

# JUVENILE TARPON *Megalops atlanticus* EMIGRATION FROM EPHEMERALLY CONNECTED COASTAL PONDS IN SOUTHWEST FLORIDA

Matthew Bunting, Philip Stevens, Courtney Saari, David Blewett



**UF | IFAS**  
UNIVERSITY of FLORIDA

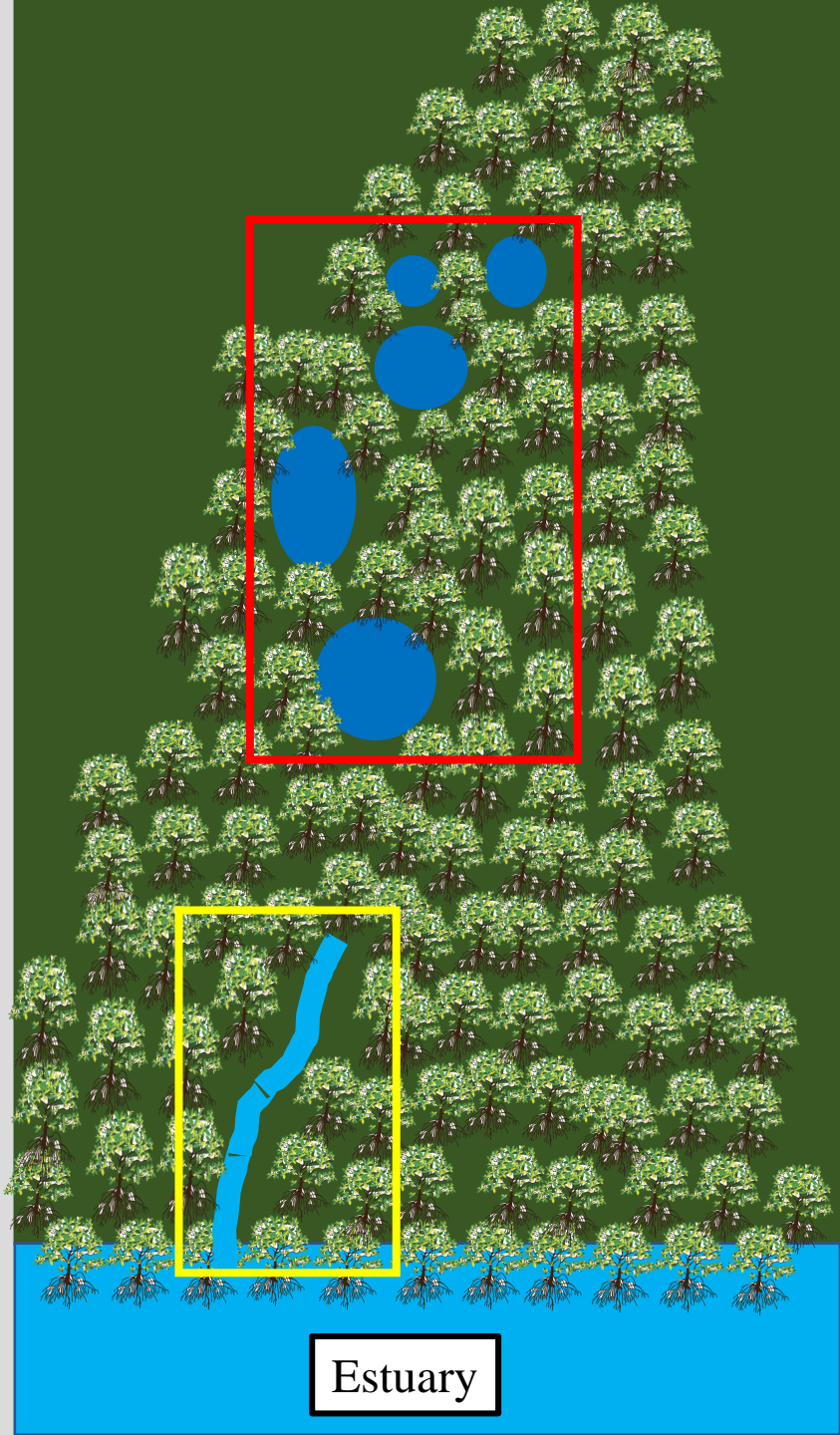
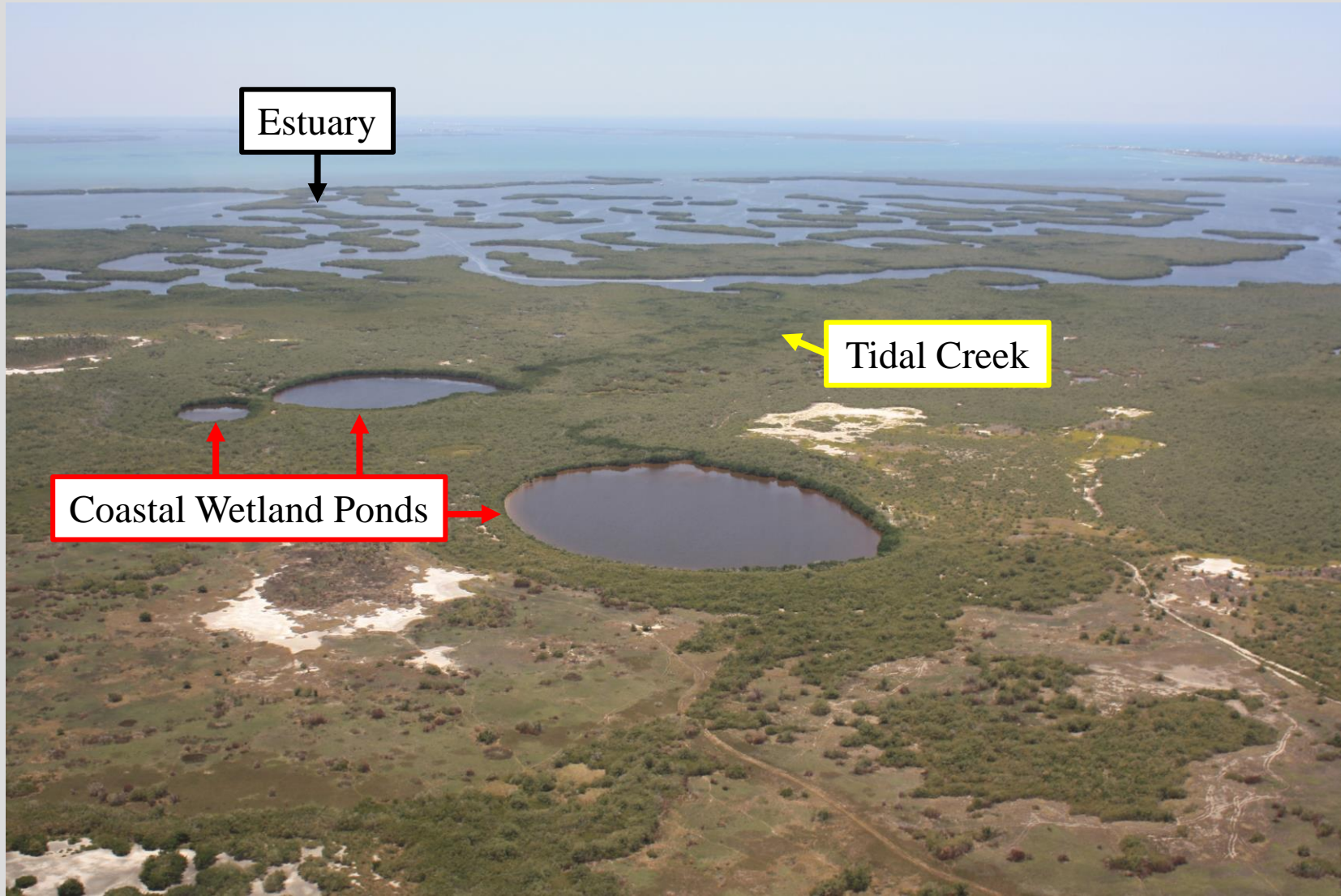


Coastal and Heartland National Estuary Partnership  
Watershed Summit 2023  
June 21, 2023





