Northern Snakehead in Georgia: Discovery, Response, and Current Monitoring Strategies

Hunter Roop

Introduction

Introduction

WRD Senior Fisheries Biologist

- Lake Lanier
- Chattahoochee River
- Lake Chatuge
- Lake Nottely
- Northern Snakehead "Hunter"

Introduction

Georgia Discovery

On October 4th 2019, local angler Johnathon Maynard reported catching a snakehead out of a private pond in Gwinnett County.

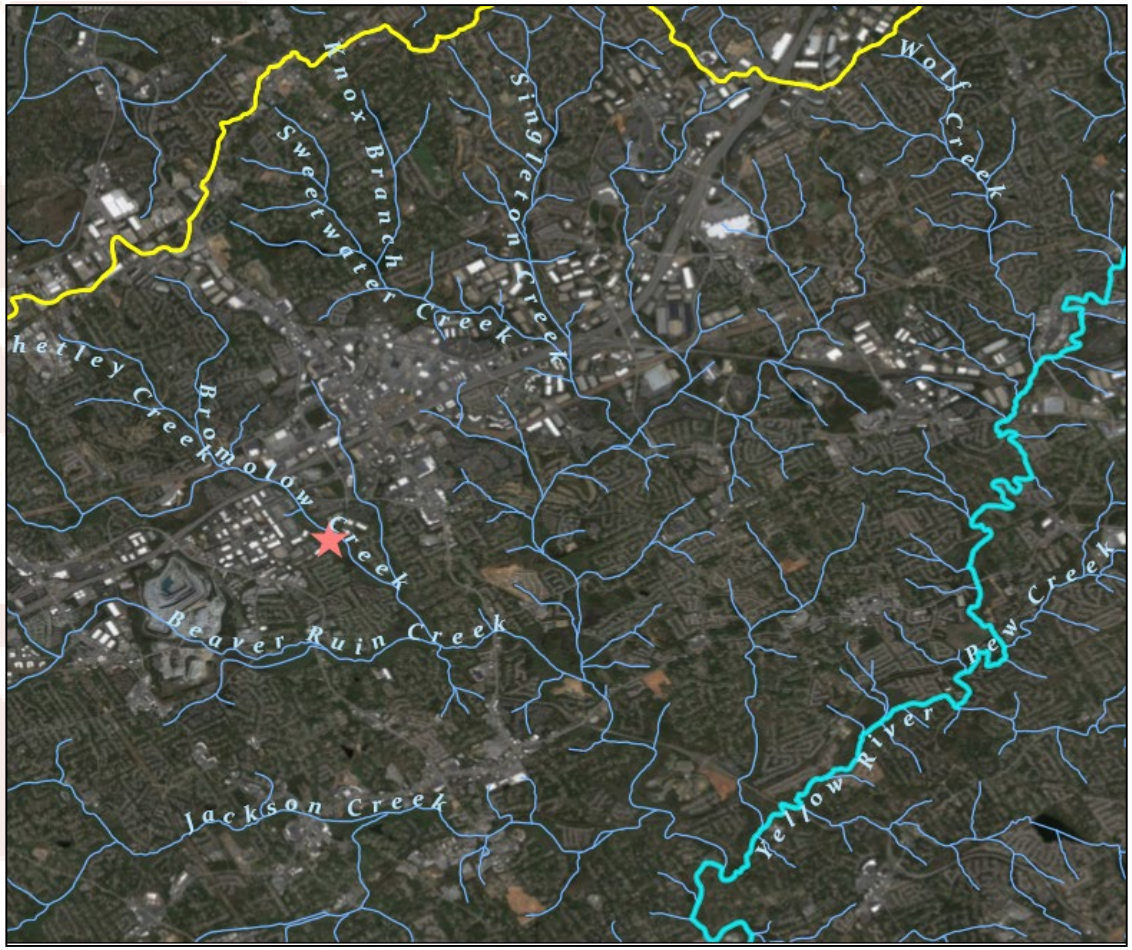
Reconnaissance

On October 7th 2019, Region 1 Fisheries staff surveyed the private pond and adjacent waters with boat and back pack electrofishing equipment, producing two juvenile fish.

Rapid Response

Objectives

1) Determine extent of population in watershed.



Rapid Response

Objectives

1) Determine extent of population in watershed.

2) Determine presence/absence of T & E species.

Rapid Response

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1) Determine extent of population in watershed.

2) Determine presence/absence of T & E species.

3) Develop eradication/removal plan in light of incoming information.

