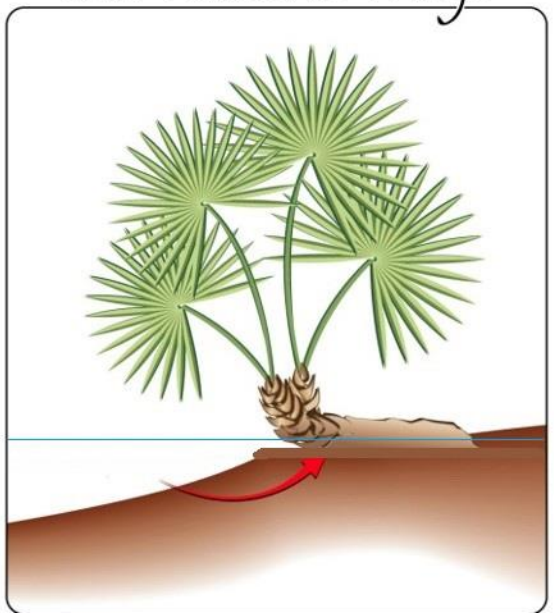


Lyonia



Diameter at base >1 inch

Saw Palmetto Fringe



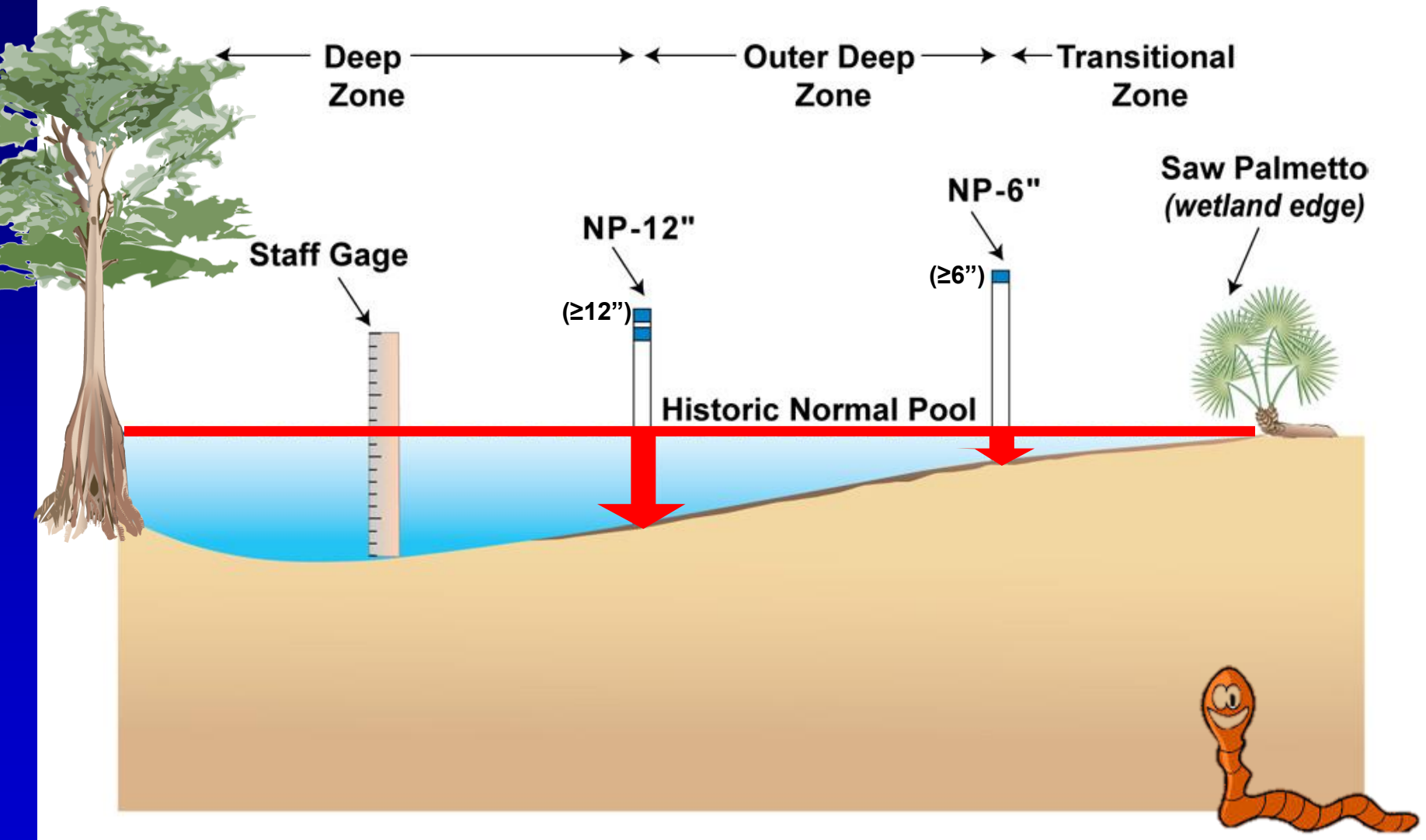
# Normal Pool Indicators

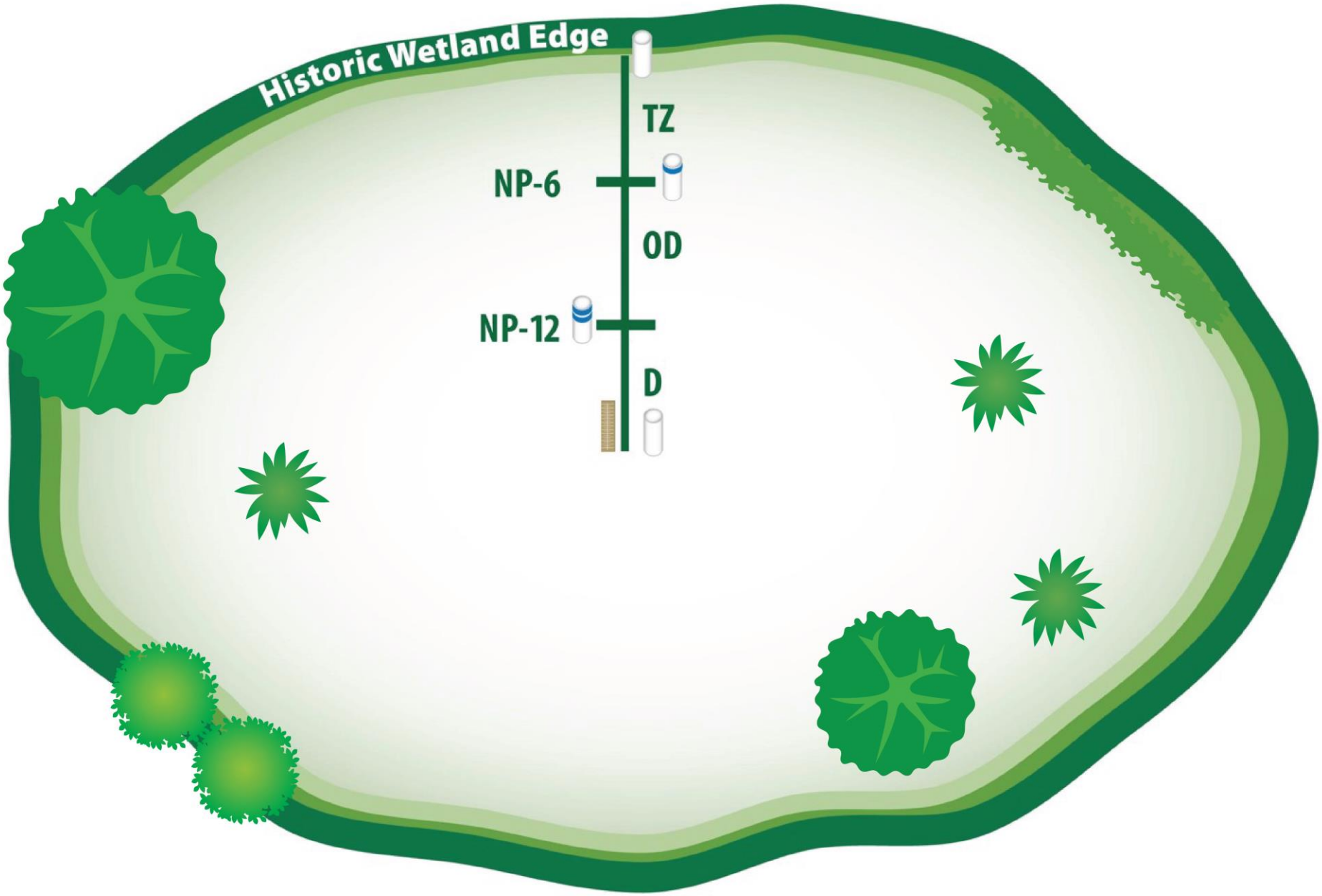
# Normal Pool Indicators

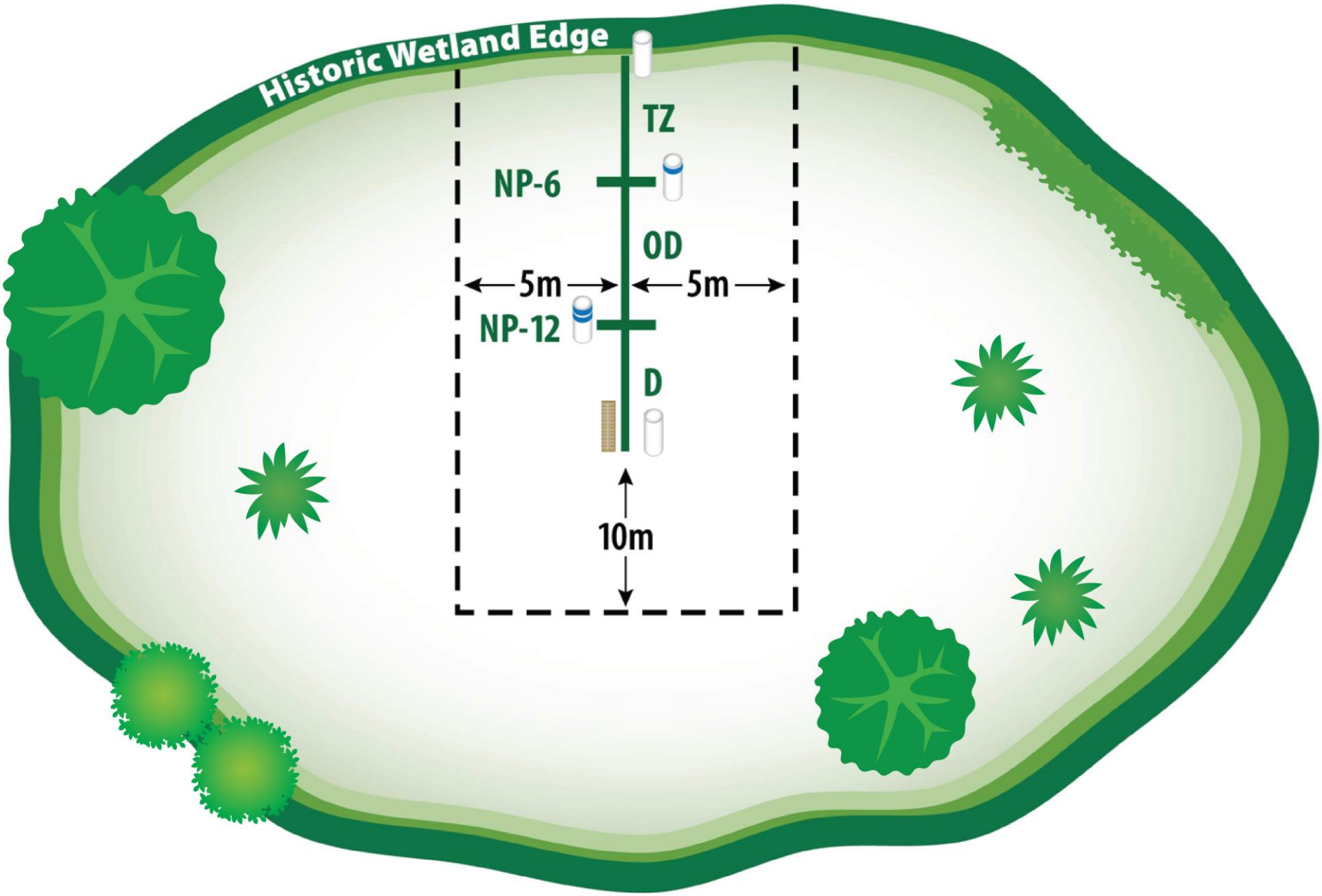

Photos by Scott Emery

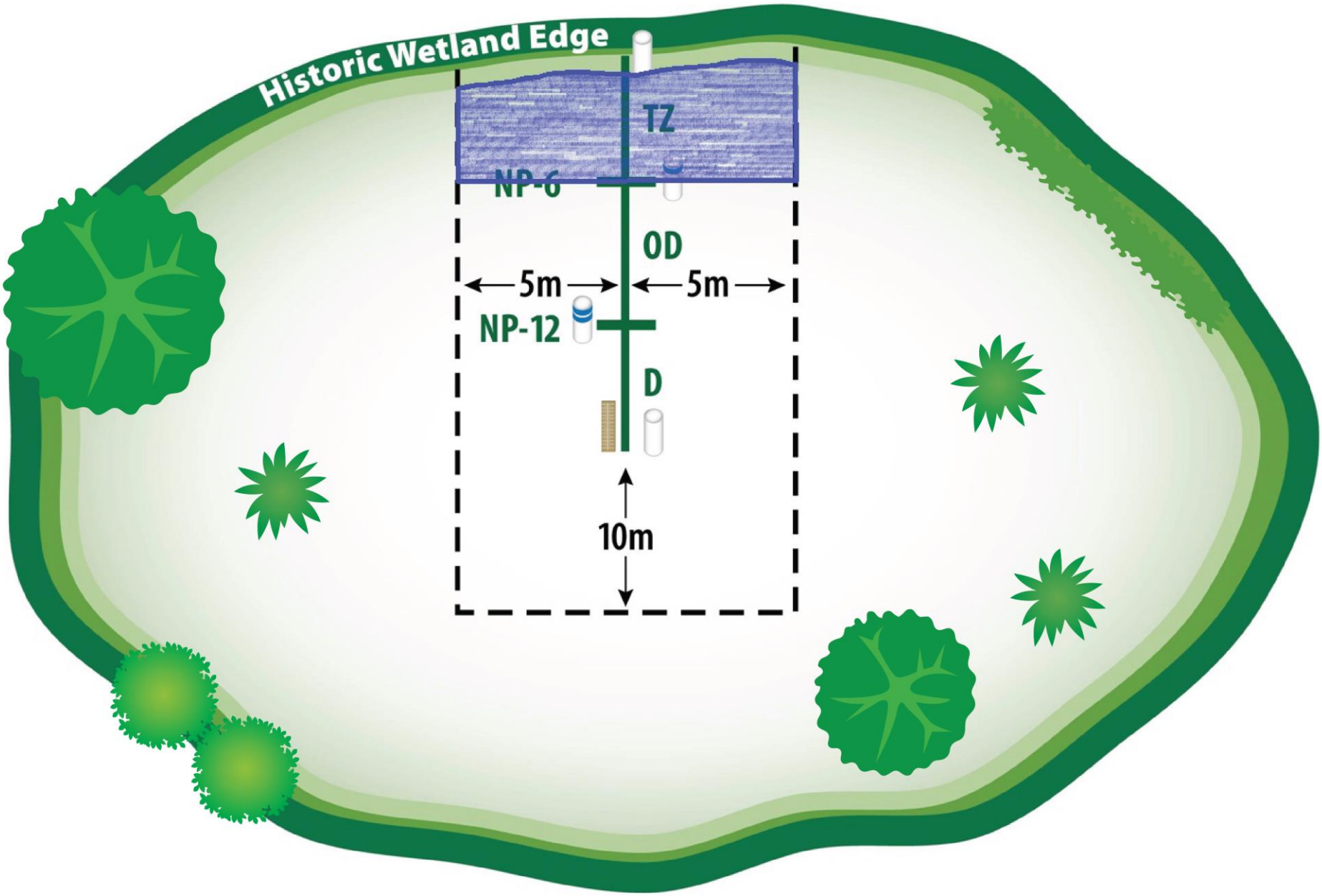

The Transect

# *Example of Typical WAP Transect*




Historic Wetland Edge
TZ
NP-6
OD
NP-12
D


Historic Wetland Edge
TZ
NP-6
OD
5m
5m
NP-12
D
10m


Historic Wetland Edge
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NP-6
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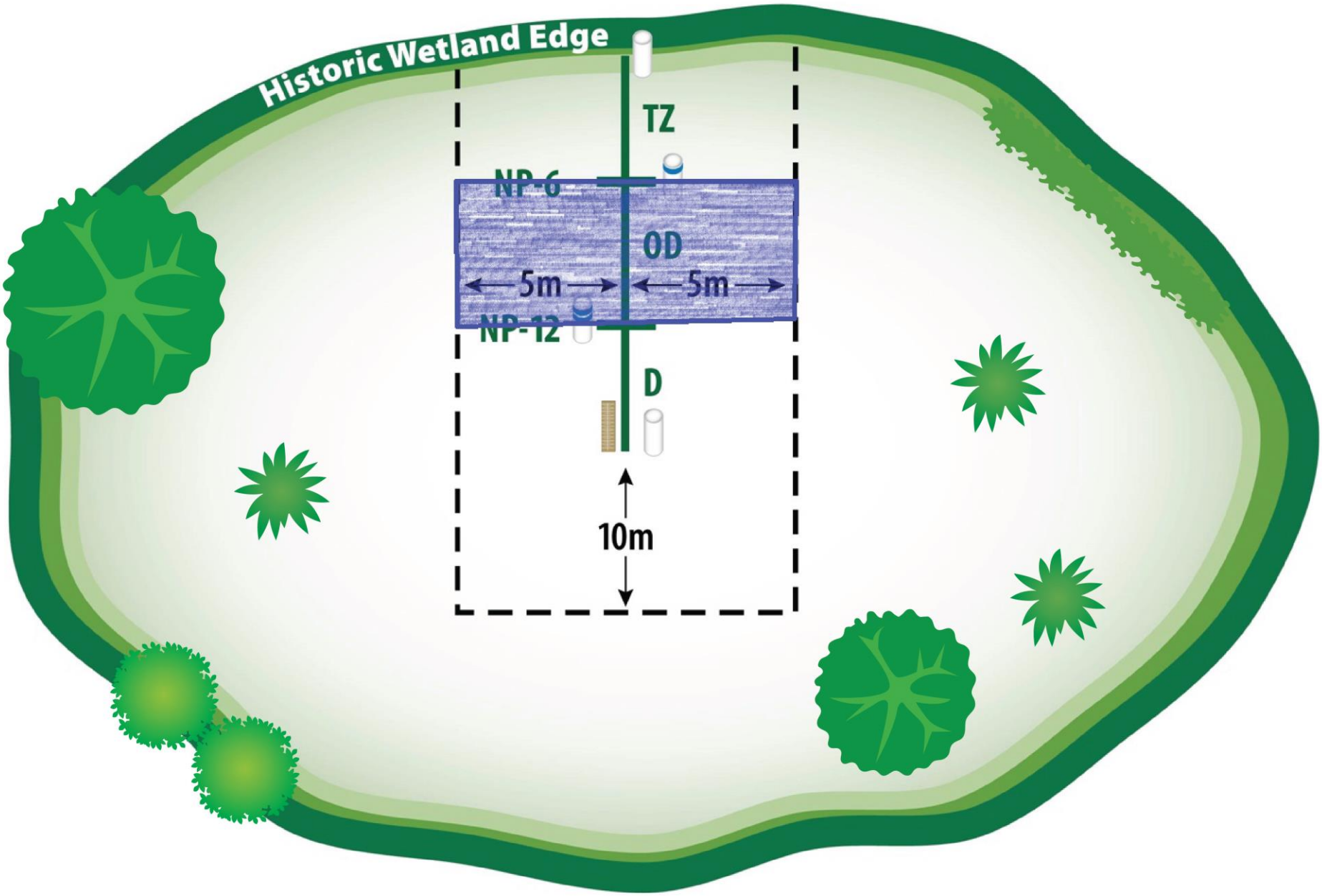
D
10m


Historic Wetland Edge
TZ
NP-6
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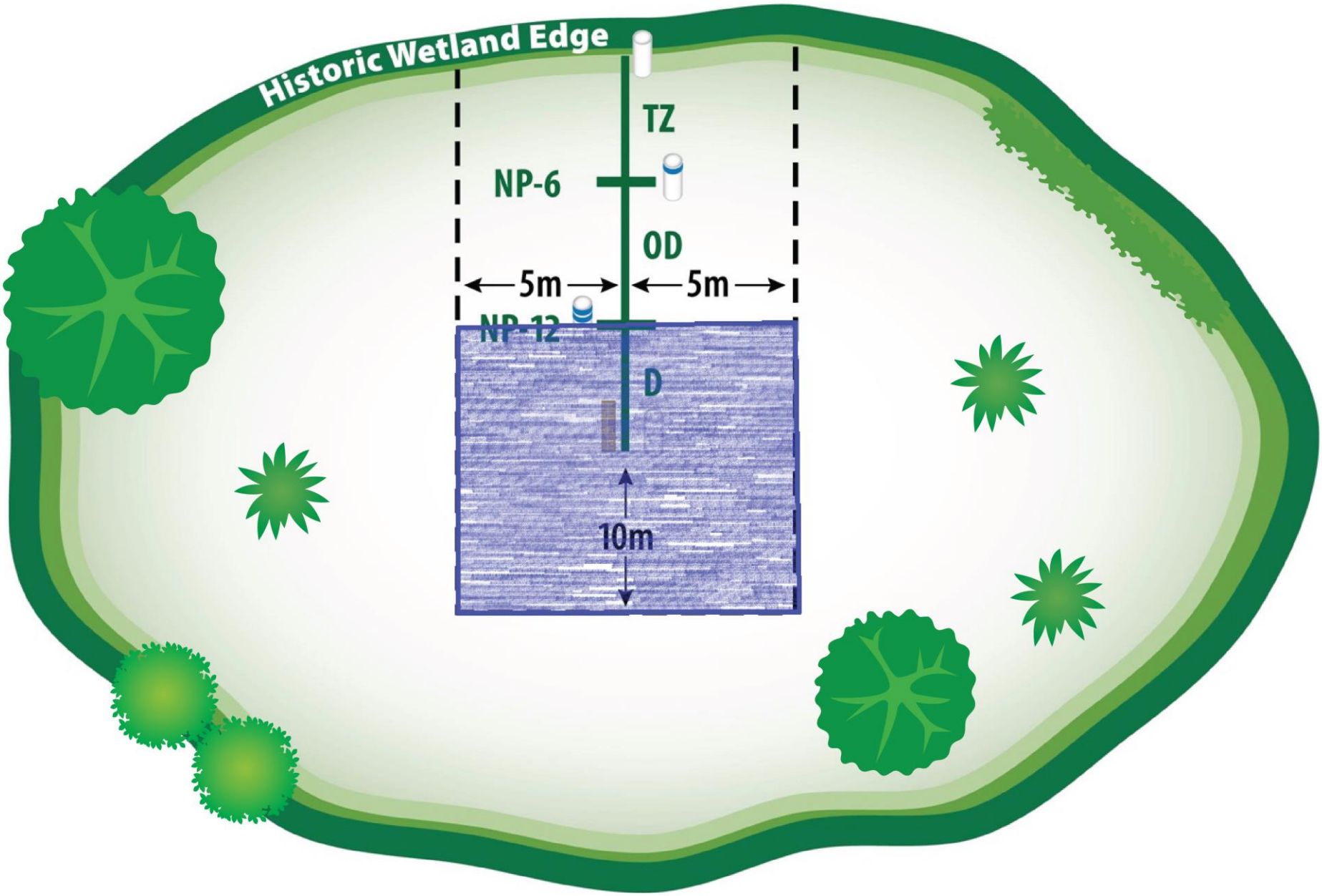
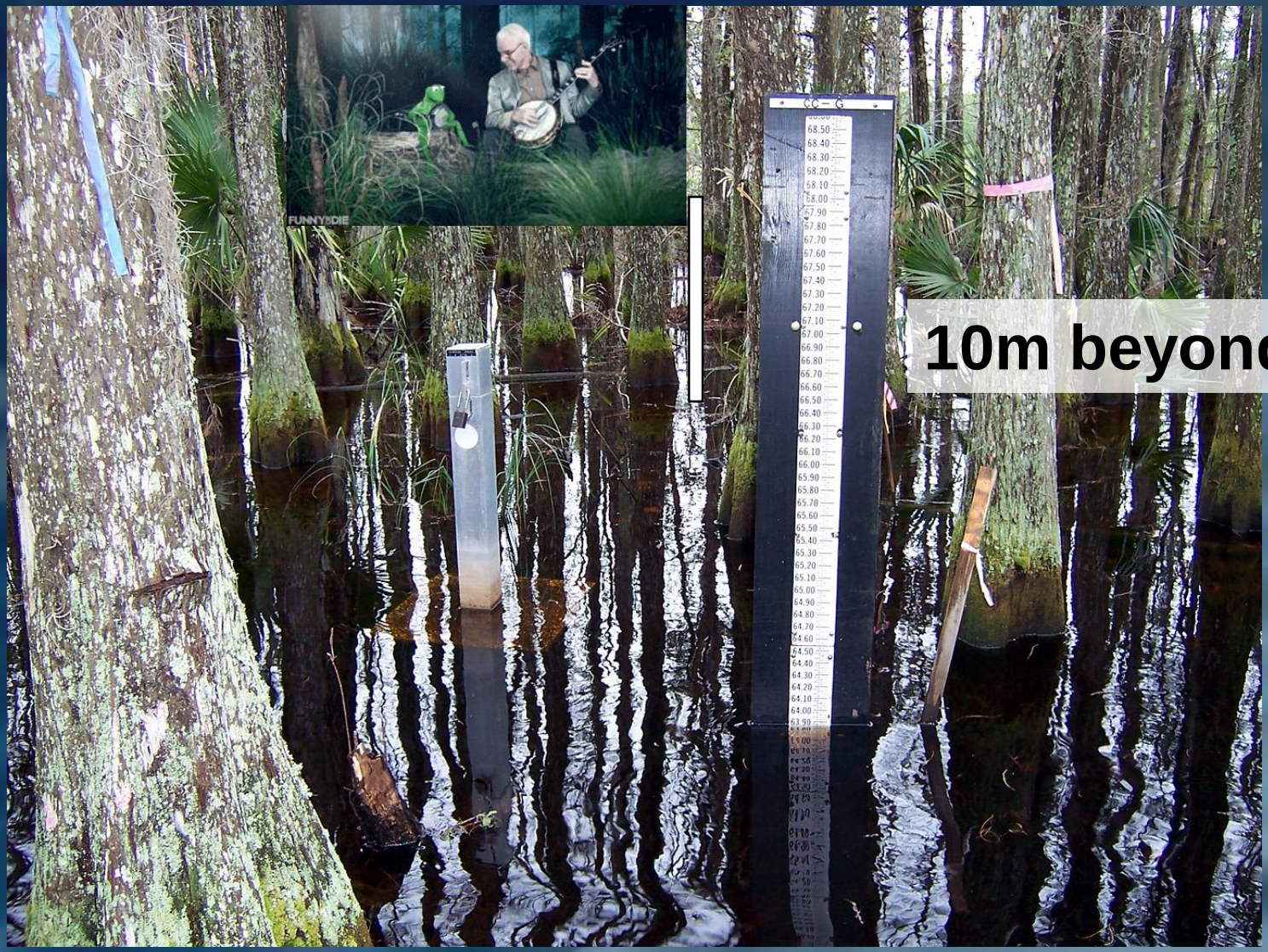
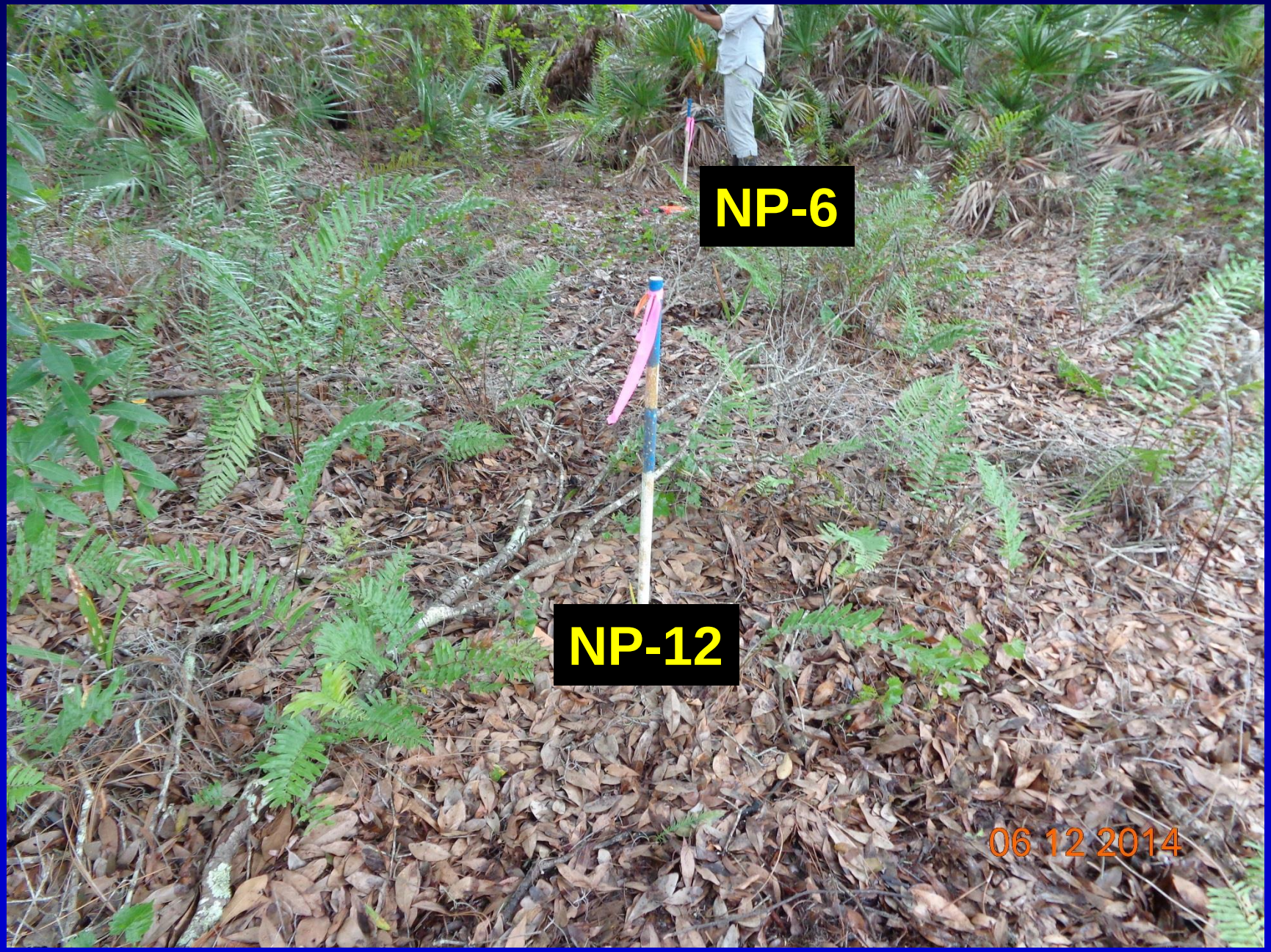
10m


