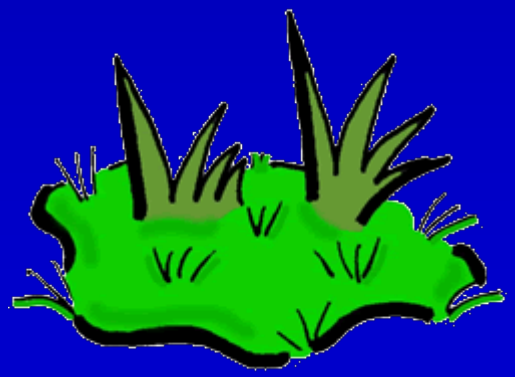
Welcome
The 15th Annual
Wetland Assessment Procedure (WAP)
Workshop 2018

Instructors:

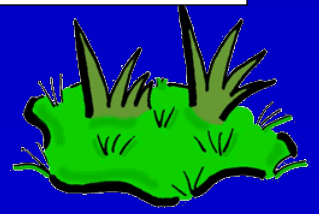
District:
Donna Campbell
David Carr
Kym Holzwart
Mark Hurst

GPI:
Diane Willis



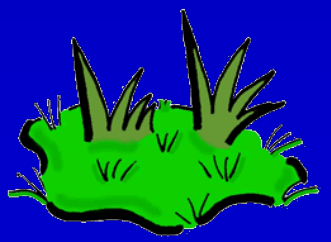
Agenda – Two Tracks – Day 1

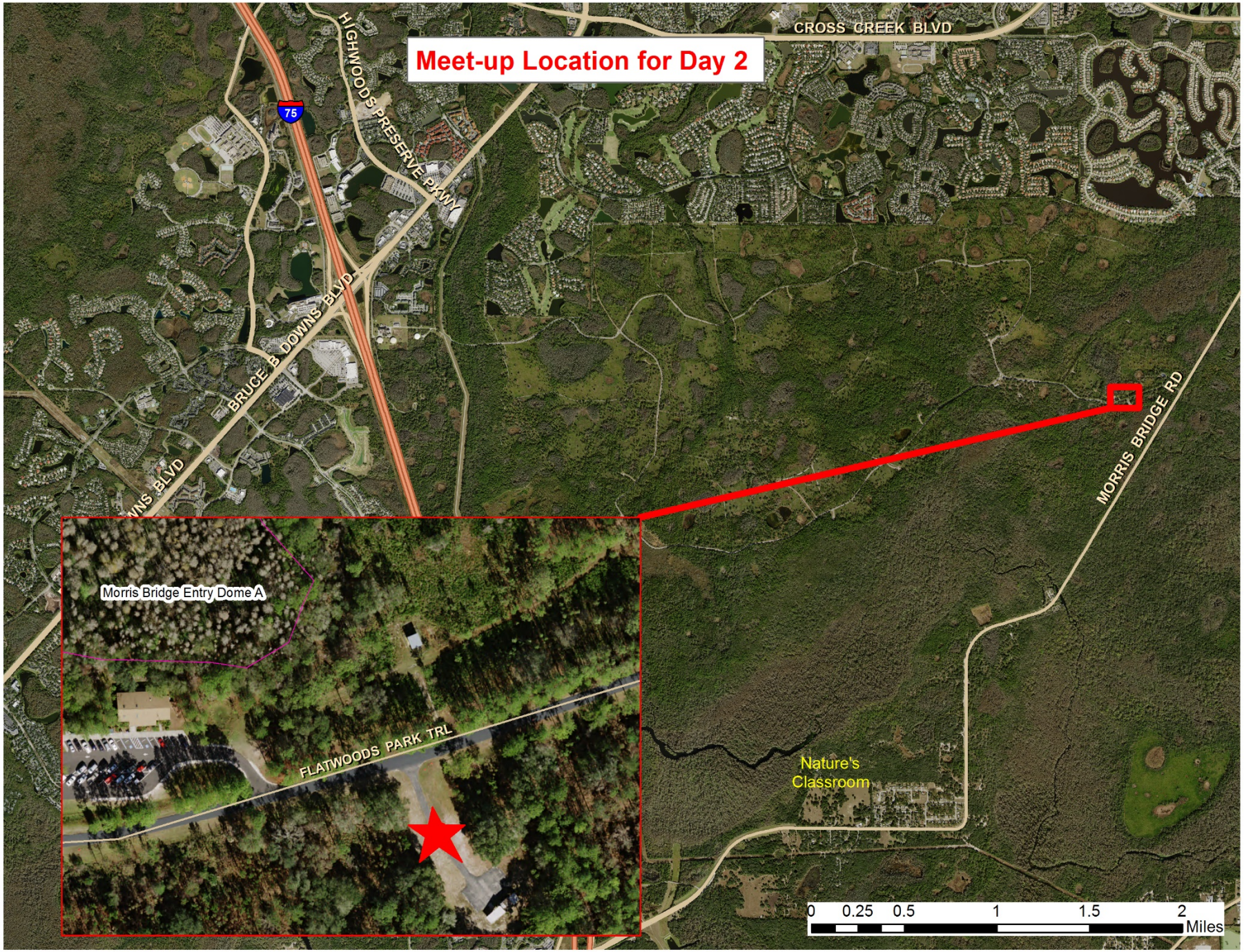
Day 1		
08:00 - 08:30	Sign In / Refreshments (meet at Nature's Classroom)	
08:30 - 08:40	Welcome and Agenda	
	Novice Track	**Expert Track**
08:45 - 9:40	WAP Training Presentation	2 WAPs on your own (turn in WAP forms by 2:00pm)
9:40 - 9:50		
9:50 - 10:50		
10:50 - 11:00		
11:00 - 12:00		
12:00 - 1:00	Lunch	
1:00 - 2:00	Field - Transect Setup	
2:00 - 2:10	Break	
2:10 - 4:30	Plant ID - Nature's Classroom	



Agenda – Two Tracks – Day 2

Day 2		
08:00 - 08:30	Sign In (Meet at Flatwoods Park)	
	Novice Track	**Expert Track**
08:30 - 11:30	Plant ID in Field	
11:30 - 12:30	Lunch	
12:30 - 3:30	Perform 2 WAPs in Field	Classroom Review Day 1 Forms
3:30 – 4:30	Classroom WAP Form Review	Done




Meet-up Location for Day 2
CROSS CREEK BLVD
HIGHWOODS PRESERVE PKWY
75
BRUCE B. DOWNS BLVD
MORRIS BRIDGE RD
Morris Bridge Entry Dome A
FLATWOODS PARK TRL
Nature's Classroom
0 0.25 0.5 1 1.5 2
Miles

Experts to the field

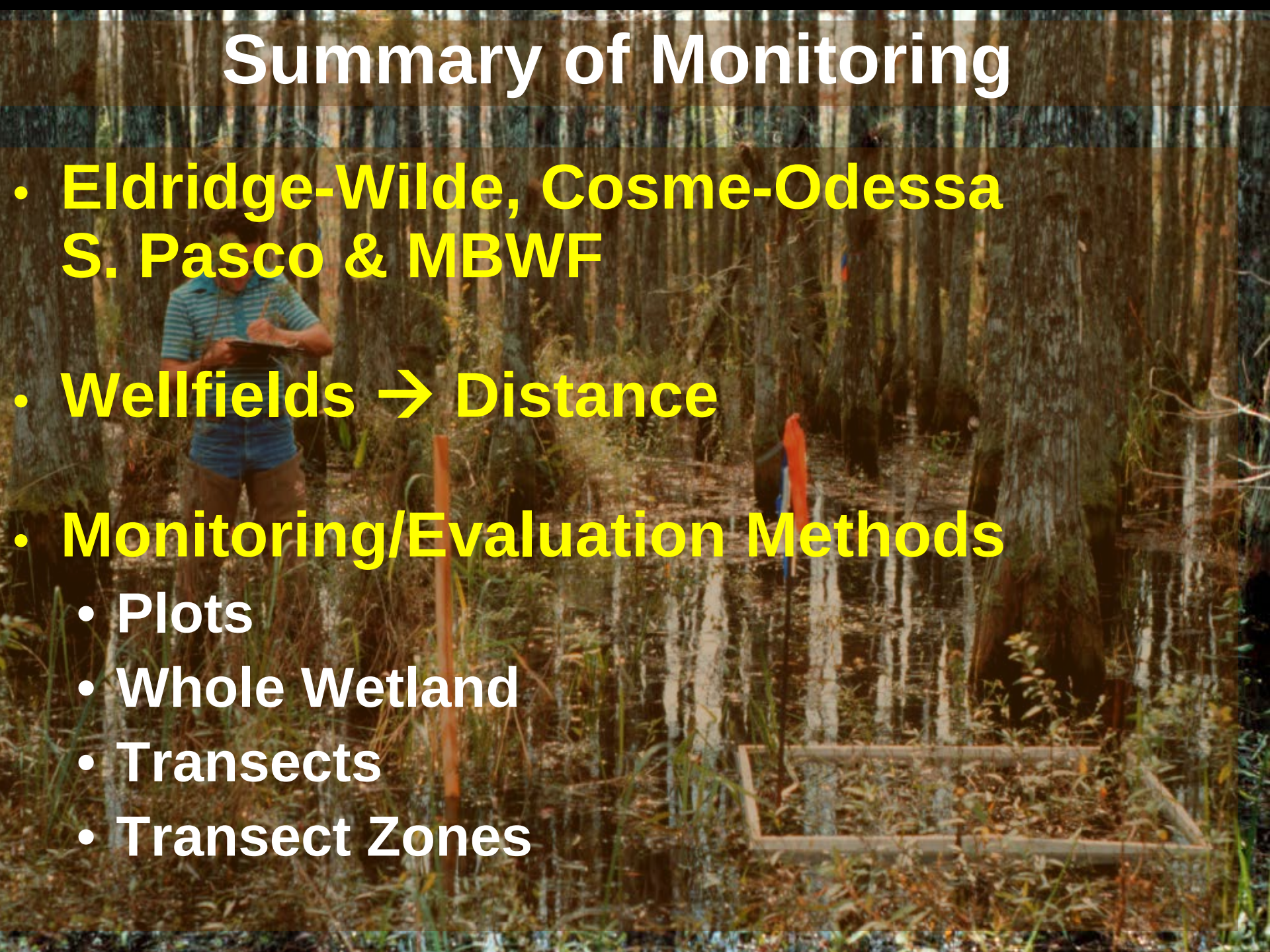
Scat!

Brief History of Wetland Monitoring

Monitoring Wellfields 1971

Green Swamp as Controls 1980's

Summary of Monitoring



- Eldridge-Wilde, Cosme-Odessa S. Pasco & MBWF
- Wellfields → Distance
- Monitoring/Evaluation Methods
  - Plots
  - Whole Wetland
  - Transects
  - Transect Zones

Pre-WAP Development - 1999

WAP Review 2000 - 2002 test of 57 cross-over sites – Spring & Fall

2004 WAP Development Test

21 experts - 10 wetlands

- Plant ID
- DEP list
- Zonation
- Assess annually
- Variability in % cover
- Hummocks & “islands”
- General lack of comments

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

Todays WAP completed in 2005

- **Current WAP methodology applied in 400+ wetlands since 2005**

2018 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)**
  - **Recovery assessment**

Main Goal of 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)

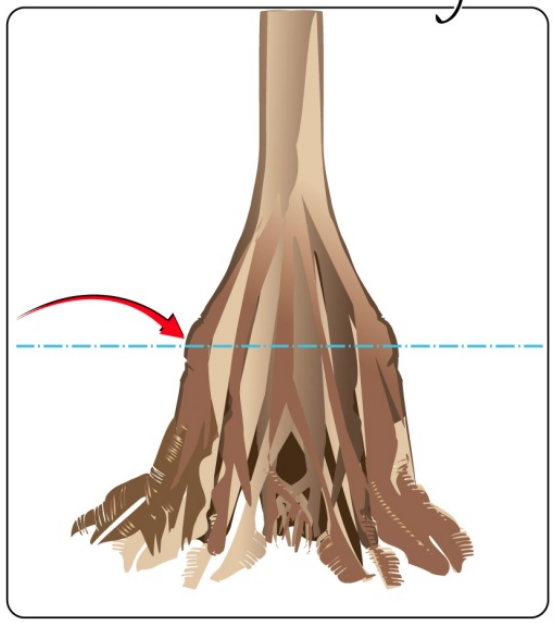
- Not consistent in Naboo swamps

Annually

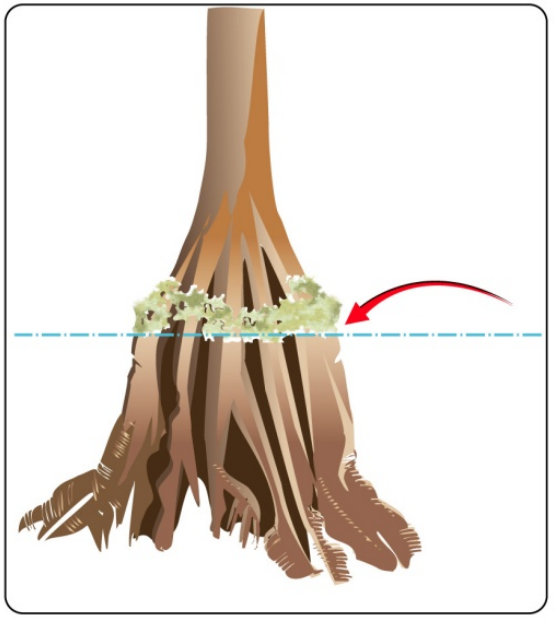
- **May through June assessments**
- **Main components:**
  - **Species documentation**
  - **Zonation scoring**
  - **Explanations**
  - **Additional Information**
    - **Stress**
    - **Comments**

Establishing WAP Zones

Buttress Swelling



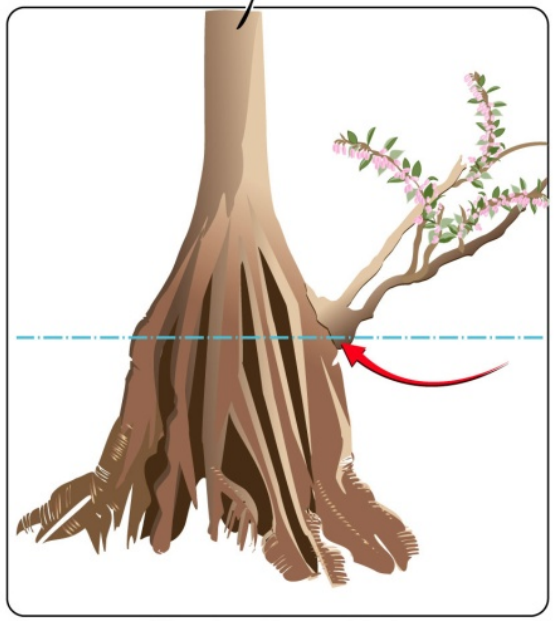
Moss Collar



WAP Zones:

