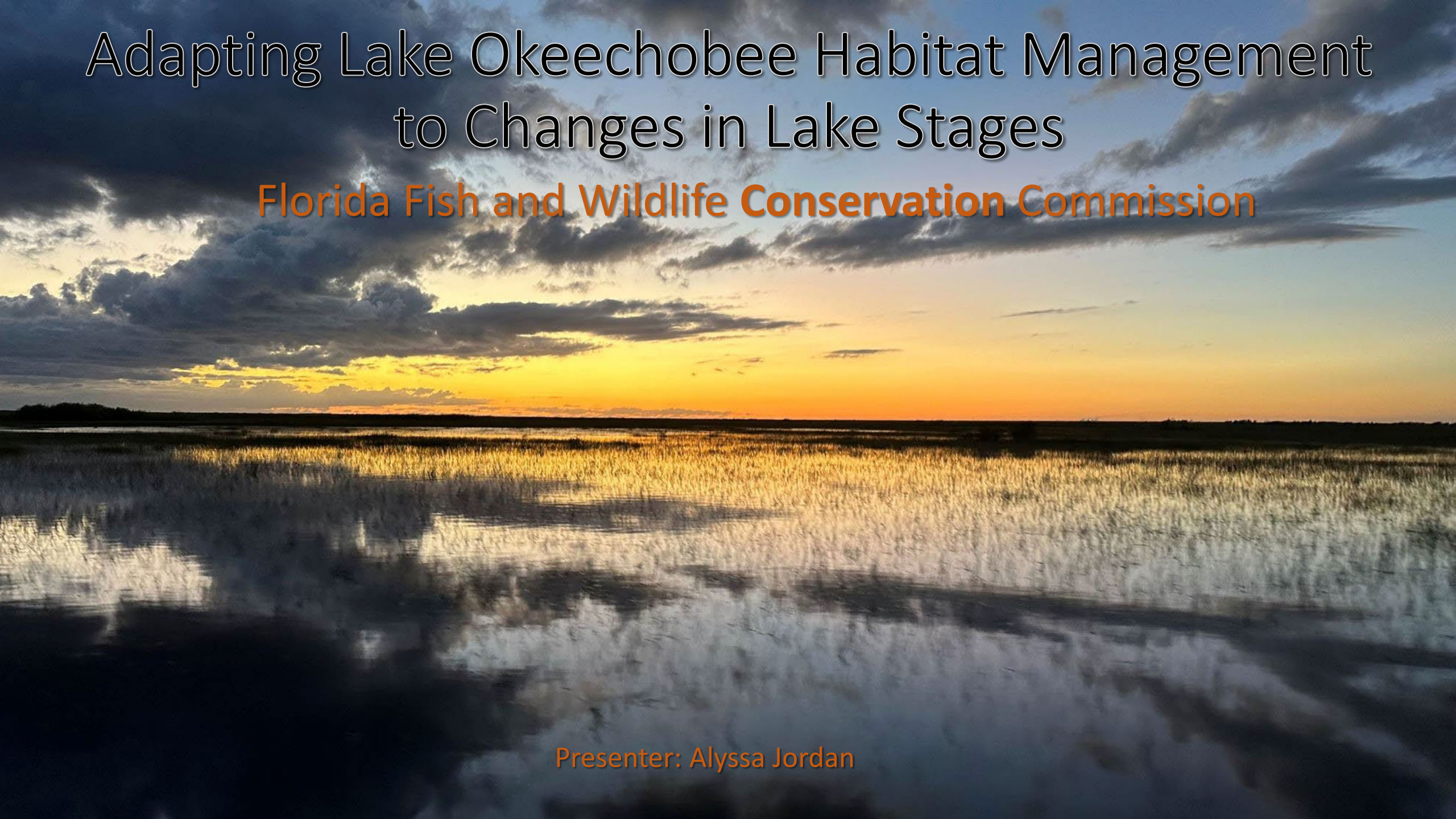
Adapting Lake Okeechobee Habitat Management to Changes in Lake Stages

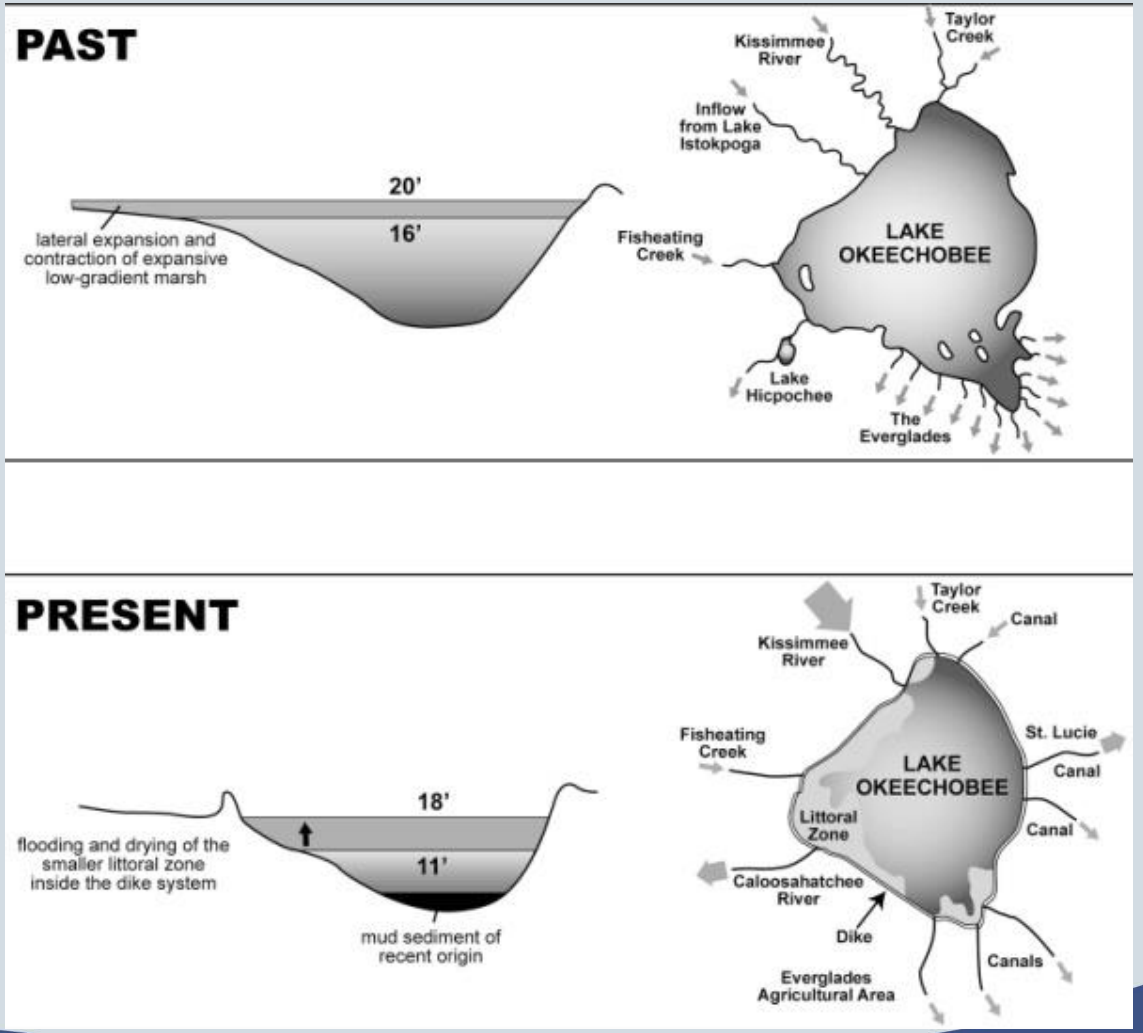


Florida Fish and Wildlife **Conservation** Commission

Presenter: Alyssa Jordan

Why is the Ecological Stage Envelope Important?

- Levee at 15 ft NGVD, water stacks when higher
- Changes shallow marsh from sedge/grass dominated to more lily/cattail
- Wading bird foraging issues
- Nutrients into shallow marsh – increase cattail further
- Loss of nearshore vegetation



What Can We Do?

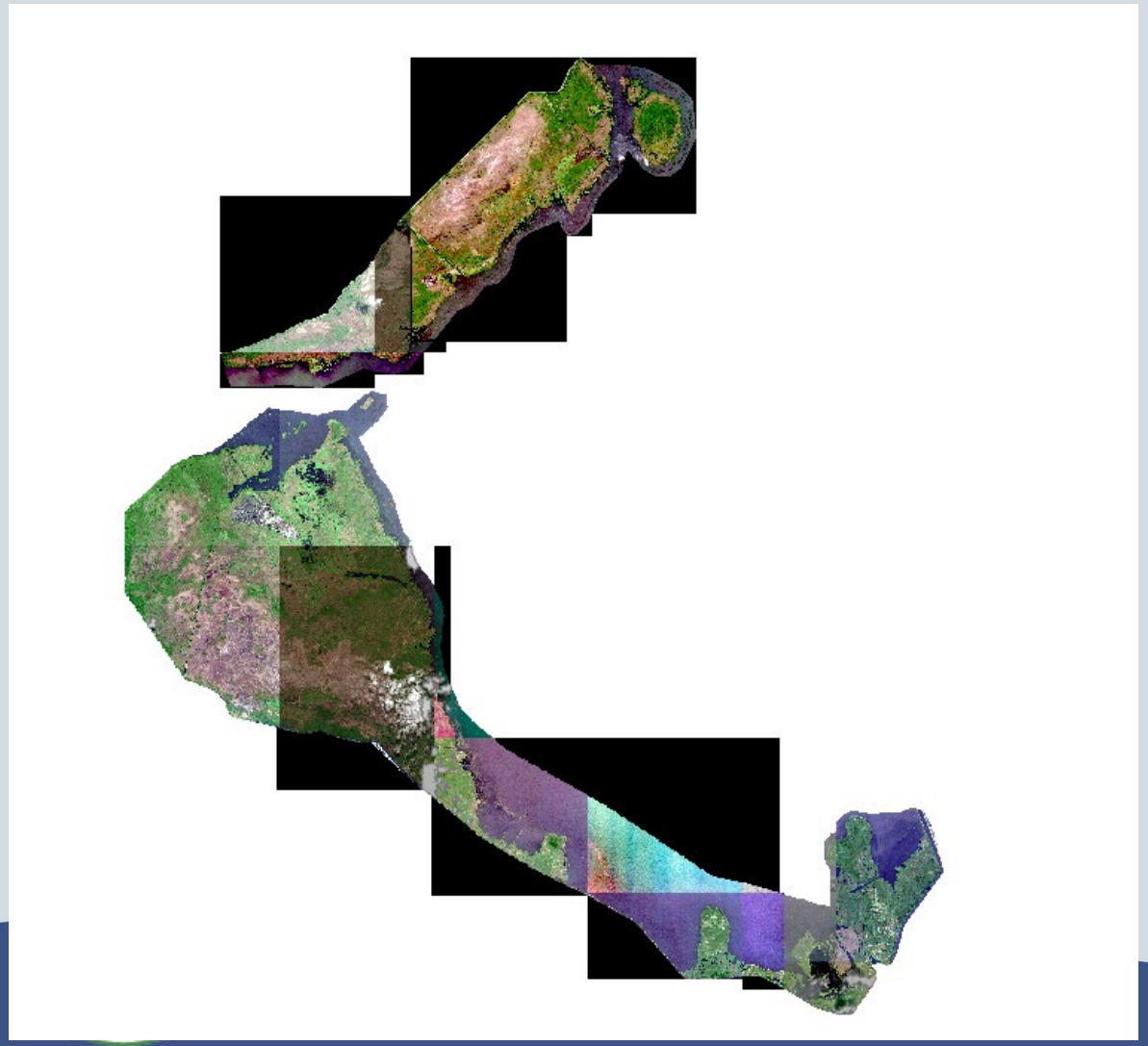
Improve Monitoring:

