

# Repatriation of Illegally Collected Alligator Snapping Turtles (*Macrochelys temminckii*) into Native Texas Waters

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# Alligator Snapping Turtle (*Macrochelys temminckii*)

Largest freshwater turtle in North America

Wide historic range across the southern United States

Proposed listing for federal protection under the ESA

Populations vulnerable to overharvest and bycatch (Moore 2011; Steen and Robinson Jr 2017)

Protected in Texas, but not neighboring Louisiana

Illegal harvests of *M. temminckii* for food and novelty products continues



# Project Background

In 2016, USFWS  
confiscated ~30 adult *M.*  
*temminckii* from poachers.

Individuals kept at the  
USFWS Fish Hatchery in  
Natchitoches, LA

Collaboration to  
repatriate turtles back into  
Texas waters



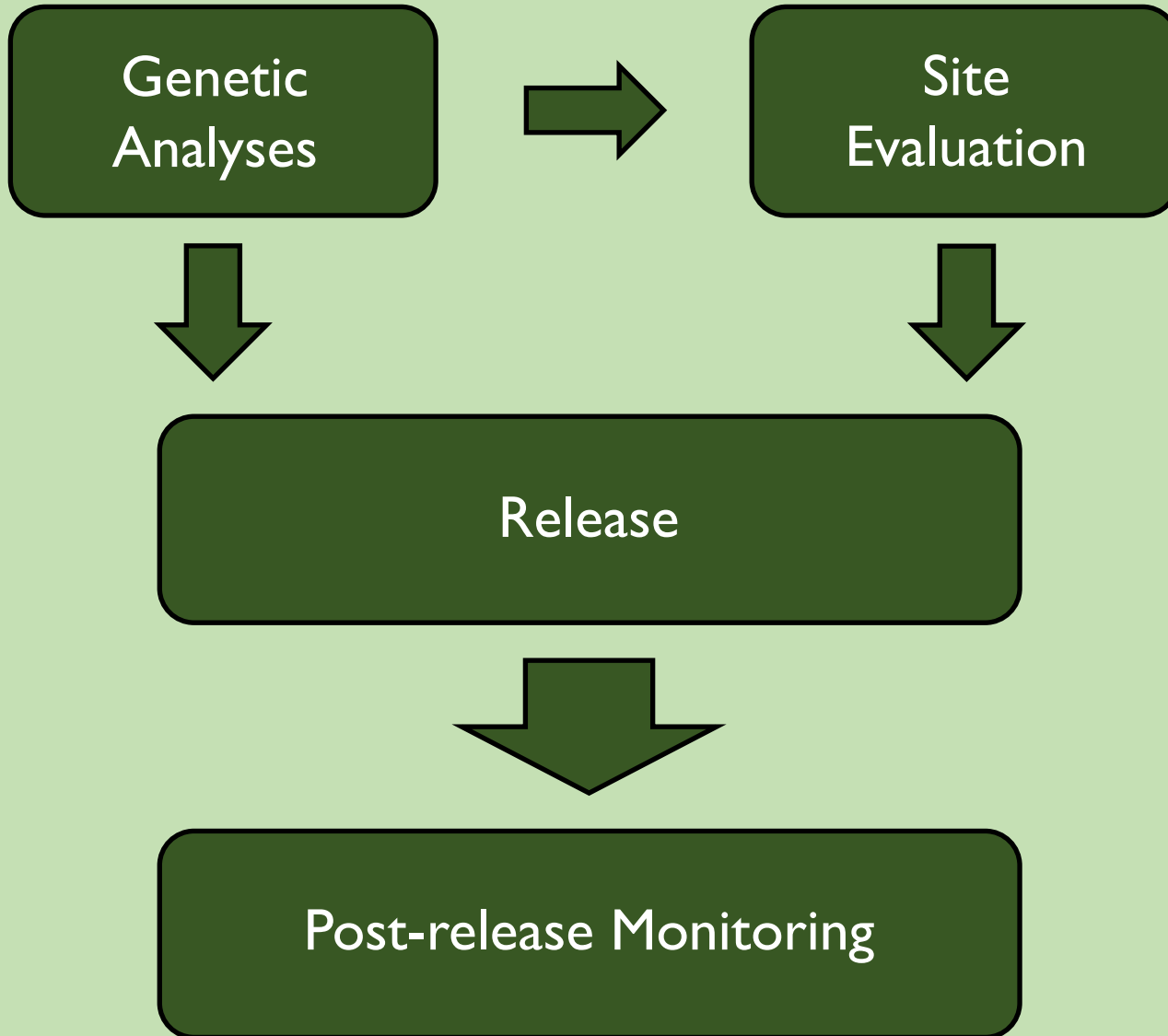
# Scope and Objectives

What is the feasibility of releasing poached *M. temminckii* back into their native waters?