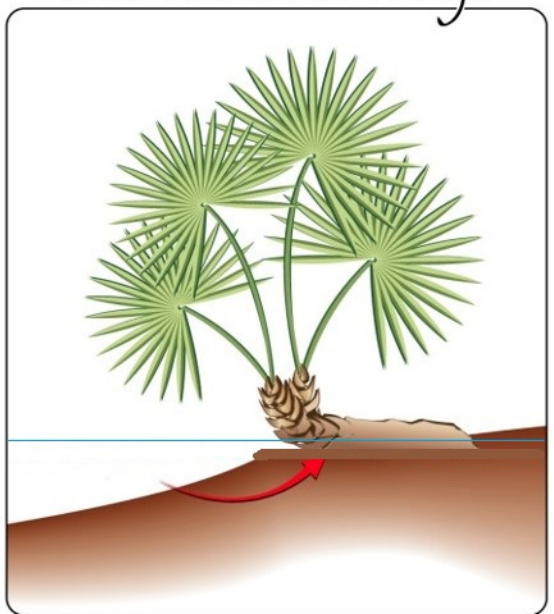
Horizontal Distance From Normal Pool

Lyonia



Diameter at base >1 inch

Saw Palmetto Fringe



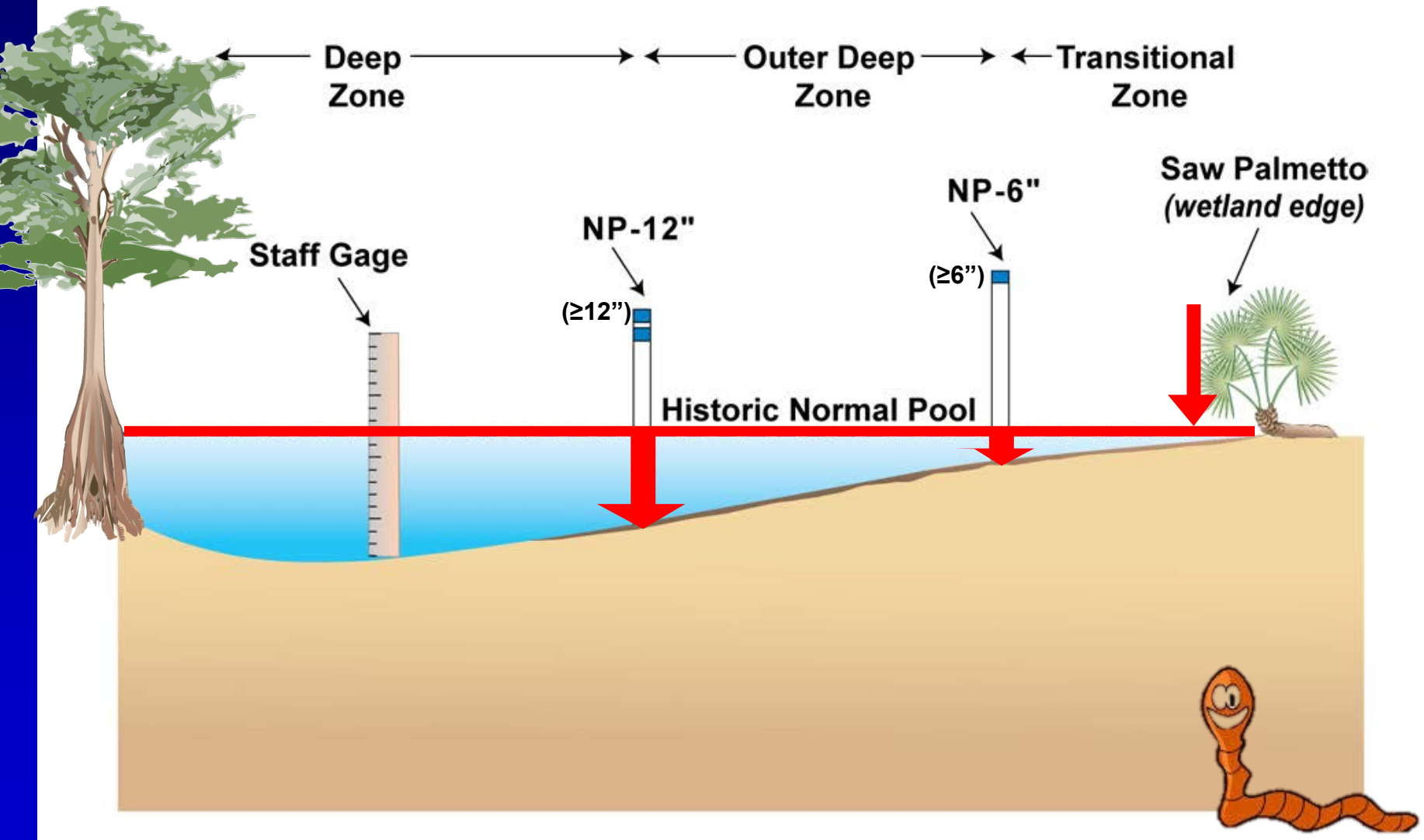
Normal Pool Indicators

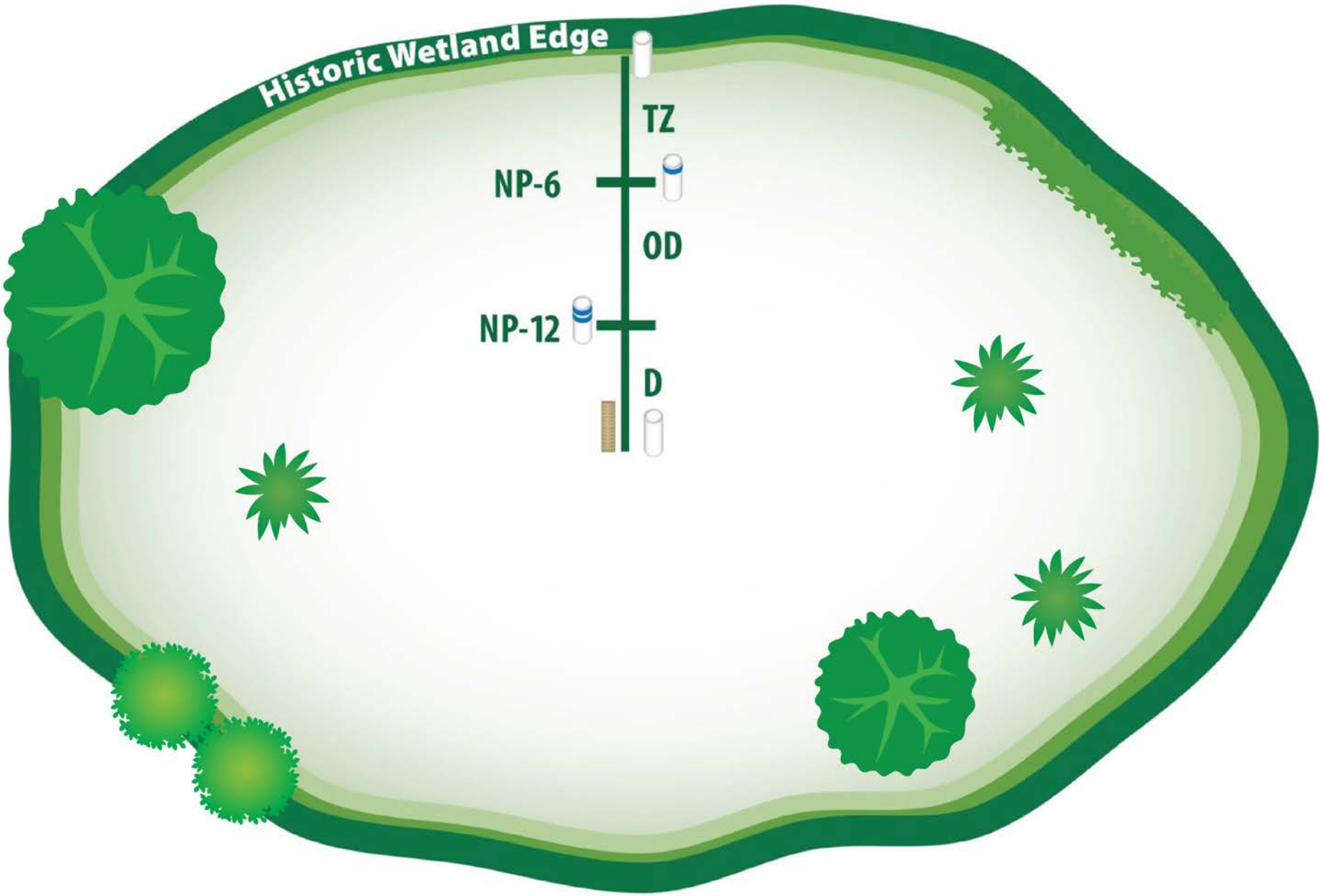
Normal Pool Indicators

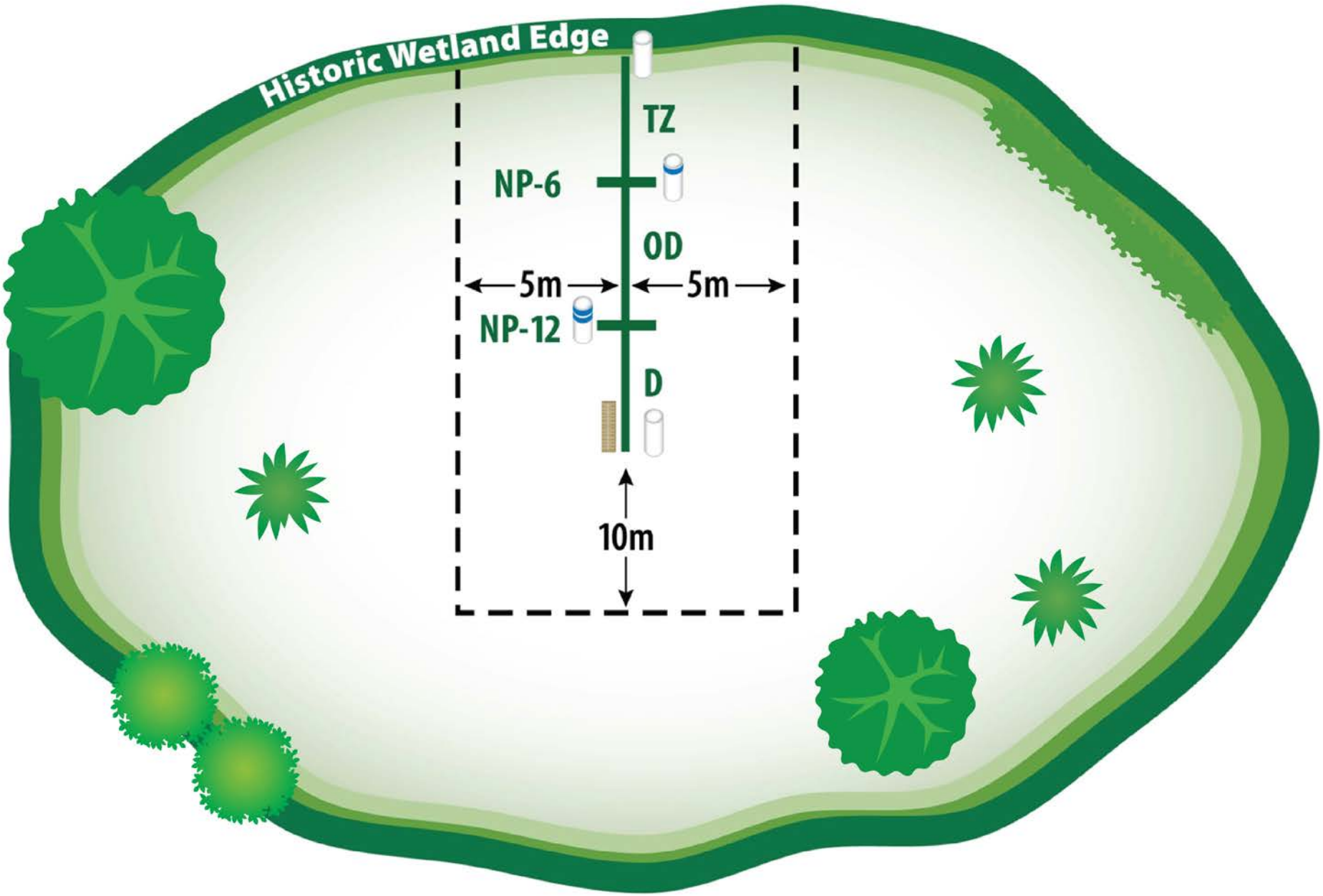
Photos by Scott Emery

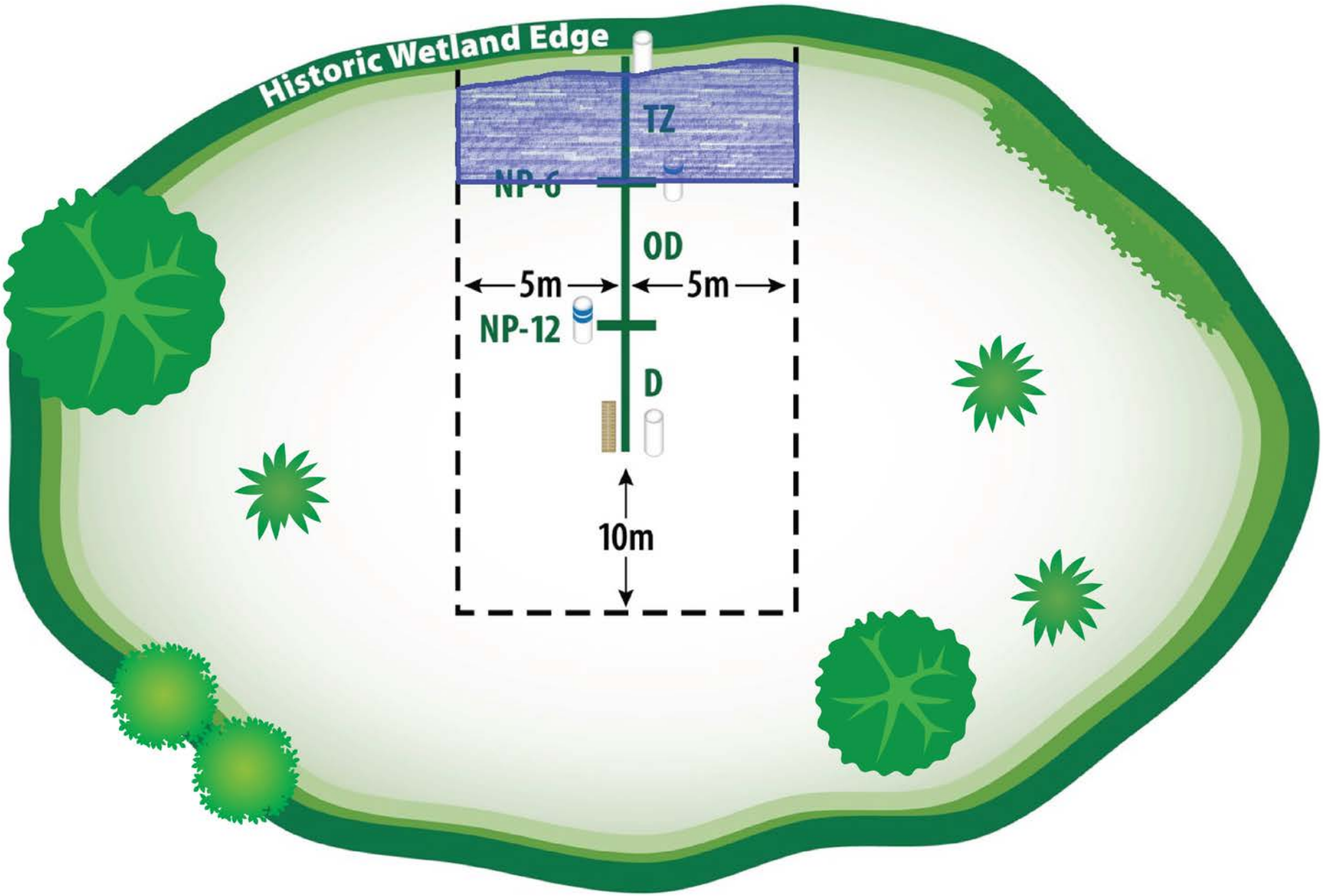

The Transect
Michelle Dachsteiner

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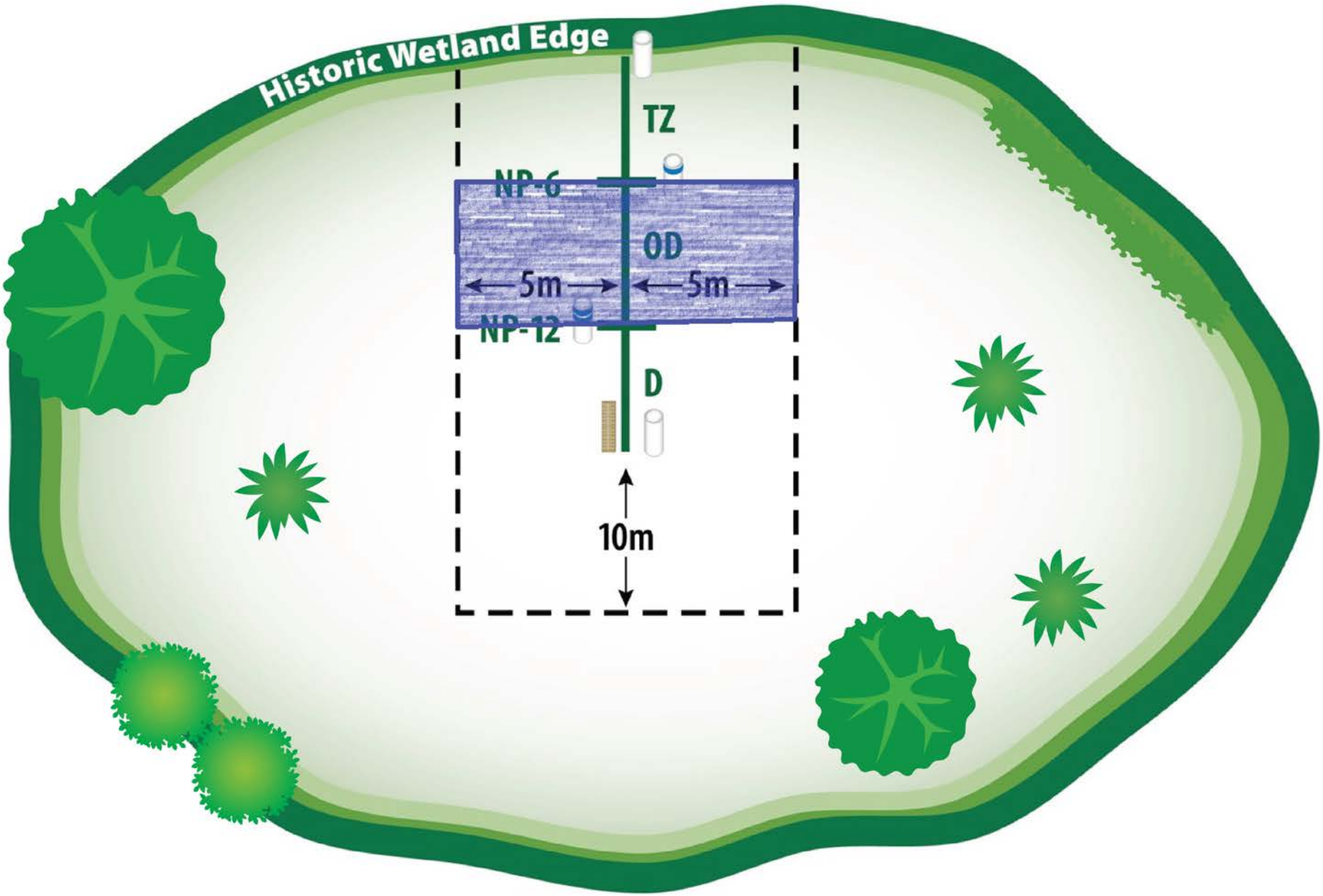
Historic Wetland Edge
TZ
NP-6
OD
5m
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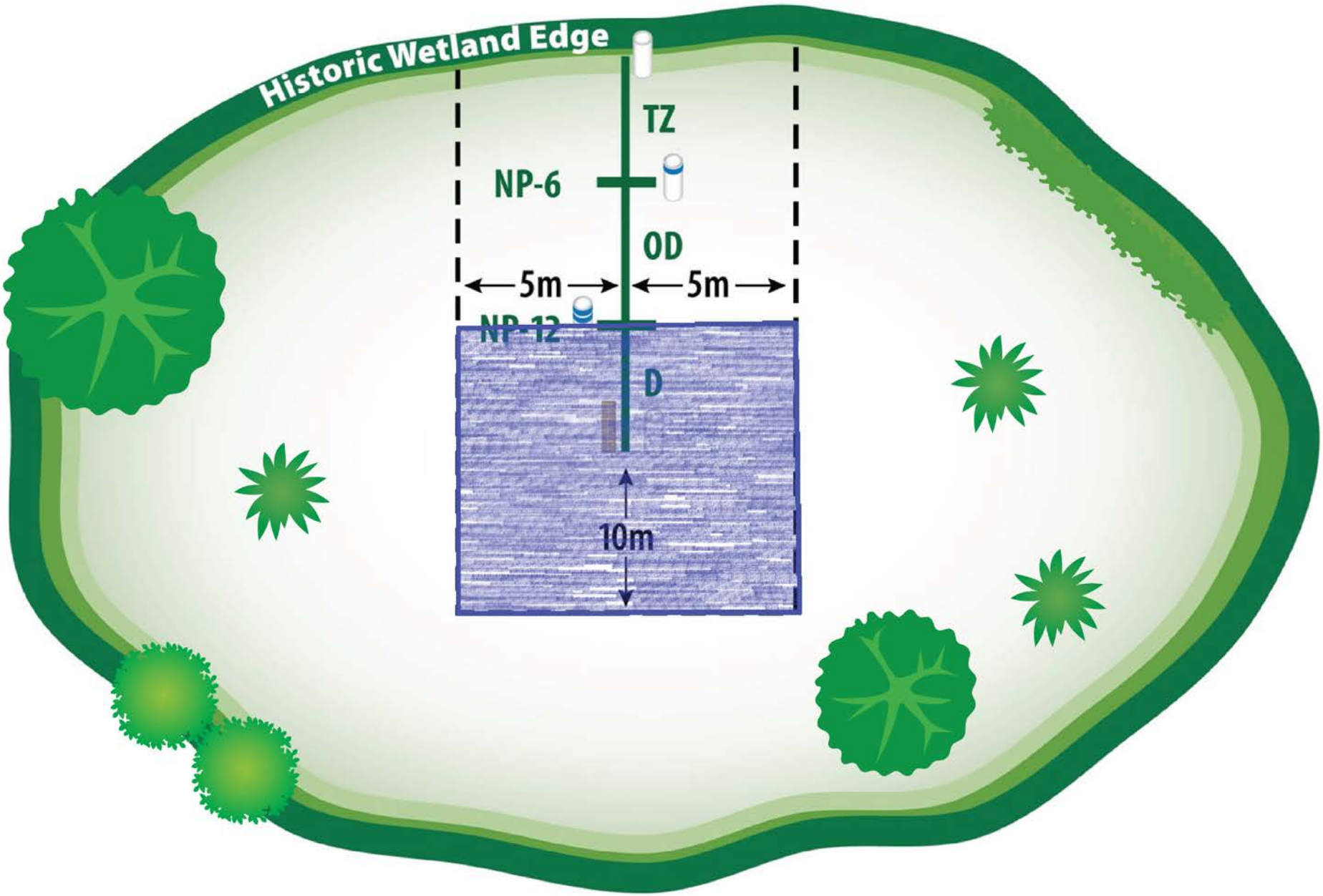
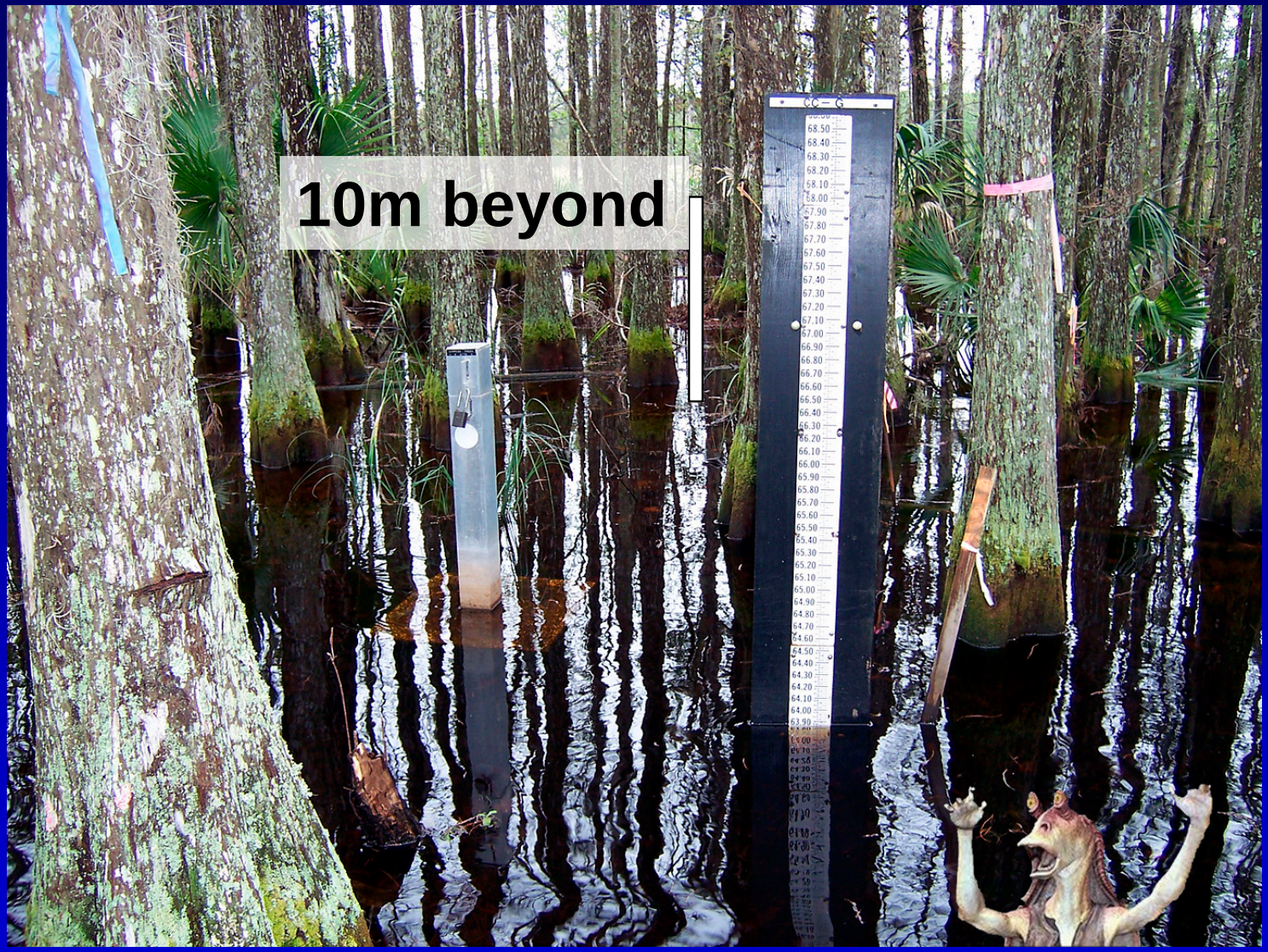
D
10m