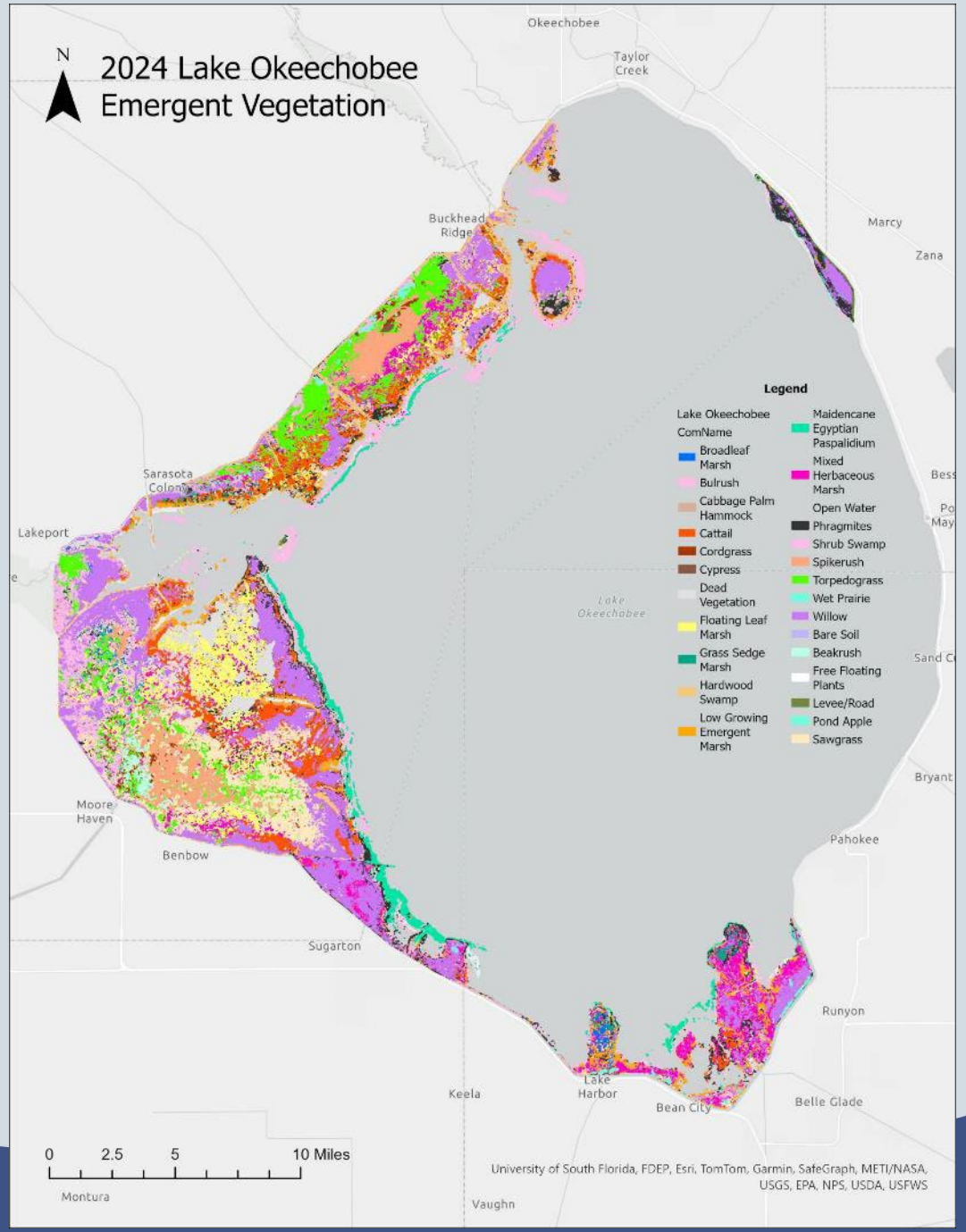
1. Emergent Vegetation Trends – Using Satellite Imagery
2. Submersed Aquatic Vegetation (SAV) sampling

Change Management Strategies:

1. Concentrate on littoral marsh improvement
2. Find ways to protect nearshore zone

Satellite Imagery for Vegetation Maps





Year	2024				
Spring 2024					
Sum of Acres	Column Labels				
Area	1	2	3	4	Grand Total
Bare Soil		0	49.74		49.74
Beakrush		502.12			502.12
Broadleaf Marsh	451.81	2459.5	1229.01		4140.32
Bulrush	1488.59	716.39	537.44	63.72	2806.14
Cabbage Palm Hammock	129.69				129.69
Cattail	7228.99	8688.29	1320.71	85.21	17323.2
Cordgrass	207.61	195.11			402.72
Cypress	70.55				70.55
Dead Vegetation	161.02	1261.71	0.77		1423.5
Floating Leaf Marsh	1630.47	6889.93	82.84		8603.24
Free Floating Plants			83.69	6.22	89.91
Grass Sedge Marsh	538.26	154.22	191.56	164.87	1048.91
Hardwood Swamp	635.08	168.49	153.38		956.95
Levee/Road				111.77	111.77
Low Growing Emergent Marsh	944.05	998.39	2800.23	122.34	4865.01
Maidencane/ Egyptian Paspalidium	207.2	493.48	1092.89		1793.57
Mixed Herbaceous Marsh	1287.77	1465.45	2635.17	98.57	5486.96
Open Water	13829.82	9006.83	10480.92	557.53	33875.1
Phragmites	962.69	1042.32	591.43	382.36	2978.8
Pond Apple			194.19		194.19
Sawgrass		4030.65			4030.65
Shrub Swamp	649.03	1927.31	133.42		2709.76
Spikerush	1646.42	2332.29	0		3978.71
Torpedograss	6312.07	6910.82	1.33		13224.22
Wet Prairie	122.97				122.97
Willow	4417.09	12496.26	4783.73	704.8	22401.88
Grand Total	42921.18	61739.56	26362.45	2297.39	**133320.58**

Monitor gains and losses:

- Track impacts of projects
- Track impacts of water level changes
- Track wildlife usages of habitat type

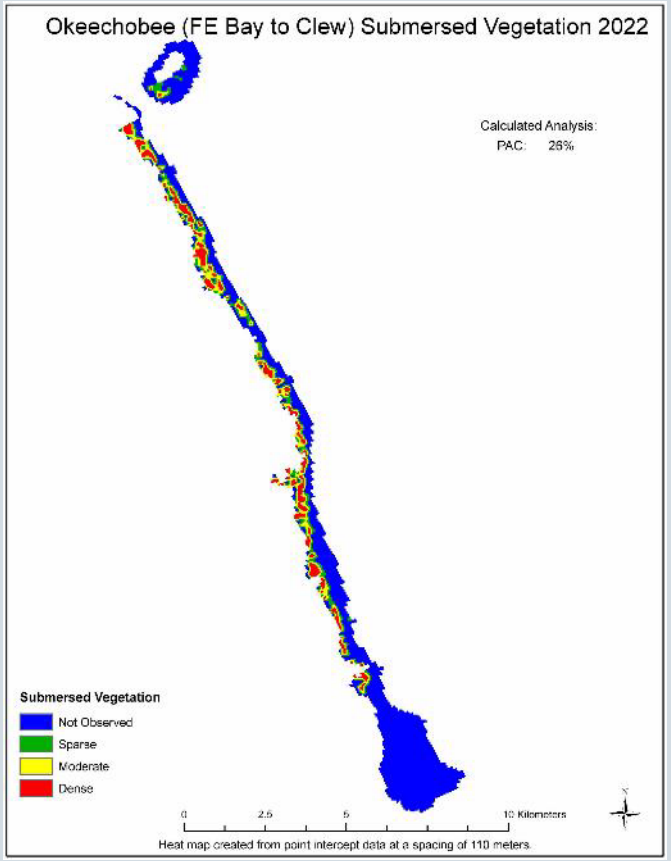
Species	Actual Acres	RECOVER & Habitat Management Plan Acres	Status
Bulrush	2,806	> 4,700	1,894 acres UNDER
Beakrush, spikerush, wet prairie + grass/sedge	5,653	> 24,710	19,057 acres UNDER
Lilies (Floating Leaf Marsh)	8,603	< 3,700	4,903 acres OVER
Cattail	17,323	< 19,800	Under, Goal Met
Willow	22,401	7,400 – 12,400	10,001 acres OVER
Shrub Swamp (Other Woody)	2,709	1,200 – 3,700	Goal Met
Torpedograss	13,224	< 5,000	8,224 OVER

Submersed Aquatic Vegetation Monitoring

<u>Enhances SFWMD sampling efforts</u>

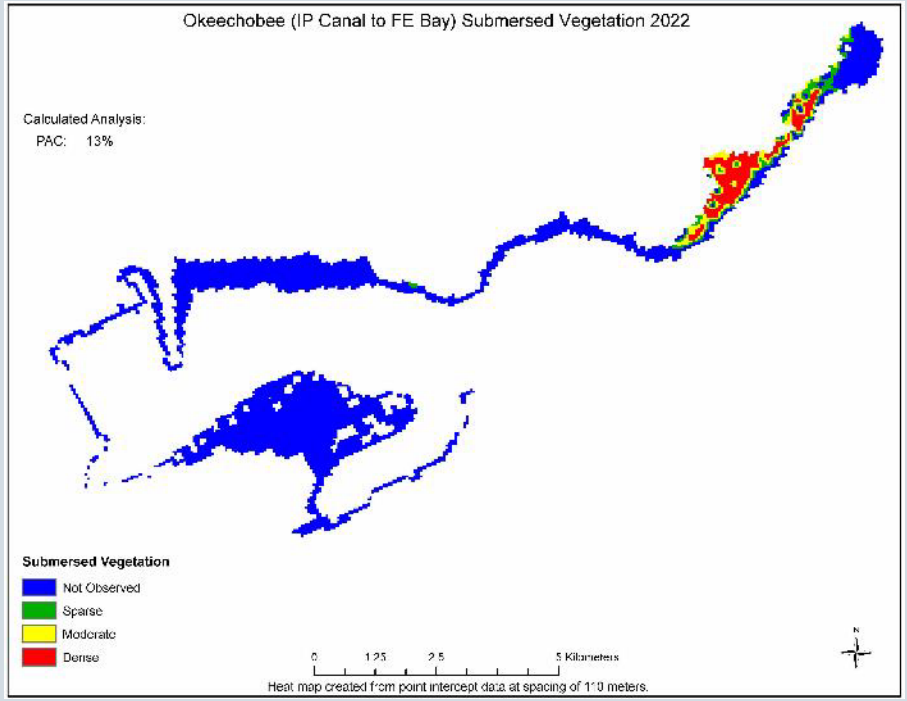
1. Finer resolution - smaller grids
   (3 acres vs 247 acres)
2. Side scan sonar
3. Density estimates
4. Percent frequency and density of emergent vegetation

