From Guinea Pigs to Contributors – A Foray into Game Camera Citizen Science

Mike Farley and Kathy McCormack

Texas Master Naturalist 2020 Virtual Annual Meeting Project Fair

October 2020

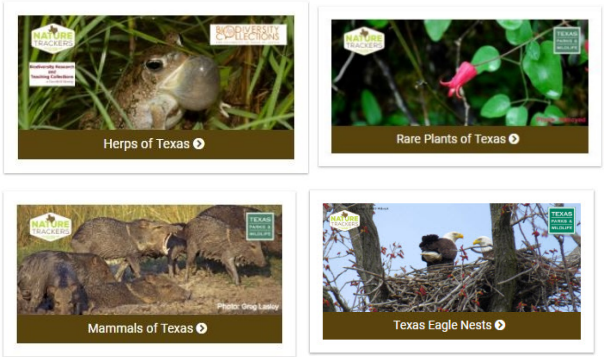
Presentation Outline

- Background Information
- Phase 1
- Phase 2
- Logistics
- Contributions
- Future Plans, Acknowledgements, Contact Information, and References

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

NATURE TRACKERS
TEXAS PARKS AND WILDLIFE

iNaturalist Projects



Collect data on wide variety of native plants & animals throughout Texas

Species of Greatest Conservation Need

Top Priority Tracked Species

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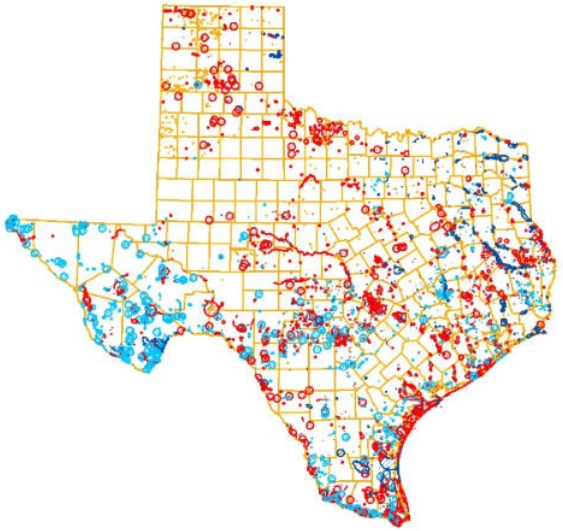
TX Natural Diversity Database



Conservation planning & research

Camera Trap Loan Program

- Game camera kits available to check out for Texas Master Naturalist **chapter projects**
- Application form
- **Species of Greatest Conservation Need (SGCN) mammal targets will be given priority**
- Results must be shared with Texas Nature Trackers iNaturalist projects

Good Water Texas Master Naturalists deploying cameras in the field July 2019

GWMN Application

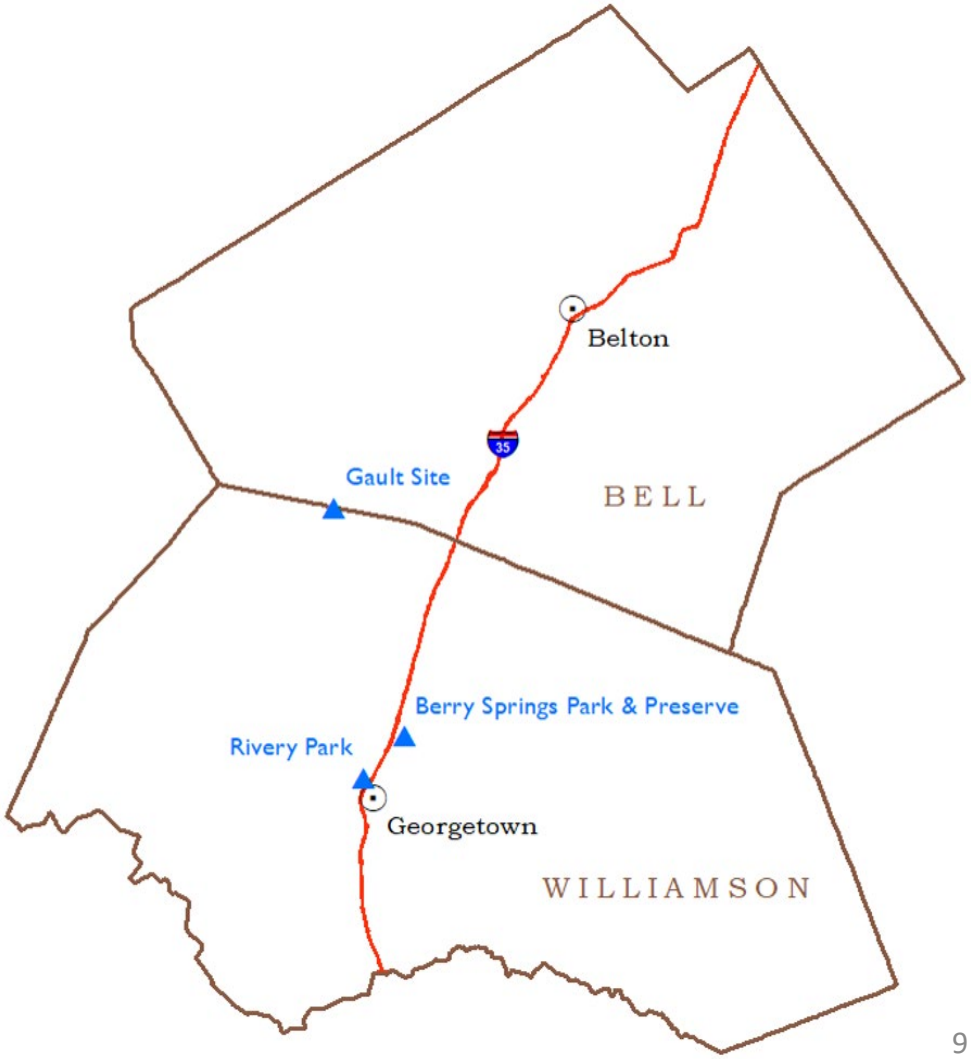
- In 2019, the Good Water Master Naturalist (GWMN) chapter was the first to submit an application to the TPWD Camera Trap Loan Program
- The GWMN application listed Swamp Rabbit (*Sylvilagus aquaticus*) as the SGCN mammal target