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

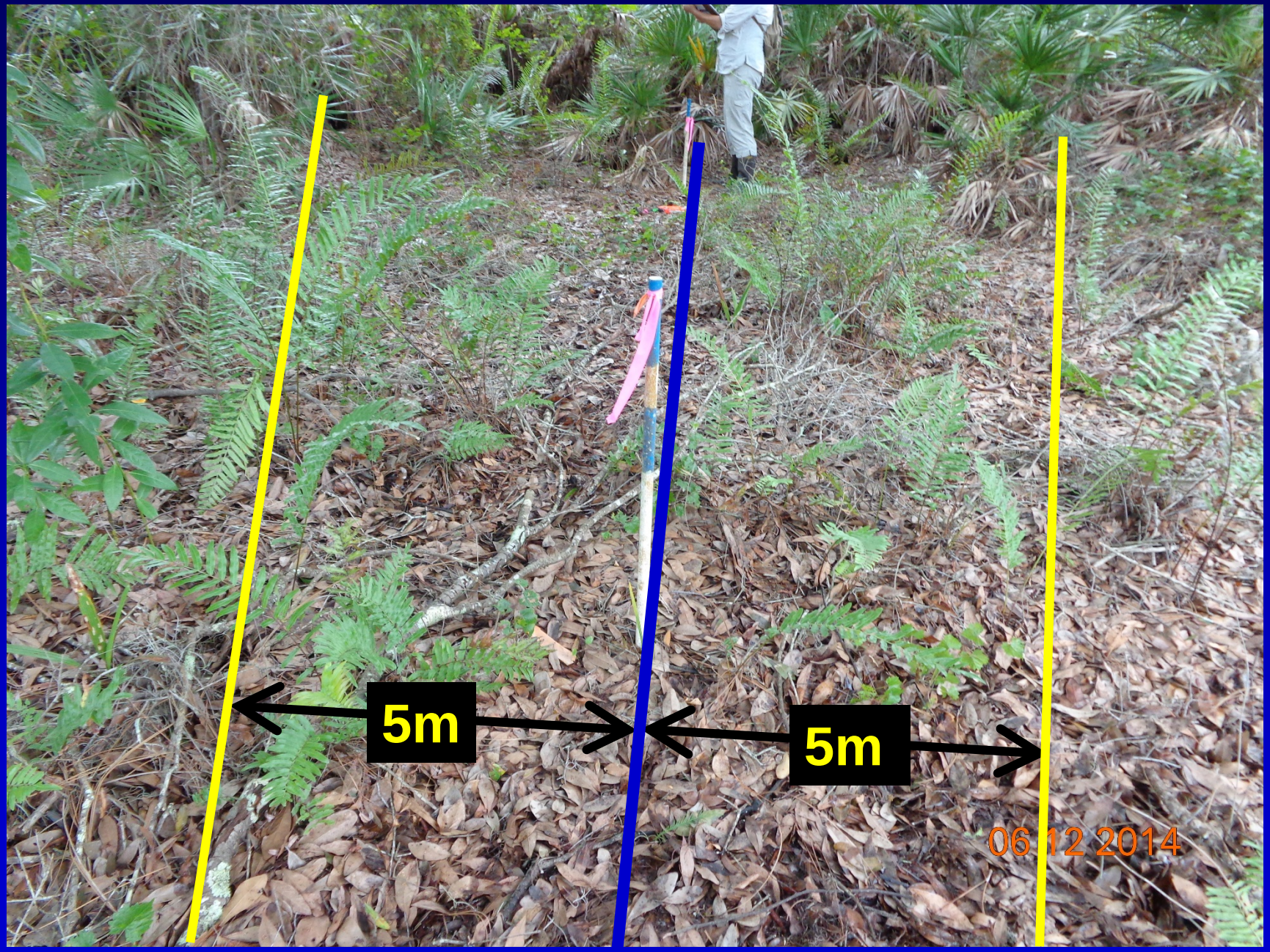
Transect End



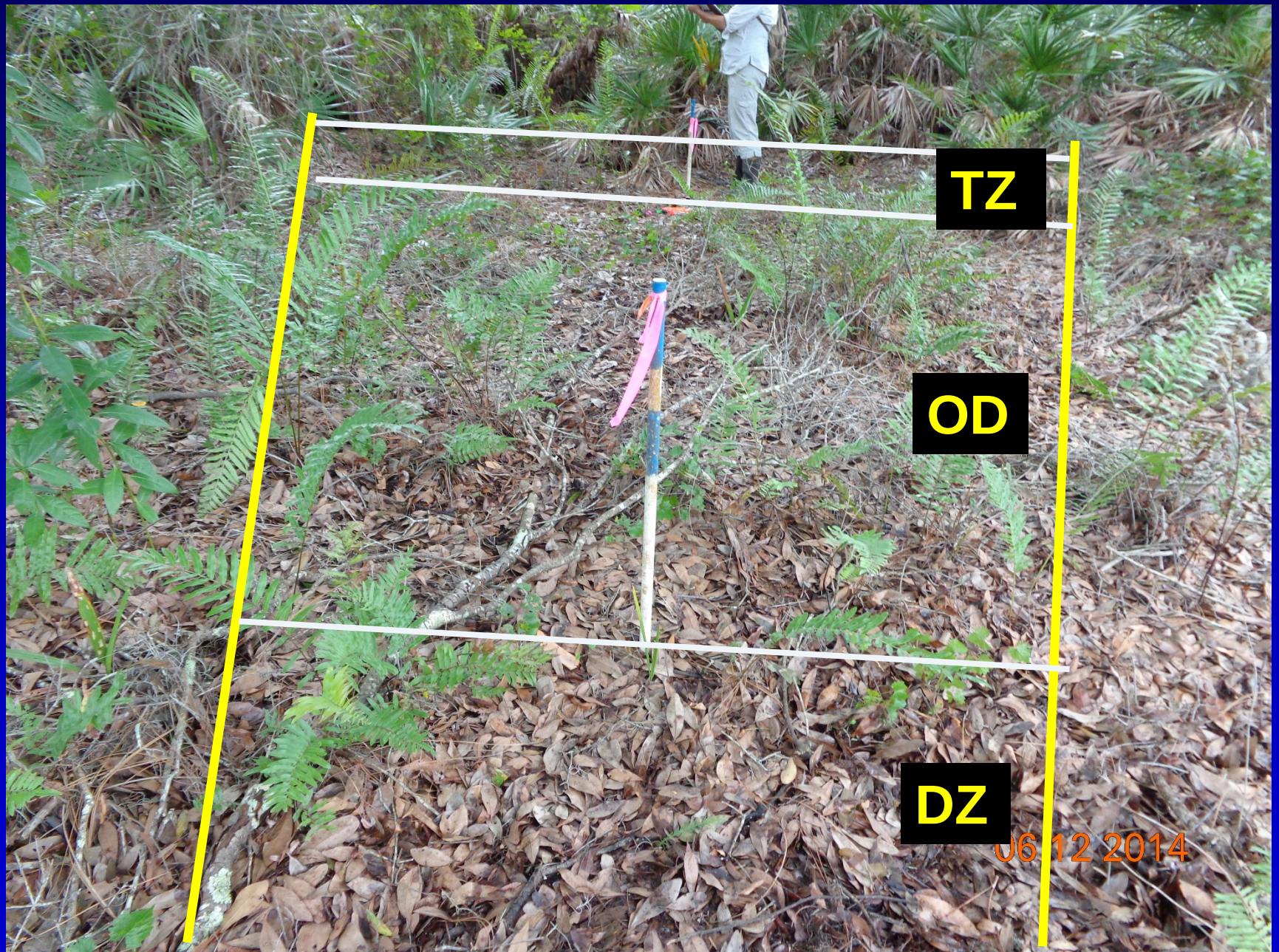
NP-6 & NP-12 Markers

Transect Line

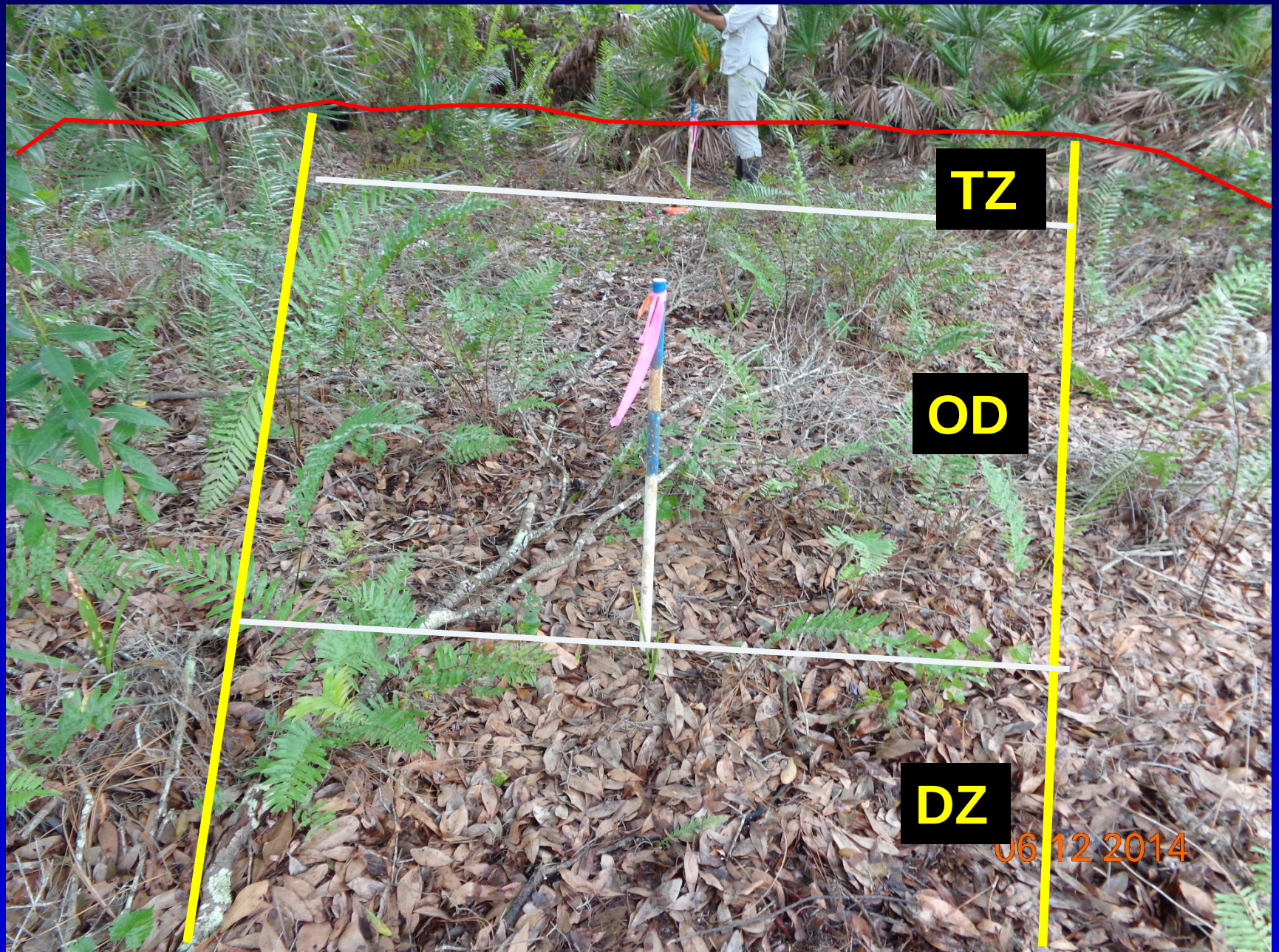
10m Boundary



Zones



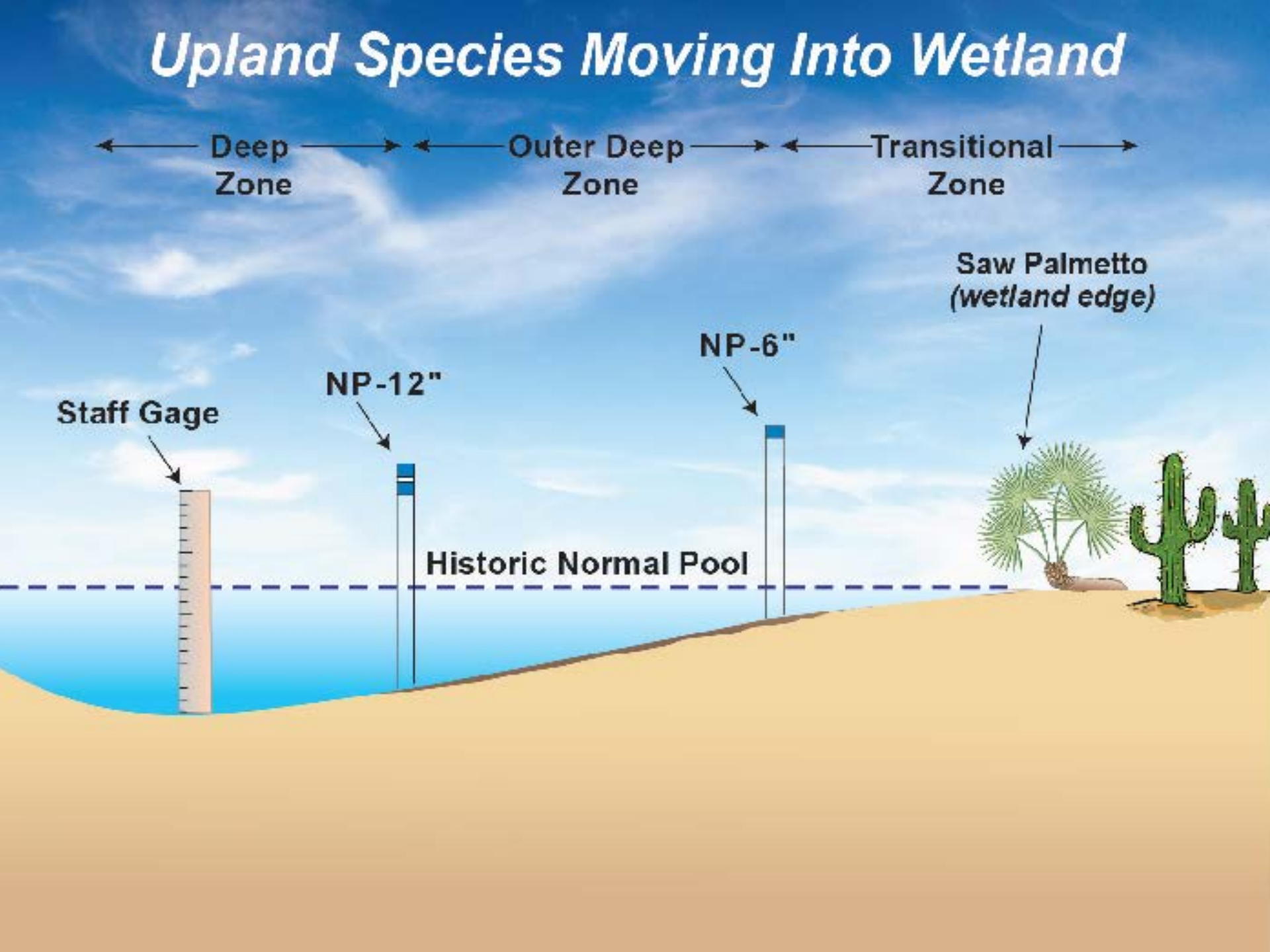
Edge Delineation

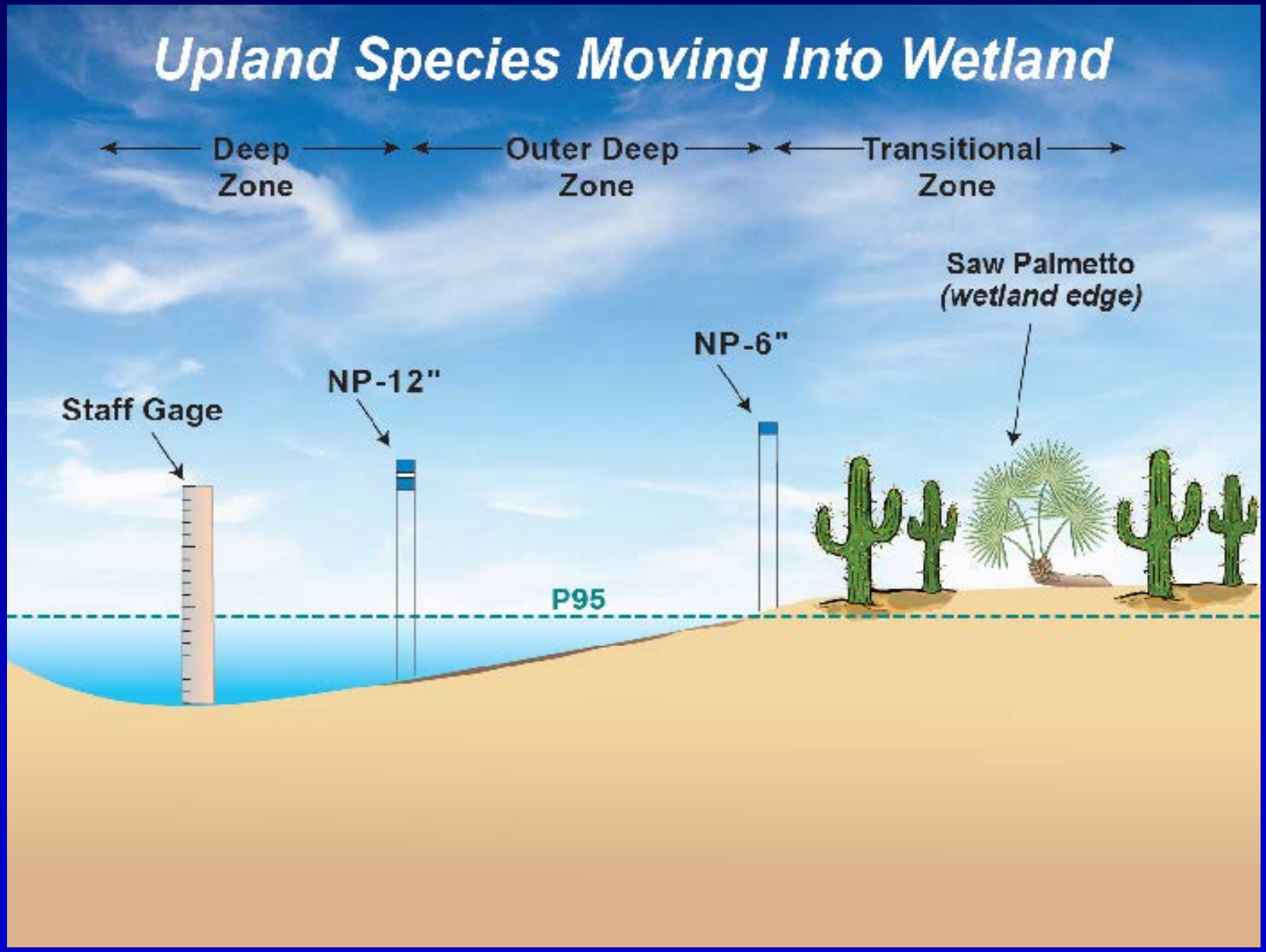


Edge

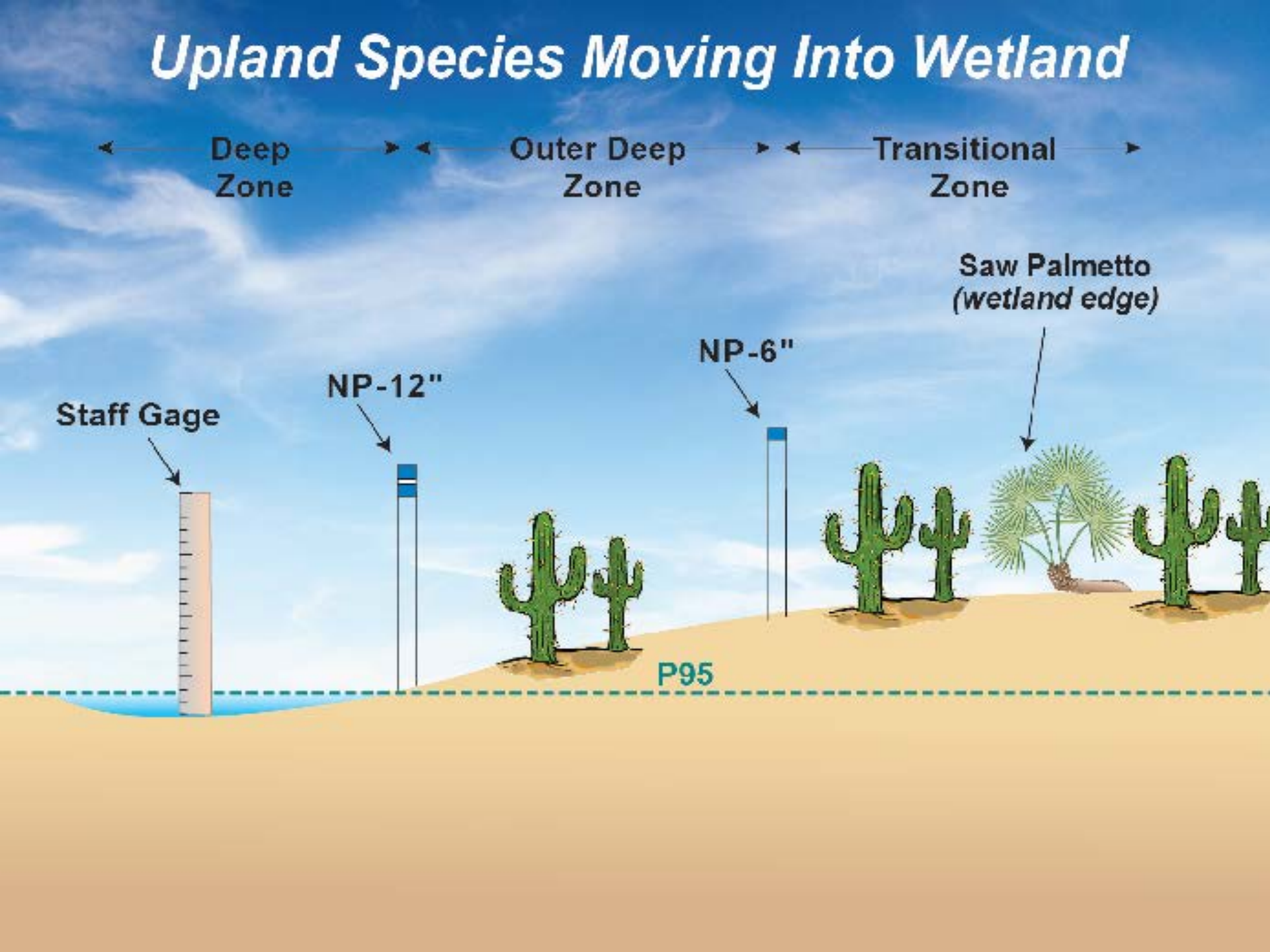
02 07 2014

Upland Species Moving Into Wetland

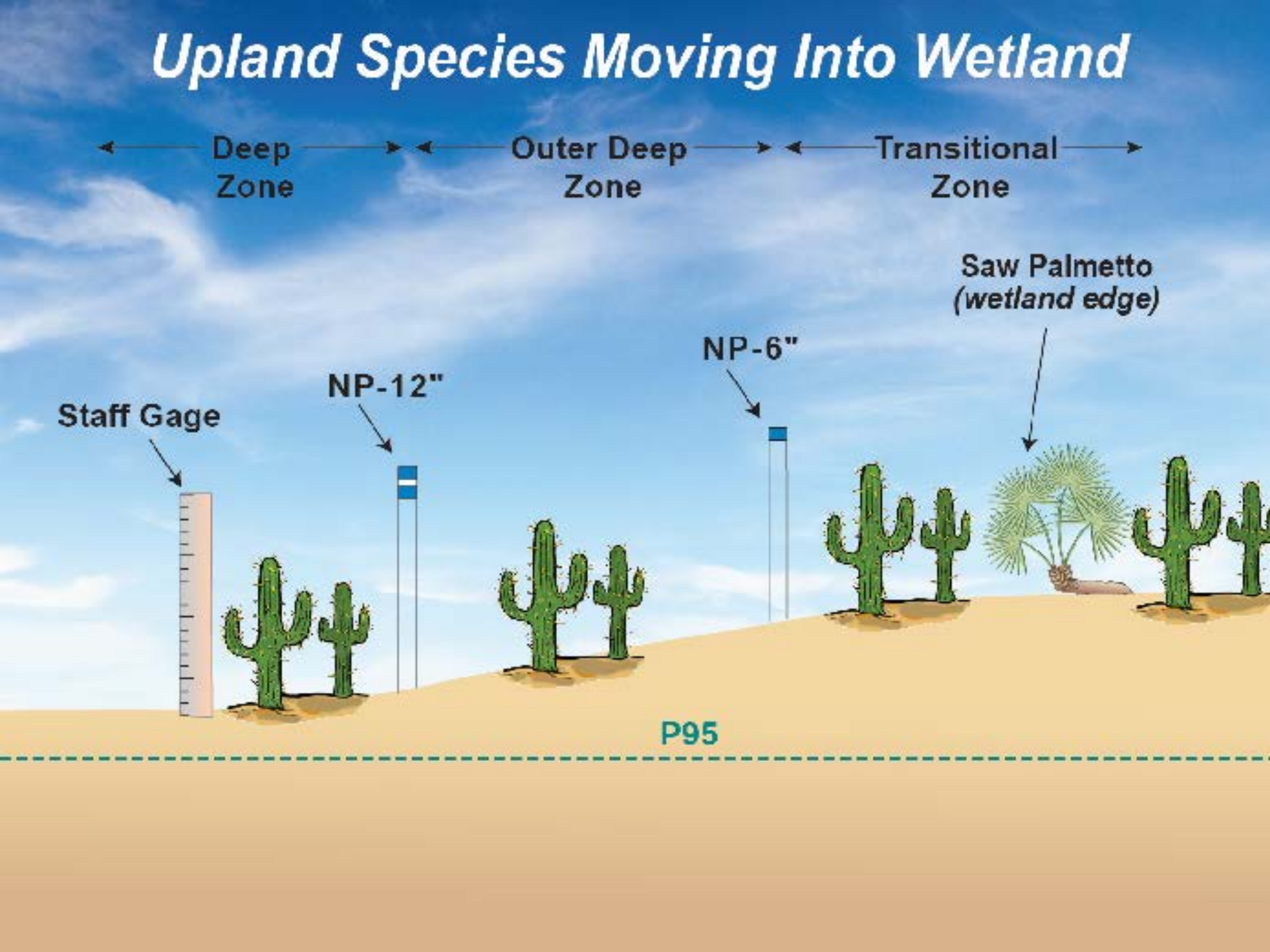



Upland Species Moving Into Wetland
Deep Zone
Outer Deep Zone
Transitional Zone
Saw Palmetto
(wetland edge)
NP-6"
NP-12"
Staff Gage
P95