- **Determine the movement patterns of repatriated *M. temminckii* post-release and across seasons**
- **Determine the microhabitat selection of repatriated *M. temminckii* across sites and season**
- Estimate the survival of repatriated *M. temminckii*



# Methodology



# I) Pre-release phase

## Genetic Analyses

- Tangled Bank Conservancy
- Basin-level population substructure in east Texas
- Assigned to Neches, Cypress, and Sabine river drainages

## Site Evaluation

- Pre-release surveys at 4-6 candidate sites within assigned drainages
- Collected habitat data and determined presence/relative abundance of wild *M. temminckii*





## 2) Release phase

Health assessment performed on each individual

Morphological measurements and demographic information

Holohil AI-2F transmitters with temperature sensors attached to carapaces

Turtles (n = 23) transported overnight and released at three sites

- Angelina/Neches WMA (Neches)
- Couch Mountain Ranch (Cypress)
- North Toledo Bend WMA (Sabine)





### 3) Post-release

Radiotracking turtles to get weekly fixes

Collecting a suite of microhabitat variables for turtle localities and paired random points

- Water depth, water temperature, canopy cover, flow rate, substrate, percent cover of various structure, presence of artificial habitat, temperature sensor reading, etc.



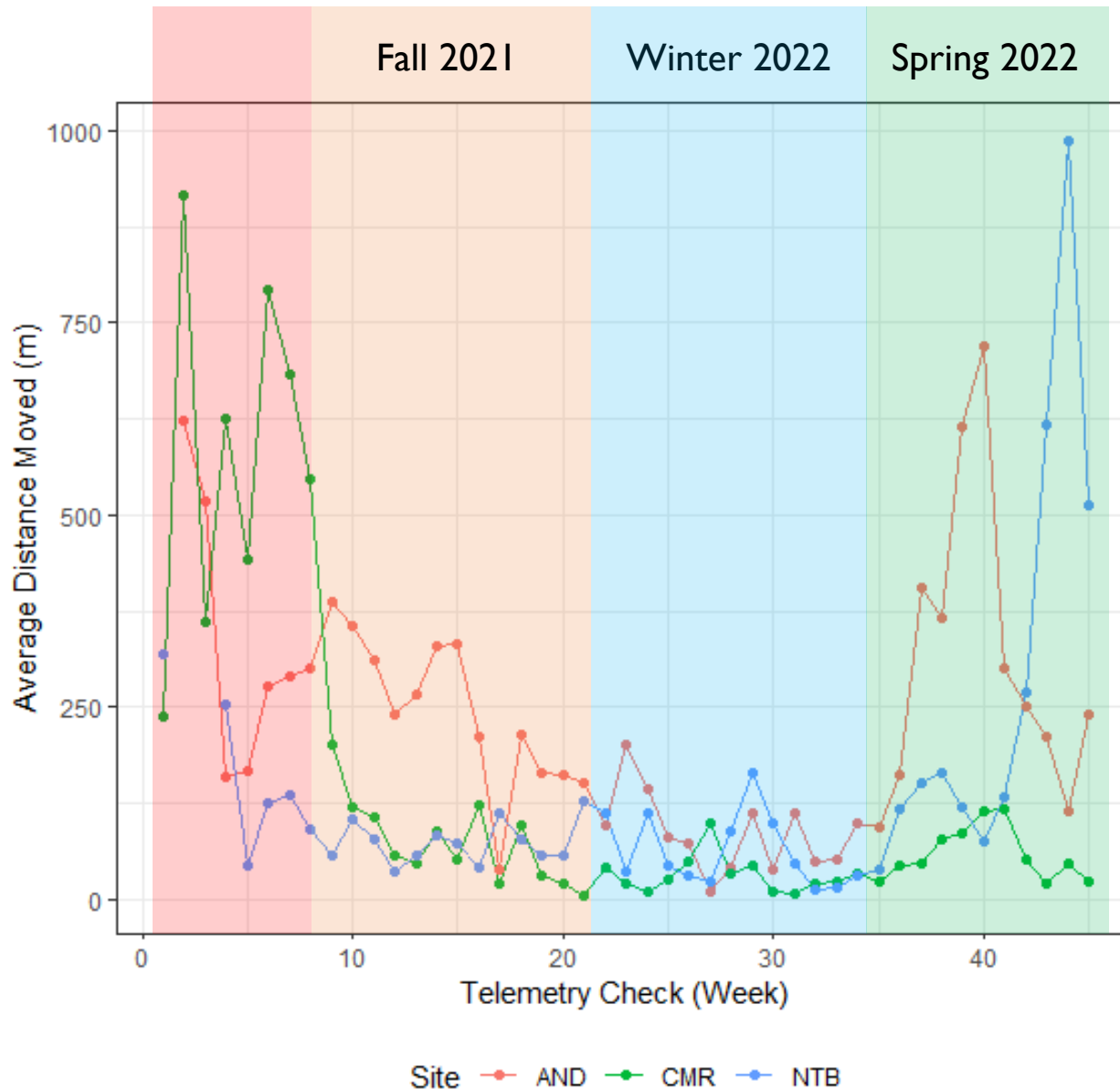
# Results — Movement Patterns

Maximum/  
Minimum  
movements

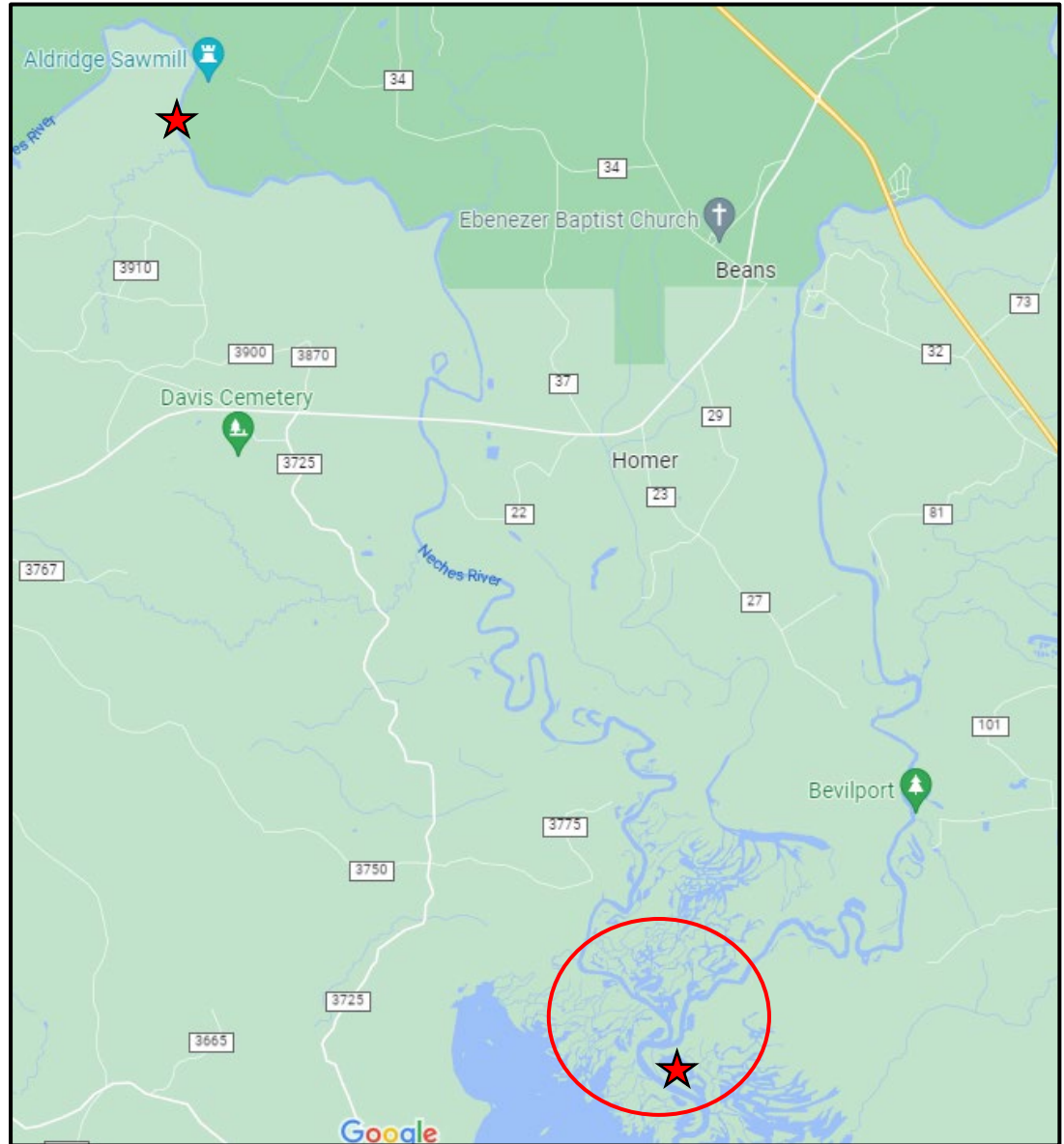
AND =  
3,267 / 0 m

CMR =  
2,833 / 0 m

NTB =  
6,302 / 0 m



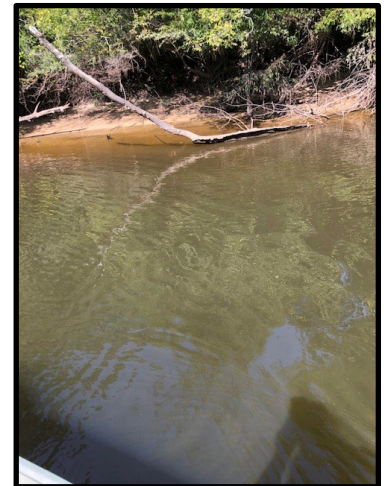
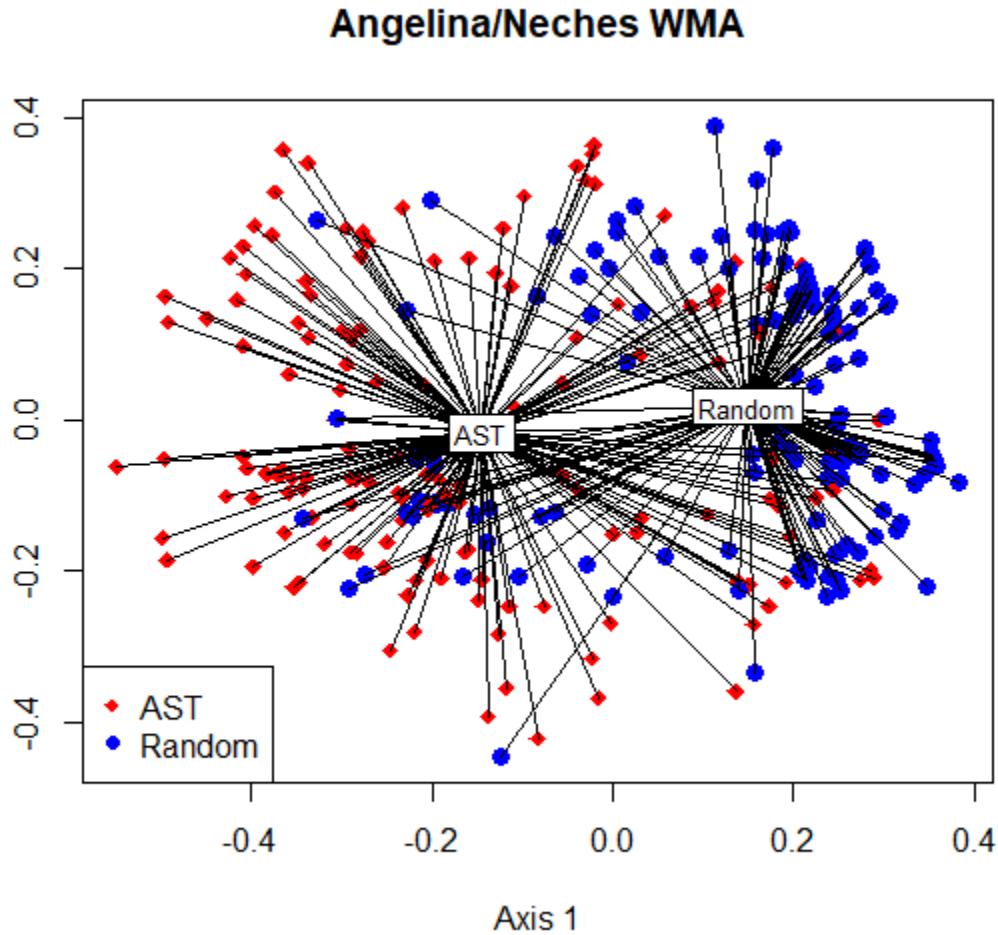