Rapid Response

Department of Natural Resources
Wildlife Resources Division

Rapid Response

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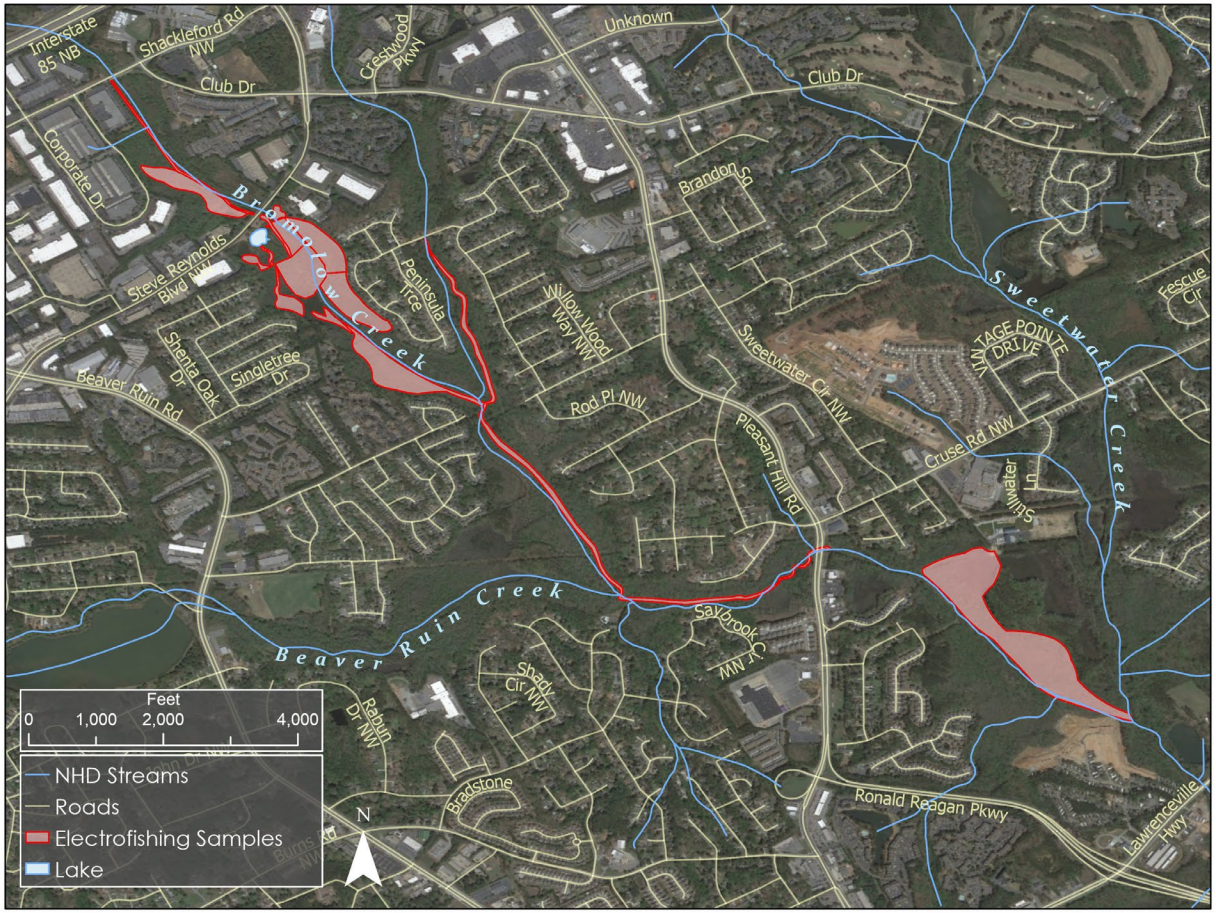


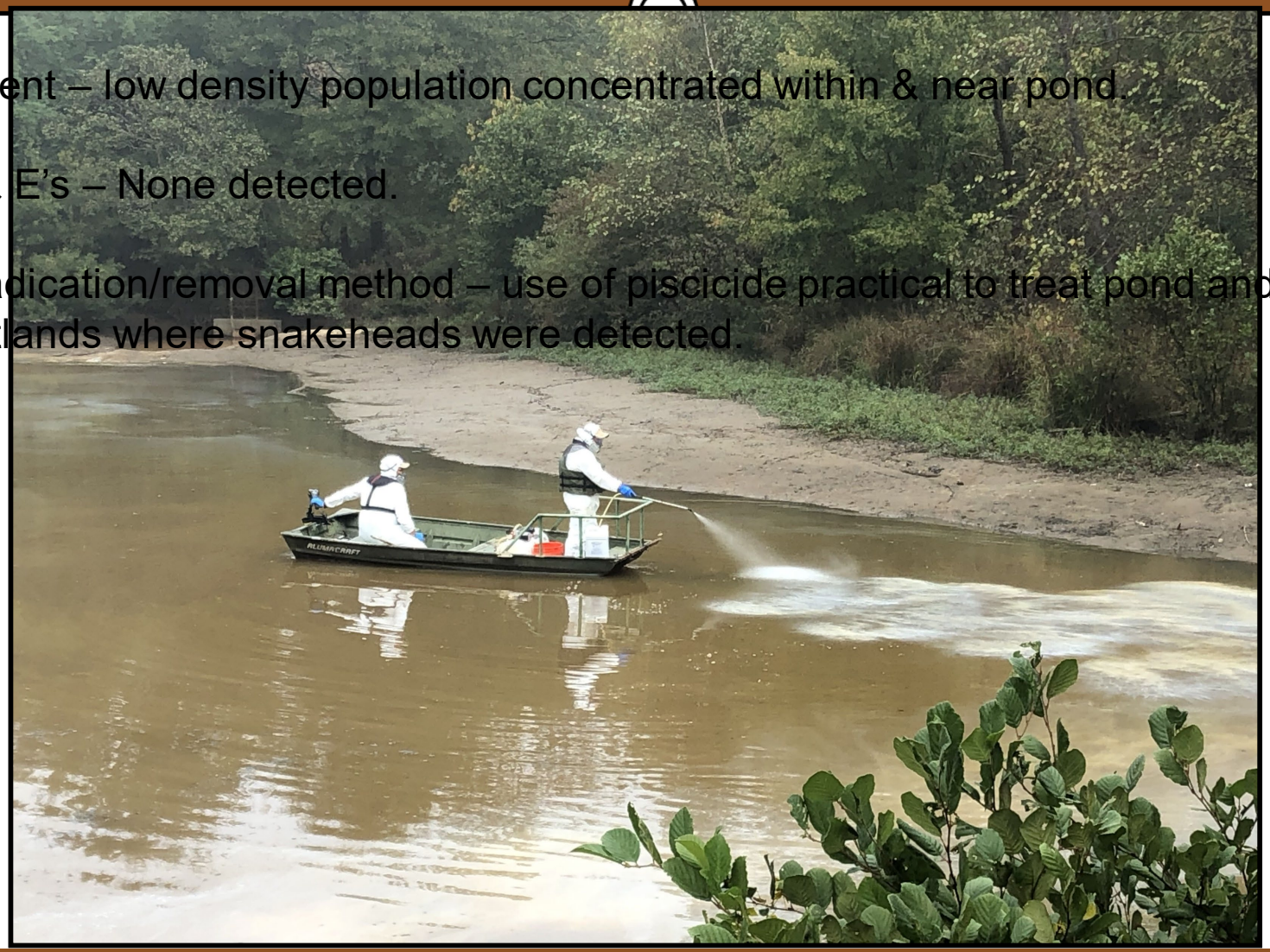
- Surveyed 5.7 miles of stream and river
- 91 acres of wetland
- 2 ponds (1.5 acres)
- Captured 16 snakeheads in pond or adjacent wetlands.
- Data → pond is epicenter of incipient population, likely release location

Review Objectives

1) Extent – low density population concentrated within & near pond.

2) T & E's – None detected.

