



Evaluation of Artificial Nest Structures and In-stream Habitat of Flathead Catfish in the Rock River Using Radio Telemetry Methods



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Project Objectives

- ◆ 1. Frequency of artificial nest use by flathead catfish identified using telemetry and sonar.
- ◆ 2. Determine nest site fidelity of males and females and spawning periodicity.
- ◆ 3. Determine amount of movement over dams between adjacent reaches and environmental conditions contributing to those movements.
- ◆ 4. Map river bottom in reach to identify and associate natural nesting areas and habitat use.



Flathead Catfish



Nebraska Game and Fish Commission

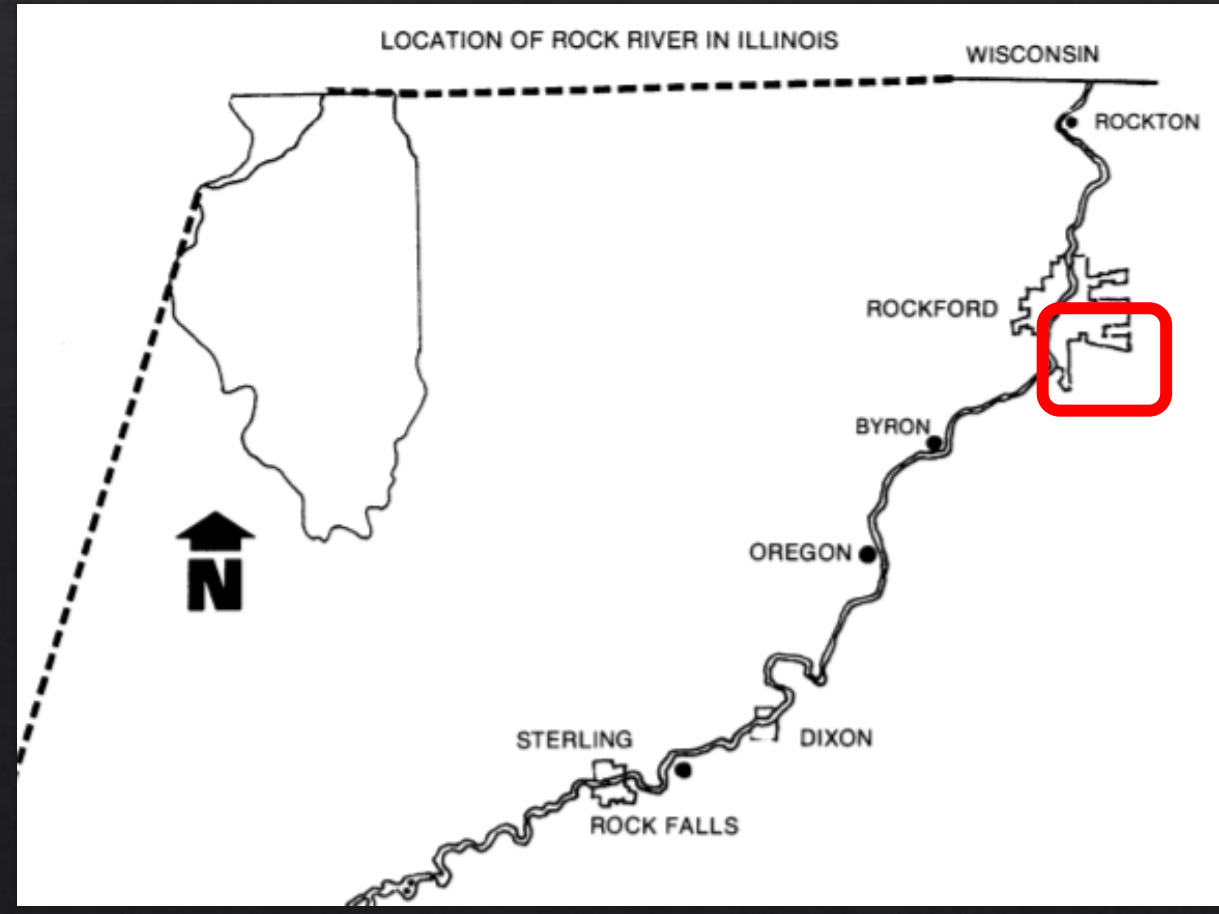


Texas Aquatic Science



Why

- ◆ Train cars carrying 95% ethanol derailed near Cherry Valley IL.
- ◆ Dumped about 60,000 gallons.
- ◆ 72,000 fish killed.



