



Field App Development for Loggerhead Shrike Data Collection – A Wildlife and Community Science Application Example

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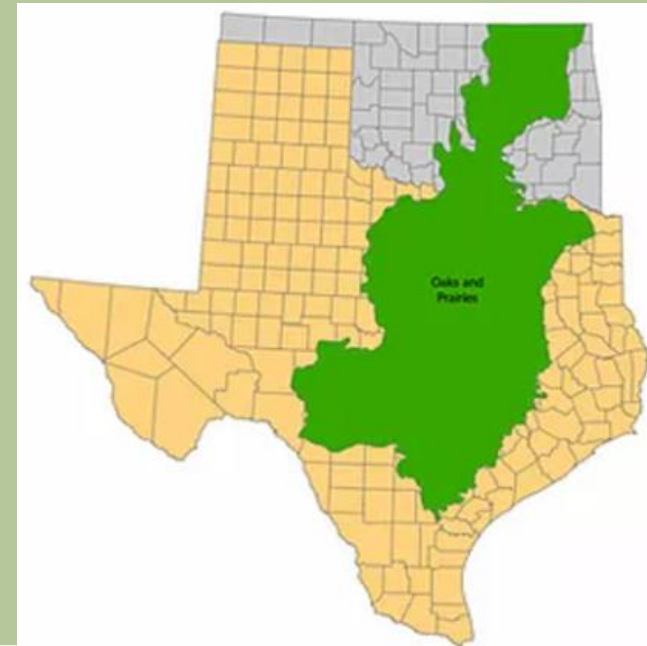
Oaks & Prairies Joint Venture



Anna Matthews and Jim Giocomo

A regional, self-directed partnership of government and non-governmental organizations and individuals working in part to:

- Deliver landscape-level conservation
- Link on-the-ground management with national bird population goals
- Organizing outreach, research, and monitoring

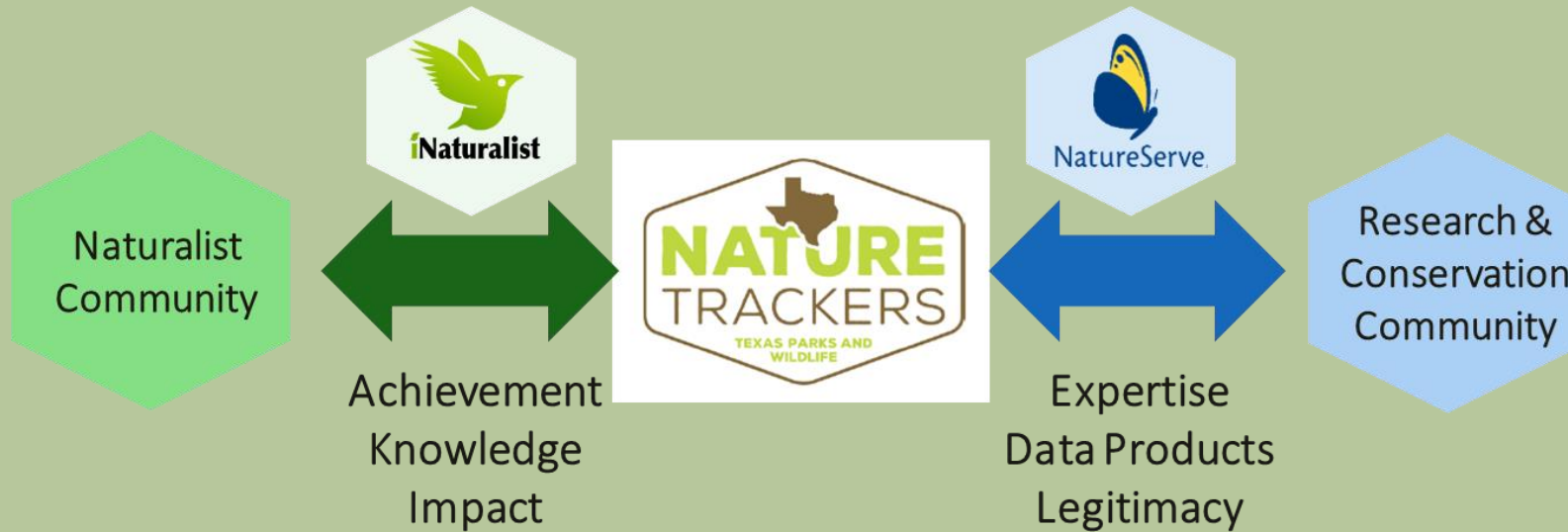


<https://www.opjv.org/>

Texas Parks and Wildlife's Texas Nature Trackers Program



Craig
Hensley



Tania
Homayoun

Goal: Move high quality, robust community science data into the Texas Natural Diversity Database



Wendy
Anderson

Grassland Birds and Loggerhead Shrikes

Grassland Birds

- Loss of 3 billion birds in North America since 1970s



Rosenberg et al. (2019). Figure from K. Rosenberg

Grassland Birds

- 700 million are grassland birds
 - Includes species such as Loggerhead Shrike, Eastern Meadowlark, Grasshopper Sparrow, and many more