Historic Wetland Edge
TZ
NP-6
OD
5m
5m
NP-12
D
10m

# Transect End

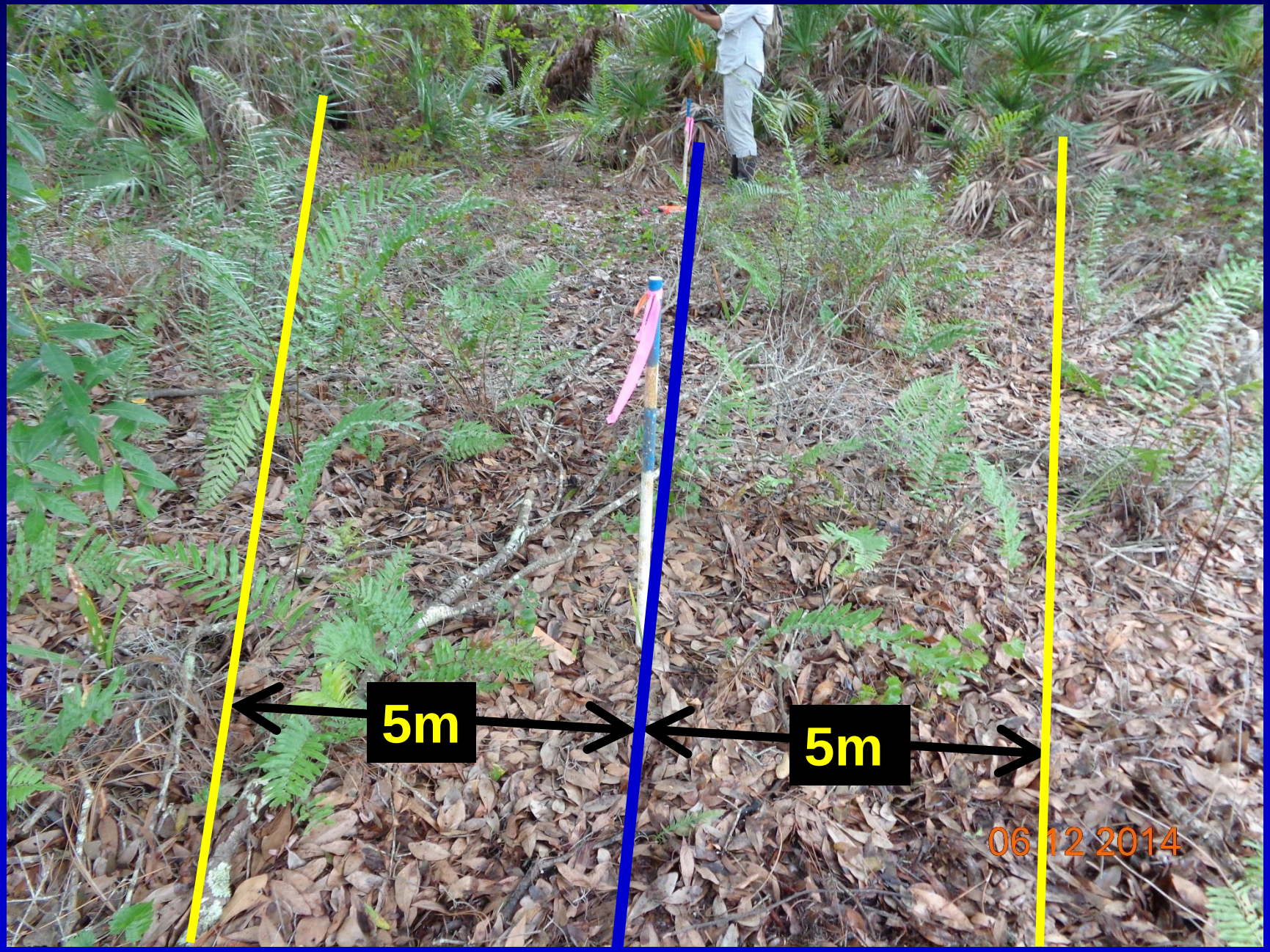


# NP-6 & NP-12 Markers

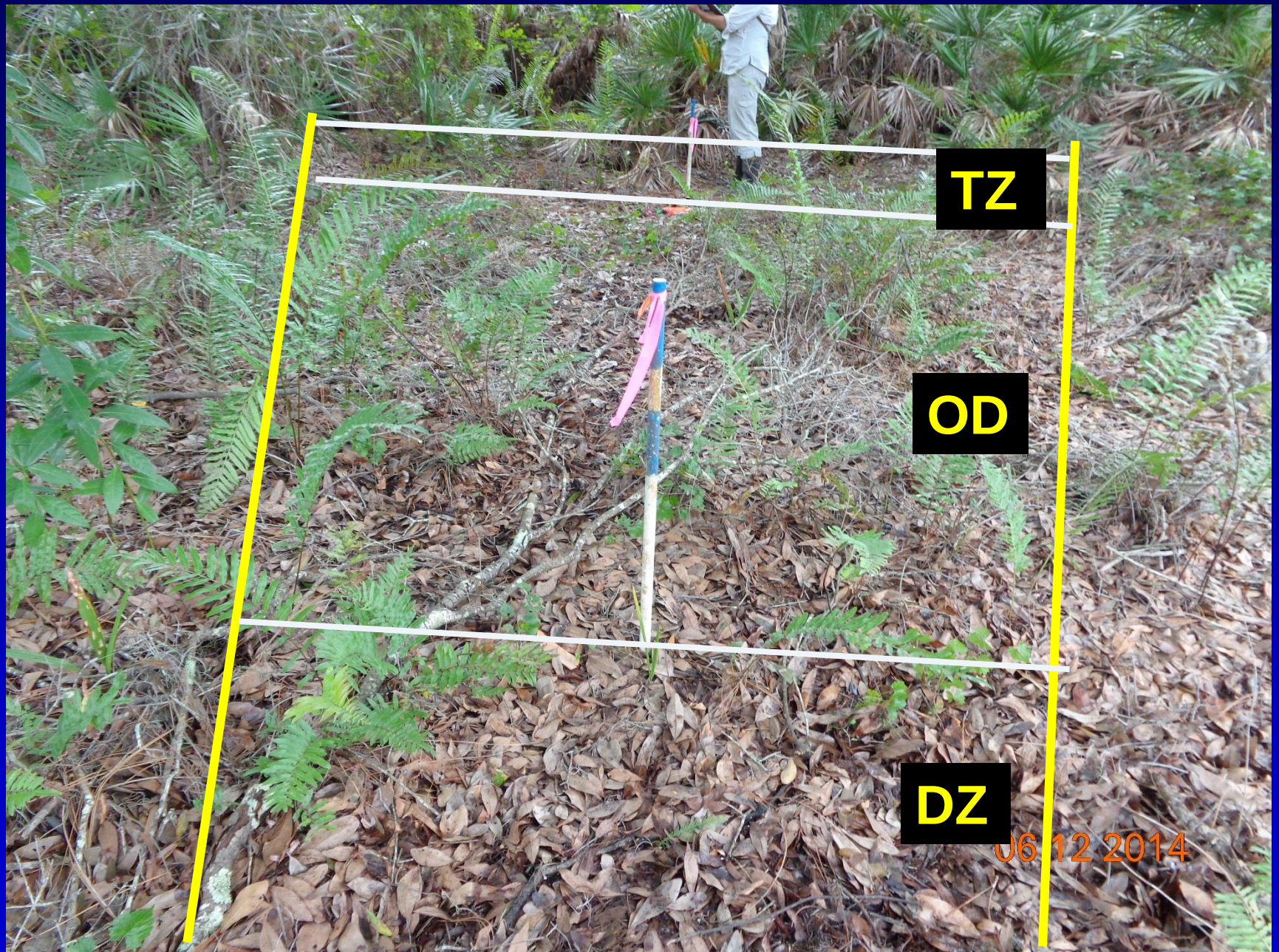


# Transect Line

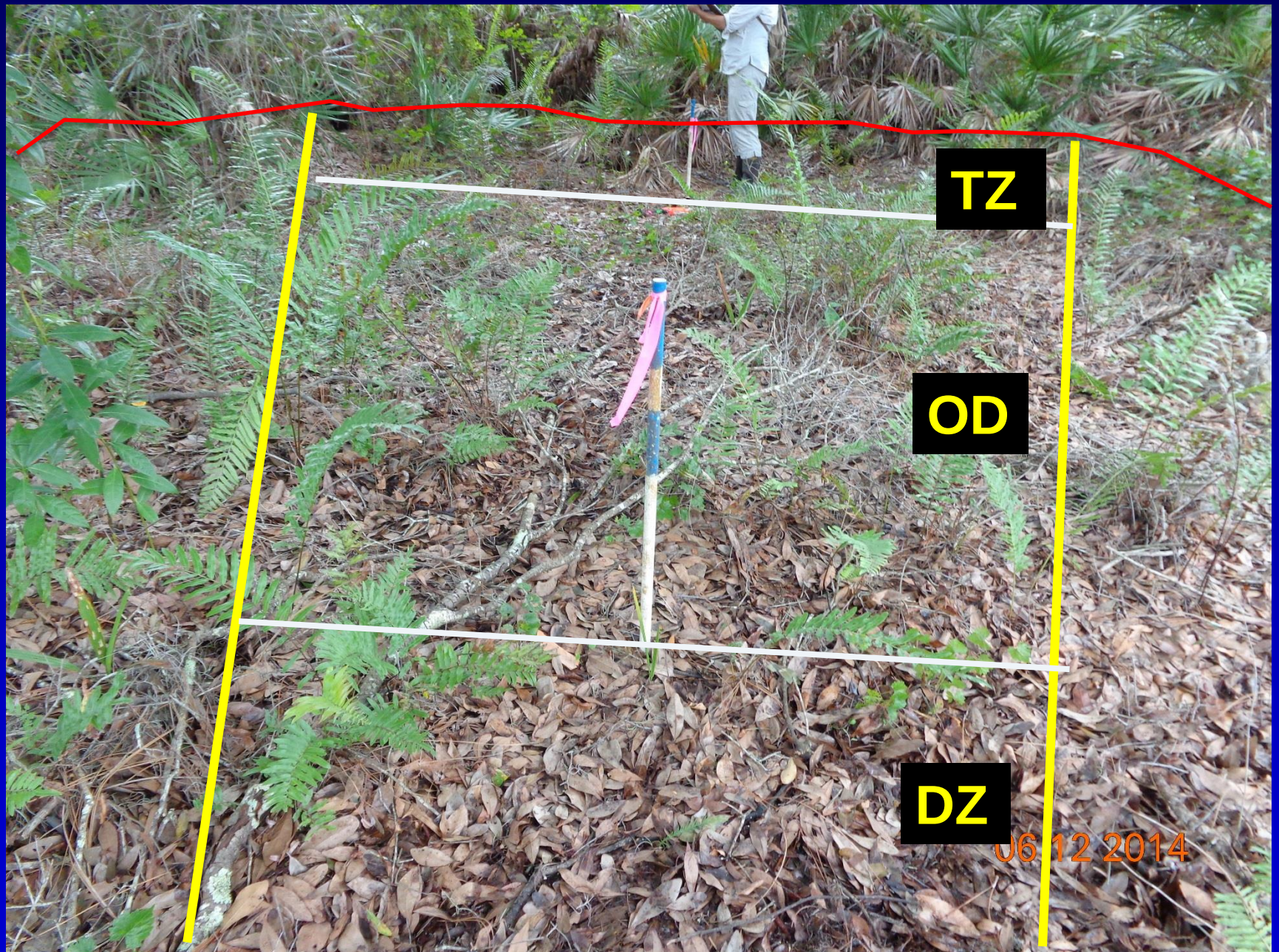
# 10m Boundary



# Zones

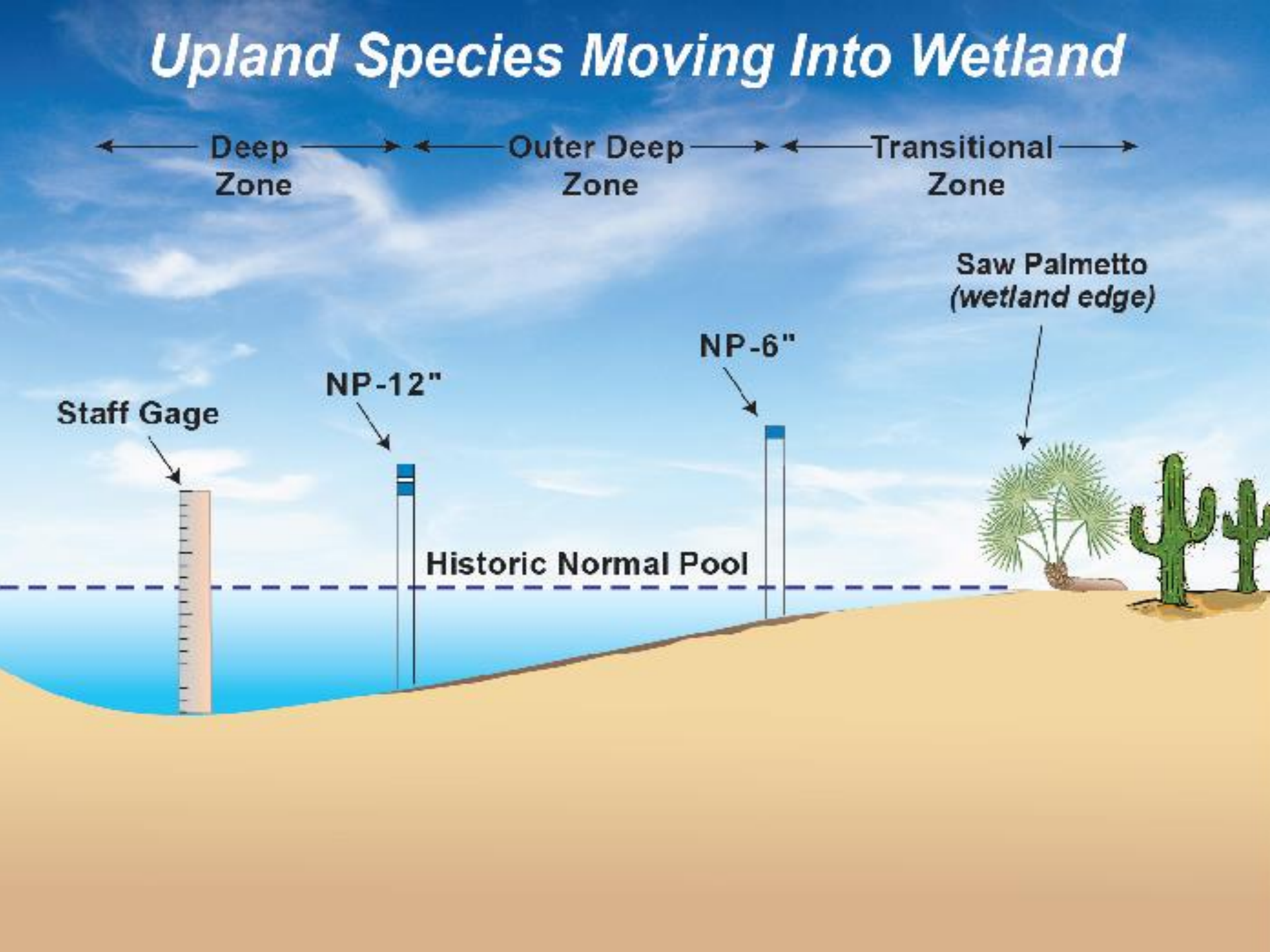


# Edge Delineation



# Edge

# Upland Species Moving Into Wetland



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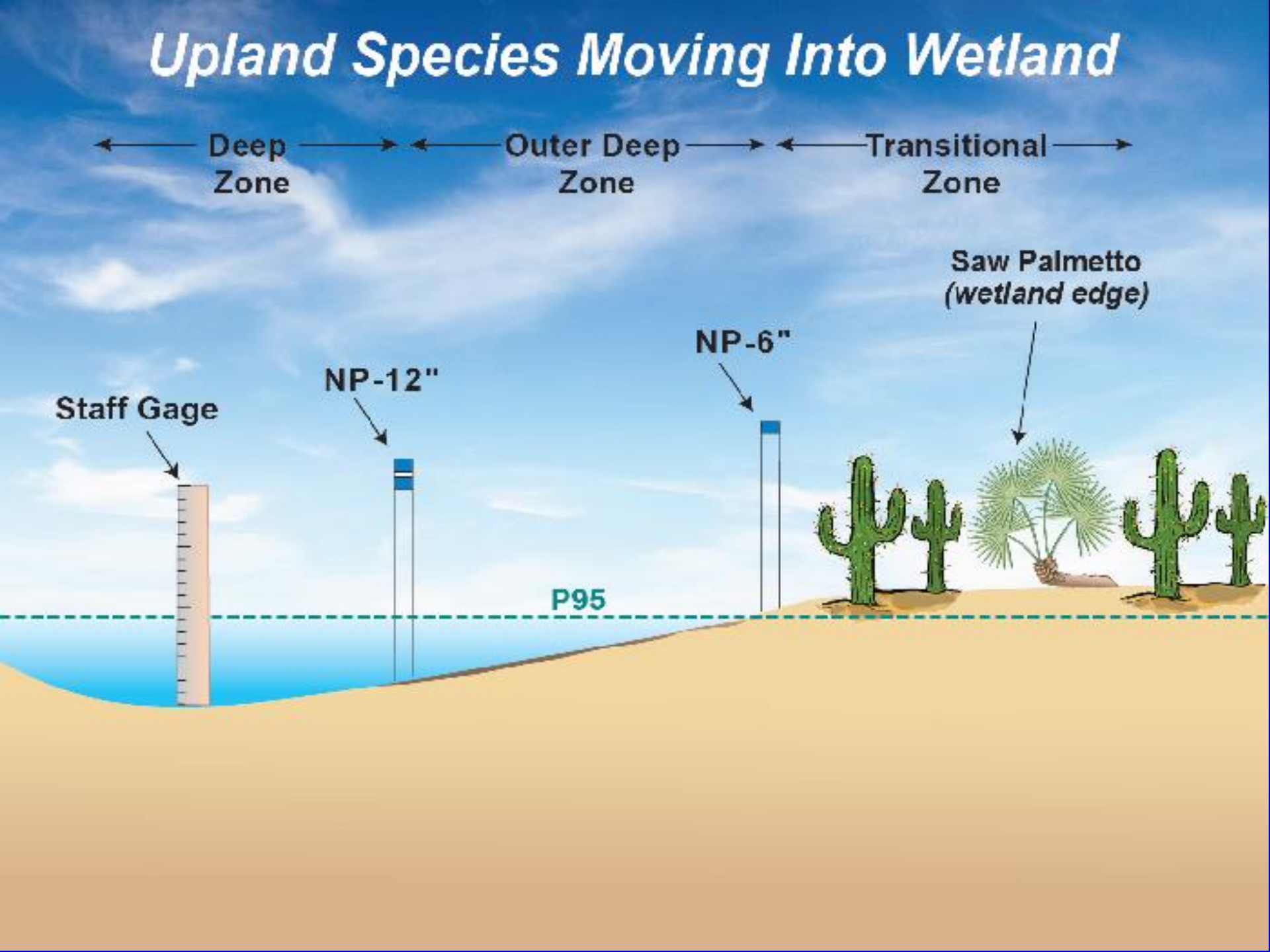

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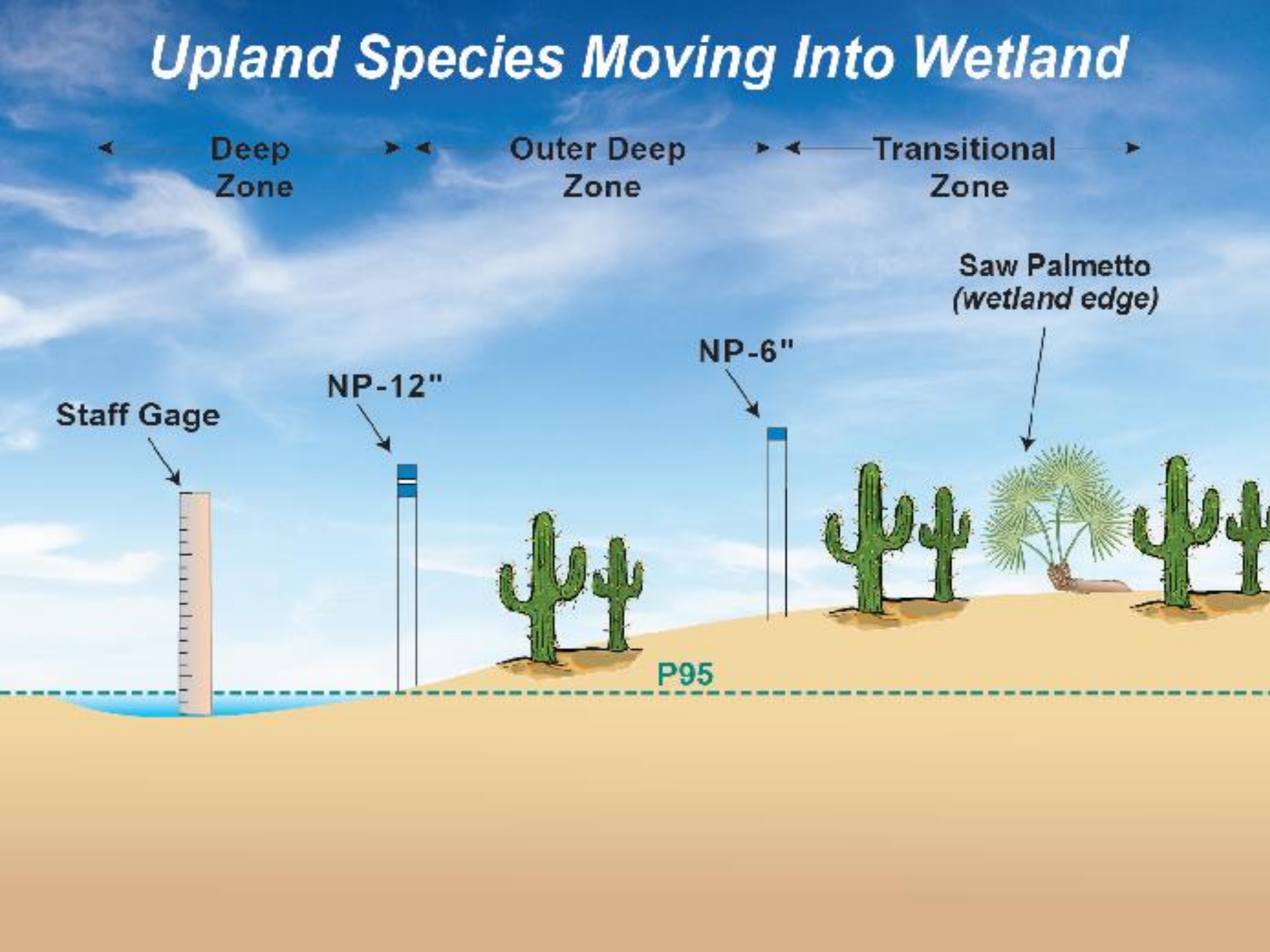

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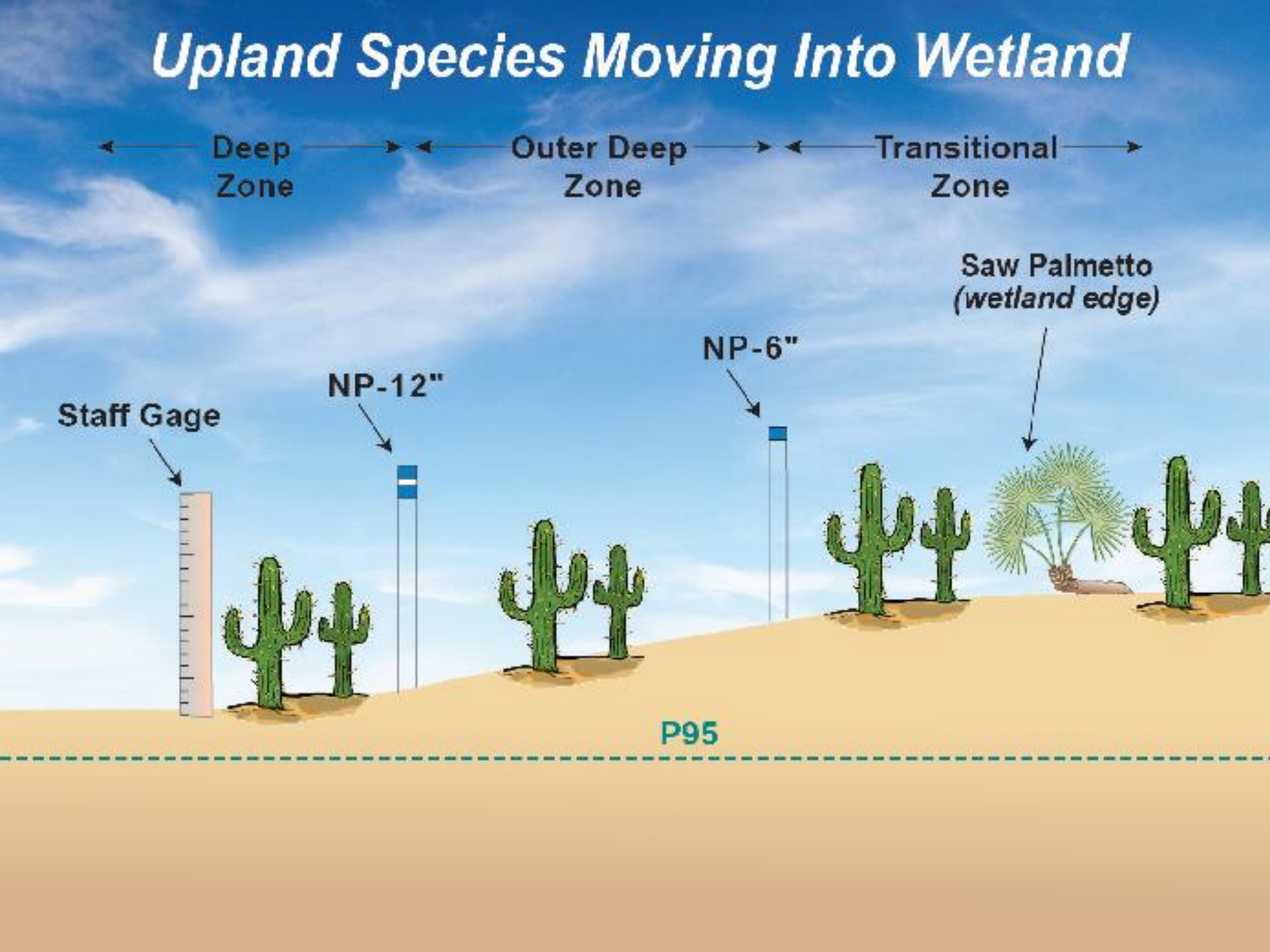
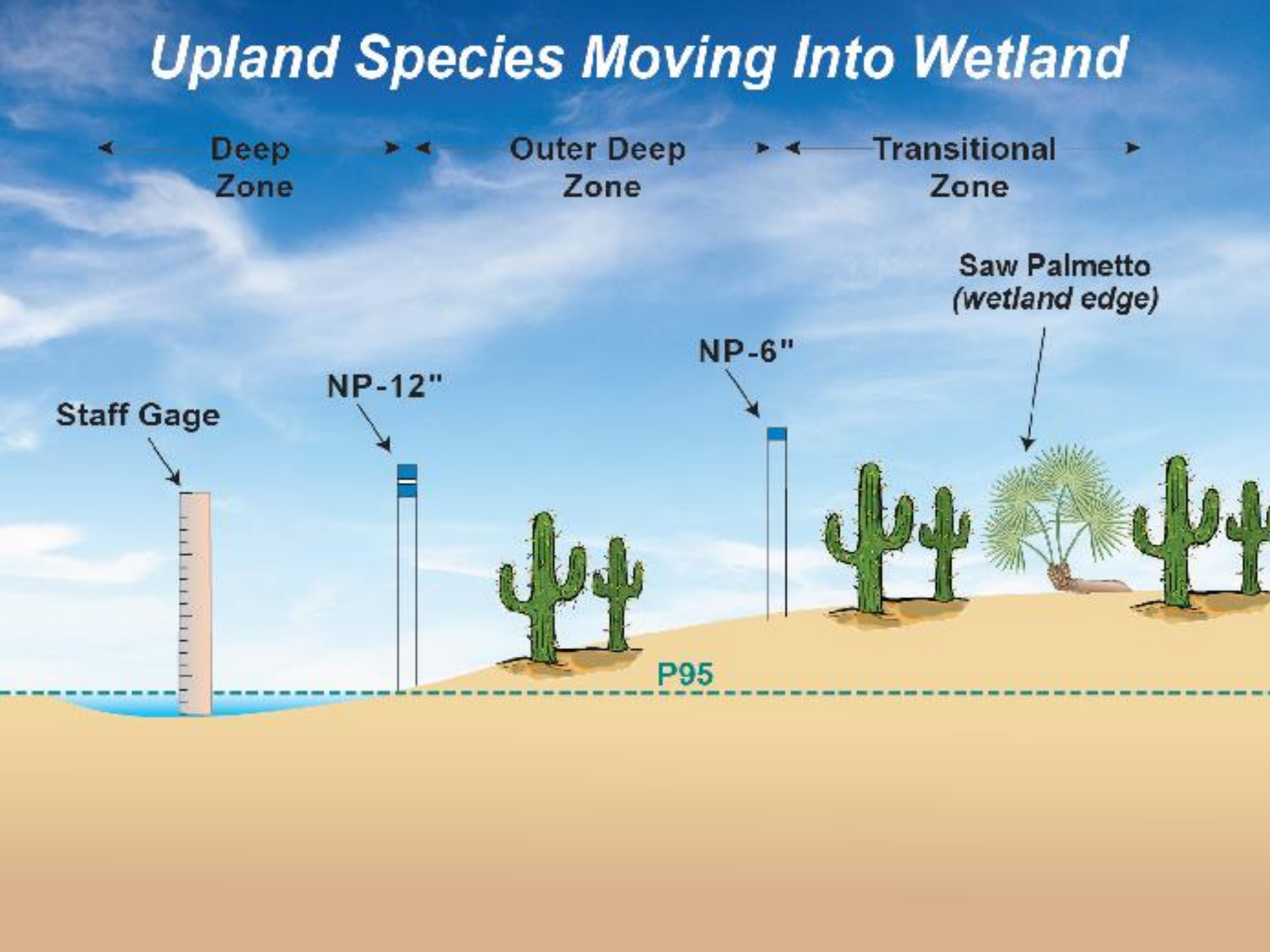