Okeechobee (FE Bay to Clew) Submersed Vegetation 2022



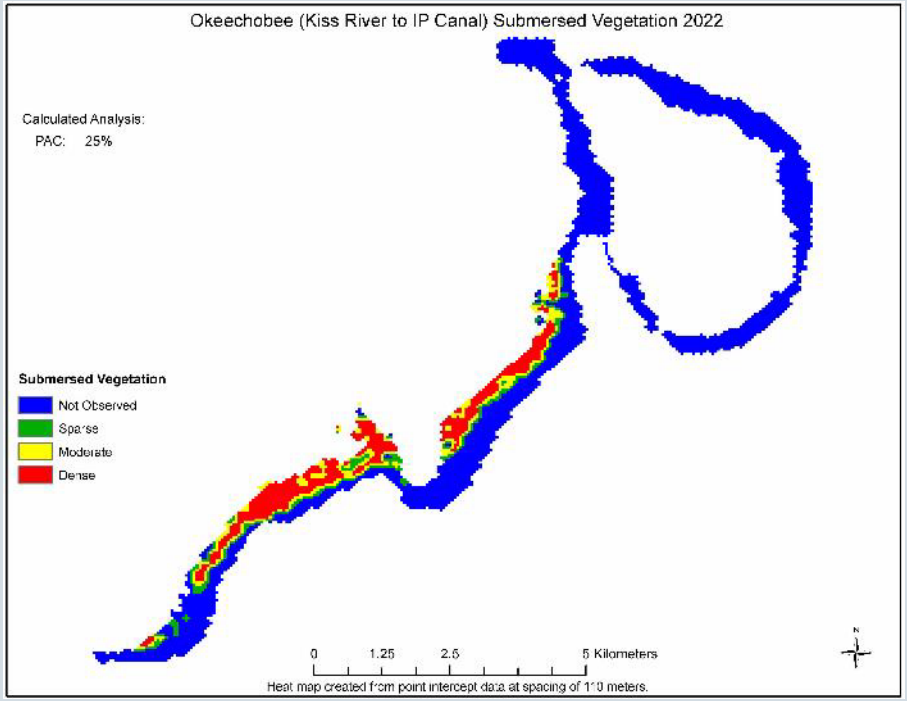
Heat map created from point intercept data at a spacing of 110 meters.

Okeechobee (IP Canal to FE Bay) Submersed Vegetation 2022



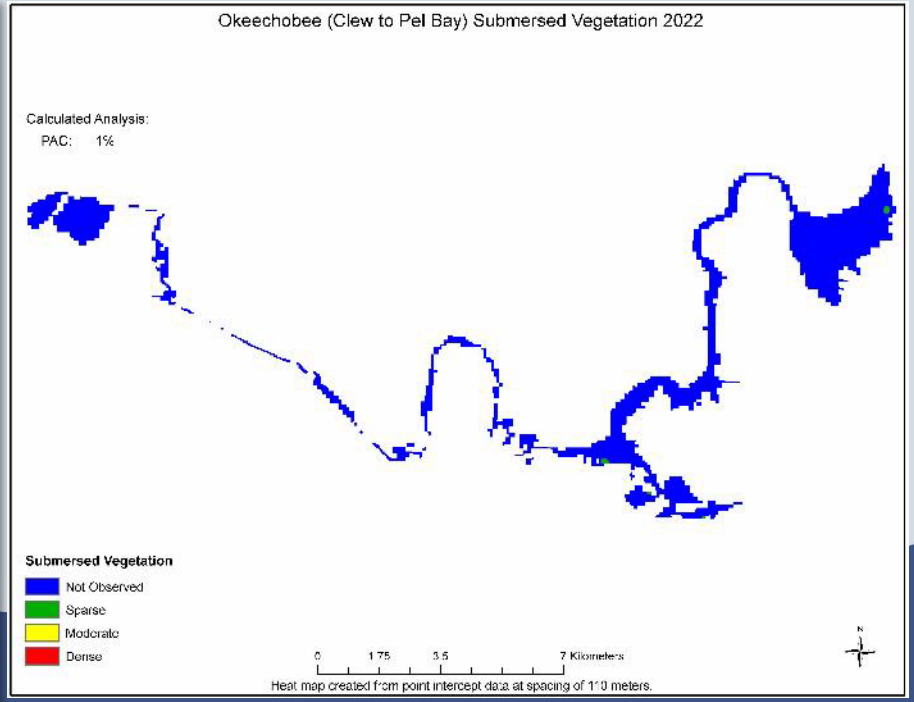
Heat map created from point intercept data at spacing of 110 meters.

Okeechobee (Kiss River to IP Canal) Submersed Vegetation 2022



Heat map created from point intercept data at spacing of 110 meters.

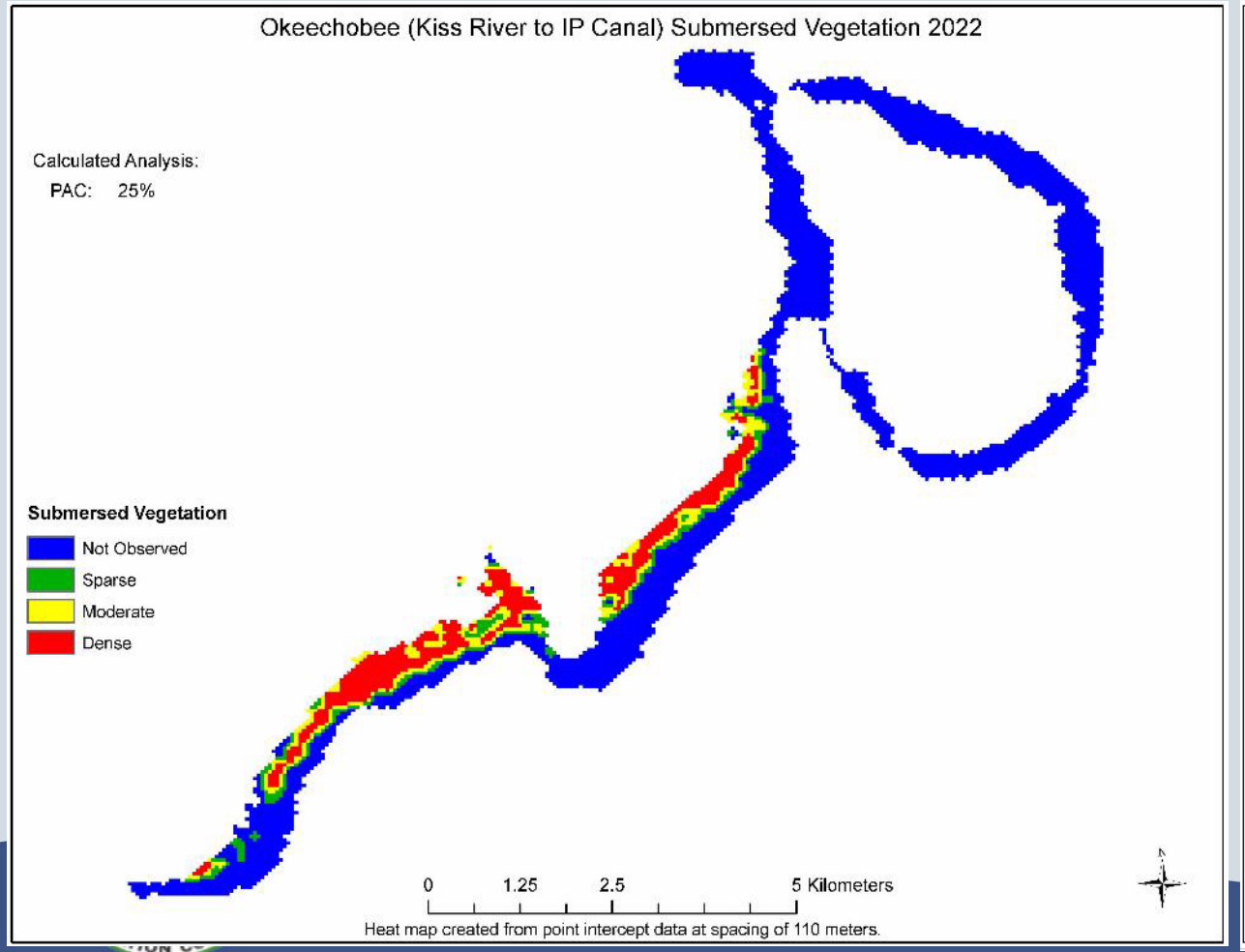
Okeechobee (Clew to Pel Bay) Submersed Vegetation 2022