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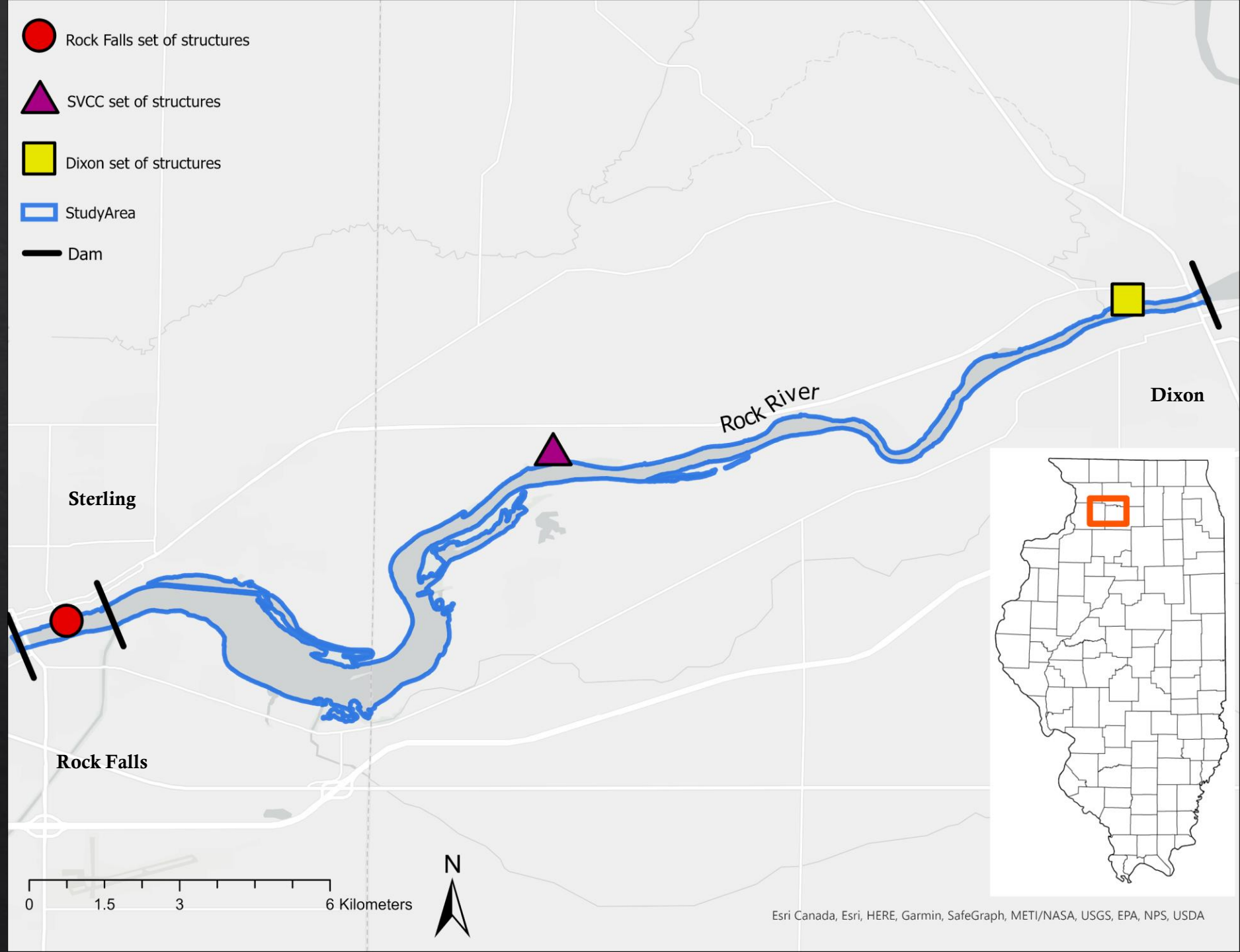
Artificial nest structures within the study reach