Rosenberg et al. (2019). Figure from K. Rosenberg

Loggerhead Shrikes at a Glance

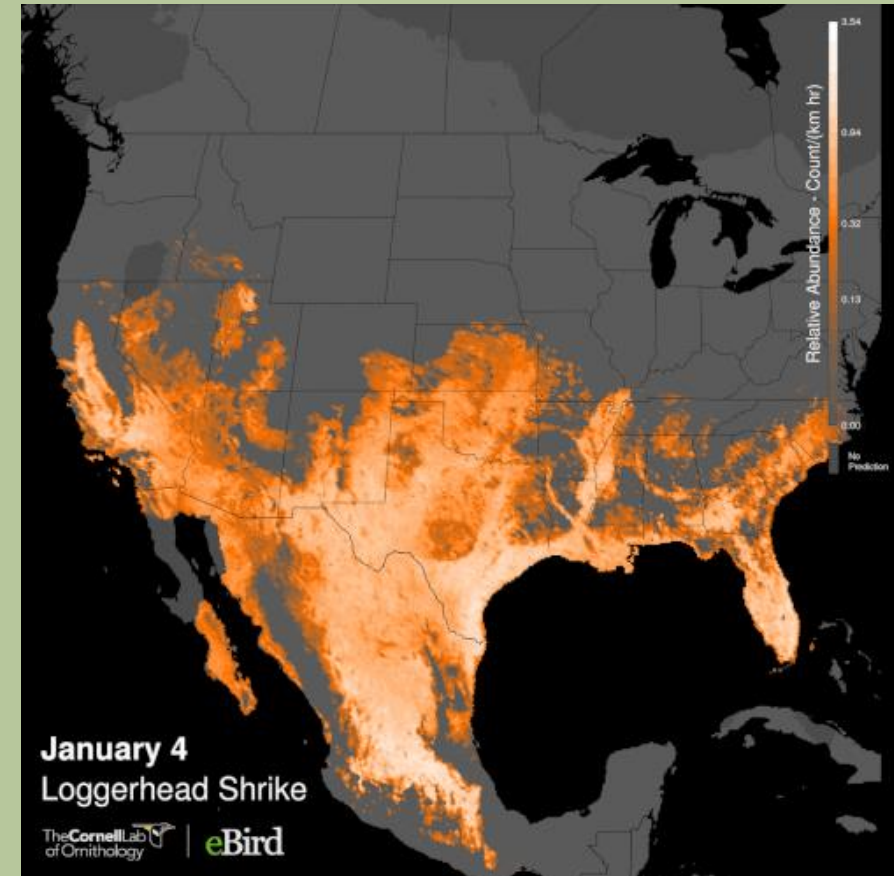
- Found only in North America
- A raptorial songbird, able to take small rodents, birds, lizards, skinks and arthropods - Butcherbird
- Birds of open country with scattered trees and shrubs for perching



Photo by Craig Hensley

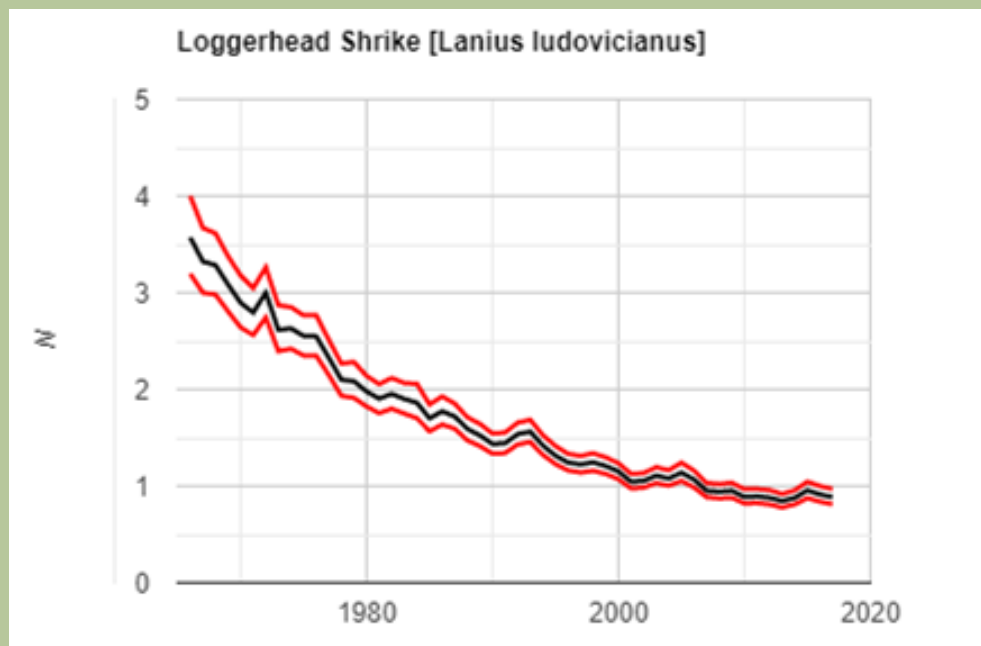
Loggerhead Shrike Distribution

- Year-round residents throughout most of Texas
- Breeding birds from the northern range come south in winter to Texas
- Texas supports 6% of North America's breeding shrikes and 22% of wintering shrikes (eBird Regional Statistics)



Loggerhead Shrike Conservation

- Species of Greatest Conservation Need in 34 states
- Since 1966, population has dropped 76% globally
- Federally endangered in eastern Canada
- Source of decline is not well understood



USGS Breeding Bird Survey

6% annual loss of breeding shrikes within the Oaks and Prairies Bird Conservation Region, which includes Dallas, Houston, and San Antonio (Partners in Flight 2020).

The Birth of a Community Science Project

Loggerhead Shrikes

- Some shrikes nest in urban/suburban areas such as public parks
 - **Location = Community Science?**
- **Goal:** Collect information to fill in knowledge gap about shrike nesting and productivity in suburban/urban areas and assess effects of urban features on shrikes
 - Monitor nests
 - Band birds with color bands



Photos by Craig Hensley



How Do We Create a Data Collection Program That Answers Questions and Can Be Scaled Up and/or Applied to Other Birds and Taxa?



How Will We Collect Data?

Nest monitoring methods are well-established for birds

How Do We Collect This Data With A:

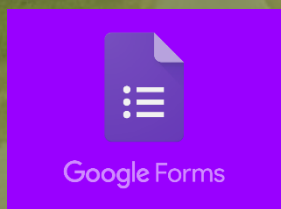
1. Large Group
2. Large Geographic Area
3. Small Team to Manage Data?



Solutions So Far

Data Collection Apps/Software

eBird



The Data Collection Strategy

- Esri Field Maps and Survey123



- Field Maps

- Track Nest Locations
- Navigate to Nests
- Track Nest Status Visually
- Launch Survey123 for Data Collection At Each Nest

- Survey123

- Collection of Nest Monitoring Information (e.g. new nest locations, breeding status of adults, # of eggs, etc.)