# Results — Microhabitat Selection



Axis 2

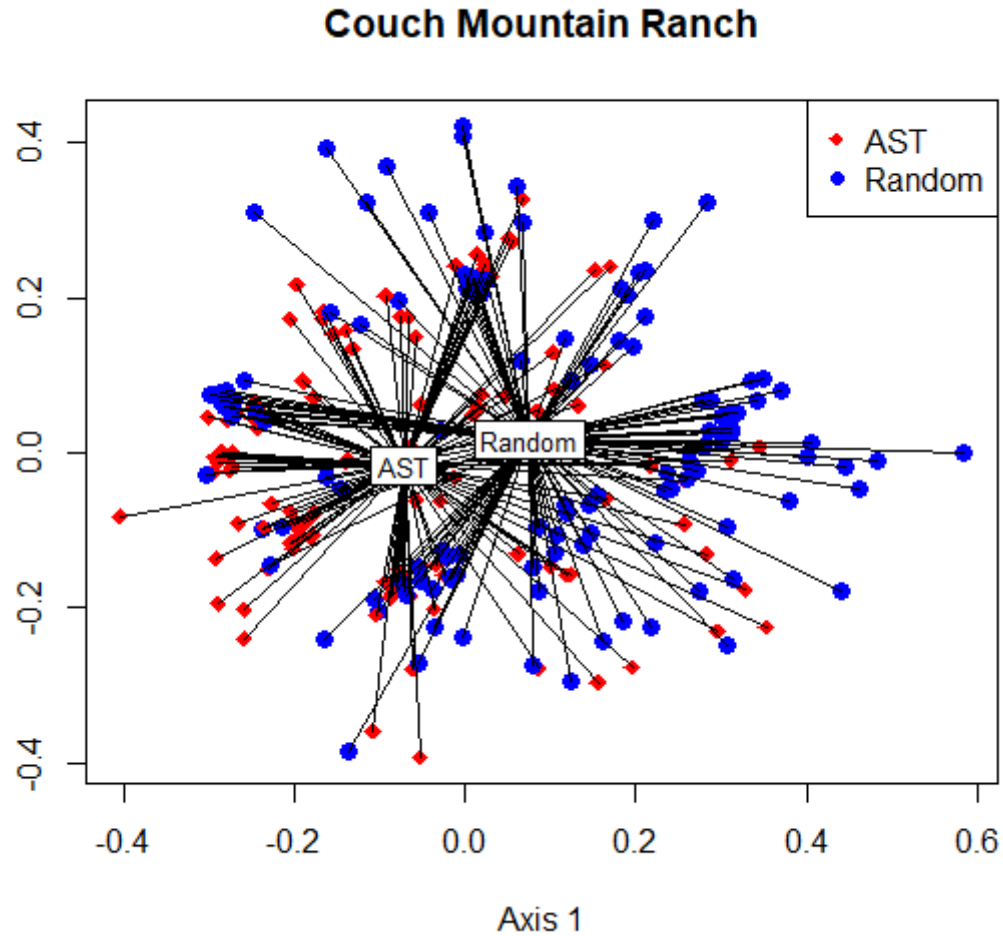




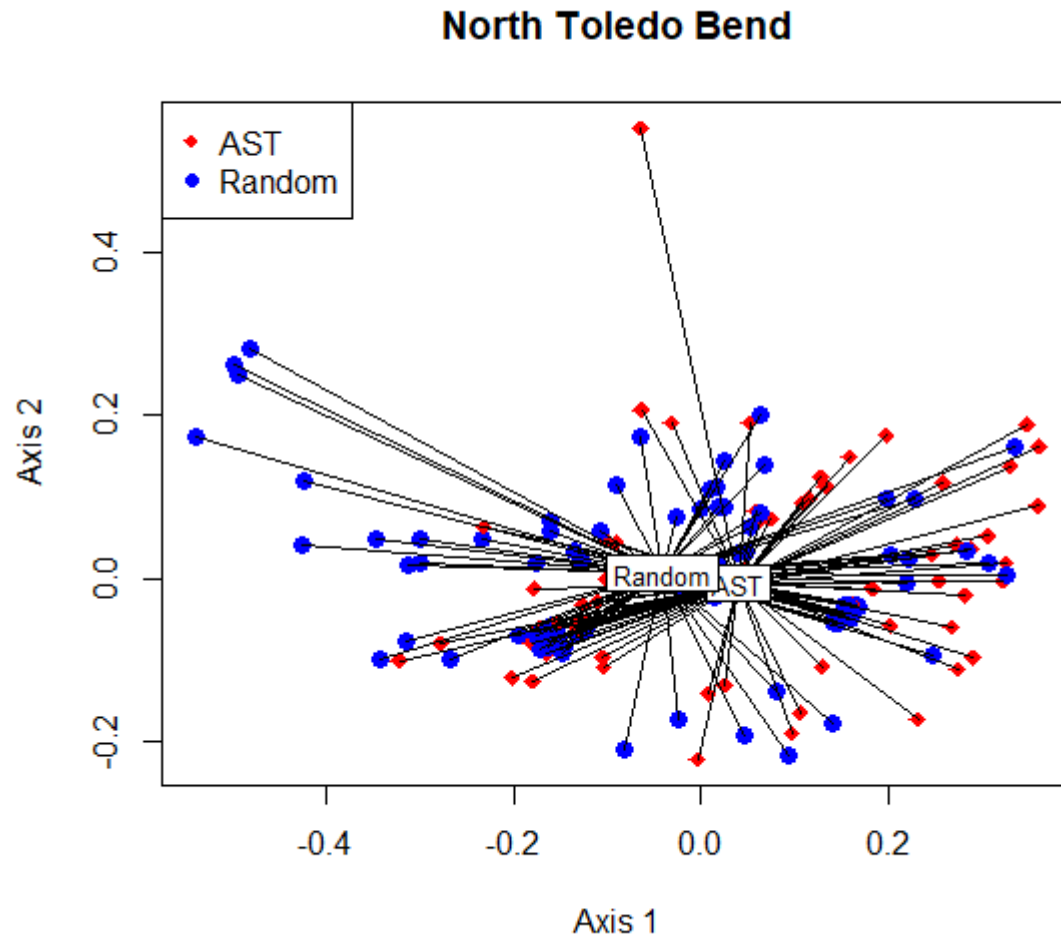
# Results — Microhabitat Selection



Axis 2



# Results — Microhabitat Selection



# Discussion

Our results are consistent with other ongoing studies investigating the movement and microhabitat selection of wild *M. temminckii*.

- Wild *M. temminckii* in Buffalo Bayou decreased movements in summer and winter months (Munscher et al. 2021).
- Despite the initial spike in movement post-release, repatriated *M. temminckii* movements were similar in monthly distance and range.
- Wild *M. temminckii* and the repatriated turtles had affinity for similar microhabitats (i.e., abundant large structure, water depth between 1-2.5 m).
- Temperature a strong driver of microhabitat selection (Fitzgerald and Nelson 2010).

May be variation in movement and microhabitat selection between sites