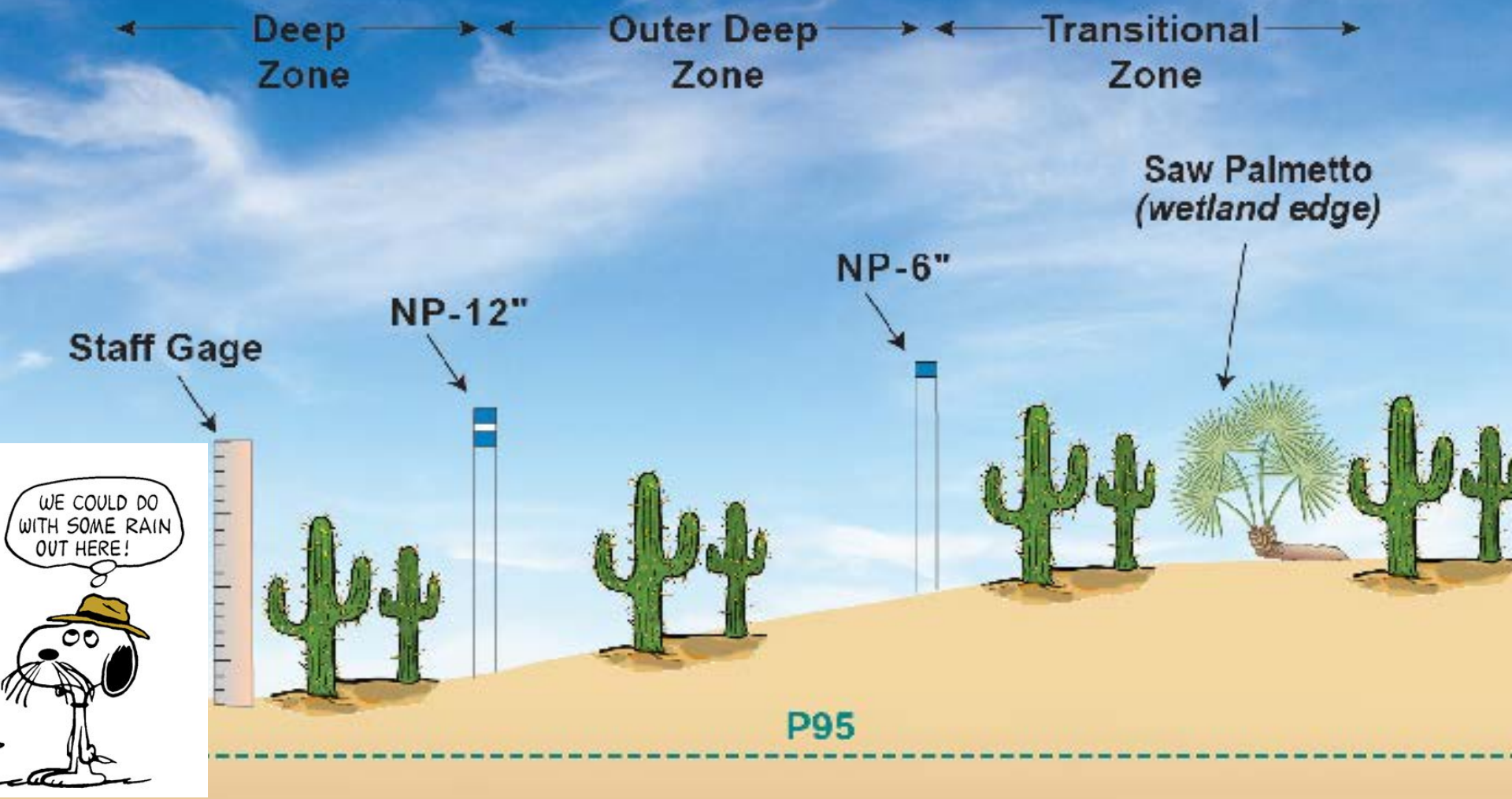
Upland Species Moving Into Wetland



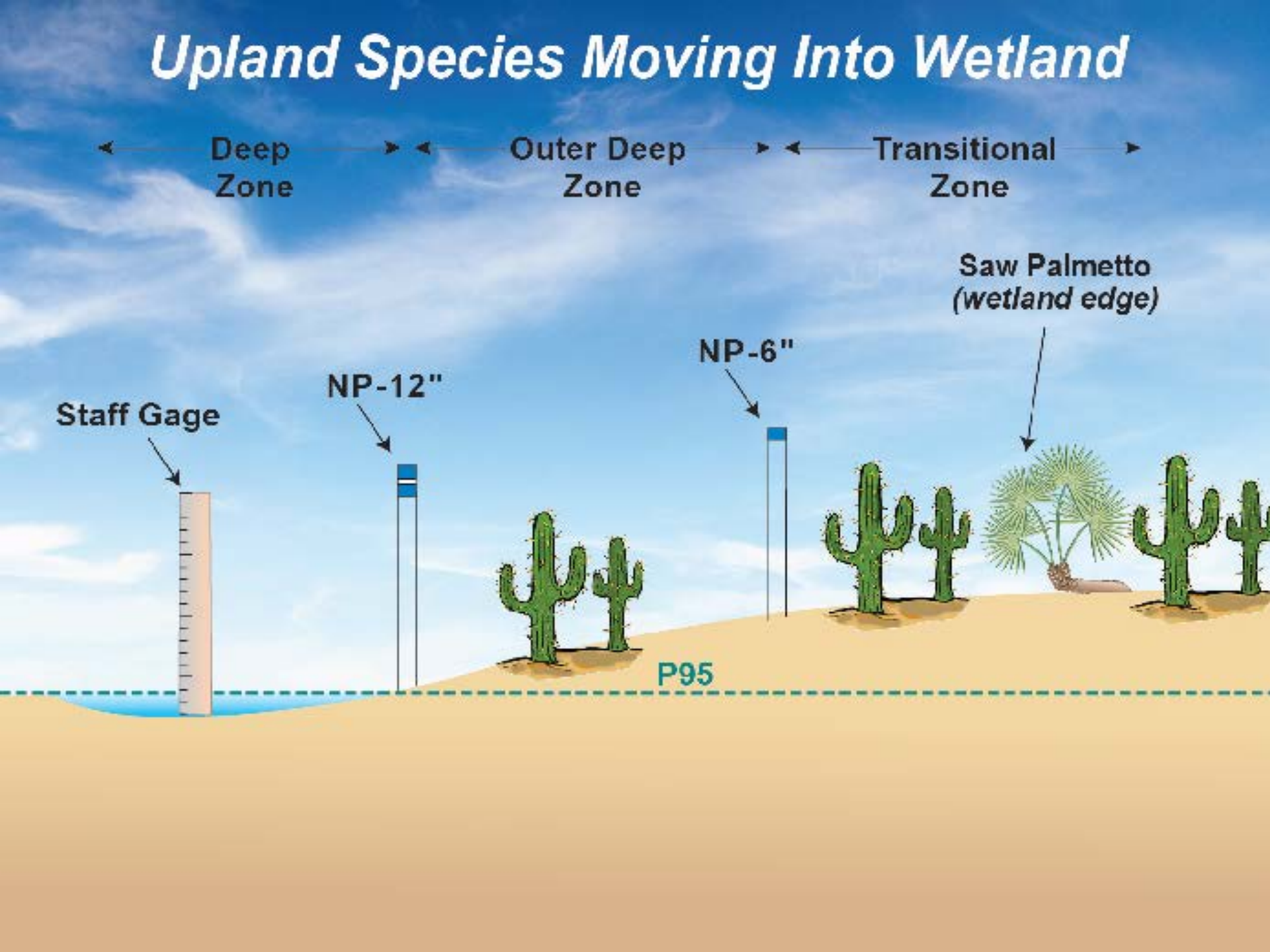
Upland Species Moving Into Wetland



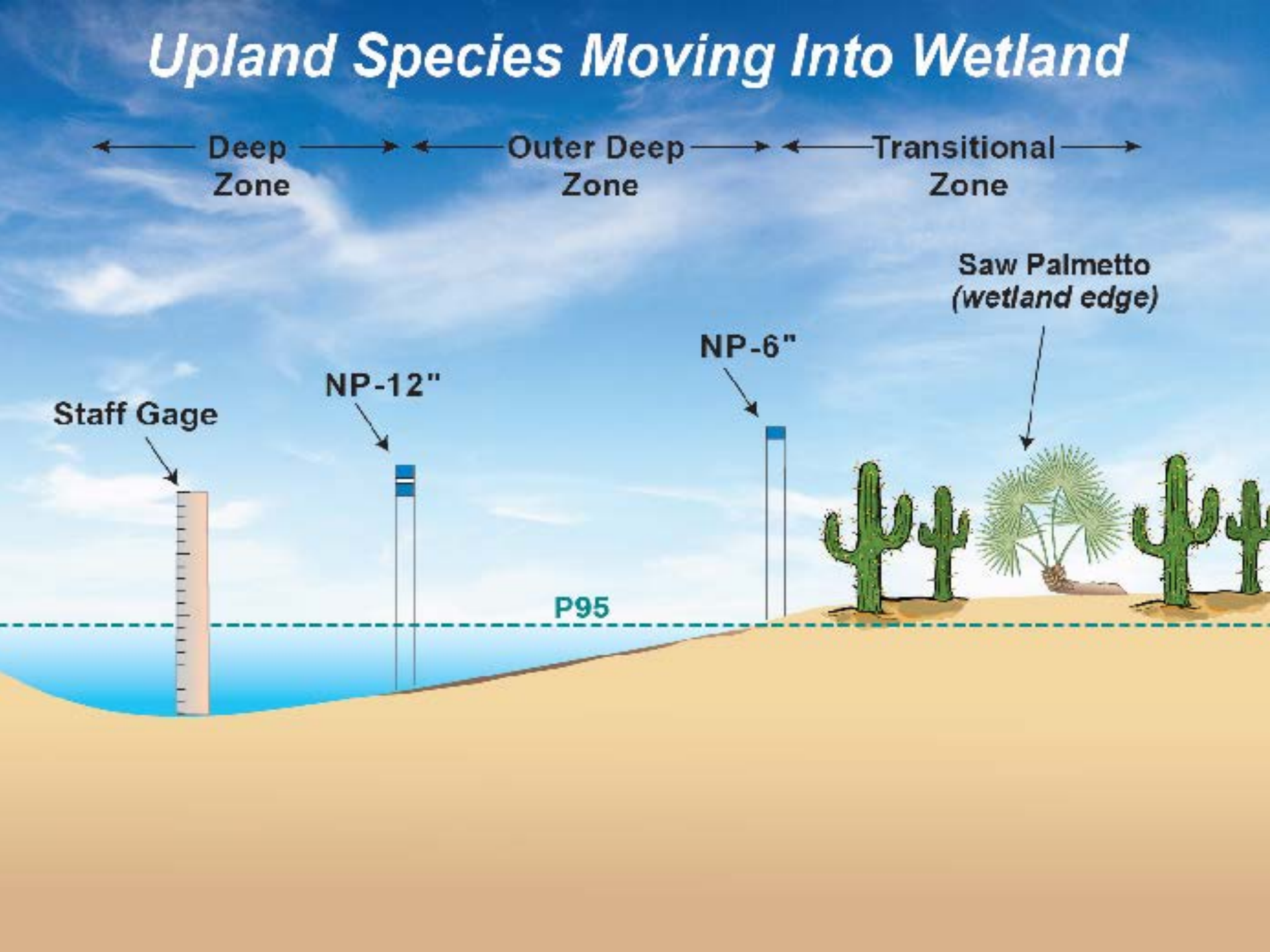
Upland Species Moving Into Wetland



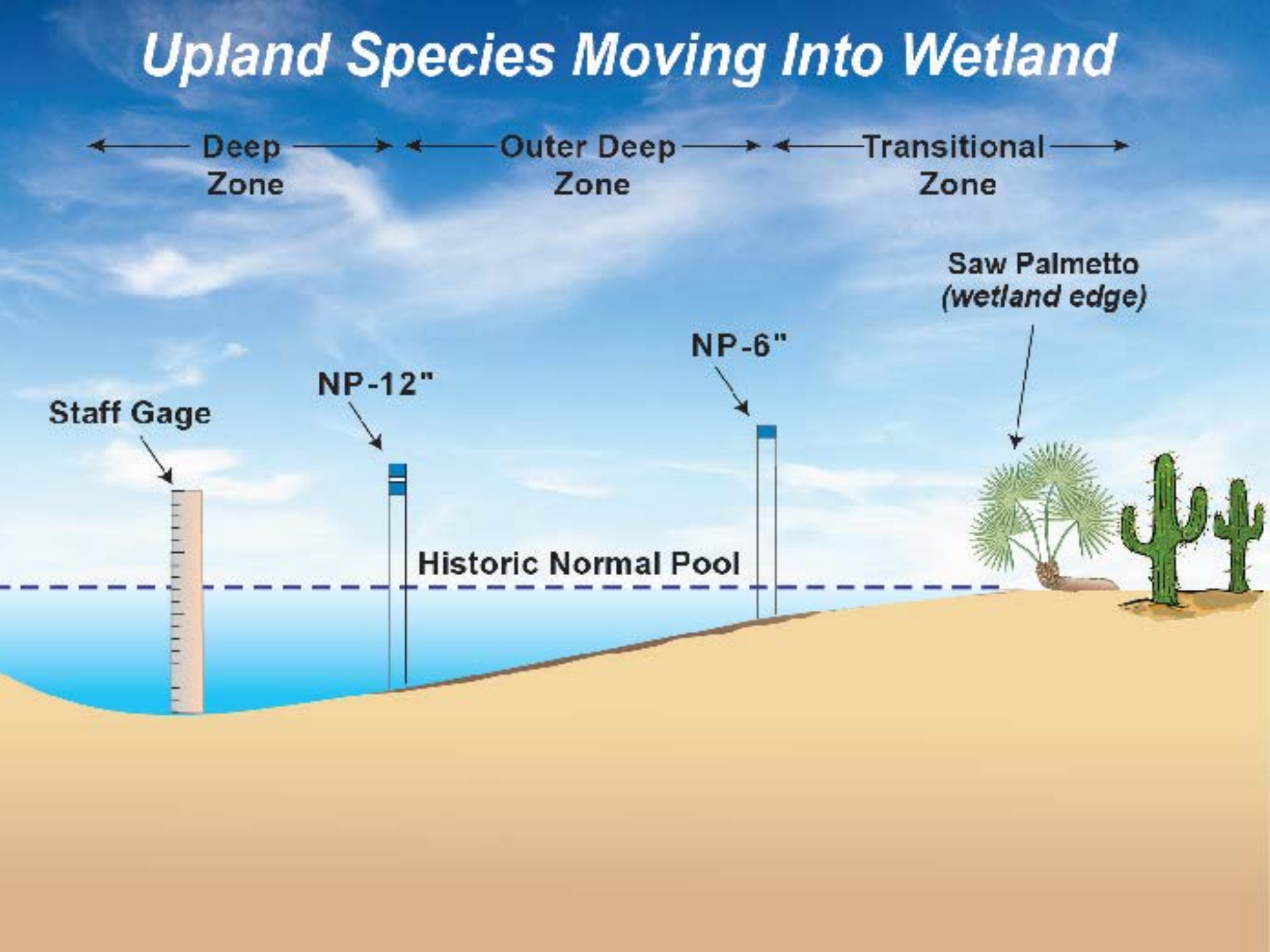
Upland Species Moving Into Wetland



Upland Species Moving Into Wetland



Upland Species Moving Into Wetland

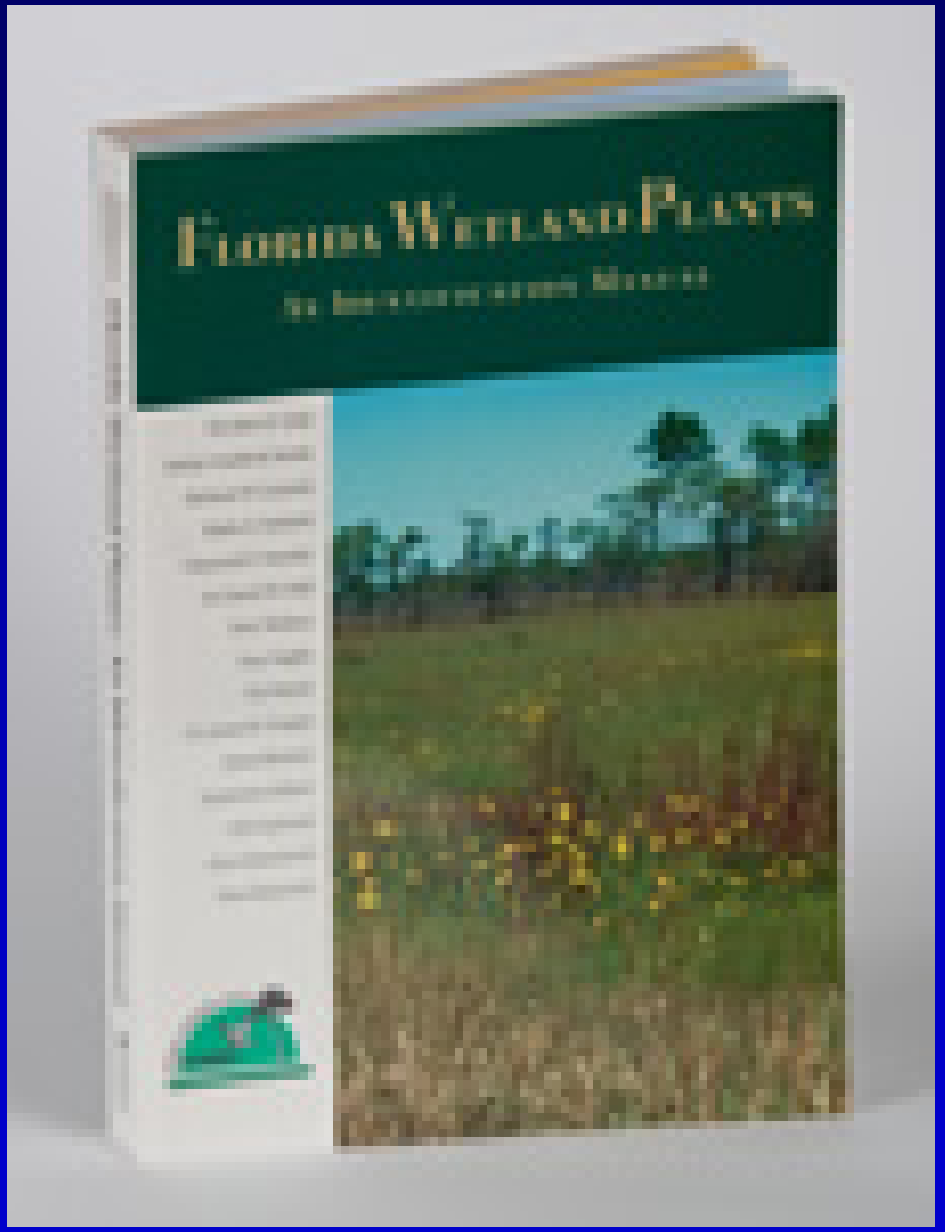


Plant ID Resources

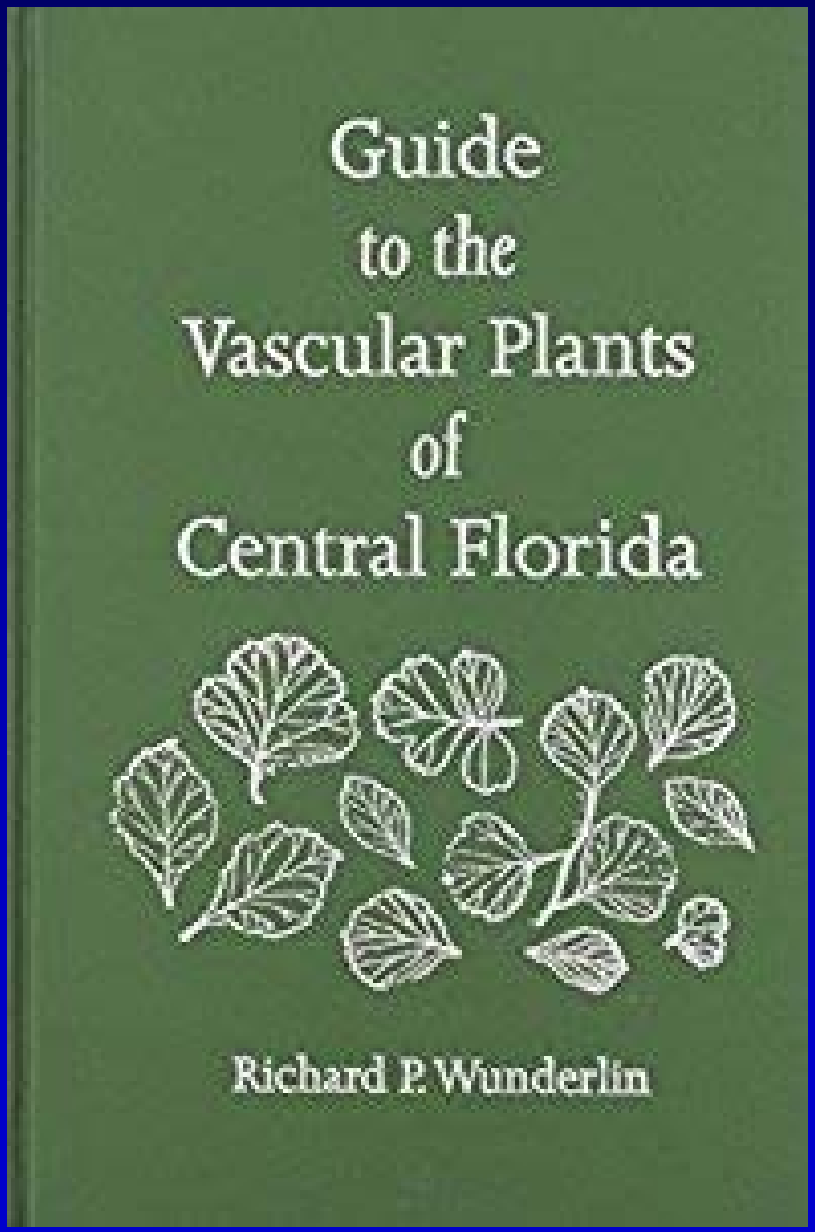
WAP Field Guide

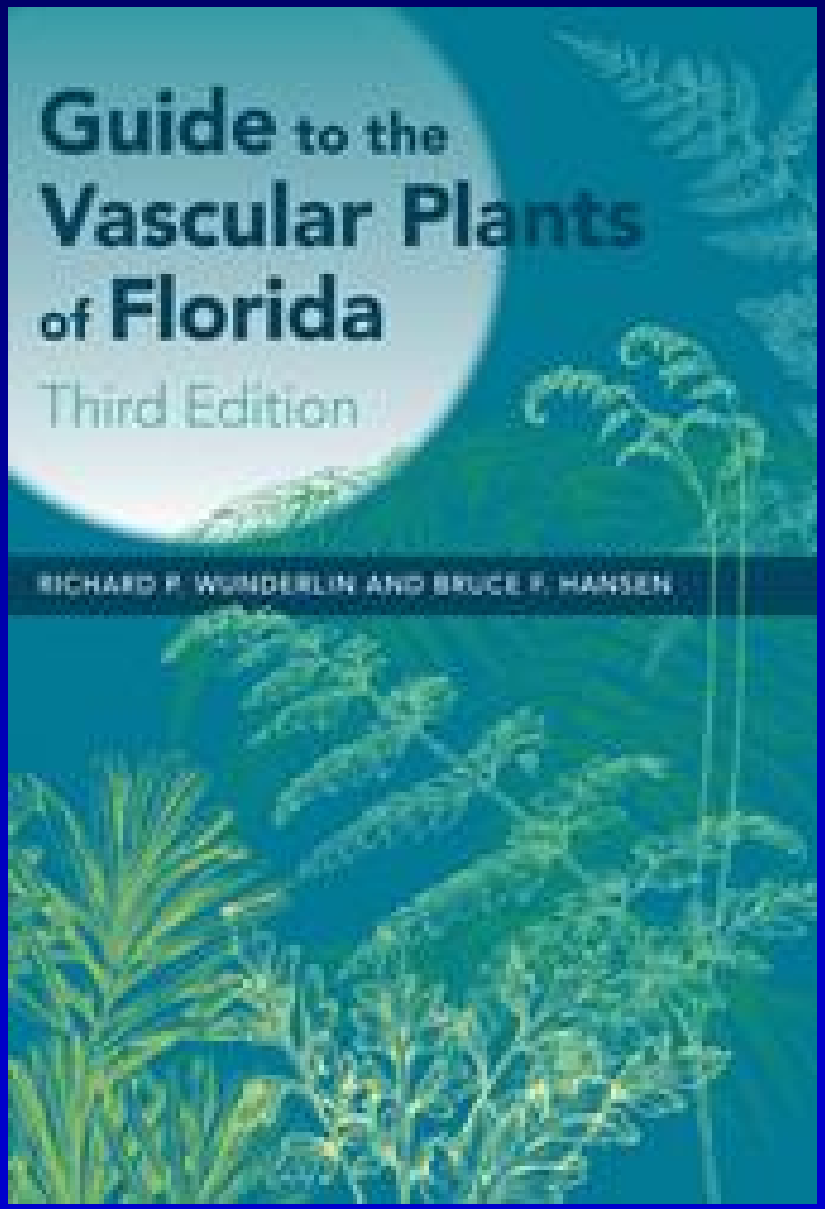
Plant ID Resources

Tobe and others, 1998



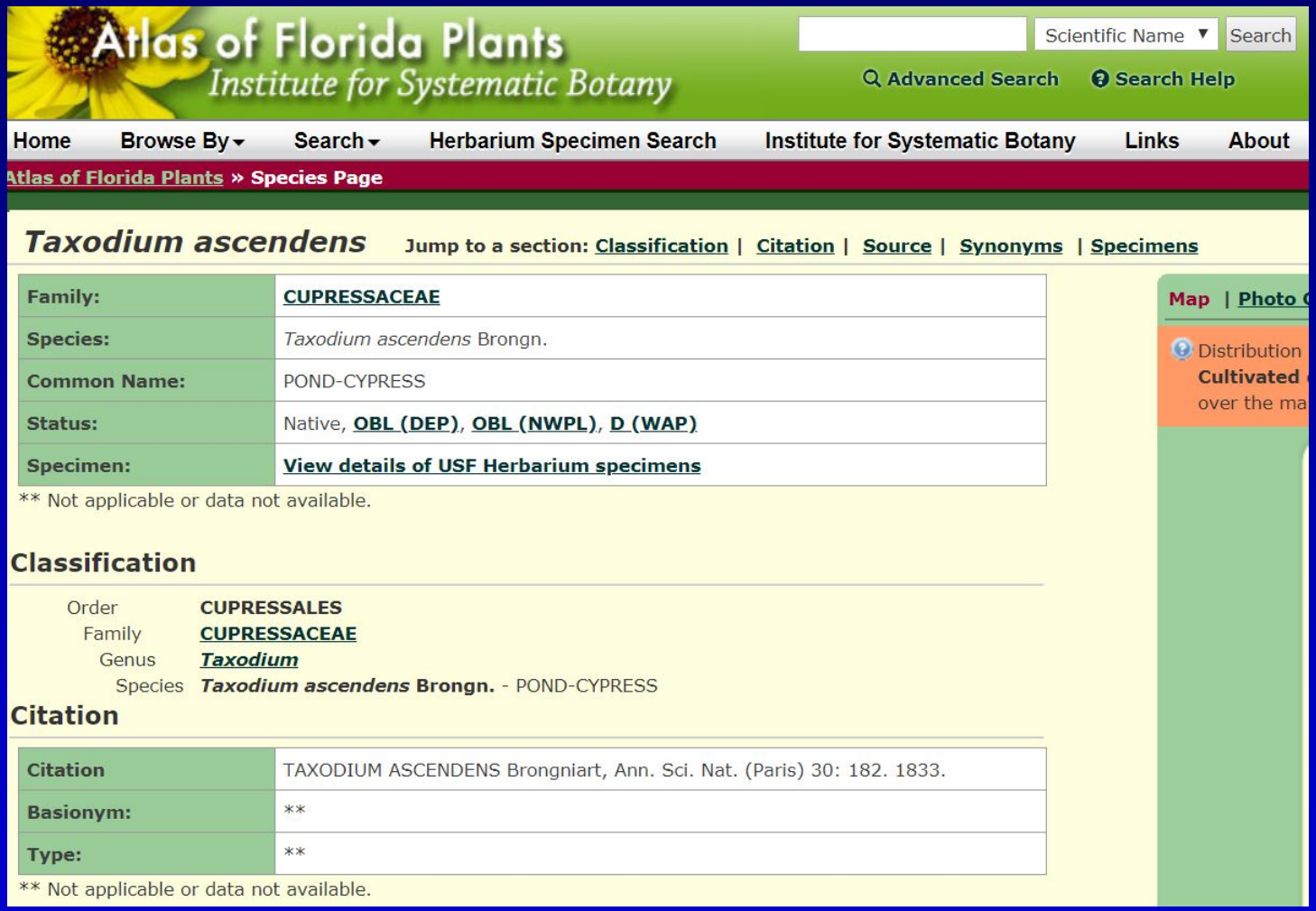
Plant ID Resources





Plant ID Resources

USF Atlas of Florida Plants



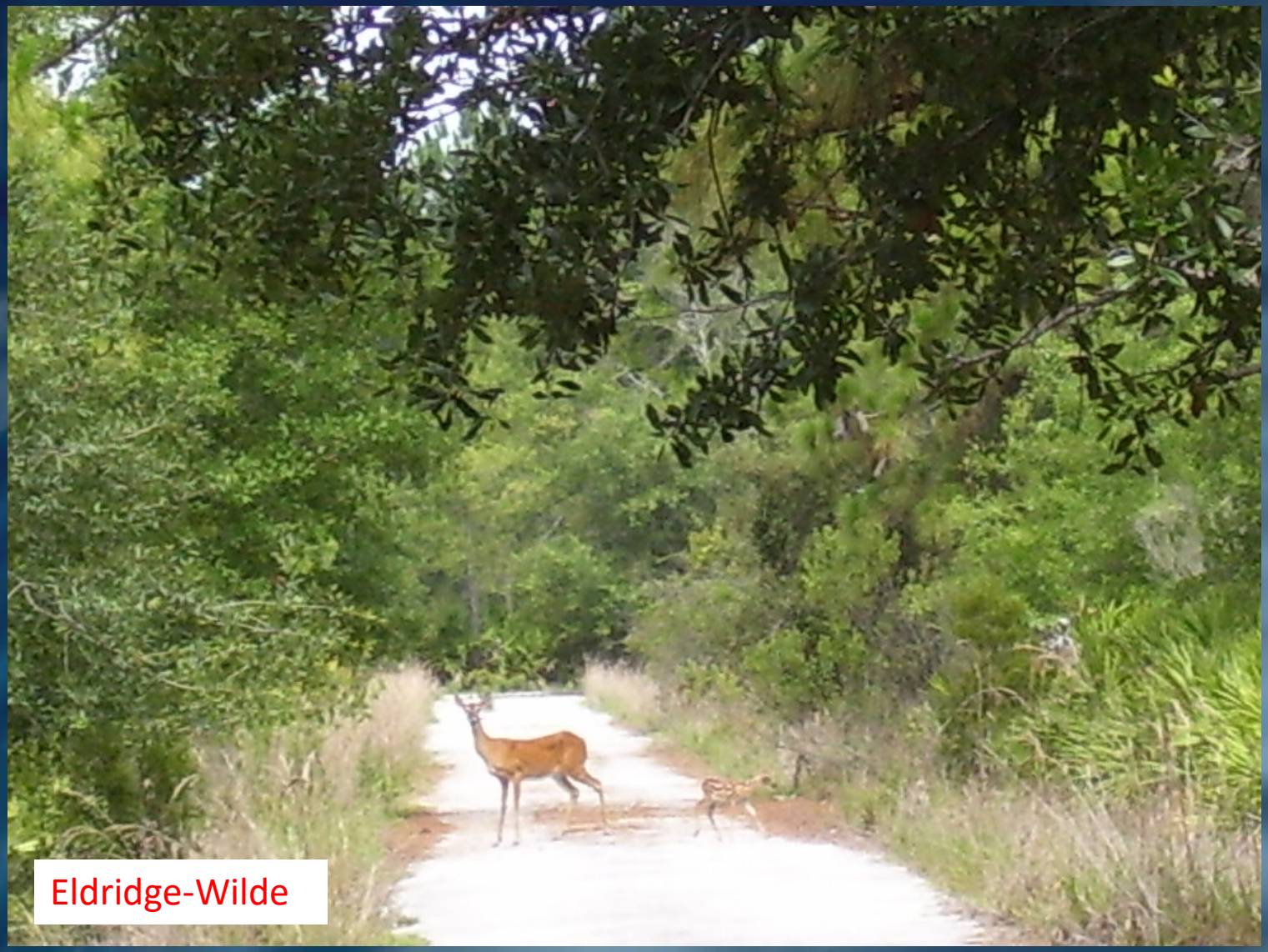
http://florida.plantatlas.usf.edu

Break?

Wetland History

- **Description of what we know about each wetland**
- **Can include:**
  - assessment of aerial photography
  - interviews with previous evaluators
  - review of previous studies
  - initial field visit notes
- **Benefit for User of Data**

2018 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 (2017 info is shaded).

Wetland Impacts			Wetland Drainage		
Wetland edges filled or disturbed?	No		Augmentation equipment in place?	No	
Excessive dumping or trash in wetland?	No		Augmentation occuring at time of WAP?	No	
Hog disturbance?	Yes		Clear evidence of direct stormwater inflow?	No	
Significant impact from cattle (trampling)?	No		Clear evidence of direct drainage from wetland?	No	
Vehicles through wetland (including bicycles)?	Yes		Other drainage activities in area?	No	
Insect damage?	No		Borrow pit/retention pond in wetland vicinity?	No	
Disease?	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:

3” root exposure on several Cypress near gage

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:

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

Species Count	Common Name	Evidence Description	

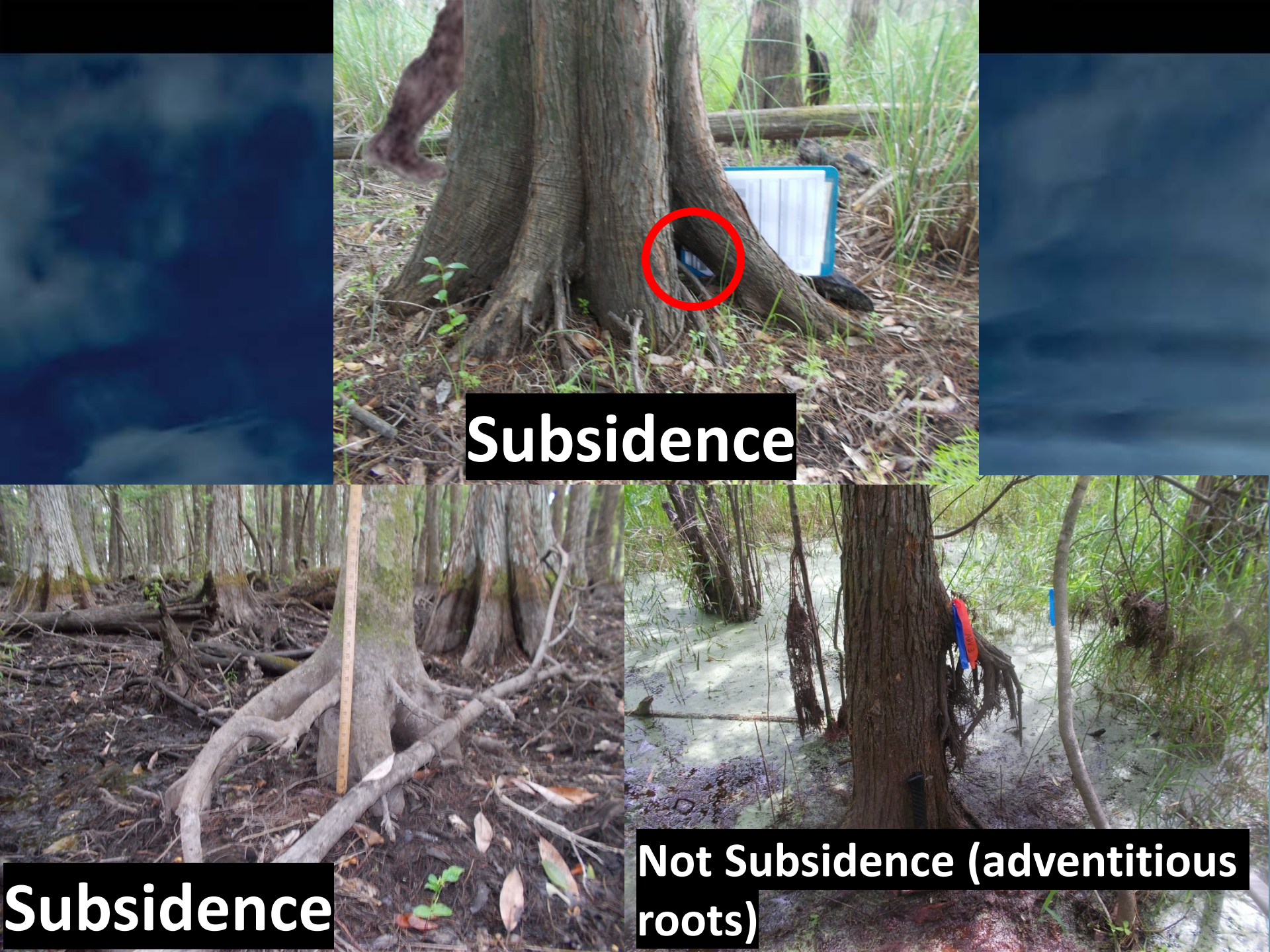
Soil Subsidence

- Organics oxidation with microbes

- Loss of buoyancy and soil compaction / shrinkage

- ~~Erosion~~ - not true subsidence

Reddy, K. R. , Osborne, T. Z., Inglett, K. S. and R. Corstanje. 2006. Influence of Water Levels on Subsidence of Organic Soils in the Upper St. Johns River Basin. St. Johns River Water Management District, Palatka, FL.