The Apps

Following slides showing app screenshots borrowed from Tania and Craig's training slides



Urban Loggerhead Shrike Nest Monitoring Project



TEST Map & Survey Links

Use these links to practice and explore the map & apps



TEST Urban Loggerhead Shrike Nests Map:

Opens in ESRI Field Maps mobile app & has links to TEST surveys

<http://bit.ly/TestShrikeMap>



SCAN FOR MAP

TEST Survey Forms

Each opens in ESRI Survey 123 mobile app & requires password



TEST Urban Loggerhead Shrike Larders

<https://arcg.is/jrODT0>



TEST Urban Loggerhead Shrike Nests

<https://arcg.is/0Guzi4>

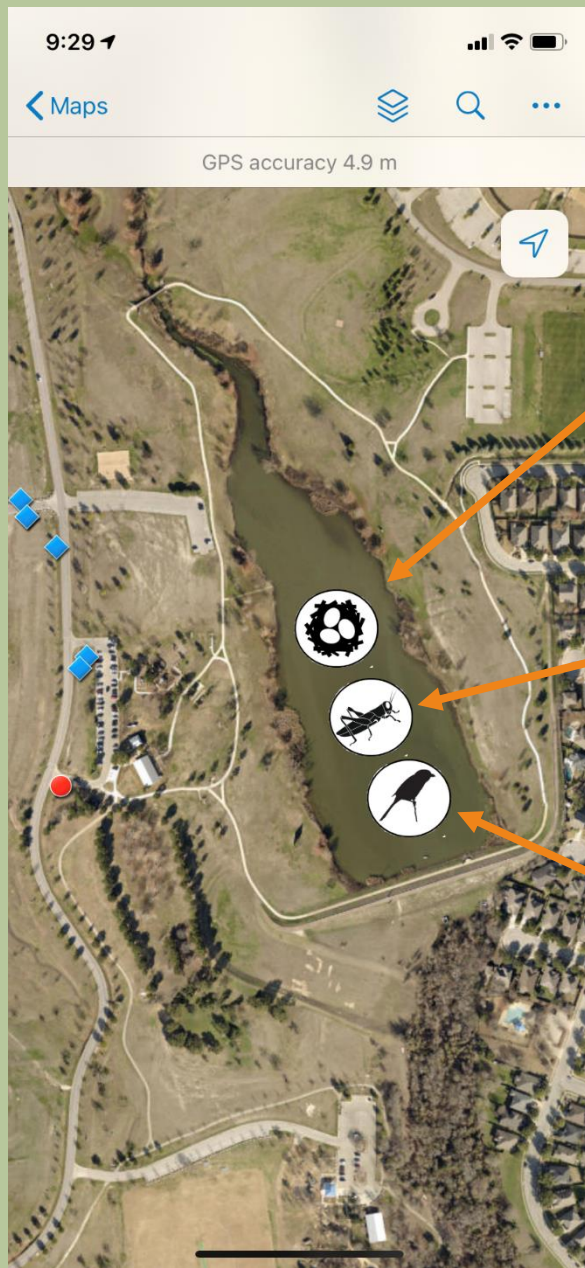


TEST Urban Loggerhead Shrike Sightings

<https://arcg.is/09Pnfm>



Password = superLOSH



Enter a new nest



Enter a larder



Enter a shrike
sighting

Scan to open the
map in
**ESRI Field
Maps** app



Start of Live Demo

Apps and Dashboard

End of Live Demo

Apps and Dashboard

But What Do Those Slides *Mean*?

- Volunteers collect nest monitoring data on their phone
- Data is immediately sent to the cloud
- Data is immediately formatted into a standard online file type
- Data is immediately available to view in a map, table, etc.
 - Data can be put into a map that updates live for display of new nests, changed nest status, and for navigation to nests
- Data can be immediately downloaded for analysis
- Maps, dashboards, etc. can be shared online and show live updates

This is how apps are changing the face of data collection and sharing for wildlife and other industries!

TEST Urban Loggerhead Shrike Nests

Overview

Analyze

Data

 4/1/21 - 9/10/21

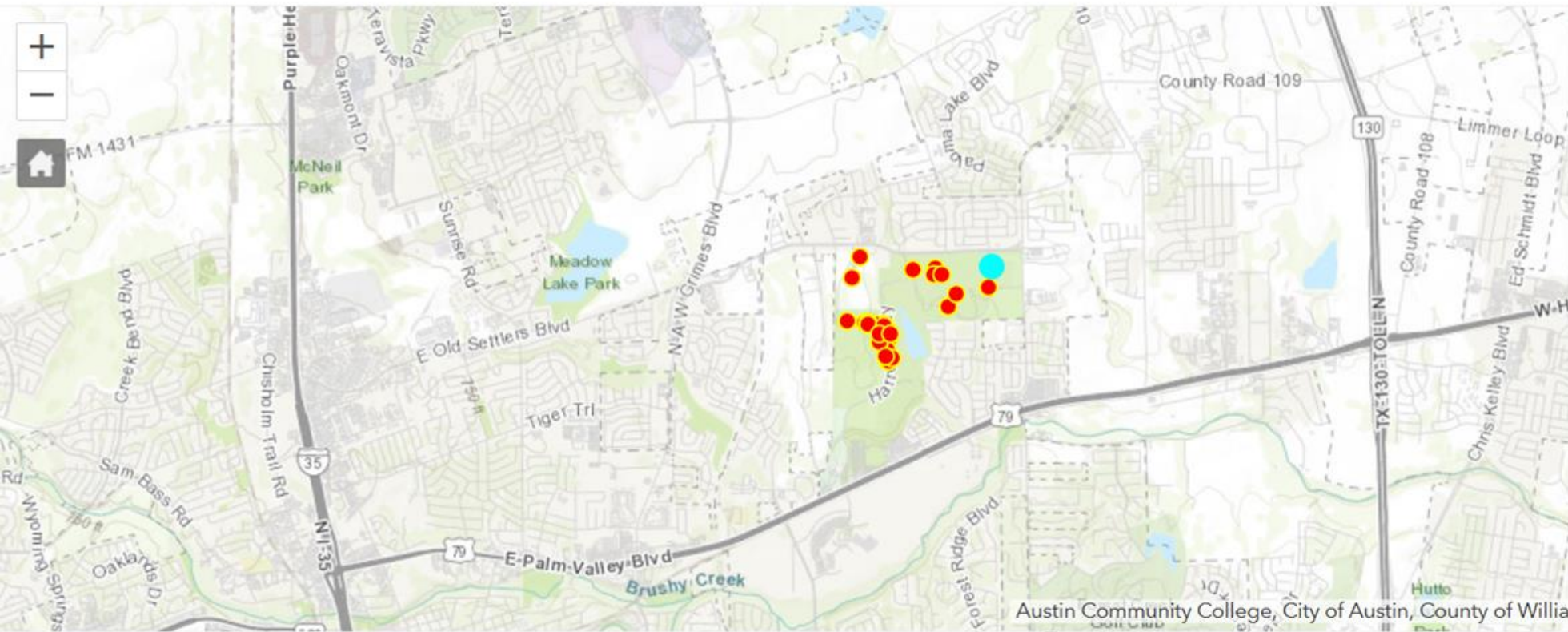
 Filter

Report


Export ▼

Open in Map Viewer

46/46



Layer List

- TEST Urban Loggerhead Shrike Nests ⋮
-  Remember that left and right refer to the bird's legs, not your own perspective! ⋮



Overview

Data

Visualization

Usage

Settings

Layer: v1_0_Urban_Loggerhead_Shrike_Nests

Table

Fields

Double-click a value in the table to change it.