Photo courtesy of Mike Farley,
January 30, 2019,
Rivery Park, Georgetown, Texas

GWMN Nature Tracking Project

- In Phase 1, the first of 10 Reconyx Hyperfire HC600 cameras were set up on July 20, 2019, and they were set up at over 50 different sites in three locations
  - Gault Site
  - Berry Springs Park & Preserve
  - Rivery Park
- Note that the HC600 model takes only day/night still camera observations (i.e., no video camera observations)

Phase 1 – Texas, Counties, Locations

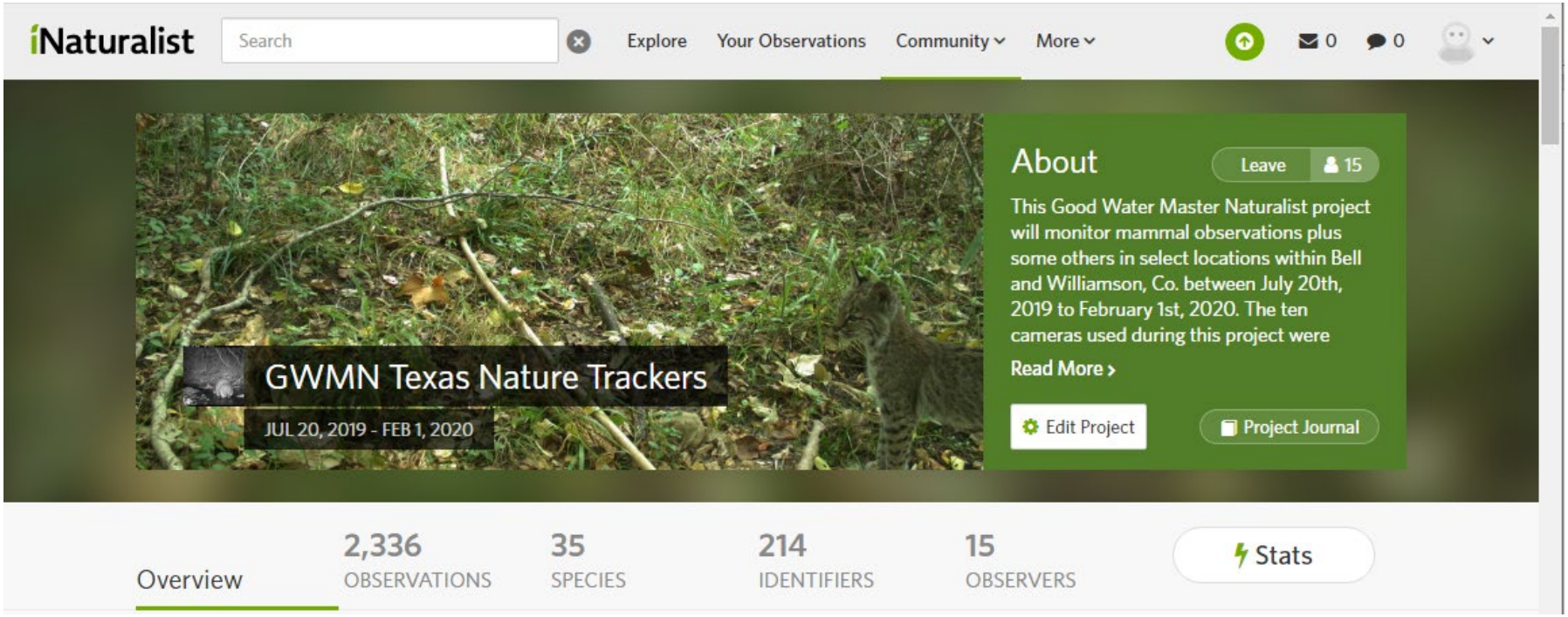


Camera and Supporting Hardware

Stand designed/manufactured by Mike Farley

Master Lock Python Cable Lock 8413

Phase 1 iNaturalist Project

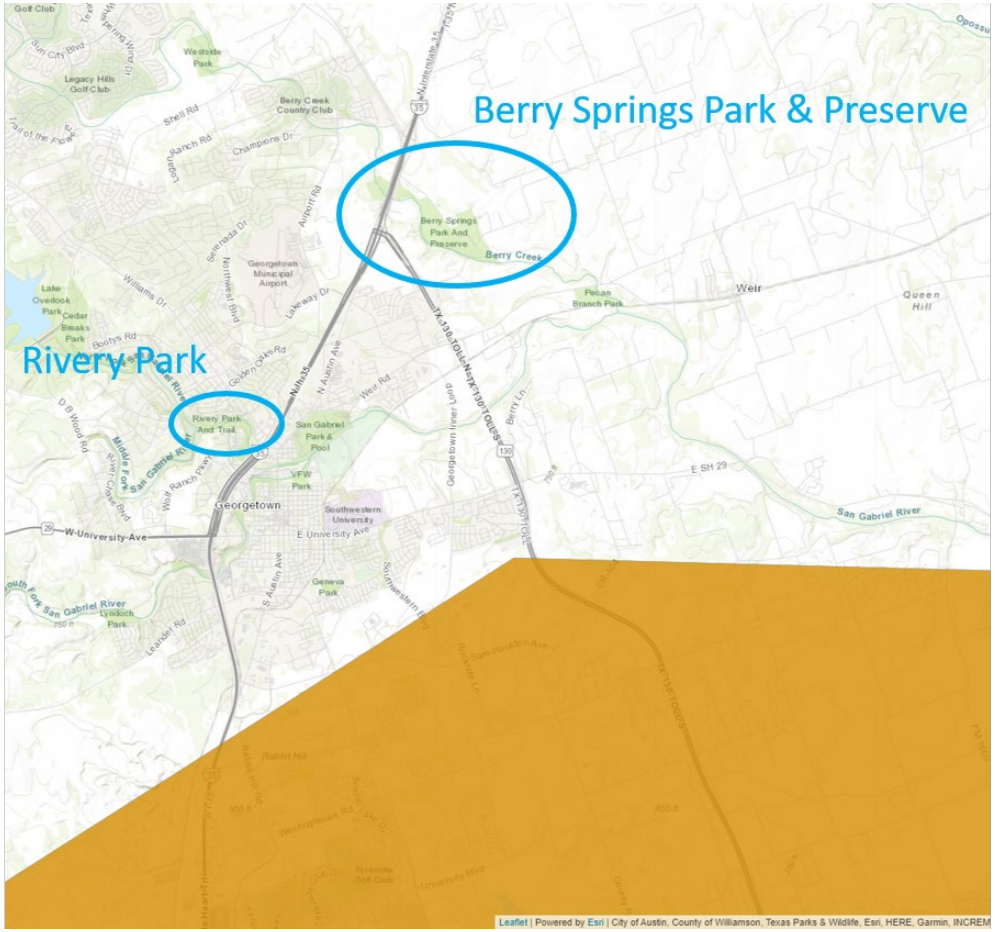


Phase 1 Mammal Observations, 20Jul2019 – 01Feb2020

Swamp Rabbit (*Sylvilagus aquaticus*) was the project's Phase 1 SGCN mammal target

1	Common Raccoon	804
2	Fox Squirrel	330
3	Virginia Opossum	215
4	Nine-banded Armadillo	211
5	White-tailed Deer	203
6	Southern Flying Squirrel	78
7	American Beaver	66
8	Wild Boar	52
9	Gray Fox	37
10	**Swamp Rabbit (SGCN)**	**37**
11	Ringtail	31
12	Coyote	30
13	Bobcat	27
14	Rock Squirrel	24
15	Eastern Cottontail	17
16	North American River Otter (SGCN)	12
17	Striped Skunk	12
18	Deer Mouse	11
19	Attwater's Pocket Gopher	8
20	Nutria	4
21	Typical Old World Mice	3
22, 23	Mexican Free-tailed Bat, Wood Rat	1 each
24, 25	Black-tailed Jackrabbit, Cotton Rat	1 each
26, 27	North American Least Shrew, Goats & Sheep	1 each
	Total	**2,218**