Subsidence
Subsidence
Not Subsidence (adventitious roots)

Soil Subsidence Comments

Forested – Root Exposure

- o Zero
- o 3”-6”
- o 6”-12”
- o >12”
- o 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	

Vegetation

(pp. 2, 3, and 4)

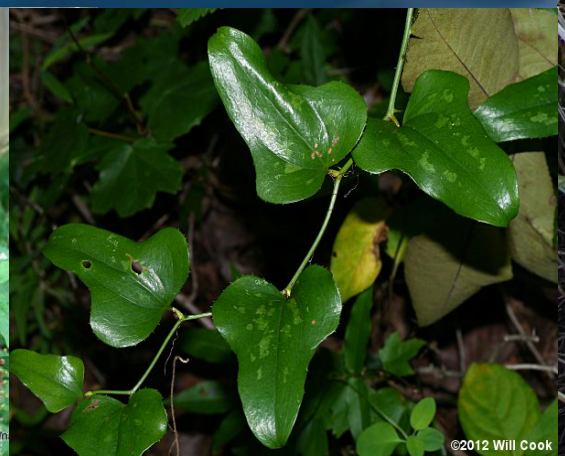
Strata

- 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, e.g., *Ilex glabra*
- Rooted in the wetland
- *Always g*roundcover*:* *Eupatorium, Phytolacca*, *Rubus*, and all vines



Shrubs and Small Trees

- Woody plants >1 meter tall & <4 cm DBH
- Cabbage palm >1 meter tall and <6 meters tall
- Must be rooted in wetland
- Generally have multiple stems
- Includes *Hypericum fasciculatum*, *Ilex glabra, Myrica, Cephalanthus, Callicarpa*, and *Lyonia* spp. when >1 meter tall

Trees

- All woody plants ≥ 1 meter tall *and* ≥ 4 cm DBH
- Includes cabbage palms > 6 meters tall
- Rooted in the ground (overhanging)
- *Never* a tree:
  Cephalanthus
  Myrica
  Schinus

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

Outer Deep Zone

Check if no groundcover ☐

Species	Z	%	#	D

Deep Zone

Check if no groundcover ☐

Species	Z	%	#	D

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

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:

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)

WAP Species & Assigned Zones

Wetland Assessment Procedure

Wellfield/Property: Portfolio	Wetland Name	Wetland Type
J.B. STARKEY	Starkey T	Cypress Isolated

Wetland ID:	Prev Yr. Assessment Area Width 2013	Zone Assessment Notes	Transect
503	5M on each side of transect		Starkey T A

Groundcover (2015 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 2015 ☐ Current ☐

		2015			Current		
Species	Z	%	#	D	%	#	D
Erioca decang	NA	10		T			
Amphic muhlen	OD	10		T			
Stilli aquati	D	5		T			
Eupato leptop	OD	5		T			

Outer Deep Zone

Check if no groundcover 2015 ☐ Current ☐

		2015			Current		
Species	Z	%	#	D	%	#	D
Stilli aquati	D	10		T			
Gratiola sp.	NA	5		E			
Pluche baccha	OD	5		T			
Eupato leptop	OD	5		T			

Deep Zone

Check if no groundcover 2015 ☐ Current ☐

		2015			Current		
Species	Z	%	#	D	%	#	D
Rhynch inunda	NA	30		T			
Panicu hemito	NA	5		T			
Sagitt gramin	NA	5		T			
Carex verruc	NA	5		T			

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

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 either FACW or 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 either FACW or OBL by DEP.

Zones

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

Wetland Assessment Procedure

Wellfield/Property: Portfolio	Wetland Name	Wetland Type
J.B. STARKEY	Starkey T	Cypress Isolated

Wetland ID:	Prev Yr. Assessment Area Width 2013	Zone Assessment Notes	Transect
503	5M on each side of transect		Starkey T A

Groundcover (2015 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 2015 ☐ Current ☐

		2015			Current		
Species	Z	%	#	D	%	#	D
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 2015 ☐ Current ☐

		2015			Current		
Species	Z	%	#	D	%	#	D
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 2015 ☐ Current ☐

		2015			Current		
Species	Z	%	#	D	%	#	D
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			

Zonation Scoring How To

- Walk the transect and list all the plant species you see in each zone
  - Use scientific names (eventually!)
  - Focus on species with significant cover (but include all species observed)

Convention

- If any zone has been temporarily disturbed (pig rooting, fire, etc.):
  - Check “no cover” box (top of zone species list)
  - Add an explanation
  - Re-evaluate next year

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

Dead vs. Live Vegetation

- Include planted and landscape species, etc.

- Species different from last year? Take a second look (especially on Shrubs and Small Trees, or Trees).

Vegetation Cover and Number

- Estimate the percent cover of each species and, for "Shrubs and Small Trees" and "Trees", always count the number of plants.
  - Estimate percentage of the zone in assessment area covered by each species
  - For groundcover, if one, two, three, or four individuals – write 1, 2, 3 or 4
  - Otherwise, choose 5% or increments of 10% (10, 20, 30, etc.)
  - No ranges (no ">" or "<")
  - For Trees and Shrubs, if >50 individuals, write ">50"


1
2

Groundcover (2015 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 2015 ☐ Current ☐

Species	Z	%	#	D	%	#	D
		2015			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 2015 ☐ Current ☐

Species	Z	%	#	D	%	#	D
		2015			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 2015 ☐ Current ☐

Species	Z	%	#	D	%	#	D
		2015			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 (2015 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 2015 ☐ Current ☐

Species	Z	%	#	D	%	#	D
		2015			Current		
Stilli aquati	D		4	T			

Outer Deep Zone

Check if no shrubs 2015 ☐ Current ☐

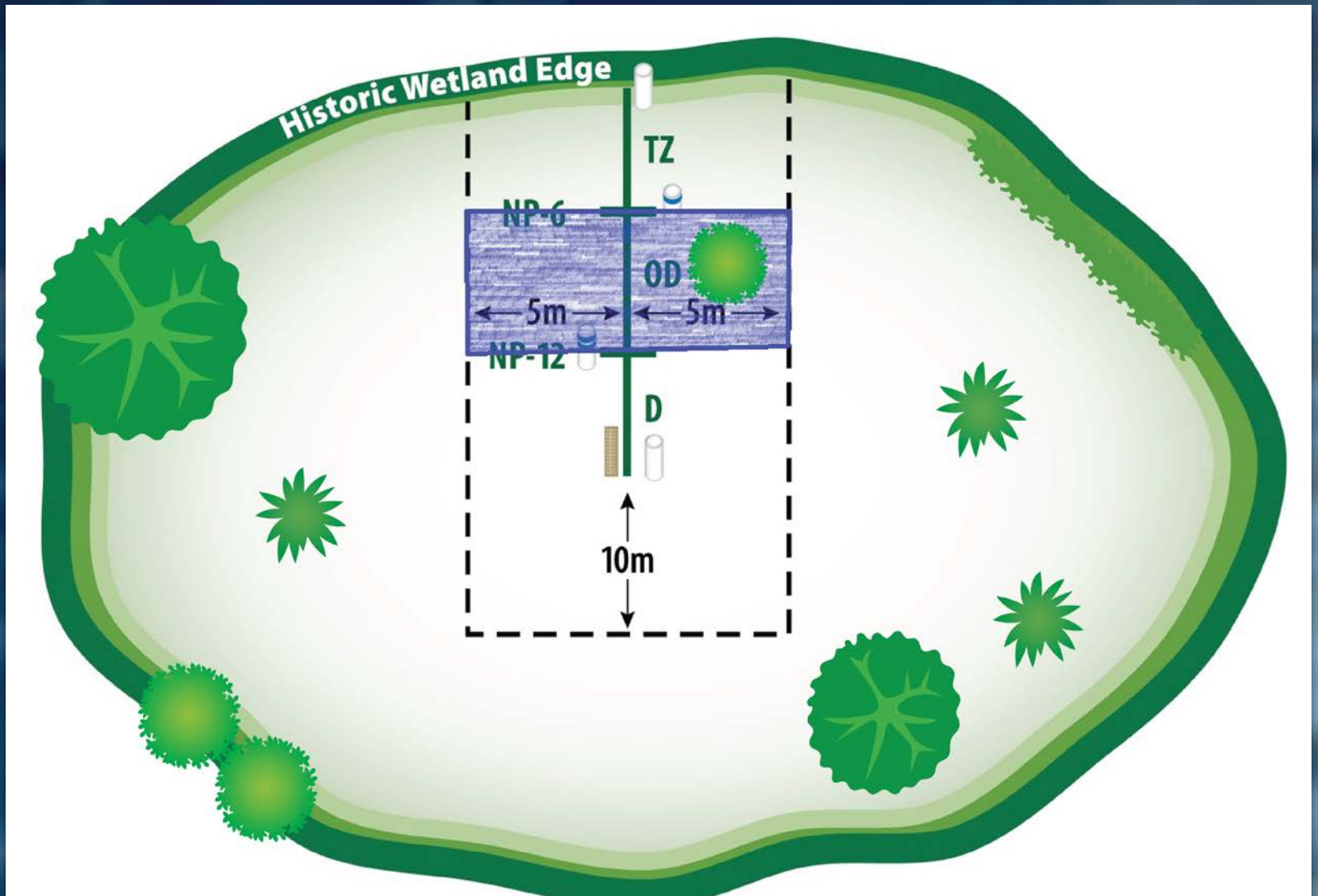
Species	Z	%	#	D	%	#	D
		2015			Current		
Myrica cerife	AD	20	15	T			
Taxodi ascend	D	10	10	T			
Stilli aquati	D	5	10	T			
Hyperi fascic	OD	5	5	T			
Pinus elliot	AD	5	3	T			
Persea palust	OD		1	T			

Deep Zone

Check if no shrubs 2015 ☐ Current ☐

Species	Z	%	#	D	%	#	D
		2015			Current		
Taxodi ascend	D	10	17	T			
Stilli aquati	D	5	8	T			
Myrica cerife	AD	5	6	B			

Remember, only in 10% increments.
10% < ~~15%~~ > 20%



Distribution

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 ☐

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

Outer Deep Zone

Check if no shrubs 2014 ☐ Current ☐

	2014				Current		
Species	Z	%	#	D	%	#	D
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			
Persea palust	OD		1	T			

Deep Zone

Check if no shrubs 2014 ☐ Current ☐

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

- E – Edge
- B - Beyond a few feet (inside transect)
- T - Throughout

Things to Consider

- 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

COFFEE BREAK

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
  - Two scoring methods / guides

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 1 Zone**

Species distributed THROUGHOUT MUCH of the Zone *or* **Species found ONLY along Zone Edge**

GC	☐	< 5% cover for all 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 located a few feet into OD Zone)

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 into a Zone**

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

AND/OR (Adaptive Species Only located THROUGHOUT MUCH of the Trans Zone)

Transition Zone ☐ > 25% GC *and/or* ☐ > 5specimens 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 into 2 Zones distributed BEYOND a few feet of a Zone)

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

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

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

AND/OR (Upland species distributed BEYOND a few feet into the DEEP ZONE)

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

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:**

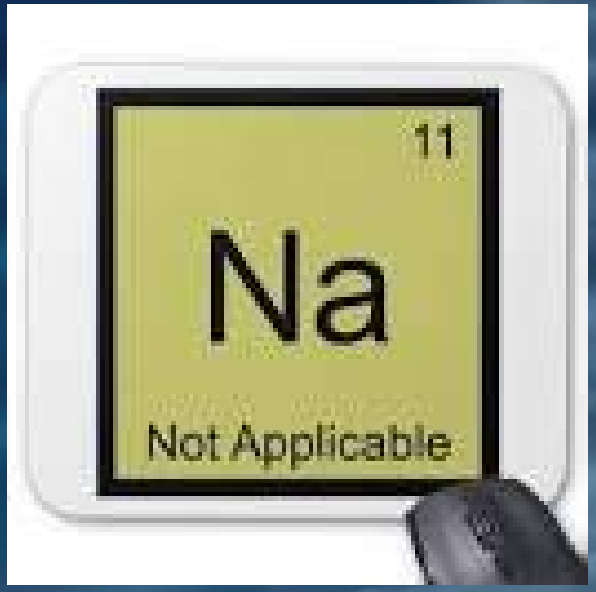
a. "Enough numbers" generally means 2 or 3 specimens.
b. "High numbers" generally means greater than 5 specimens.
c. "Enough distribution" generally means located beyond a few feet of the appropriate **zone**.
d. "High distribution" generally means located throughout much of the **zone**.

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.

NA is:

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



When is NA an Appropriate Score?

Guidance –

- If <5% groundcover, <2 shrubs and small trees, or <2 trees
- Can also be due to high water, fire, inaccessibility, or other temporary reasons
- Explain reasons

Examples of not enough groundcover (NA)

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.
- "High distribution": Located throughout much of the zone.

Numbers & Percentages

- Percentages are not cumulative between zones

  - 3 AD plants into the OD zone, and 3 OD plants into the D zone is *not* a one zone move for 6 plants

  - 15% AD species into the OD zone, and 20% OD species into the D zone is not a 35% one zone move.

Scoring a 5

- Some species may have migrated inward one zone, but they are *not* in enough numbers (i.e., <5%, 1 shrub or tree) and/or are only along the zone edge.

- Adaptive species in the Transition zone are not considered abnormal if they are not in high numbers (i.e., </= 25%, </= 5) and high distribution.

Scoring a Four

- Species have moved in one zone in enough numbers (>5%, 2-3 trees / shrubs) and enough distribution to be of concern, and/or;
- Adaptive species are in high numbers (>25%, >5 trees / shrubs) and high distribution in the Transition zone.

Scoring a Three

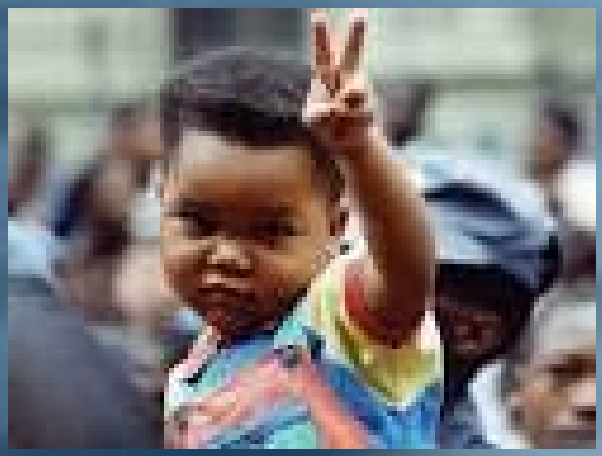
- Species have moved in one zone in high numbers and high distribution, and/or;

- Species have moved in two zones in enough numbers and enough distribution to be of concern.

Scoring a Two

- Species have moved in two zones in high numbers and high distribution, and/or;

- Some Upland species have moved into the Deep zone in enough numbers and enough distribution to be of concern.



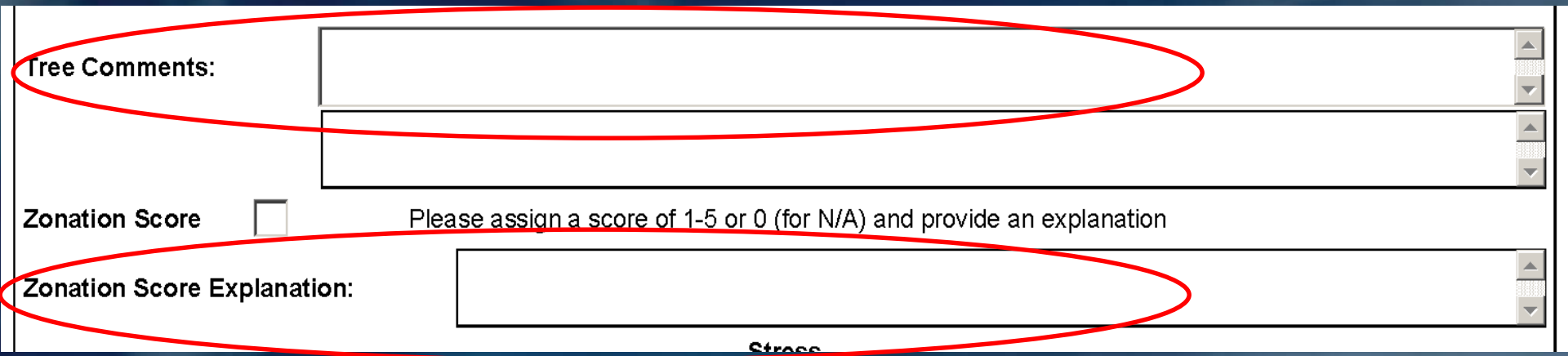
Scoring a One

- Upland species have moved into the Deep zone in high numbers and high distribution.

Explanations

- Explain your score in the Explanation box
  - 5 and NA too!
  - Critical and mandatory part of process
  - Also, comments in the Comments box, if appropriate

Explanations



Explanation Examples…

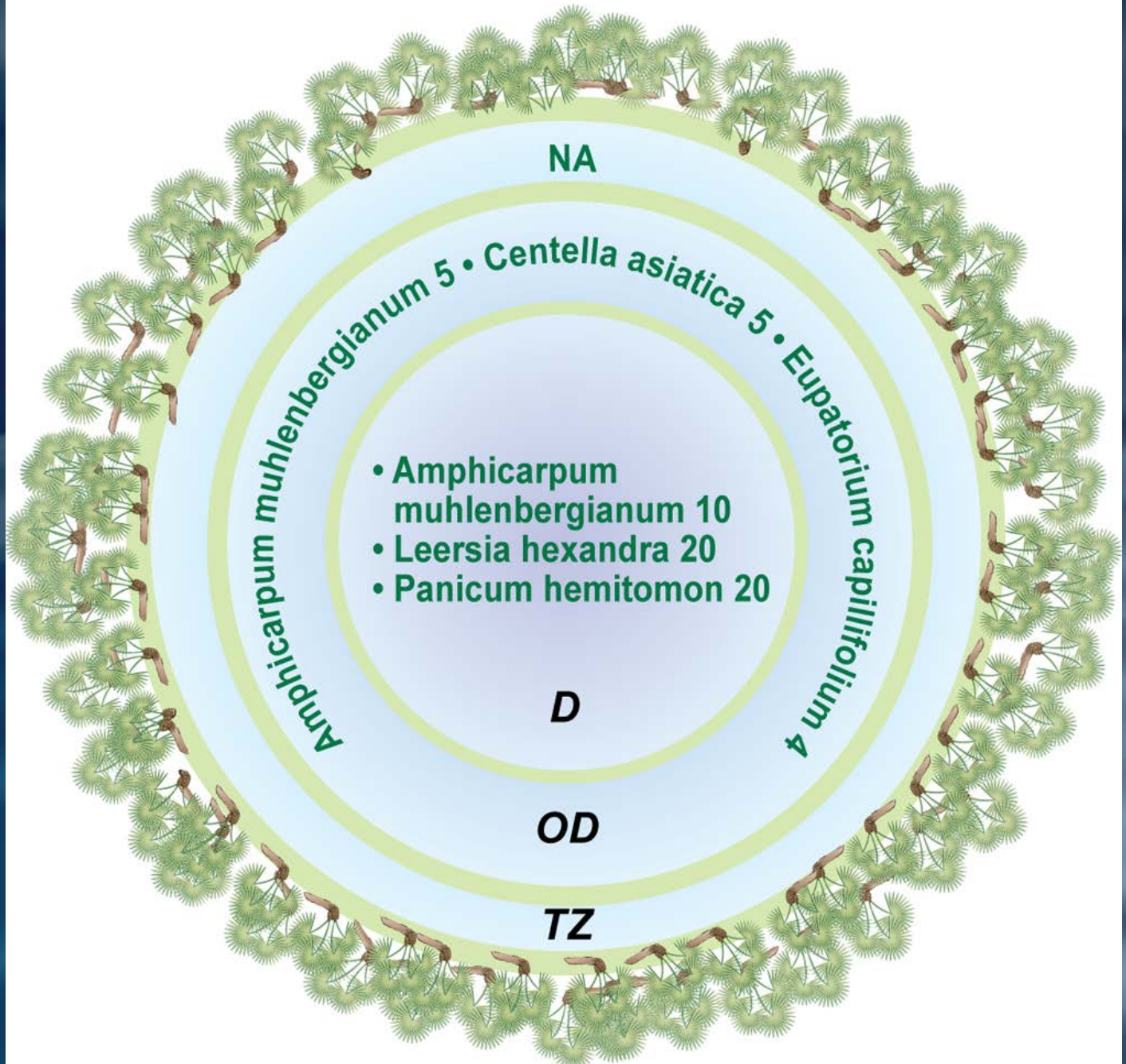
- "OD into D-zone w/ high cover & distribution."
- "T/AD into D-zone distributed throughout the zone but not high cover."
- "All species in appropriate zones"
- "All species in appropriate zone (OD plants in D-zone very near NP-12 marker)"

Note:

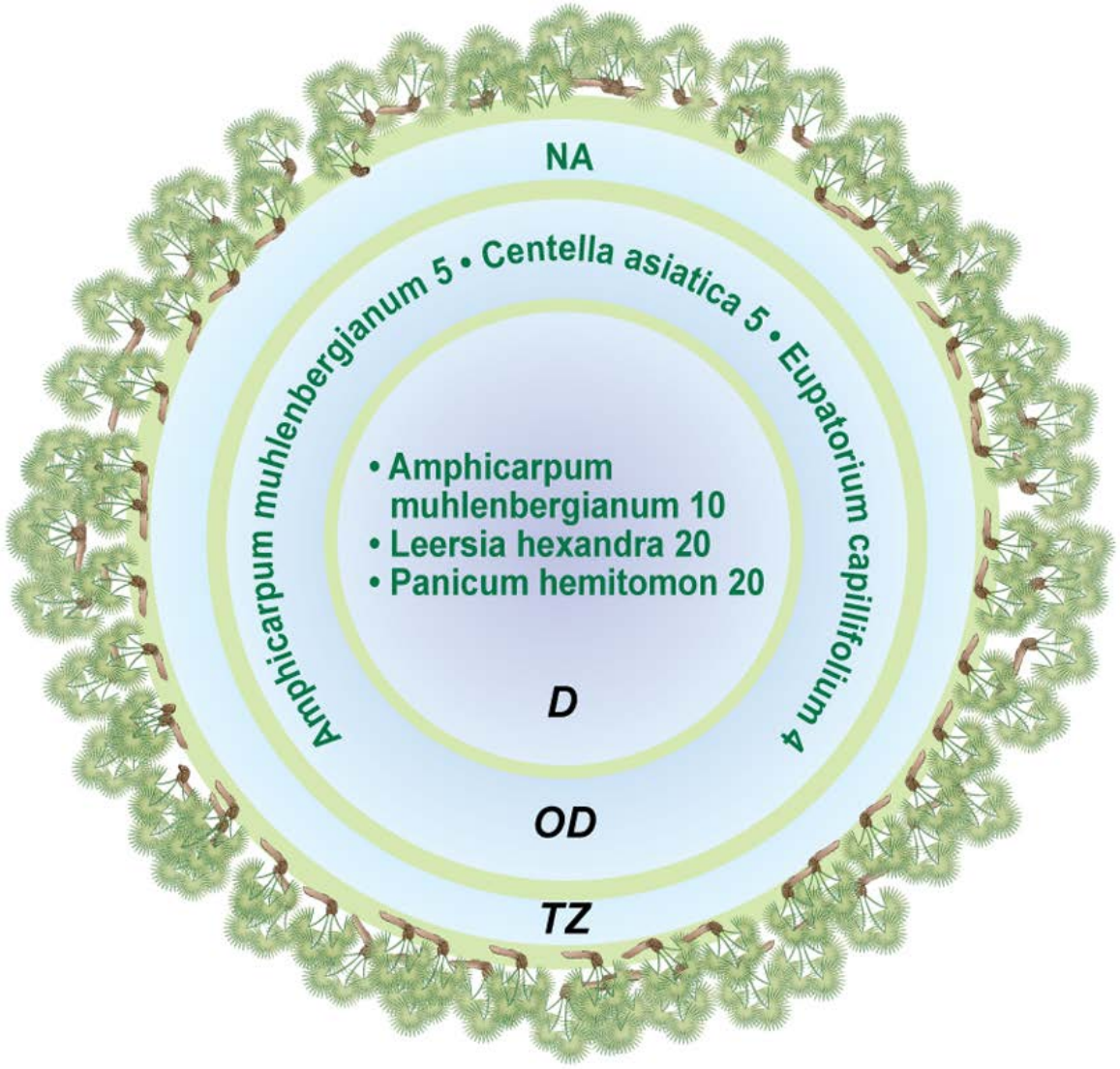
- If a zone does not exist, notate in the appropriate box.
- If no species exist in a zone, check the appropriate box.
- If the wetland is not accessible, write NA in the Score area and give an explanation.