Future efforts to estimate repatriated *M. temminckii* survival (mark-recapture method using turtle localities from telemetry checks).

Repatriation efforts could be a useful tool for future conservation efforts

- Removal of 2% of females can lead to substantial population decline
- Repatriation efforts can bolster wild populations of *M. temminckii*



# Future Directions

- Long-term radiotracking of wild alligator snapping turtles alongside repatriated individuals at Angelina/Neches Dam WMA.
  - Ten wild turtles ( 5 males, 5 females).
- Feasibility of satellite-linked GPS tags on females.
- Compare and contrast movement patterns, microhabitat use, and survival of repatriated and wild turtles.



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# Questions?

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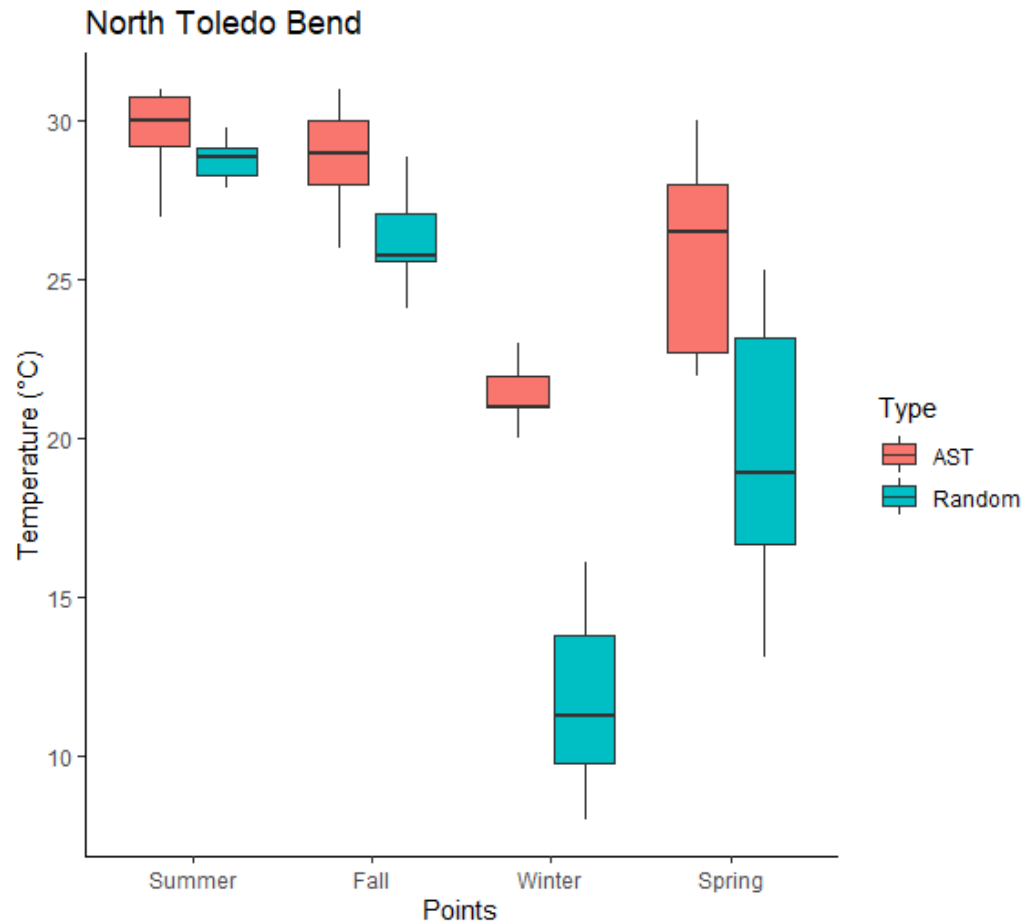
# Results — Microhabitat Selection