# Upland Species Moving Into Wetland



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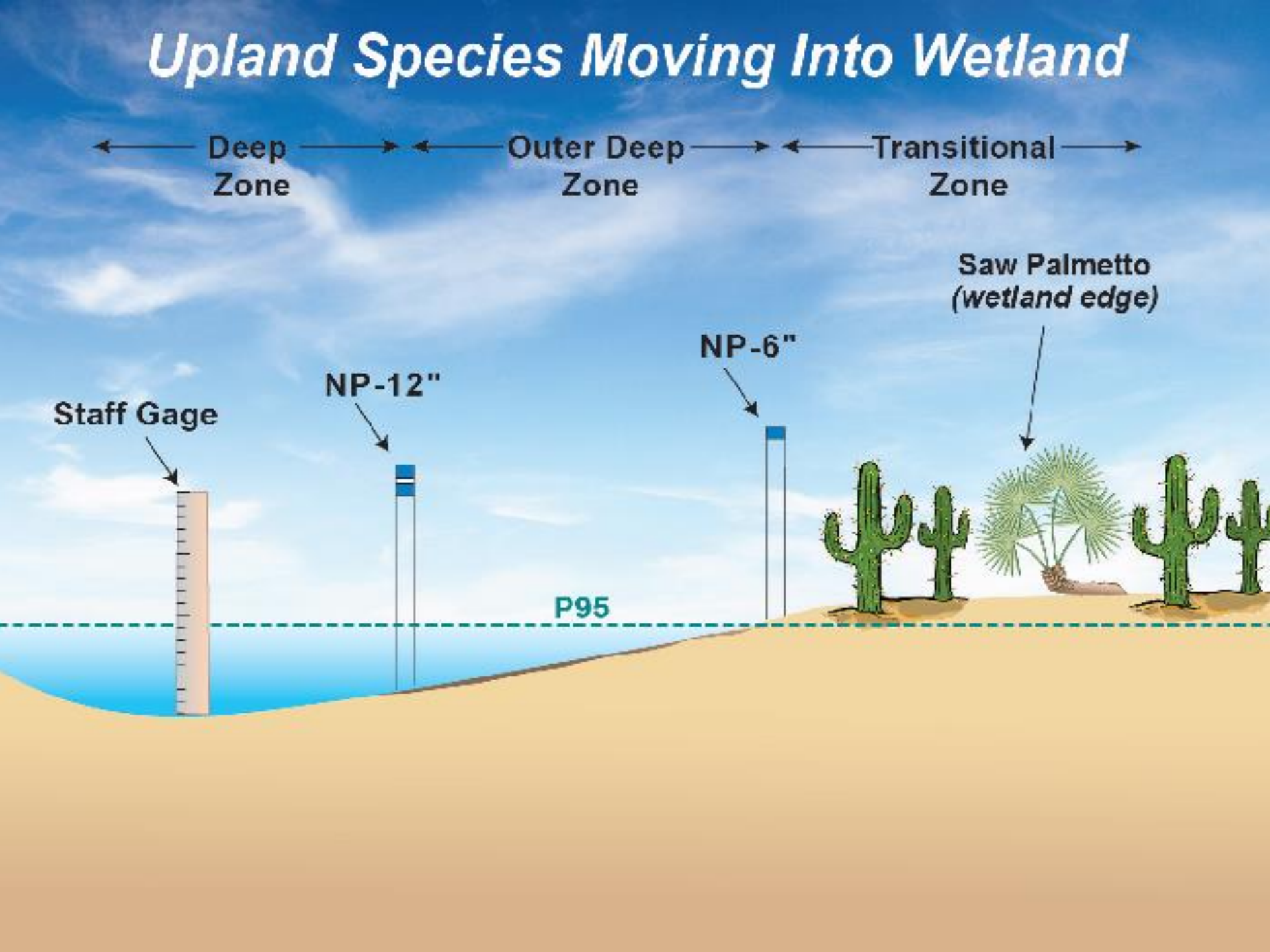

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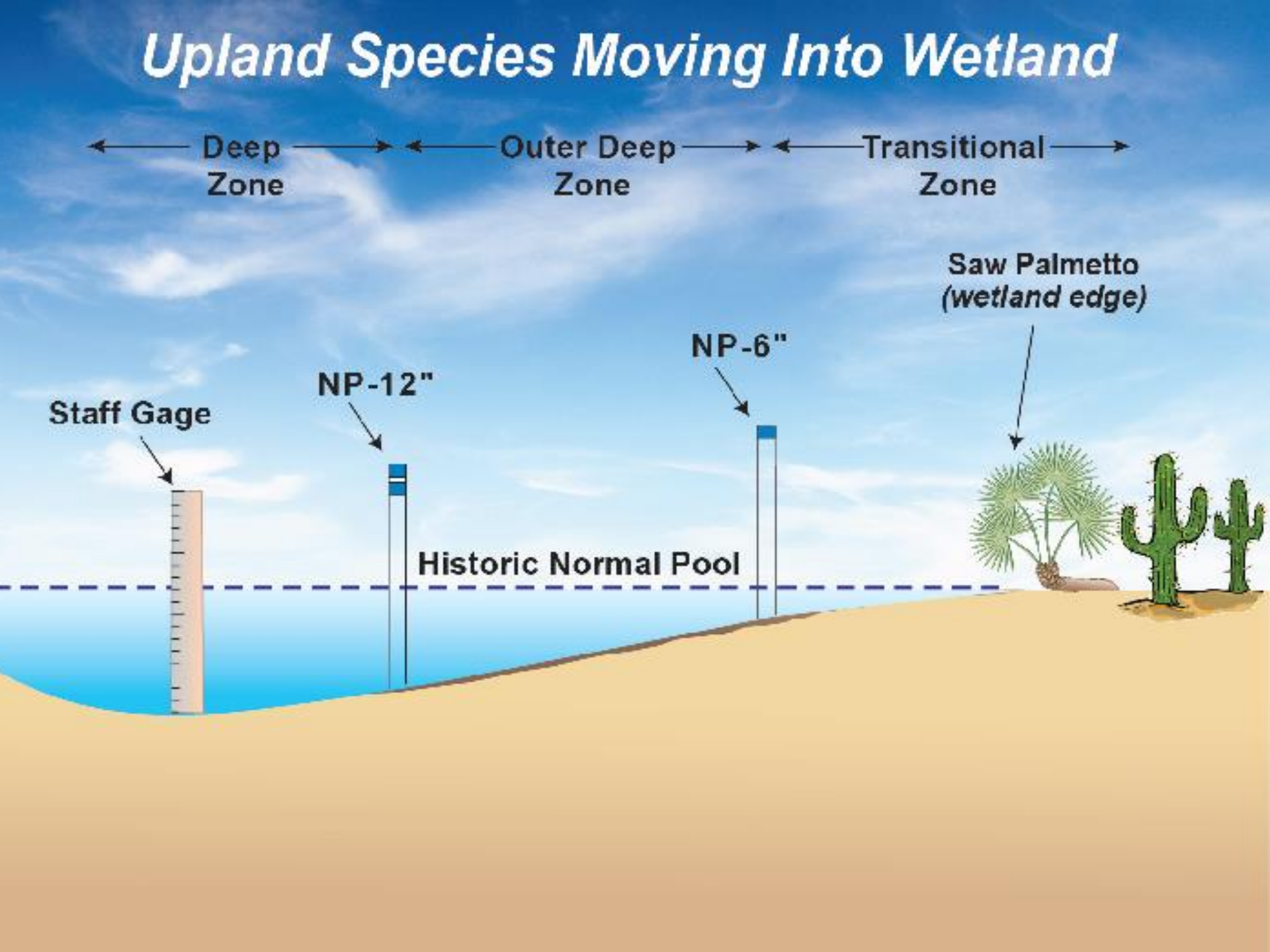
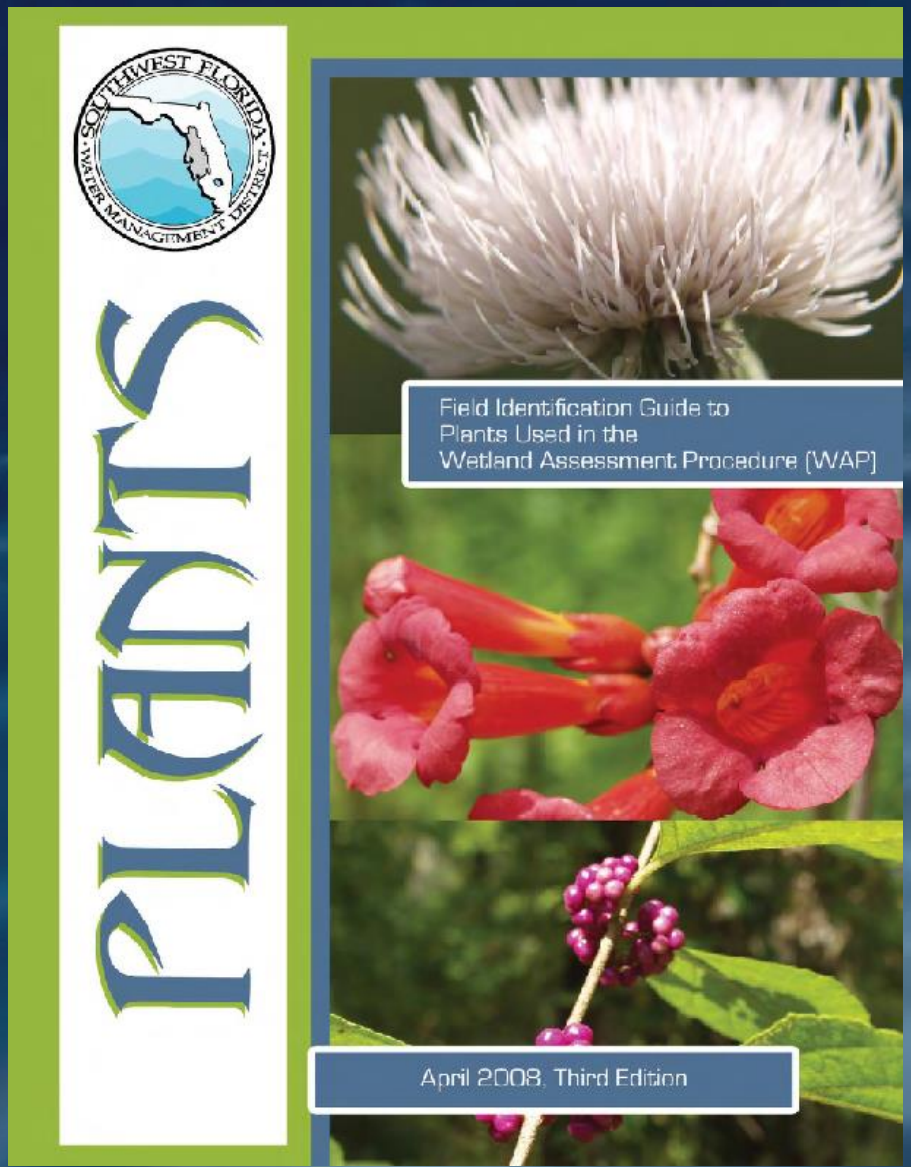


# Plant ID Resources

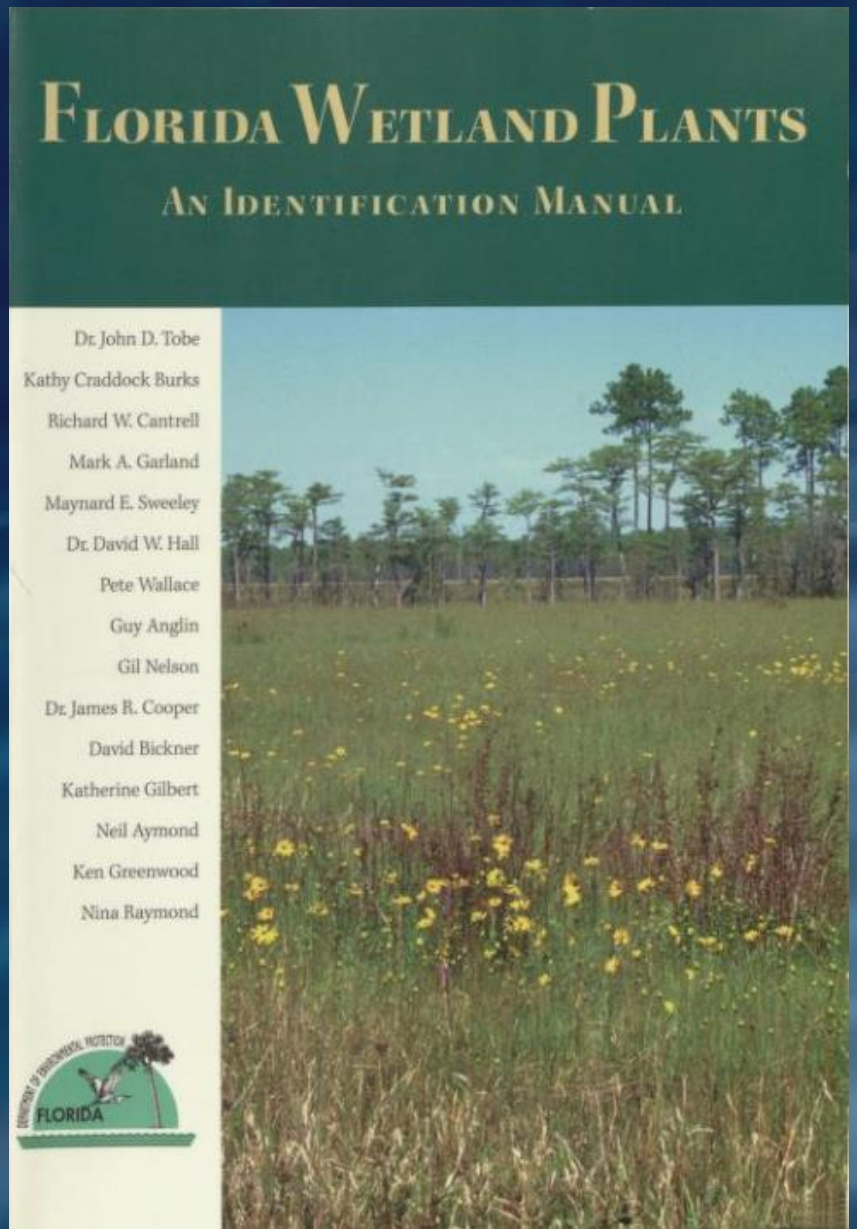
# Plant ID Resources

**WAP Field Guide**



# Plant ID Resources

**Tobe et al, 1998**



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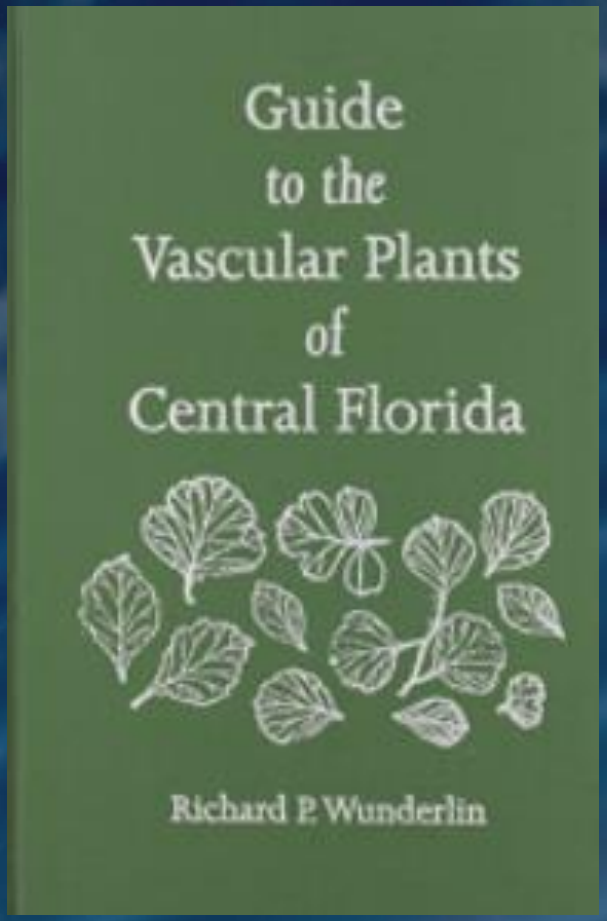


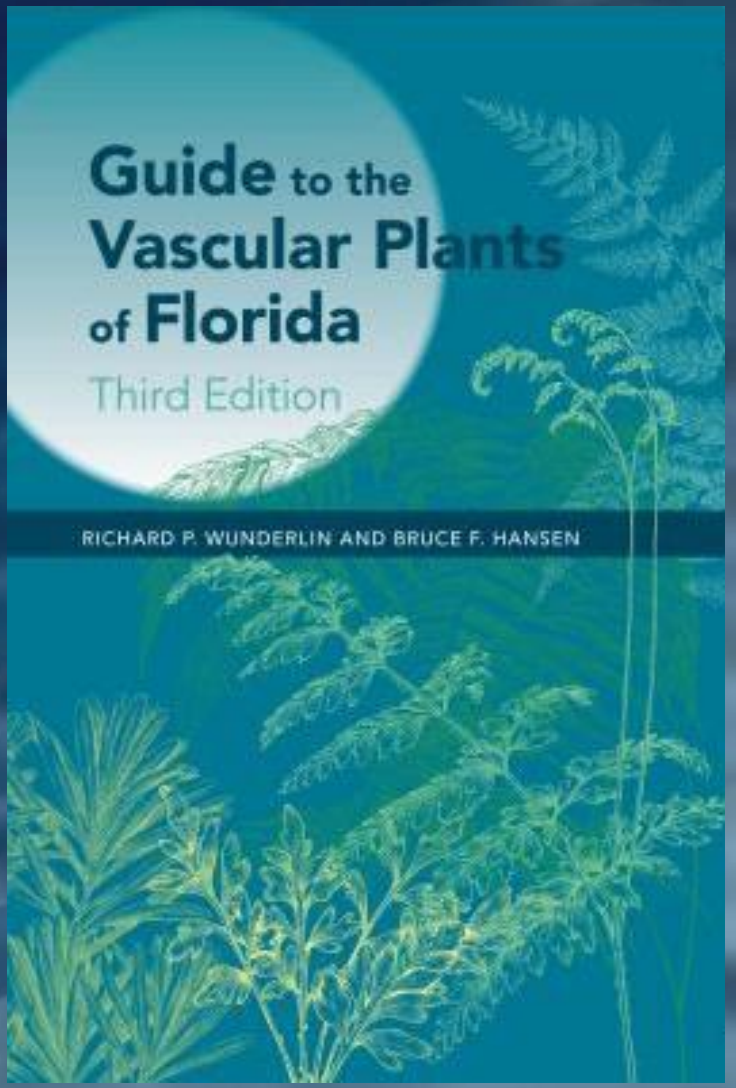

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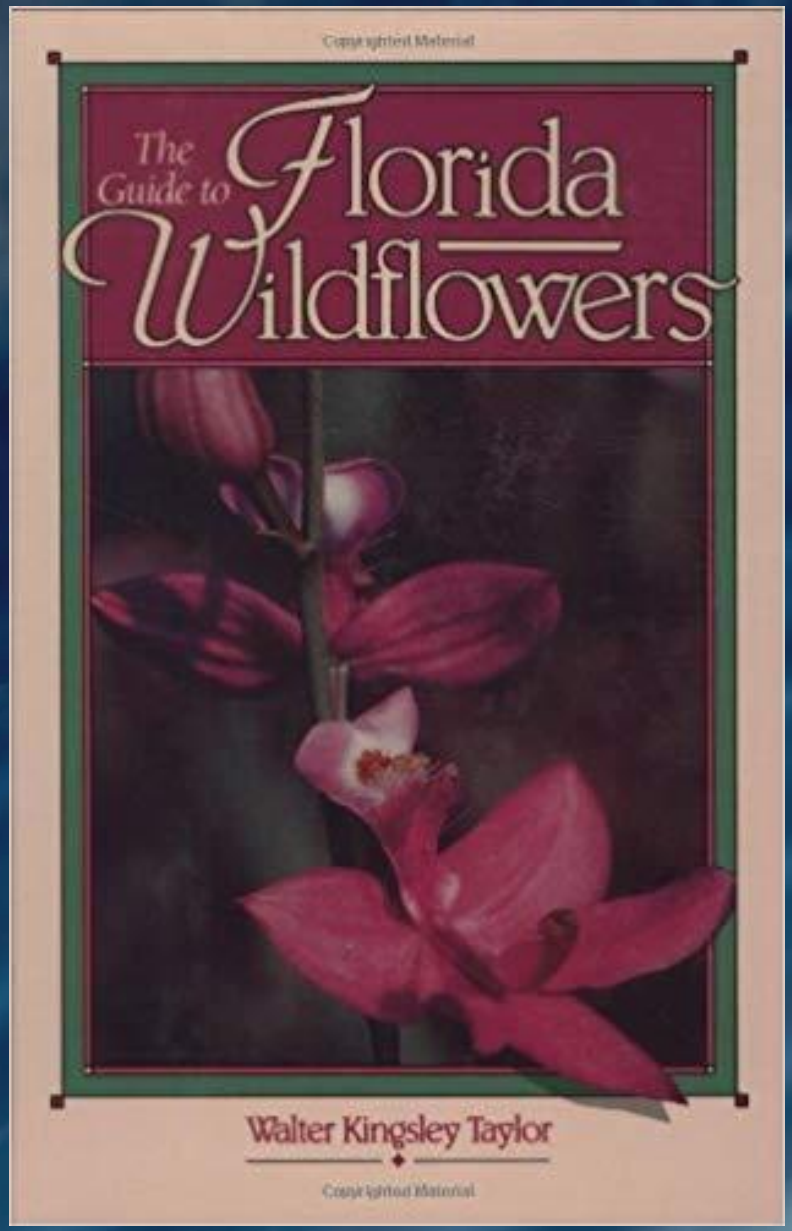
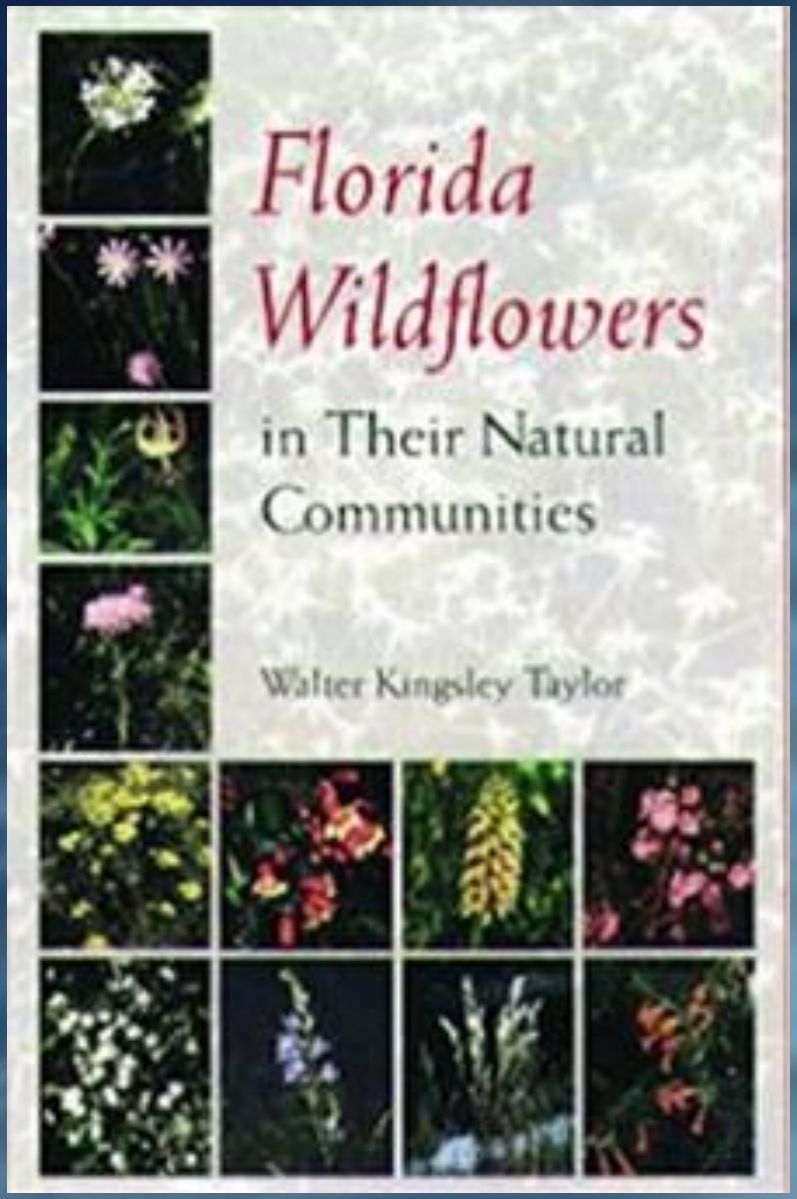
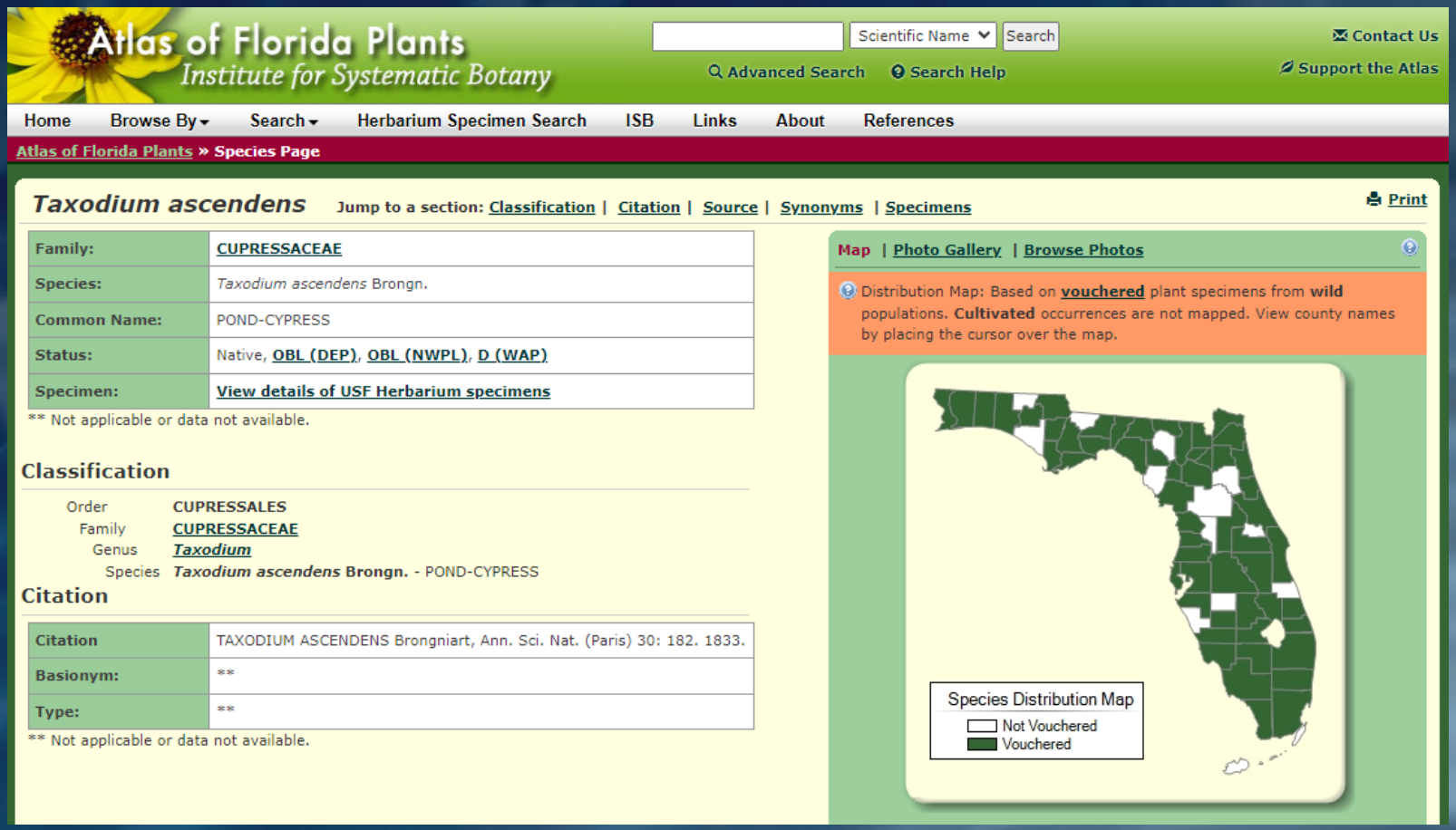


# Plant ID Resources

## USF Atlas of Florida Plants




florida.plantatlas.usf.edu

# 2022 WAP Training
# Part 1 – The Form

# The Form

## Our first look


**Wetland Assessment Procedure** P. 1

| DID: | Wellfield/Property: Portfolio | Wetland Name | Wetland Type |
|---|---|---|---|
| No DID | J.B. STARKEY | Starkey T | Cypress Isolated |

| Wetland ID: | Site ID: | Data Owner: | Personnel's Employer: | Date: | Start Time: | End Time: | Transect |
|---|---|---|---|---|---|---|---|
| 503 | 776584 | DIST | | | | | Starkey T A |

WAP Assessment Personnel:

**Photo Documentation**

| Frame | Description | Photo Point Desc | Direction |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

**Water Level Information**

Dry? Yes ☐ No ☐

Elevation (ft): Device Type: Well/Gauge ID:

Please enter Yes (Y), No (N), or Not Sure (NS) for the following questions and provide comments/explanations ( 2013 data shaded).