# Coastal Wetland Ponds



# How are these ponds functioning as nurseries?

## Objective 1

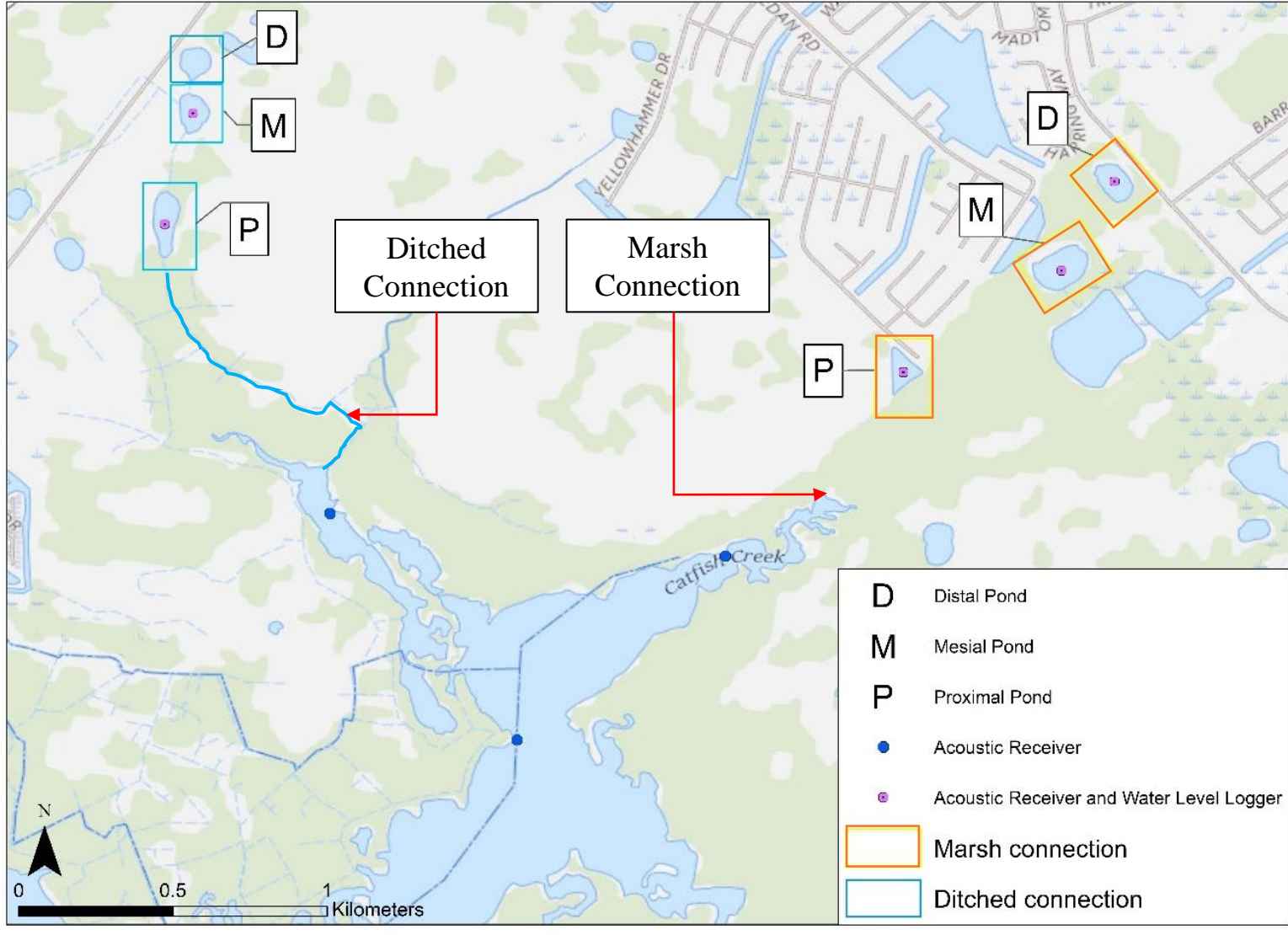
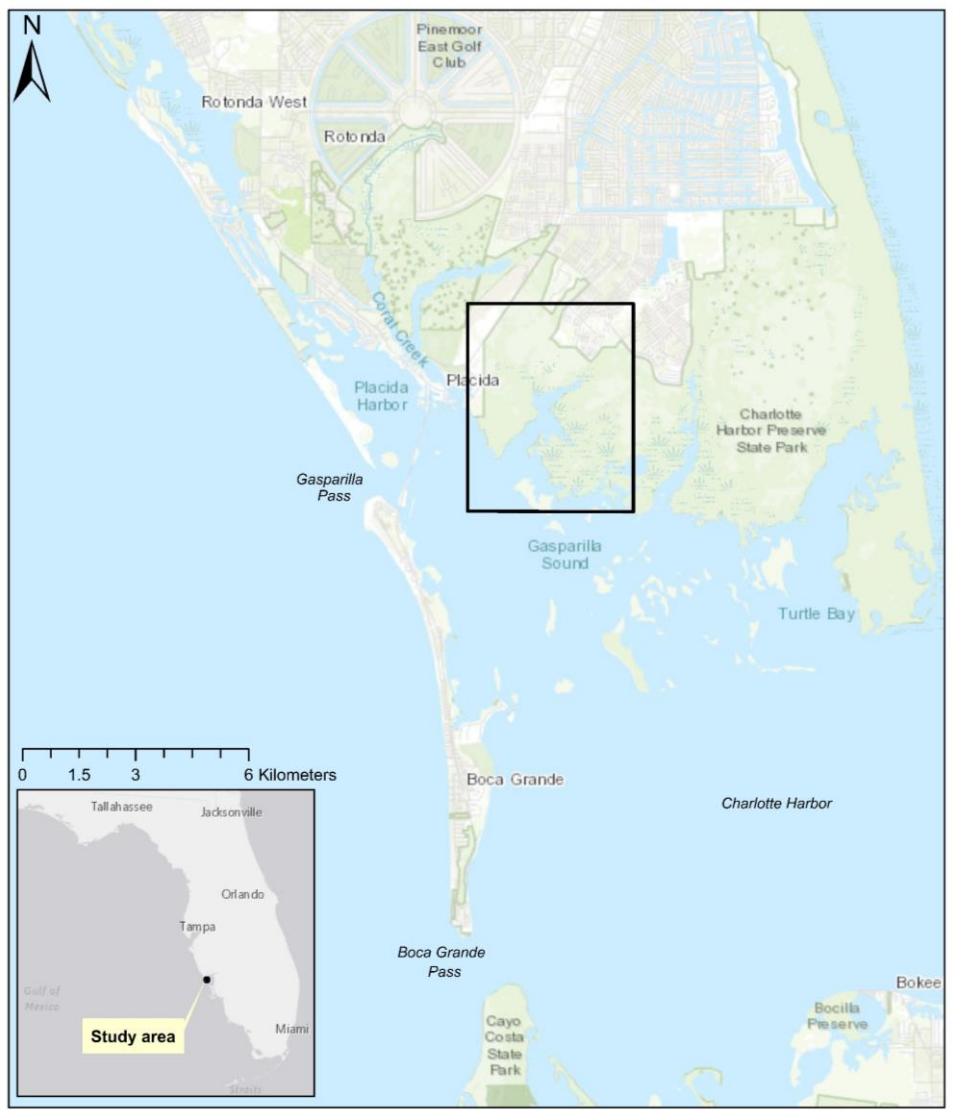
Determine opportunities for emigration using acoustic telemetry