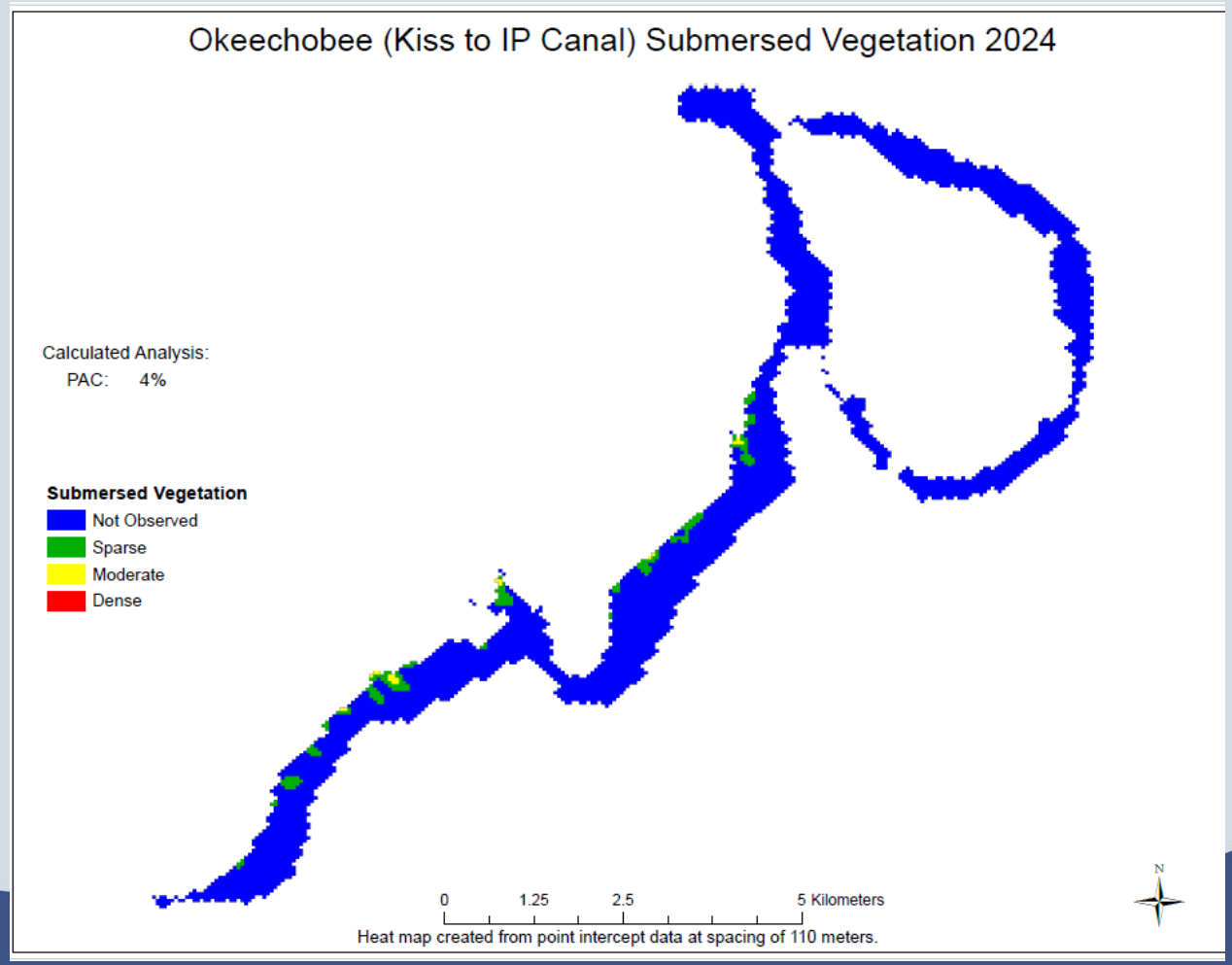
Heat map created from point intercept data at spacing of 110 meters.

SAV: 2022 vs. 2024

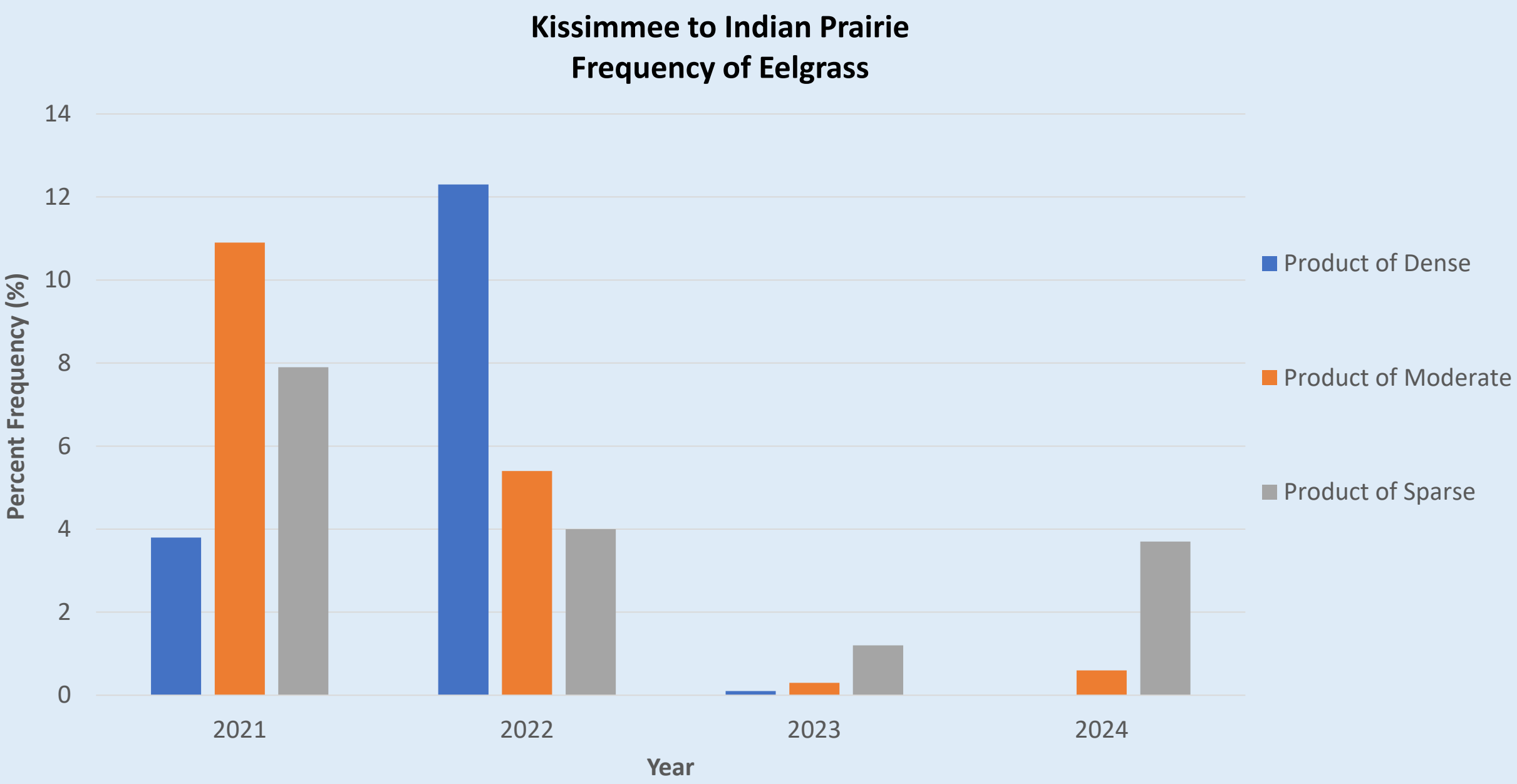
25% Area Coverage



4% Area Coverage



Kissimmee River to Indian Prairie SAV Acres


Kissimmee to Indian Prairie
Frequency of Eelgrass
14
12
10
8
6
4
2
0
Percent Frequency (%)
2021
2022
2023
2024
Year
Product of Dense
Product of Moderate
Product of Sparse

Littoral Marsh

1. Reduce torpedograss, improve diversity
2. Prevent cattail encroachment
3. Improve wading bird and snail kite foraging
4. Plant wetland trees, primarily cypress

Lake Okeechobee Torpedograss Management

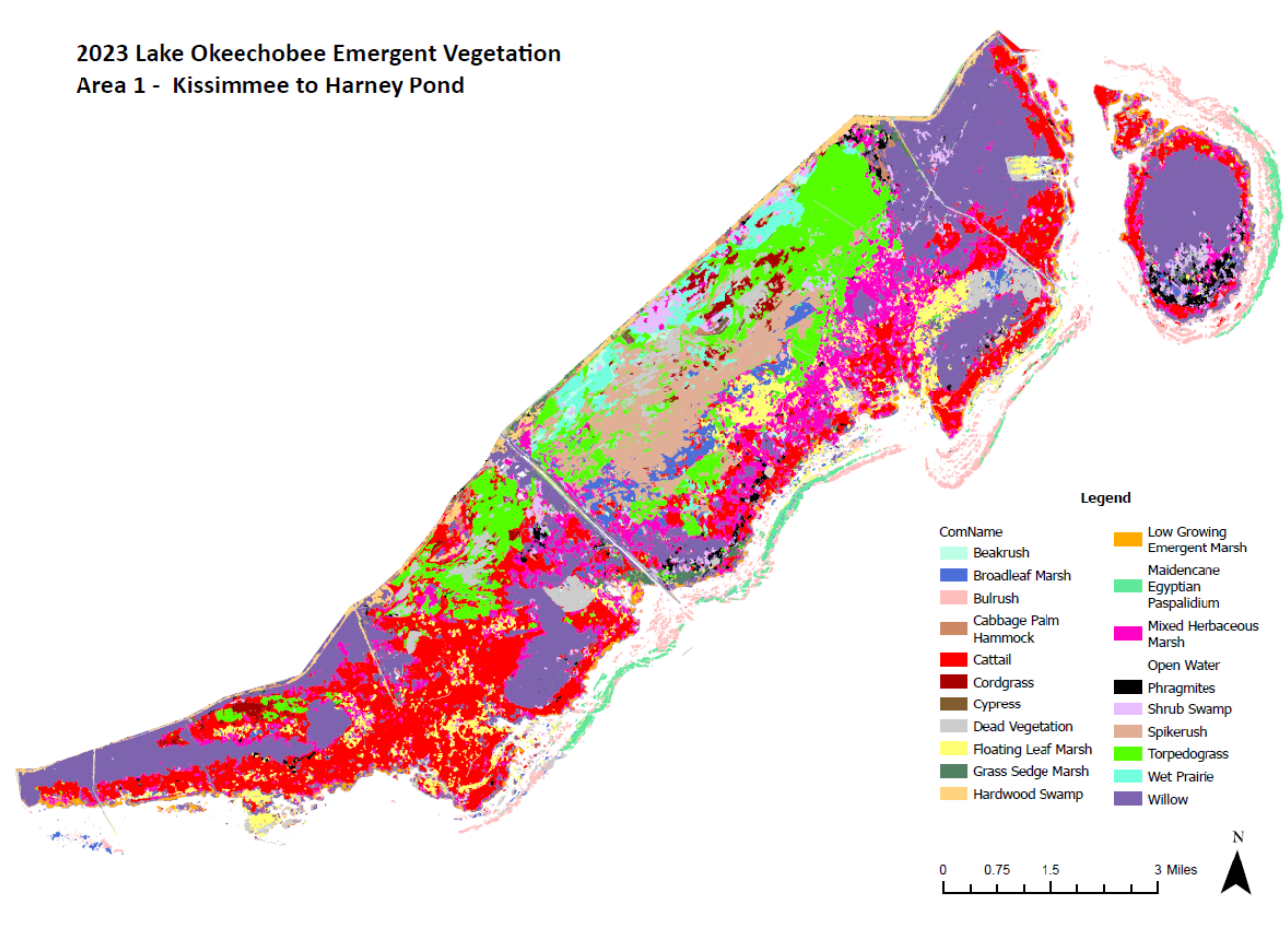
- 1990's to 2017: > 16,000 acres. Big treatments.
- 2019: 10,000 - 14,000 acres