Data Last Updated: Apr 15, 2021, 9:57:07 AM

v1_0_Urban_Loggerhead_Shrike_Nests (Features: 22, Selected: 0)

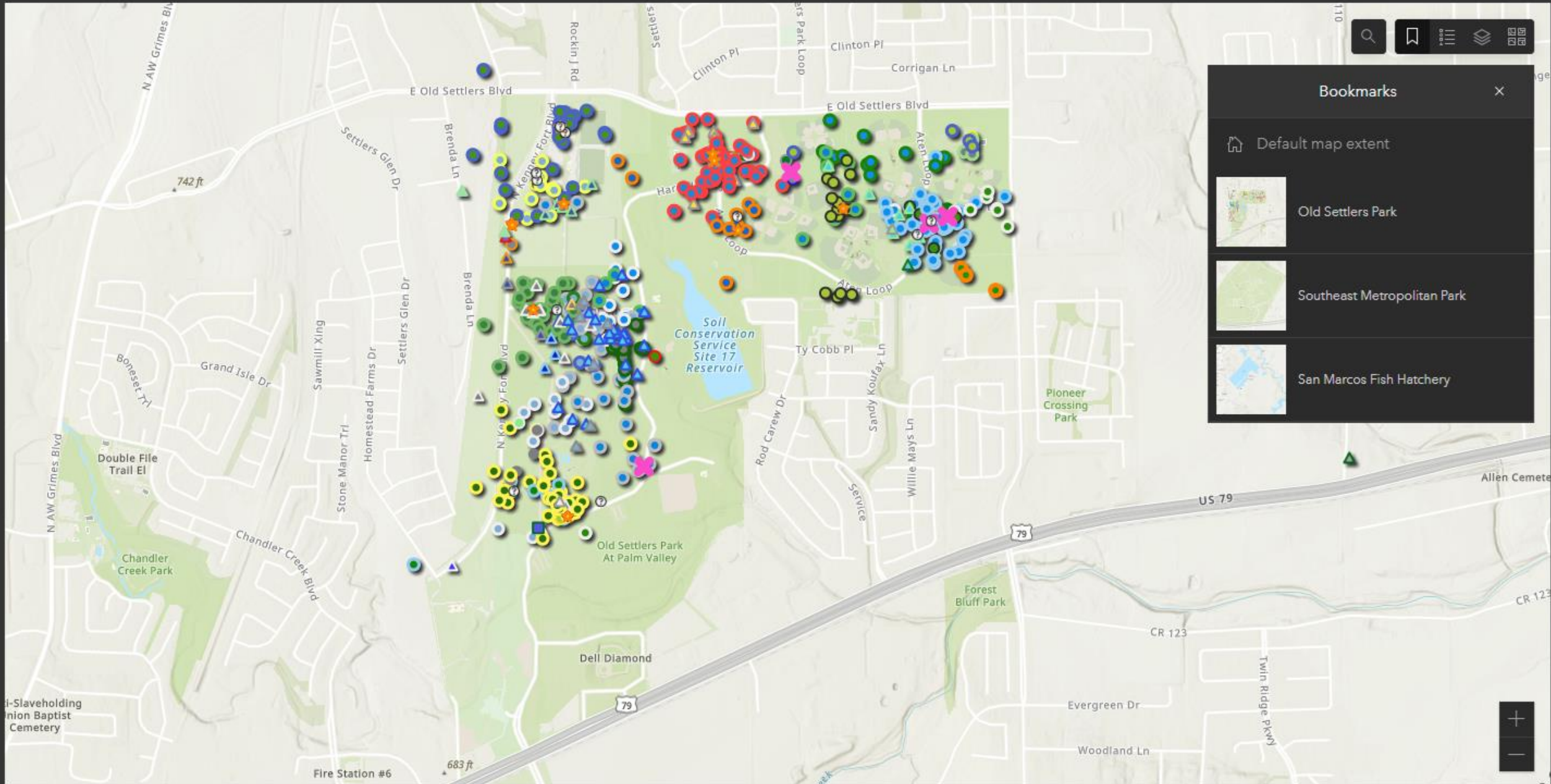


Observer Name:	Other Observers	Date:	Time:	Survey Area ID:	Is this a new nest?	NestID	NestLat	
							
craig_hensley		4/12/2021, 12:00 PM	12:38	Old Settlers Park	Yes	NESTcraig_hensley_	30.5368551508670	-
tania_homayoun		4/12/2021, 12:00 PM	13:34	Old Settlers Park	No	NESTtania_homayo	30.5388389096045	-
tania_homayoun		4/12/2021, 12:00 PM	13:51	Old Settlers Park	Yes	NESTtania_homayo	30.5416820348694	-
tania_homayoun		4/12/2021, 12:00	14:02	Old Settlers Park	No	NESTtania_homayo	30.5431782759362	-



Loggerhead Shrike Band Resights & Nests

Search for band re-sightings and nests in Central Texas



Bookmarks

- Default map extent
- Old Settlers Park
- Southeast Metropolitan Park
- San Marcos Fish Hatchery