**Wetland Impacts**

| | | |
|---|---|---|
| Wetland edges filled or disturbed? | No | |
| Excessive dumping or trash in wetland? | No | |
| Hog disturbance? | Yes | |
| Significant impact from cattle (trampling)? | No | |
| Vehicles through wetland (including bicycles)? | Yes | |
| Insect damage? | No | |
| Disease? | No | |

**Wetland Drainage**

| | | |
|---|---|---|
| Augmentation equipment in place? | No | |
| Augmentation occuring at time of WAP? | No | |
| Clear evidence of direct stormwater inflow? | No | |
| Clear evidence of direct drainage from wetland? | No | |
| Other drainage activities in area? | No | |
| Borrow pit/retention pond in wetland vicinity? | No | |

**Wetland Impact Comment(s)**

none

**Wetland Drainage Comment(s)**

none

**Fire**

Signs of Fire? No ☐ Yes ☐ No

**Lakes/Docks**

☐ Docks completely out of water
☐ Docks touching water or with < 50% of dock over water
☐ Docks > 50% out of water
☐ N/A

2013 Is the littoral zone stranded? Current: ☐ Yes ☐ No

**Fire Comment (year, expanse, intensity)**

none

**Lakes/Docks Comments:**

**Soil Subsidence**

New signs of oxidation/subsidence? No ☐ Yes ☐ No

**Soil Subsidence Comment:**

none

**General Comments/Observations:**

Future users of these data may not want to analyze/compare these data with other wetlands due to the extensive level of:

2013 Current

☐ ☐ Non-grounded water withdraw related disturbance
☐ ☐ Soil subsidence

| Species Count | Common Name | Evidence Description | Comment |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

# Top - Page 1

**Wetland Assessment Procedure** P. 1

| DID: | Wellfield/Property: Portfolio | Wetland Name | Wetland Type |
|---|---|---|---|
| No DID | J.B. STARKEY | Starkey T | Cypress Isolated |

| Wetland ID: | Site ID: | Data Owner: | Personnel's Employer: | Date: | Start Time: | End Time: | Transect |
|---|---|---|---|---|---|---|---|
| 503 | 776584 | DIST | | | | | Starkey T A |

WAP Assessment Personnel:

**Photo Documentation**

| Frame | Description | Photo Point Desc | Direction |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

**Water Level Information**

Dry? Yes ☐ No ☐

Elevation (ft): Device Type: Well/Gauge ID:

Water Levels with description of inundation

443 StkDD 6Stake Landward WAP2018.jpg

443 StkDD 6Stake Waterward WAP2018.jpg

443 StkDD Gage Cardinal N WAP2018.jpg

**Wetland Willie**
*Delaware Wetland Restoration Project*

# Impacts and Drainage

Please enter Yes (Y), No (N), or Not Sure (NS) for the following questions and provide comments/explanations (2021 info is shaded. First column of yes/no entries)

**Wetland Impacts**

| | | |
|---|---|---|
| Wetland edges filled or disturbed? | No | |
| Excessive dumping or trash in wetland? | No | |
| Hog disturbance? | Yes | |
| Significant impact from cattle (trampling)? | No | |
| Vehicles through wetland (including bicycles)? | Yes | |
| Insect damage? | No | |
| Disease? | No | |

| | | |
|---|---|---|
| Augmentation equipment in place? | No | |
| Augmentation occuring at time of WAP? | No | |
| Clear evidence of direct stormwater inflow? | No | |
| Clear evidence of direct drainage from wetland? | No | |
| Other drainage activities in area? | No | |
| Borrow pit/retention pond in wetland vicinity? | No | |

**Wetland Impact Comment(s)**

none

Lower 1/2 OD rooted 6” deep - fresh

**Wetland Drainage Comment(s)**

none

Stormwater inflow from Publix lot

Datsun Engineering

# FIRE

**Fire**

Signs of Fire? No ☐ Yes ☐ No

**Fire Comment (year, expanse, intensity)**

none

**Lakes/Docks**

- ☐ Docks completely out of water
- ☐ Docks touching water or with < 50% of dock over water
- ☐ Docks > 50% out of water
- ☐ N/A

2014 Is the littoral zone stranded? ☐ Current: ☐ Yes ☐ No

**Lakes/Docks Comments:**

# Soil Subsidence

**Fire**

Signs of Fire? No ☐ Yes ☐ No

**Lakes/Docks**

- ☐ Docks completely out of water
- ☐ Docks touching water or with < 50% of dock over water
- ☐ Docks > 50% out of water
- ☐ N/A

2014 Is the littoral zone stranded? ☐ Current: ☐ Yes ☐ No

**Fire Comment (year, expanse, intensity)**

none

**Lakes/Docks Comments:**

**Soil Subsidence**

New signs of oxidation/subsidence: No ☐ Yes ☐ No

**Soil Subsidence Comment:**

none

3" root exposure on several Cypress near gage

Future users of these data may not want to analyze/compare these data with other wetlands due to the extensive level of:

| 2014 | Current | |
|---|---|---|
| ☐ | ☐ | Non-grounded water withdraw related disturbance |
| ☐ | ☐ | Soil subsidence |

**General Comments/Observations:**

| Species Count | Common Name | Evidence Description | |
|---|---|---|---|
| | | | |
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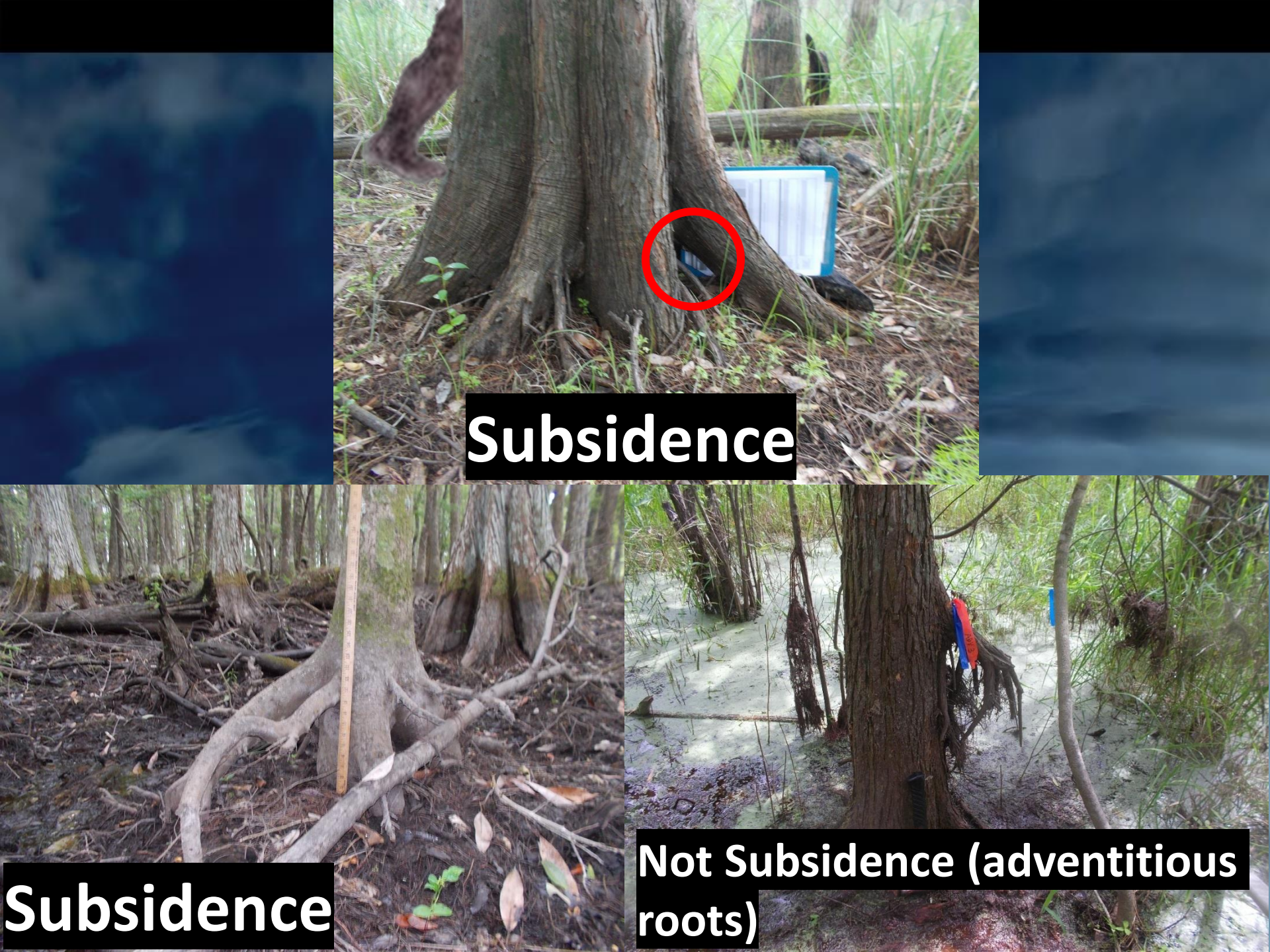
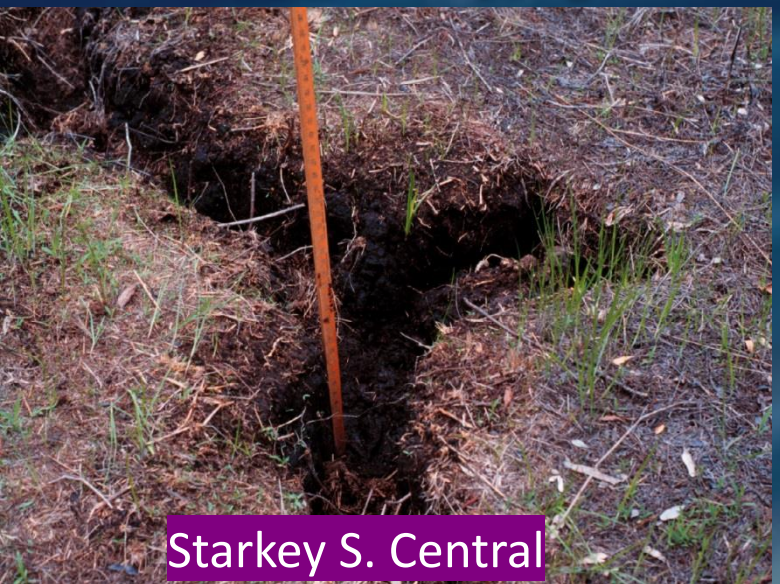

Subsidence
Subsidence
Not Subsidence (adventitious roots)

# Soil Subsidence Comments

## Forested – Root Exposure

- 0 - 1”
- 2”- 6”
- 6”-12”
- >12”
- Slumping/Pedestals


## Herbaceous – Cracks / Crevices

# Wildlife

**Lakes/Docks**

- ☐ Docks completely out of water
- ☐ Docks touching water or with < 50% of dock over water
- ☐ Docks > 50% out of water
- ☐ N/A

2014 Is the littoral zone stranded? ☐ Current: ☐ Yes ☐ No

**Lakes/Docks Comments:**

**General Comm**

Future users of these data may not want to analyze/compare these data with other wetlands due to the extensive level of:

2014 Current

- ☐ ☐ Non-grounded water withdraw related disturbance
- ☐ ☐ Soil subsidence

| Species Count | Common Name | Evidence Description | |
|---|---|---|---|
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# Vegetation

**(pp. 2, 3, and 4)**

## Strata

- Groundcover (page 2)
- Shrubs and Small Trees (page 3)
- Trees (page 4)


Trees
Shrubs and
Small Trees
Groundcover

# Groundcover

- All non-woody species
- All woody species <1 meter tall
- Rooted in the wetland
- *Always g*roundcover*: Eupatorium, Typha, Phytolacca*, *Rubus*, and all vines



# Shrubs and Small Trees

- Woody plants > 1 meter tall *and* < 4 cm DBH
- Cabbage palm >1 meter tall and <6 meters tall
- Must be rooted in wetland
- Generally have multiple stems
- Includes *Hypericum* spp., *Ilex glabra, Myrica (Morella), Lyonia*, and other woody plants with multiple stems *when > 1 m tall*

# Trees

- All woody plants ≥ 1 meter tall *and* ≥ 4 cm DBH
- Includes cabbage palms > 6 meters tall
- Rooted in the wetland
- *Not Trees- Myrica (Morella)*, *Lyonia* spp., and other woody plants with multiple stems that are greater than one meter tall are assessed as shrubs and small trees.

# WAP Species & Assigned Zones

## Appendix A. Plant list used for WAP methodology.

| Botanical Name | Common Name | Synonymy | Wetland Zone |
|---|---|---|---|
| *Acer rubrum* | red maple | | OD |
| *Amaranthus australis* | southern amaranth | | T |
| *Ambrosia artemisiifolia* | common ragweed | | U |
| *Amorpha fruticosa* | Bastard indigobush; false indigobush | | T |
| *Ampelopsis arborea* | Peppervine | | AD |
| *Amphicarpum muhlenbergianum* | blue maidencane | | OD |
| *Andropogon glomeratus* | bushy bluestem | | T |
| *Andropogon glomeratus var. glaucopsis* | purple bluestem | | OD |
| *Andropogon virginicus* | broomsedge bluestem | | AD |
| *Andropogon virginicus var. decipiens* | broomsedge bluestem | | AD |
| *Andropogon virginicus var. glaucus* | chalky bluestem | | U |
| *Axonopus spp.* | Carpetgrass | | AD |
| *Baccharis spp.* | silverling, groundsel tree, sea myrtle | | AD |
| *Bacopa caroliniana* | lemon bacopa; blue waterhyssop | | OD |
| *Berchemia scandens* | alabama supplejack; rattan vine | | T |
| *Callicarpa americana* | American beautyberry | | U |
| *Campsis radicans* | trumpet creeper | | T |
| *Carex longii* | long's sedge | | T |
| *Celtis laevigata* | sugarberry; hackberry | | T |
| *Centella asiatica* | Spadeleaf | | T |
| *Cephalanthus occidentalis* | common buttonbush | | D |

# Groundcover (page 2)

## Groundcover

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count(#)(1-4), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

### Transition Zone

Check if no groundcover ☐

| Species | Z | % | # | D |
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# Groundcover (page 2)

## Groundcover

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count(#)(1-4), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

### Transition Zone

Check if no groundcover ☐

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# Zones
# WAP Instruction Manual
# Appendix B – Definition of Wetland Assessment Method Terms

- Upland (U) – Plant species that are not expected to be seen in wetlands. It is possible that a few of these species may be found along wetland edges, but are not expected throughout the Transition zone.

# Zones
# Appendix B – Definition of Wetland Assessment Method Terms

- Adaptive (AD) – Plant species designated as FAC or UPL by DEP, but commonly seen in the Transition zone (T) in limited numbers. *When Adaptive species are found in the Outer Deep (OD) or Deep (D) zones, they should be treated the same as Transition zone species.*

# Zones
# Appendix B – Definition of Wetland Assessment Method Terms

- Transition (T) – Plant species commonly found in the Transition zone, and designated FACW (a few OBL) by DEP.

# Zones
# Appendix B – Definition of Wetland Assessment Method Terms

- Outer Deep (OD) – Plant species commonly found in the Outer Deep zone, and designated either FACW or OBL by DEP.

# Zones
# Appendix B – Definition of Wetland Assessment Method Terms

- Deep (D) - Plant species commonly found in the Deep zone, and designated OBL by DEP.

# Zones

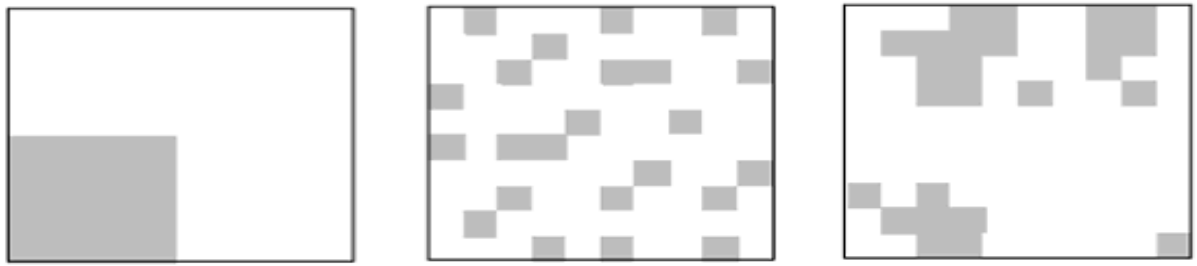
- If a species is not a WAP plant, Zone designation is NA
- However, all species observed should be recorded

# Percent Cover

**1% to 5%:** These are all 5% cover

**6% to 10%:** These are all 10% cover

**11% to 25%:** These are all 25% cover



# Groundcover (page 2)

## Groundcover

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count(#)(1-4), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

### Transition Zone

Check if no groundcover ☐

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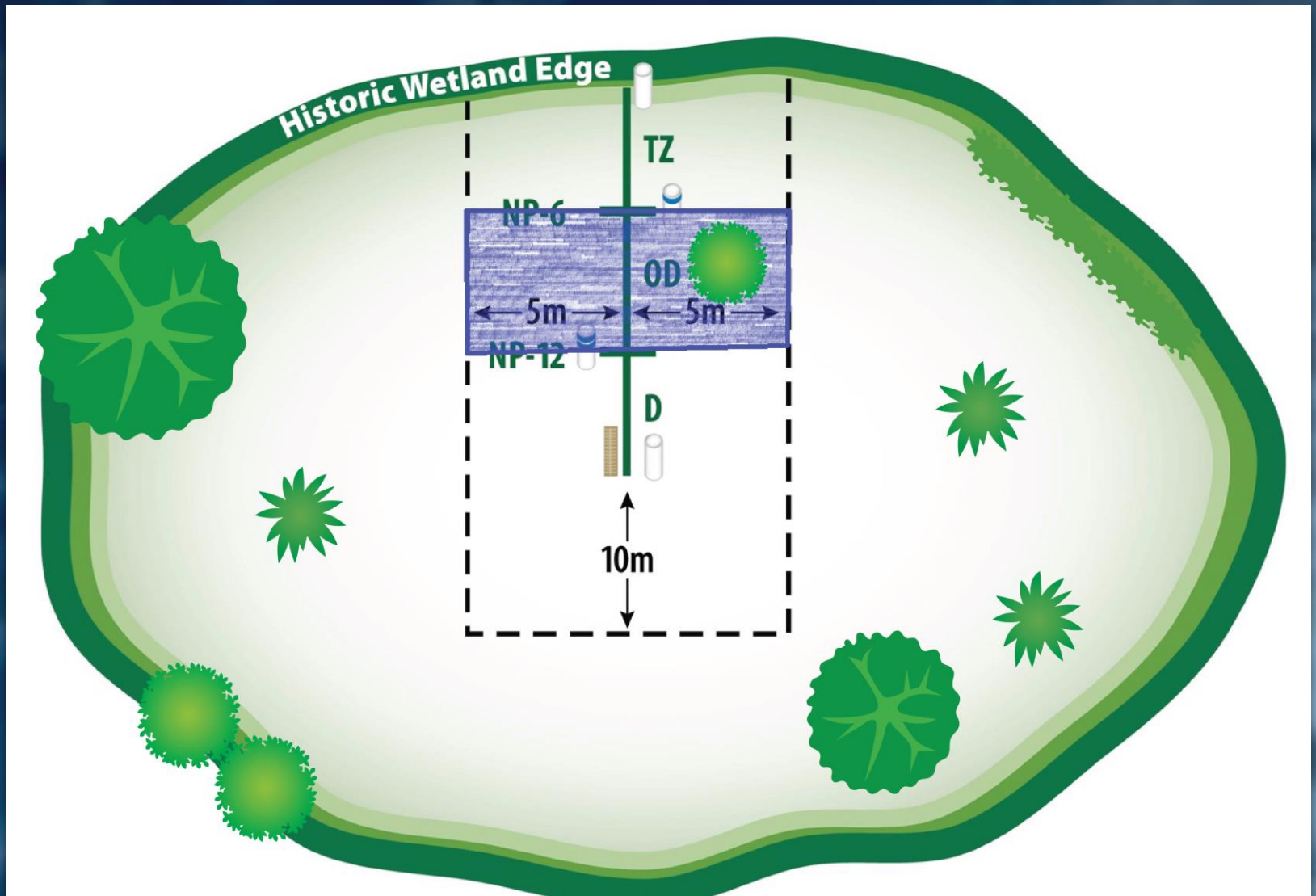
# Remember, only in 10% increments.
# 10% < 15% < 20%



# Groundcover (page 2)

## Groundcover

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count(#)(1-4), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

### Transition Zone

Check if no groundcover ☐

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### Outer Deep Zone

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# Shrubs and Small Trees/ Trees (page 3 & 4)

**Shrubs/Small Trees**

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count (#) (1 - >50), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

**Transition Zone**

Check if no shrubs/small trees ☐

| Species | Z | % | # | D |
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**Outer Deep Zone**

Check if no shrubs/small trees ☐

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**Deep Zone**

Check if no shrubs/small trees ☐

| Species | Z | % | # | D |
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**Shrubs/Small Trees Comments**

**Zonation**

**Zonation Score** ☐ Please assign a score of 1-5 or 0 (for N/A) and provide an explanation

**Zonation Score Explanation:**

## Groundcover ( 2014 data shaded)

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count (#)(1-4), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

### Transition Zone

Check if no groundcover 2014 ☐ Current ☐

| Species | Z | % | # | D | % | # | D |
|---|---|---|---|---|---|---|---|
| | | 2014 | | | Current | | |
| Erioca decang | NA | 10 | | T | | | |
| Amphic muhlen | OD | 10 | | T | | | |
| Stilli aquati | D | 5 | | T | | | |
| Eupato leptop | OD | 5 | | T | | | |
| Pluche baccha | OD | 5 | | T | | | |
| Droser capill | NA | 5 | | T | | | |
| Dichan commut | NA | 5 | | T | | | |
| Gratio ramosa | T | 5 | | T | | | |
| Hyperi fascic | OD | 5 | | T | | | |
| Syngon flavid | NA | | 1 | T | | | |
| Xyris elliot | NA | | 1 | T | | | |
| Sagitt gramin | NA | | 1 | T | | | |
| Juncus scirpo | NA | | 1 | T | | | |

### Outer Deep Zone

Check if no groundcover 2014 ☐ Current ☐

| Species | Z | % | # | D | % | # | D |
|---|---|---|---|---|---|---|---|
| | | 2014 | | | Current | | |
| Stilli aquati | D | 10 | | T | | | |
| Gratiola sp. | NA | 5 | | E | | | |
| Pluche baccha | OD | 5 | | T | | | |
| Eupato leptop | OD | 5 | | T | | | |
| Amphic muhlen | OD | 5 | | T | | | |
| Rhynch inunda | NA | 5 | | T | | | |
| Erioca decang | NA | | 2 | T | | | |
| Androp glomer glauco | OD | | 2 | T | | | |
| Rhynch cephal | NA | | 2 | T | | | |
| Taxodi ascend | D | | 1 | T | | | |
| Xyris jupica | NA | | 1 | T | | | |
| Androp glomer | T | | 1 | T | | | |

### Deep Zone

Check if no groundcover 2014 ☐ Current ☐

| Species | Z | % | # | D | % | # | D |
|---|---|---|---|---|---|---|---|
| | | 2014 | | | Current | | |
| Rhynch inunda | NA | 30 | | T | | | |
| Panicu hemito | NA | 5 | | T | | | |
| Sagitt gramin | NA | 5 | | T | | | |
| Carex verruc | NA | 5 | | T | | | |
| Erioca decang | NA | 5 | | T | | | |
| Cladiu jamaic | NA | | 4 | T | | | |
| Pluche baccha | OD | | 2 | B | | | |

## Shrubs/Small Trees (2014 data shaded)

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count (#) (1 - >50), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

### Transition Zone

Check if no shrubs 2014 ☐ Current ☐

| Species | Z | % | # | D | % | # | D |
|---|---|---|---|---|---|---|---|
| | | 2014 | | | Current | | |
| Stilli aquati | D | | 4 | T | | | |

### Outer Deep Zone

Check if no shrubs 2014 ☐ Current ☐

| Species | Z | % | # | D | % | # | D |
|---|---|---|---|---|---|---|---|
| | | 2014 | | | Current | | |
| Myrica cerife | AD | 20 | 15 | T | | | |
| Taxodi ascend | D | 10 | 10 | T | | | |
| Stilli aquati | D | 5 | 10 | T | | | |
| Hyperi fascic | OD | 5 | 5 | T | | | |
| Pinus elliot | AD | 5 | 3 | T | | | |

### Deep Zone

Check if no shrubs 2014 ☐ Current ☐

| Species | Z | % | # | D | % | # | D |
|---|---|---|---|---|---|---|---|
| | | 2014 | | | Current | | |
| Taxodi ascend | D | 10 | 17 | T | | | |
| Stilli aquati | D | 5 | 8 | T | | | |
| Myrica cerife | AD | 5 | 6 | B | | | |

# Groundcover (page 2)

## Groundcover

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count(#)(1-4), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

### Transition Zone

Check if no groundcover ☐

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### Outer Deep Zone

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### Deep Zone

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# Dead vs. Live Vegetation

# Explanations and Comments

**Shrubs/Small Trees**

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count (#) (1 - >50), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

**Transition Zone**

Check if no shrubs/small trees ☐

| Species | Z | % | # | D |
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**Outer Deep Zone**

Check if no shrubs/small trees ☐

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**Deep Zone**

Check if no shrubs/small trees ☐

| Species | Z | % | # | D |
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**Shrubs/Small Trees Comments**

**Zonation**

Zonation Score ☐ Please assign a score of 1-5 or 0 (for N/A) and provide an explanation

**Zonation Score Explanation:**

**Stress**

Signs of stress of appropriate shrubs and small trees (including dead species)

# Guidance/Reminders

- Don’t include plants in pathways / trails
- Be careful with ID and estimates of distant plants
- Add any notes to explain yourself, as needed
- Remember to include only living plants
- Edge vs. Throughout

# Guidance/Reminders

- Look at previous year's data, and try to be consistent (within reason)
- Trees shouldn't change much
- Exact width of transect is not critical
- When disagreeing with previous years, include explanation

# Guidance/Reminders

If any zone has been temporarily disturbed (pig rooting, fire, etc.):

- Check “no cover” box (top of zone species list, pp. 2,3, and 4)
- Add an explanation
- Re-evaluate next year

# Examples of not enough groundcover (NA)

https://vetstreet.brightspotcdn.com/dims4/default/02bd838/2147483647/thumbnail/645x380/quality/90/?url=https%3A%2F%2Fvetstreet-brightspot.s3.amazonaws.com%2Fa3%2F767b00a33511e087a80050568d634f%2Ffile%2FSphynx-4-645mk062211.jpg

# When is NA an Appropriate Score?

## Not enough cover in any zone to make an evaluation of a stratum

- If <5% groundcover, only one shrub or small tree, or only one tree

> **Guidance**: If you feel there is not enough of the **cover** to make a meaningful score, choose NA.

- Can also be due to high water, fire, inaccessibility, or other temporary reasons

- **Explain reasons**

# Zonation Score

- For each stratum, score each zone
  - Stick closely to the rules
  - A choice of 1-5 or NA must be made for each stratum based on the *lowest zone score in each stratum*

## COVER CATEGORIES RANKING SCALE

Wetland ID_____
Personnel_____
Date_____

*Check the **ONE** box that applies for each Cover category. Each Cover category can have only 1 Rank Score, e.g.: Rank 2, GC; Rank 4, Tr; Rank 4, S; that best describes the most degraded condition for each cover category. Two different Rank Scores can never be assigned to a cover category. **DO NOT** accumulate percentages or numbers between zones. Copy the ranking scales derived for each Cover category to the WAP Field Form*

RANK SCORE

**5** **No Migration or**

**Inward Migration 1 zone BEYOND or THROUGHOUT** *or* **Species found only along Zone EDGE (within 1 ft.)**

| | | | | | |
|---|---|---|---|---|---|
| GC | ☐ | < 5% cover for all inappropriate species | GC | ☐ | 5% - 25% cover for all species |
| S | ☐ | < 2 specimens | S | ☐ | 2 or 3 specimens |
| Tr | ☐ | < 2 specimens | Tr | ☐ | 2 or 3 specimens |

**AND/OR (Adaptive Species in the Transition Zone)**

☐ < 25% GC *and/or* ☐ < 5 specimens S *and/or* ☐ < 5 specimens Tr

**4** **Migration Inward 1 Zone – Species distributed BEYOND a few feet or THROUGHOUT a Zone**

| | | |
|---|---|---|
| GC | ☐ | 5% - 25% cover for all species |
| S | ☐ | 2 or 3 specimens |
| Tr | ☐ | 2 or 3 specimens |

**AND/OR (Adaptive Species located THROUGHOUT much of the Trans Zone)**

☐ > 25% GC *and/or* ☐ > 5 specimens S *and/or* ☐ > 5 specimens Tr

**3** **Migration Inward 1 Zone – Species distributed THROUGHOUT MUCH of the Zone**

| | | |
|---|---|---|
| GC | ☐ | >25% cover for all species |
| S | ☐ | > 5 specimens |
| Tr | ☐ | > 5 specimens |

**AND/OR (Inward Migration 2 Zones distributed BEYOND or THROUGHOUT)**

| | | |
|---|---|---|
| GC | ☐ | 5% - 25% cover for all species |
| S | ☐ | >2 but <5 specimens |
| Tr | ☐ | >2 but <5 specimens |

**2** **Migration Inward 2 Zones – Species distributed THROUGHOUT the Zone**

| | | |
|---|---|---|
| GC | ☐ | >25% cover for all species |
| S | ☐ | > 5 specimens |
| Tr | ☐ | > 5 specimens |

**AND/OR (Upland species moved into DEEP zone, distributed BEYOND or THROUGHOUT)**

| | | |
|---|---|---|
| GC | ☐ | 5% - 25% cover for all species |
| S | ☐ | >2 but <5 specimens |
| Tr | ☐ | >2 but < 5specimens |

**1** **Migration of Upland species distributed THROUGHOUT much of the DEEP zone**

| | | |
|---|---|---|
| GC | ☐ | >25% cover for all species |
| S | ☐ | > 5 specimens |
| Tr | ☐ | > 5 specimens |

**N/A** **Not enough Cover to make an evaluation, <2 S or <5% GC (*Please explain below*)**

GC ☐
S ☐
Tr ☐

**Notes: 1. AD species are treated the same as T species when they are found in the OD and D Zones**
**2. If there are not enough species or #'s to justify one score, choose the higher score.**

*Legend*

GC = Ground Cover Tr = Tree Cover T = Transitional AD =Adaptive
S = Shrub & Small Tree Cover D = Deep Zone OD = Outer Deep

**Ranking Scale**

5. Normal **zonation**. Some species may have migrated inward one **zone**, but they are not in enough numbers and/or right along the **zone** edge. **Adaptive species** in the **transition zone** are not considered abnormal if they are not in high numbers and distribution.

4. Species have moved in one **zone** in enough numbers and distribution to be of concern, and/or species with an **adaptive** classification are in high numbers and distribution in the **transition zone**.

3. Species have moved in one **zone** in high numbers and distribution, and/or species have moved in two **zones** in enough numbers and distribution to be of concern.