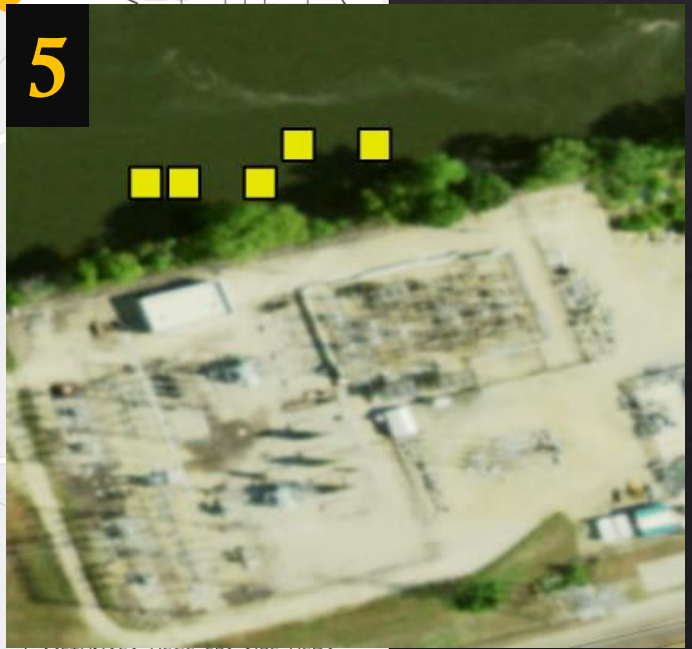
Photos from IDNR

Study Area, Rock River

-  Rock Falls set of structures
-  SVCC set of structures
-  Dixon set of structures
-  StudyArea
-  Dam



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-  SVCC set of structures
-  Dixon set of structures
-  StudyArea
-  Dam



Total = 20



Transmitter Implantation

N = 263 fish tagged



Stat	Length (mm)	Length (IN)	Weight (kg)	Weight (lbs)
Average	747	29.4	6.07	13.4
Max	1160	45.7	22.56	49.7
Min	516	20.3	1.51	3.2

Average Surgery Time:
04:32

External Sexing



**Males:
133**



**Females:
110**

LOTEK
MCFT2-3L
MC046594
67.720 MHz
ode: 112
4.5 Sec
return to
River
Station
000

Tracking

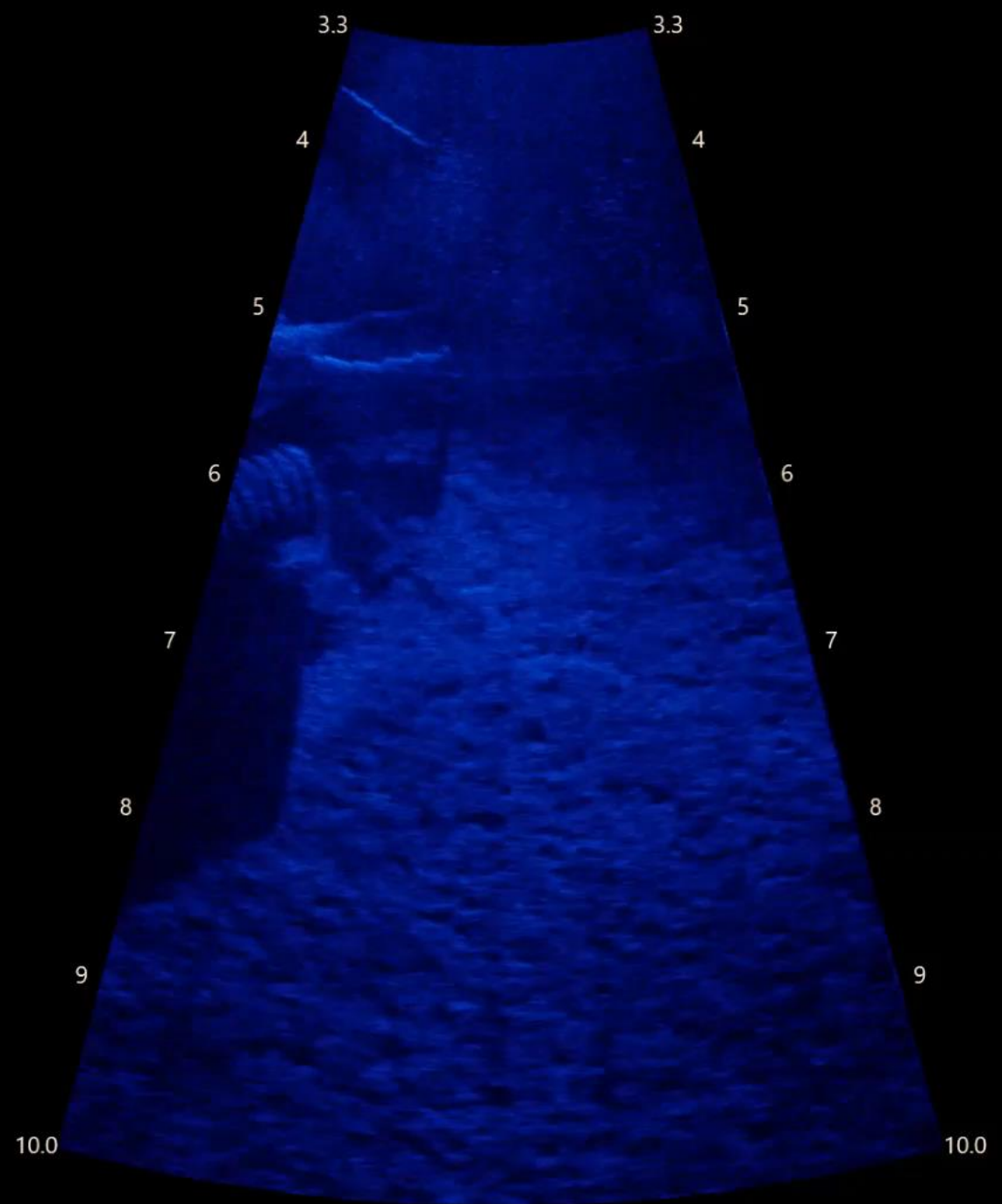
- ◇ 1. Frequency of artificial nest use by flathead catfish identified using telemetry and sonar.
- ◇ 2. Determine nest site fidelity of males and females and spawning periodicity.