3) Eradication/removal method – use of piscicide practical to treat pond and portion of wetlands where snakeheads were detected.



Methods

- Pond drawdown occurred prior to rotenone treatment
- ~5 gallons of rotenone
- ~ 3 acres of pond and wetland
- Produced 18 snakeheads

Discussion

- Three size classes produced (two adults and two apparent juvenile cohorts)
- Documented natural reproduction
- 34 fish collected

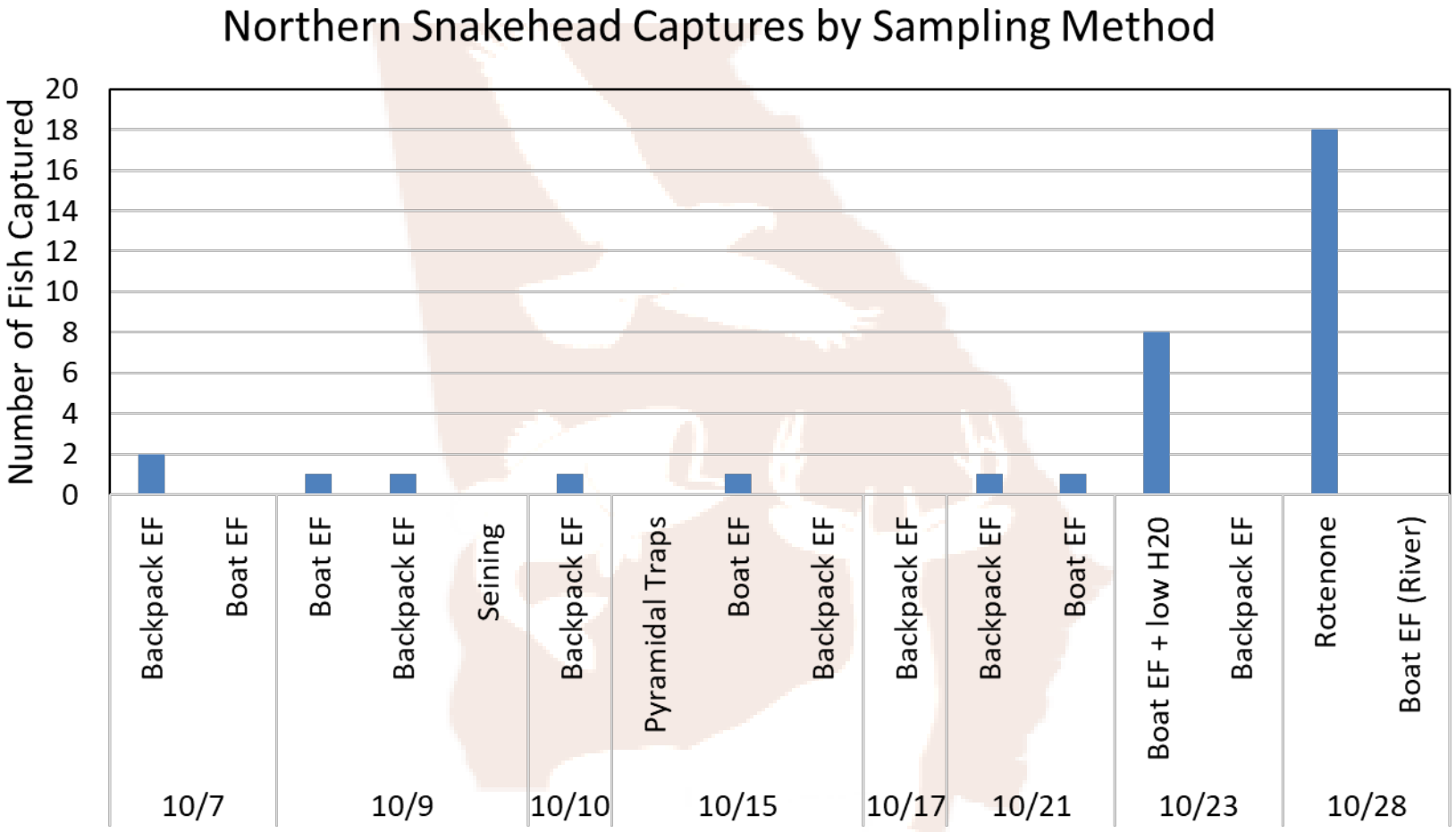
Methods

Male

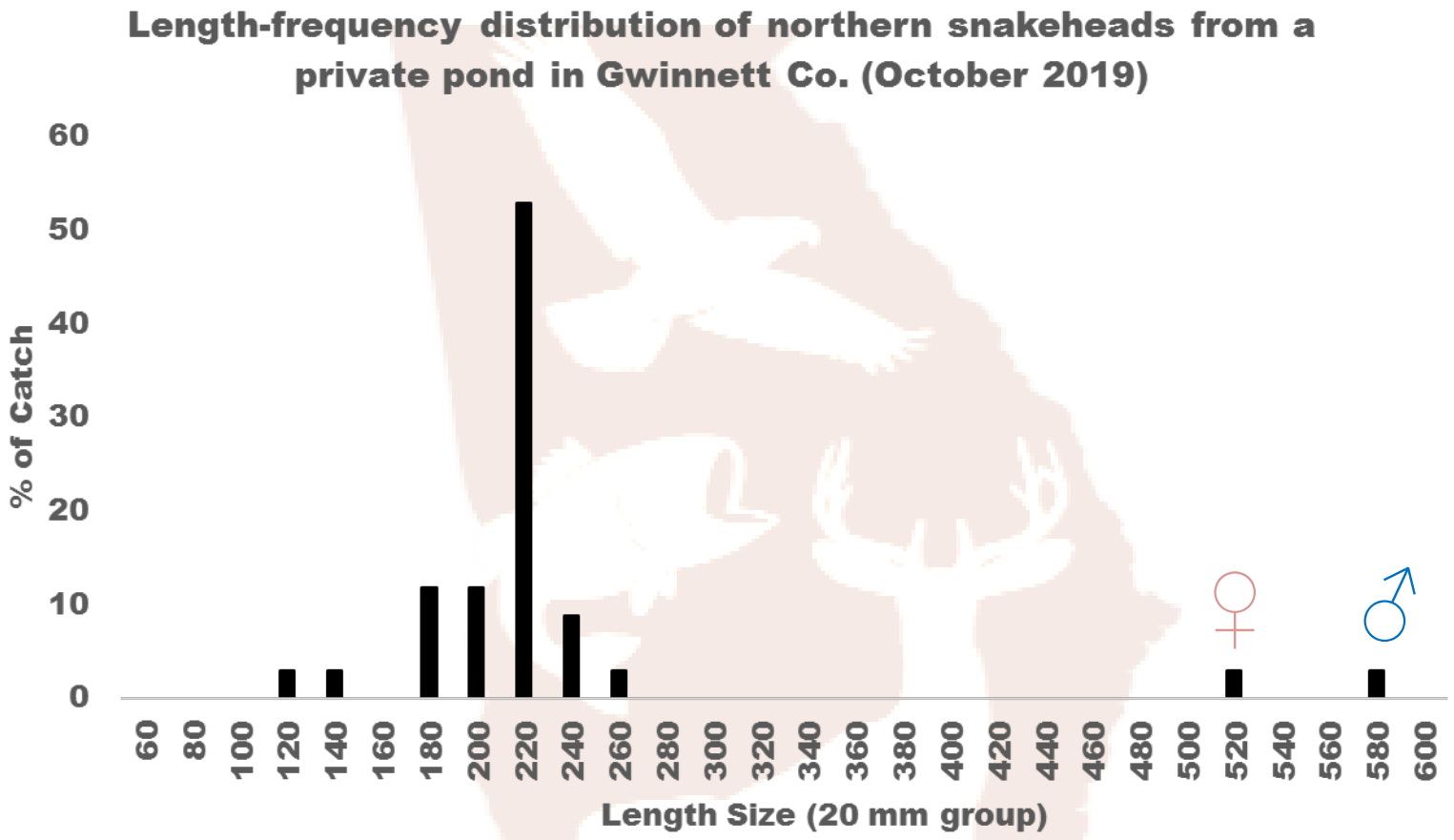
October 9th, 2019

October 4th, 2019

Results


Northern Snakehead Captures by Sampling Method
Number of Fish Captured
20
18
16
14
12
10
8
6
4
2
0
Backpack EF
Boat EF
Boat EF
Backpack EF
Seining
Backpack EF
Pyramidal Traps
Boat EF