Loggerhead Shrike Band Resights & Nests

Search for band re-sightings and nests in Central Texas



Band Combinations

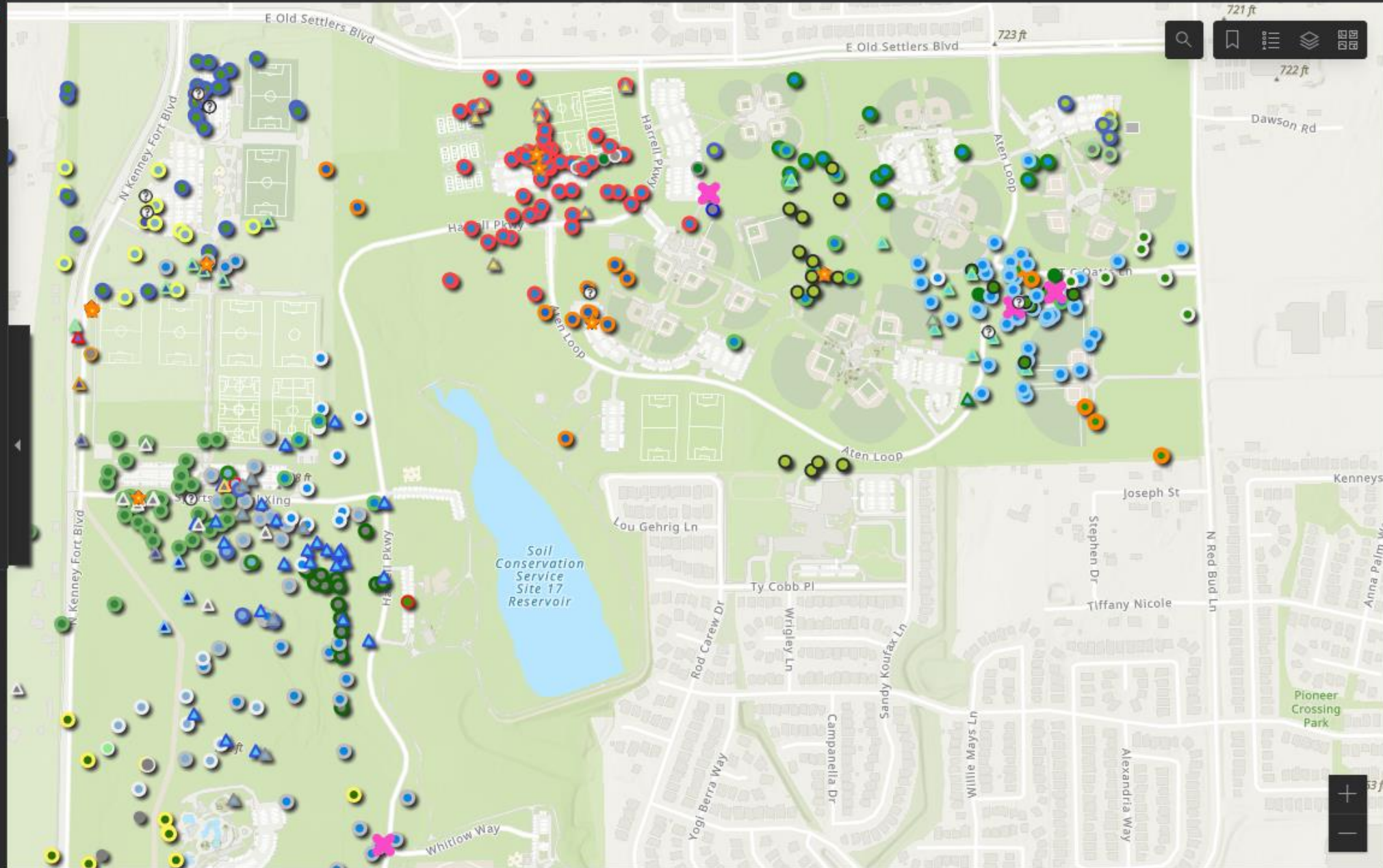
Left Leg Top

None

Search...

- None
- Dark Blue
- Dark Green
- gray
- Light Blue
- Light Green

Reset



Select bands for each leg to search for a banded bird.