Swamp Rabbit Range Map



Species Description

- Swamp Rabbit (*Sylvilagus aquaticus*) is the largest North American cottontail rabbit
  - 3 – 6 pounds, 18 – 22 inches
- Field marks
  - Cinnamon-colored eye ring
  - Brownish-gray fur with black streaking
  - Hind foot length > 100 mm
- Practices coprophagy (re-ingestion of fecal droppings)

Special Habitat Factors

- Swamp Rabbits are associated with dense, brushy thickets and vines in wooded floodplains along borders of lakes, rivers, and swamps
- Commonly seeks water to escape danger
- Fallen logs and other flood debris are used as latrines
  - Latrine logs communicate information about territories, resource availability, breeding status, etc.

Swamp Rabbit Observations

- Although Swamp Rabbit had previously been documented at Berry Springs Park & Preserve, only trace evidence (i.e., a latrine log) was observed there during Phase 1 of this project
- However, it *was* well documented near Rivery Park during the Phase 1 of this project
  - Multiple latrine logs with extensive and on-going use
  - Still and video camera observations

Swamp Rabbit Latrine Log near Rivery Park

Swamp Rabbit near Rivery Park

Swamp Rabbit near Rivery Park

same latrine log from different perspective

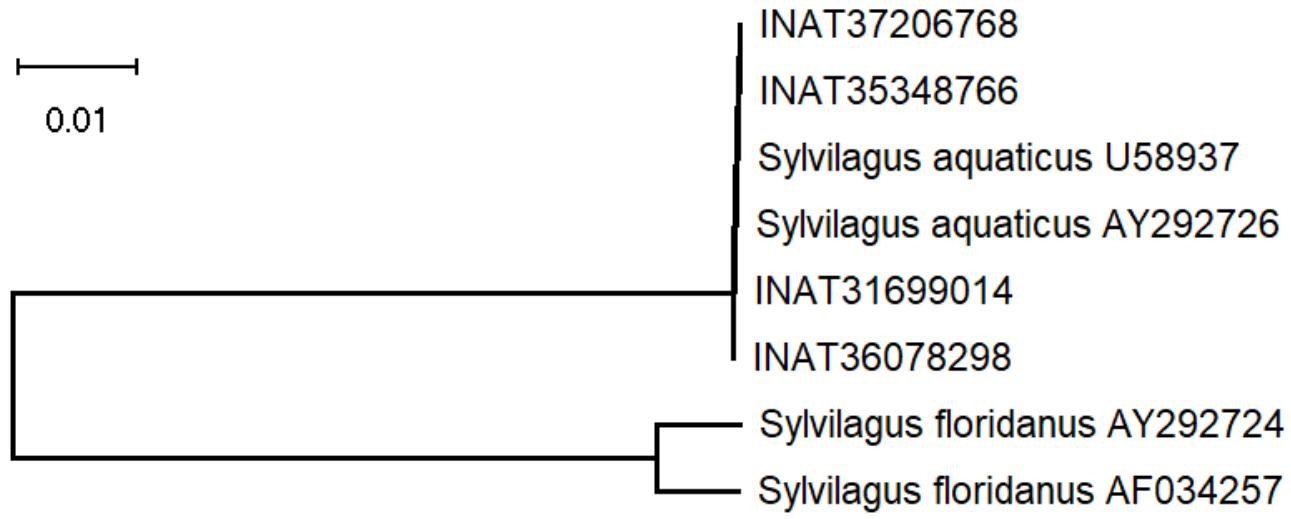
flashes from still camera; rabbit can't see them

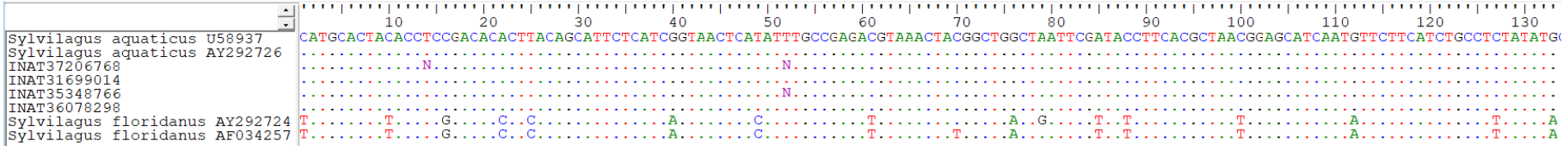
iNaturalist Contacts…

iNaturalist Contacts…

…Become Collaborators

Pellet Samples DNA Results





Texas Conservation Symposium

- Late last year, we submitted an abstract about the project to the annual Texas Conservation Symposium hosted by the Williamson County Conservation Foundation
- On January 10, 2020, we presented these Phase 1 slides, and we hope to give an update on the project at next year's symposium

