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East Texas Aquatic Turtle Surveys: Western Chicken Turtles & Alligator Snapping Turtles



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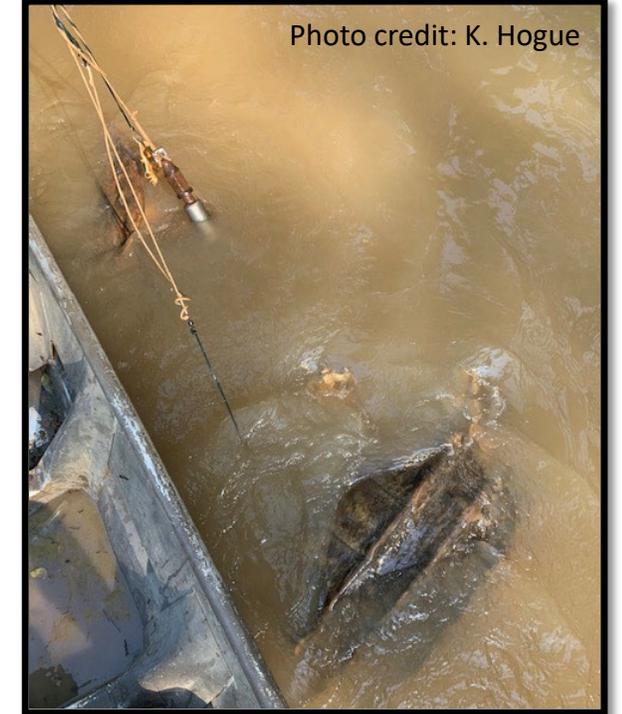


Cypress Basin Clean Rivers Program Stakeholder Meeting

23 March 2021

Conservation Need

- Petitions for listing as part of the Endangered Species Act¹
- Significant 90-day findings for both species²
 - Factor A: habitat alteration – WCT and AST
 - Factor B: overutilization – WCT and AST
 - Factor C: disease or predation – AST
 - Factor D: inadequate regulatory mechanisms – WCT and AST
 - Factor E: natural and man-made factors – WCT
- Pending Species Status Assessment (SSA)
 - WCT = 2024 or sooner
 - AST = 2021