Example Exercises

Groundcover



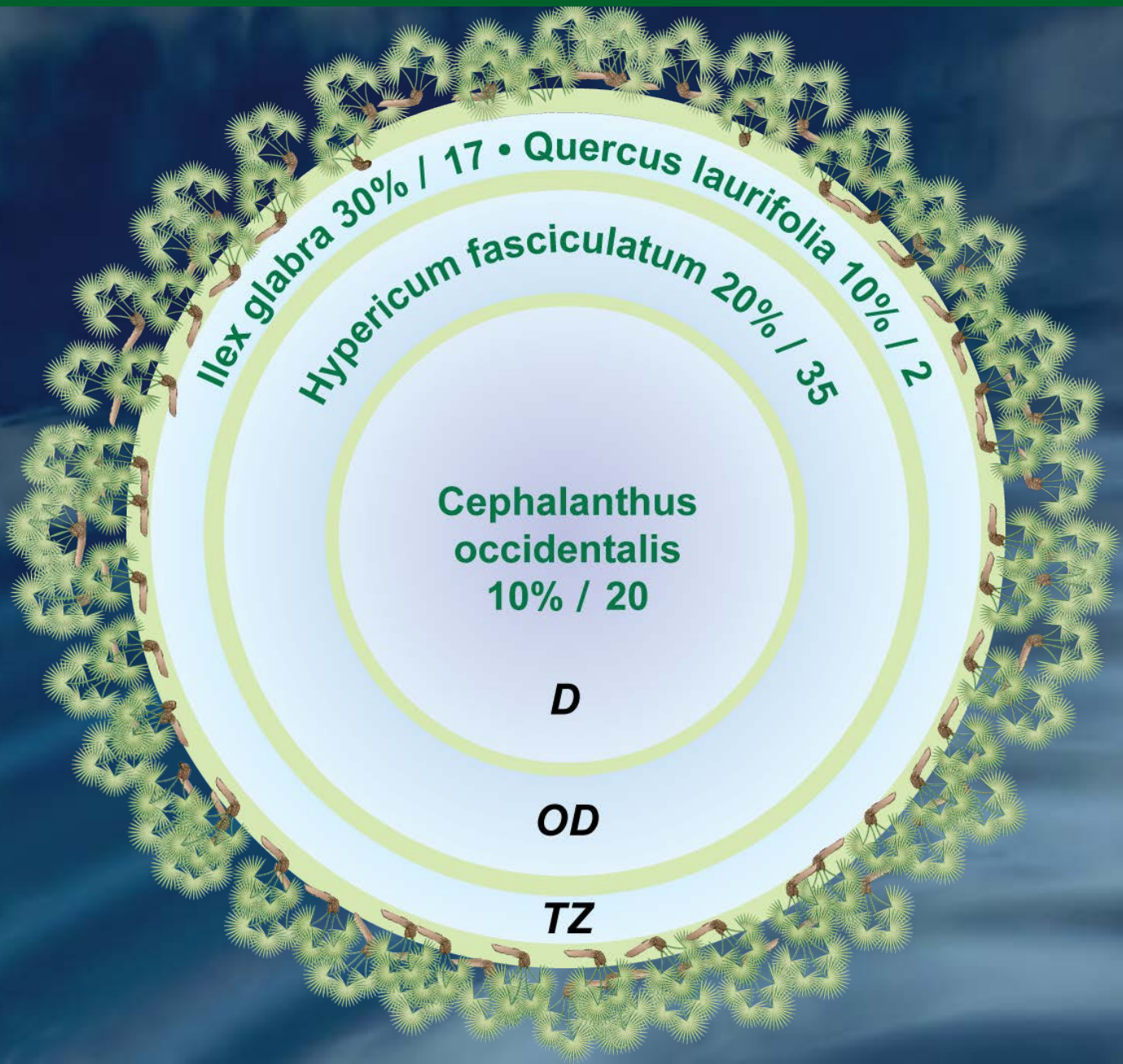
Groundcover



Groundcover Zonation Explanation

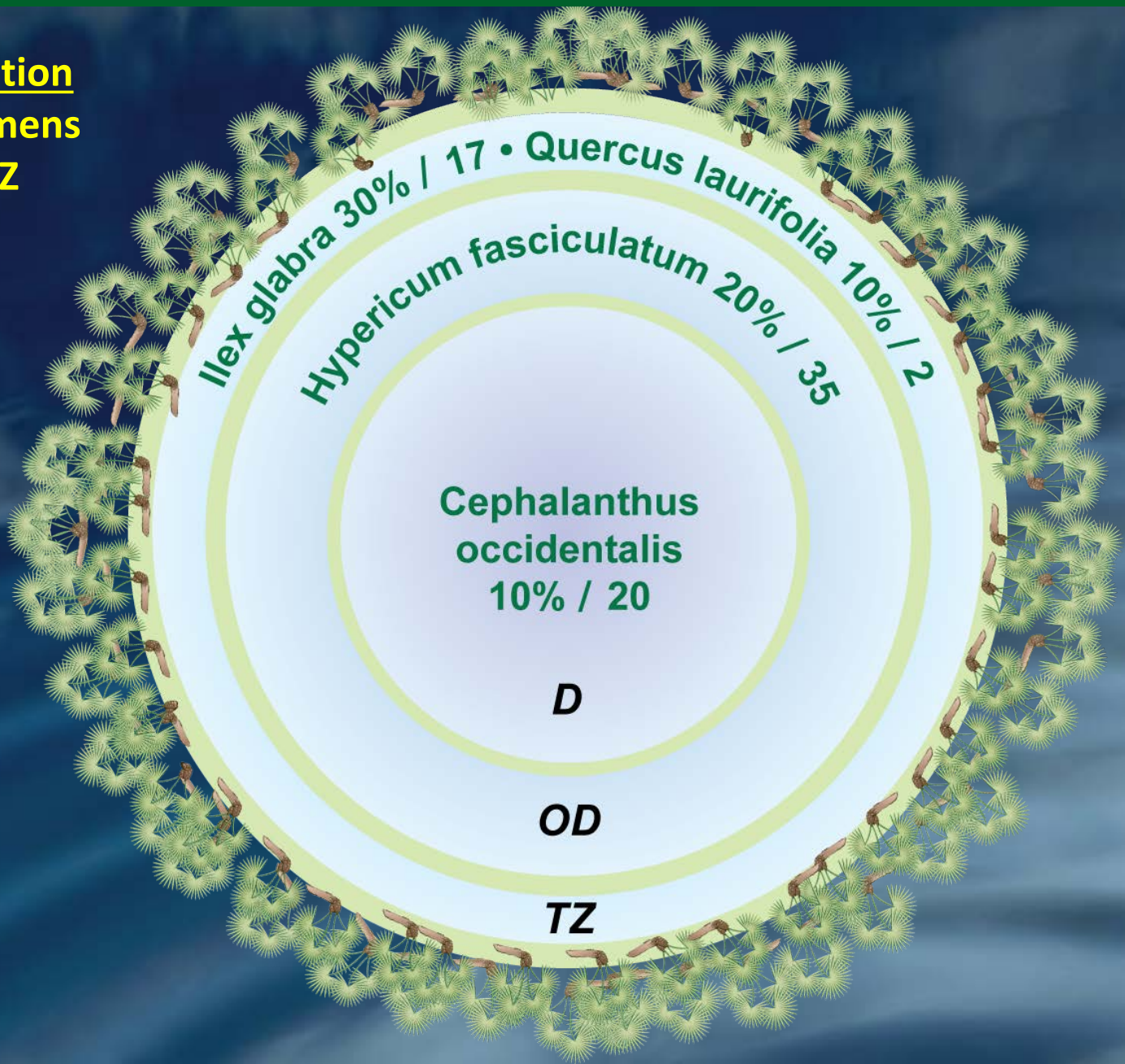
SCORE	
3	Species have moved one zone in high numbers and distribution.

Shrubs and Small Trees



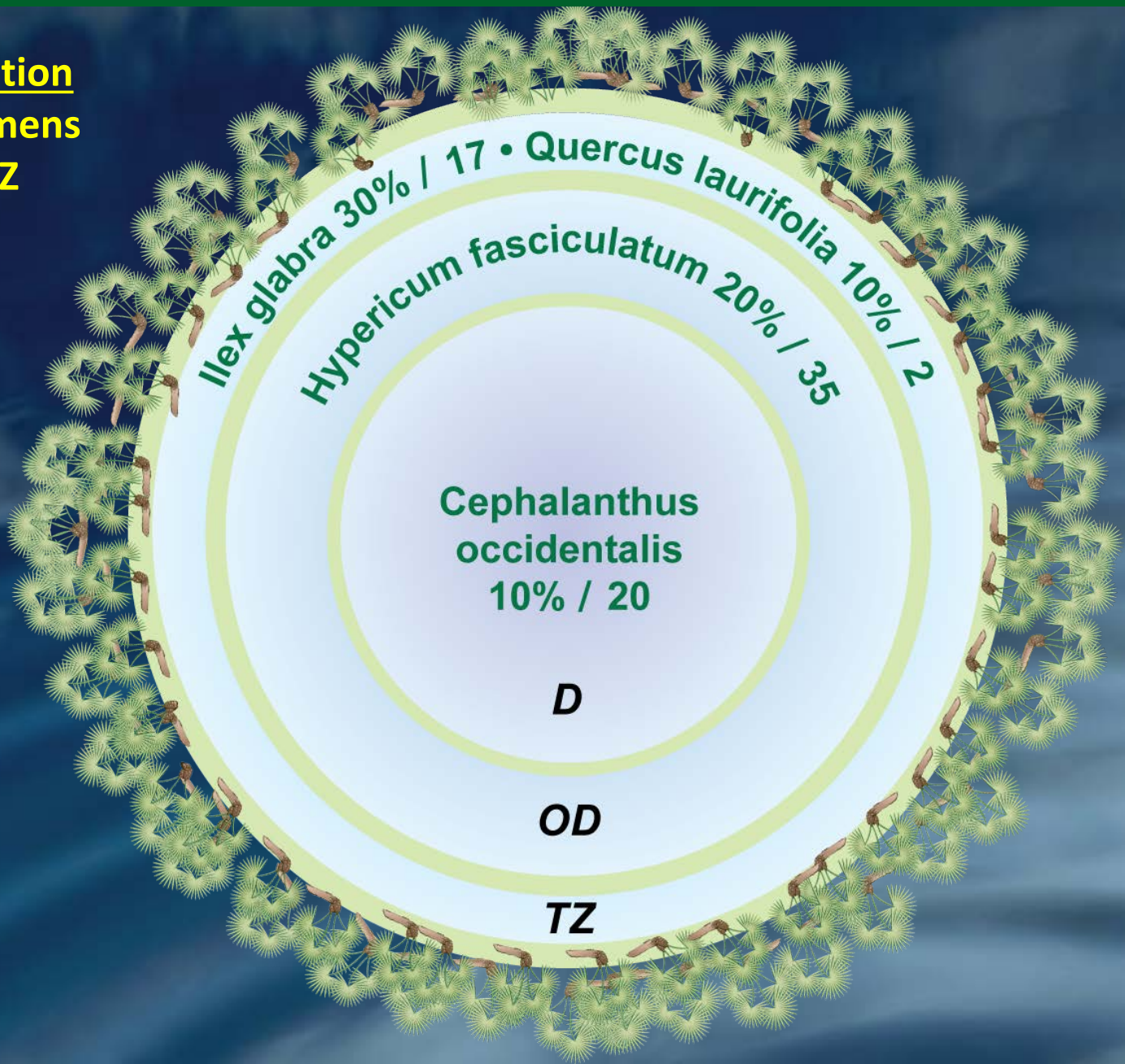
Shrubs and Small Trees

Zone Explanation
> 5 AD Specimens throughout TZ



Shrubs and Small Trees

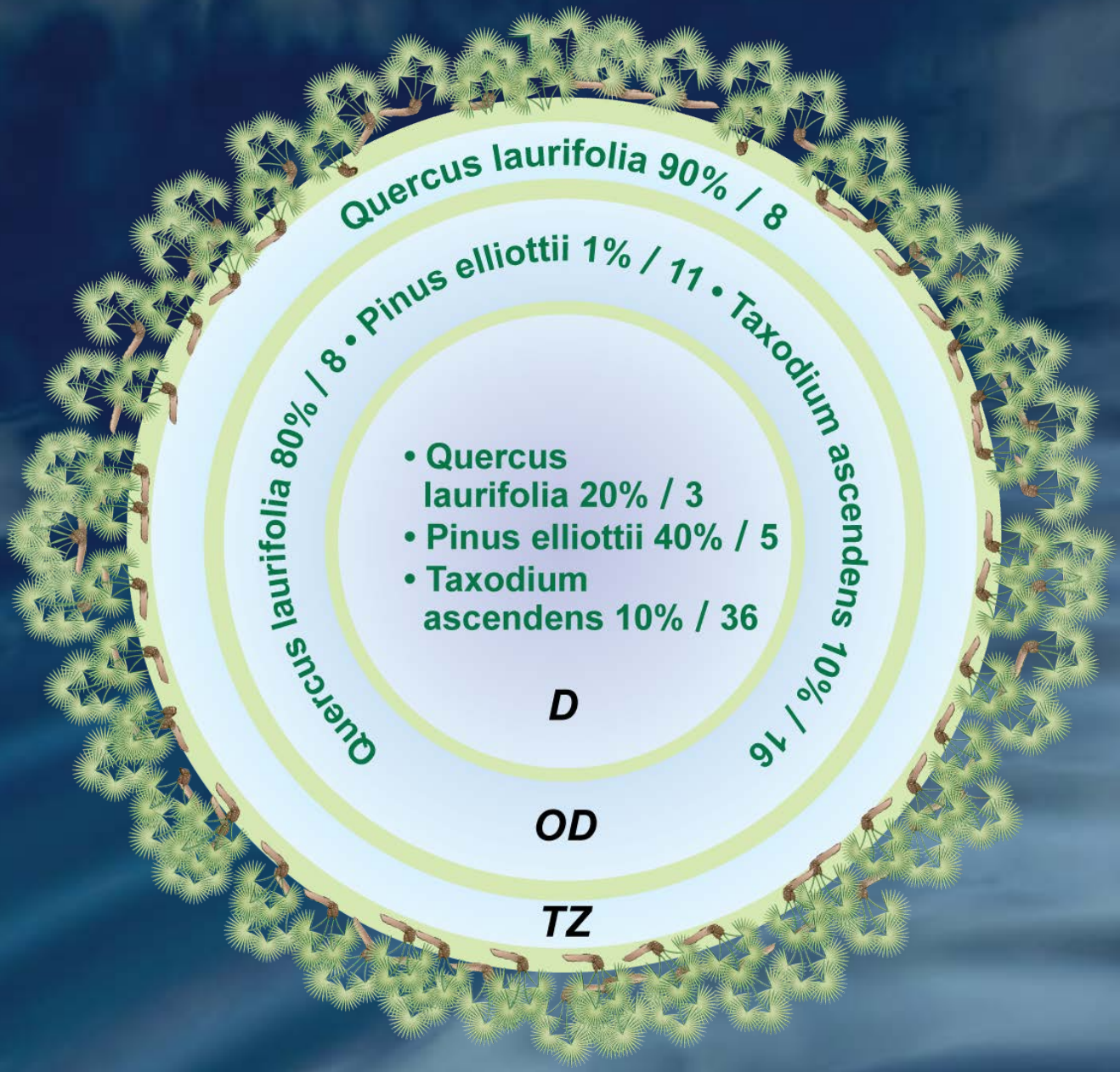
Zone Explanation
> 5 AD Specimens throughout TZ



Score

4

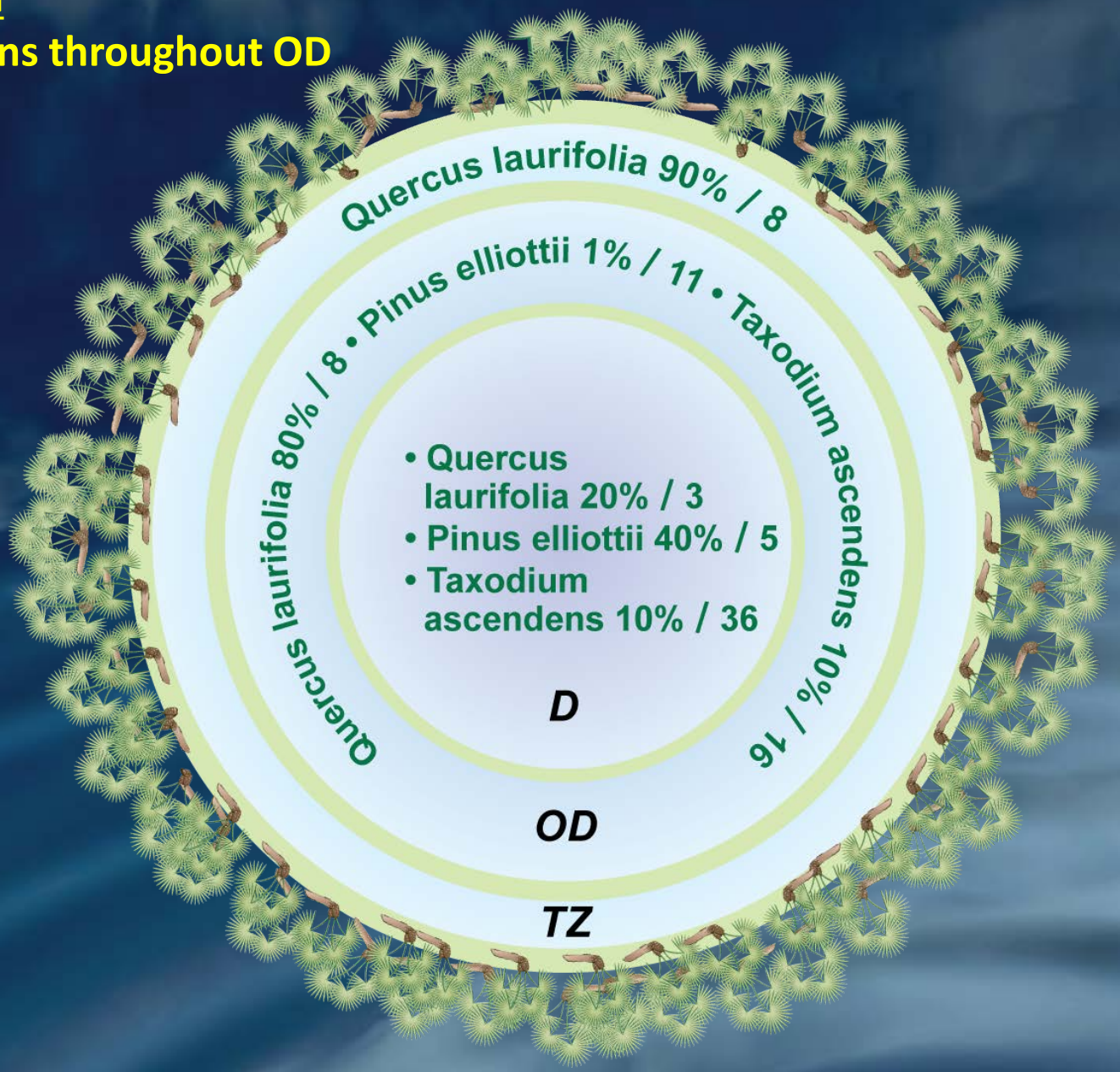
Trees


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

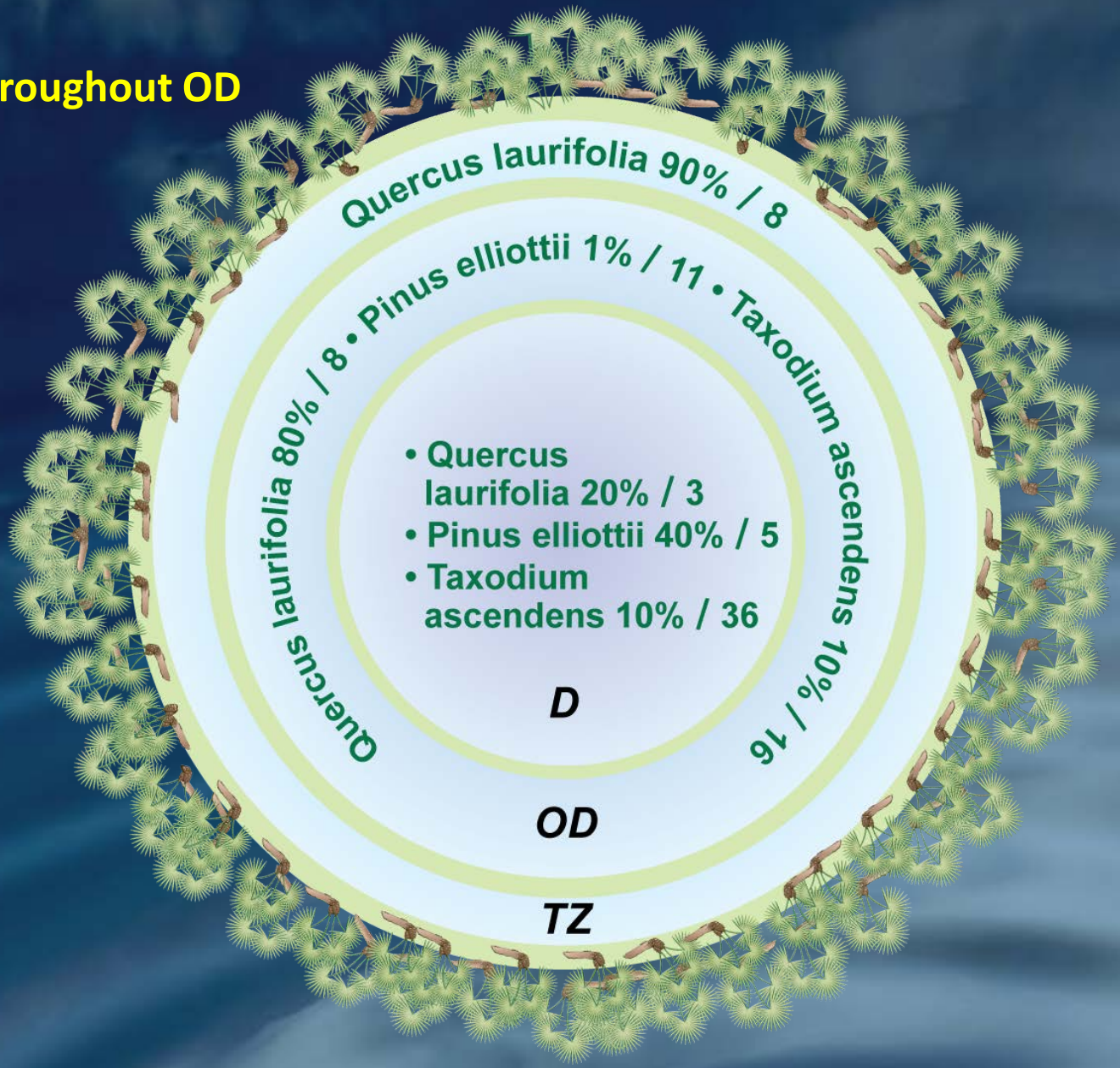


Trees

Zone Explanation

>5 T/AD Specimens throughout OD

>5 T/AD Specimens throughout D

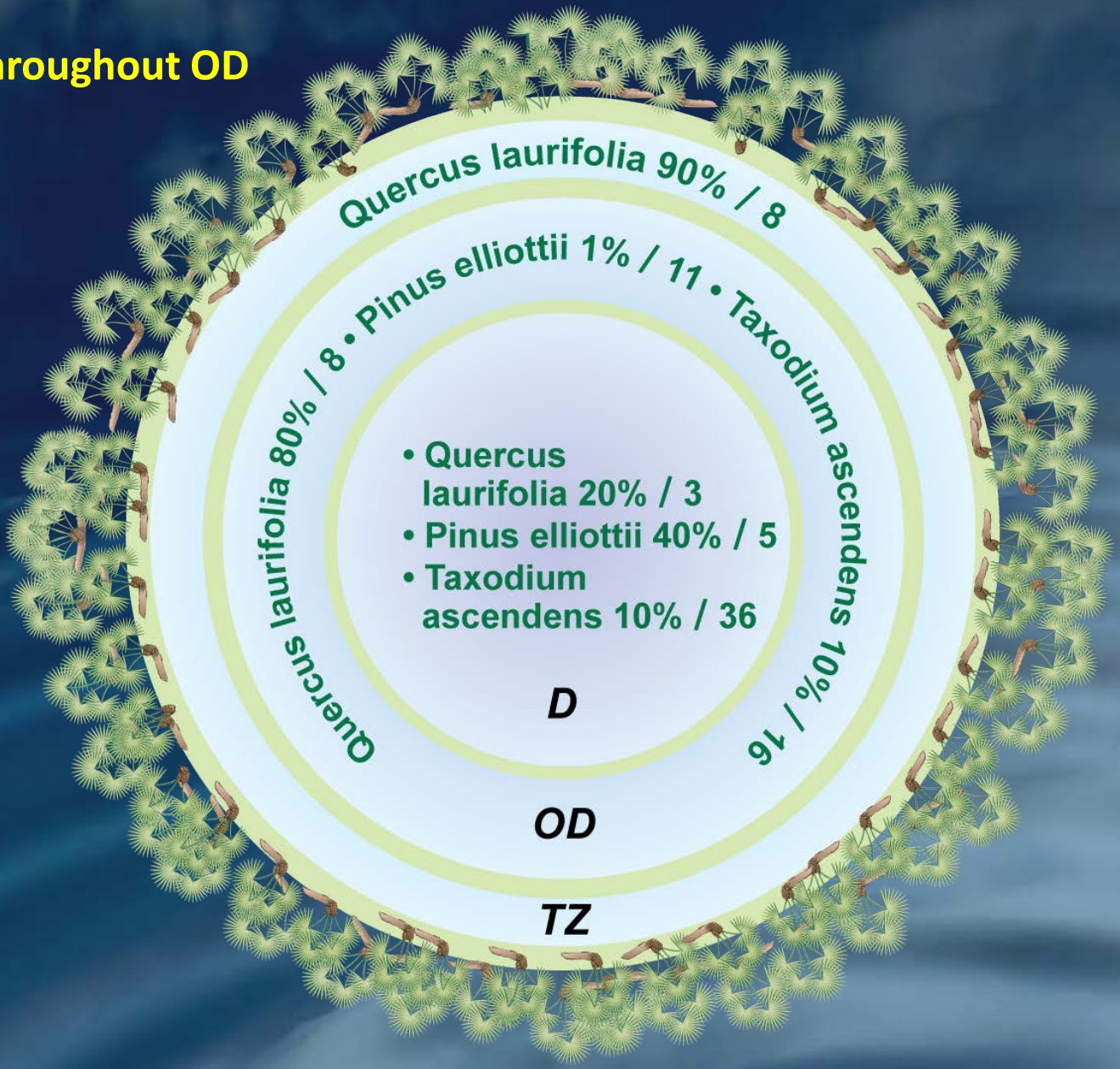


Trees

Zone Explanation

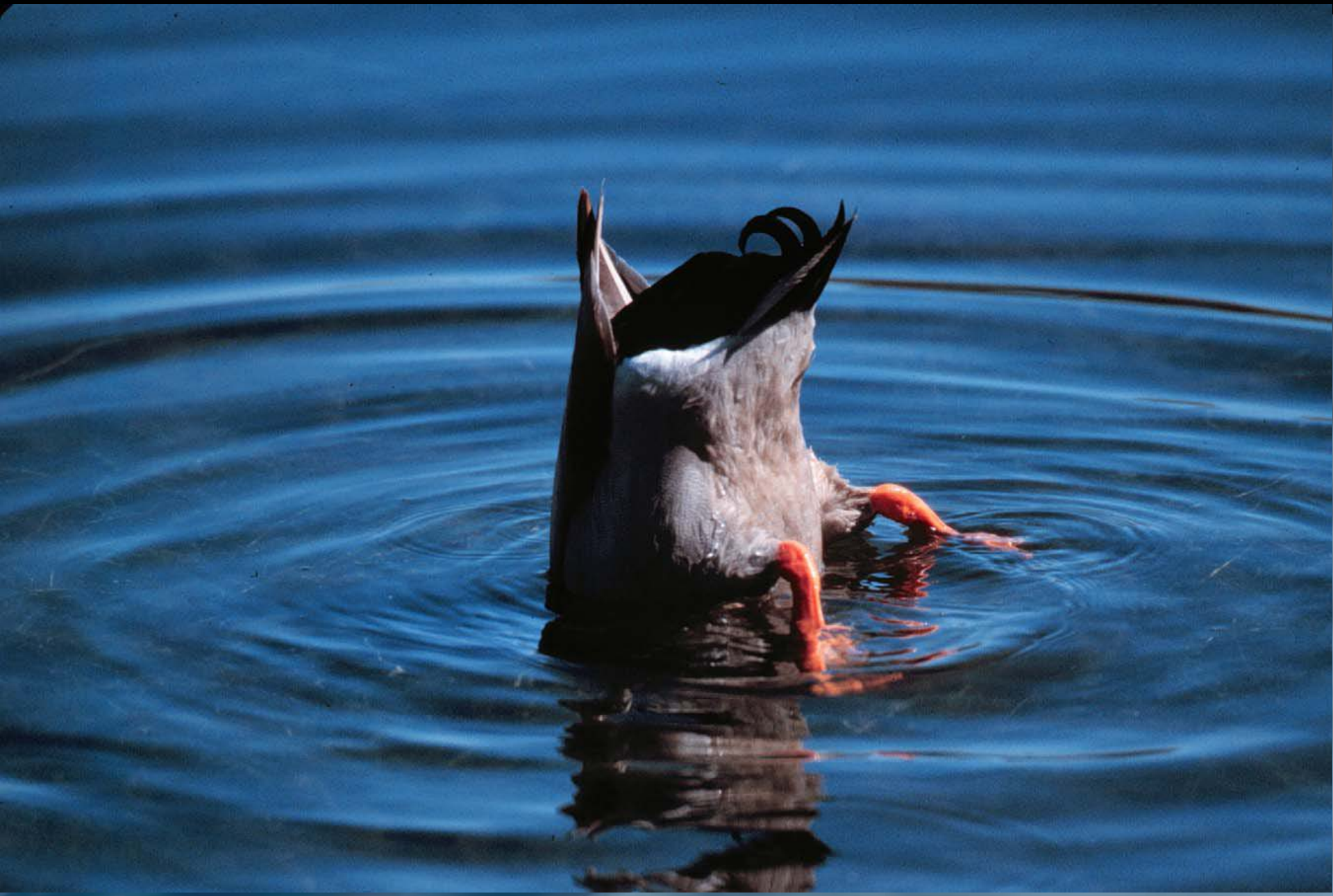
>5 T/AD Specimens throughout OD

>5 T/AD Specimens throughout D



Score

2



Extra slides

Special Cases!