## Objective 2

How does segregation among ponds affect groups of tarpon



# Study Sites

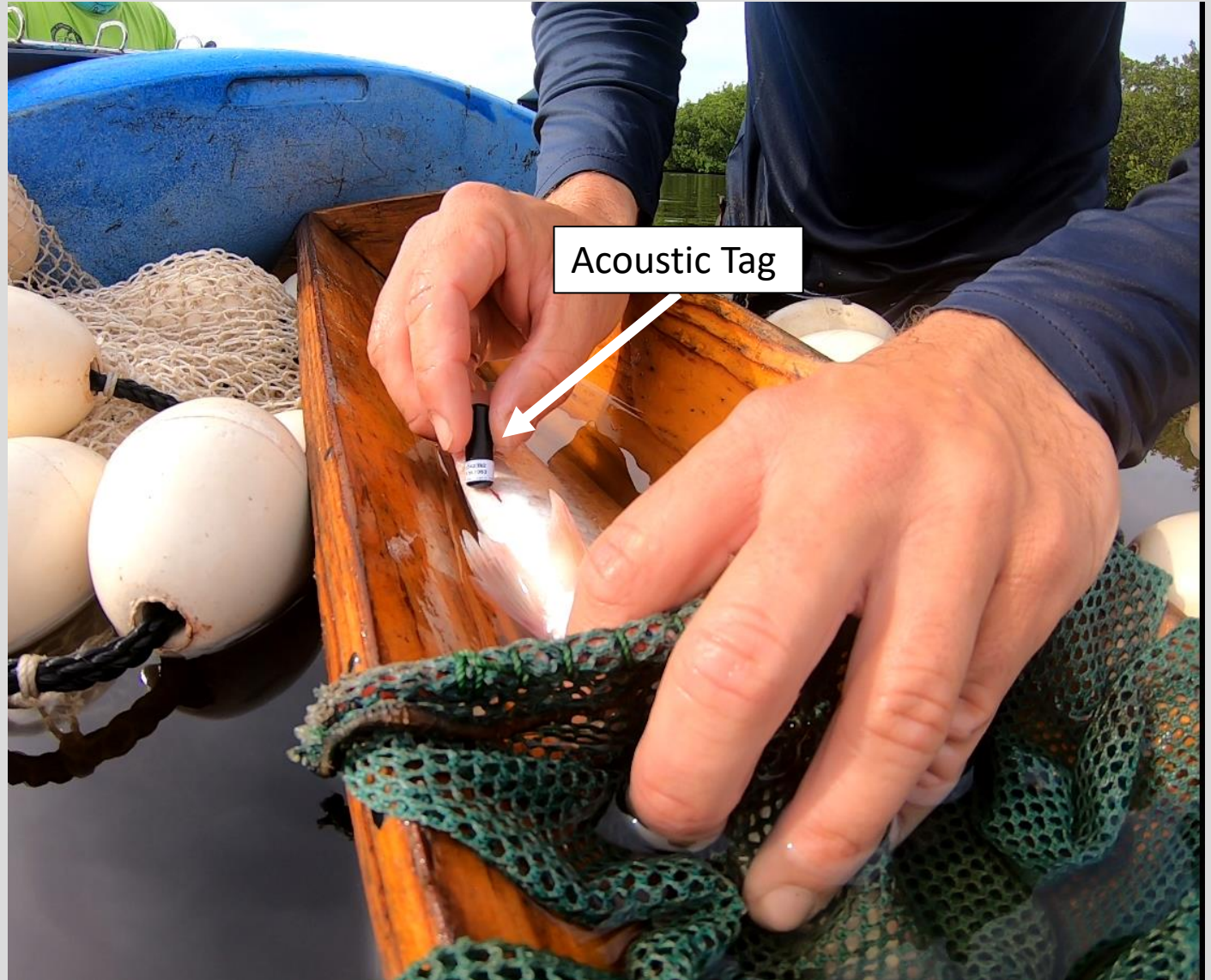




# Tagging

Tarpon typically ranged  
330-600 mm TL

Vemco V9 69 kHz  
acoustic tags



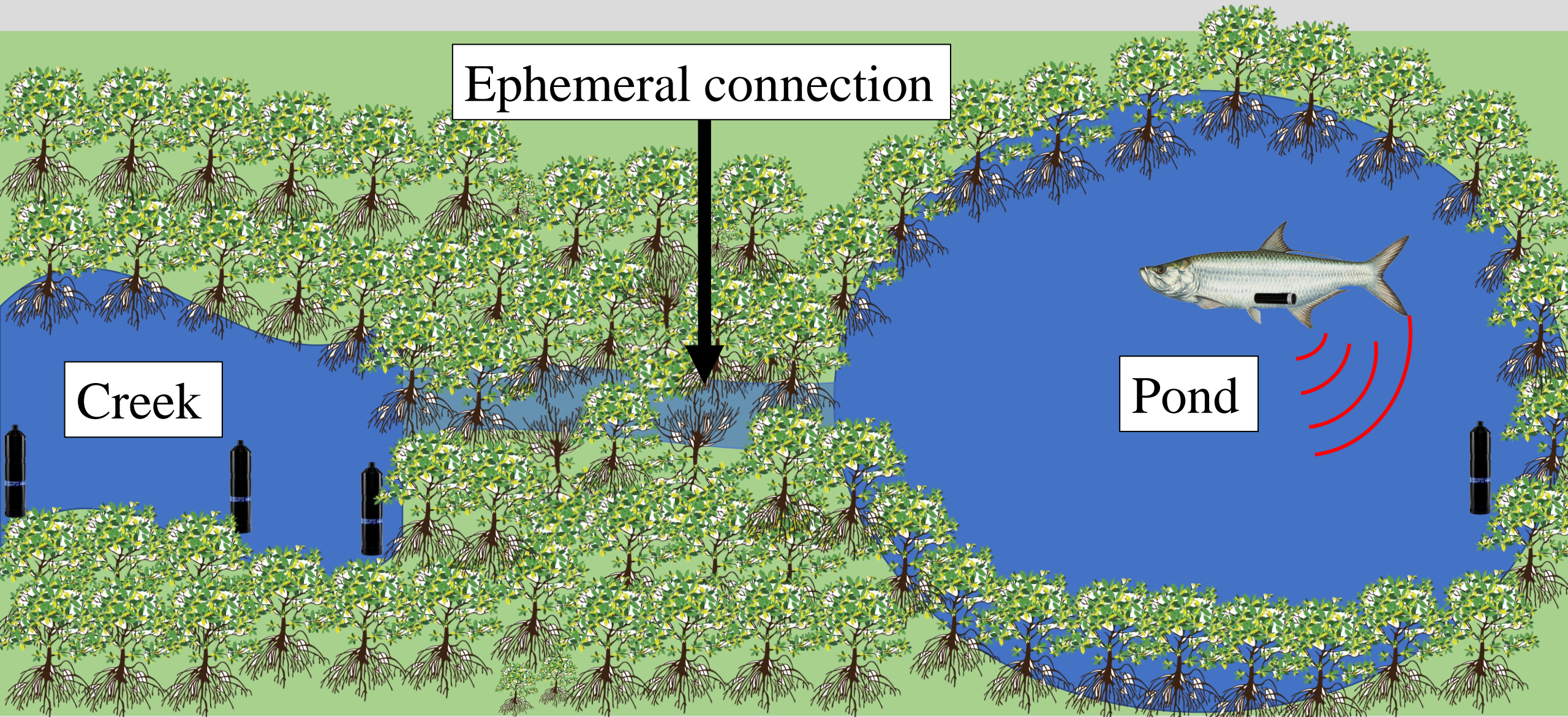


# Acoustic Telemetry

Ephemeral connection

Creek

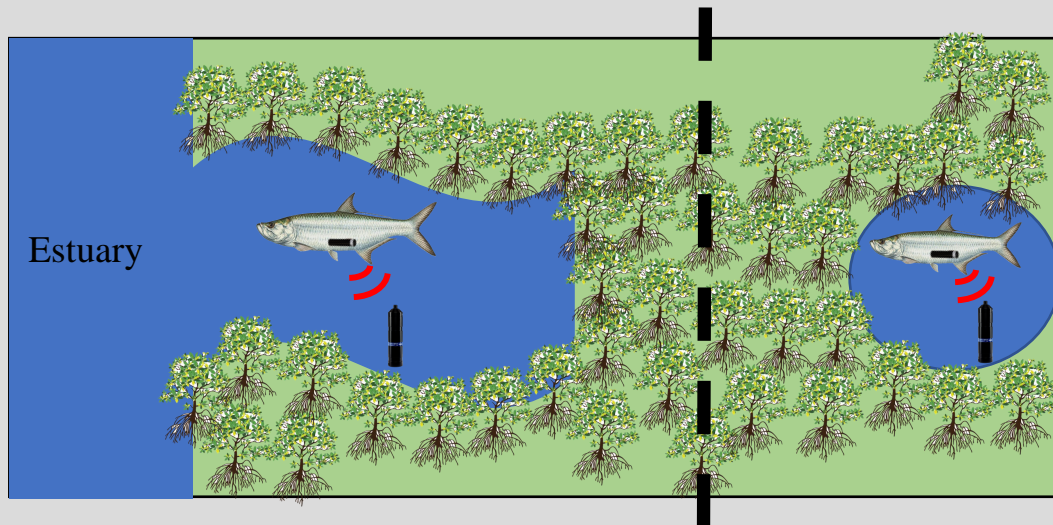
Pond





# Possible Cues Driving Emigration

Tested using mixed effects  
logistic regression models



- 1) Water Level
- 2) Age and Growth
- 3) Pond Connection Type and Distance
- 4) Barometric Pressure
- 5) Water Temperature

# What Did we Learn From the Models?

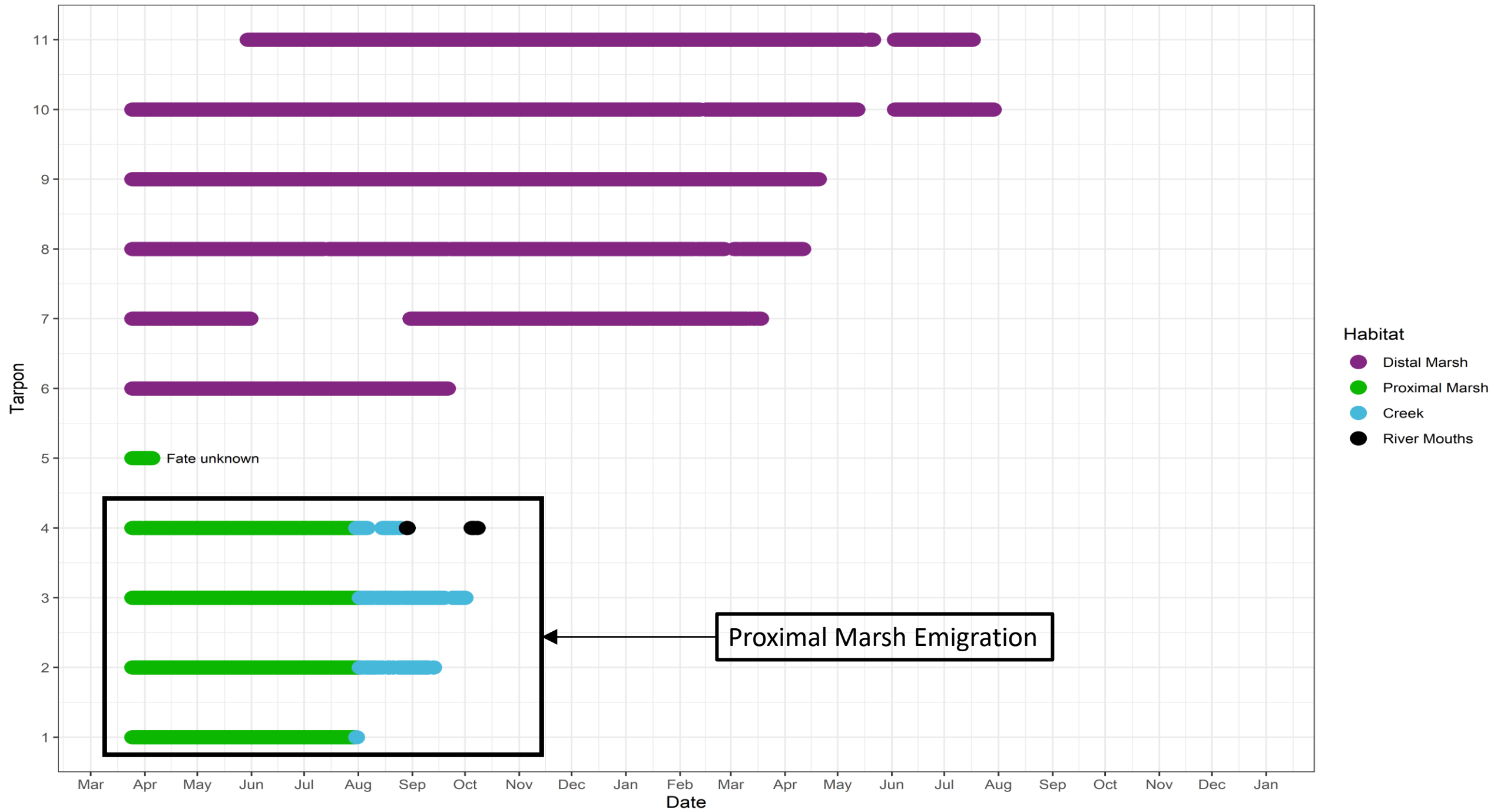
Culmination of factors occurring simultaneously prompt the habitat shift from coastal wetland pond to estuary.

These include:

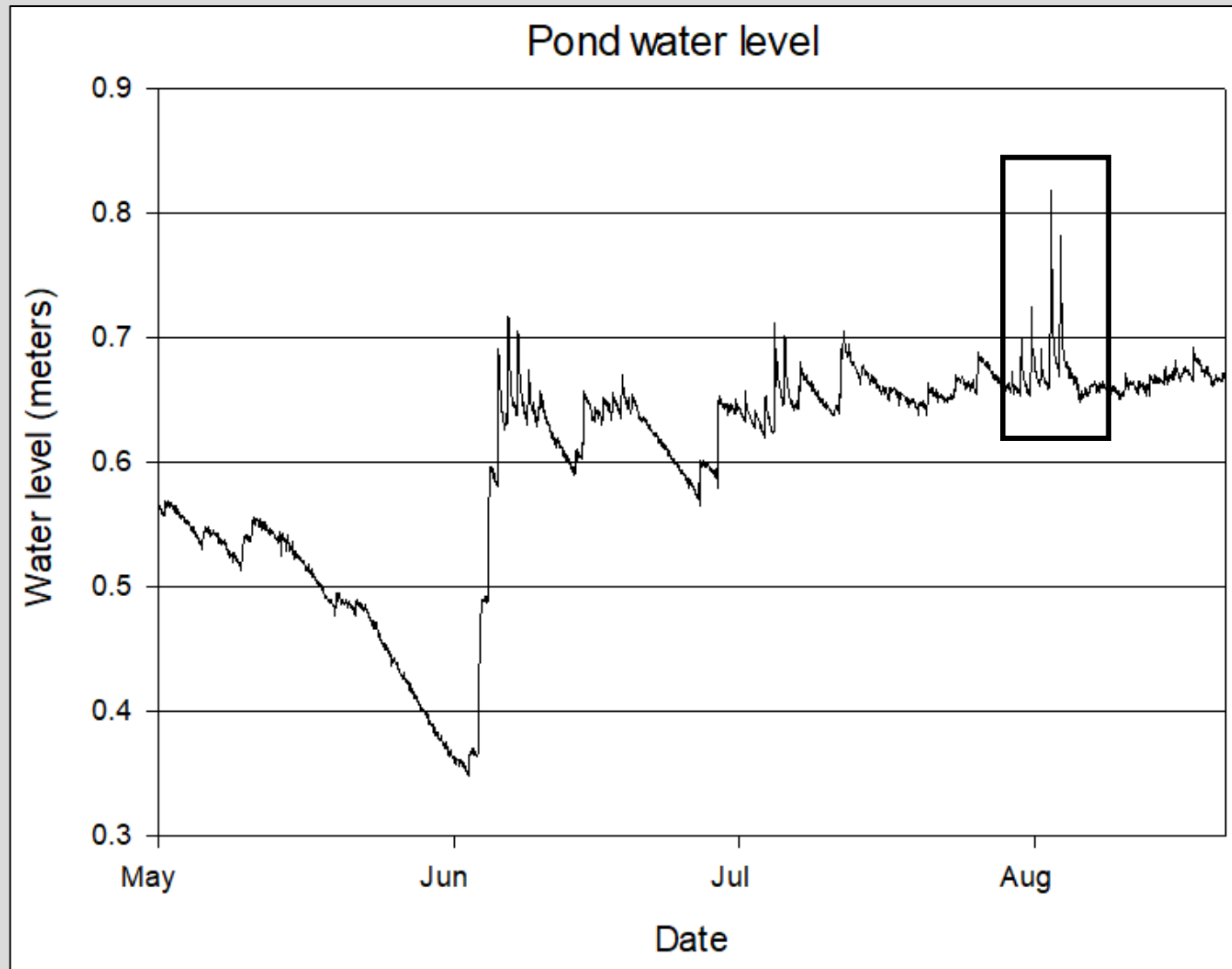
- 1) High Water Levels
- 2) Low Barometric Pressure
- 3) Estimated Fish Size
- 4) Drop in Water Temperature
- 5) Pond Distance from Connecting Creek and Connection Type