Backpack EF
Backpack EF
Backpack EF
Boat EF
Boat EF + low H20
Backpack EF
Rotenone
Boat EF (River)
10/7
10/9
10/10
10/15
10/17
10/21
10/23
10/28

Results


Length-frequency distribution of northern snakeheads from a private pond in Gwinnett Co. (October 2019)
% of Catch
0
10
20
30
40
50
60
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
580
600
Length Size (20 mm group)
♀
♂

Recovery & Mitigation

Short-term Objectives:

- Restore functional use of irrigation pond for landowner
- Restore fish community/fishery.

Long-term Objectives:

Recovery & Mitigation

Objective: Leverage Existing Data to trace origin of captured snakehead.

Genetics:

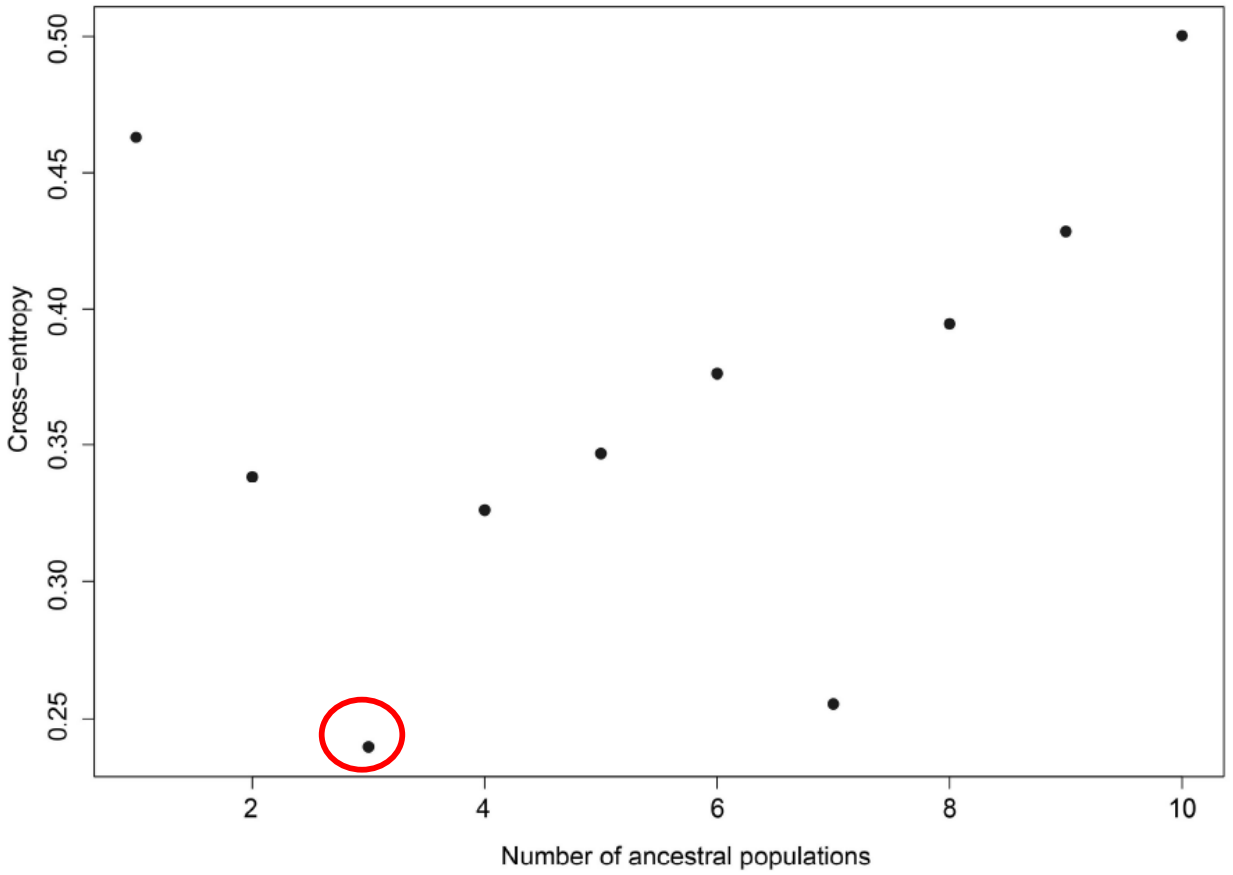


Figure 3. Cross-entropy values for each tested value of K.