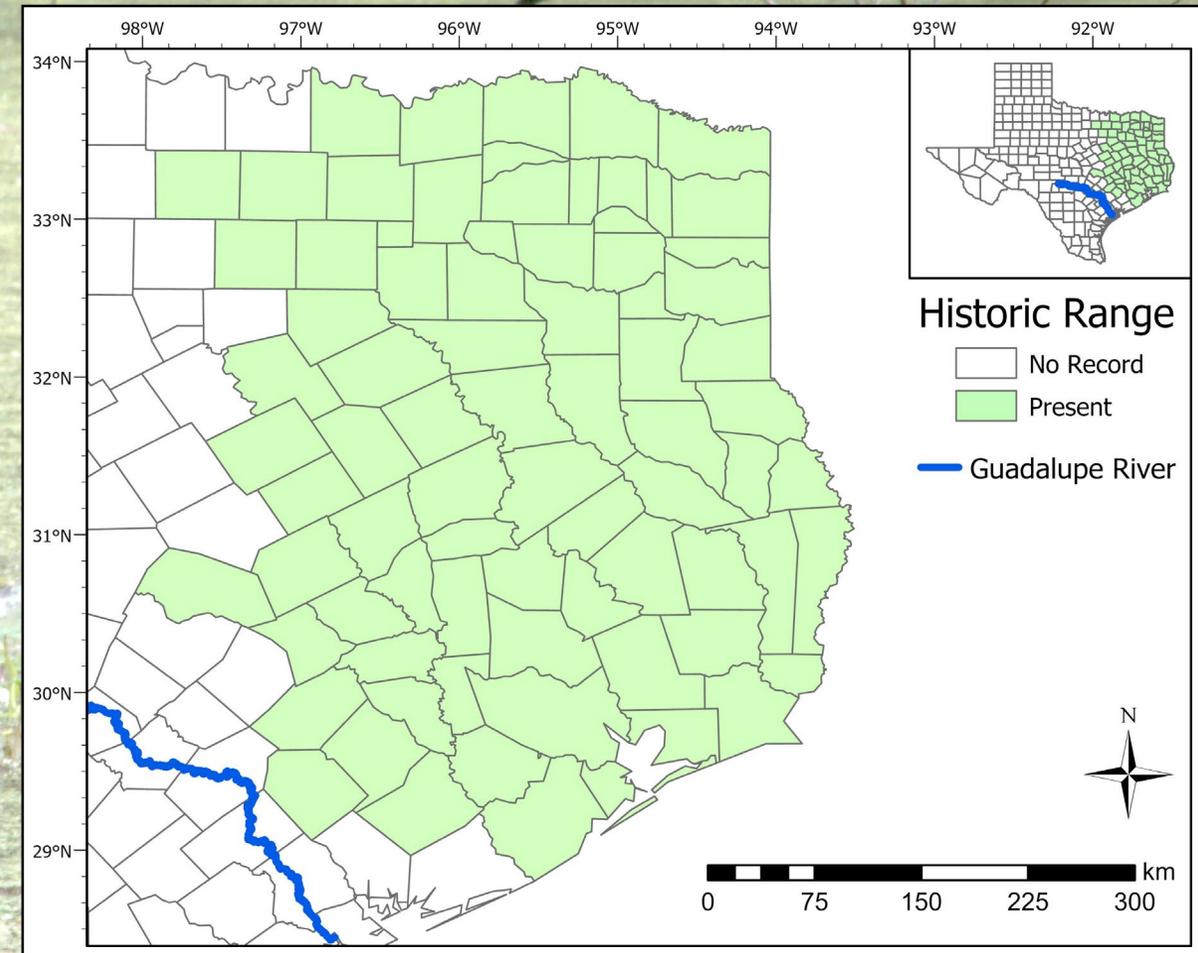


¹Center for Biological Diversity, 2010; Geise et al., 2012

²USFWS, 2011, 2015

Western Chicken Turtles in Texas

- Historic range extends through east Texas to north of the Guadalupe river basin³
- Typically found in ephemeral or depressional freshwater wetlands⁴
- Shorter life span and smaller population size may increase perception of rarity⁵
- Exhibit discrete seasonal activity patterns⁶



³Dixon, 2013; USFWS, 2016

⁴Buhlmann et al., 2008; Ryberg et al., 2017

⁵Dinkelacker and Hilzinger, 2014

⁶McKnight et al., 2015

Western Chicken Turtle Identification

Western Chicken Turtle (*Deirochelys reticularia miaria*) Identification Sheet



- Long neck with horizontal yellow stripes
- No “red ears” or other vertical yellow marks or crescents present in sliders, cooters, or map turtles
- The rim of the carapace (top of the shell) is yellow

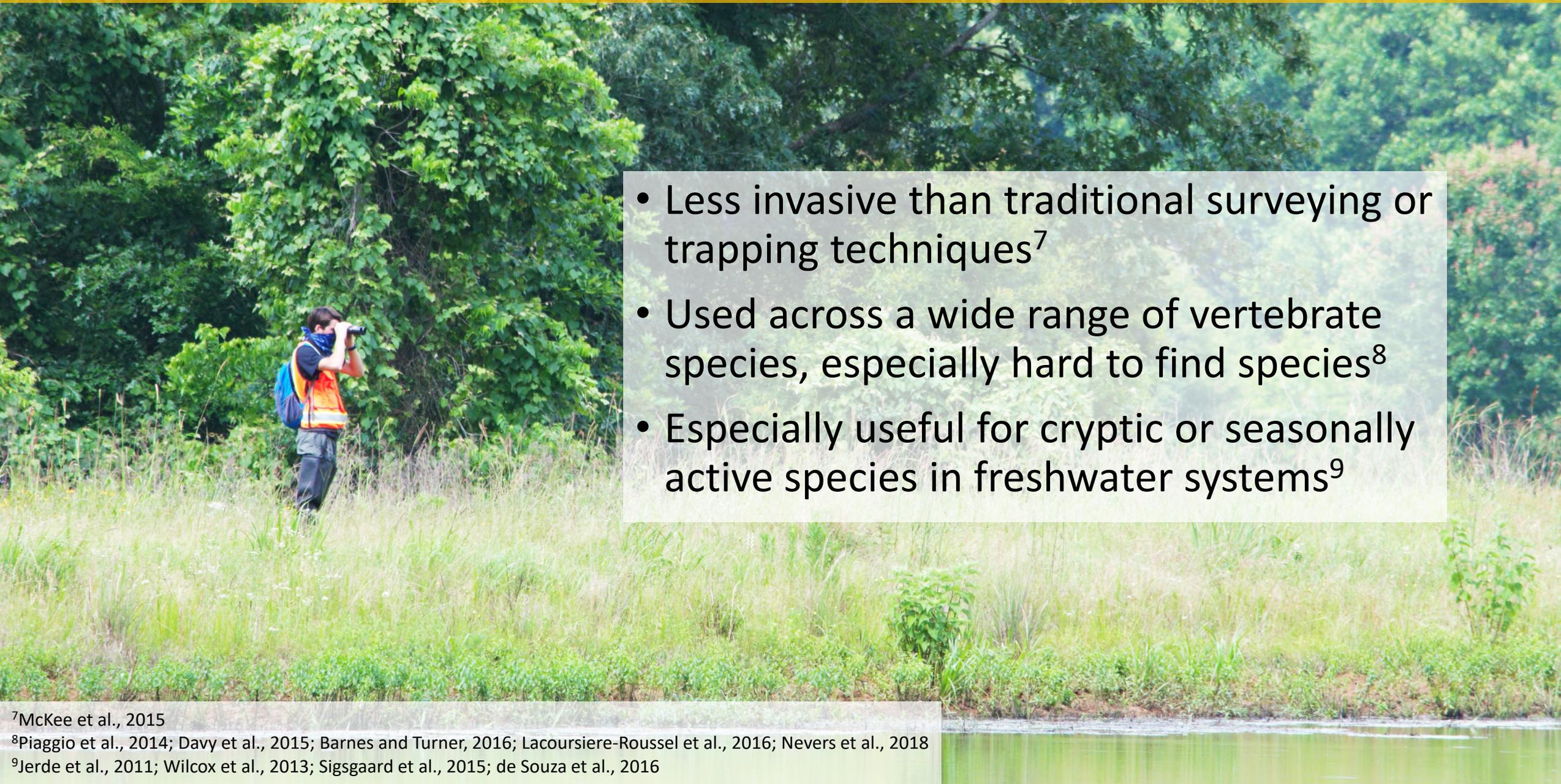


- The rear of the thigh has alternating black and yellow bars, also may be described as “stripy pants”
- The bridge that connects the carapace with the plastron (bottom of the shell) has a dark horizontal strip