# 2019-2020

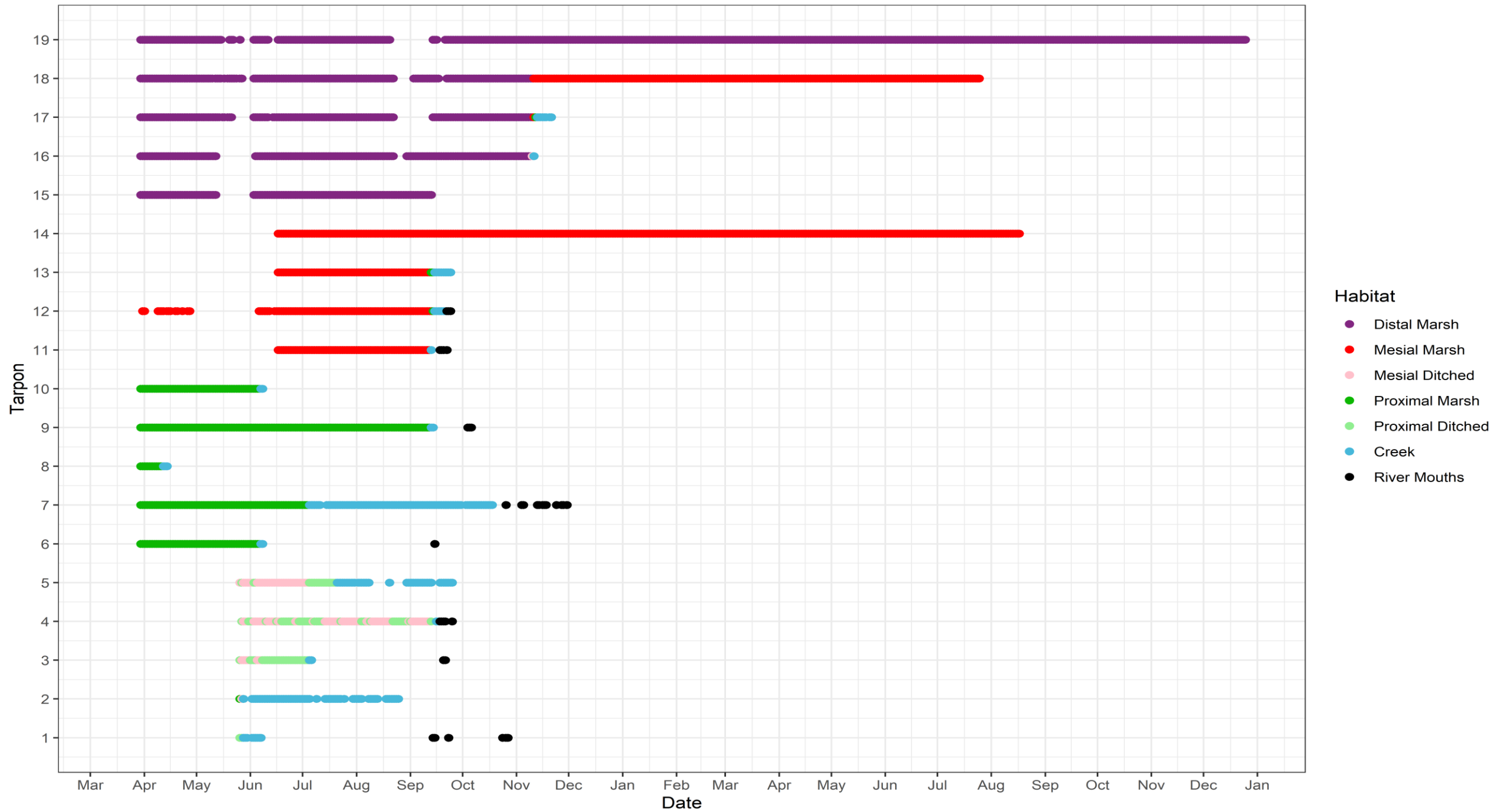


# Why'd All The Fish Leave?



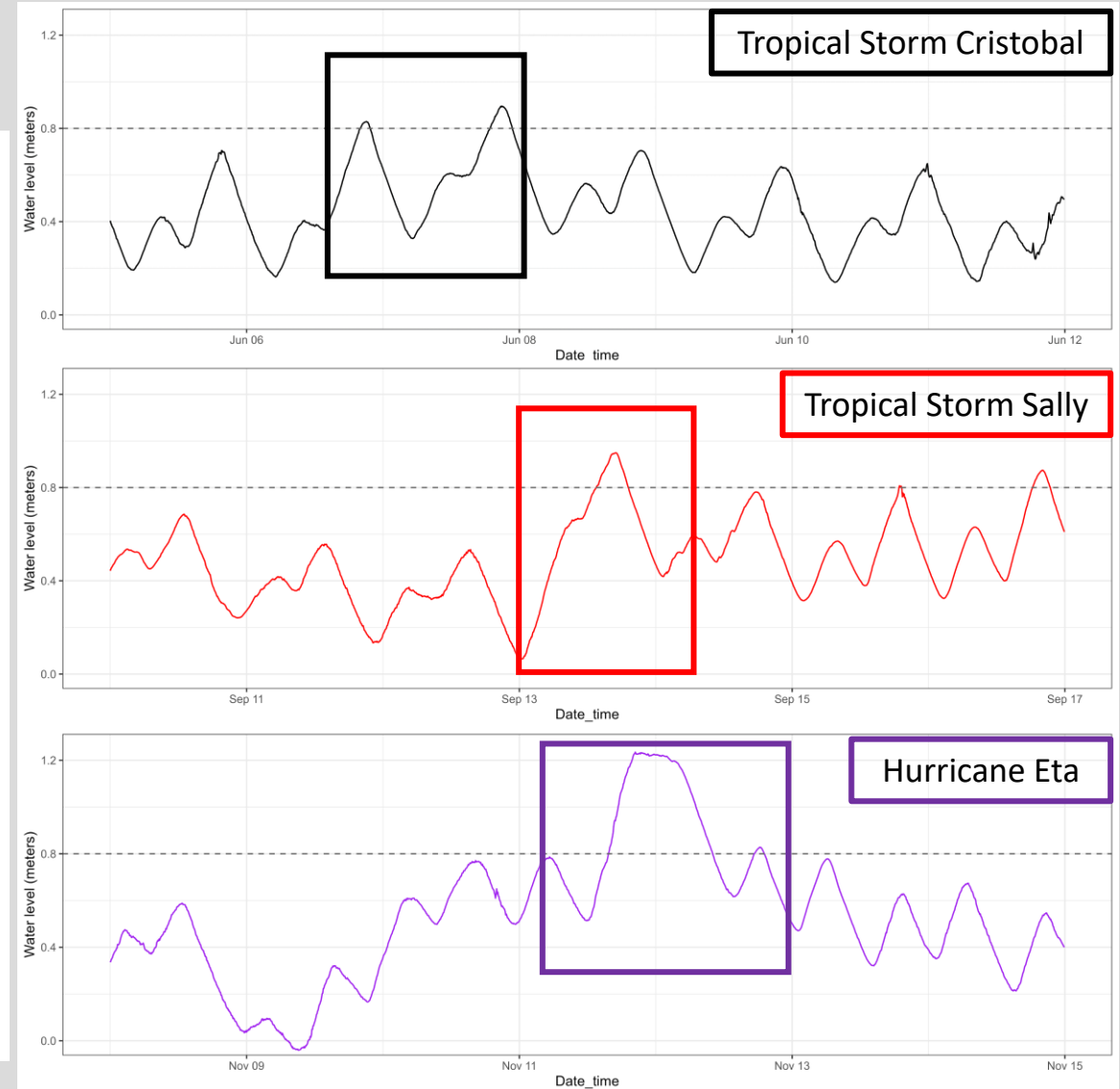
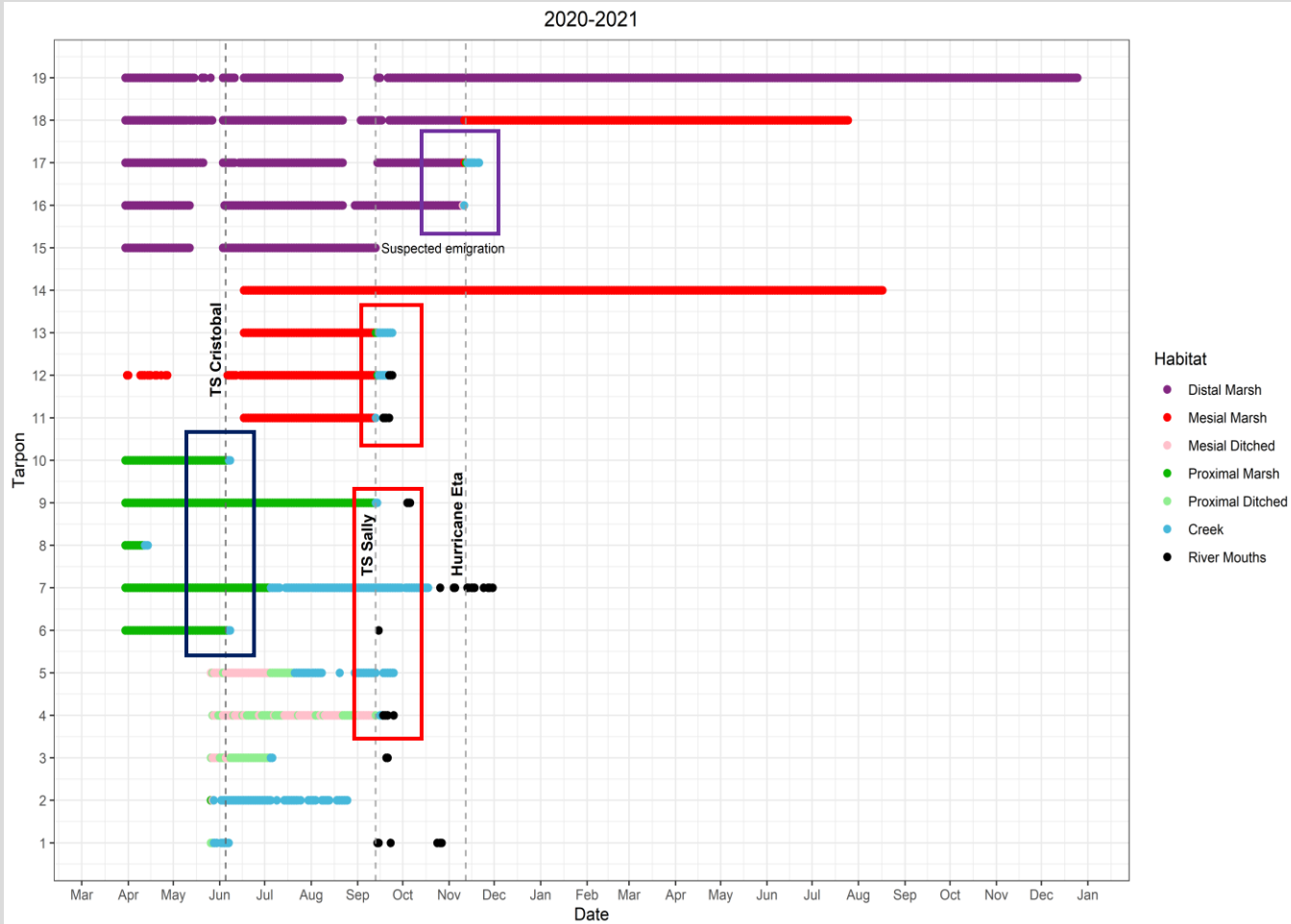