Phase 1 Chapter Member Involvement

- GWMN members = 167
- Project members = 20 (10 in Fall 2019 class)
- Project iNaturalist observers = 14 (7 in Fall 2019 class)
- Project field research hours July 2019 – Jan 2020 = 624.25
  - Estimated value of this volunteer service = $14,357.75
  - Kathy (in CAMN) added 148.75 hours and $3,421.25

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Project's Effect on Chapter

- Several GWMN members purchased game cameras, or expressed interested in purchasing them, based on project results presented in the monthly chapter meeting updates
- Across three orders, the GWMN chapter purchased seven cameras and supporting hardware for use after the loan program ended
  - Three of these seven cameras were funded by two project member donations, along with one corporate match
  - Special thanks to Randy Spurlock and Dale MacLean

GWMN Nature Tracking Project

- For Phase 2 of the project, project members had an initial discussion about the SGCN target species and associated study site(s), and several experts weighed in with their suggestion
  - Eastern Spotted Skunk (*Spilogale putorius*)
  - The Plains subspecies of Eastern Spotted Skunk (*Spilogale putorius* ssp. *interrupta*)
    - The Western Spotted Skunk (*Spilogale gracilis*) is not a SGCN

Spotted Skunk (aka, civet cat)

Wanted: Spotted Skunks

What: All observations of Spotted Skunks (civet cats), statewide. Current, recent, and historical encounters sought.

Information Wanted: Location, date, pictures (if available), and a short description of the encounter. If a road-killed animal, photograph and salvage any part possible. Call number below for further instructions.

Contact: Robert Dowler at **skunk.project@angelo.edu** or (325) 486-6639. For immediate response, contact Clint Perkins at (318) 623-1678.

Department of Biology, Angelo State University, San Angelo, TX 76909

Figure 2. Wanted poster created to crowd source observations of both eastern (*Spilogale putorius*) and western (*Spilogale gracilis*) spotted skunks in Texas.