- The forearms have a wide yellow patch that runs the length of the limb from the shoulder to the feet
- The plastron is usually unmarked and varies from yellow to orange

Environmental DNA Detection



- Less invasive than traditional surveying or trapping techniques⁷
- Used across a wide range of vertebrate species, especially hard to find species⁸
- Especially useful for cryptic or seasonally active species in freshwater systems⁹

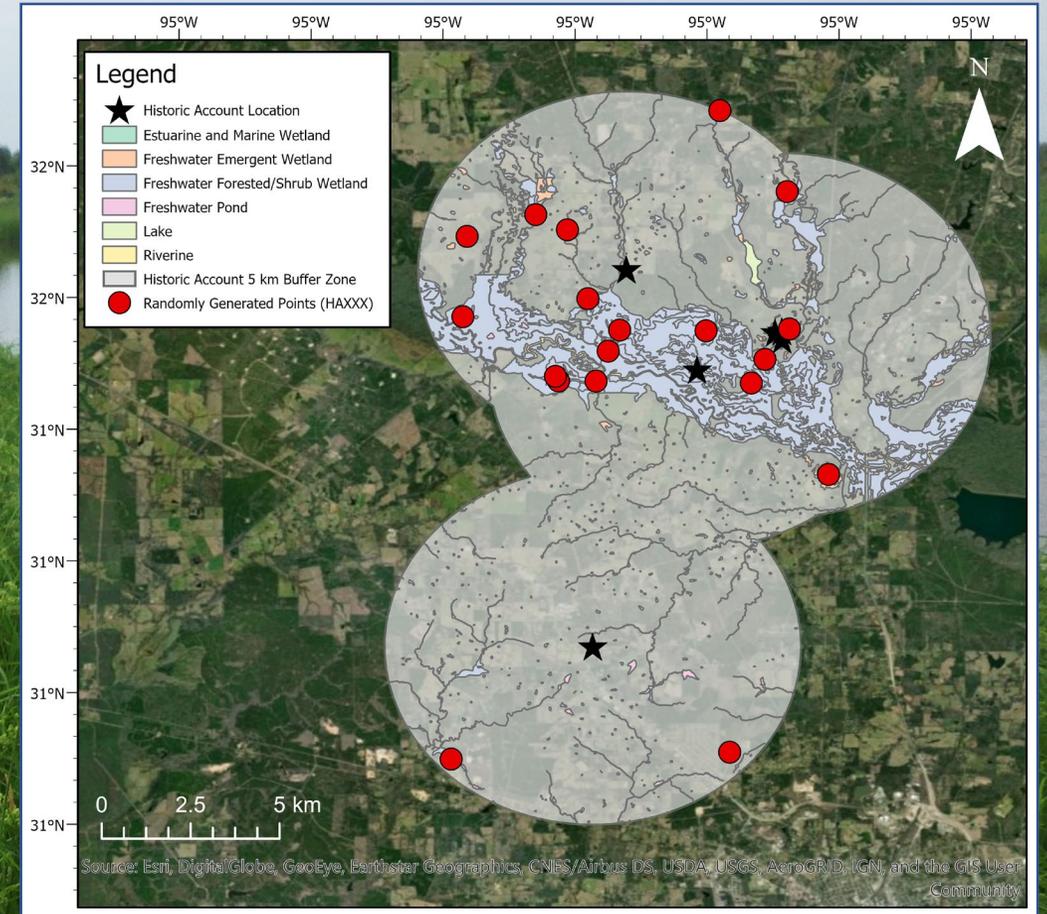
⁷McKee et al., 2015

⁸Piaggio et al., 2014; Davy et al., 2015; Barnes and Turner, 2016; Lacoursiere-Roussel et al., 2016; Nevers et al., 2018