- If one wax myrtle or live oak has made a two or three zone move, choose the next highest score

  - Case 1 – ***one wax myrtle*** shrub (AD) in the Deep zone (2 zone move), all other species in correct zones, choose a Shrub and Small Tree score of 4.

  - Case 2 – ***one live oak*** tree (U) in the Deep zone (3 zone move), all other species in correct zones, choose a Tree score of 3.

2018 WAP Training
Part 2
Additional Considerations

- Additional criteria on WAP forms
  - Stress
  - Recovery
- 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

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

- **Appropriate Species** - normally expect these species to be in the wetland zone in which they are found (e.g., *Myrica* in Transition zone)

- **Inappropriate Species** - normally don't expect these species to be in the wetland zone in which they are found (e.g., *Myrica* in Outer Deep or Deep zones)

Stress

- Do ***not*** include if species is not a WAP plant, but include comment (dead shrubs and trees an exception).

- Do ***not*** include if species is on hummocks or is overhanging. It must be rooted in the wetland to count!

- List the species, specify zones, and nature of stress.

Stress

- showing little to no signs of stress
- showing noticeable signs of stress.
- showing significant signs of stress
- NA


Ilex glabra

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

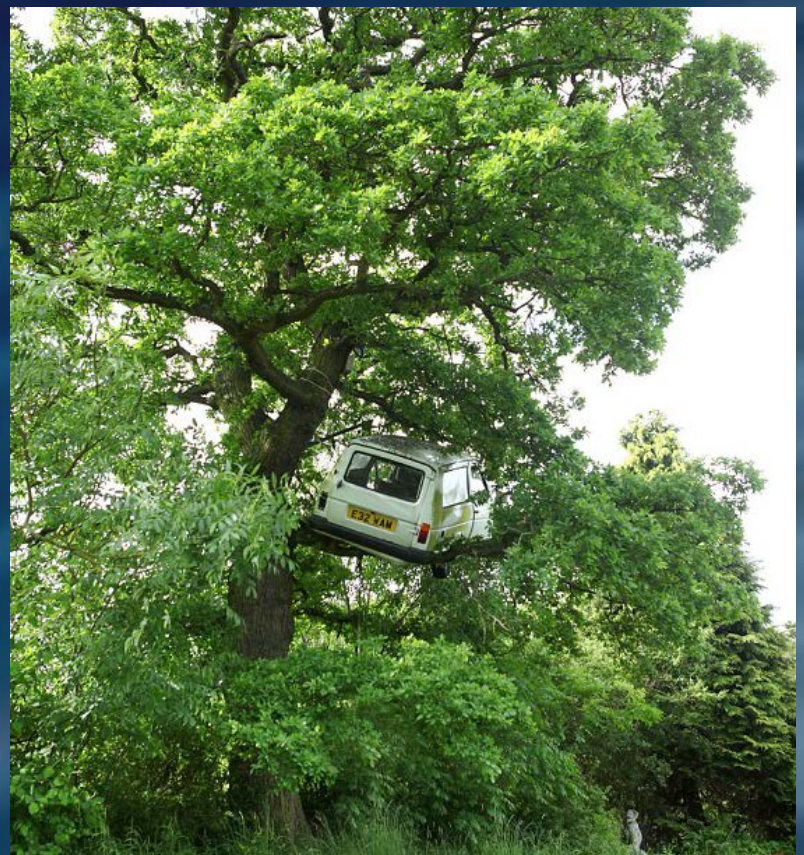
Stress of Appropriate Trees

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 trees in entire wetland (viewable distance).
- Include standing dead trees.
- Include trees dead on the ground.
- Include trees that died and were removed, if known.
- Leaning = 30 degrees or more.
- Do not include timbered trees or "tornado" impacts.

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.

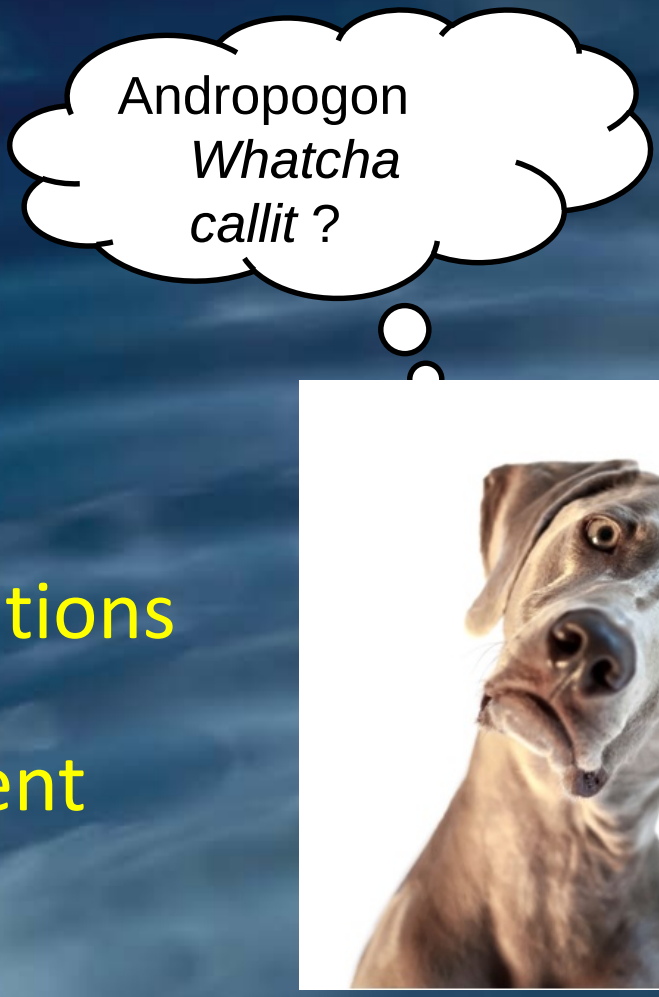
Inappropriate vine death suggesting recovery — 2015 1 Data: N/A

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

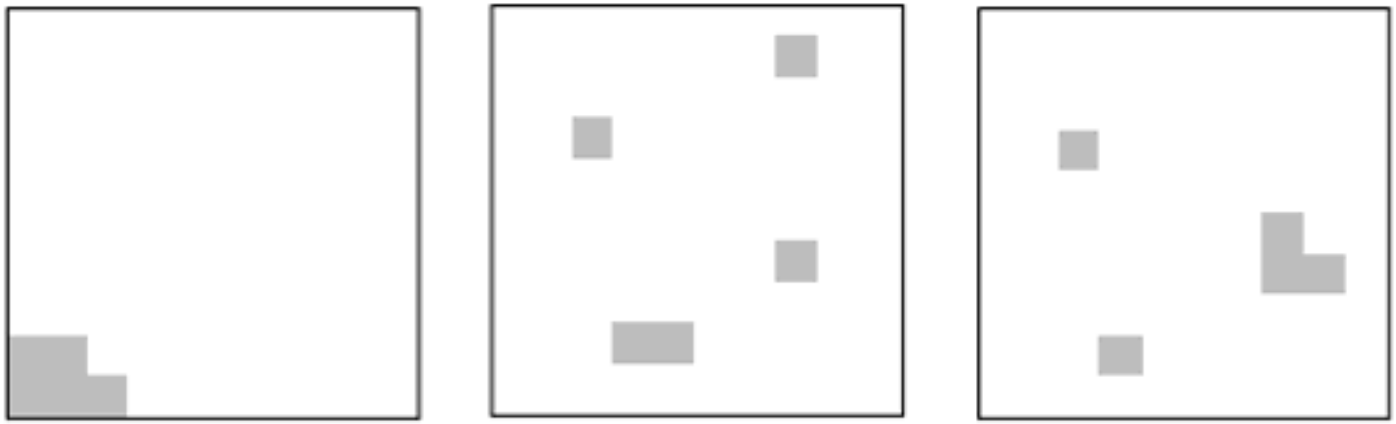
Example: *Vitis* in deeper zones (not on hummock) now dying.