2. Species have moved in two **zones** in high numbers and distribution, and/or some species with an **upland** classification have moved into the **deep zone** in enough numbers and distribution to be of concern.

1. Species with an **upland** classification have moved into the **deep zone** in high numbers and distribution.

NA. Not enough **cover** to make evaluation (< 5 percent for groundcover, and < 2 individuals for "shrubs and small trees" and "trees")

**Guidance**:

For **groundcover**:

a. "Enough numbers" generally means greater than 5 percent **cover** for all species.
b. "High numbers" generally means greater than 25 percent **cover**.
c. "Enough distribution" generally means located beyond a few feet of the appropriate **zone**.
d. "High distribution" generally means located throughout much of the **zone**.

For **shrubs and small trees**, and **trees:**

a. "Enough numbers" generally means 2 or 3 specimens.
b. "High numbers" generally means greater than 5 specimens.
c. "Enough distribution" generally means located beyond a few feet of the appropriate **zone**.
d. "High distribution" generally means located throughout much of the **zone**.

*If there are not enough specimens to justify one score, choose the one higher. For example, if all you have is one T shrub well into the deep zone (two zone move), a "3" is not justified (less than 2 to 3 specimens). Choose a "4".*

*Note: For scoring purposes, AD species are treated the same as T species when they are found in the Outer Deep and Deep zones.*

Created April 16, 2008

# Numbers & Distribution

- "Enough numbers": >5% for groundcover and 2-3 trees or shrubs / small trees
- "High numbers": >25% for groundcover, and >5 individual trees or shrubs / small trees.
- "Enough distribution": Located beyond a few feet of the appropriate zone marker (edge, NP-6, NP-12).
- "High distribution": Located throughout much of the zone.

# Numbers & Percentages

- Percentages are <u>not cumulative between zones</u>
  - 3 Adaptive (AD) plants into the Outer Deep (OD) zone, and 3 Outer Deep plants into the Deep (D) zone is *<u>not</u>* a one zone move for 6 plants
  - 15% Adaptive species into the Outer Deep zone, and 20% Outer Deep species into the Deep zone is not a 35% one zone move.

**Ranking Scale**

5. Normal **zonation**. Some species may have migrated inward one **zone**, but they are not in enough numbers and/or right along the **zone** edge. **Adaptive species** in the **transition zone** are not considered abnormal if they are not in high numbers and distribution.

4. Species have moved in one **zone** in enough numbers and distribution to be of concern, and/or species with an **adaptive** classification are in high numbers and distribution in the **transition zone**.

3. Species have moved in one **zone** in high numbers and distribution, and/or species have moved in two **zones** in enough numbers and distribution to be of concern.

2. Species have moved in two **zones** in high numbers and distribution, and/or some species with an **upland** classification have moved into the **deep zone** in enough numbers and distribution to be of concern.

1. Species with an **upland** classification have moved into the **deep zone** in high numbers and distribution.

NA. Not enough **cover** to make evaluation (< 5 percent for groundcover, and < 2 individuals for "shrubs and small trees" and "trees")

| Wellfield/Property: Portfolio | Wetland Name | Wetland Type |
|---|---|---|
| MORRIS BRIDGE | Morris Bridge Clay Gully Cypress | Cypress Isolated |

| Wetland ID: | Prev Yr. Assessment Area Width 2017 | Zone Assessment Notes |
|---|---|---|
| 273 | 5M on each side of transect | Transitional zone too narrow to evaluate. Morris Bridge Clay Gully Cypi |

**Groundcover** (2017 data shaded)

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count(#)(1-4), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

**Transition Zone**

Check if no groundcover 2017 ☐ Current ☐

| 2017 | | | | | Current | | |
|---|---|---|---|---|---|---|---|
| Species | Z | % | # | D | % | # | D |
| pan hemit | NA | 5 | | T | | | |
| syng flavid | NA | 5 | | T | | | |
| and rop glom glauc | OD | 5 | | T | | | |
| hyp myrt | T | | | | | | |
| eup cap | AD | | | | | | |
| eup lep | OD | | | | | | |
| drosera | NA | 5 | | T | | | |
| ilex glabra | AD | 5 | | T | | | |
| lachna carol | NA | 5 | | T | | | |
| xyris spp. | NA | | | | | | |

AD- 5%+1 (5)

**Outer Deep Zone**

Check if no groundcover 2017 ☐ Current ☐

| 2017 | | | | | Current | | |
|---|---|---|---|---|---|---|---|
| Species | Z | % | # | D | % | # | D |
| Amphic muhlen | OD | 20 | | T | 20 | | T |
| ~~Xyris spp.~~ | ~~NA~~ | ~~5~~ | | ~~T~~ | | | |
| Pteroc pycnos | NA | 5 | | T | | | |
| Panicu hemito | NA | 5 | | T | 5 | | T |
| Androp glomer glauco | OD | 5 | | T | 5 | | T |
| Eupato leptop | OD | | 2 | T | 5 | | T |
| Pinus elliot | AD | | 2 | T | | 2 | T |
| Quercu laurif | T | | 1 | T | | 2 | T |
| Syngon flavid | NA | | | | 5 | | T |
| Sabal palmett | NA | | | | | 1 | T |
| Lachn caroli | NA | | | | 5 | | T |
| Drosera sp. | NA | | | | 5 | | T |
| unk herb | NA | | | | | 1 | T |

AD+T: 4 (5)

**Deep Zone**

Check if no groundcover 2017 ☐ Current ☐

| 2017 | | | | | Current | | |
|---|---|---|---|---|---|---|---|
| Species | Z | % | # | D | % | # | D |
| Woodwa virgin | NA | 30 | | T | 40 | | T |
| ~~Eupato leptop~~ | ~~OD~~ | 10 | | T | 5 | | T |
| Juncus effusu solutu | NA | 10 | | T | 10 | | T |
| Androp glomer glauco | OD | 5 | | T | 5 | | T |
| Panicu hemito | NA | 5 | | T | 5 | | T |
| Carex verruc | NA | 5 | | T | 10 | | T |
| Lachna caroli | NA | 5 | | T | 5 | | T |
| ~~Erecht hierac~~ | ~~AD~~ | ~~5~~ | | ~~T~~ | | | |
| Smilax bona-n | AD | 5 | | T | 5 | | T |
| ~~Eupato capill~~ | ~~AD~~ | ~~5~~ | | ~~T~~ | | | |
| Amphic muhlen | OD | 5 | | T | 5 | | T |
| Pinus elliot | AD | | 4 | T | | 1 | B |
| sag grams | NA | | | | 5 | | T |
| Q. laurifolia | T | | | | 5 | | T |
| Q. virginiana | U | | | | | 1 | T |
| taxodium | D | | | | 5 | | T |
| nyssa | NA | | | | | 1 | T |
| polygamum | OD | | | | 5 | | T |

AD+T: 10%+1
U: 1 (N/A) (3)

**Groundcover Comments**

**Zonation**

**Zonation Score:** [3]

Please assign a score of 1-5 or 0 (for N/A) and provide an explanation

**Zonation Score Explanation:**

2 zone move in enough #'s (smilax + laurel oak into Deep)

# Explanations

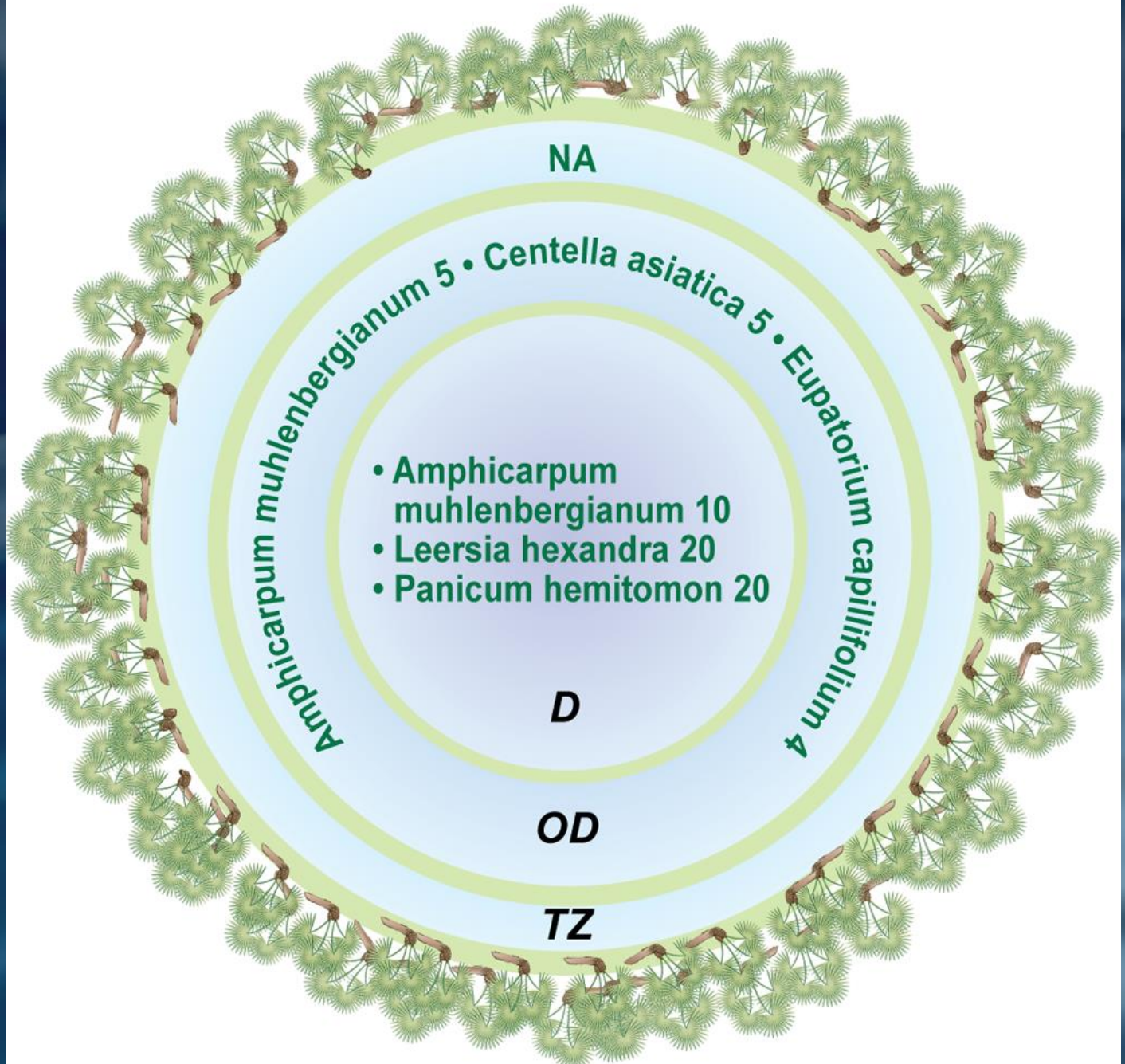
- Explain your score in the Zonation Score Explanation box


  - Critical and mandatory part of process

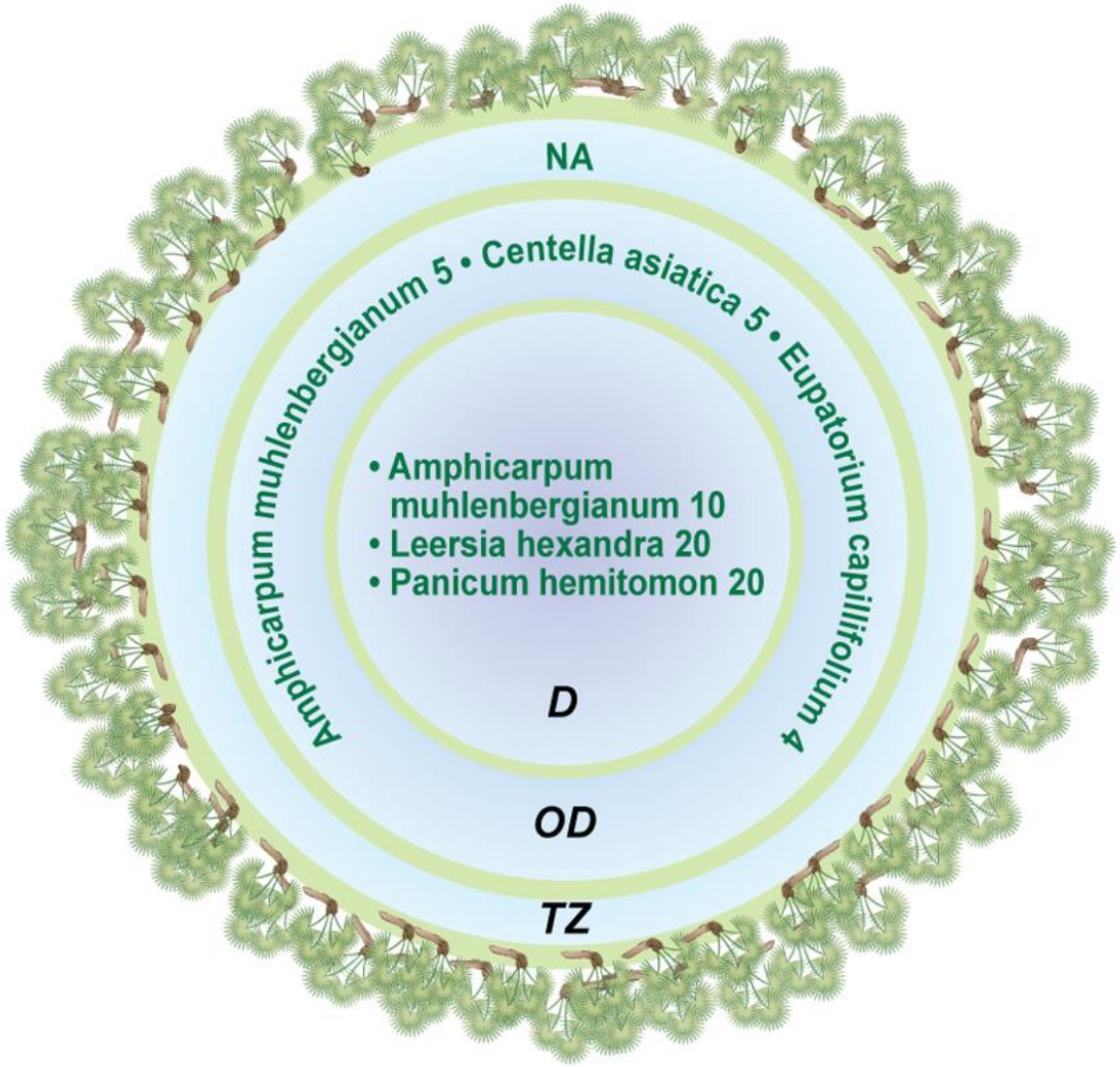
  - Also, comments in the Comments box, if appropriate

# Example Exercises

# Groundcover



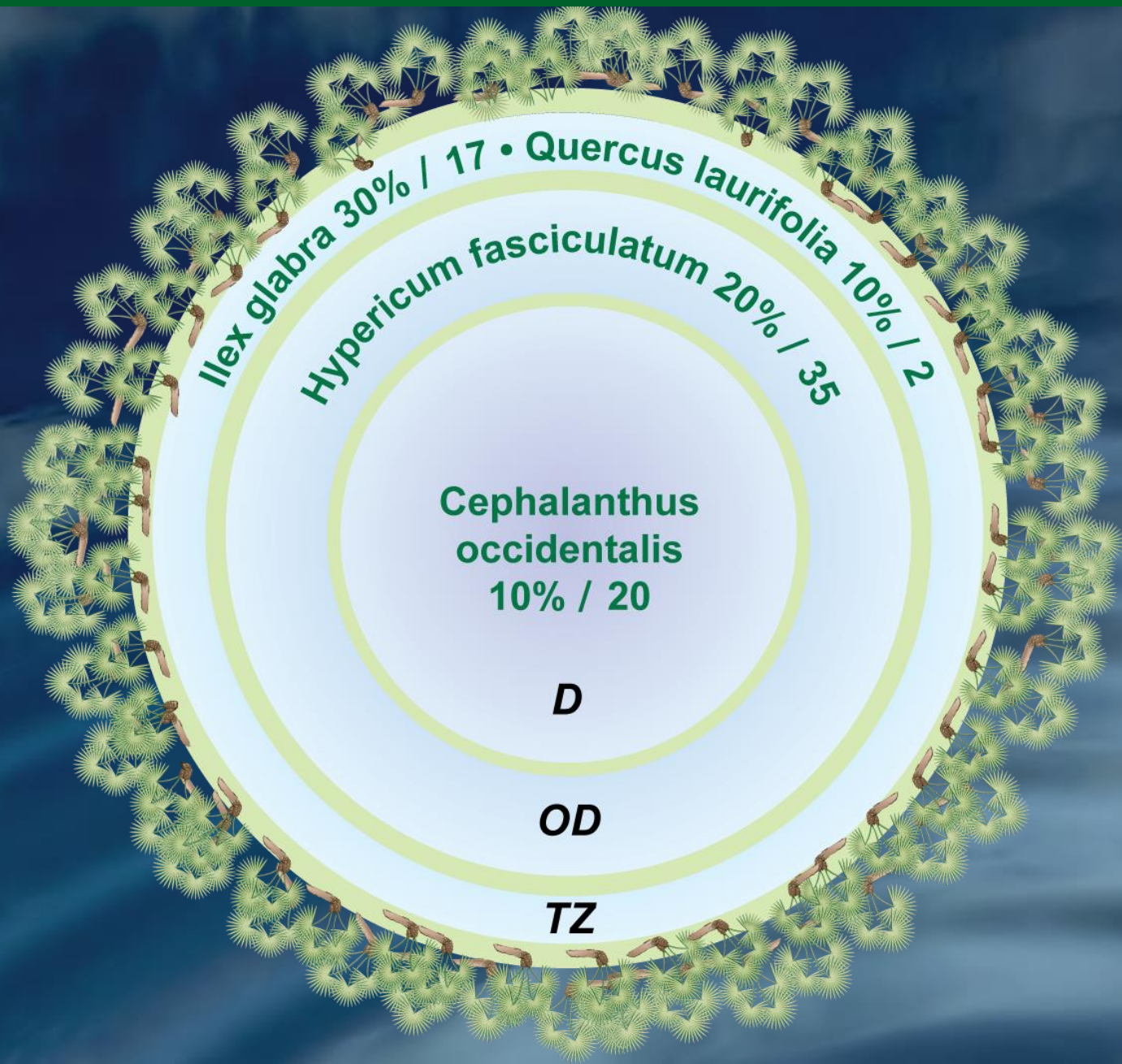
# Groundcover




**Groundcover Zonation Explanation**

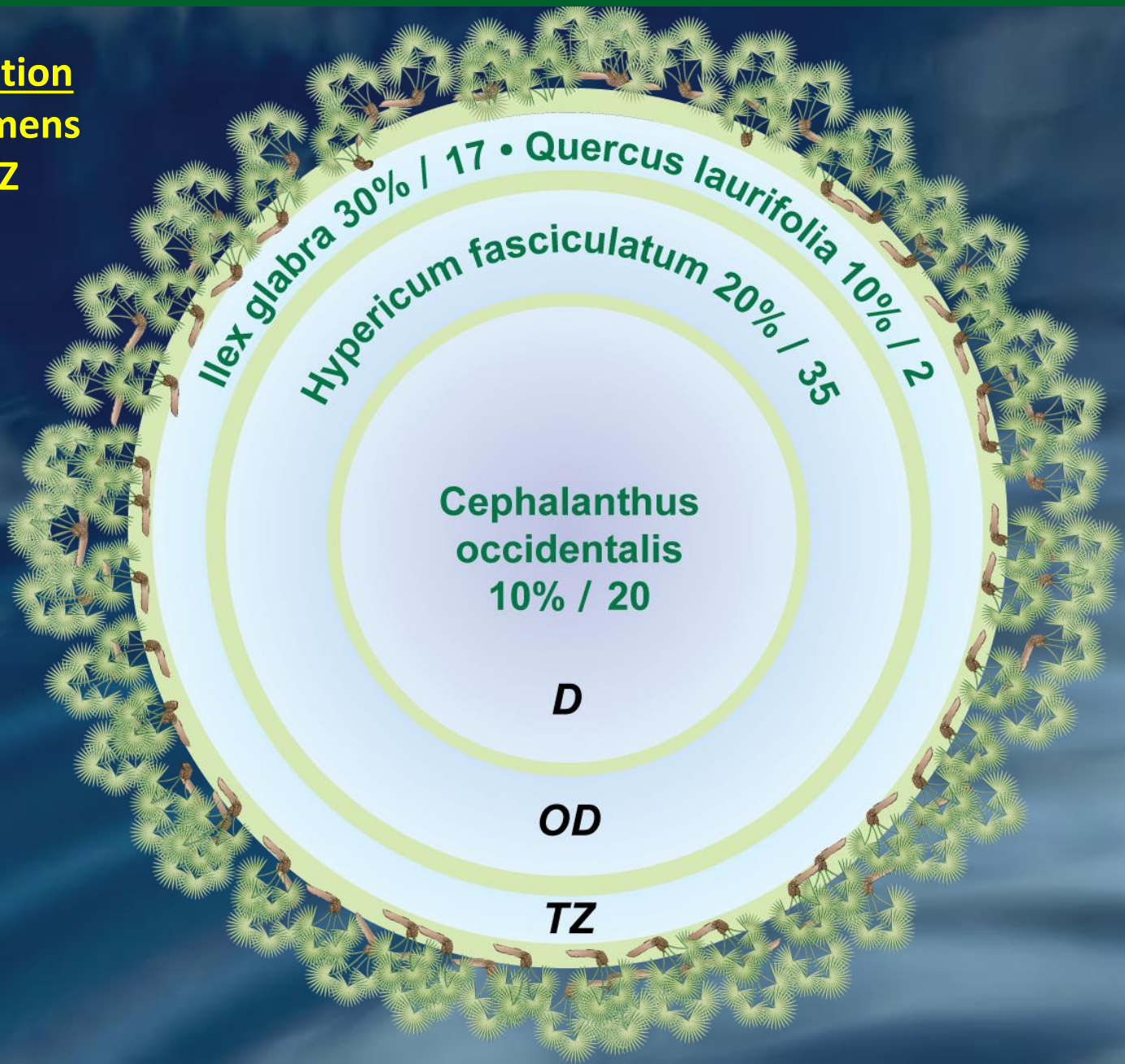
| SCORE | |
|---|---|
| 3 | Species have moved one zone in high numbers and distribution. |

# Shrubs and Small Trees



# Shrubs and Small Trees

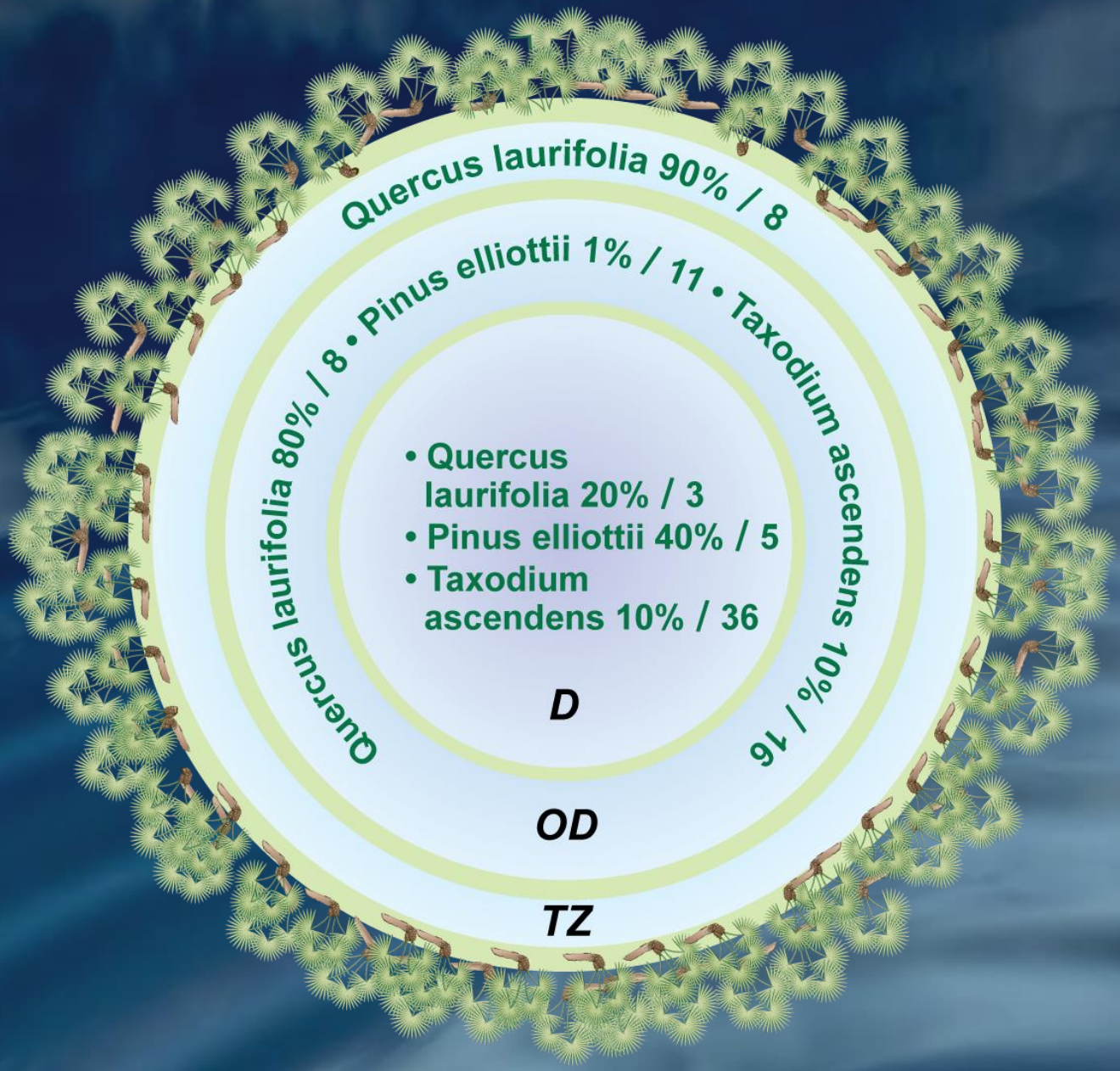
**Zone Explanation**
**> 5 AD Specimens throughout TZ**




Score

4

# Trees

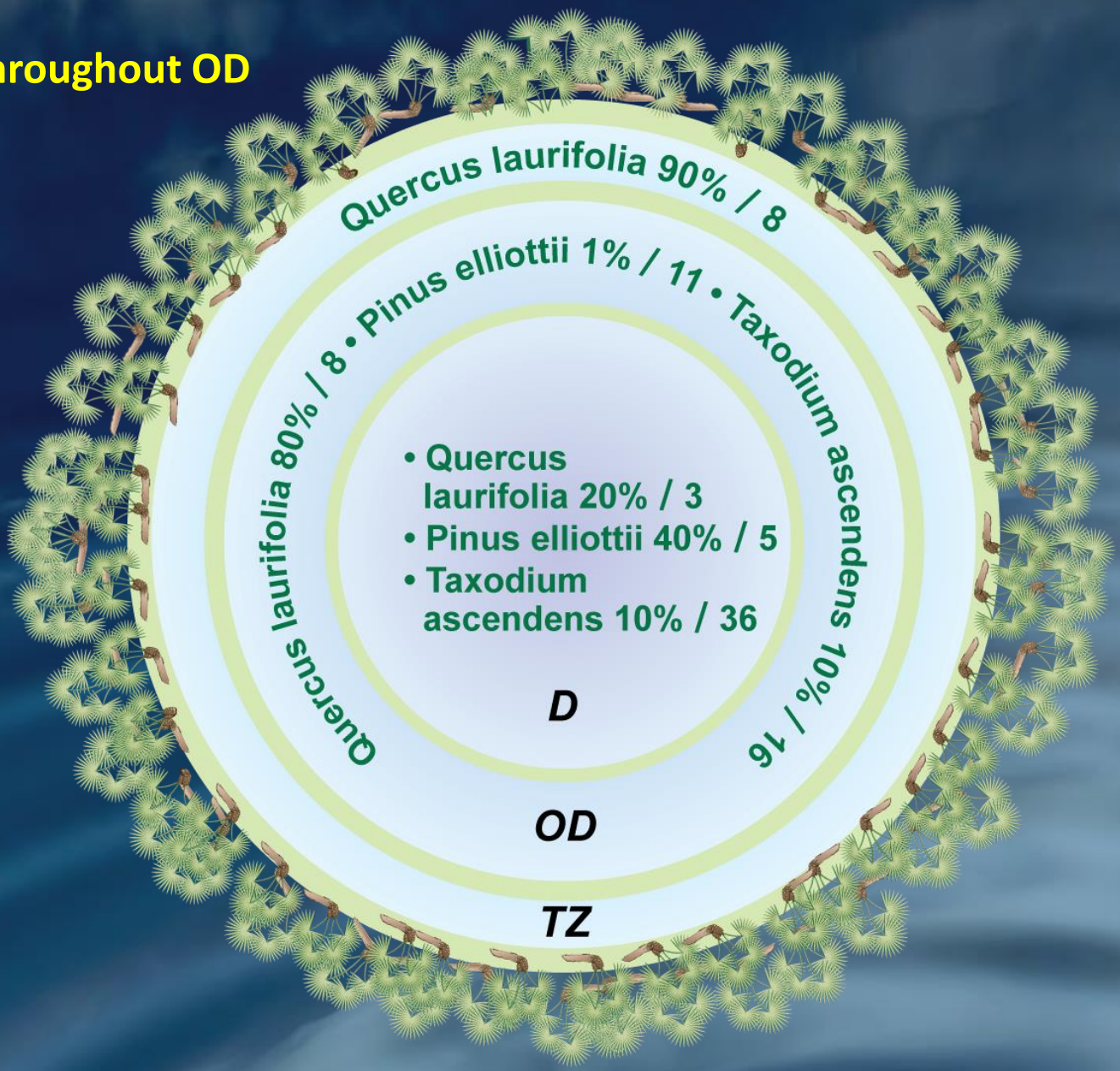

Quercus laurifolia 90% / 8
Pinus elliottii 1% / 11
Taxodium ascendens 10% / 16
Quercus laurifolia 80% / 8
• Quercus laurifolia 20% / 3
• Pinus elliottii 40% / 5
• Taxodium ascendens 10% / 36
D
OD
TZ