Citation: Roop HJ, Whelan NV, Williams AS, Page J (2020) First record of occurrence and genetic characterization of a population of northern snakehead *Channa argus* (Cantor, 1842) in Georgia, USA. *BioInvasions Records* 9(4): 842–852, https://doi.org/10.3391/bir.2020.9.4.18

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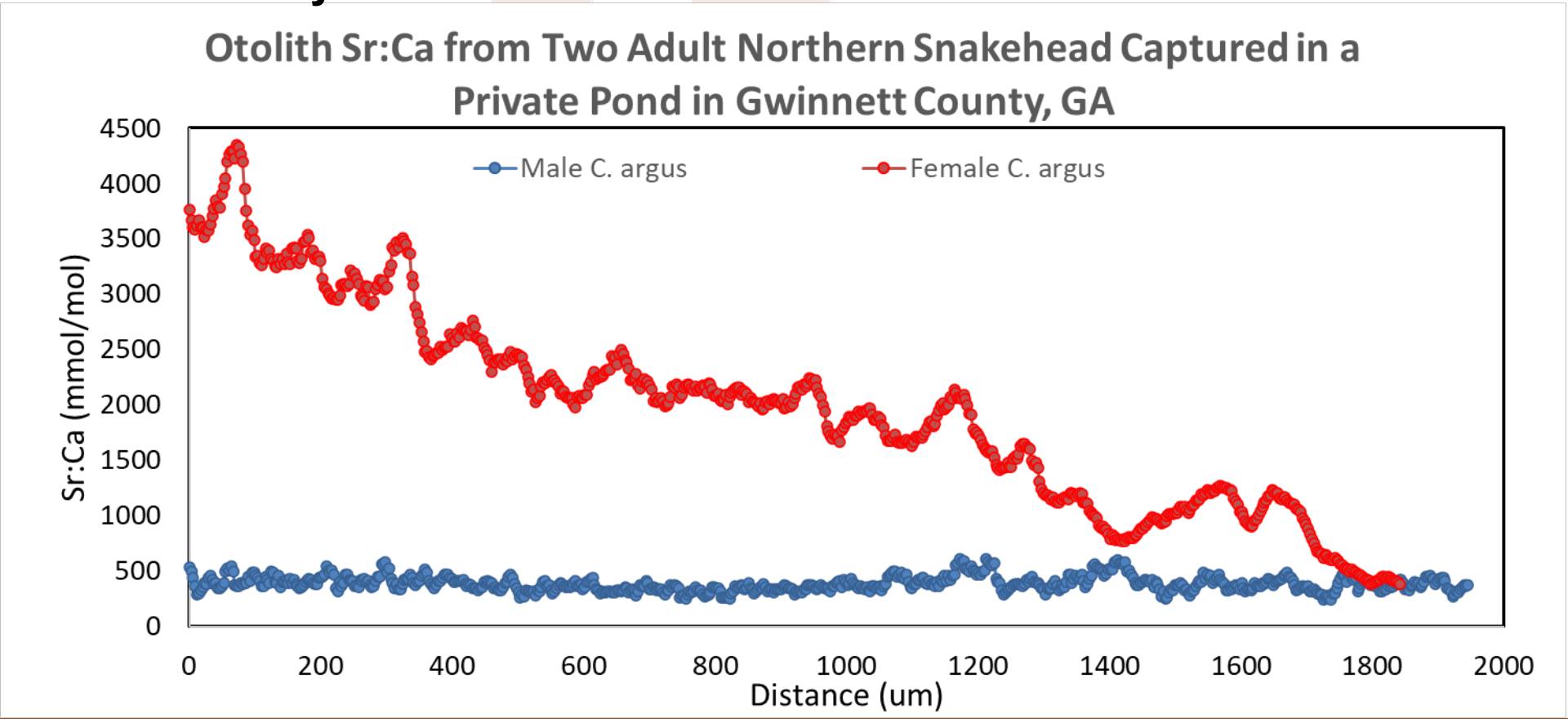
Microchemistry:



Monitoring

Objective: Continue field surveys for remnant snakehead populations

Electrofishing :