Loggerhead Shrike Band Resights & Nests

Search for band re-sightings and nests in Central Texas



Band Combinations

Left Leg Top

Orange

Left Leg Bottom

Metal

Right Leg Top

None

Right Leg Bottom

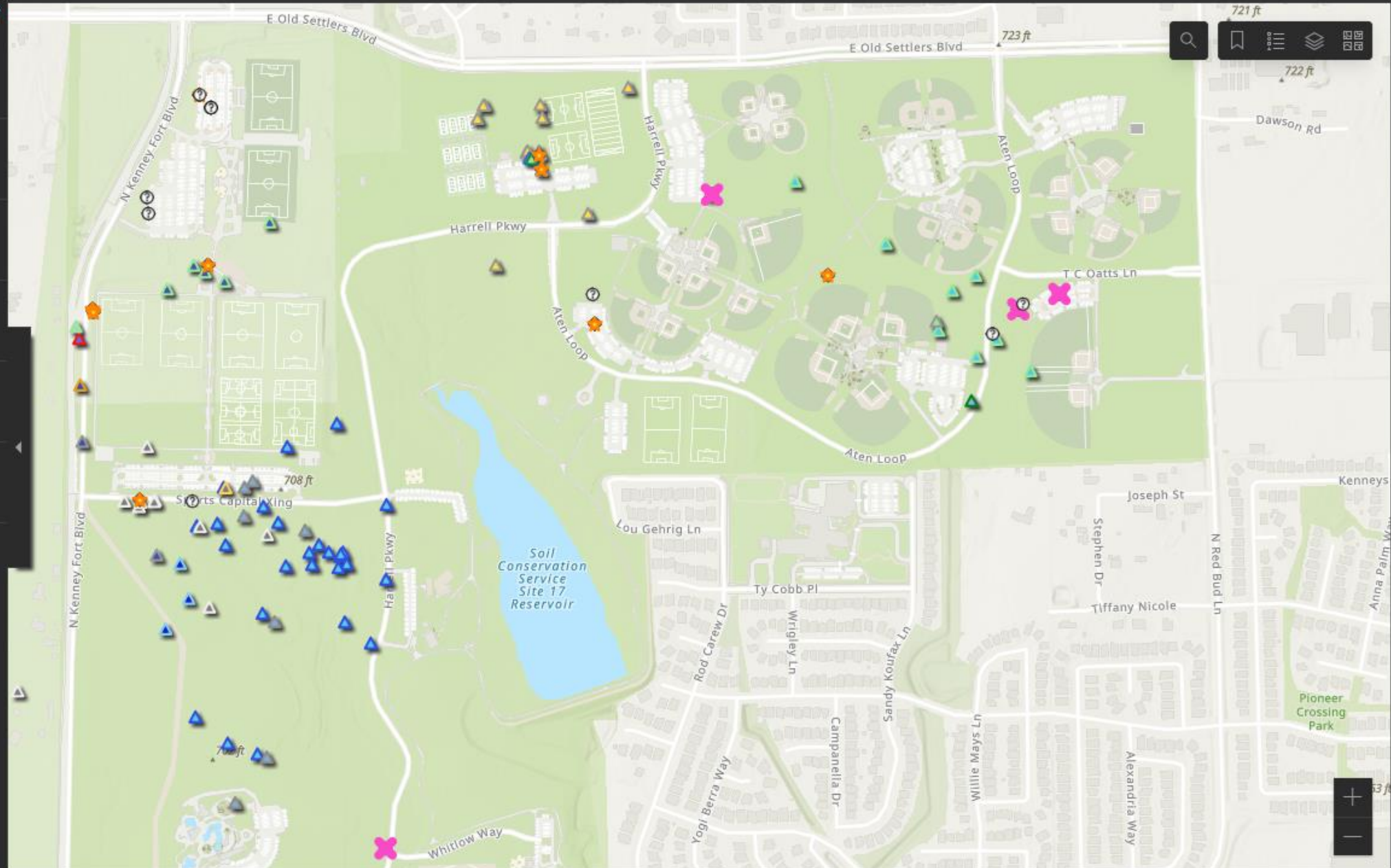
None

Date Observed

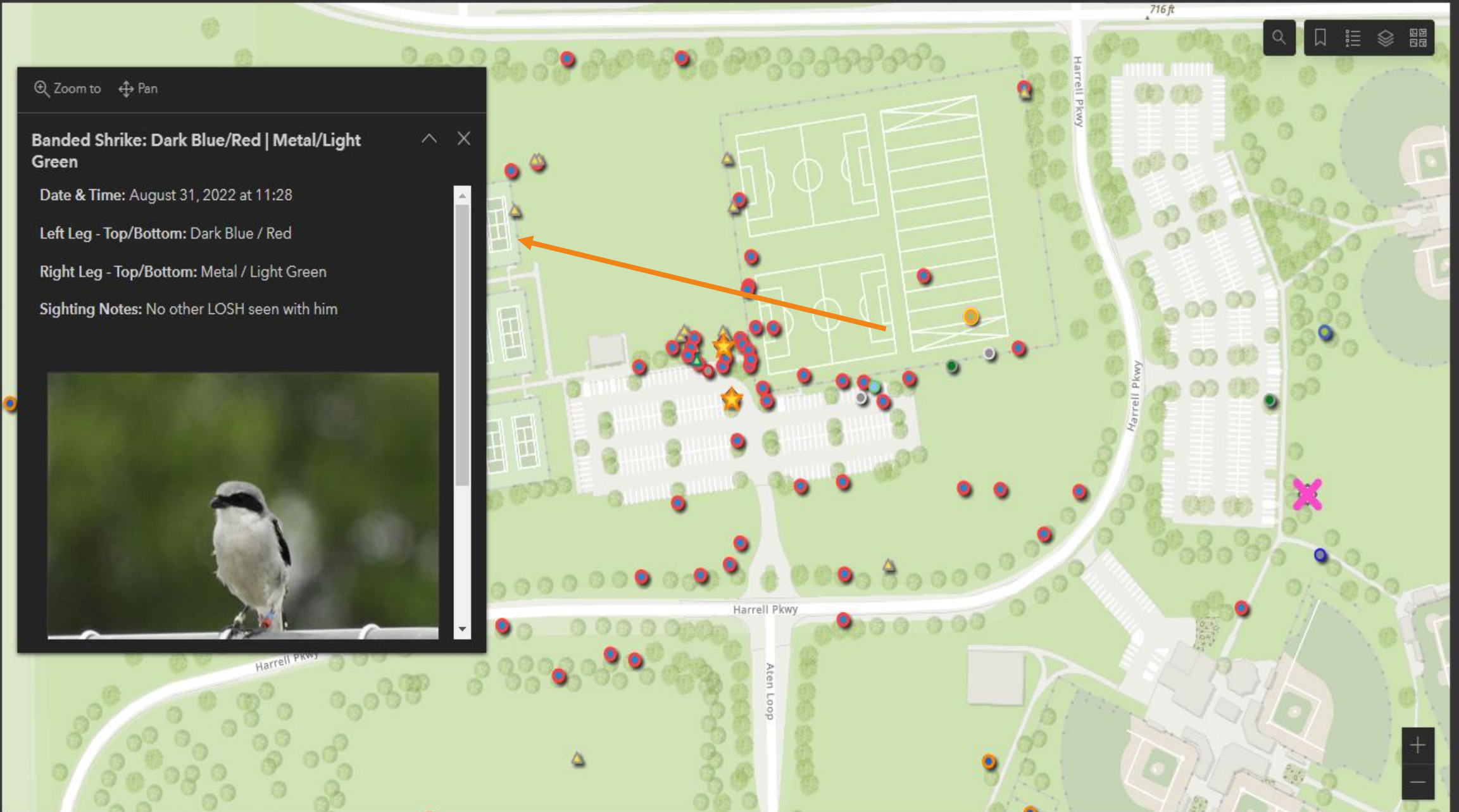
Select date(s)

Observations by Year

None



Select bands for each leg to search for a banded bird.



Pilot and Prelim Results

Pilot Program

- Public Park in Round Rock, TX
- Launched Mid-April 2021
- Texas Master Naturalists Chapter Members
- Online webinar to walk-through:
 - Code of Conduct
 - Monitoring Methods
 - Use of Apps
- Follow-up field session to:
 - Practice with apps
 - Teach shrike identification



Mayfield Method Nest Survival Results

- 50% of nests successfully fledged ≥ 1 young
- Average successful nest produced 4.4 young

Nesting Stage	Percentage Successful	Daily Survival	Exposure Days	Failures	Sample Size (n)	Length of Stage
Egg Laying	90.5%	0.9835	60.5	1	16	6 days
Incubation	66.2%	0.9729	258.5	7	25	15 days
Nestling	83.6%	0.9881	252	3	23	15 days
Overall	50.0%	0.9807	571	11	32	36 days

Results align with nest success found in other studies from other parts of Loggerhead Shrike range