# 2020-2021



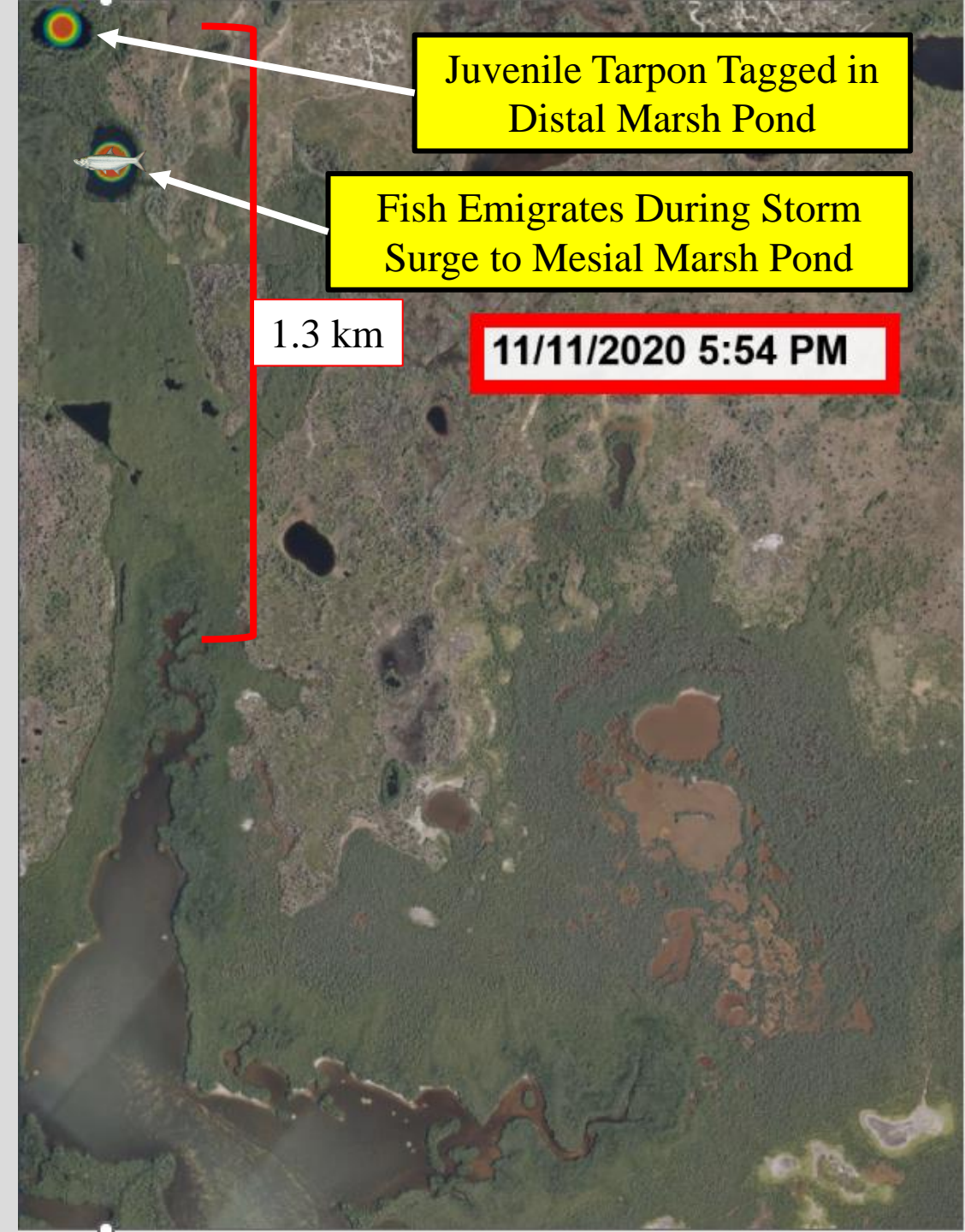
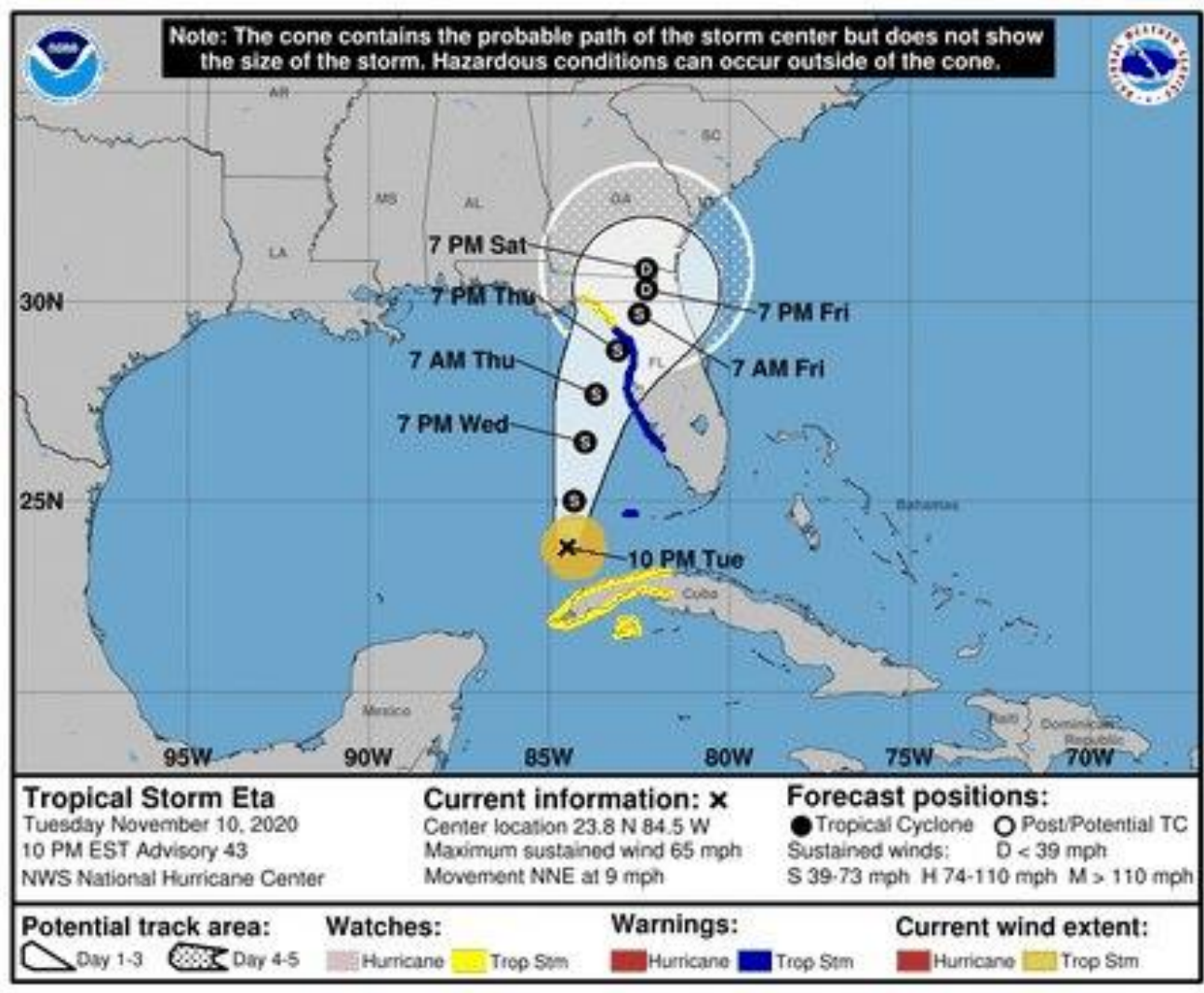
# 2020-2021 Telemetry