Aris Sonar

No tagged fish have been detected
at any artificial nest structures

No indication that untagged fish are
using the nest structures either



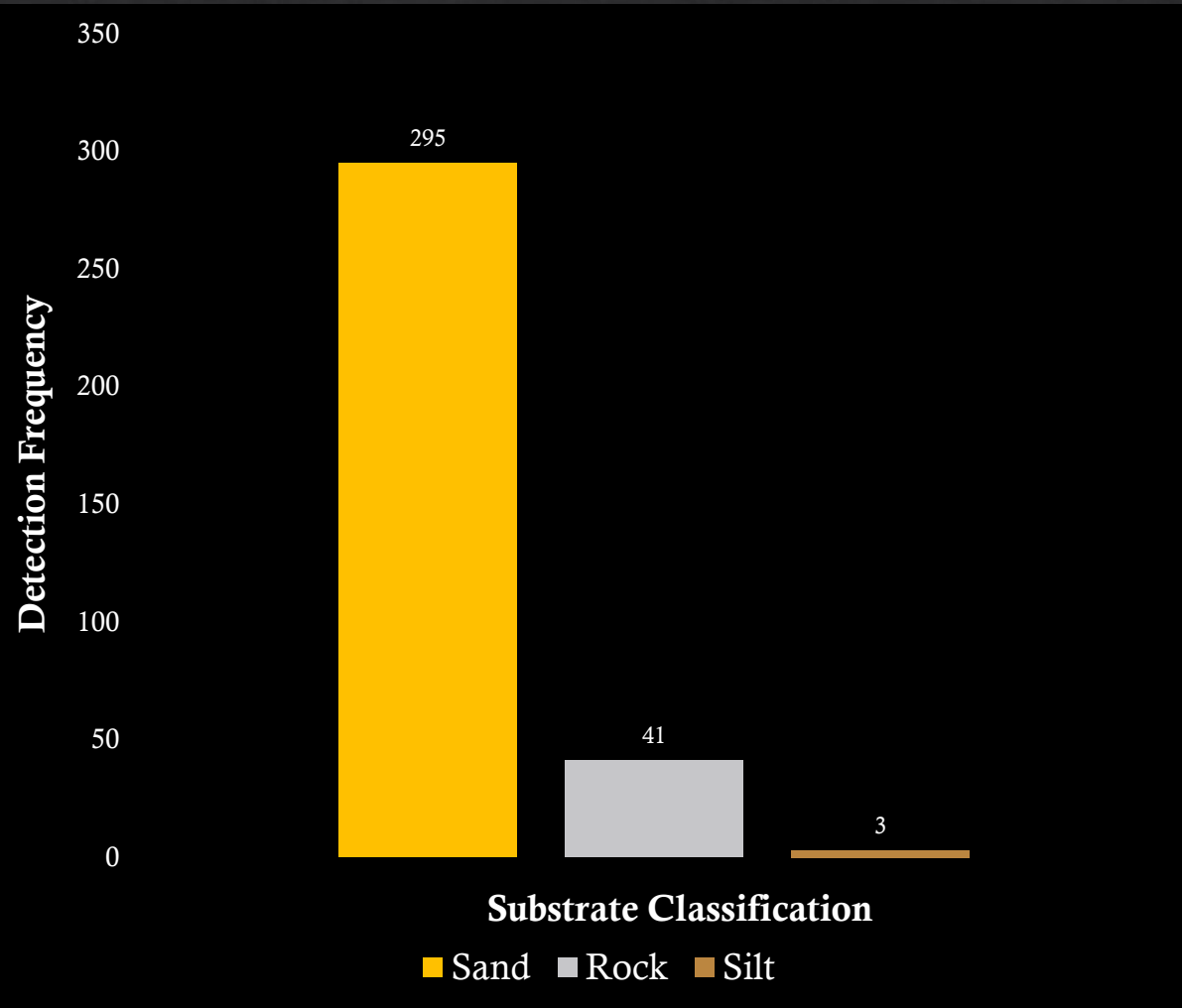
Tracking Results

- 238 tags were implanted for 2021 season
- 157 tags were detected (66%)
- In possession of 18 tags
 - 4 angler caught fish
 - 13 retrieved from shallow water