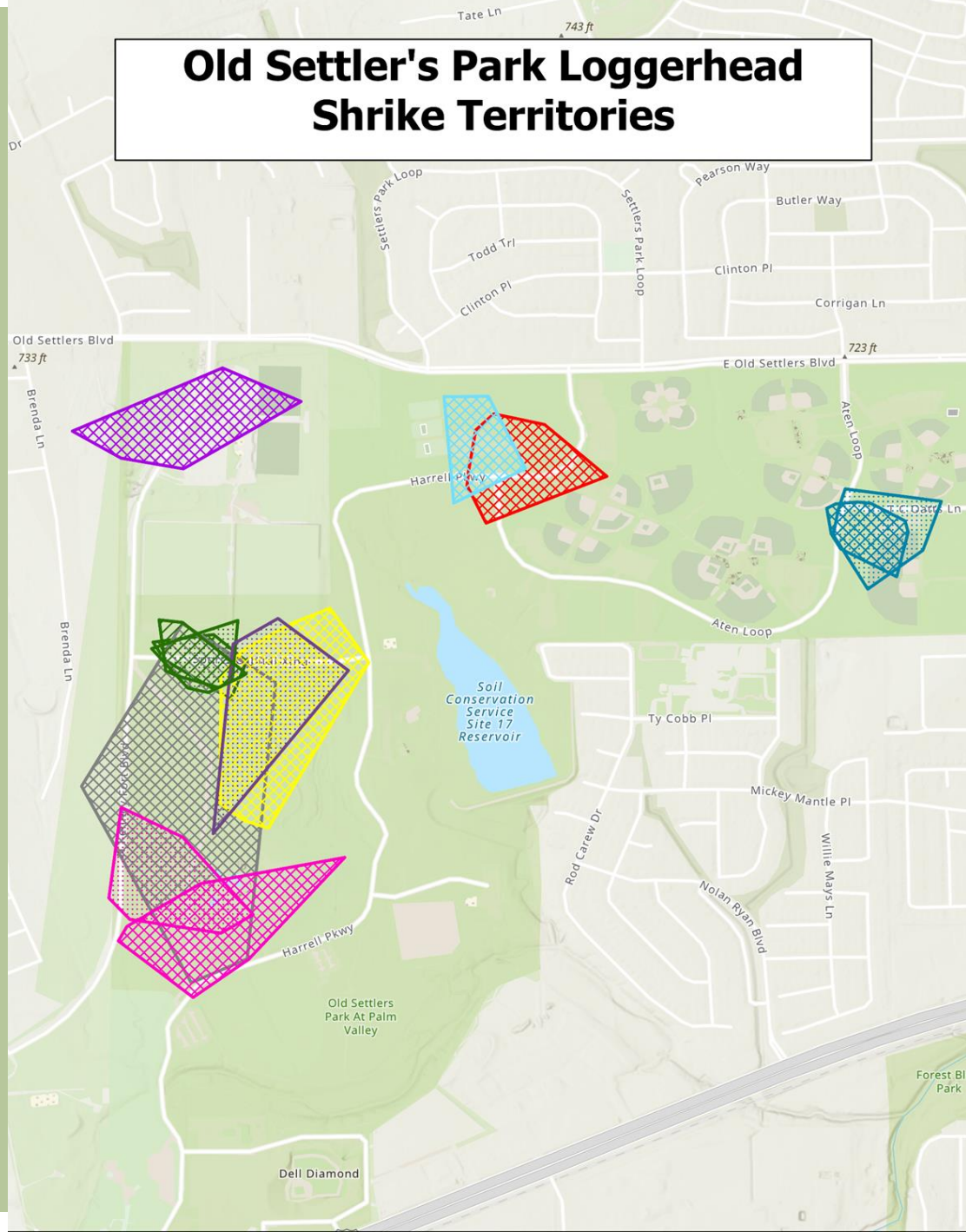
Known Residents of Old Settlers Park

- 50 birds banded at Old Settlers Park
- 9 banded birds stayed for 3 seasons in a row – Breeding 2021, Winter 2021-2022, and Breeding 2022
- 11 banded birds were here for 2 seasons
- Where did all of the other birds that we banded go?