# Trees

**Zone Explanation**

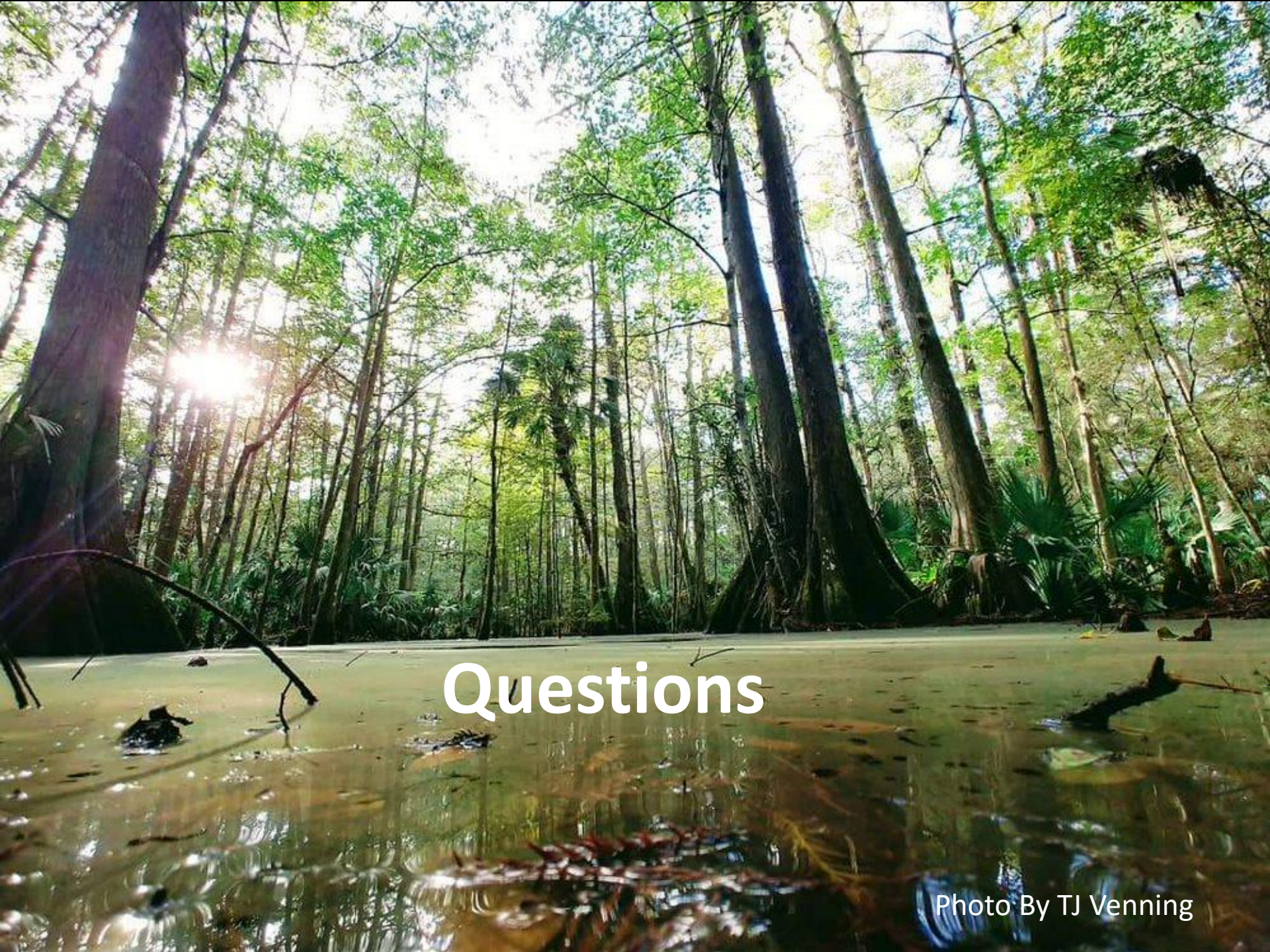
**>5 T/AD Specimens throughout OD**

**>5 T/AD Specimens throughout D**




Score

2


Questions
Photo By TJ Venning

# 2022 WAP Training
# Part 2
# Additional Considerations

# Additional Considerations

- Additional criteria on WAP forms
  - Shrub and Tree Stress (pages 3 and 4)
  - Tree Recovery (page 4)

- Challenging aspects of WAP

# Stress

# Shrubs and Small Trees (page 3)

**Shrubs/Small Trees**

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count (#) (1 - >50), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

**Transition Zone**

Check if no shrubs/small trees ☐

| Species | Z | % | # | D |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Outer Deep Zone**

Check if no shrubs/small trees ☐

| Species | Z | % | # | D |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |

**Deep Zone**

Check if no shrubs/small trees ☐

| Species | Z | % | # | D |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Shrubs/Small Trees Comments**

**Zonation**

**Zonation Score** ☐ Please assign a score of 1-5 or 0 (for N/A) and provide an explanation

**Zonation Score Explanation:**

**Stress**

Signs of stress of appropriate shrubs and small trees (including dead species)

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

Signs of stress of inappropriate shrubs and small trees (including dead species)

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

# Stress (Shrubs and Small Trees)

- Appropriate species – species found in the WAP zone in which they would normally be expected (e.g., *Myrica (Morella)* in Transition zone)
- Inappropriate species – species found in the WAP zone in which they would *not* normally be expected (e.g., *Myrica* in the Outer Deep or Deep zones)
- Include all dead shrubs and small trees (appropriate *and* inappropriate)

# Stress

- Little or None
- Noticeable
- Significant
- Not Applicable

# Stress

- ***Do not*** include non-WAP species in stress *assessment,* but include *comments* for stress/death of non-WAP species

- ***Do not*** include species on hummocks or overhanging from the uplands into Transition zone. It must be rooted in the wetland!

- List the species, specify zone(s), and nature of stress.


*Ilex glabra*

# Stress
# (Shrubs and Small Trees)

**Stress**

Signs of stress of appropriate shrubs and small trees (including dead species) 2014 Data: NOTICEABLE

Hyp fas dead in OD Zone and D Zone.

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

# Trees (page 4)

## Trees

For each zone assessed, please document the following: species abbreviation, WAP zone (ZONE) (U, AD, T, OD, or D), percent cover (%) (5% or 10% - 100% in increments of 10%), count (#) (1 - >50), and distribution (DIST) (E=edge, B=beyond a few feet, or T=throughout).

**Transition Zone Trees**

Check if no trees ☐

| Species | Z | % | # | D |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Outer Deep Zone Trees**

Check if no trees ☐

| Species | Z | % | # | D |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Deep Zone Trees**

Check if no trees ☐

| Species | Z | % | # | D |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Tree Comments:**

## Zonation

**Zonation Score** ☐ Please assign a score of 1-5 or 0 (for N/A) and provide an explanation

**Zonation Score Explanation:**

## Stress

Signs of stress of appropriate trees (do not include dead species)

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

Signs of stress of inappropriate trees (include dead species)

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

Dead/leaning trees (include standing dead trees and dead trees on ground that are appropriate.

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

## Recovery

Signs of tree recovery

- ☐ Yes
- ☐ No
- ☐ Not Sure
- ☐ Not Applicable

Inappropriate vine death suggesting recovery

- ☐ Yes
- ☐ No
- ☐ Not Sure
- ☐ Not Applicable

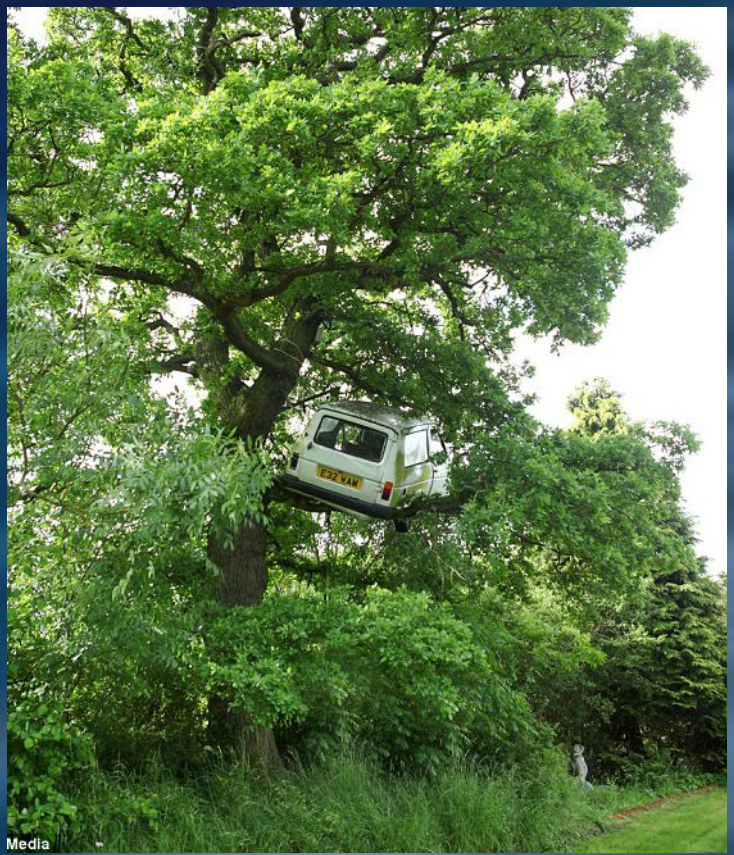
# Stress of Appropriate Trees

**Stress**

Signs of stress of appropriate trees (do not include dead species)

2014 Data: LITTLE OR NONE

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable




Taxodium


Stressed vs. Dead?

# Stress of Inappropriate Trees

Signs of stress of inappropriate trees (include dead species)

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable


*Pinus elliottii*

# Dead and Leaning Trees

**Stress**

Signs of stress of appropriate trees (do not include dead species)

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

Signs of stress of inappropriate trees (include dead species)

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

Dead/leaning trees (include standing dead trees and dead trees on ground that are appropriate.

- ☐ Little or None
- ☐ Noticeable
- ☐ Significant
- ☐ Not Applicable

**Recovery**

Signs of tree recovery

- ☐ Yes
- ☐ No
- ☐ Not Sure
- ☐ Not Applicable

Inappropriate vine death suggesting recovery

- ☐ Yes
- ☐ No
- ☐ Not Sure
- ☐ Not Applicable

# Dead and Leaning Trees

- Include only appropriate trees.
- Include all trees in entire wetland (viewable distance).
- Include standing and fallen dead trees.
- Do not include timbered trees or storm/wind impacts.
- Include leaning trees that are alive (leaning = 30 degrees *or more*.)

Think: **Is it *hydrology* related?**


30º


30º

# Recovery

**Recovery**

Signs of tree recovery — 2015 4 Data: N/A

- ☐ Yes
- ☐ No
- ☐ Not Sure
- ☐ Not Applicable

Example: Young cypress recruitment.

Inappropriate vine death suggesting recovery — 2015 1 Data: N/A

- ☐ Yes
- ☐ No
- ☐ Not Sure
- ☐ Not Applicable

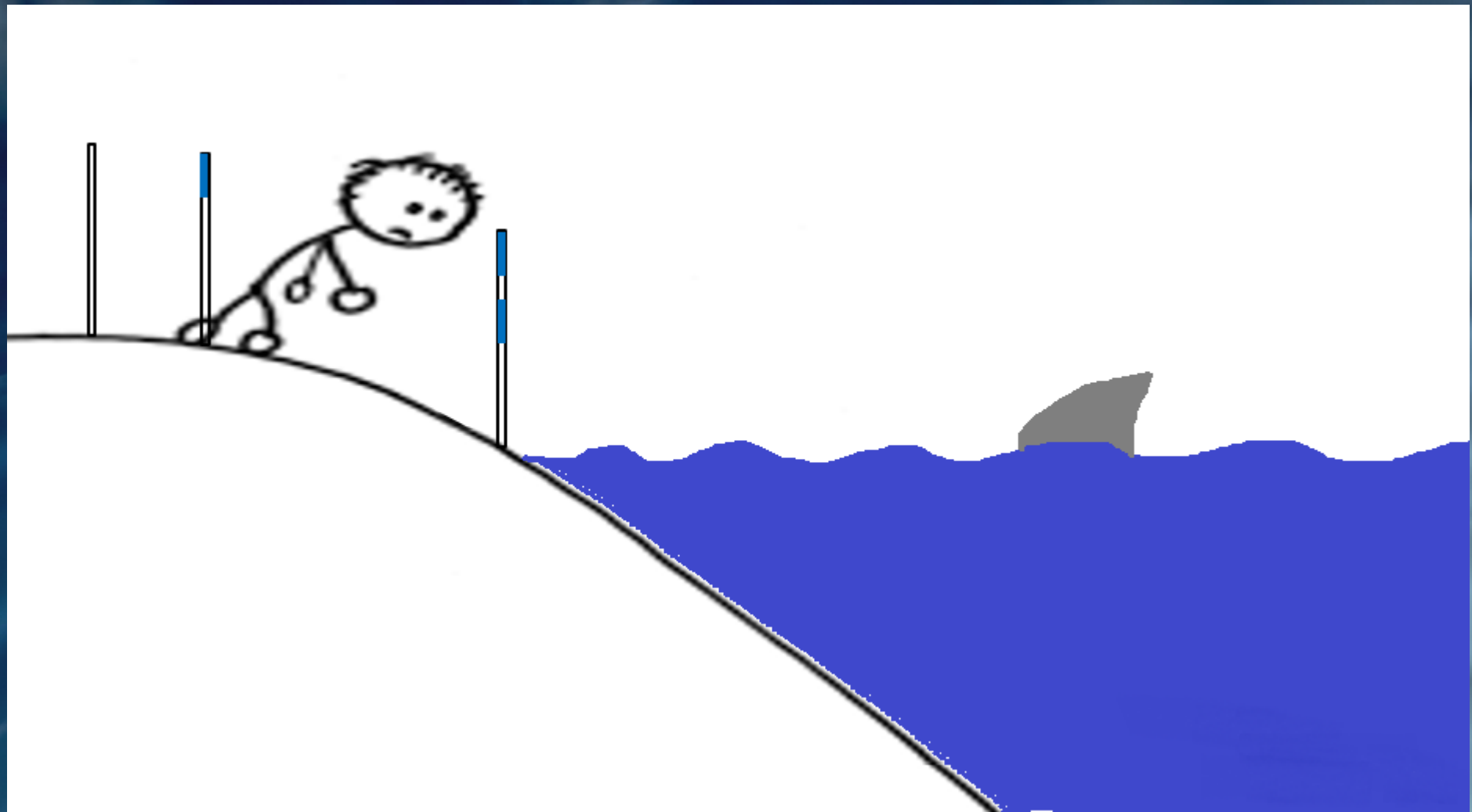
Example: *Vitis* in deeper zones (not on hummock) now dying.

# Challenging Aspects of WAP

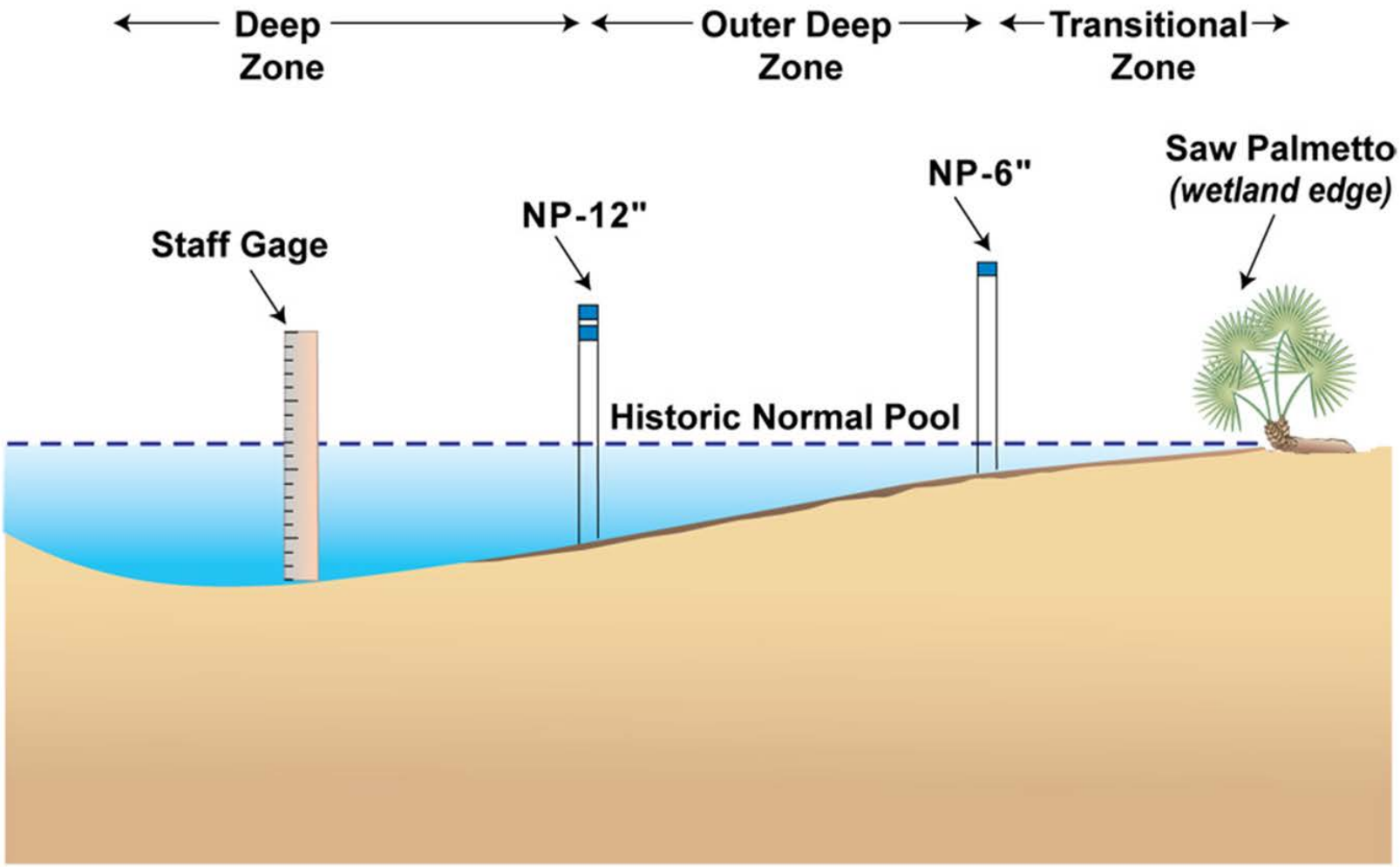
- Knowing the plants / WAP Field ID Guide
- Percent cover
- Topography
- Hummocks
- Writing down explanations
- Trusting your judgement