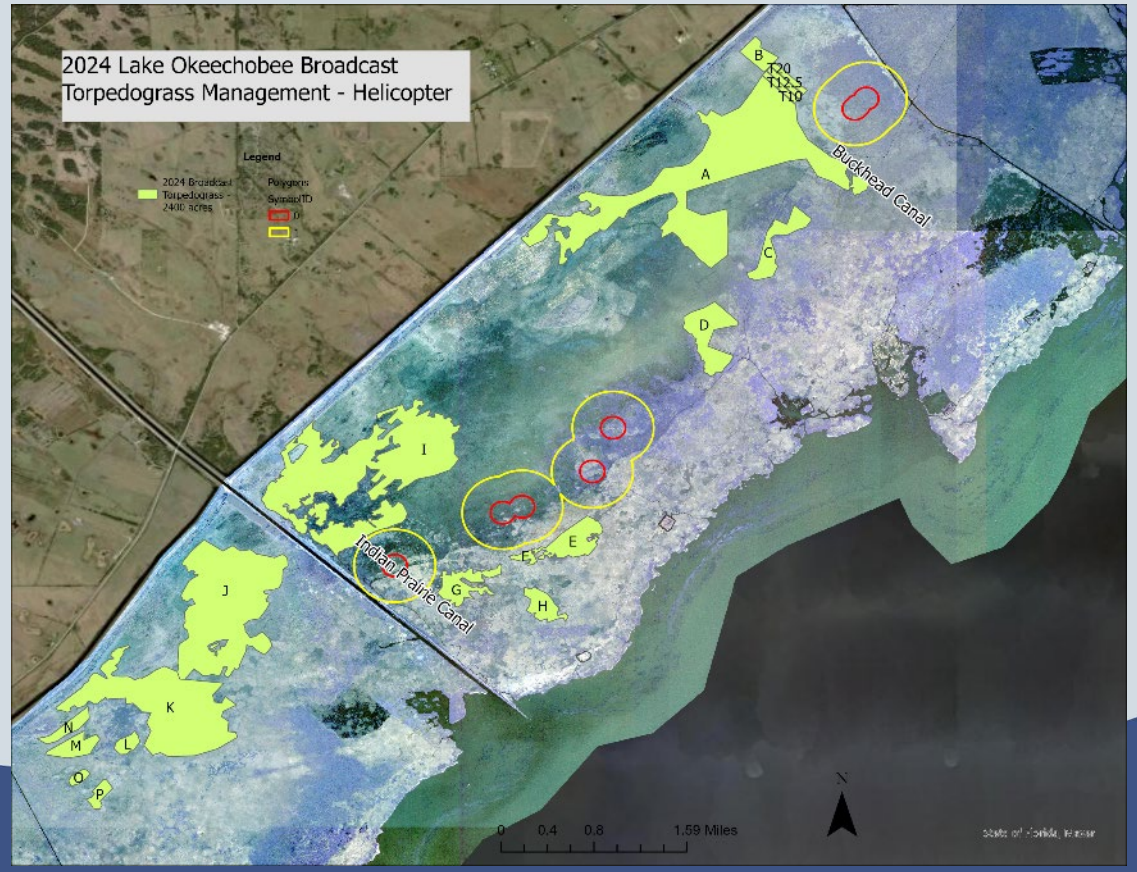
Annual Spot management within previous broadcast areas

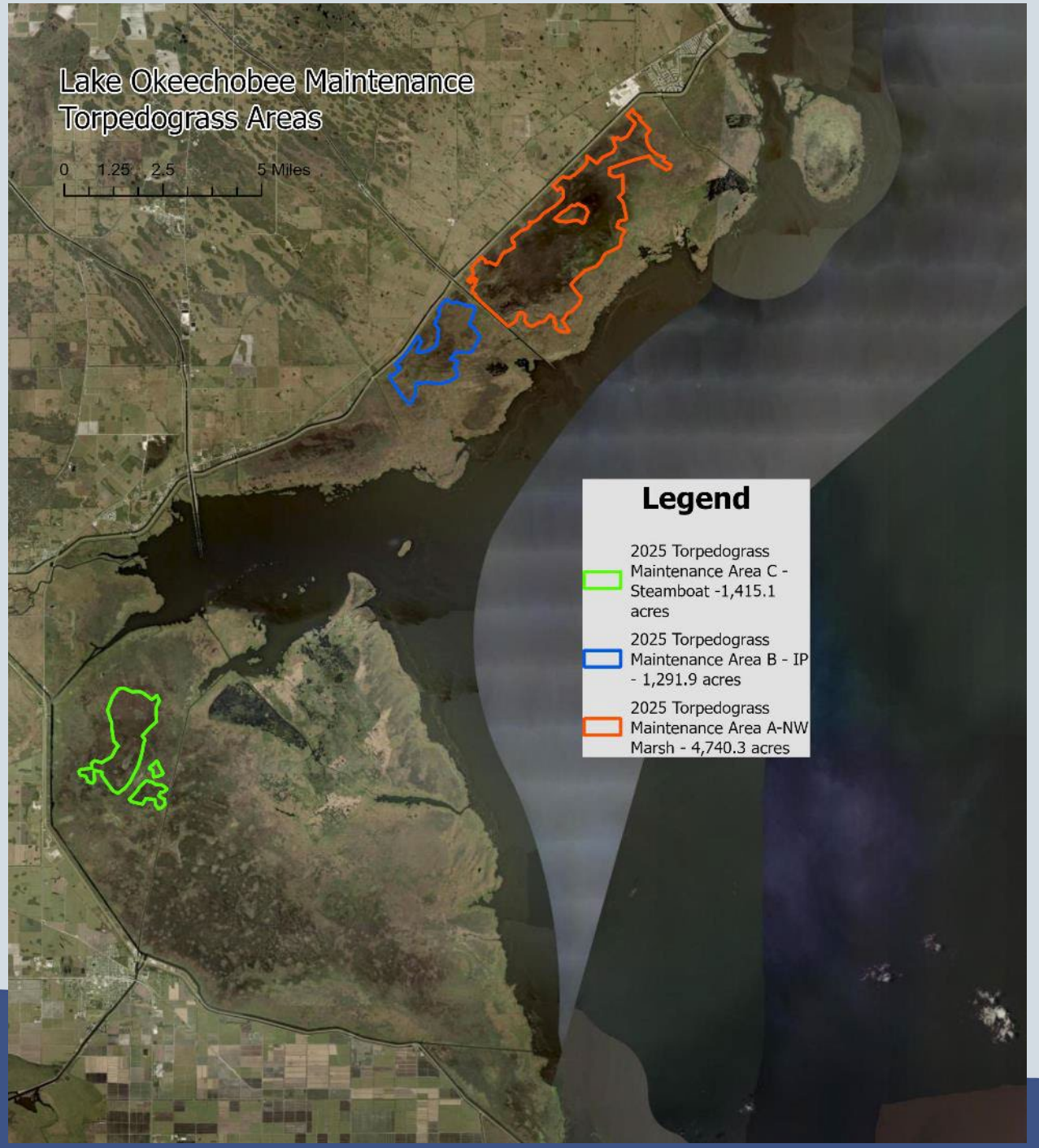
FWC Management:

- 2019 - 2024: >7,000 acres in management
- 2025: 5,000 - 8,000 acres remaining
- 2025: 1,500 acre treatment planned