Challenging Aspects of WAP

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

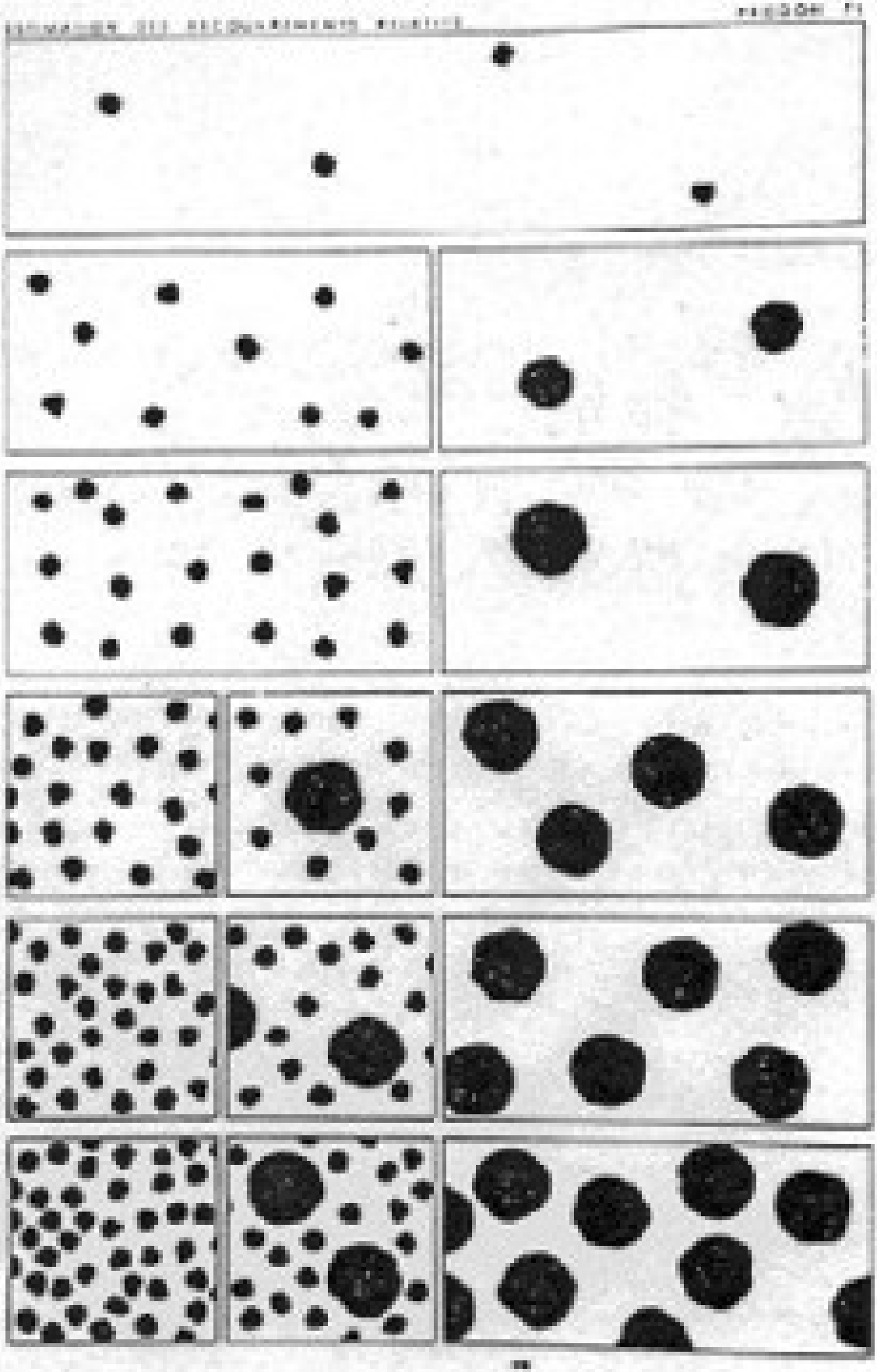


These are all 5% cover

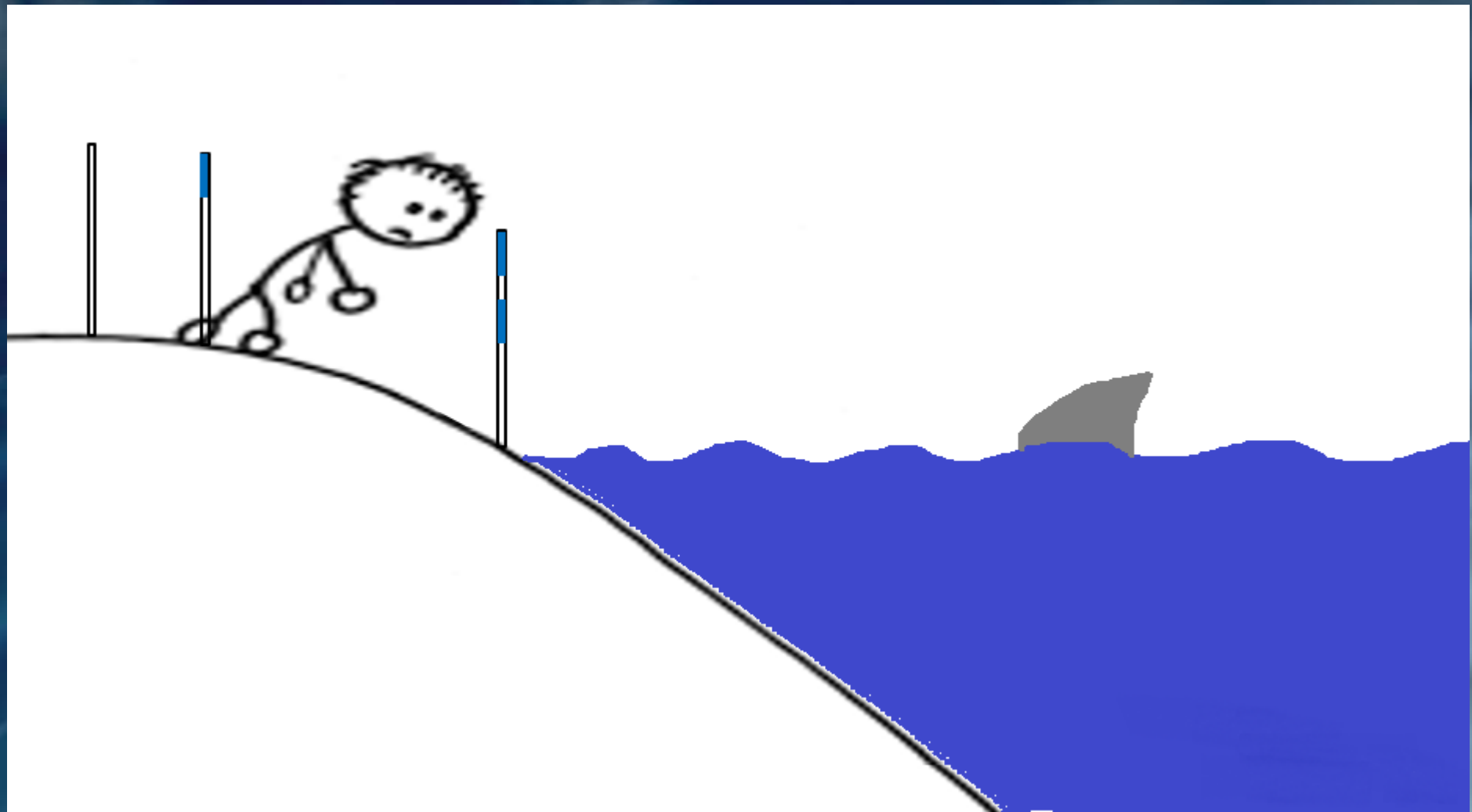


These are all 10% cover

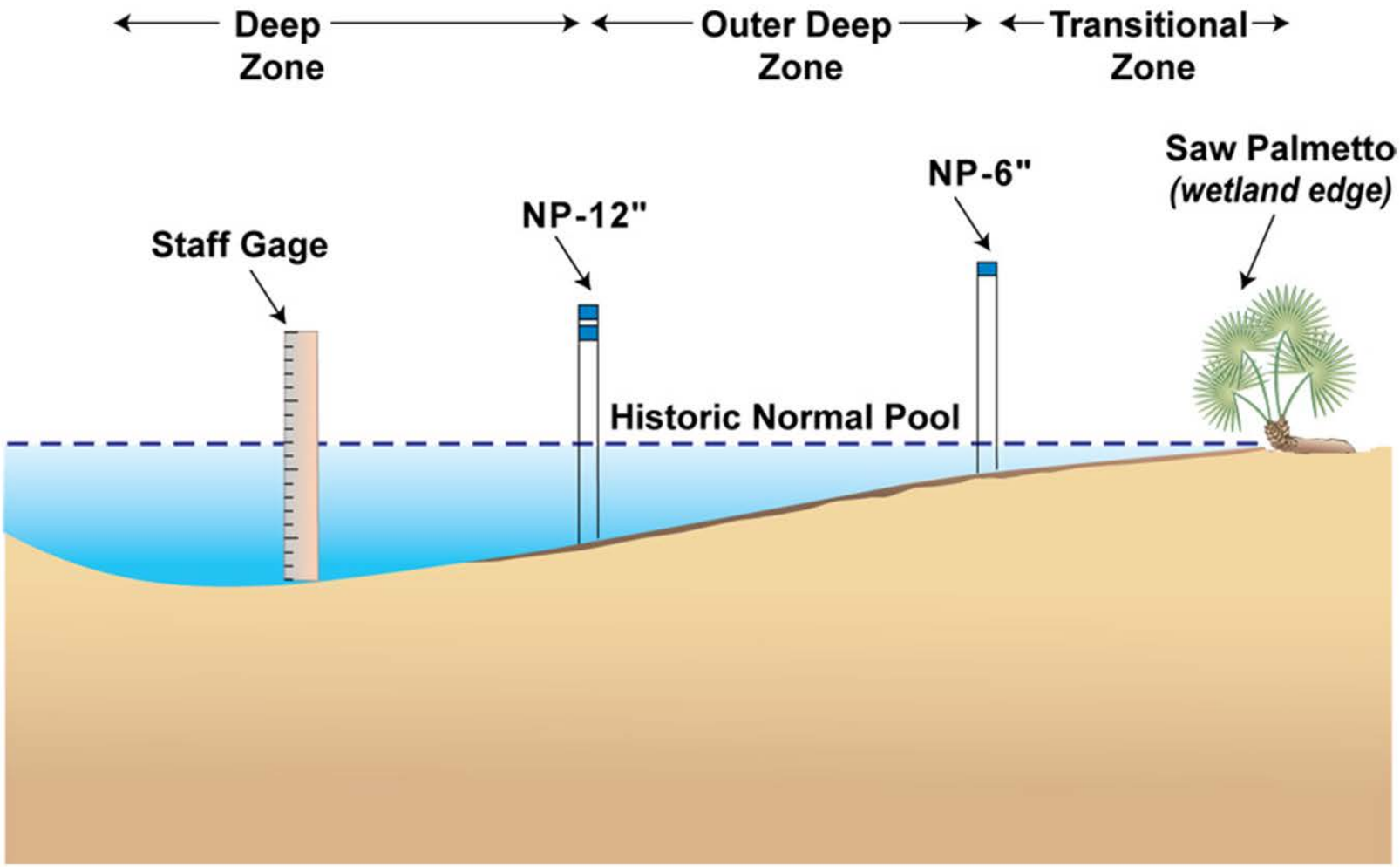
Fig 3

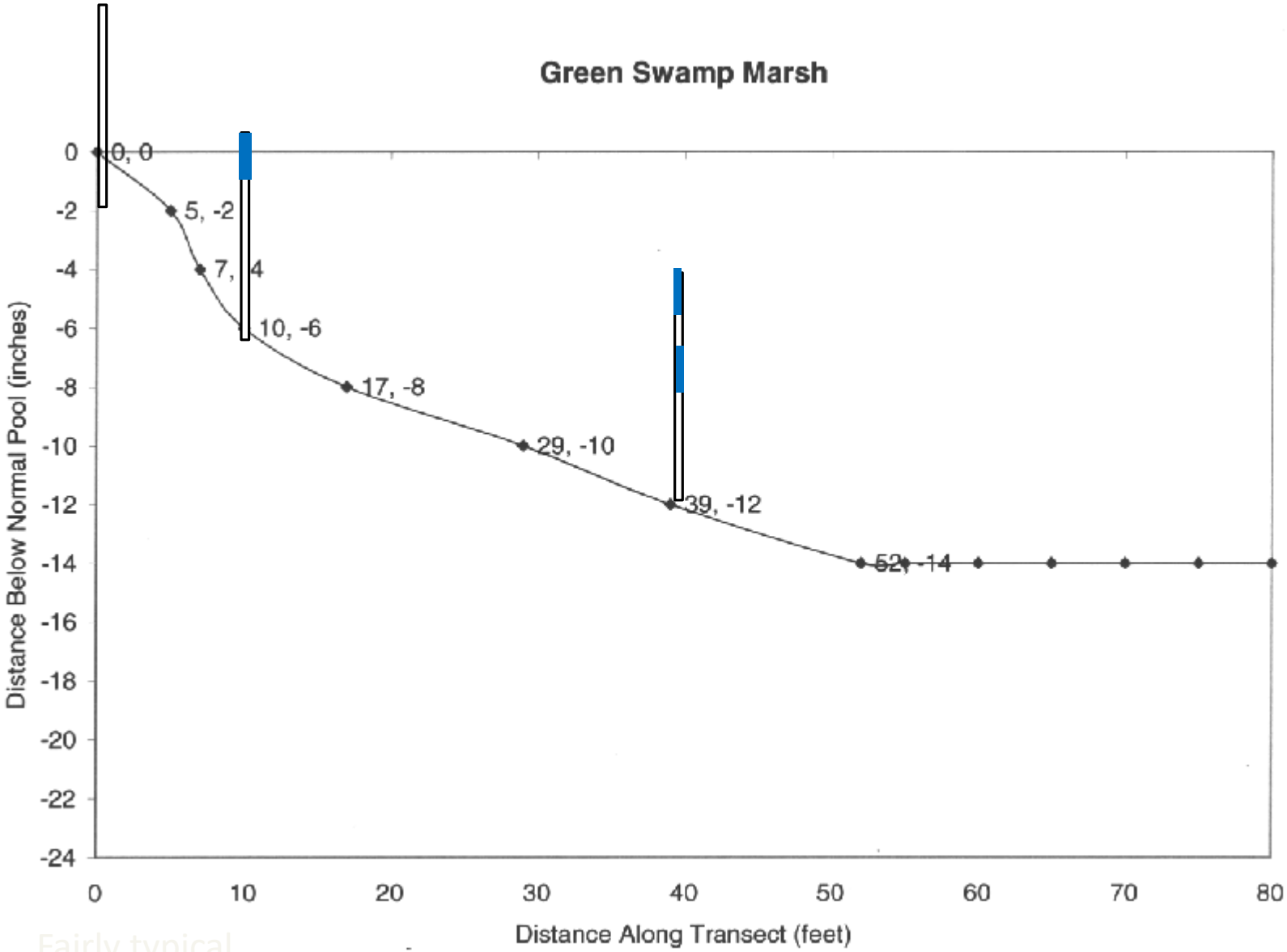


Topography
Transect Issues



Example of Typical WAP Transect

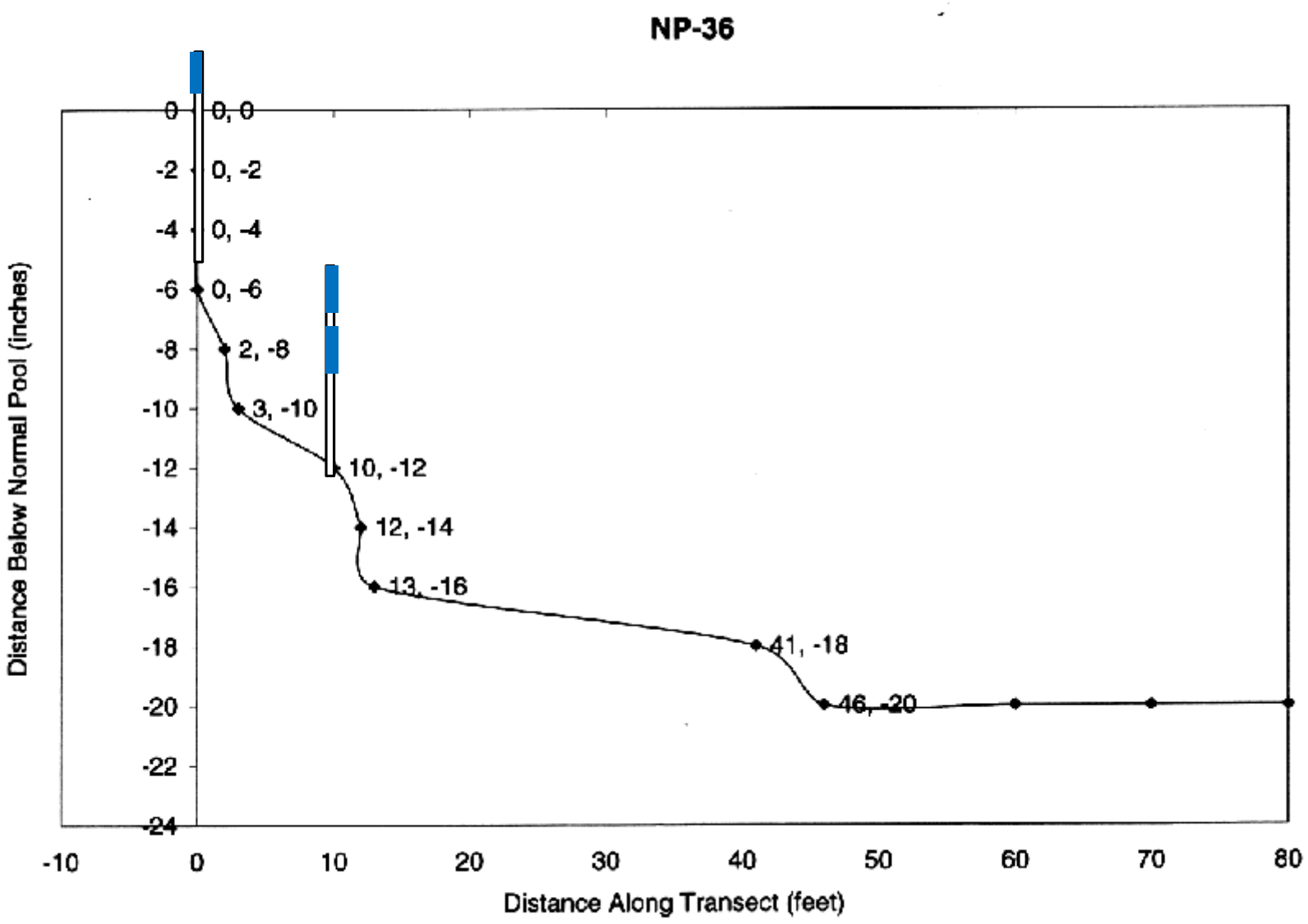




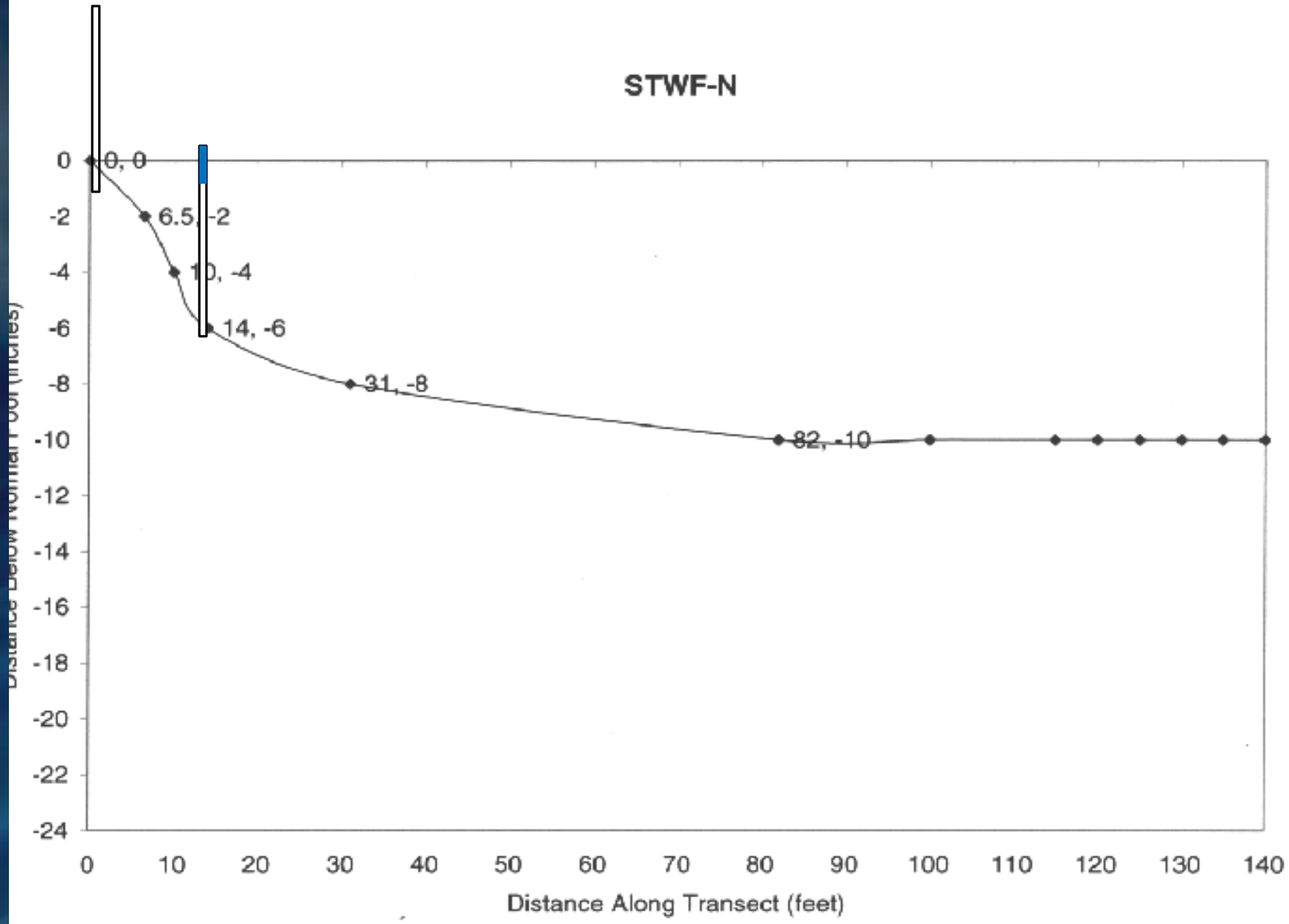
Fairly typical.

Berryman & Henigar, 2005

Missing Zones

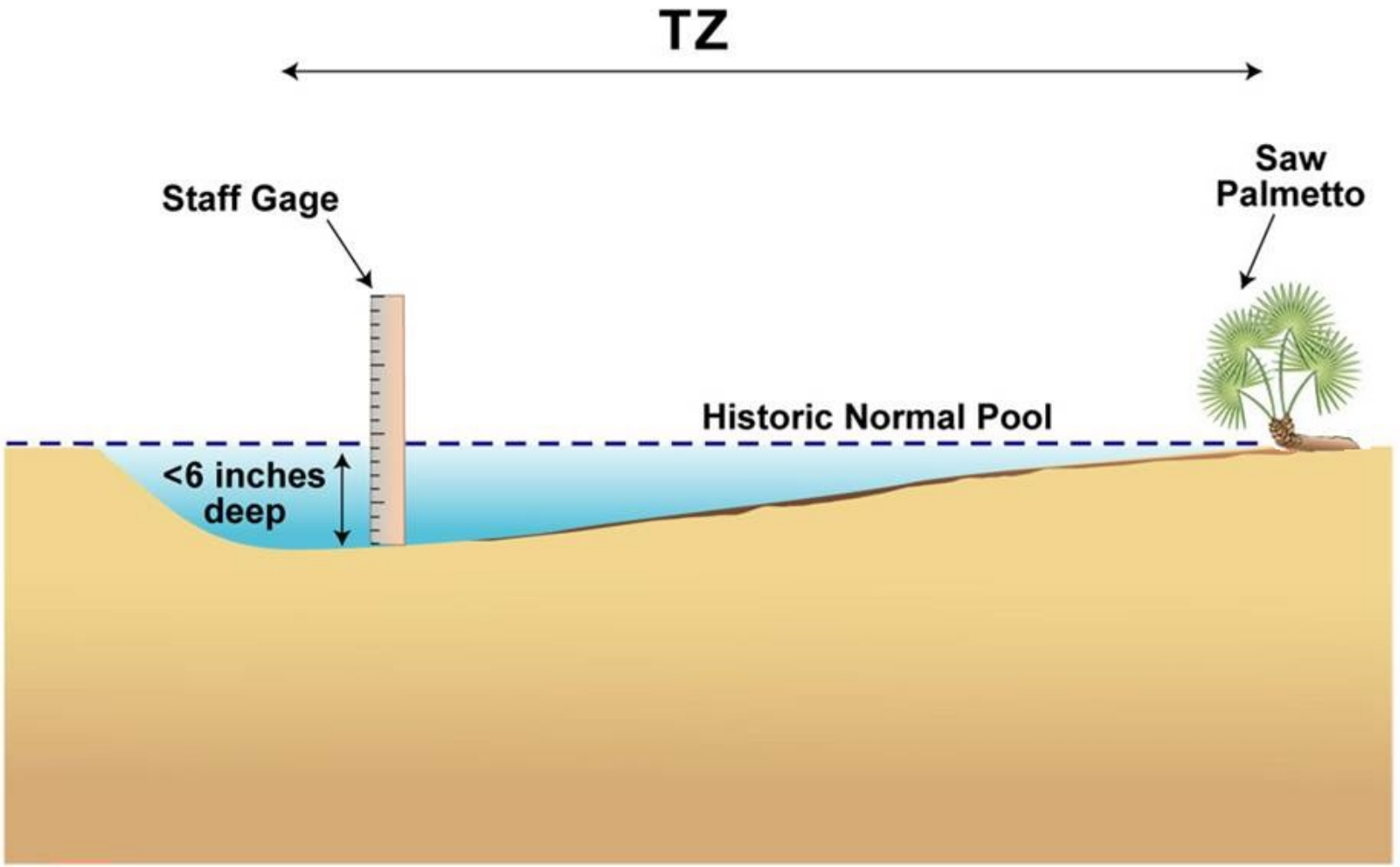


Berryman & Henigar, 2005



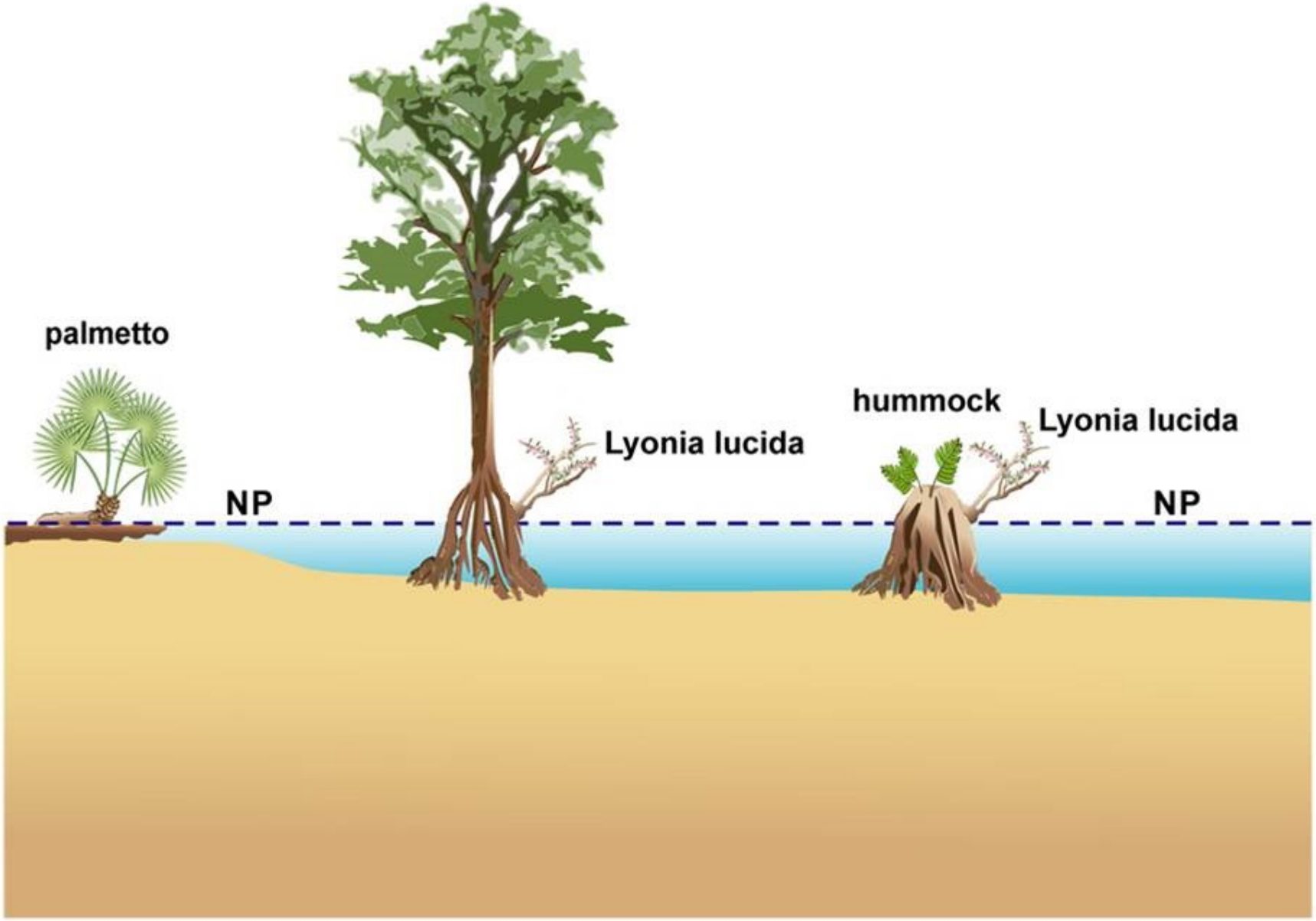
Berryman & Henigar, 2005

Example of WAP Transect in a Shallow Wetland

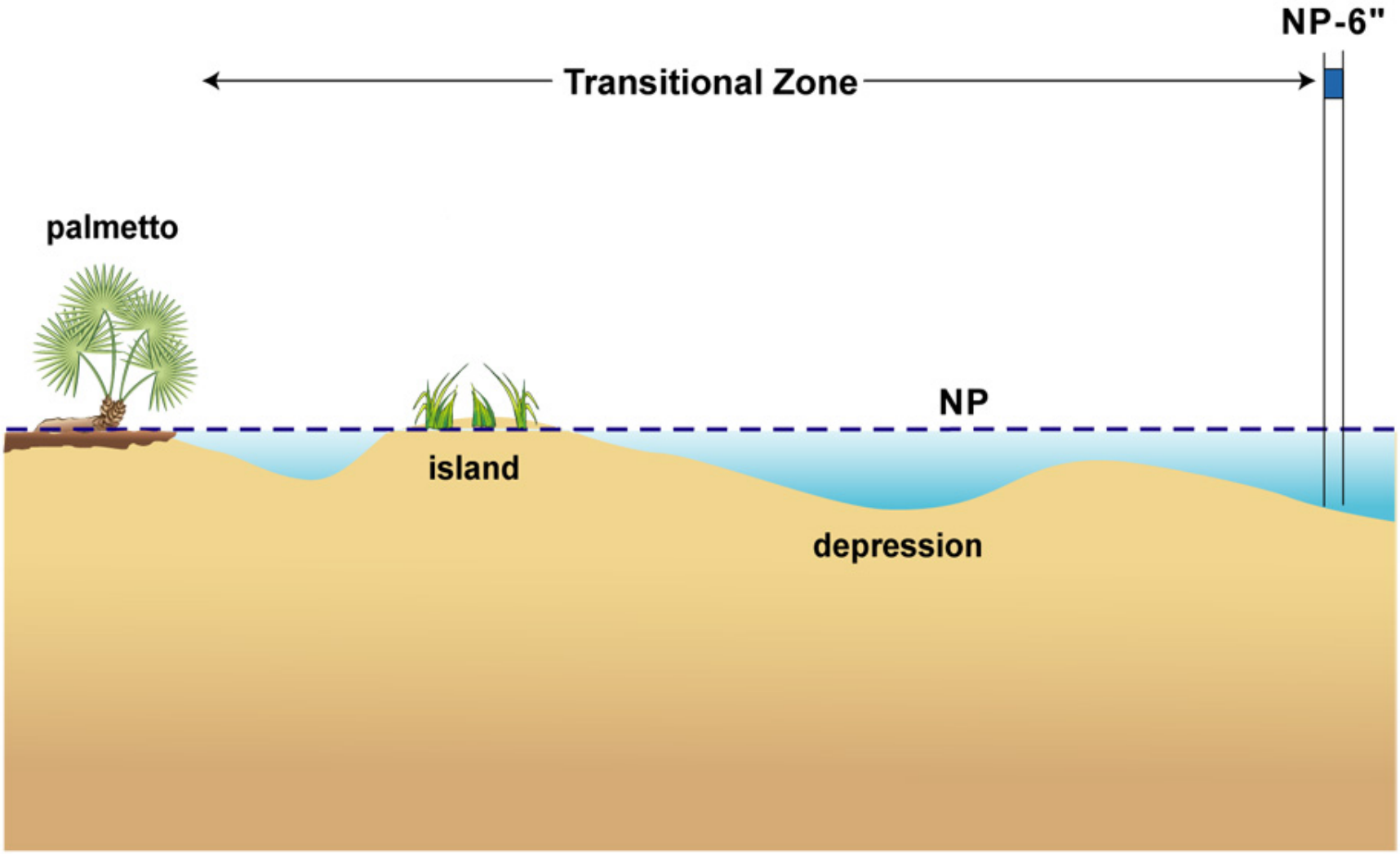


Hummocks

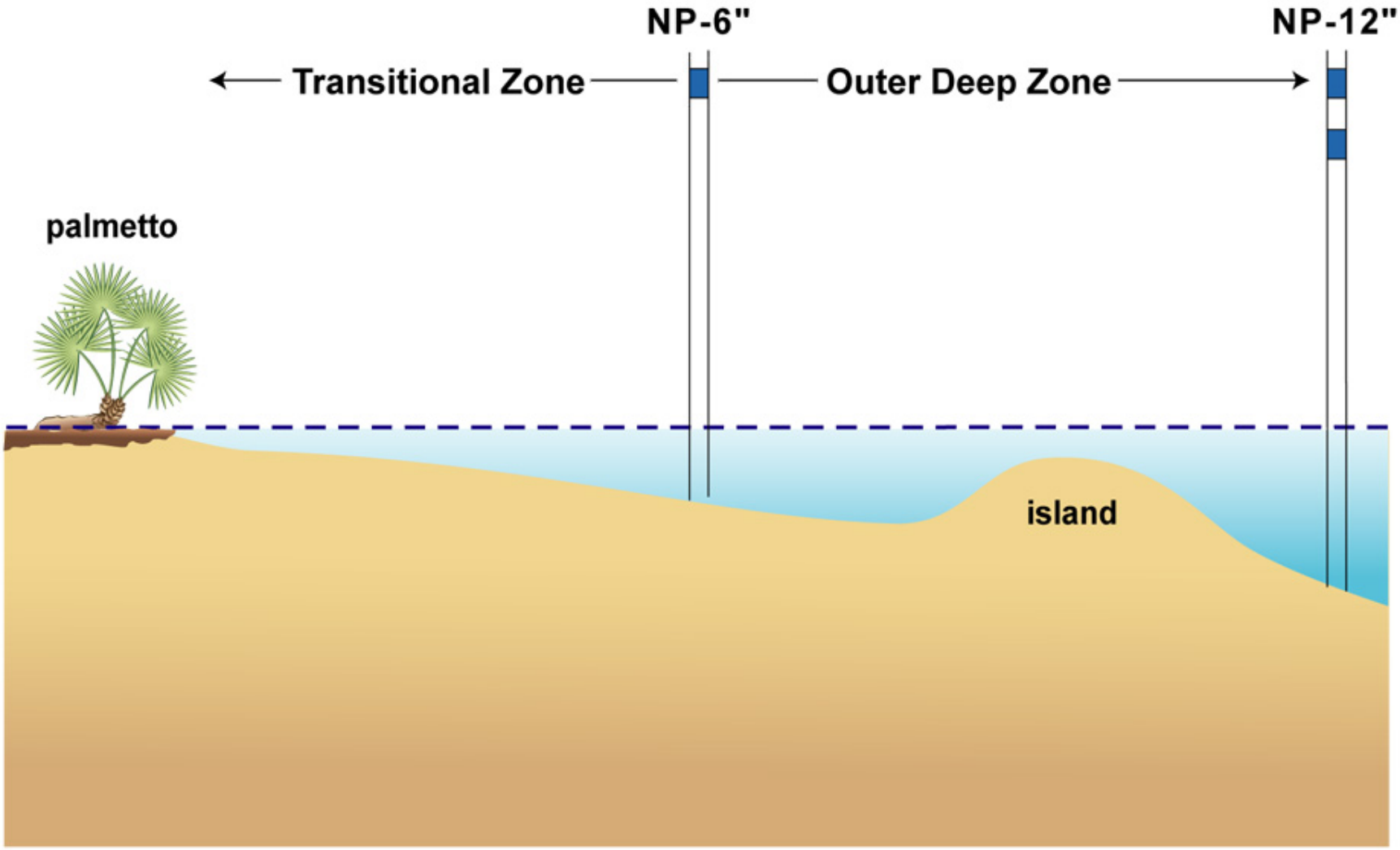
Tree Bases and Hummocks

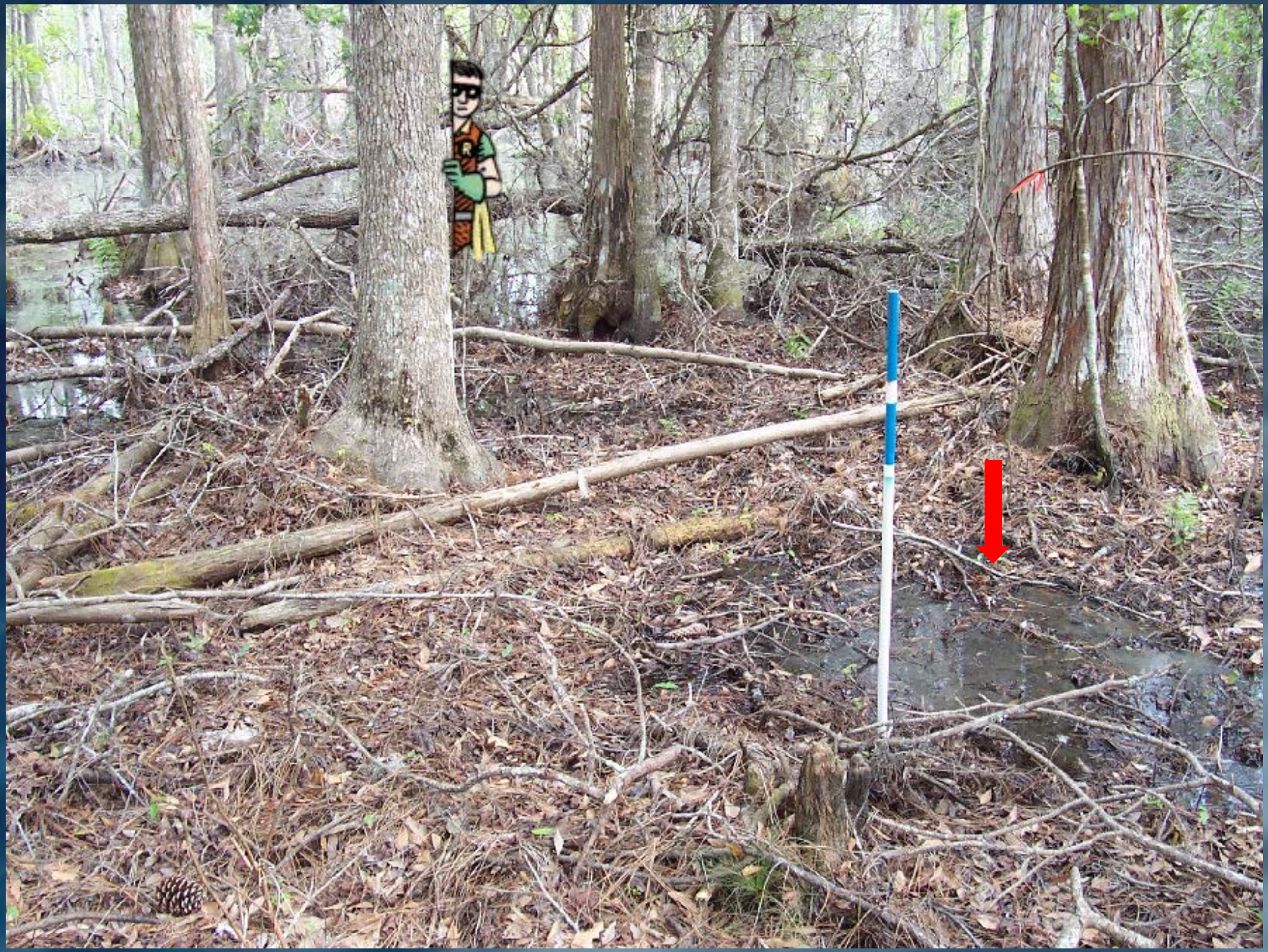


Island and Depression in the Transitional Zone



"Island" in the Outer Deep Zone





Vehicle Impact

Exclude?
Include?
Note it.

Appendices of WAP Manual

A - Plant List
B - Definitions
C - HWE and HNP instructions
D - Wetland Types
E - Wetland History
F - Transect Information “Worksheet”
G - References

https://www.swfwmd.state.fl.us/waterres/ntb/wetland_assessment_procedure.php

Questions??