&

Monitoring

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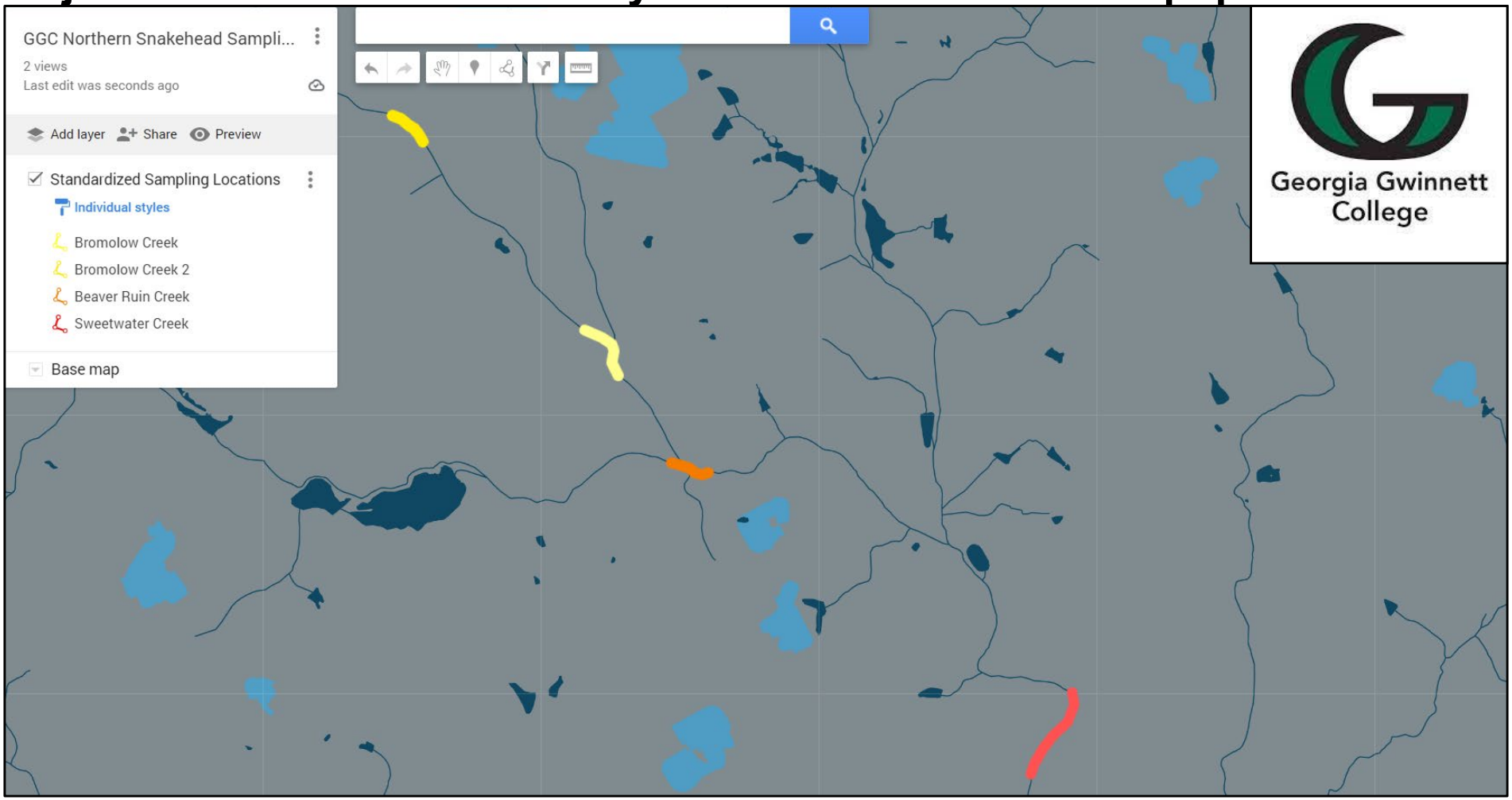

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Georgia Gwinnett College

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Recovery & Mitigation

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eDNA :

Recovery & Mitigation

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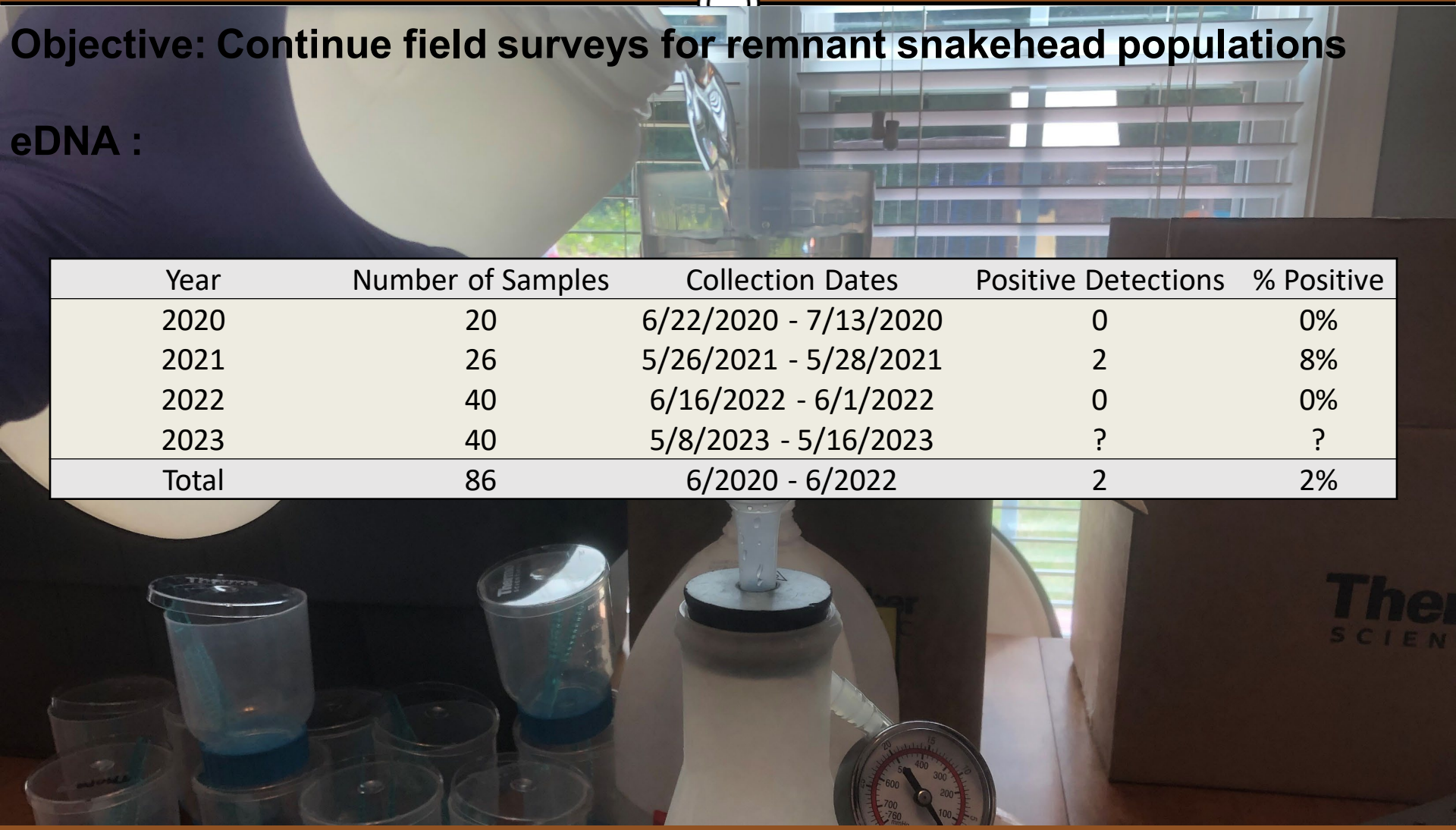
eDNA :