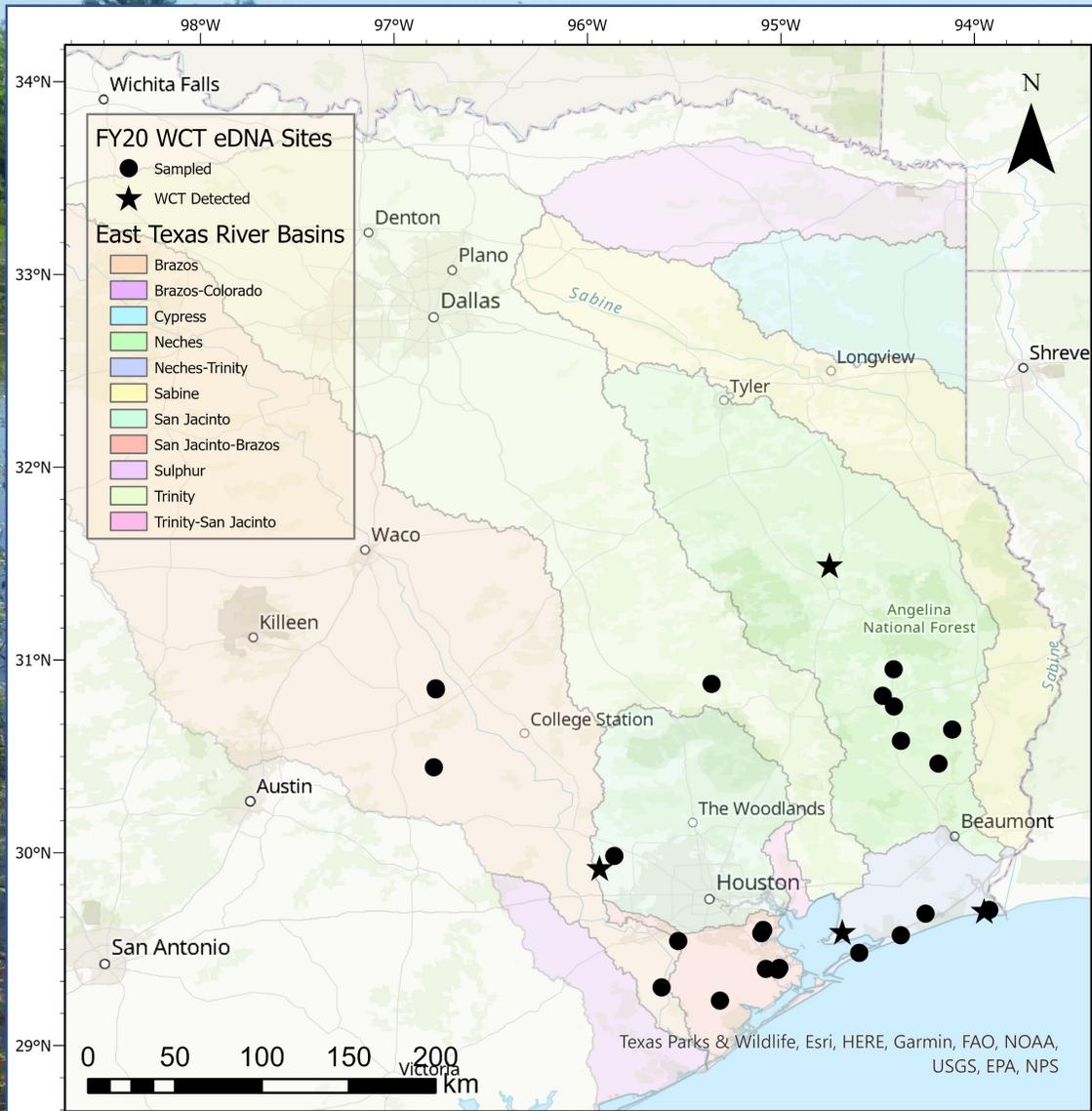
⁹Jerde et al., 2011; Wilcox et al., 2013; Sigsgaard et al., 2015; de Souza et al., 2016

WCT Environmental DNA Study Design

- Goal: sample 87 sites throughout the western chicken turtle historic range
- Randomized Site Design:
 - Counties associated with historic accounts
 - Counties without historic accounts
 - Variety of wetland types from NWI¹⁰
- Combination of sample types:
 - Ambient water
 - Resuspended sediment
 - Soil



2020 WCT eDNA Sampling



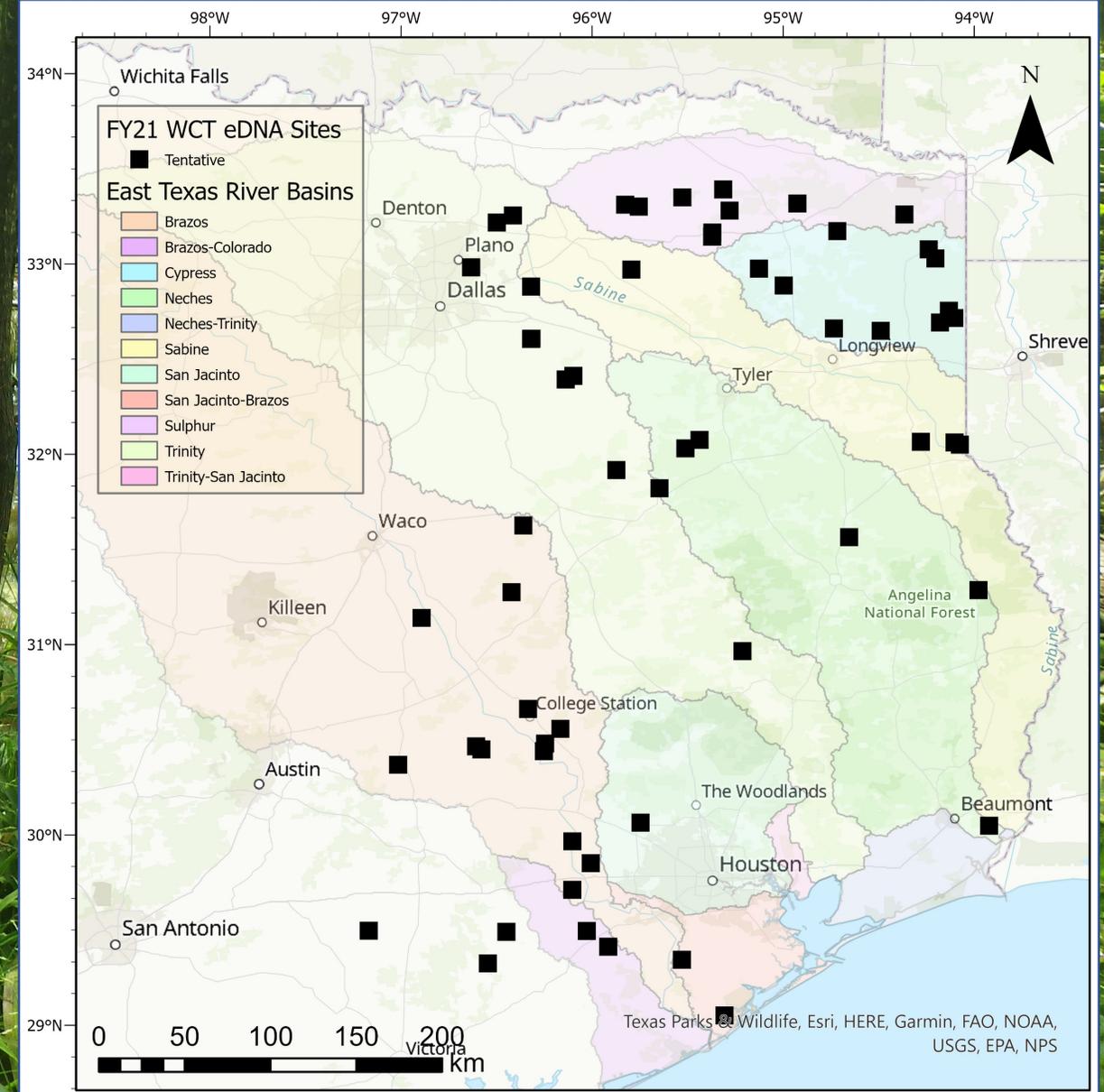
- 27 sites sampled
 - Restricted to southeast Texas due to COVID-19
- eDNA detections at 4 sites (15%)
- 9 observations through visual surveys