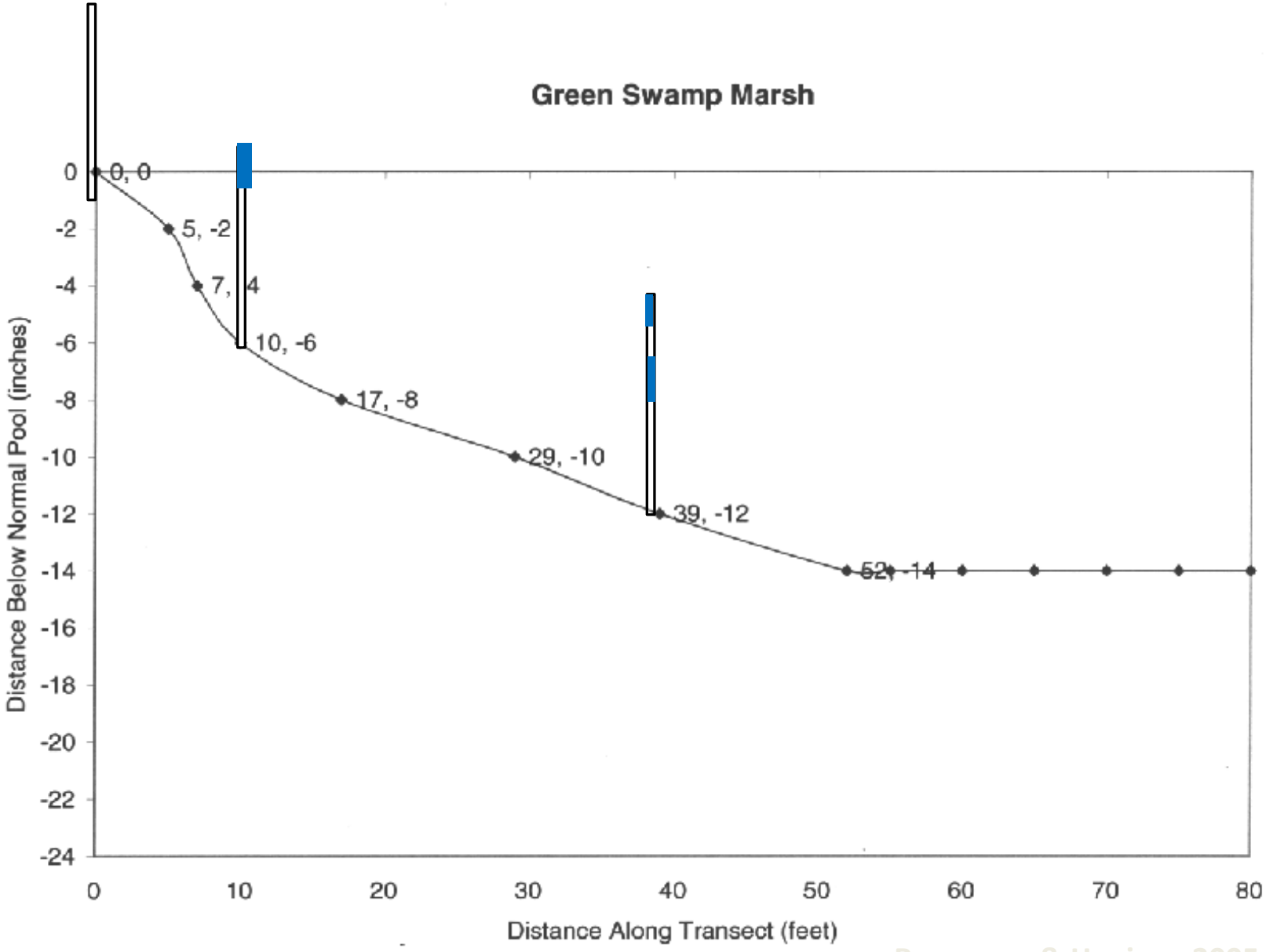
# Knowing the Plants

# Topography
# Transect Issues



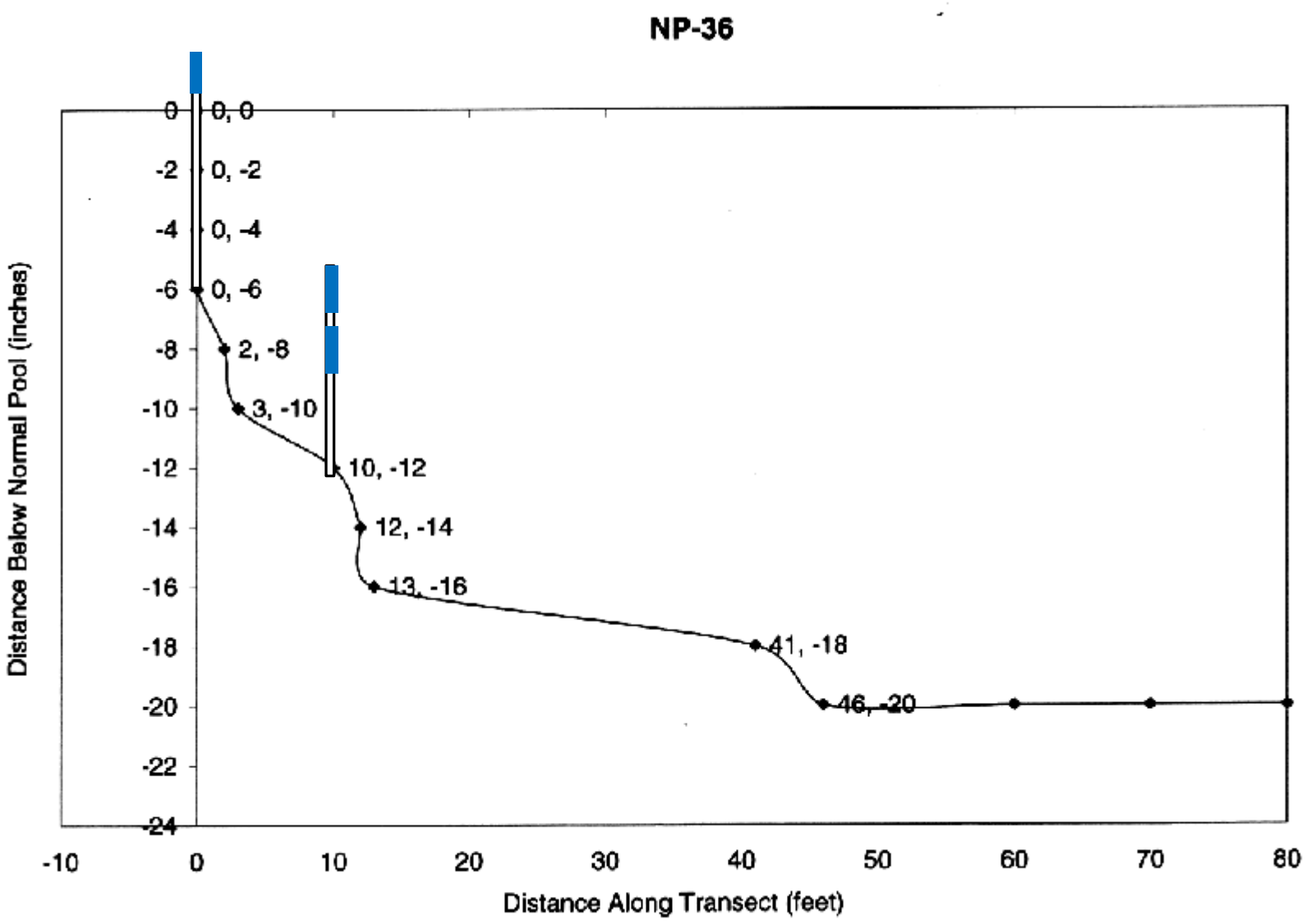
# Example of Typical WAP Transect





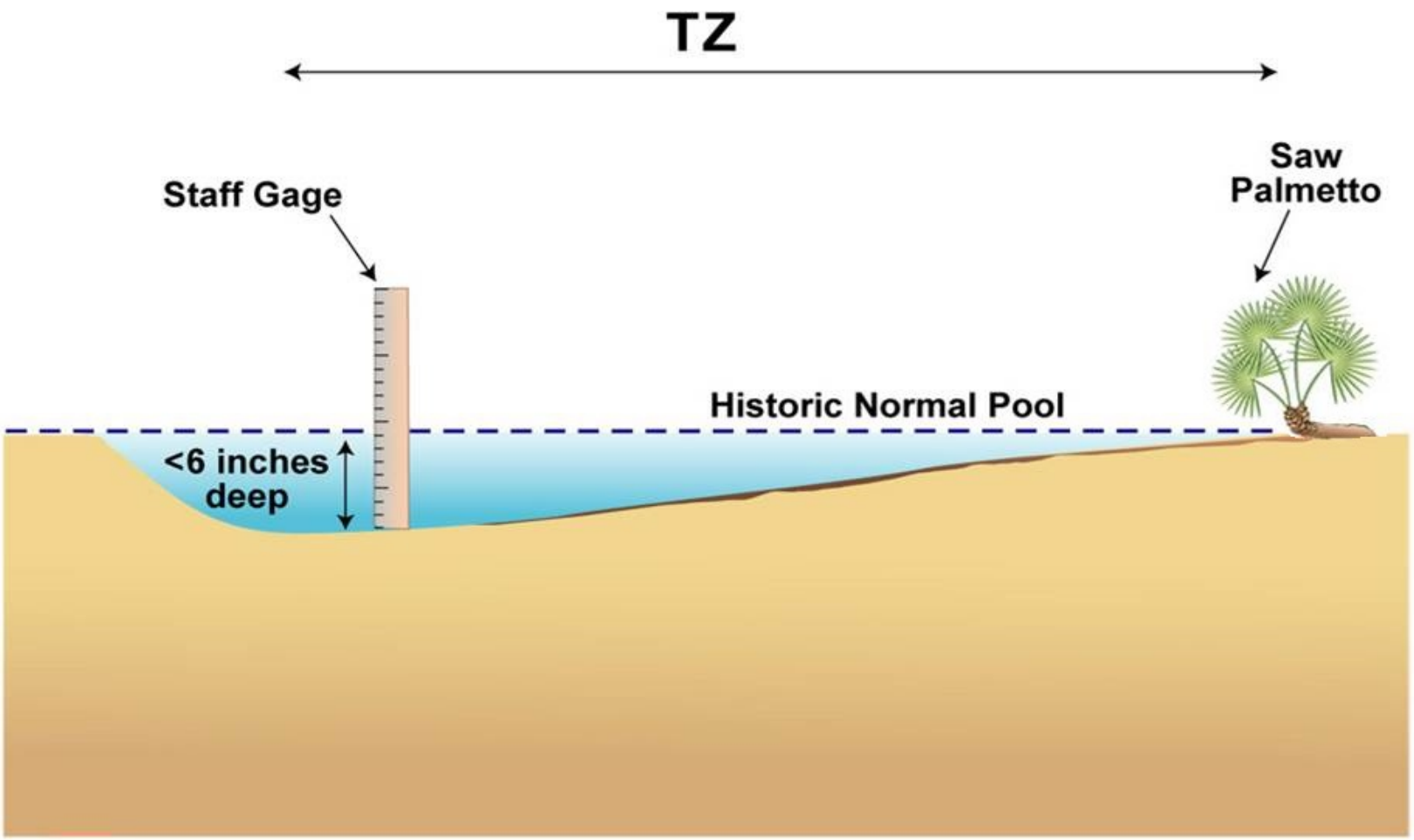

Berryman & Henigar, 2005

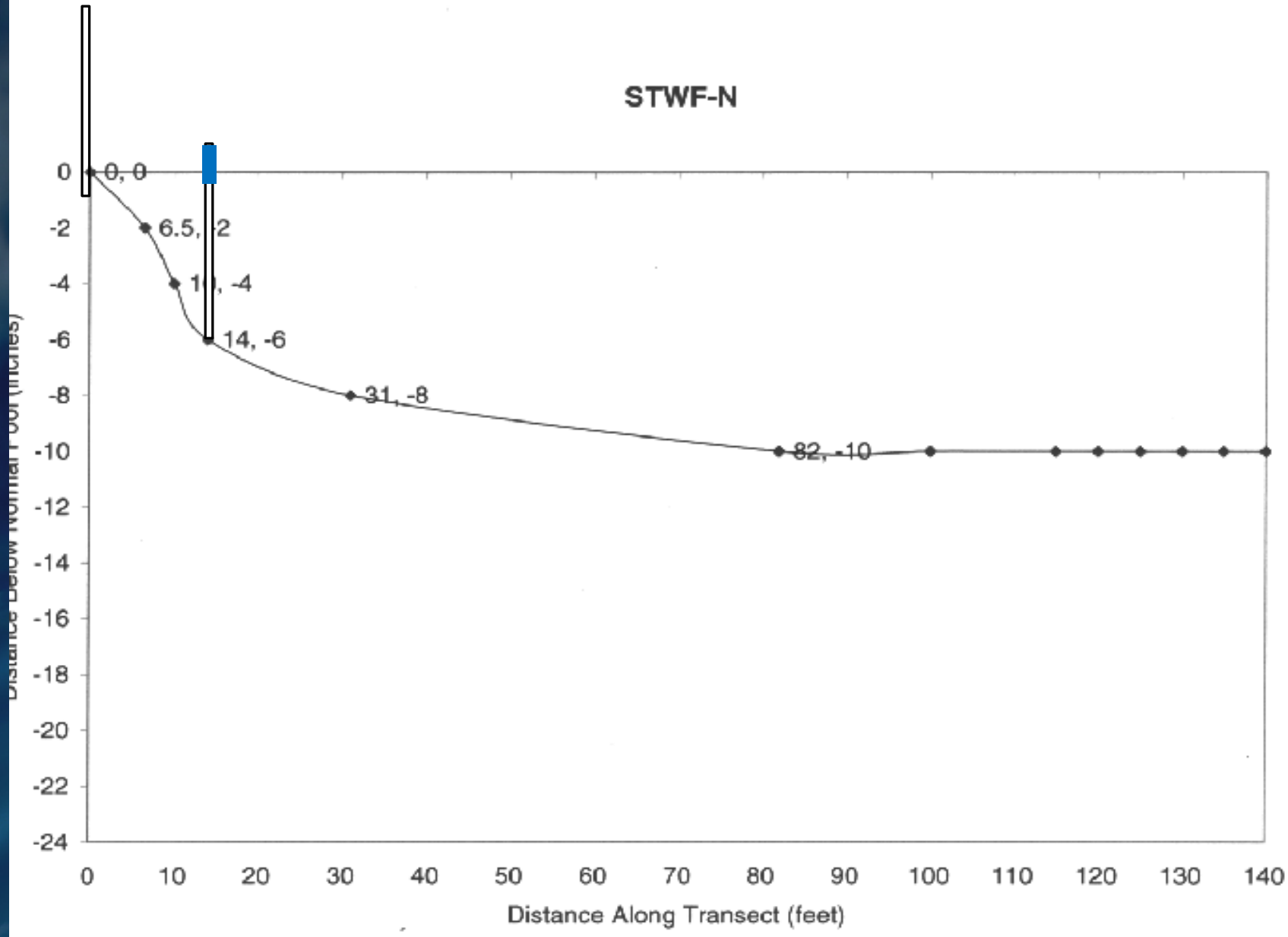
# Missing Zones




Berryman & Henigar, 2005

# *Example of WAP Transect in a Shallow Wetland*

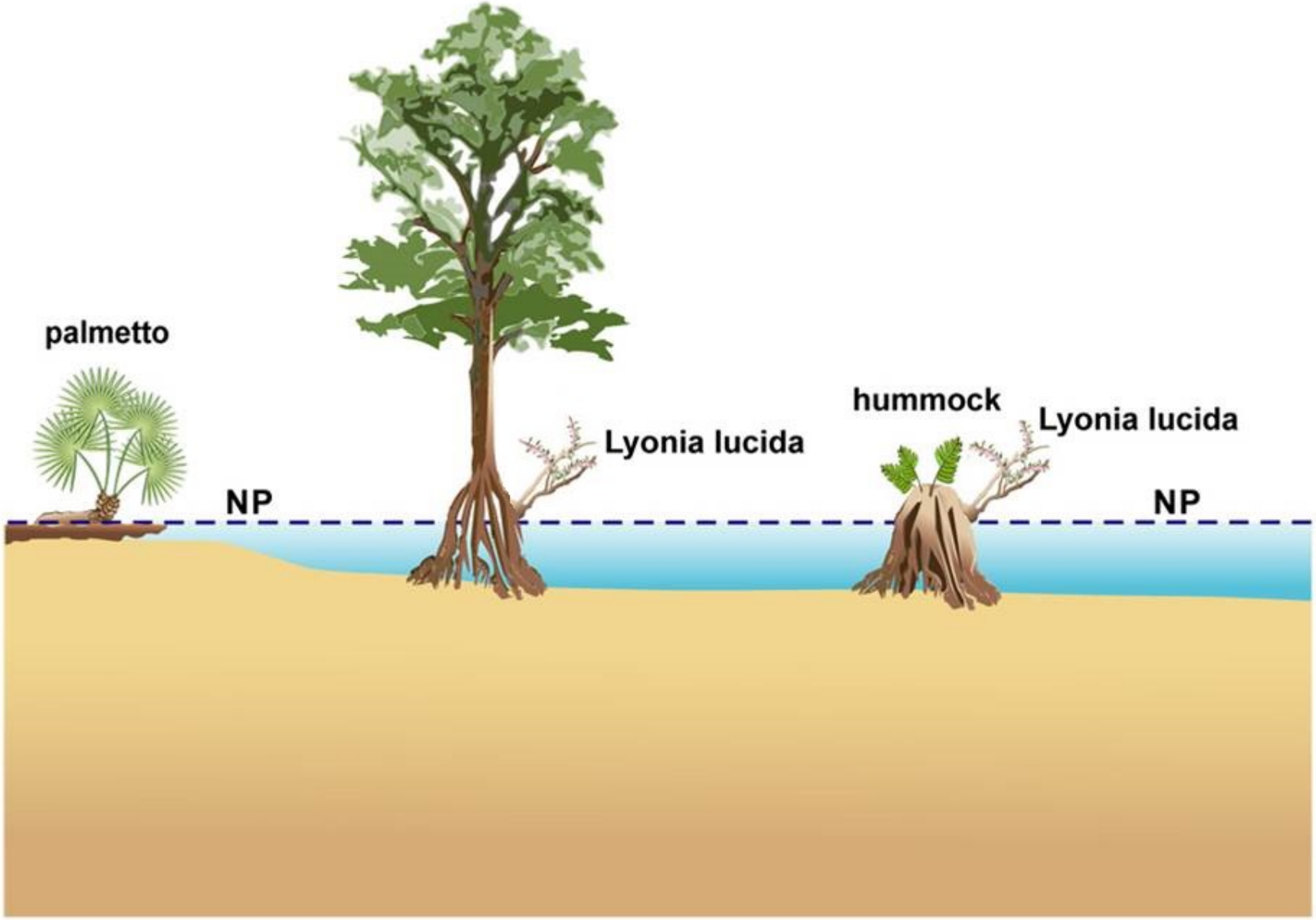




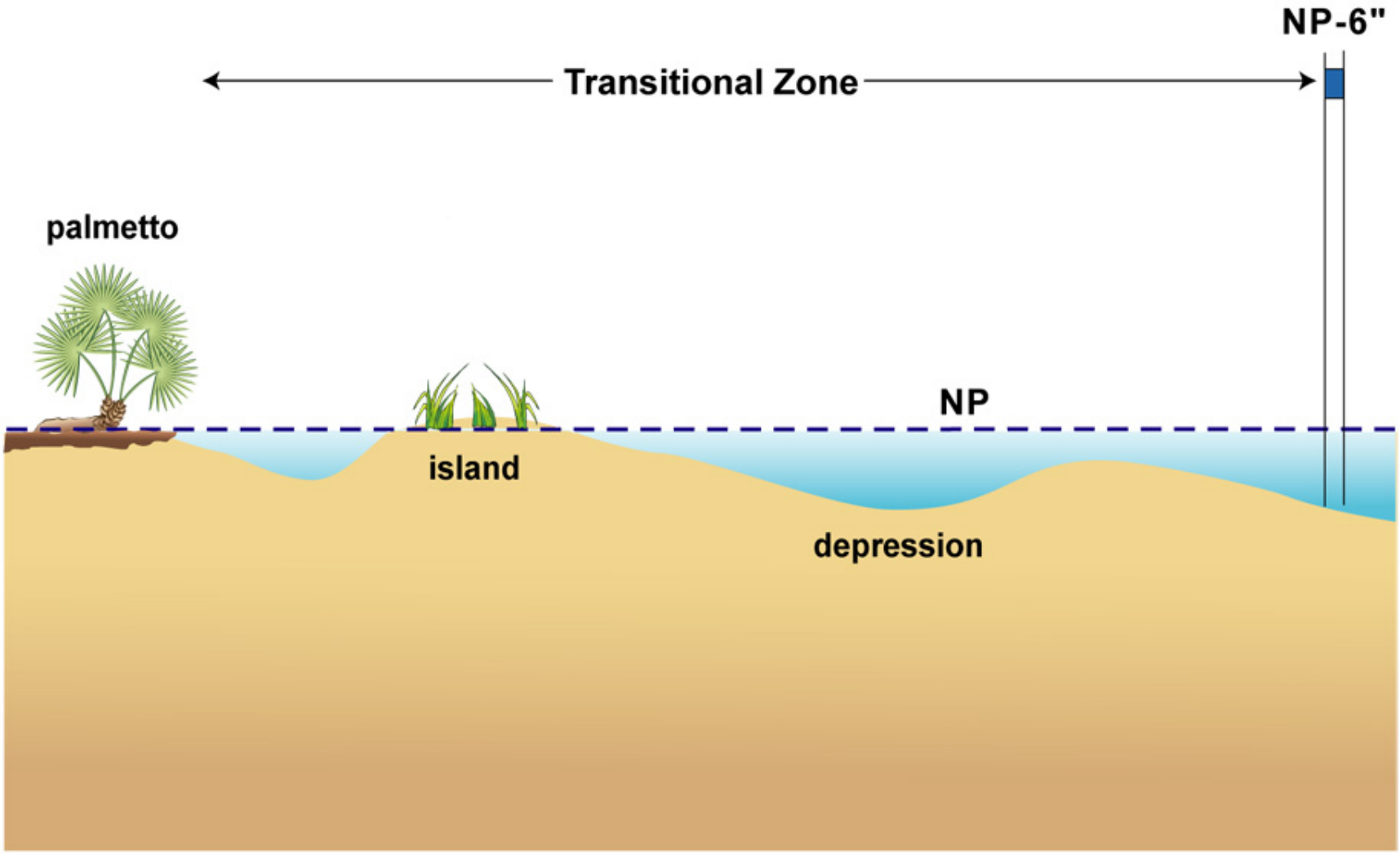

Berryman & Henigar, 2005

# Hummocks

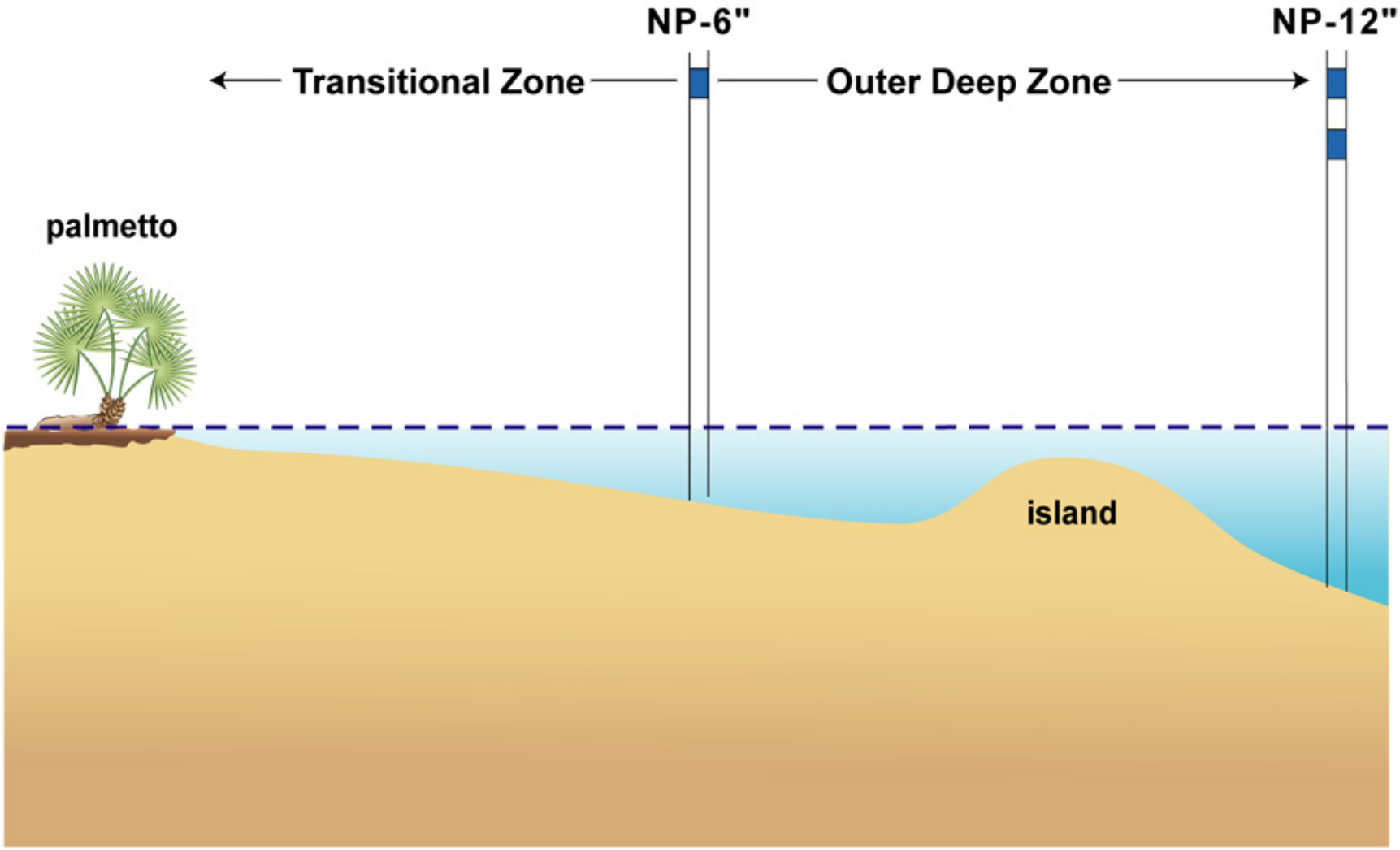
# Tree Bases and Hummocks

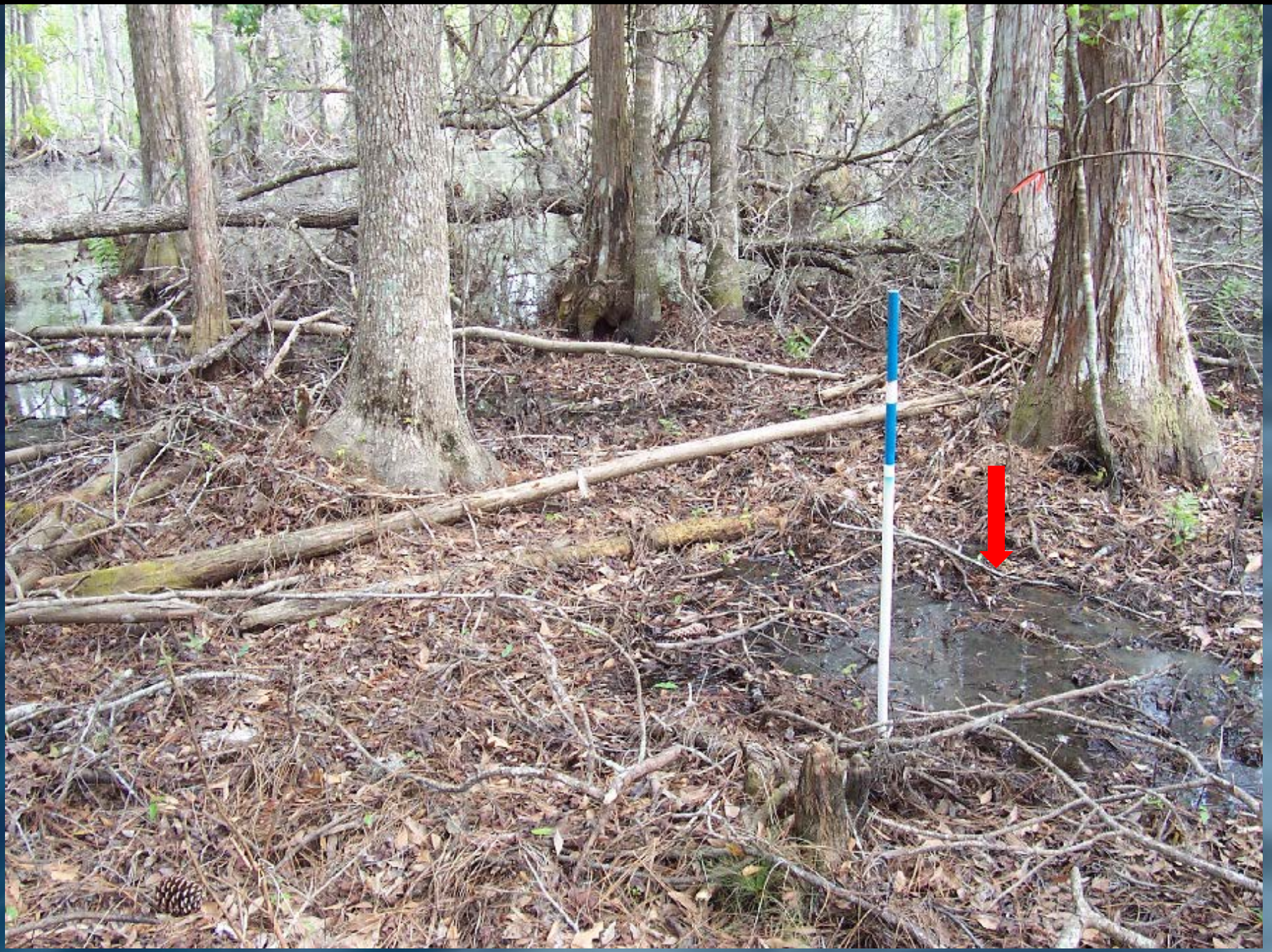


# Island and Depression in the Transitional Zone



# "Island" in the Outer Deep Zone





# Vehicle Impacts

Exclude?
Include?
Note it.

# Appendices of WAP Manual

A - Plant List
B - Definitions
C - Historic Normal Pool and Historic Wetland Edge
D - Wetland Types
E - Wetland History
F - Transect Information “Worksheet”
G - References

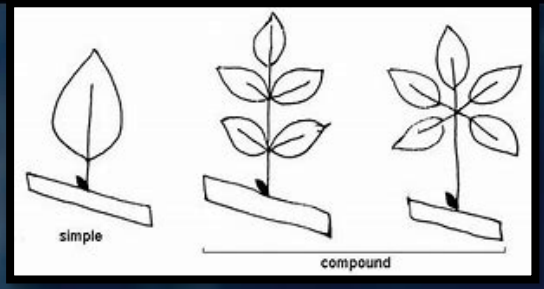
https://www.swfwmd.state.fl.us/projects/ntb-wetland-assessment-procedure

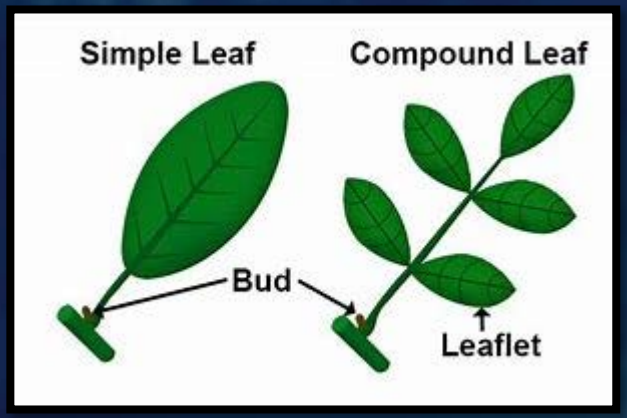
# 2022 WAP Training
# Plant ID 101

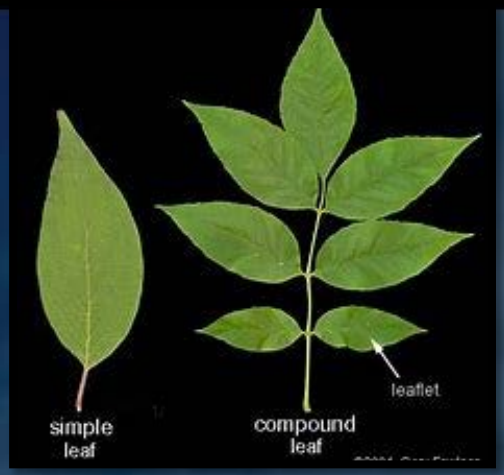
**Prepared by**
**Kym Rouse Holzwart**
**Senior Environmental Scientist**

Southwest Florida
*Water Management District*

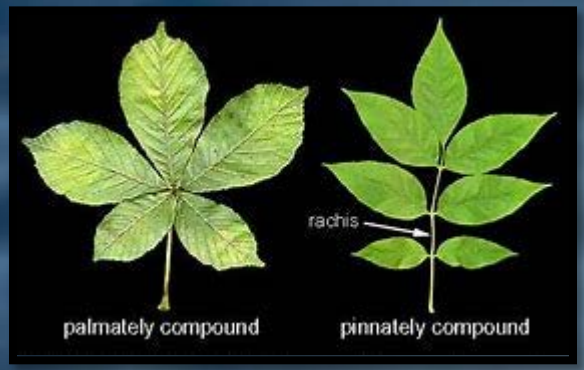
# Leaf Types





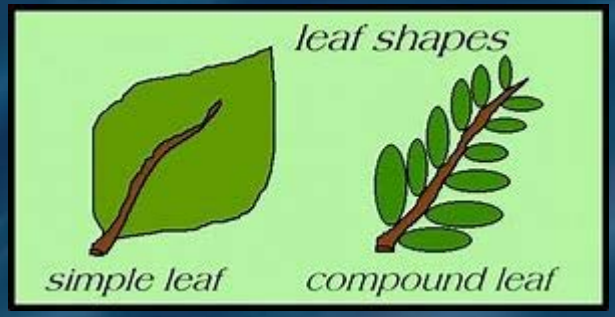


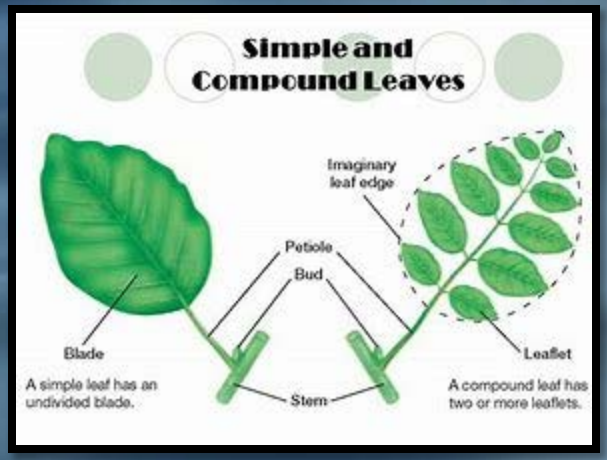

***Difference between simple leaves and compound leaves, simple and compound leaf forms***

| Simple leaf | Compound leaf |
|---|---|
| 1. Consists of a single lamina.<br>2. The bud is usually present at the leaf axil.<br>3. Stipules may be present at the base.<br>Examples: mango, *peepal, guava* | Consists of several leaflets.<br>The bud is not present at the axils of the leaflets.<br>Stipules are not present at the base of the leaflets.<br>Examples: neem, rose, tamarind |

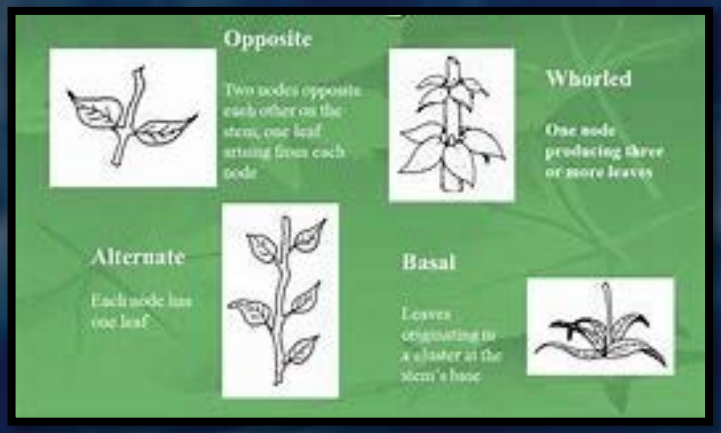
***Simple and compound leaf***

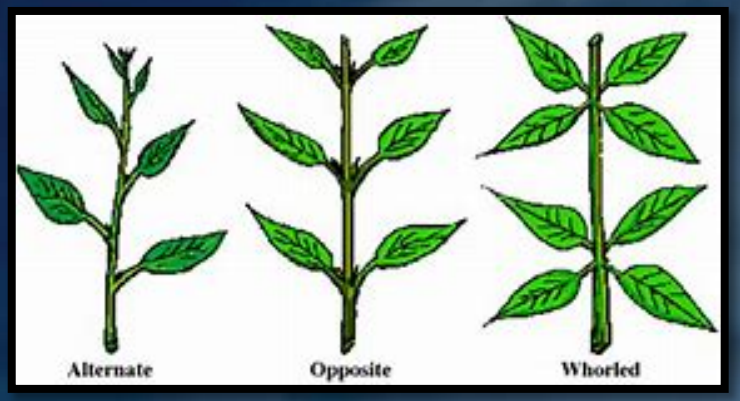
- In simple leaves, the leaf surface is not divided into leaflets. It has only one blade or lamina. The leaves of papaya, mango and money plant are simple leaves.
- In compound leaves, the leaf lamina is divided and is not a unit. A leaf with more than one blade is known as a compound leaf. The blades of a compound leaf are called leaflets. Rose, neem and walnut have compound leaves.

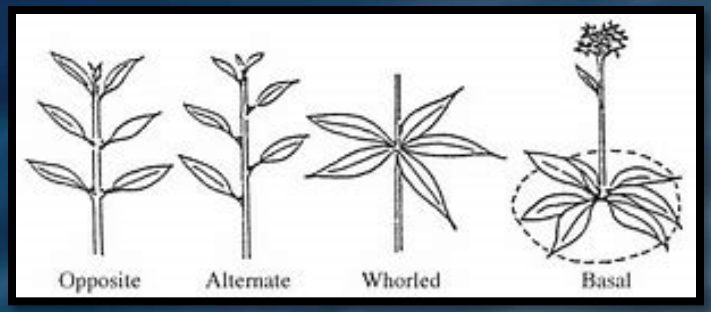



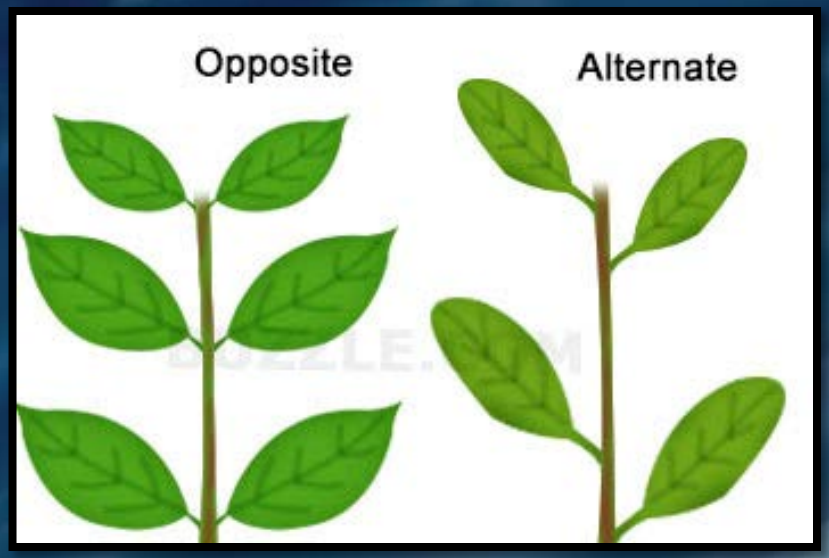



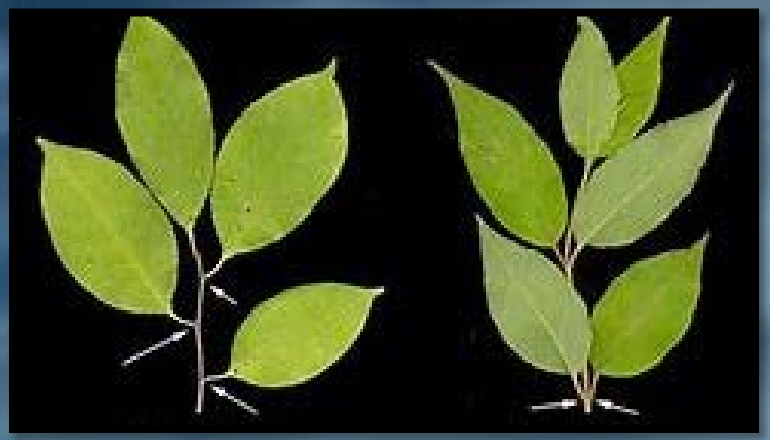
# Leaf Arrangement



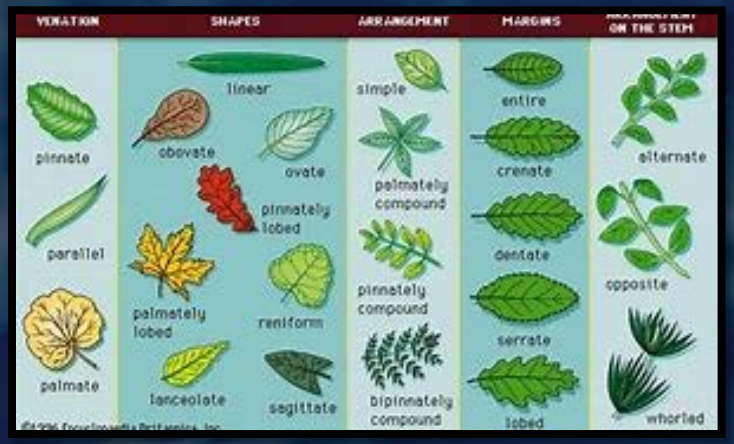



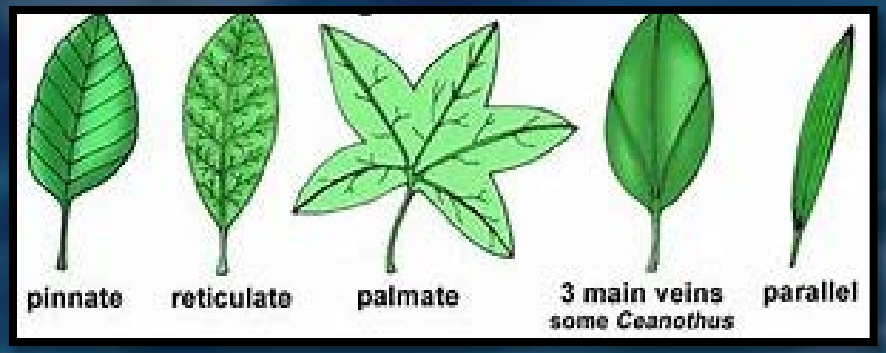



# Leaves


VENATION
SHAPES
ARRANGEMENT
MARGINS
ON THE STEM
pinnate
parallel
palmate
linear
obovate
ovate
pinnately lobed
palmately lobed
reniform
lanceolate
sagittate
simple
palmately compound
pinnately compound
bipinnately compound
entire
crenate
dentate
serrate
lobed
alternate
opposite
whorled


Entire
eg. beech


pinnate
reticulate
palmate
3 main veins
some Ceanothus
parallel


Leaf Venation
How veins are arranged on the leaf
pinnate
reticulate
palmate
3 main veins
parallel

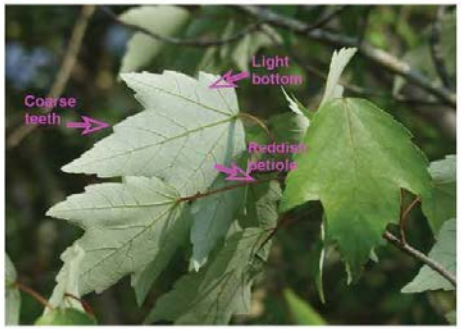
# Must-Know Plants on the WAP List

- Of the 111 WAP plants, 65 are considered “must know” to correctly complete a WAP assessment
- Must know = Incorrect identification could affect the WAP score
- 62 plants are U, T, AD, or OD (3 are D)
- Recommendation: If you are new to plant identification, focus on learning the 65 must-know plants first

# Red Maple (*Acer rubrum*) and Sweetgum (*Liquidambar styraciflua*)

*Acer rubrum* | **Red maple** | **WAP Zone: OD**




Tree. Leaves opposite with reddish petioles, usually 3-lobed (if 5 lobes, then bottom ones are small), margin with coarse teeth. Tree has smooth, light gray bark. Fruits in January – February, pair of winged samaras. Depending on time of year, there is almost always something red associated with this tree.
**Similar Species** – *Liquidambar styraciflua* has 5 lobes with small teeth, alternate leaves.