Photo by Tania Homayoun

Old Settler's Park Loggerhead Shrike Territories

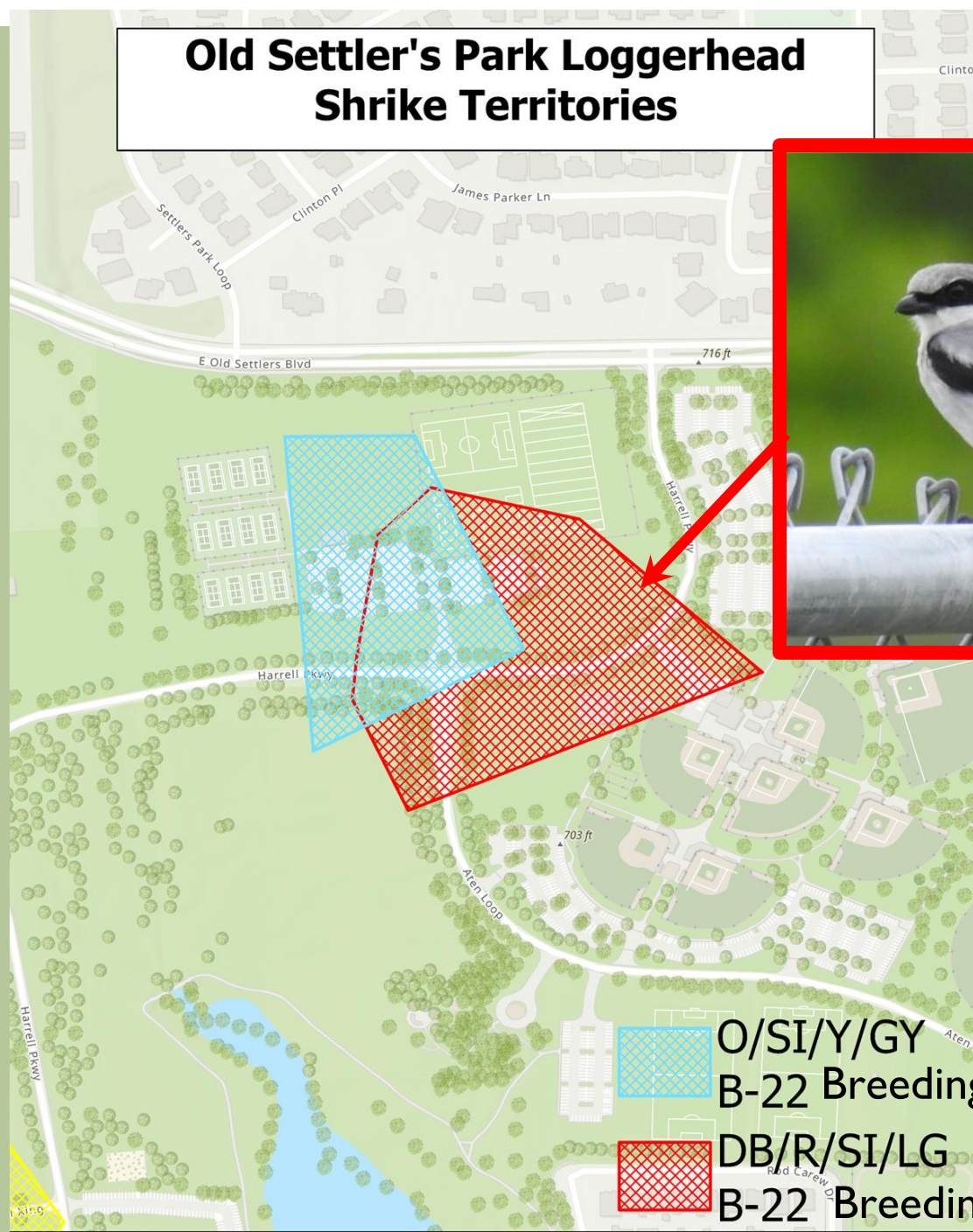



Old Settler's Park Loggerhead Shrike Territories




-  DB/LB/SI/LG - W-21,22 Winter (non-breeding)
-  DB/LB/SI/LG B-22 Breeding

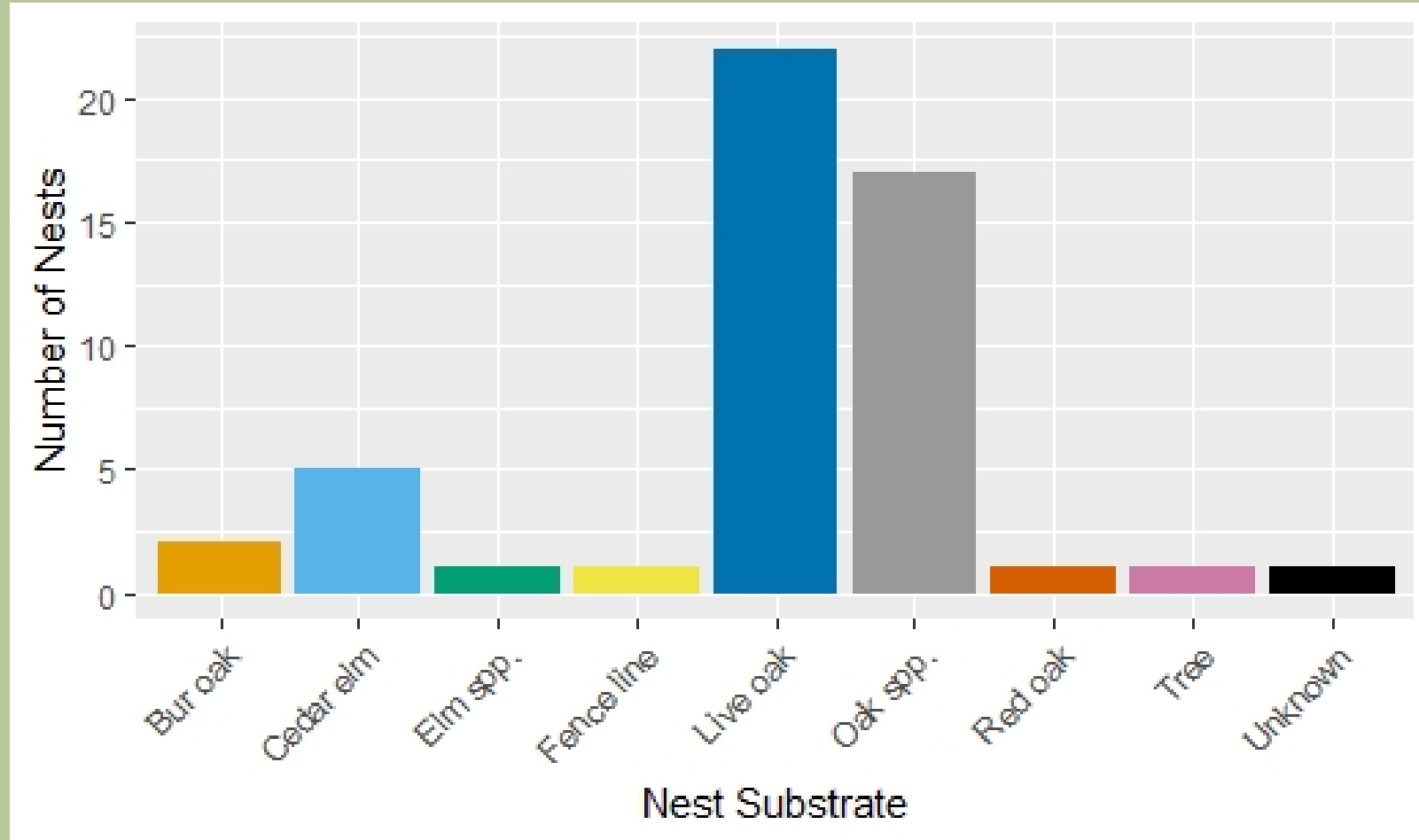
Old Settler's Park Loggerhead Shrike Territories



 O/SI/Y/GY
B-22 Breeding - FEMALE

 DB/R/SI/LG
B-22 Breeding - MALE

Nest Substrate



What We Learned and What's Next

Lessons Learned So Far

Biologists

- Take your time
- Keep it simple and visual
- Get your GIS staff involved early
- Be ready to make rapid adjustments
- There will always be data cleanup and organization to do

Community Scientists

- Be patient with your project managers
- Please always share feedback about what works and what doesn't
- If something doesn't work, try to share screenshots or describe in detail what went wrong

Next Steps

- Continue to learn from initial pilot program
- Expand to new areas in Texas in future years
- Conduct analysis using vegetation and nest location data to model how these affect nest success
- Share methodology with Loggerhead Shrike Working Group and create similar programs in other regions of shrike range



Photo by Jim Giocomo



Questions?



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