Temp sensor ranges +  
water column  
temperature range  
(surface T – bottom T)

Significant differences  
between AST and  
Random distributions

Significant differences  
between seasonal  
temperatures

AST's selecting  
microhabitats with  
warmer temperatures but  
within a narrow range







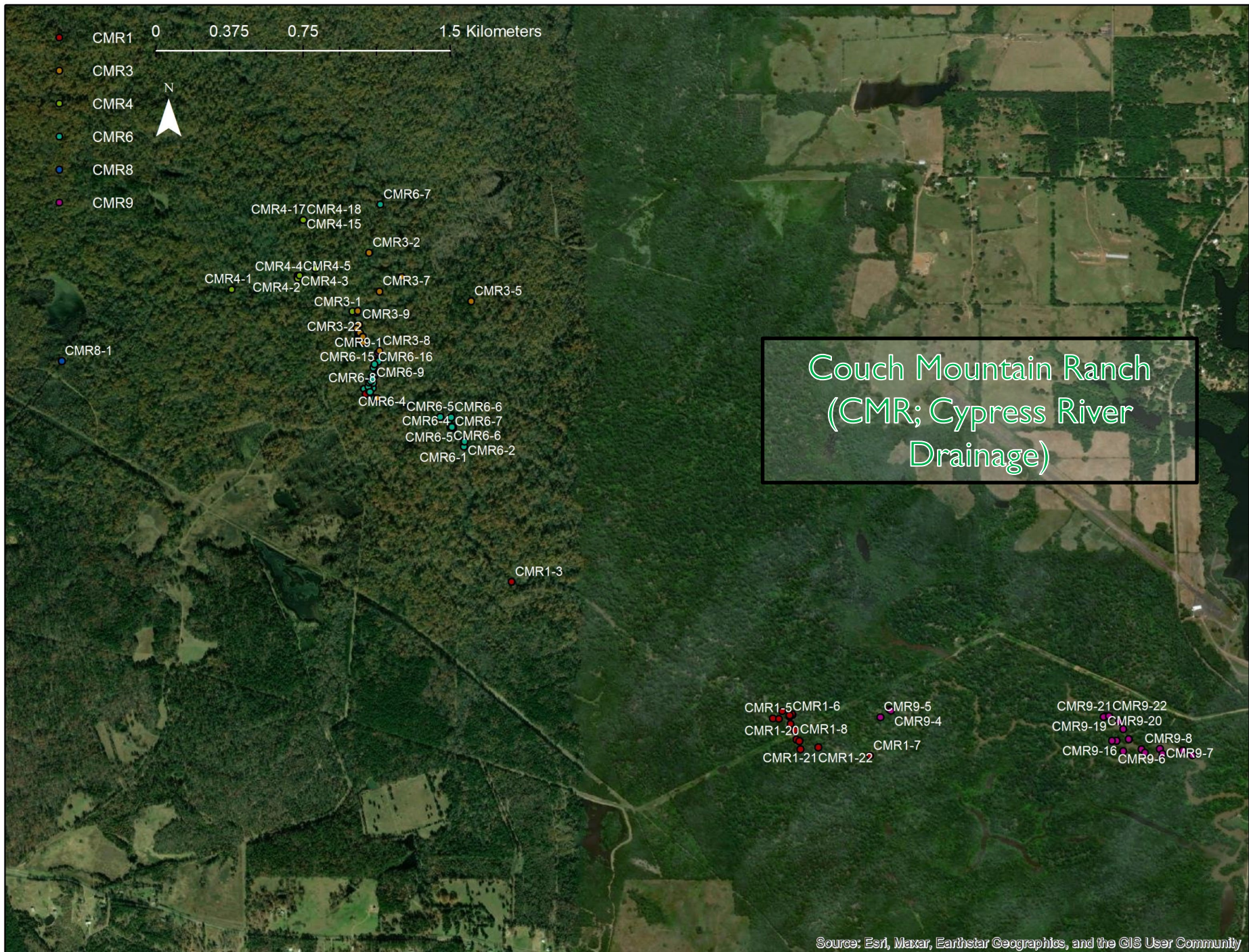
- AND1
- AND2
- AND3
- AND4
- AND5
- AND7
- AND8
- AND9