County	Mar	Apr	May	Jun	Jul	Aug
Nacogdoches			CSS			
Waller						
Chambers						
Jefferson						

BAVS = Binocular Assisted Visual Surveys; CSS = Canid Scent Surveys

WCT Project Future Directions

- 60 eDNA site remaining
 - Includes sites in north and central east Texas watersheds
 - Pending landowner access approval
- Intensification of efforts at sites with positive eDNA detections
 - UAV surveys
 - Trapping efforts
 - Remote sensing



WCT Online Reporting Tool

E-Services Hawk Card Class Schedule Outlook Blackboard Give UHCL Pearland Year in Review

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Distribution and Habitat Associations of the Western Chicken Turtle in Texas

Current Projects

Completed Projects

Equipment and Capabilities

Publications

Research Staff



Contact

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[f](#) [t](#) [i](#)

Chicken Turtle Reporting Tool

Purpose/Objectives

Access the Reporting Tool Here:

<https://arcg.is/11yWyn>

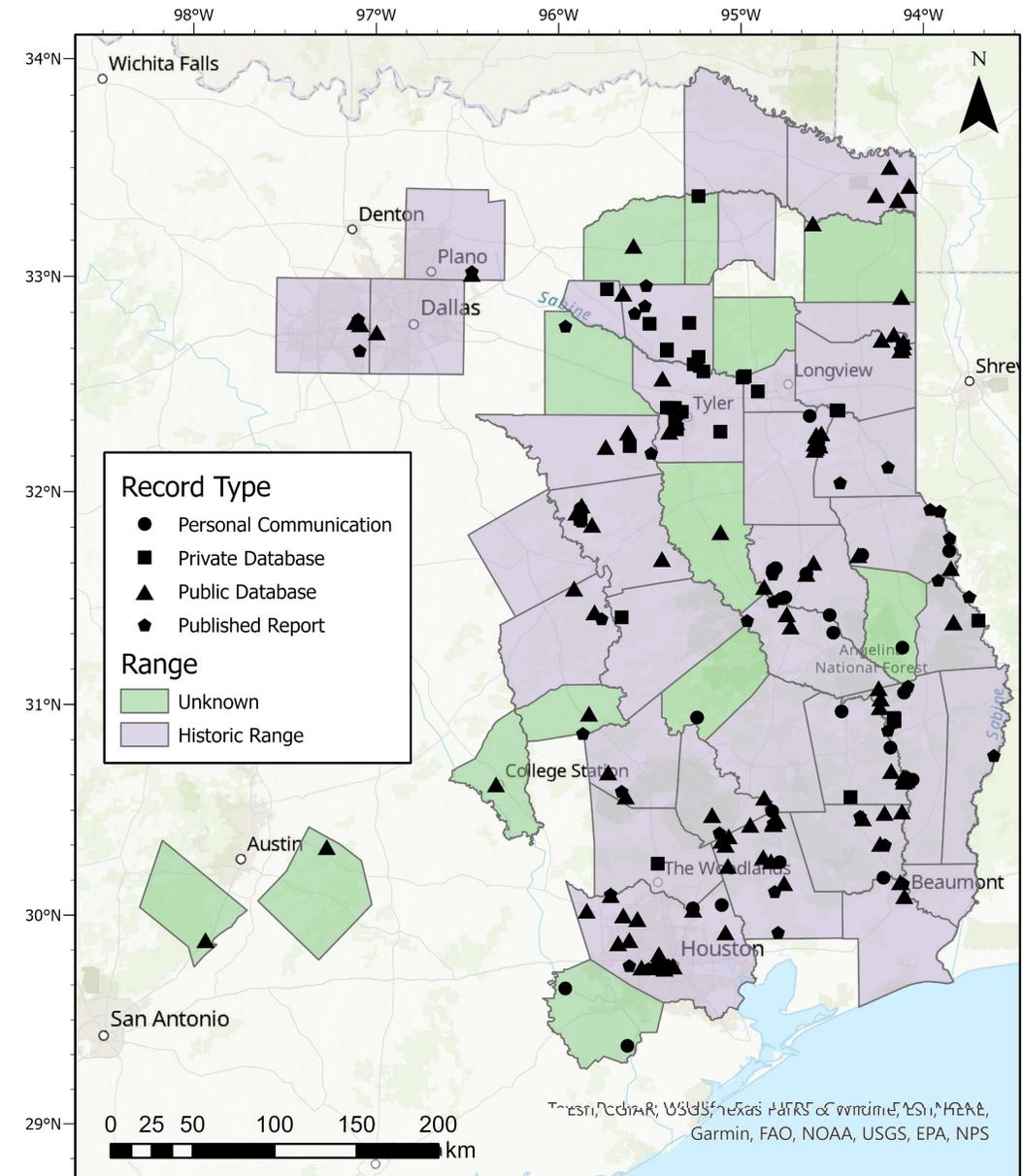
Or scan for mobile access now:



<https://www.uhcl.edu/environmental-institute/research/current-projects/western-chicken-turtle>

Alligator Snapping Turtles in Texas

- Historic range extends throughout east Texas river basins¹¹
- Typically found in deep, slow moving freshwater associated with rivers¹²
- Rarely bask, generally nocturnal, spend most of the time submerged¹³
- Threatened species status in Texas¹⁴



¹¹Dixon, 2013; Hibbitts and Hibbitts, 2016; TexasTurtles.org, 2021

¹²Ernst and Lovich, 2009; Hibbitts and Hibbitts, 2016

¹³Hibbitts and Hibbitts, 2016

¹⁴Texas Register, 1987

Alligator Snapping Turtles Identification

Short neck with
fleshy tubercles

Three distinct
keels on carapace



Large, wide head
with pointed snout



Hooked "beak"

Grey or bright pink
"lure" on tongue

Baseline Assessment of Alligator Snapping Turtles

- 3-year state-wide assessment (2021-2023)
- Primary objectives:
 - Abundance and demographics
 - Population genetic structure in Texas
 - Training for future long-term surveys
 - Produce web-based viewer for future research

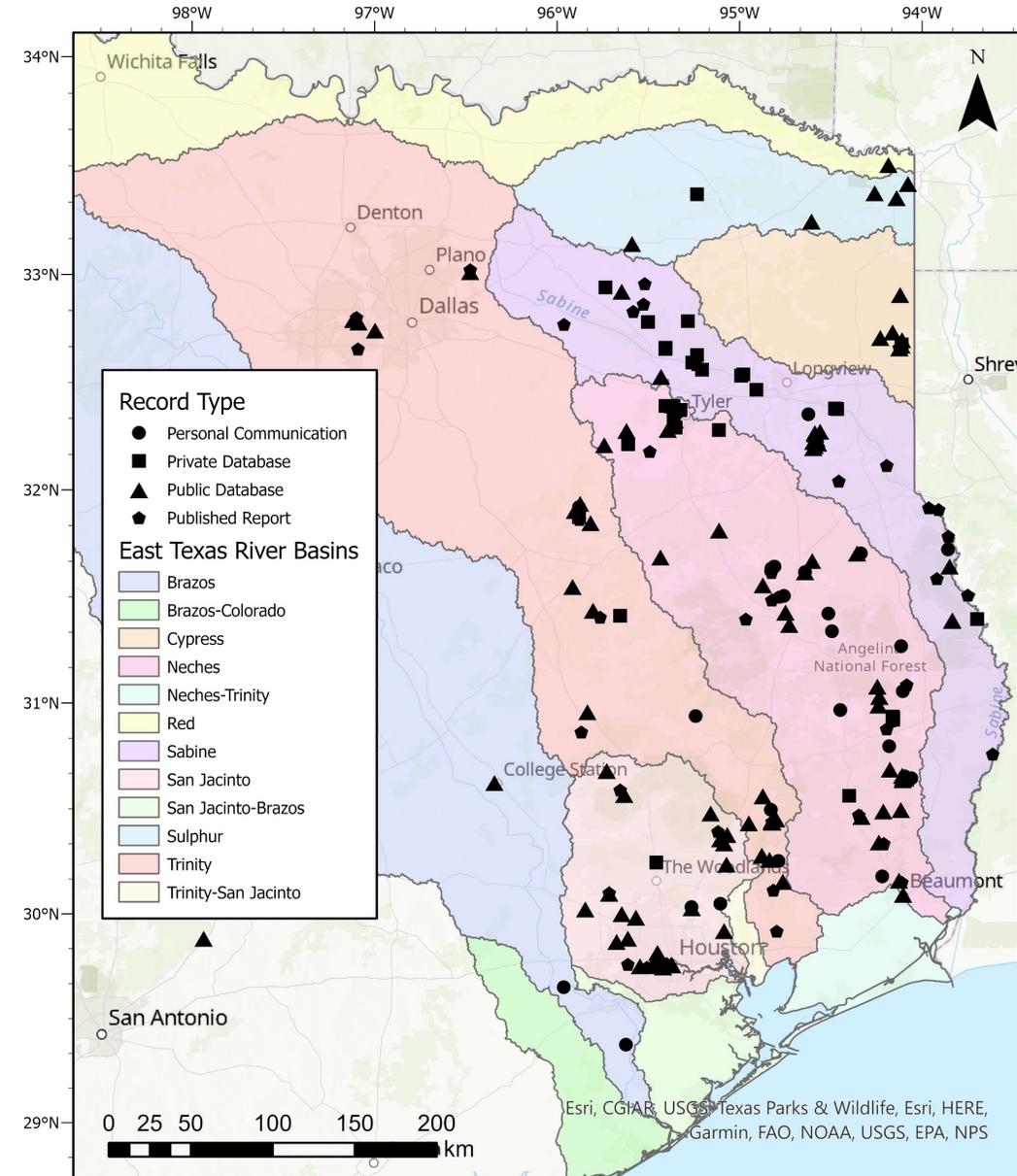


Baseline Assessment of Alligator Snapping Turtles

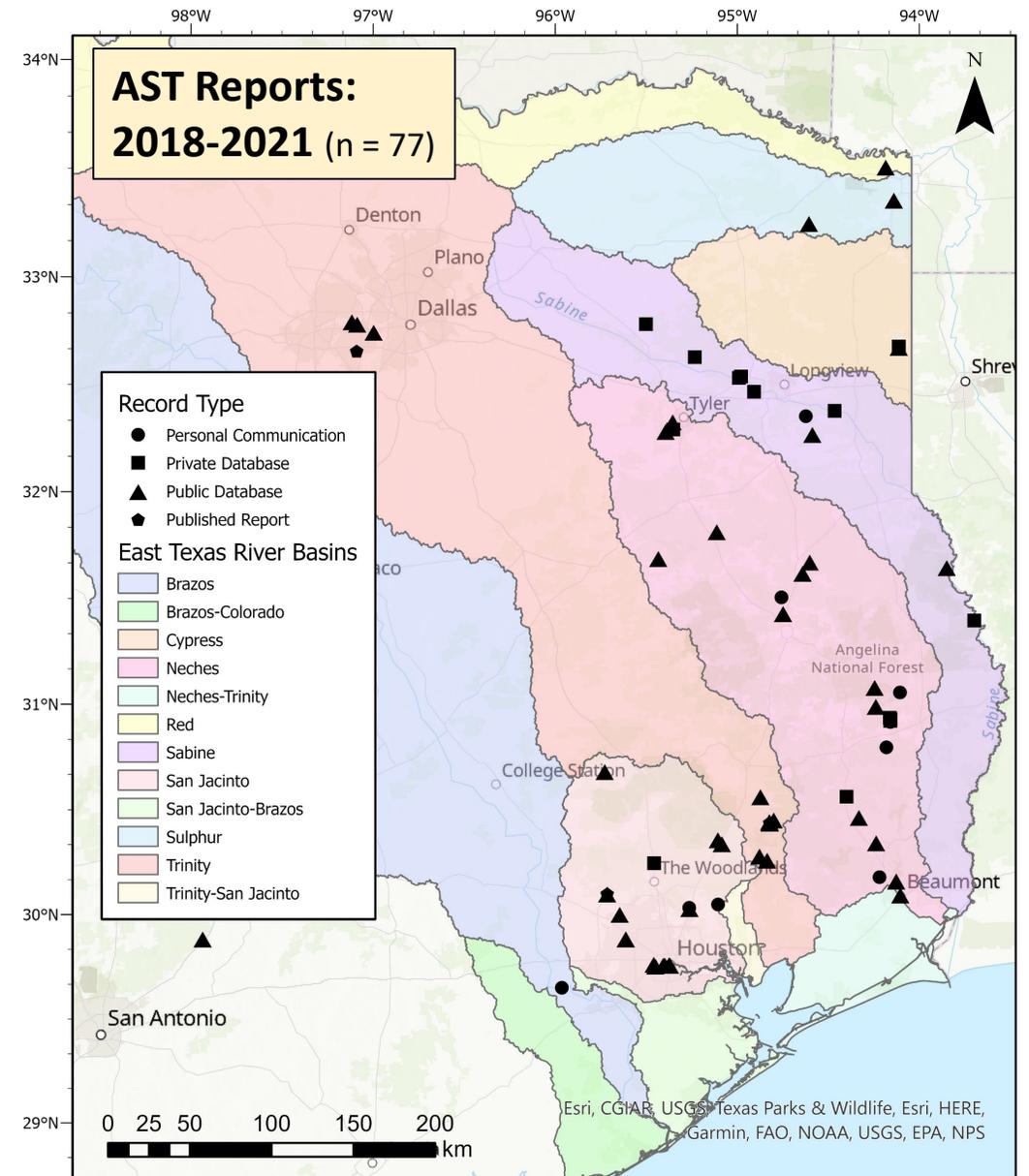
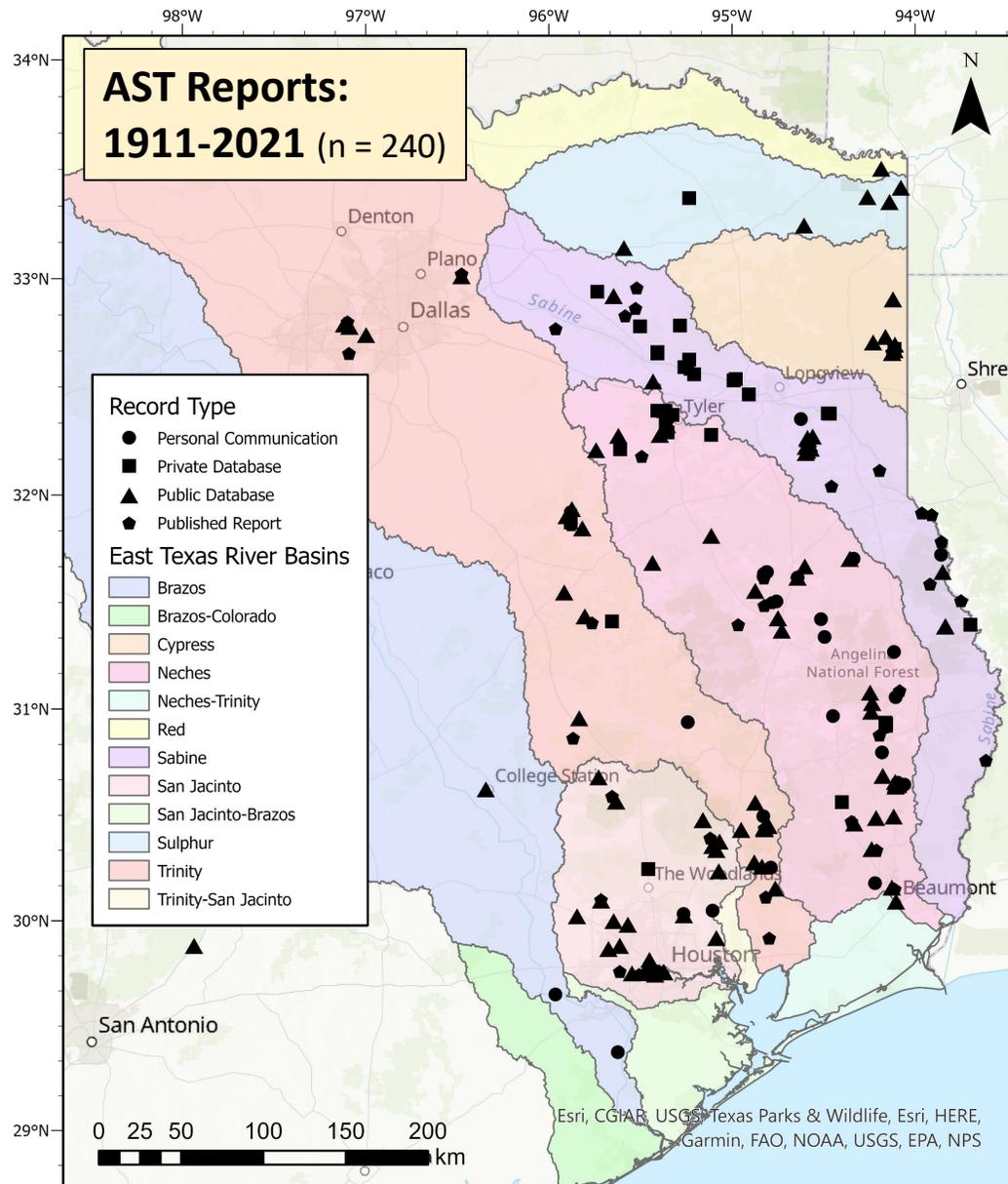
- Overall goal: fill the knowledge gap
- Collaborative effort
 - Suggestions for sampling locations
 - Developing matrix for site selection