Year	Number of Samples	Collection Dates	Positive Detections	% Positive
2020	20	6/22/2020 - 7/13/2020	0	0%
2021	26	5/26/2021 - 5/28/2021	2	8%
2022	40	6/16/2022 - 6/1/2022	0	0%
2023	40	5/8/2023 - 5/16/2023	?	?
Total	86	6/2020 - 6/2022	2	2%



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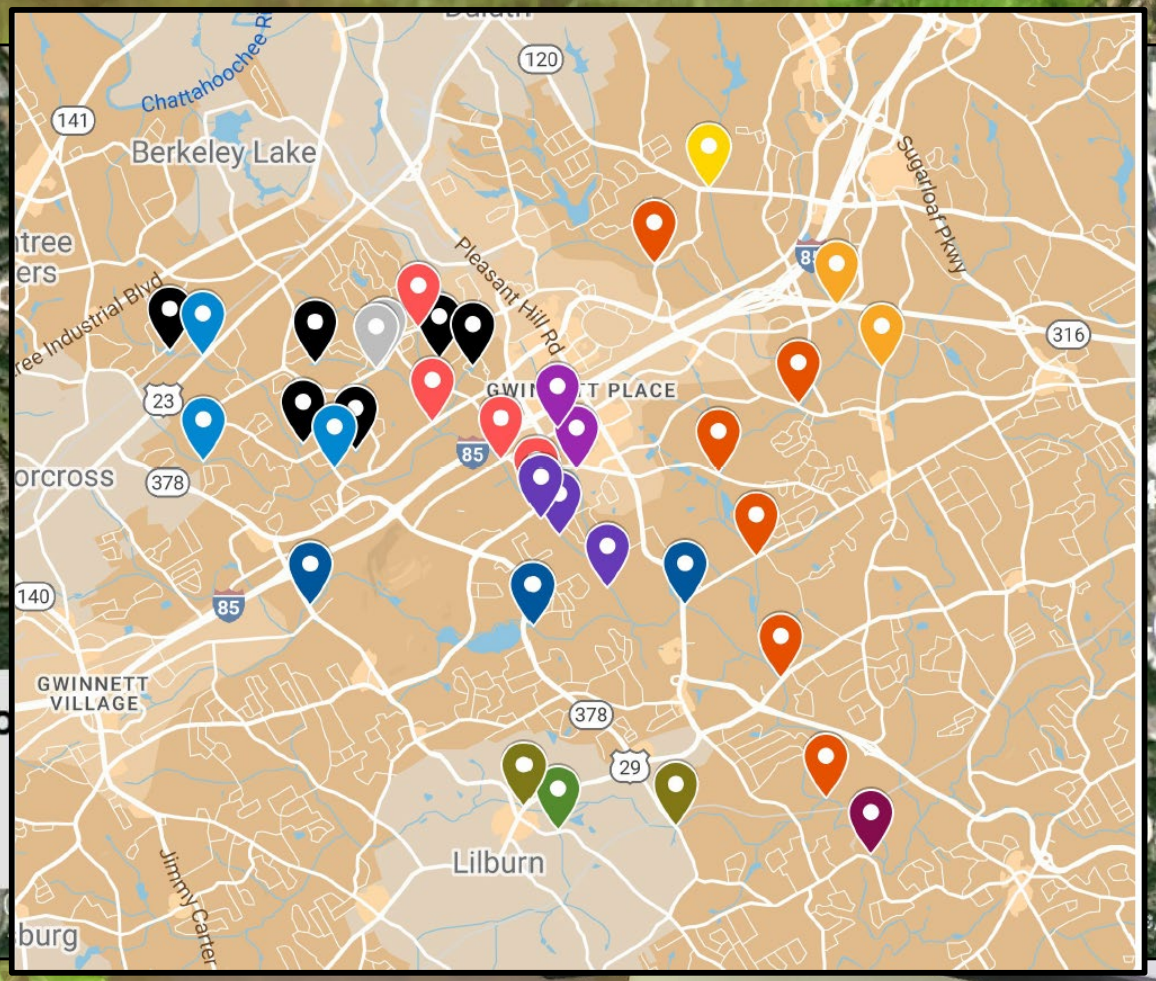