From 2nd Spotted Skunk reference

From iNaturalist observation near Killeen

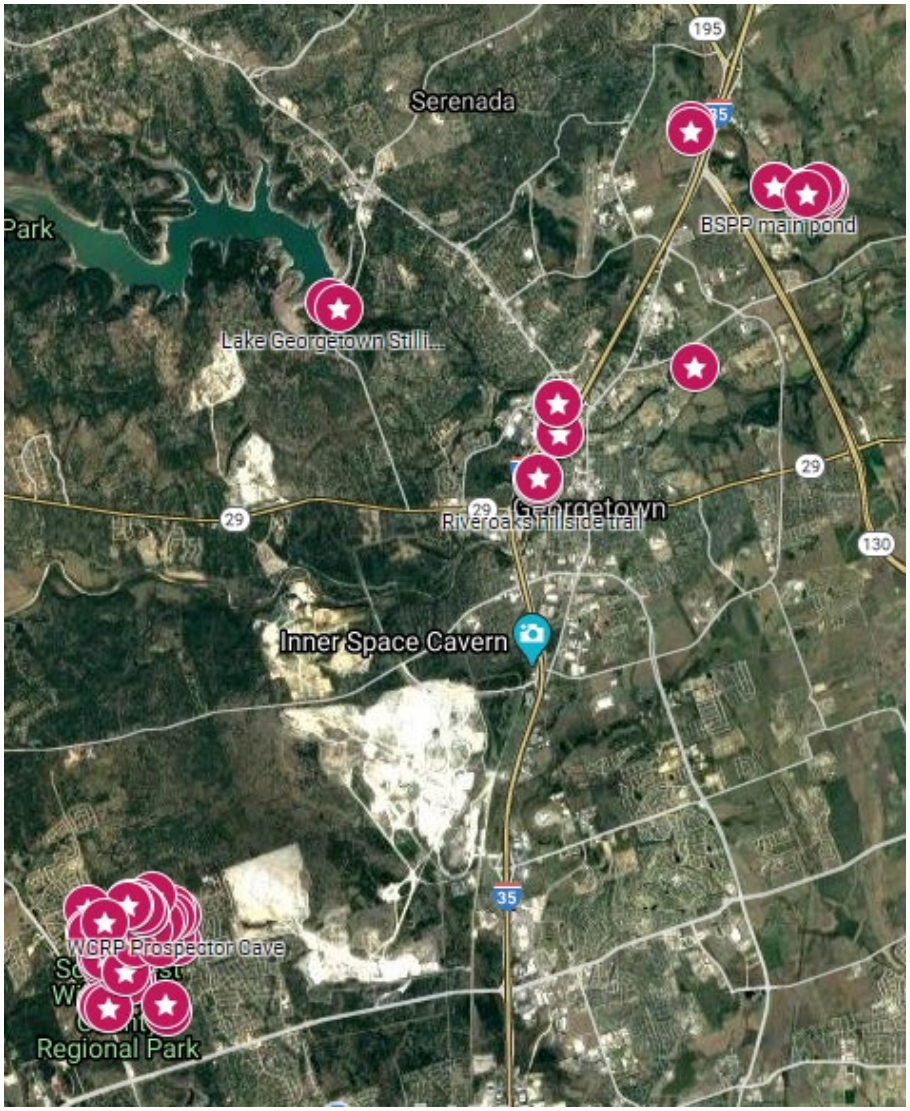
GWMN Nature Tracking Project

- Due to the COVID-19 pandemic, however, Phase 2 of the project quickly shifted to focusing on a basic inventory of the Southwest Williamson County Regional Park, with spot checks in a few additional locations, in order to continue collecting observations of any kind during trying times
- Williamson County park staff also requested that we limit the number of people during each outing to the park

GWMN Nature Tracking Project

- For Phase 2 so far, six Reconyx Hyperfire2 HF2X cameras and one Reconyx Hyperfire2 Professional HP2X camera have been set up at almost 90 different sites in six locations
  - Berry Springs Park & Preserve
  - Lake Georgetown Stilling Basin
  - Rivery Park
  - Riveroaks Preserve
  - San Gabriel River Island
  - Southwest Williamson County Regional Park