## Water levels that led to emigration of tarpon.





Hurricane Eta 11/11/2020  
 Landfall at 7:00 PM North of Charlotte Harbor

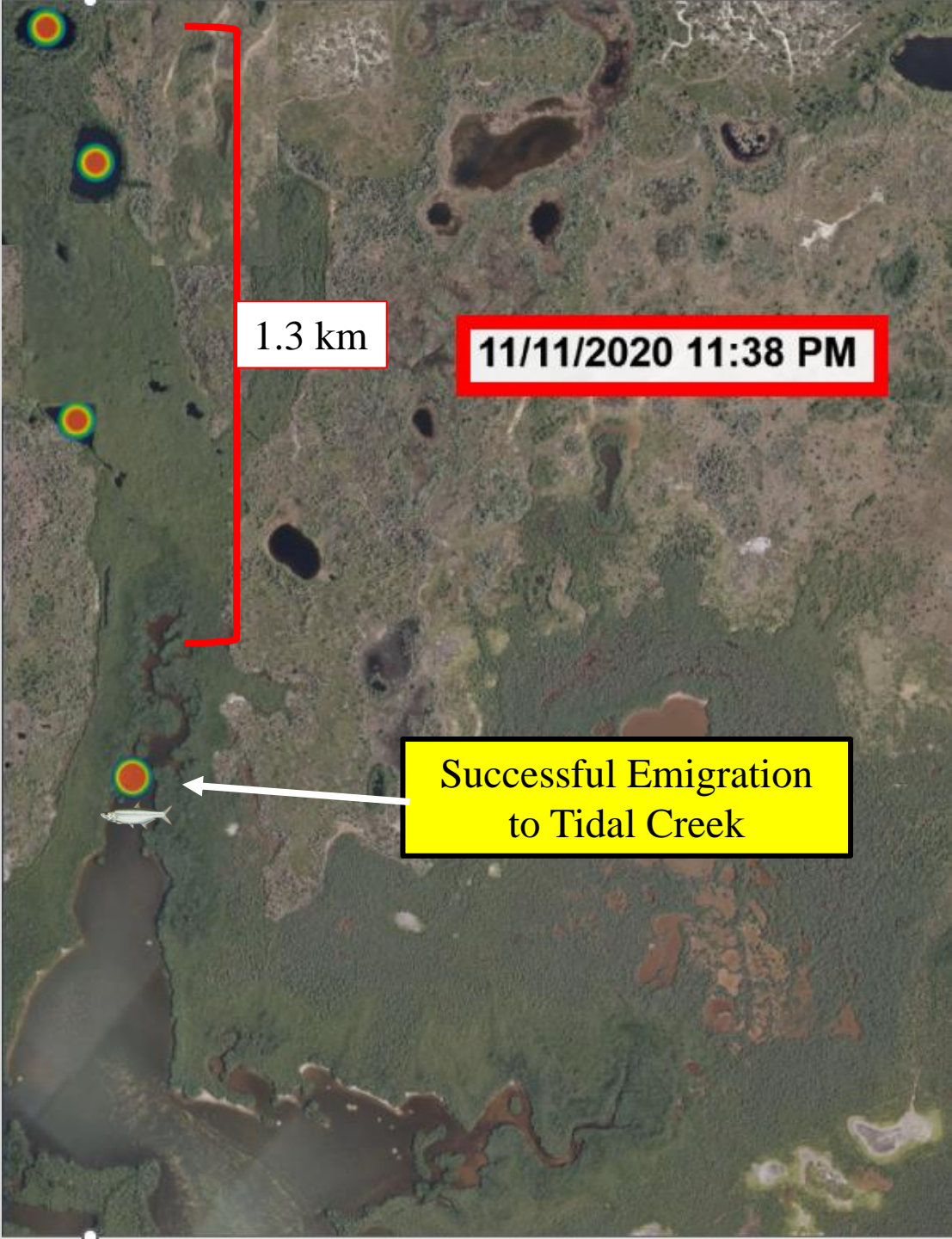
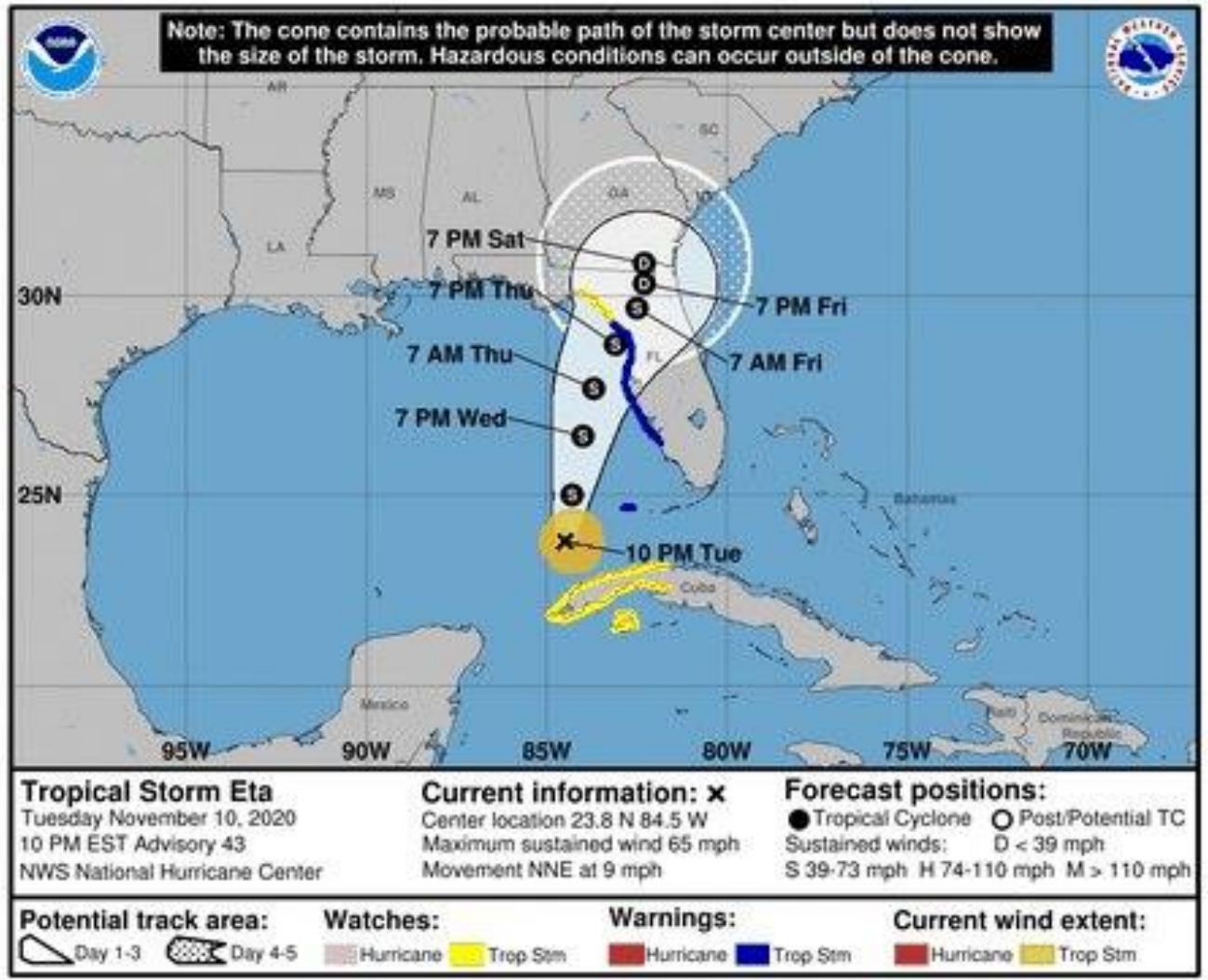


Juvenile Tarpon Tagged in Distal Marsh Pond

Fish Emigrates During Storm Surge to Mesial Marsh Pond



Hurricane Eta 11/11/2020  
 Landfall at 7:00 PM North of Charlotte Harbor





# Telemetry Results

## Emigration

10 distinct high-water events

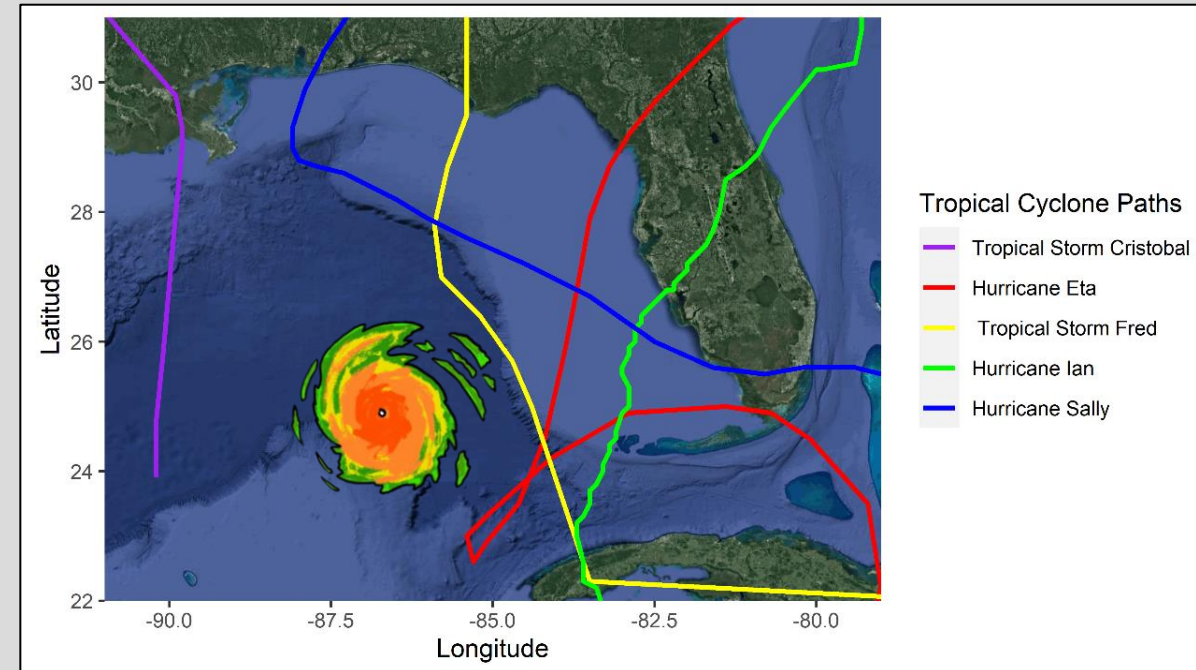
44% emigrated during tropical cyclones

## Survival

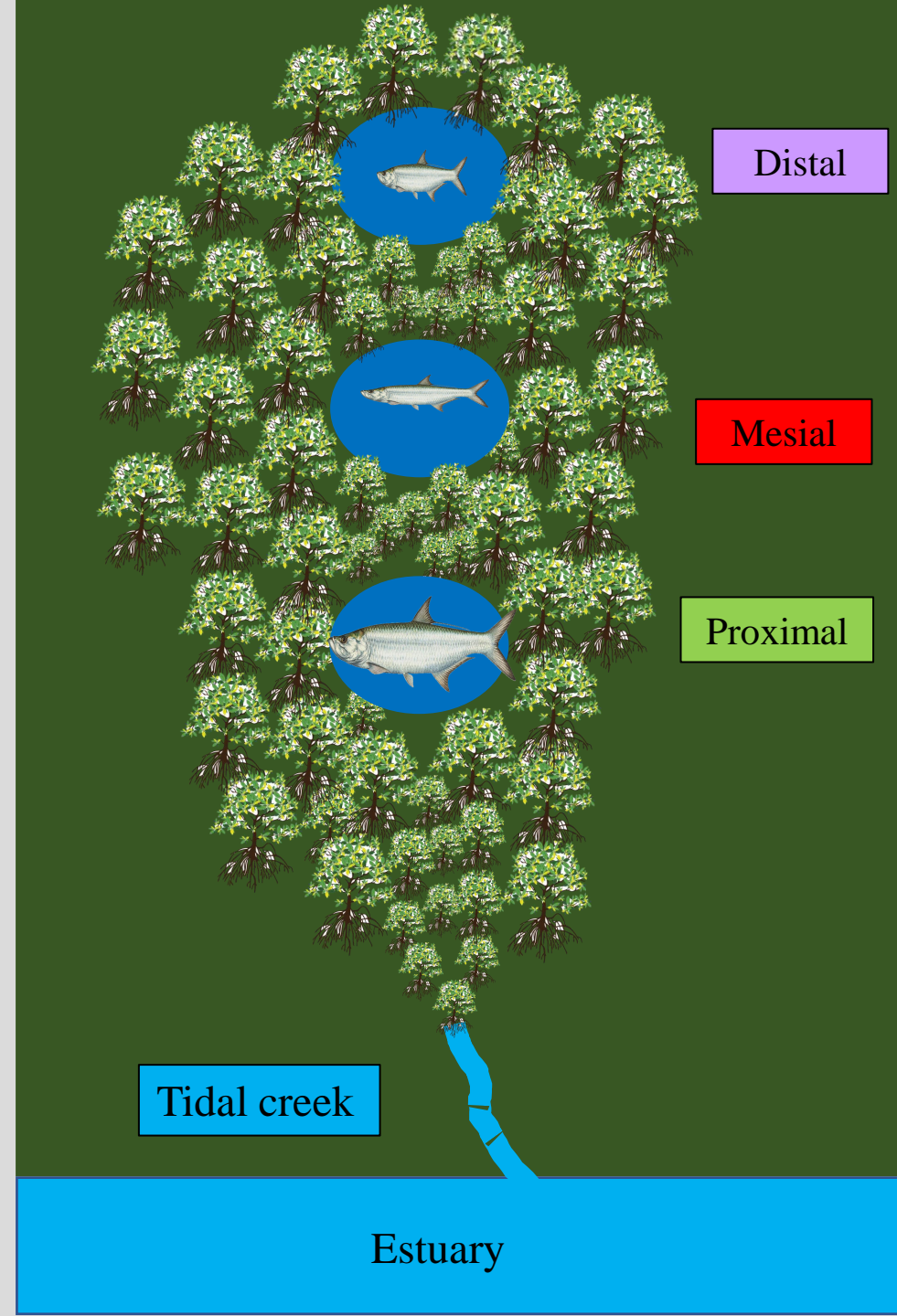
27 of 53 (51%) fish detected emigrating

19 more reached battery life (> 1 year)