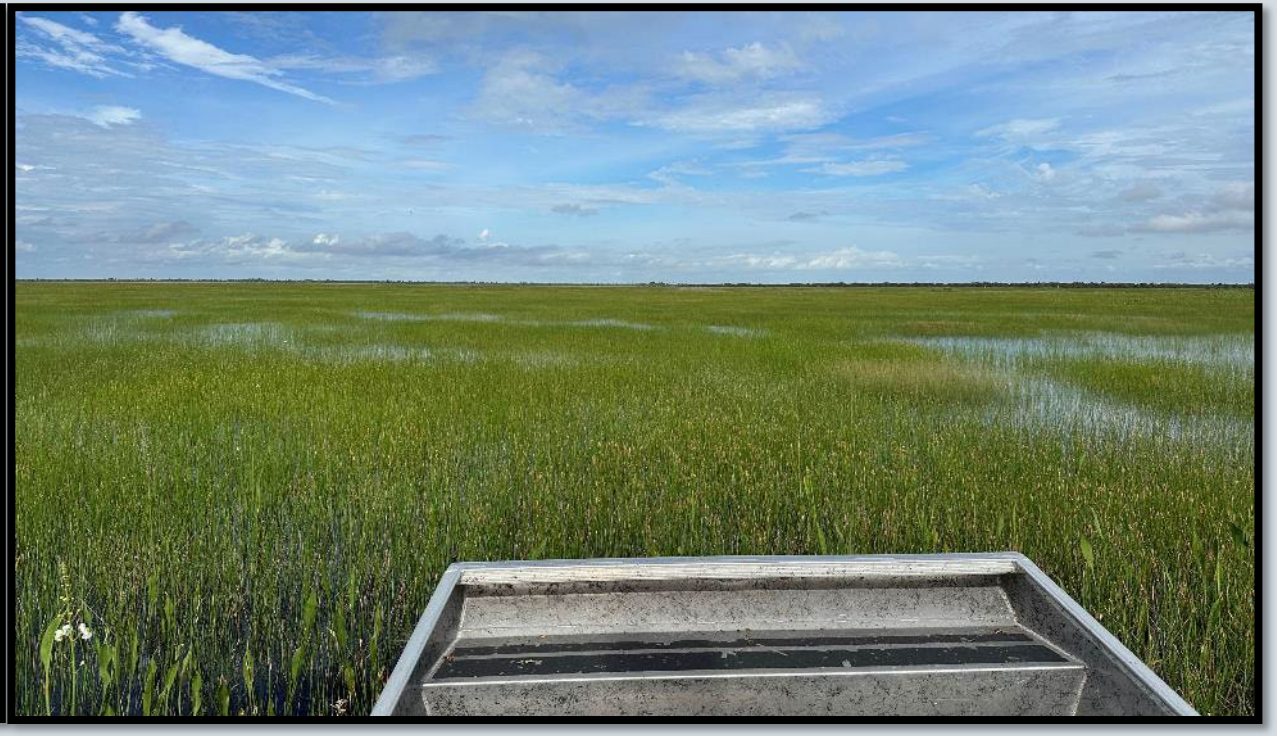
Torpedograss Management



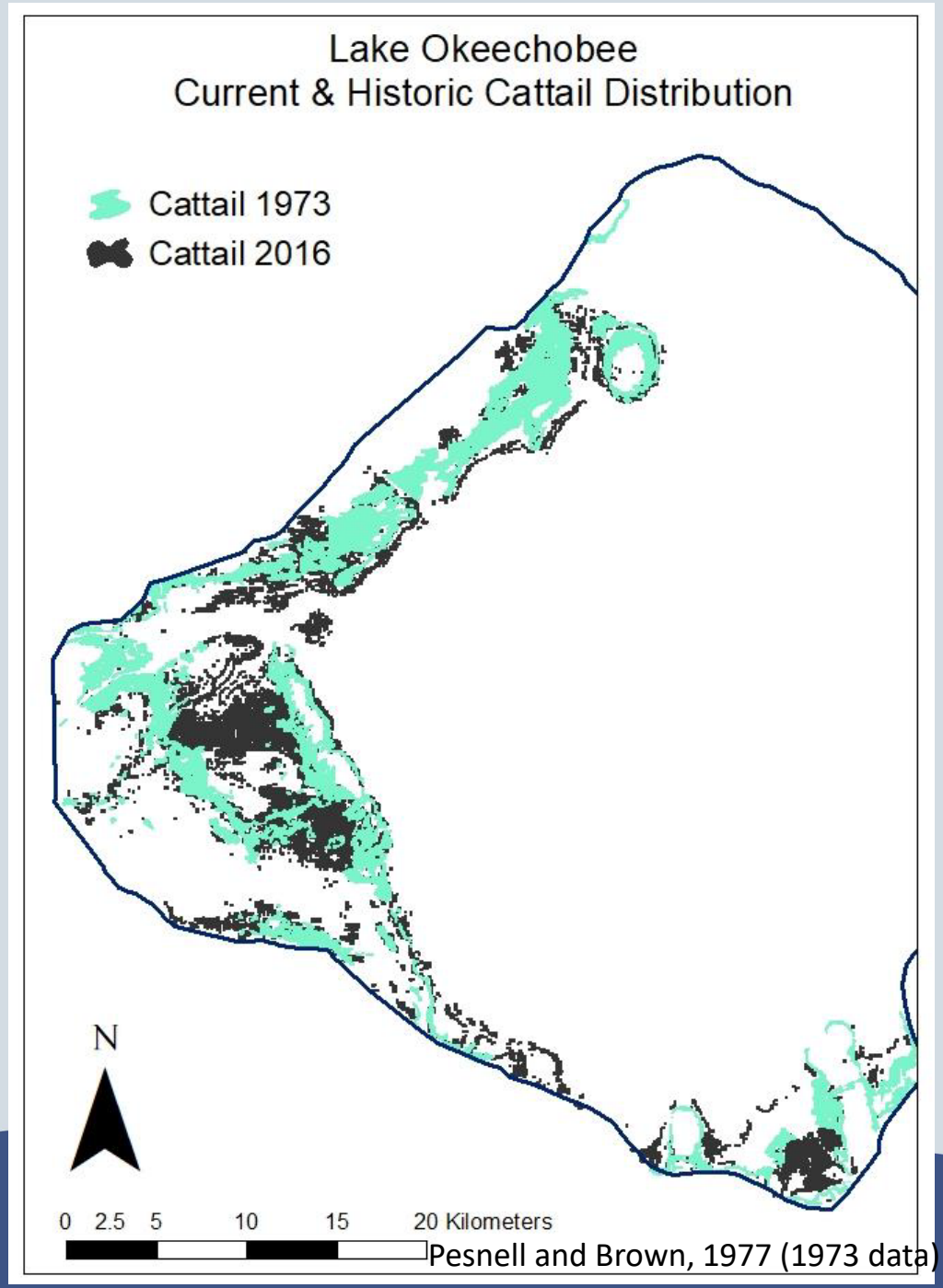



Lake Okeechobee Maintenance
Torpedograss Areas
0 1.25 2.5 5 Miles
Legend
2025 Torpedograss Maintenance Area C - Steamboat -1,415.1 acres
2025 Torpedograss Maintenance Area B - IP - 1,291.9 acres
2025 Torpedograss Maintenance Area A-NW Marsh - 4,740.3 acres

Post Management



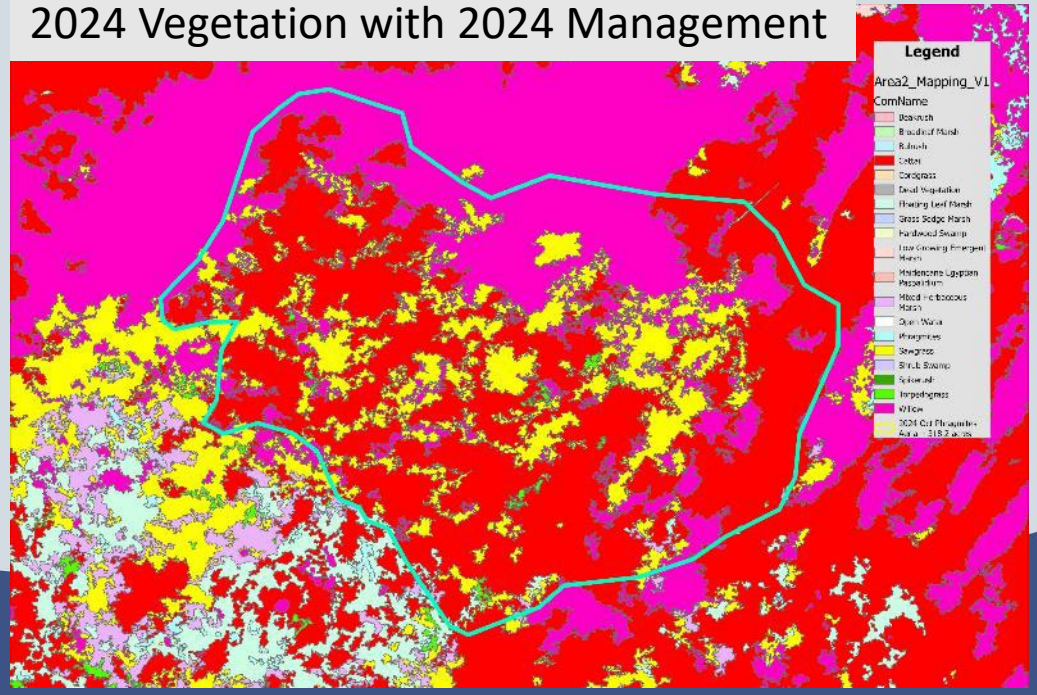
Cattail Management



Pesnell and Brown, 1977 (1973 data)

1973 Vegetation with 2024 Management

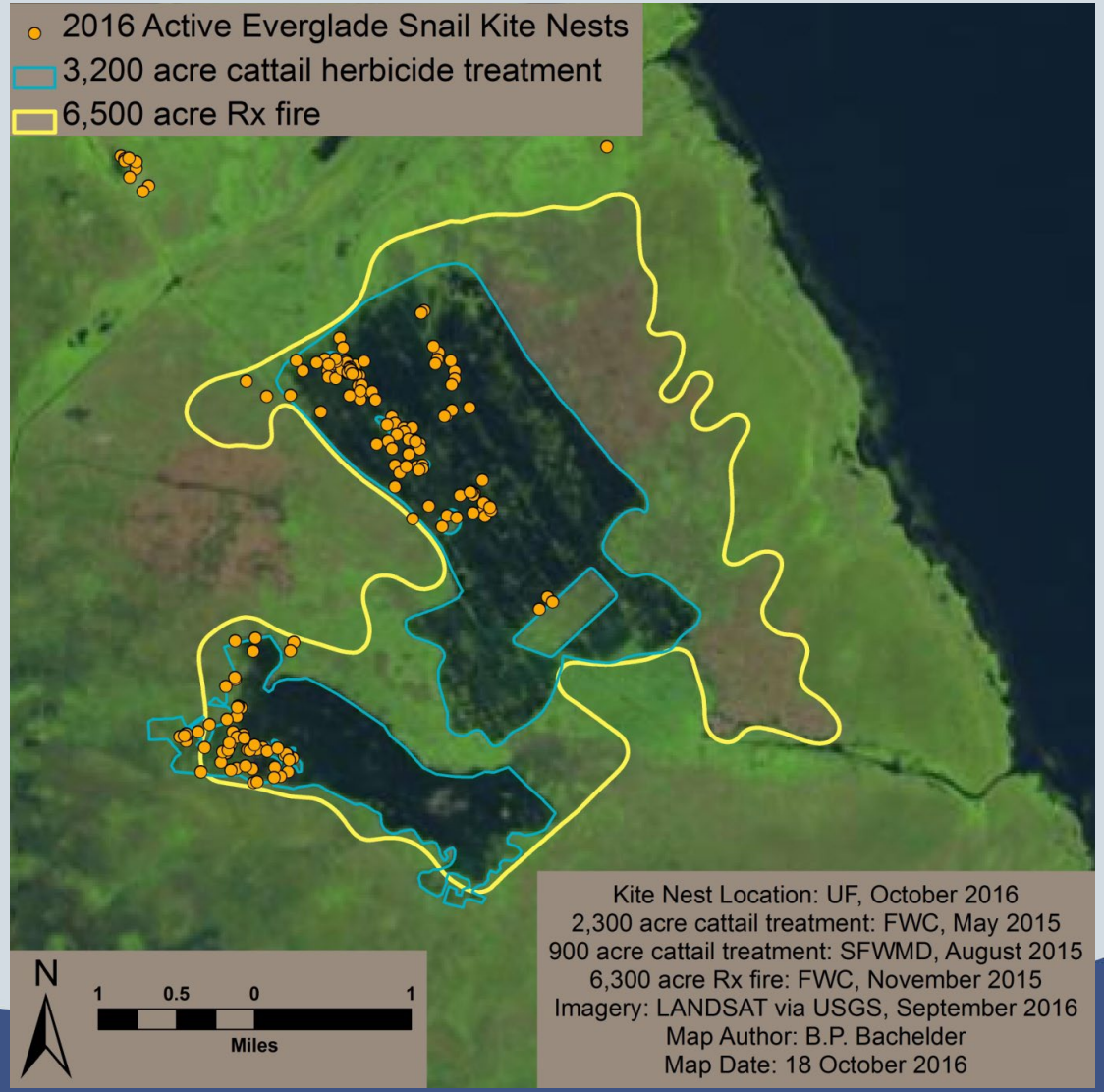
2024 Vegetation with 2024 Management






Torpedograss, Cattail Management and Snail Kites

- @ 70% of nesting on Lake Okeechobee in 2016
- 82% of the successful nests on Lake Okeechobee came from Moonshine Bay in 2016
- Record breaking Everglade snail kite nesting event for Lake Okeechobee