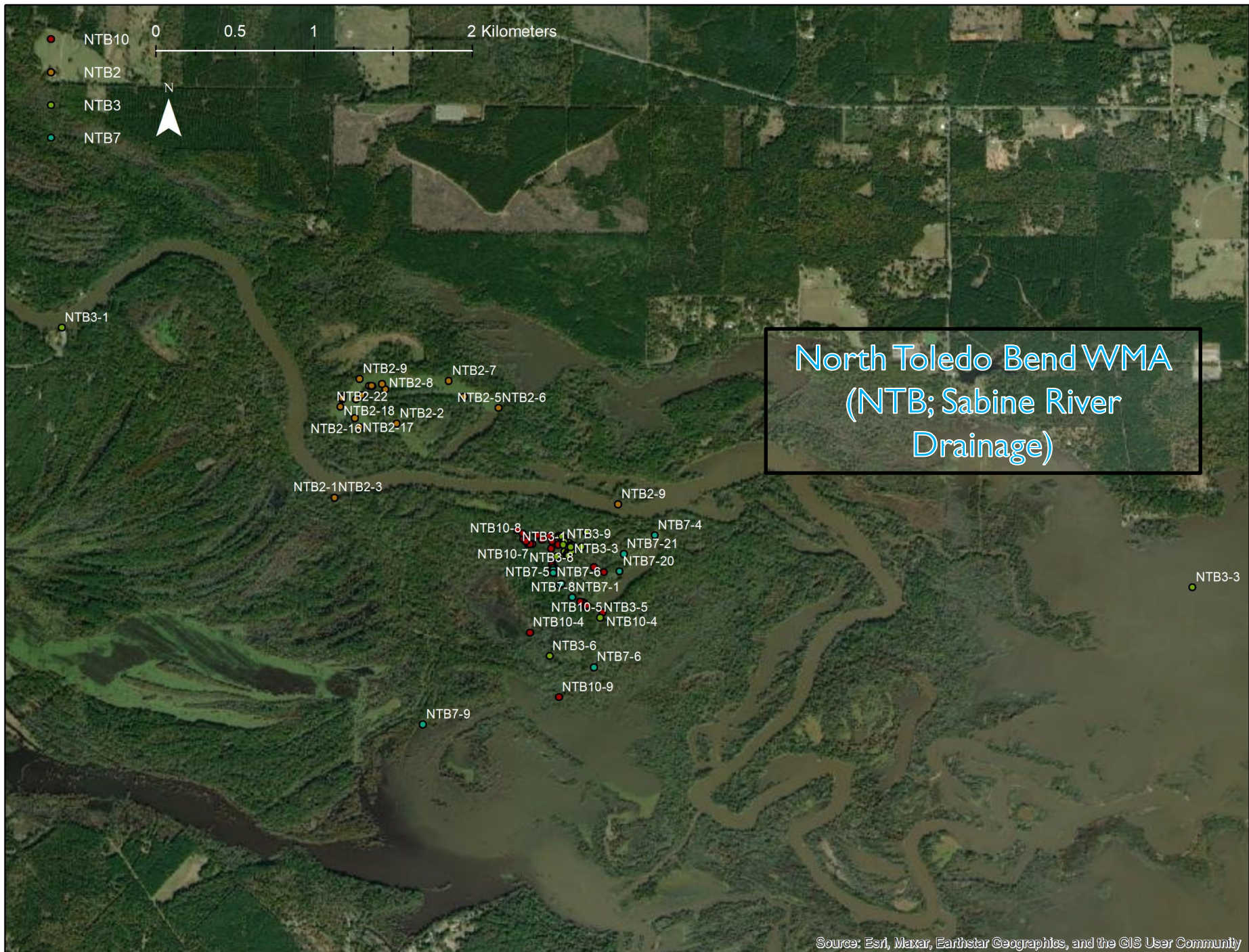
Angelina / Neches Dam B  
WMA  
(AND; Neches River  
Drainage)

AND2-2









NTB3-1

NTB2-9  
NTB2-22  
NTB2-18  
NTB2-16  
NTB2-17  
NTB2-8  
NTB2-7  
NTB2-5  
NTB2-6

NTB2-1  
NTB2-3

NTB2-9

NTB10-8  
NTB10-7  
NTB7-5  
NTB7-8  
NTB7-1  
NTB3-1  
NTB3-9  
NTB3-3  
NTB7-21  
NTB7-20  
NTB7-6  
NTB10-5  
NTB10-4  
NTB3-6  
NTB7-6  
NTB10-9

NTB7-9

NTB3-3

North Toledo Bend WMA  
(NTB; Sabine River  
Drainage)