Table 1 Ongoing *Macrochelys temminckii* studies, surveys, and outreach in Texas.

Agency	Survey Area	Brief Project Description
Angelina-Neches River Authority	Angelina-Neches river basin	Raising awareness about status of <i>M. temminckii</i> for stakeholders
Lower Neches Valley Authority	Lower Neches river basin	Development of mapping tool for <i>M. temminckii</i> and others in partnership with TPWD and research institutions
Paschal High School (in conjunction with Texas Turtles)	Trinity River and Artesian Lakes (Liberty county)	General turtle population survey with documented <i>M. temminckii</i> capture
Sabine River Authority	Sabine River Basin	Raising awareness about status of <i>M. temminckii</i> for stakeholders
Stephen F. Austin University	Sites from Rudolph et al. (2002)	Re-evaluation of population structure & habitat use; eDNA detection; heavy metal bioaccumulation
Texas A&M University – Commerce	Red River basin (Bowie county) and Sulphur River	<i>M. temminckii</i> population survey in Bowie county; general turtle survey with potential for <i>M. temminckii</i> capture in Sulphur River
Texas Parks & Wildlife	Statewide	Citizen-science based snapping turtle reporting hotline
Turtle Survival Alliance (TSA)	Rangewide (including Texas)	Nationwide population genetic assessment
TSA - North American Freshwater Turtle Research Group	Buffalo Bayou (Harris county)	Population structure & habitat use; radiotelemetry
West Texas A&M University	Primarily Gus Engeling WMA	Assemblage study for multiple species; mostly driven by field course work



Baseline Assessment of Alligator Snapping Turtles



2021 AST Project Plans

- Reconnaissance and finalization of site list
- Sample each site once per season
 - Spring = February-May
 - Summer = June-September
 - Fall/Winter = October-January
- Trapping surveys at primary and secondary sites
 - Resampling primary sites in 2022
 - New list of secondary sites planned for 2022
- Tentative plan for first round of training in late 2021 or early 2022



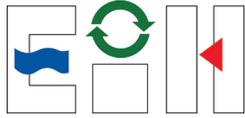
Thank You

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of Houston
Clear Lake



Environmental Institute of Houston

Research partners:

25+ private
landowners



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