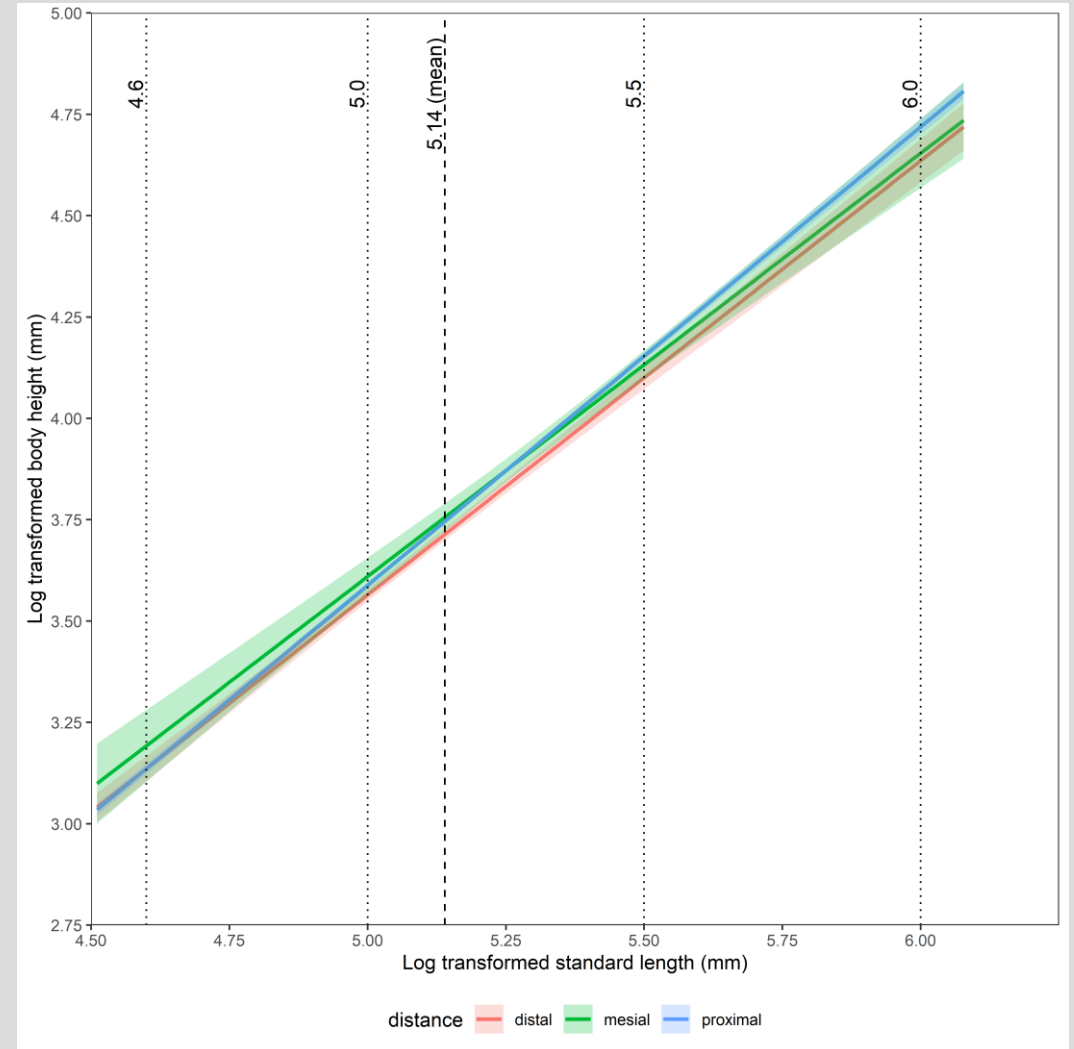
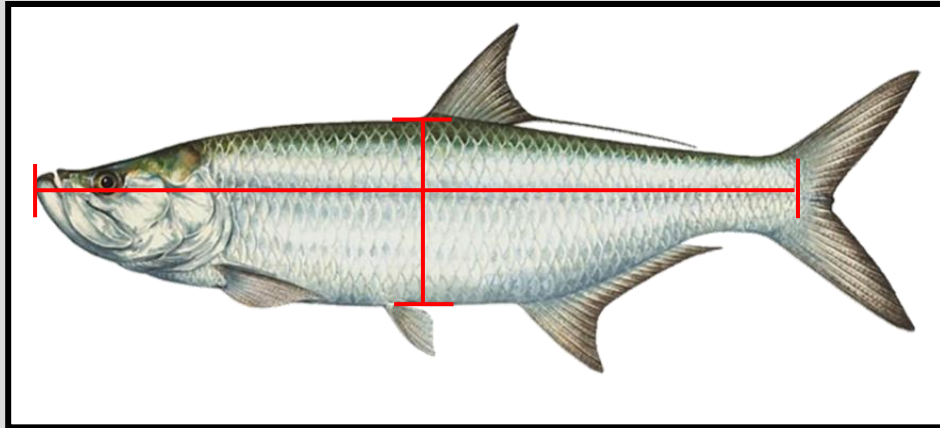
**87% apparent survival of Tarpon**



# Does Connectivity Affect Body Condition?



# Body Condition Analysis

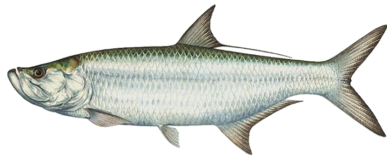




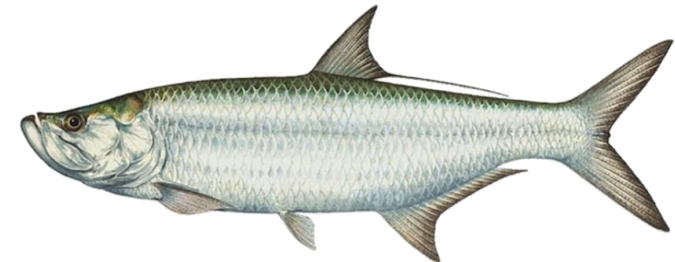
# Age Determination

300 mm was chosen to represent fish older than 1 year using scales.