*Liquidambar styraciflua* | **Sweetgum** | **WAP Zone: T**



Large tree with straight trunk. Twigs sometimes with corky wings. Leaves alternate, 5-lobed (star-shaped), fine teeth on edge. Older leaves may be purple-black. Pale bark, with deep furrows separating narrow, round-tipped, scaley ridges, broken up into small blocks (looks like paint drying). Fruit a spiny ball of capsules. Most common in moist bottomlands and uplands near wetland edges.
**Similar Species** – *Acer rubrum* has smooth bark, opposite leaves with 3 lobes.

# Blue Maidencane (*Amphicarpum muehlenbergianum*)

*Amphicarpum muhlenbergianum*

**Blue maidencane**

**WAP Zone: OD**

Sod-forming grass. Lance-shaped leaves bluish in color, central vein not obvious, many parallel veins, outer edge of leaf white, leaves feel stiff, sheaths hairy. Dead leaves tend to curl.
Shallow wetland and transitional areas, typically open.
**Similar Species** – *Panicum hemitomon* has longer bright green leaves.
*Dichanthelium* spp. grows in distinct clumps.

# *Andropogon* spp.

*Andropogon glomeratus* — **Bushy bluestem** — **WAP Zone: T**




Grass, tall (to 5 ft). Grows in dense tufts. Leaves mostly longer than 35 cm, usually flat, not folded, medium green, often blotched with red spots. Ligule thin, papery, usually more than 1 mm long. Sheath long. Inflorescence dense, "hairy" with awns and hairs. Looks bushy and somewhat flat-topped, silvery turning medium brownish-orange. Wide variety of open, moist, disturbed areas.
**Similar Species –** *Andropogon virginicus* has folded leaves with bluish cast, old inflorescences turn pale orange.

*Andropogon glomeratus var. glaucopsis* — **Purple bluestem** — **WAP Zone: OD**


Similar to *A. glomeratus*, but somewhat smaller. Leaves blue-green with lavender chalky bases. Inflorescence, not as bushy as *A. glomeratus*, but bushier than *A. virginicus*. Marshes, moist disturbed areas.
**Similar Species –** *Andropogon virginicus* var. *glaucus* has pale blue chalky leaves shorter than 35 cm.

*Andropogon virginicus* — **Broomsedge bluestem** — **WAP Zone: AD**






ass to 6 ft tall (generally 3-4 ft). Tufted. Branches 1-3 at nodes. Ligules thin, papery, less than 1 mm, c with fringe of hairs. Leaf sheaths with long hairs on margins. Blades shorter than *A. glomeratus*, folde more bluish in color, more hairy and rough on upper surface near the base. Inflorescence finer (fewer branches) than *A. glomeratus*. Old inflorescences turn pale orange in winter.

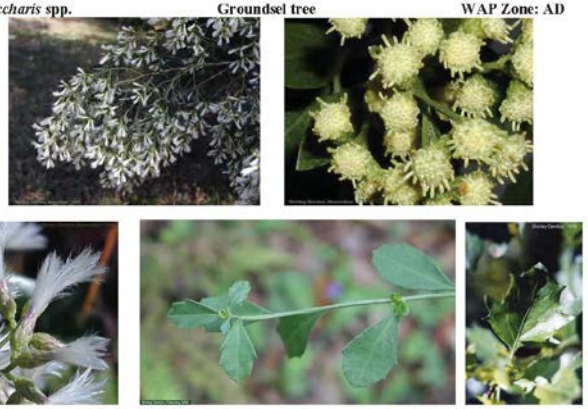
*Andropogon virginicus var. glaucus* — **Chalky bluestem** — **WAP Zone: U**



Grass. Similar to *A. virginicus* but much shorter and blue-white, chalky character. Typically found in dry uplands.
**Similar Species –** *Andropogon glomeratus* var. *glaucopsis* has longer leaves, purple-colored bases.

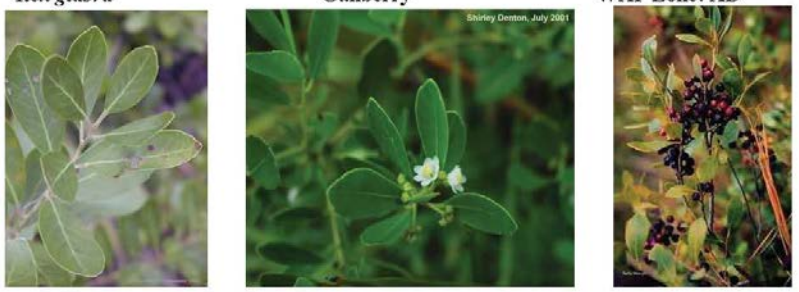
# *Baccharis* spp., Wax Myrtle (*Myrica/Morella cerifera*), Gallberry (*Ilex glabra*), and Fetterbush (*Lyonia lucida*)

*Baccharis* spp. Groundsel tree WAP Zone: AD



Shrub. Alternate leaves dark green in color. Leaves with shallow lobes or coarse teeth. *B. glomeruliflora* lacks punctate glands on leaves; flowers not stalked. *B. halimifolia* has punctate glands on leaves, flowers stalked (stalks sometimes very short). *B. augustifolia* will not be in WAP wetlands (coastal).
**Similar Species** – *Myrica cerifera* has orangish buds with amber-colored dots on leaves.

*Ilex glabra* Gallberry WAP Zone: AD



Shrub, usually to about 3 ft though may get to be very tall and leggy in shade. Clonal. Leaves alternate, thick, dark green, evergreen; have a few blunt teeth near the tip. Flowers white. Fruits a black drupe (not edible, note the common name!) Typically found in flatwoods especially on the edges of flatwoods ponds, may be in transitional edges of wetlands. Occasionally on hummocks.
**Similar Species** – *Baccharis* has leaves with coarse teeth and is not clonal.

*Myrica cerifera* Wax myrtle WAP Zone: AD


Large shrub. Leaves alternate, narrow, typically a few teeth especially near tip. From a distance, new foliage has orangish cast. Amber-colored dots on leaves. Flowers in small, woody, cone-like clusters (catkins) in leaf axils and directly from stems. Mature into somewhat woody, waxy fruits. May be in unburned flatwoods, low disturbed areas, wetland transition zones. May be on hummocks in deep zones.
**Similar Species** – *Baccharis* has shorter dark green leaves with coarse teeth.

*Lyonia lucida* Fetterbush WAP Zone: T

Shrub, usually about 4 ft tall but can get much taller in shade or if protected from fire. Leaves evergreen, alternate, thick, margin thickened by presence of vein along the edge of the leaf, other lateral veins not very obvious. Flowers hang downward from nodes (spring-early summer), pink to white, urn-shaped, with united petals; fruit a capsule. Flatwoods, wetland edges. Often occurs on hummocks in the interior of swamps.

# *Centella asiatica* and *Hydrocotyle umbellata*

***Centella asiatica*** **Coinwort** **WAP Zone: T**

Low herb spreading by runners. Leaves shaped like a rounded arrowhead, palmately veined, margins slightly dentate (coarse teeth) or sinuate (wavy). Flowers small, in clusters near base of plant, greenish –white to pinkish but generally inconspicuous. Despite the scientific name, this is a native species.
**Similar Species –** *Dichondra caroliniensis* has smaller leaves with no teeth;
*Viola* grows in clumps and has leaves with long petioles.

***Hydrocotyle umbellata*** **Manyflower marshpennywort** **WAP Zone: OD**

Low herb spreading by stems. Leaves with long petioles. Leaves peltate (petiole attached in center of blade), round, deeply crenate. Flowers in simple (unbranched) umbels.
Typically in moist soils and may be floating in mats.
**Similar Species –** Other *Hydrocotyles* have multiple or branched umbels;
*H. ranunculoides* not peltate, notched almost to base of petiole.

# Persimmon (*Diospyros virginiana*) and Buttonbush (*Cephalanthus occidentalis*)

*Diospyros virginiana* **Common persimmon** **WAP Zone: AD**





Tree, usually small. Leaves alternate, entire (not toothed), strong central vein. Leaves often hairy when young, shiny and glabrous (not hairy) when older, especially in full sun. No smell. Leaves often have black spots, veins form net pattern on bottom. Older bark dark, with rectangular blocks.
**Similar Species –** *Cephalanthus* has opposite leaves, *Nyssa* has leaves widest above the middle.

*Cephalanthus occidentalis* **Common buttonbush** **WAP Zone: D**




Shrub typically to 10 ft tall. Arching branches. Bark with raised lenticels. Leaves opposite to whorled (3). Veins ladder-like, sunken below surface, do not extend to leaf edge, glabrous (no hairs), no teeth. Flowers in a dense, round head, white. Fruits form hard balls ("buttons"). Can grow in deep water with long duration of inundation.
**Similar Species –** *Diospyros virginiana* has alternate leaves.

# Fireweed (*Erechtites hieraciifolius*)

***Erechtites hieraciifolius*** **American burnweed; fireweed** **WAP Zone: AD**



Herb, usually about 3 ft (said to get up to 10 ft but not typical). Stem leafy from a basal rosette that disappears as the plant matures. Leaves light green, toothed, usually elliptic, occasionally larger leaves lobed; alternate. Heads cylindric (never "open"), all disk flowers, cream color. Single row of involucral bracts. Fruit an achene with long white hairs (pappus) that make the plant more visible in fruit than in flower. Disturbed areas (wet or dry). A weed's weed.

**Similar Species** – *Cirsium* has sharp spines. *Lactuca* has milky sap.

# Dogfennel (*Eupatorium capillifolium*) and Falsefennel (*Eupatorium leptophyllum*)

***Eupatorium capillifolium*** **Dogfennel** **WAP Zone: AD**


Tall (up to 6 ft), multi-stemmed herb. Finely divided leaves.
Stems of young growth hairy. Flowers white, surround racemes.
**Similar Species** – *E. leptophyllum* has reddish young stems with few hairs , flowers on one side of raceme.

***Eupatorium leptophyllum*** **Falsefennel** **WAP Zone: OD**



Medium (to 4 ft) herb. Young stems have no or few hairs. Leaves finely divided.
White flowers stick up on one side of raceme.
**Similar Species** – *E. capillifolium* has young stems with many white hairs; *E. compositifolium* is sticky.
*Ptilimnium* leaves have short stalks with more secondary branching, especially at base.

# Slender Flattop Goldenrod (*Euthamia caroliniana*)

*Euthamia caroliniana*
*Euthamia minor*

**Slender flattop goldenrod**

**WAP Zone: AD**

Herb to about 3 ft tall, clonal by rhizomes. Stems erect, leafy, most branches near top. Linear alternate leaves. Flowers in flat-topped inflorescences, in small heads, both ray and disk flowers yellow. Typically found in open areas, old fields, flatwoods, and marsh edges. May become very abundant in dry marshes.

# Elliott's Milkpea (*Galactia elliottii*)

*Galactia elliottii*


**Elliott's milkpea**

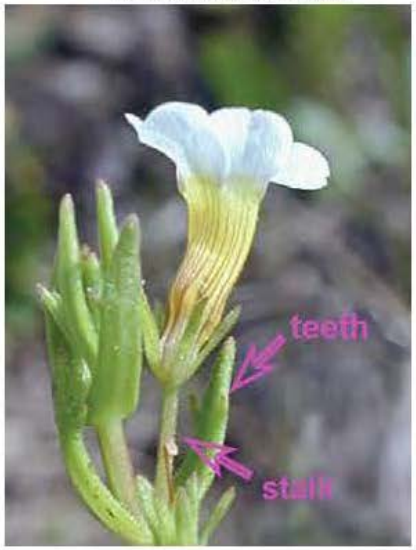

**WAP Zone: U**


Trailing vine (does not climb trees). Leaves alternate, pinnately compound, typically 5 to 7 leaflets with blunt tips. Flowers with bilateral symmetry, white.

**Similar Species** – *Apios americana* climbs trees, has pointed leaflets, reddish flowers.

# *Gratiola ramosa*

***Gratiola ramosa*** **Branched hedgehyssop** **WAP Zone: T**




Herb. Small, clonal, upright. Leaves opposite, sessile, wide at base; stiffly upward pointing with a few teeth.
Flowers tubular, obvious petals are white, united tube is yellow, bilateral.
Found in wetland transition zones and low flatwoods.
**Similar Species –** *G. pilosa* and *G. hispida* hairy, with flowers not on stalks.
*Lindernia dubia* has leaves that are narrow at base.

# *Hypericum spp.*

***Hypericum fasciculatum*** **Peelbark St. John's-wort** **WAP Zone: OD**



Shrub, typically about 4 ft tall (reported to reach 6.6 ft but not typical). Typically with branched stems. Leaves very narrow, needle-like, edges rolled and on short branches forming tufts (fascicles). Flowers yellow, five petals, many stamens, pinwheel shape. Typically found in large groups in shallow, open marshes and in open transitional edges of cypress swamps.

***Hypericum mutilum*** **Dwarf St. John's-wort** **WAP Zone: T**



Small herb, stems erect, usually less than 1 ft tall (reportedly gets to 2 ft but not typical). Not woody. Leaves opposite, sessile (no petiole), rounded triangular shape, entire margin. Flowers small, yellow, five petals, many stamens, not pinwheel shaped. Typically in fairly open, shallow wetland areas.

***Hypericum myrtifolium*** **Myrtleleaf St. John's-wort** **WAP Zone: T**



Small shrub to about 3 ft tall. Typically single-stemmed at base, loosely branched near top. Leaves opposite, sessile, ovate-triangular. Flowers yellow, five petals, not in a pinwheel. Sepals large and leafy, five, may remain on plant after petals fall and form a saucer. Closed petals sit in saucer before the flower opens. Flowers can be showy with many yellow stamens, and large. Typically in flatwoods, savannas, seep slopes, and transitional wetland edges.
**Similar Species –** *H. tetrapetalum* has 4 petals and 4 sepals (2 large and 2 small).

***Hypericum tetrapetalum*** **Fourpetal St. John's-wort** **WAP Zone: AD**

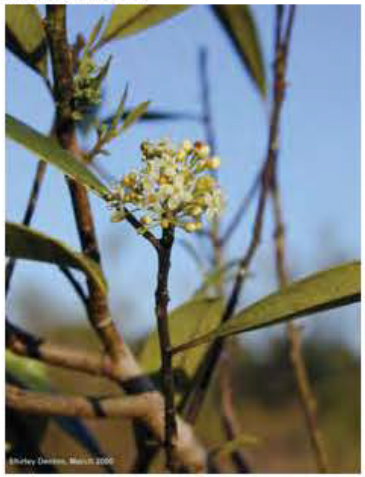




Small shrub to 3 ft tall. Openly branched, not bushy. Leaves opposite, broadly ovate, clasp the stem, sessile. Flowers yellow, four petals, form a right-angle cross. Two pairs of sepals, outer pair large, completely encloses petals before opening, looks like praying hands. Single flowers at ends of branches. Typical in low flatwoods, and wetland transition zones, savannas.
**Similar Species –** *H. myrtifolium* has 5 equal-sized sepals.
*H. hypericoides* has leaves that are narrow at the base and flower petals form an "X."

# Dahoon Holly (*Ilex cassine*)

***Ilex cassine***



**Dahoon holly**

**WAP Zone: OD**

Medium sized tree. Leaves evergreen, leathery, alternate, margins generally entire except for a few short pointed teeth. Leaf bottom is smooth and green. Bark pale and smooth, branches long and twisted. Flowers white, unisexual. Fruit a red drupe. Found in many wet forested situations including outer zones of cypress systems and on hummocks in the interior. Also found in bayheads and low unburned flatwoods.

**Similar Species** – *Nyssa* has rough bark, straight trunk with swollen base, and no teeth on leaves.

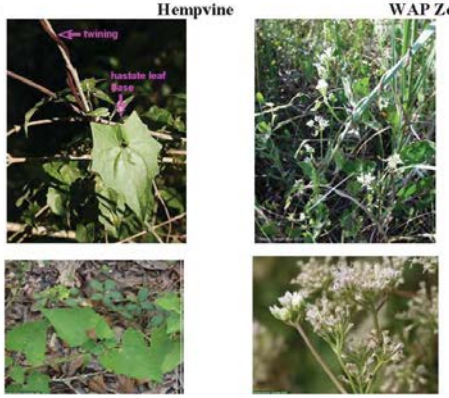
# Taperleaf Waterhorehound (*Lycopus rubellus*)

*Lycopus rubellus* **Taperleaf waterhorehound** **WAP Zone: OD**


Herb, usually 2 ft or less. Stem square. Leaves opposite, slender, with coarse teeth. White flowers with bilateral symmetry in clusters at leaf axils. Forested wetlands, typically in outer zones or on hummocks.
**Similar Species** – *Hyptis alata* has shorter, wider leaves (diamond-shaped) with flower clusters on long stalks.

# Hempvine (*Mikania* spp.), Skunkvine (*Paederia foetida*), Saw Greenbrier (*Smilax bona-nox*), and Muscadine Grape (*Vitis rotundifolia*)

***Mikania* spp.** **Hempvine** **WAP Zone: T**




Vine. Climbs by twining or sprawls on herbs and shrubs. Leaves opposite, heart-shaped with pointed tip. Base of leaves hastate (arrow-shaped, lobes spread at right angles). Main veins originate from base of leaf; coarse teeth. Flowers white, in few-flowered heads arranged into panicles.
**Similar Species –** *Paederia foetida* has rounded leaf bases, strong, stinky smell.

***Smilax bona-nox*** **Saw greenbrier** **WAP Zone: AD**


Vine that climbs with tendrils, numerous prickles on stem. Leaves often shiny but blotched (variegated), distinctive ears (big lobes) at leaf base, veins visible with main veins arising from base of blade, at least some leaves have prickles on leaf margin and underside of leaf on veins.
**Similar Species –** other *Smilax* don't have prickles on leaf margin or varigation.

***Paederia foetida*** **Skunkvine** **WAP Zone: AD**

Vine. Grows by twining. Leaves opposite, long petioles, somewhat heart-shaped base, pubescent, variable. Very strong, stinky smell. Flowers have fused petals, white to cream exterior with a hairy red throat. Invasive non-native from Asia. Found in moist disturbed areas, does not tolerate extended inundation.
**Similar Species –** *Mikania* has hastate (squarish) leaf bases.

***Vitis rotundifolia*** **Muscadine grape** **WAP Zone: AD**
***Vitis munsoniana***

Vine climbing by tendrils. Leaves opposite tendrils; glabrous (not hairy), heart-shaped, coarsely toothed.
**Similar Species** - Other *Vitis* have hairs on lower leaf surface, branched tendrils; pith not continuous at nodes, shaggy bark.

# Turkey Tangle Frogfruit (*Phyla nodiflora*)

***Phyla nodiflora*** **Turkey tangle frogfruit** **WAP Zone: AD**
***Lippia nodiflora***


Herb. Prostrate stems (usually purple in color) rooting at nodes. Leaves opposite, margins coarsely toothed on upper half. Often diamond-shaped with red edge. Angular stem. Flowers white, in small heads with bracts. Much purple on the head (individual flowers white).

# American Pokeweed (*Phytolacca americana*)

***Phytolacca americana*** **American pokeweed** **WAP Zone: U**



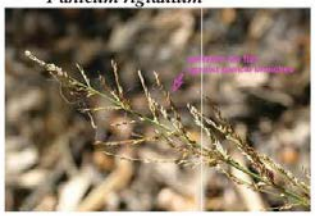
Large, coarse herb to 3 m tall. Stems typically red (unless in dense shade). Leaves large (7 – 30 cm), alternate, veins ladder-like, somewhat arcuate (curved). Flowers in axillary racemes, white, 5-petalled. Fruits a blue-black berry. Young leaves are considered to be edible, but foliage becomes poisonous as it matures.

# The Grasses

*Axonopus* spp. Carpetgrass WAP Zone: AD

Sod-forming grass. Spreading by above-ground runners (stolons). Stems flattened. Leaf sheaths glabrous, ligule membranous, blades typically flat with 2 veins parallel to midrib for *A. furcatus* and folded with no parallel veins for *A. compressus*. Both species have long hairs along leaf edge. Blades tend to be fairly wide until reaching a somewhat blunt tip. Typically in moist disturbed areas.
**Similar Species** – *Paspalum setaceum* has pointed leaf tips, no parallel main veins. *Paspalum notatum* has thinner, longer leaves with sharp tips.

*Panicum rigidulum* Redtop panicum WAP Zone: OD



Grass. Fairly large; grows in clumps. Not rhizomatous. By contrast, *Panicum anceps* and *Panicum virgatum* have scaly rhizomes and less "heavy" panicles. Leaves hairless, sheaths loose on stem. Often plant has some dark purple coloration. Fruiting inflorescence a loose panicle. Spikelets lay flat against panicle branches. Main branches tend to appear heavy since secondary branches and pedicels are very short.

*Cynodon dactylon* Bermudagrass WAP Zone: U


Grass. Perennial. Sod forming by above and below ground runners. Very fine in appearance, light green, short leaves, very branchy. Sheaths loose. Ligule ciliate. Inflorescence of 3 – 5 spikes attached at one point (digitate). Spikelets in 2 rows on one side of rachis (stem of spike). Disturbed areas. Highly invasive.
**Similar Species** – *Sporobolus virginicus* has narrow panicles, grows in tidal areas; most *Digitaria* have longer leaves and spikes; *D. serotina* is very hairy.

*Paspalum notatum* Bahiagrass WAP Zone: U


Grass. Sod-forming from underground runners. Leaves dark green, long and slender relative to other common paspalums. Fruit in 2-branched raceme. Moderately invasive, often planted as a pasture grass and on roadsides, introduced from South America.
**Similar Species** – *Axonopus* spp. have short flat leaves with blunt tips.

# Slash Pine (*Pinus elliottii*) and Longleaf Pine (*Pinus palustris*)

*Pinus elliottii* **Slash pine** **WAP Zone: AD**


Large tree. Evergreen. Needles 2 or 3 per fascicle; long (10 – 28 cm). Young shoots (candles) beige and small. Cones somewhat egg-shaped, prickly, open and full from tree when mature. Young trees branch near the ground; lack grass stage. Found in low flatwoods and outer edge of wetlands. May be on hummocks in deep zones.
**Similar Species** – *Pinus palustris* needles always 3 per fascicle, needles tufted at tips of branches.

*Pinus palustris* **Longleaf pine** **WAP Zone: U**



Large tree. Evergreen. Needles always 3 per fascicle; long (15 – 30 cm). Young shoots (candles) large (fat) and white at least near tip; cones large and long, prickly; open and fall from tree when mature. Young trees have grass stage and then shoot up rapidly without branching until above height of ground fires. Found in flatwoods and sandhill.
**Similar Species** – *Pinus elliottii* needles at least some have 2 needles per fascicle, needles not clustered at tips of branches.

# Rosy Camphorweed (*Pluchea rosea*)

***Pluchea rosea*** **Rosy camphorweed** **WAP Zone: OD**


Herb typically to 2 ft. Alternate leaves, clasping leaf base, serrate, often pink on edge, covered with sparse to dense sticky hairs, strong camphor smell. Flowers pink.

**Similar Species** - *Pluchea foetida* also has aromatic, pubescent foliage.. Leaves are alternate, sessile (no petole), clasping, *rough pubescent*. Flowers in rounded cymes, *white*.

# Mock Bishopweed (*Ptilimnium capillaceum*)

***Ptilimnium capillaceum*** **Mock bishopsweed** **WAP Zone: T**

Herb typically to 2 ft. Common on moist ground in spring. Leaves finely dissected with many secondary branches, especially at base. Flowers in a delicate umbel, white. Carrot-like (don't eat it!).

**Similar Species** – young *Eupatorium leptophyllum* has fewer secondary branches on leaves.

# The Oaks

*Quercus laurifolia* **Laurel oak** **WAP Zone: T**




Tree, often large with straight trunk, branches typically well above the ground. Leaves alternate, at least some widest in middle forming a narrow diamond, bottom green, flat with few hairs. Buds pointed, many scales. Bark smooth when young becoming furrowed in old age with broad flat ridges. Acorns take 2 years to mature. Swamp edges, low flatwoods with fire exclusion, floodplains, bottomlands.
**Similar Species** – *Q. virginiana* has trunk and large branches that often lean, dark brown rough bark with raised ridges, darker green leaves that are gray-green pubescent on bottom.
*Nyssa sylvatica* var. *biflora*: Bud rounded at tip, few scales; leaves wider toward tip (usually wider than *Q. laufifolia* in general), often turn bright red before dropping, deeply furrowed bark;

*Quercus virginiana* **Live oak** **WAP Zone: U**





Tree. Often branches close to ground, trunk and branches often lean. Leaves dark green, thick, usually with round tips, often somewhat rolled under on edges, veins often appear sunken below leaf surface; bottom green-gray and pubescent in drier habitats. Buds rounded. Acorns mature in one season.
**Similar Species -** *Q. geminata* has leaf bottom with dense pubescence hairs that usually project upward from surface, leaves curl more. *Q. laurifolia* has straight trunk, smoother bark, uncurled leaves with few hairs.

*Quercus nigra* **Water oak** **WAP Zone: T**



Tree. Leaves alternate, variable, wider toward the tip, often spoon-shaped; lower surface green. Buds pointed. Fruit an acorn that takes 2 years to mature. Acorn cap a small "tam." Bark smooth, gray on young trees becoming somewhat rougher as tree ages.

# Blackberry (*Rubus argutus*)

***Rubus argutus***
***Rubus betulifolium***

**Sawtooth blackberry**

**WAP Zone: AD**


Sprawling, arching shrub. Stems prickly ridged. Leaves alternate, trifoliate (3 leaflets) or palmate (5 leaflets), veins sunken pinnate, edges serrate, often has pricks on veins on underside of leaf. Flower white, 5 petals, many stamens, many stigmas. Fruit a berry "blackberry." Usually in disturbed situations. One of a limited number of species that thrives on dry muck soils.

# Chinese Tallowtree (*Sapium sebiferum*) and Brazilian Pepper (*Schinus terebinthifolius*)

*Sapium sebiferum* **Chinese tallowtree** **WAP Zone: AD**


Tree. Leaves alternate, long petioles, tend to droop, not toothed. Very strong central vein, short broad leaves with wide rounded bases, tips abruptly pinched and drawn out toward a point. Old leaves turn bright yellow-orange-red in fall or when stressed by high water. Flowers in spikes, not showy but in "candles."
Non-native, highly invasive. Wetland edges, disturbed uplands.
**Similar Species** – *Cinnamomum camphorum* has longer narrower leaves, strong camphor smell.

*Schinus terebinthifolius* **Brazilian pepper** **WAP Zone: AD**


Large bushy shrub to small multi-trunked tree with long arching branches covered with leaves. Leaves alternate, pinnately compound, finely toothed. Petioles and rachis (leaf stem) may be reddish. Fruits smooth, red in fall and winter. Highly invasive; introduced from South America. Some people have allergies to this plant (in same family as poison ivy, but not of concern to most people).
**Similar Species** – *Rhus copallina* has erect thin trunks with leaves concentrated at tips of branches, wings along rachis of compound leaves.

# Tropical Soda Apple (*Solanum viarum*)

***Solanum viarum*** **Tropical soda apple** **WAP Zone: U**



Herb. Prickly stems. Leaves ovate, large, alternate, with coarse teeth, prickly both top and bottom, pubescent. Flower white, hangs downward. Fruit a yellow berry (looks like a miniature green or yellow tomato). NOT EDIBLE. Non-native, invasive. Disturbed areas, pastures.

# Eastern Poison Ivy (*Toxicodendron radicans*)

*Toxicodendron radicans*

Eastern poison ivy

WAP Zone: AD


Vine that climbs by roots but may grow upward from the ground. Alternate, compound leaves with three leaflets and reddish petioles; very variable but usually with coarse teeth. Fruit a white drupe present in fall and winter.
**Similar Species** – *Parthenocissus quinquifolia* has five leaflets and climbs by tendrils with "feet" (adhesive swollen pads on ends of tendrils).

# Caesarweed (*Urena lobata*)

*Urena lobata*

Caesarweed

WAP Zone: U

Annual to 3 m tall. Leaves alternate, round but slightly 3-lobed, hairy. Flower pink, stamens combined to form a tube (small hibiscus-like flower). Fruit a bur. Introduced and moderately invasive.

# Questions?

# Video Content

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