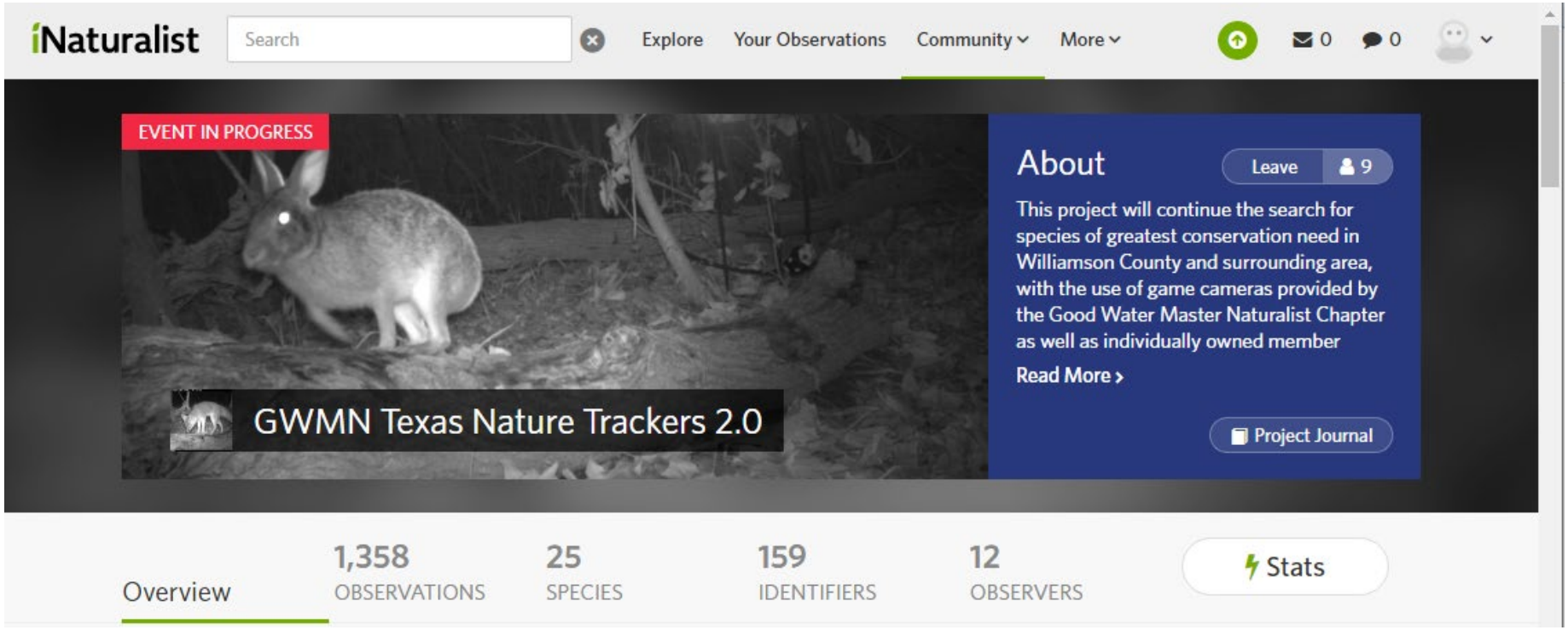
Phase 2 Overview Map



GWMN Nature Tracking Project

- Both Reconyx Hyperfire2 models take day/night still and video camera observations
  - The HyperFire2 HF2X model has a minimum focal distance of 10 feet
  - Our Hyperfire2 Professional HP2X model is custom focused at 15.75 inches
    - Many of the small mammals in Phase 1 were not being identified in iNaturalist
    - Useful in other situations (e.g., microhabitats, reptiles and amphibians, insects)

Phase 2 iNaturalist Project



Phase 2 Mammal Observations, 02Feb2020 – 07Sep2020

The project's Phase 2 SGCN mammal target has not yet been observed

1	Common Raccoon	382
2	Virginia Opossum	153
3	Nine-banded Armadillo	139
4	Eastern Cottontail	116
5	Southern Flying Squirrel	101
6	White-tailed Deer	96
7	Fox Squirrel	75
8	Coyote	52
9	Deer Mouse	49
10	Wild Boar	42
11	Hispid Cotton Rat	26
12	Ringtail	20
13	Bobcat	18
14	Rock Squirrel	17
15	Striped Skunk	13
16	American Beaver	9
17	Gray Fox	9
18	Swamp Rabbit (SGCN)	4
19	Nutria	3
20	North American River Otter (SGCN)	3
21	North American Least Shrew	2
22, 23	Black-tailed Jackrabbit, Attwater's Pocket Gopher	1 each
24, 25	North American Porcupine, Old World Rats	1 each
	Total	**1,333**

Interesting Behaviors

- Videos can provide more information than still images – here are two examples
  - Ringtail with prey
  - Nine-banded Armadillo nest-building

Ringtail with Prey

Nine-banded Armadillo Nest-building

Phase 2 Chapter Member Involvement

- GWMN members = 176
- Project members = 16 (1 in 2020 class)
- Project iNaturalist observers = 12 (0 in 2020 class)
- Project field research hours Feb – Aug 2020 = 281.50
  - Estimated value of this volunteer service = $6,474.50
  - Kathy (in CAMN) added 201.25 hours and $4,628.75

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Nature Tracking Project Logistics

- Field Kit
- Member Roles
- Hardware Costs

Nature Tracking Project Field Kit

- Logbook or clipboard and blank paper, multiple ink pens
- SD cards & SD card containers
- Game camera cable lock keys
- Nippers/Clippers
- Tape measure
- Laminated game camera setup sheet
- Scent baits
- Dimensional scale and/or ruler
- (12) Lithium AA replacement batteries for game cameras
- First aid kit
- Alcohol & Q-tips for cleaning game camera lens
- Camera with SD card slot and/or laptop with SD-USB adaptor to review files in the field
- Bacterial wipes, hand sanitizer, masks for COVID-19
- Laminated map of study area
- Latex/vinyl/nitrile gloves and work gloves
- Small/large Ziploc bags, old plastic grocery bags
- Assorted hardware: nails, extra camera screw knobs for mounting stands
- Cell phone application that provides lat/long data, or GPS and alkaline/rechargeable batteries
- Flagging tape

Nature Tracking Project Member Roles

Leader(s) in the Field and at Home

- Planning, coordination, communication, and decisions

Participants in the Field

- Camera setup and/or card swap
- Vegetation trimmer
- Scent bait manager
- SD cards “shepherd”
- SD card reviewer on digital camera or laptop
- Scribe/secretary/photographer
- Game camera locations scout
- First aid / Field nurse

Participants at Home

- Observations uploader to iNaturalist
- Lat/long file updater
- Map maker/updater
- Archiver of files from SD cards to external hard drive storage
- Files uploader to Google Drive

Files Uploader to Google Drive

- During Phase 2, two free Google accounts were set up that come with 15 GB of cloud storage, and the Drive portion of those accounts is used to share game camera files
- Team members get an email with a link to the files that they can download and process into iNaturalist
- This process was developed due to COVID-19, but it has turned into an opportunity that will continue even after the pandemic is over because it facilitates accessibility for others in the chapter

Hardware Costs

- Reconyx Hyperfire2 game camera, security enclosure, and Master Lock cable = $467
- SD cards, batteries, and scent = $31
- Reconyx Hyperfire2 Professional game camera, security enclosure, and Master Lock cable = $527
- Additional game cameras have been ordered which will be used in support roles
  - Bushnell Core Low Glow game camera and Master Lock cable = $157

Project Contributions So Far

- 3,551 mammal observations in the Mammals of Texas project in iNaturalist for 30 species
- 41 Swamp Rabbit (SGCN) observations in iNaturalist, including DNA data
- 15 North American River Otter (SGCN) observations in iNaturalist
- A number of bird and snake observations have also been added to iNaturalist

Project Contributions So Far (cont.)