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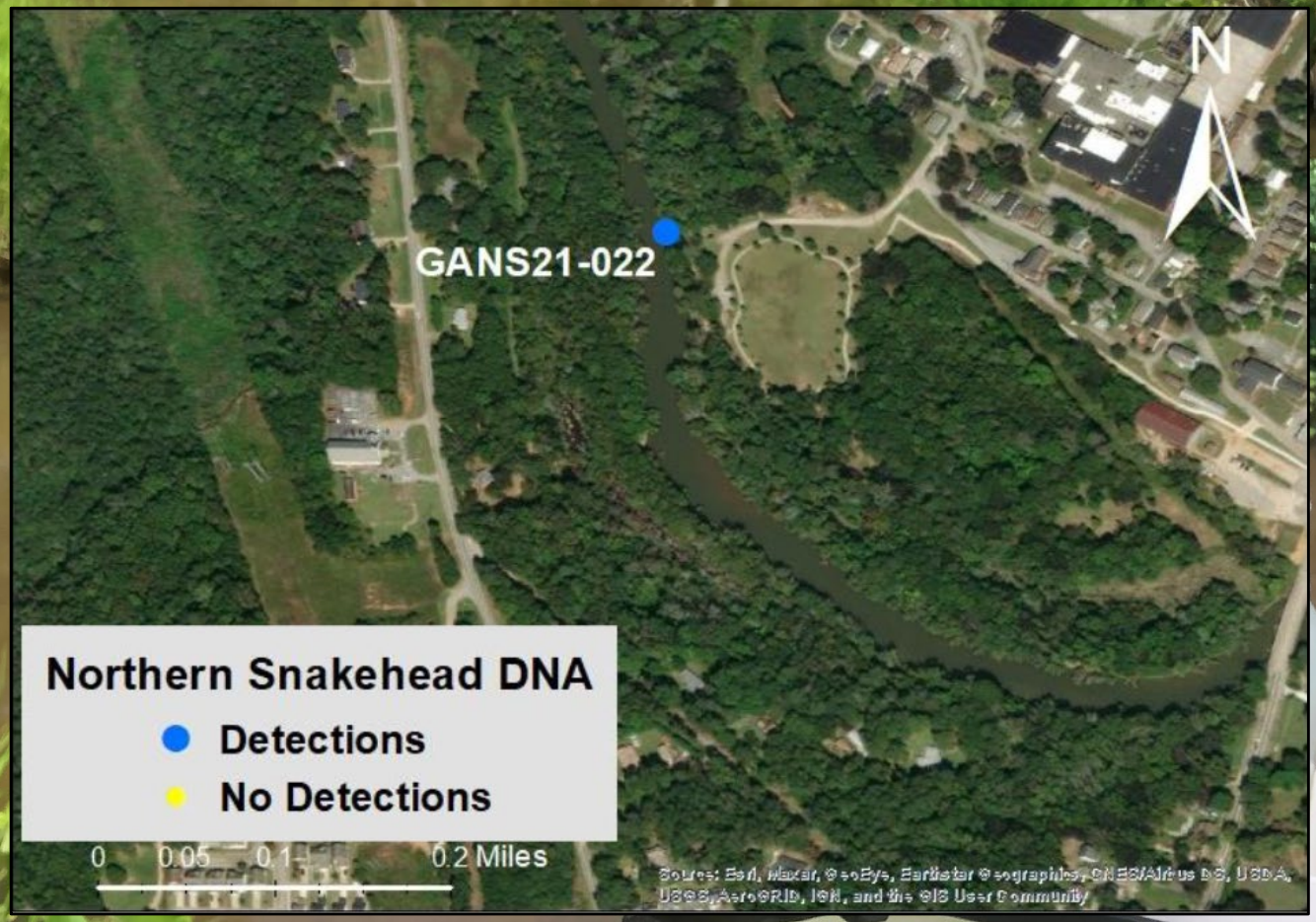
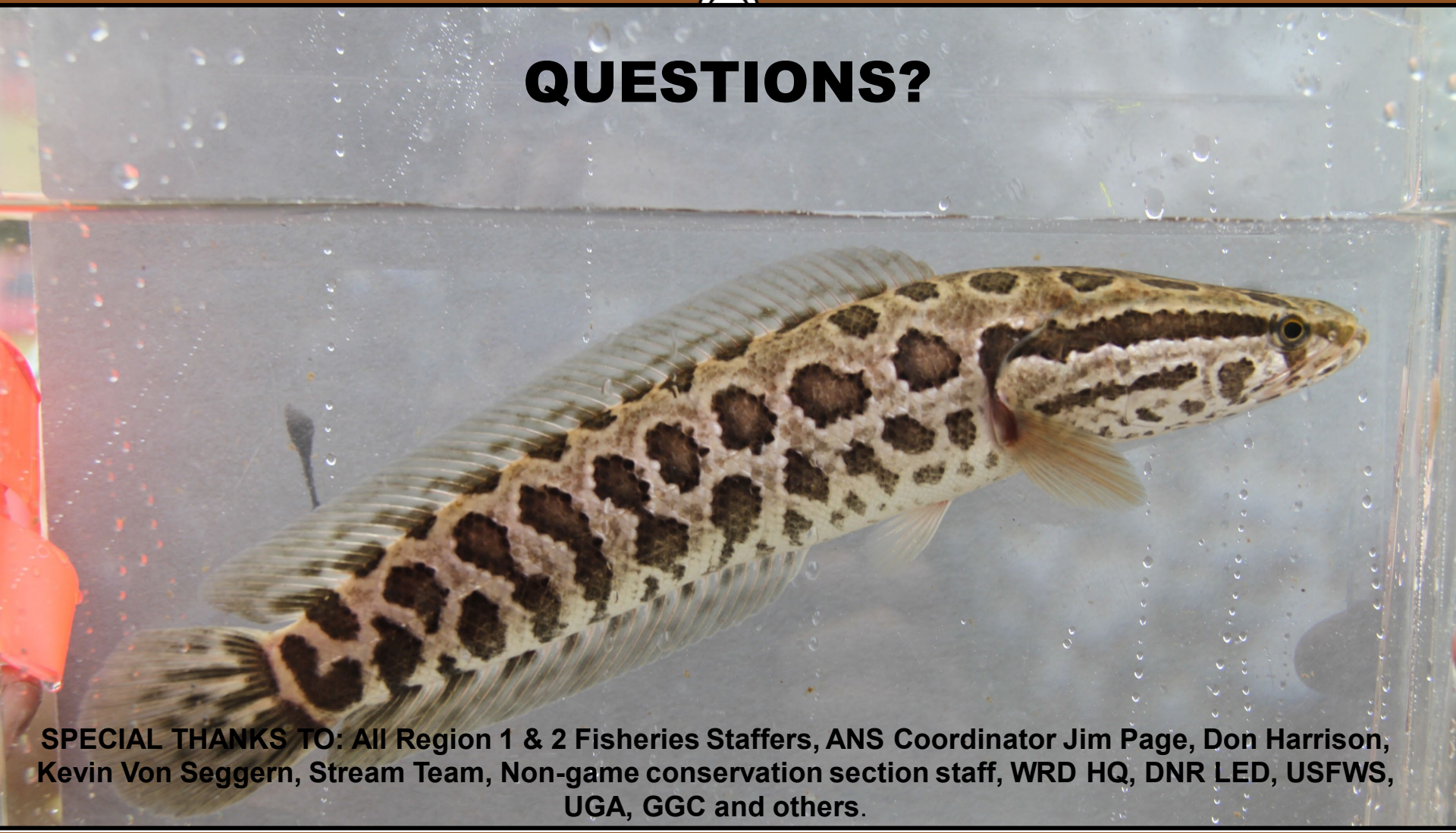


Summary

- Oct 2019: 34 northern snakehead collected from private pond and wetland.
- Genetics: The population was likely established by a small number of mature fish, two of which have been removed from the area.
- Microchemistry: There was a short window of opportunity for natural reproduction to occur in the pond prior to adult fish being removed.
- Monitoring: opportunistic and standardized surveys have yet to produce any more snakehead.
- eDNA: samples have only resulted in 2% positive detections, indicating the population is not widespread throughout the watershed.

Northern Snakehead



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