YOY < 300 mm SL

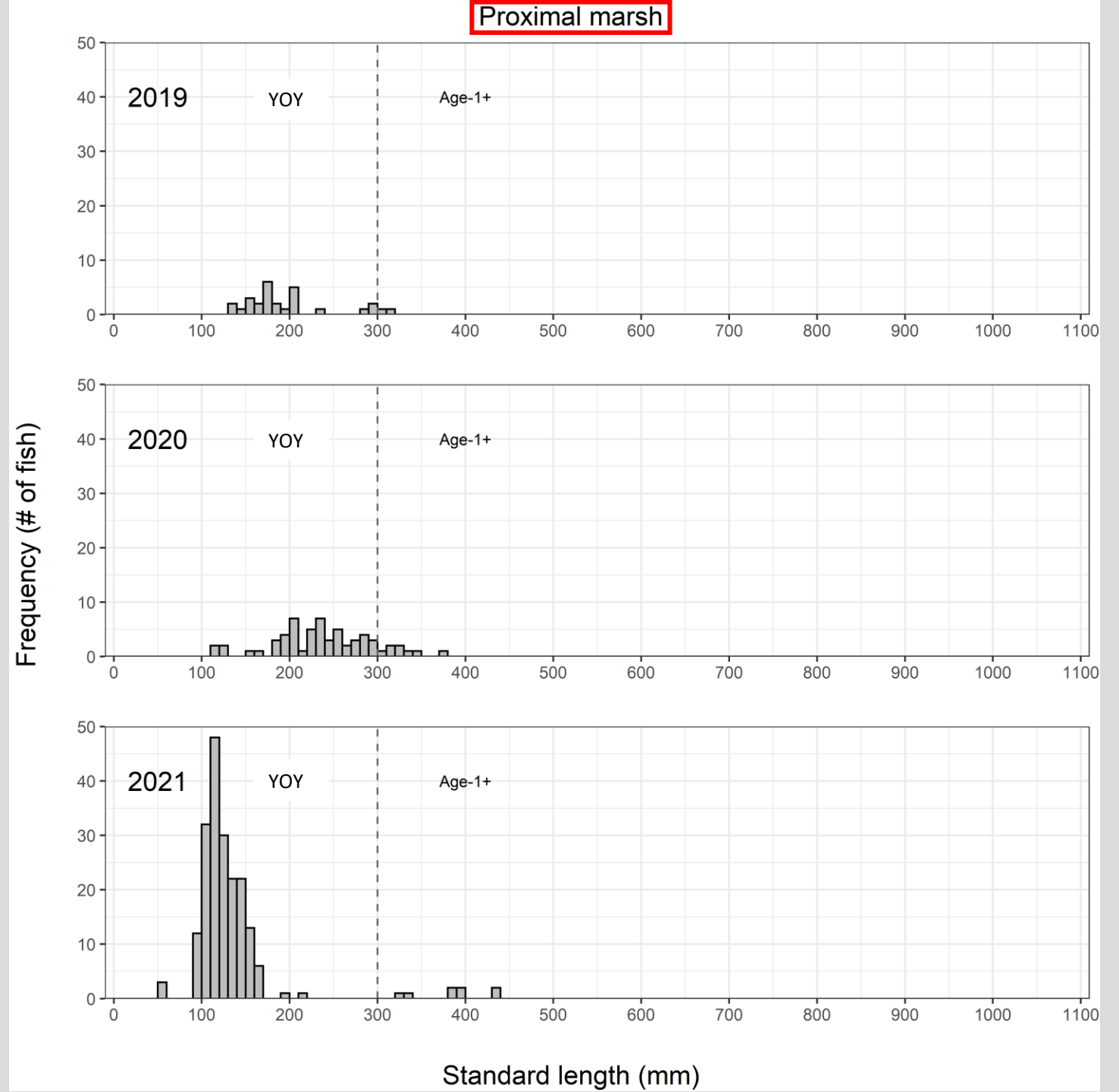


Age 1 and older  $\geq$  300 mm SL



# How Did Pond Location Affect Tarpon?

Mostly YOY in Proximal Marsh

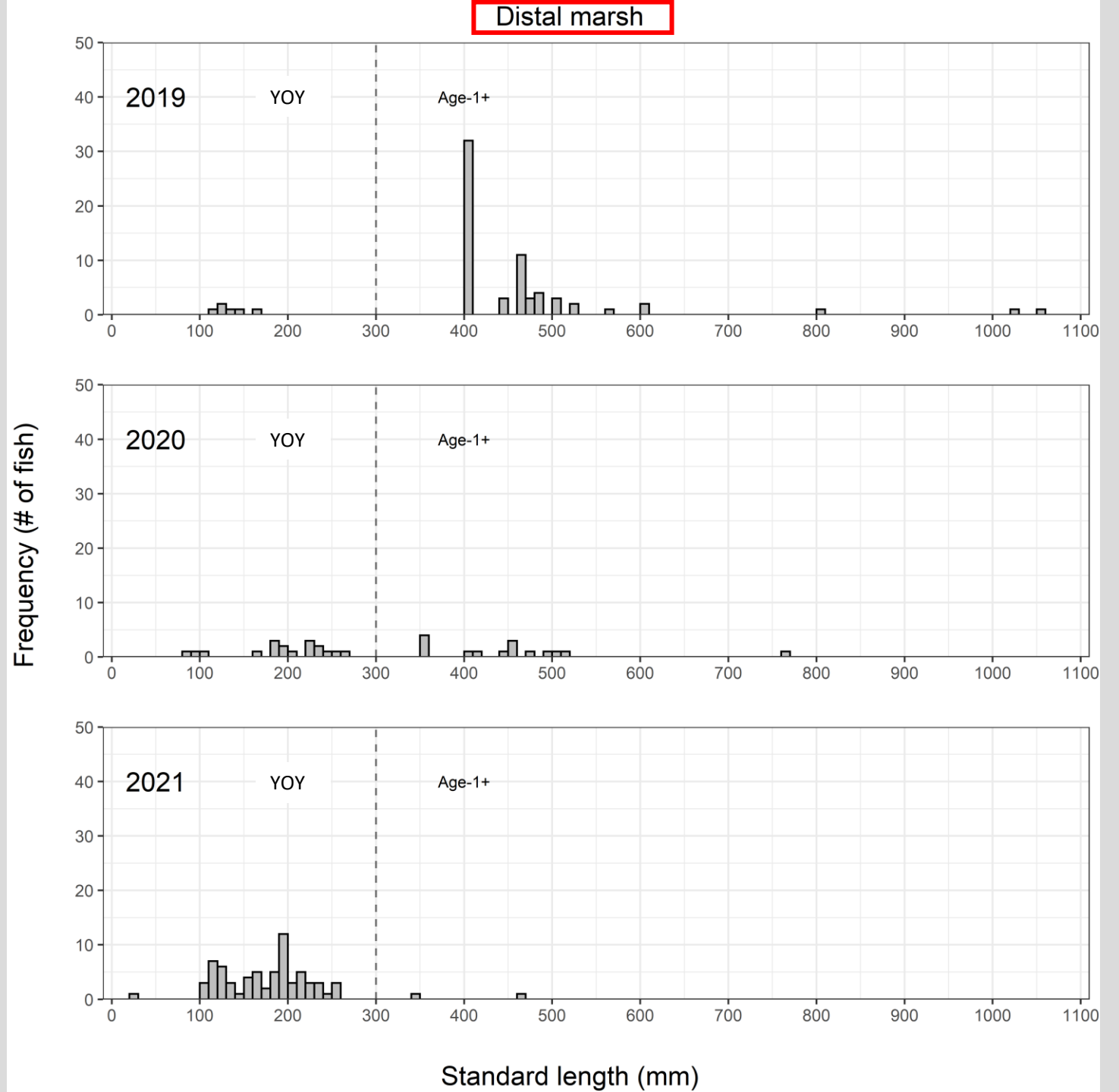




# How Did Pond Location Affect Tarpon?

Age cohorts vary annually based on flooding events in Distal Marsh

Opportunities for emigration less frequent



## Conclusion- What Did We Learn?

- High water events required for emigration
- Body condition comparable among ponds
- Flooding frequency affects emigration opportunities
- Document contribution of juvenile tarpon to estuarine population
- Knowledge can be utilized in future restoration projects

# Healthy nurseries drive productive fisheries

Coastal ponds support juvenile tarpon fishery in Charlotte Harbor



Source: FWC



Source: IGFA



Source: captwaylon.com

Juveniles contribute to the migratory adult population of Tarpon

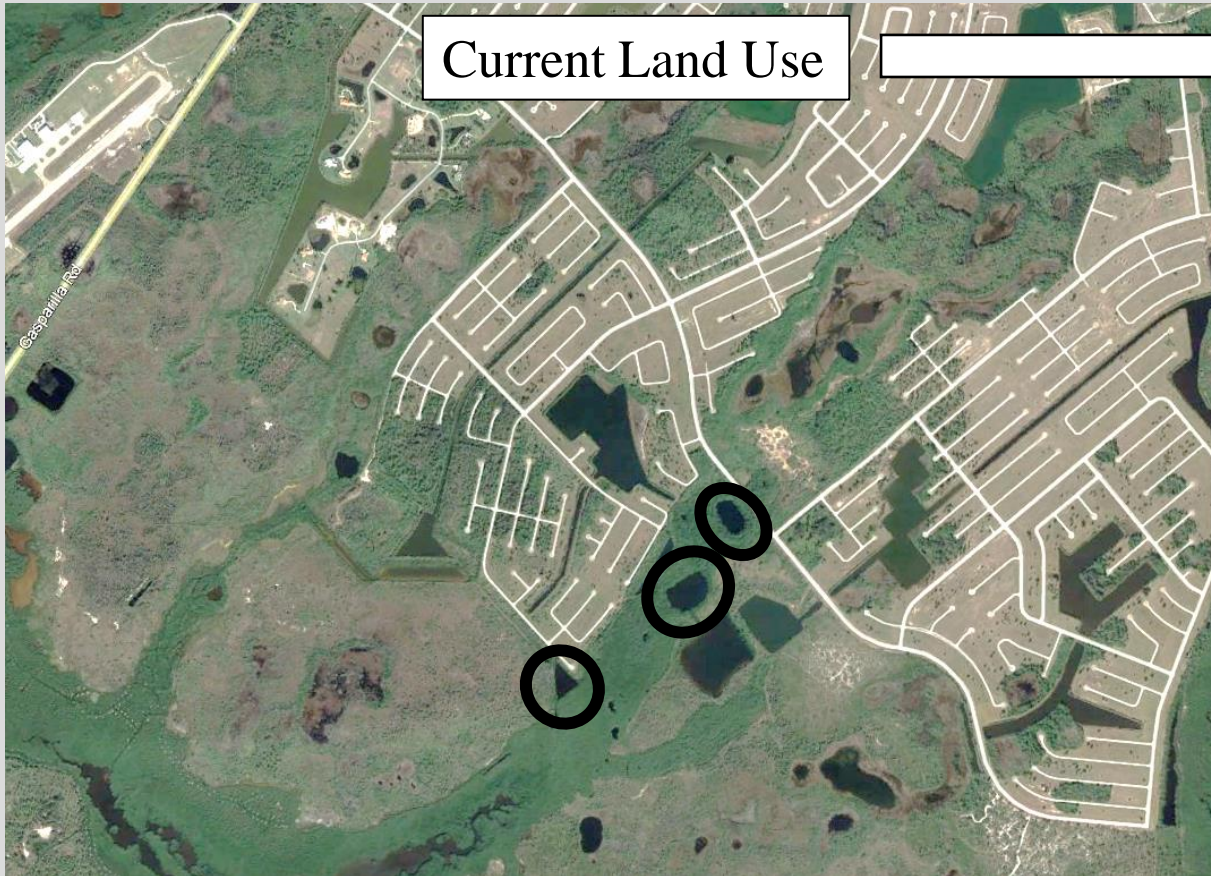


# How do we preserve these nurseries?

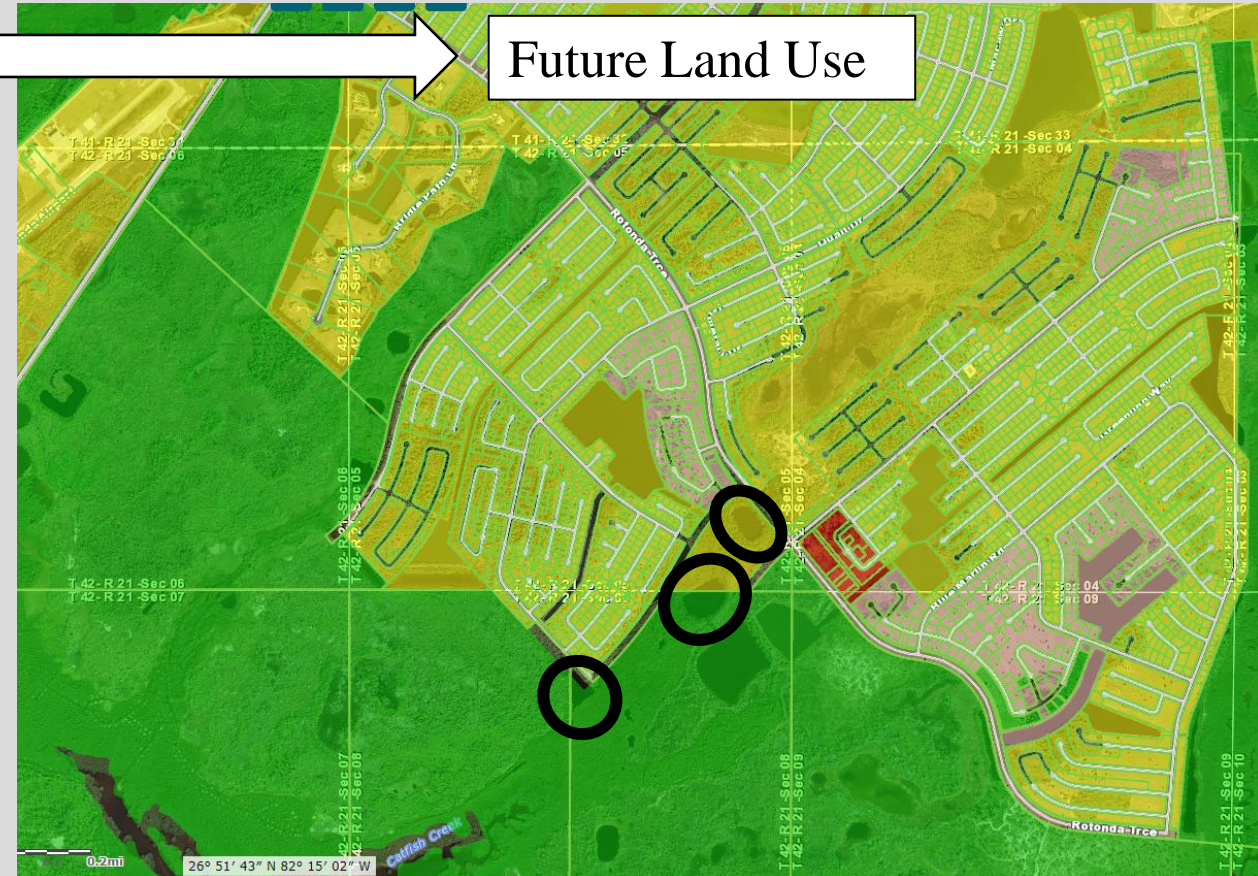
Bring awareness of sensitive habitats to residents, developers and resource managers

- = Low Density Residential
- = Medium Density Residential
- = Commercial
- = State Park
- = Tarpon Nursery Area

Current Land Use



Future Land Use





# Acknowledgements & Questions

FWC Charlotte Harbor Field Lab  
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[Matthew.bunting@myfwc.com](mailto:Matthew.bunting@myfwc.com)

(941) 613-0945



Source: FWC



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