- Two locations with confirmed Swamp Rabbit observations (Berry Springs Park & Preserve and Rivery Park) are just outside of the IUCN Red List range map
- The iNaturalist ranges of Attwater's Pocket Gopher and Southern Flying Squirrel were expanded into Williamson County
- Thorough surveys of various Berry Springs Park & Preserve and Southwest Williamson County Regional Park habitats were conducted throughout the seasons

Project Contributions So Far (cont.)

- Eastern Spotted Skunk (SGCN) and its Plains subspecies have not yet been observed at 138 sites in Williamson County where game cameras have been set up
  - However, negative findings are as valuable data to researchers as positive findings
- A summary of Phase 1 was presented at a local conference


Nikon


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Master Naturalists
Volunteer Here
Nikon

Future Plans

- Continue periodic monitoring for the Phase 1 SGCN mammal (Swamp Rabbit)
  - Attempt to partner with the Rivery Park property owner in order to protect the habitat
  - Support Dr. Pfau in preparing a scientific article
- Monitor other locations within the county
  - Parks and preserves
  - Chapter member properties
  - Attempt to partner with additional conservation organizations

Future Plans (cont.)

- Continue searching for the Phase 2 SGCN mammal (Eastern Spotted Skunk and its Plains subspecies)
- Construct and deploy “Herp Cam”
- Incorporate a donated drone into the project
  - Special thanks to Mike Finn and Amy Flinn
- Train new project members
  - In the field
  - At home

Acknowledgements

- Williamson County Parks & Recreation Staff
  - Susan Blackledge, Mark Pettigrew, and Gary Boyd
- Good Water Master Naturalist Board
  - Charles Grimes, Wayne Rhoden, Nancy Phillips, Randy Spurlock, Bob Waring, Jim Hailey, and Mary Ann Melton
- Good Water Master Naturalist project members
  - LOTS ! ☺
- Subject Matter Experts
  - Tania Homayoun (TPWD), Russell Pfau (Tarleton State University), and Zachary Adcock (Cambrian Environmental)

Contacts

- Mike Farley, spice9451@gmail.com, 512-997-8095
- Kathy McCormack, vefl21@yahoo.com, 512-698-9880
- Tania Homayoun, tania.homayoun@tpwd.texas.gov
- Russell Pfau, pfau@tarleton.edu
- Good Water Master Naturalist chapter, https://txmn.org/goodwater/

References for Swamp Rabbit

- TPWD Texas Nature Trackers, https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/texas_nature_trackers/
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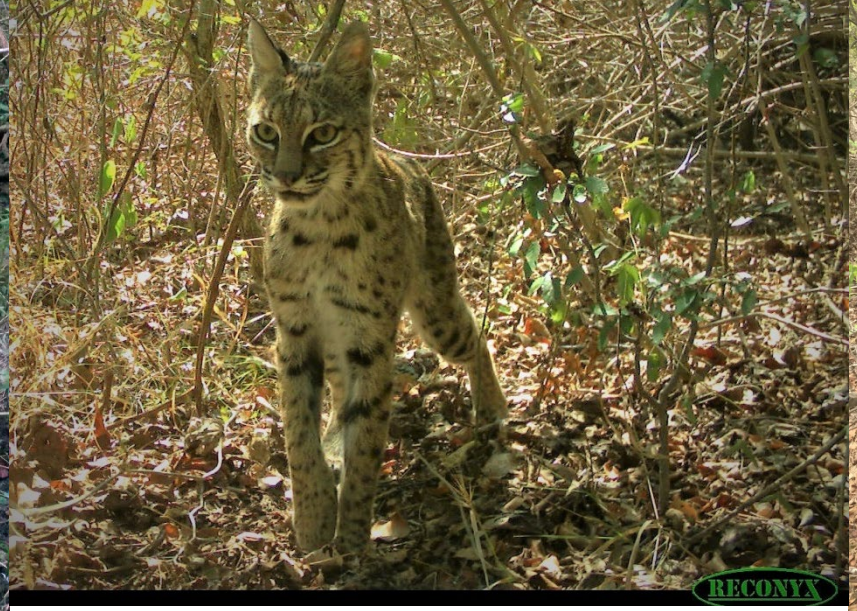

Thank you !
Questions ?