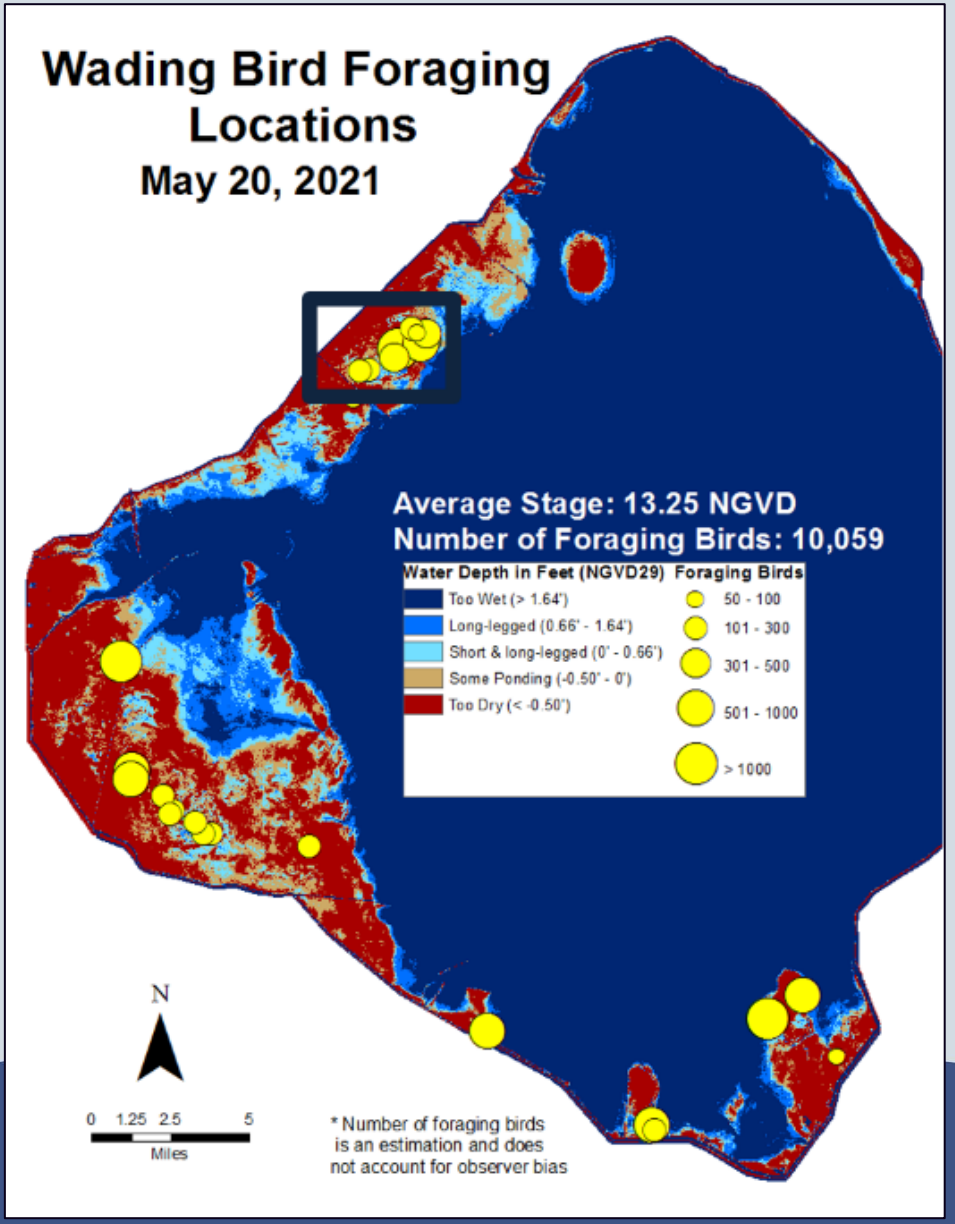
2003 – 2015 Nests

2003 – 2015 Nests
(12 years): 26 nests

2016 Nests:
175 nests (71%)
within 0.5 miles

2016 Snail Kite Nesting

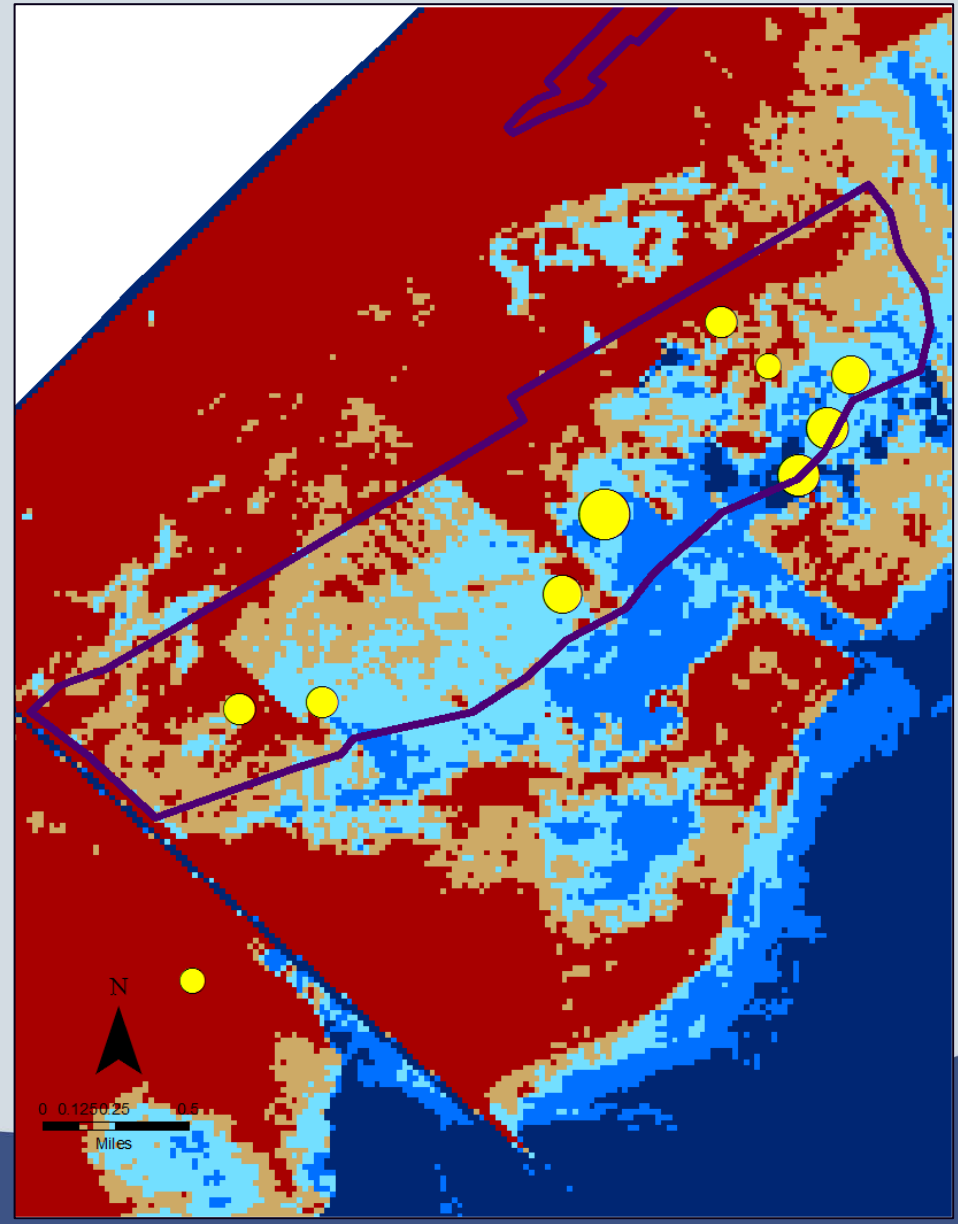
2021 Wading Birds



Torpedograss Management Area

6,185 out of 10,059 (**61%**) foraging wading birds in restoration area

May 20, 2021
13.25 ft



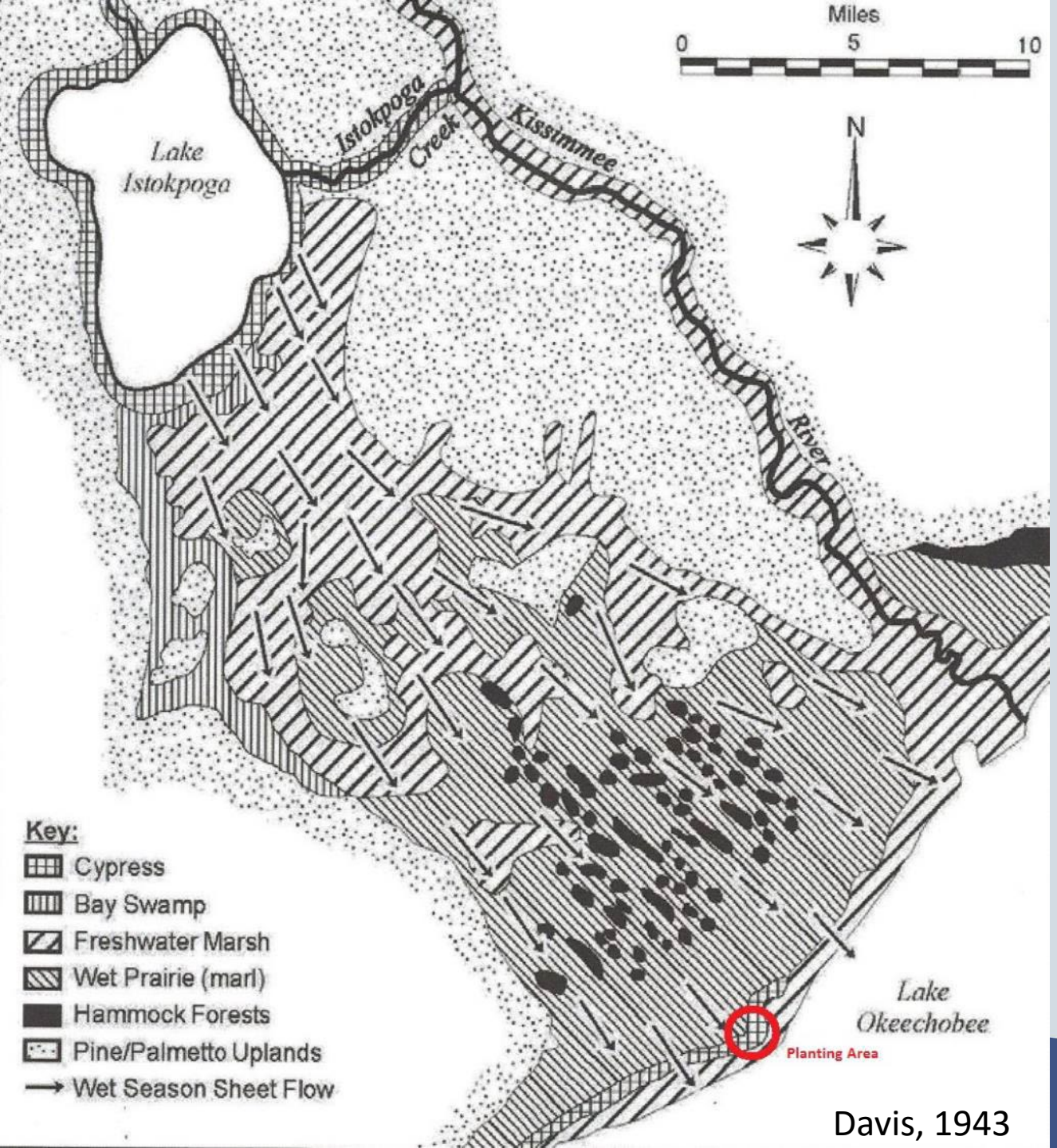
Data and Maps from SFWMD

Cypress and Wetland Tree Plantings

Bald Cypress:

Historically ringed northern, eastern and western marsh edges

<u>Why?</u> Important refuge for wildlife when water is high



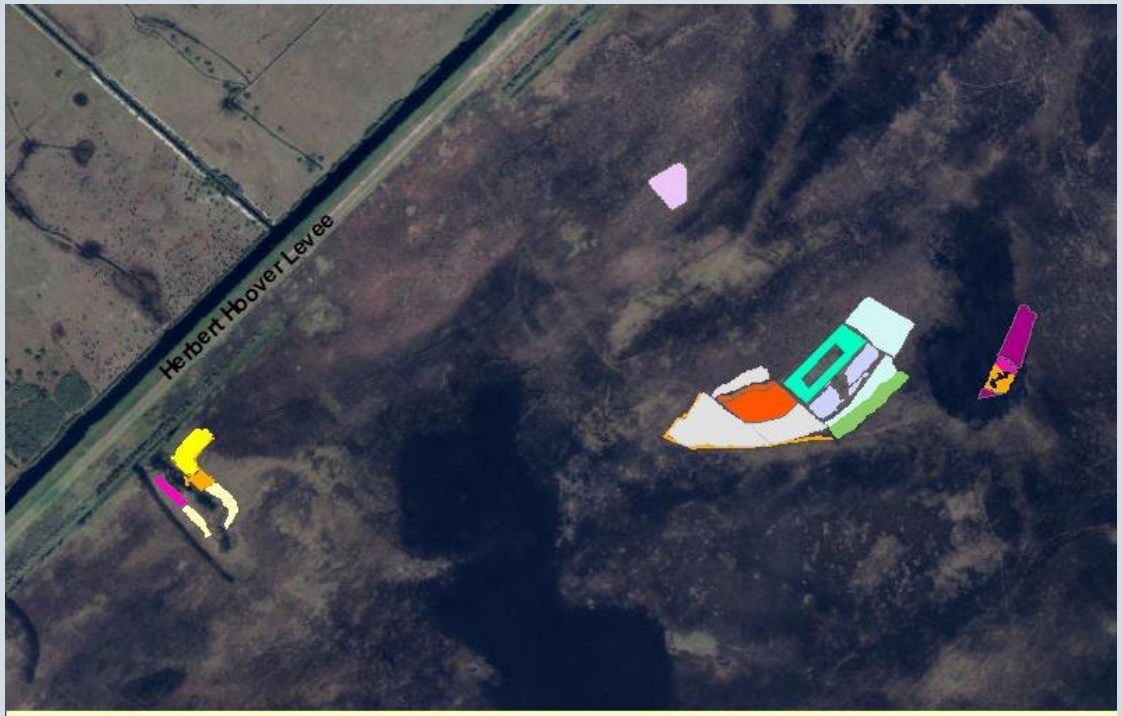
Davis, 1943

logging


Bobcat

March 2015

First planting



Lake Okeechobee Cypress Fringe and Depression Plantings 2015- 2021

Legend

- February 2015 Planting - 3.5 acres
- May 2015 Hardwood Planting - 3.9 acres
- January 2016 Planting - 2.9 acres
- May 2016 Planting - 2.4 acres
- June 2017 Depression Planting - 1.6 acres
- April 2018 Hardwood Planting II - 9.6 acres
- May 2018 Depression II Planting 1.3 acres
- March 2019 Cypress - Depression - Dome Planting
- Jan 2020 Cypress Fringe - 1.1 acres
- May 2020 Cypress Dome - 2.7 acres
- June 2021 Cypress Fringe Planting
- June 2021 Volunteer Site Planting

19,604 plants – 46.24 acres

- 11,599 bald cypress
- 8,005 wetland tree/shrubs
- 28 species

Nearshore Marsh

1. Wave Attenuation Devices + plant bulrush/Kissimmee grass to protect SAV

2. Increased organic berm management

3. Increase tussock management

Wave Attenuation Devices (WADs)

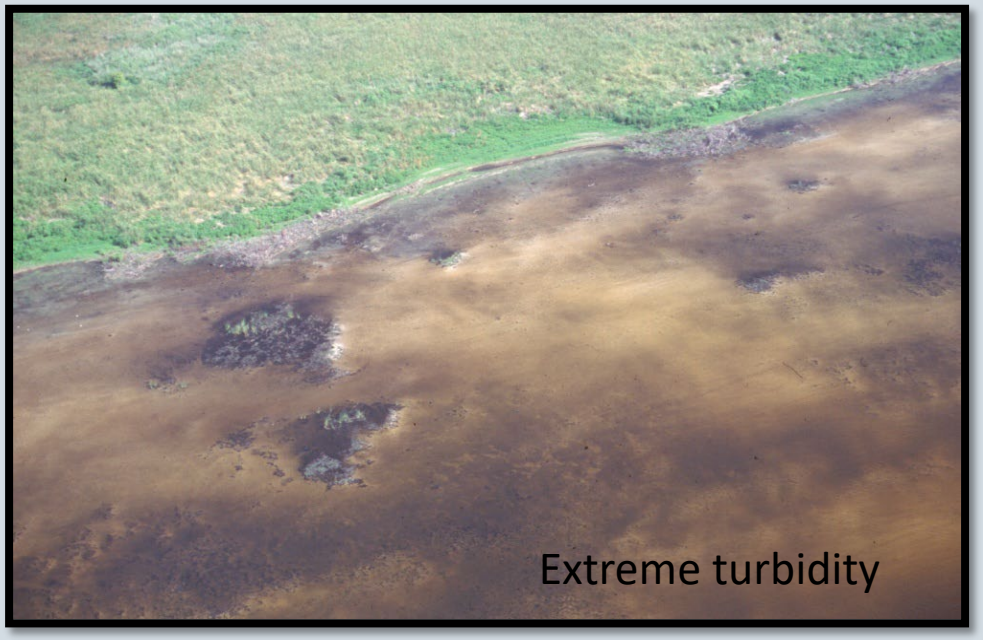
- Reduce damaging waves
- Reduce wave energy
- Reduce turbidity
- Increase water clarity
- Re-establish nearby vegetation
- Fish reef
- Bird perch/roosting

Rubble Ridges

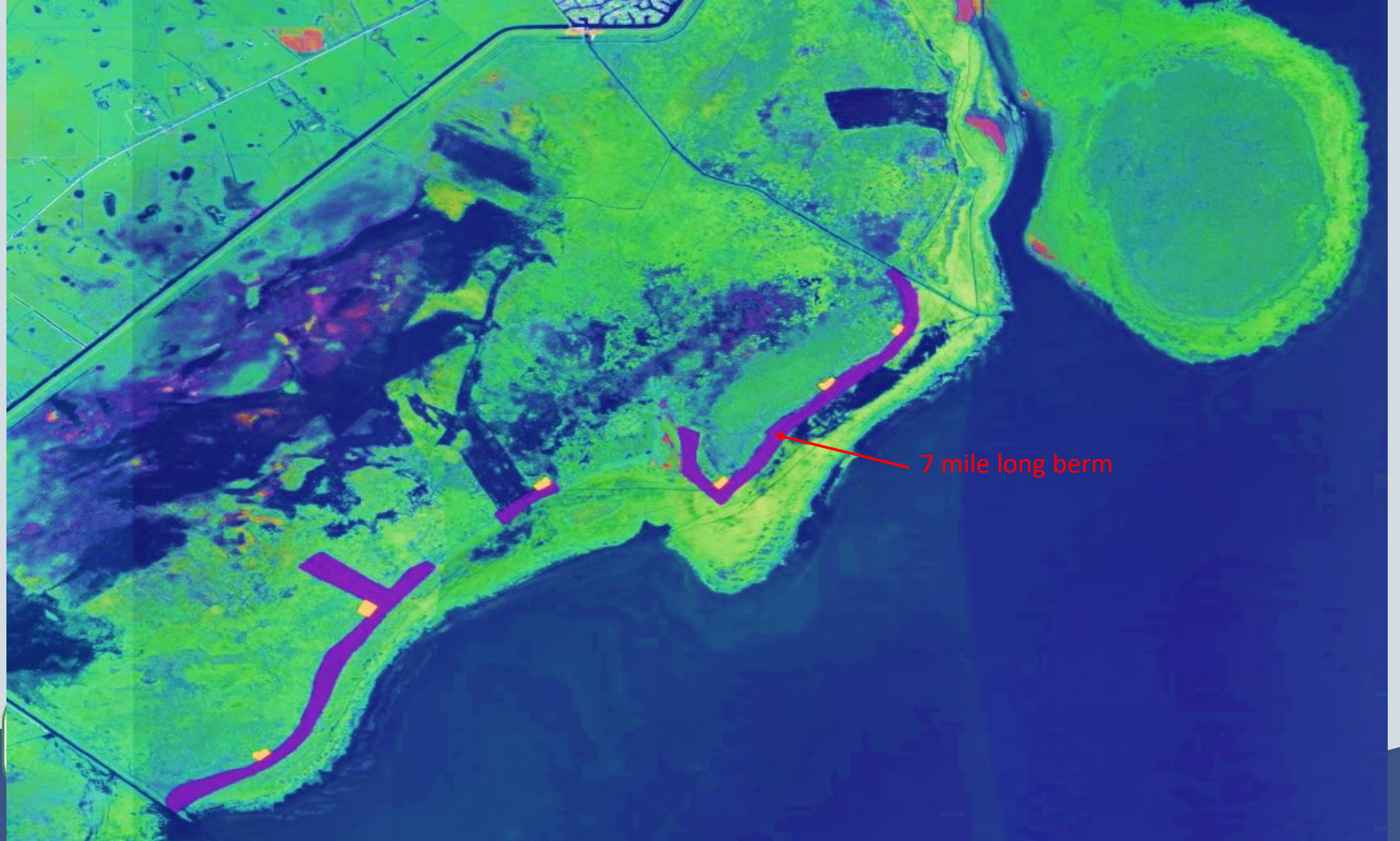
- Slightly less durable
- Slightly cheaper
- Out of sight / more natural
- Potential to incorporate vegetation

Organic Berm Management

- Accumulation of dead vegetation from high water and storms
- Piles against cattail edge, drops to the bottom, forms a “berm”
- Accumulates over time



Organic Berm: Pearce Canal to Tin House Cove 1998 - 1999


7 mile long berm

2001 berm removal
scrape project

2007/2008 Tin House scrape project

Tussock Management

- Use Mechanical Shredders
- Target tussocks blocking navigation
- Management increases when water levels increase
- Target tussocks that form on cattail edge when water is high

Other Challenges with High Water

- Prescribed Burns
- Okeechobee Gourd germination
- Loss of some shallow and deep habitats
- Nutrient intrusion

Questions?

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