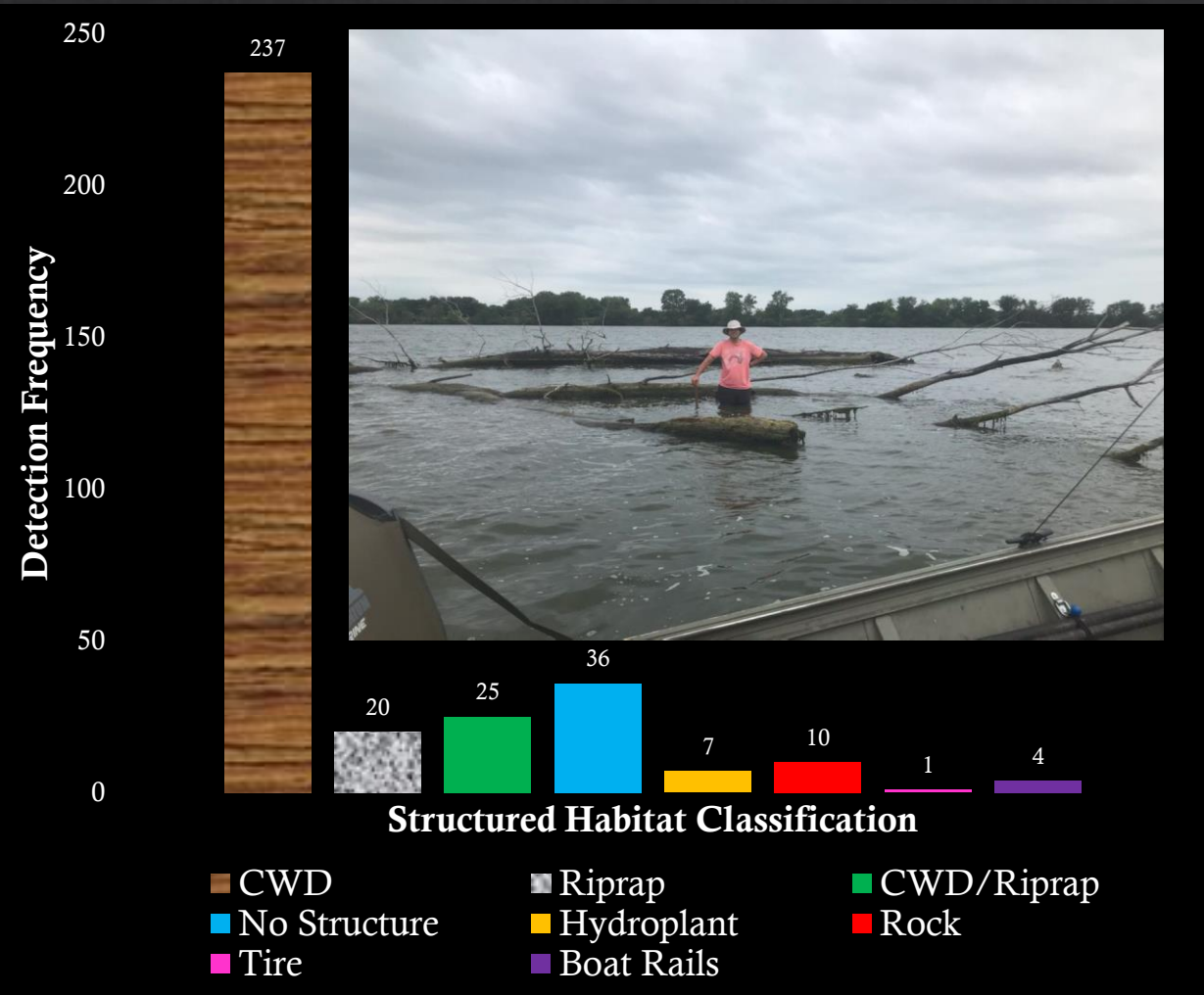


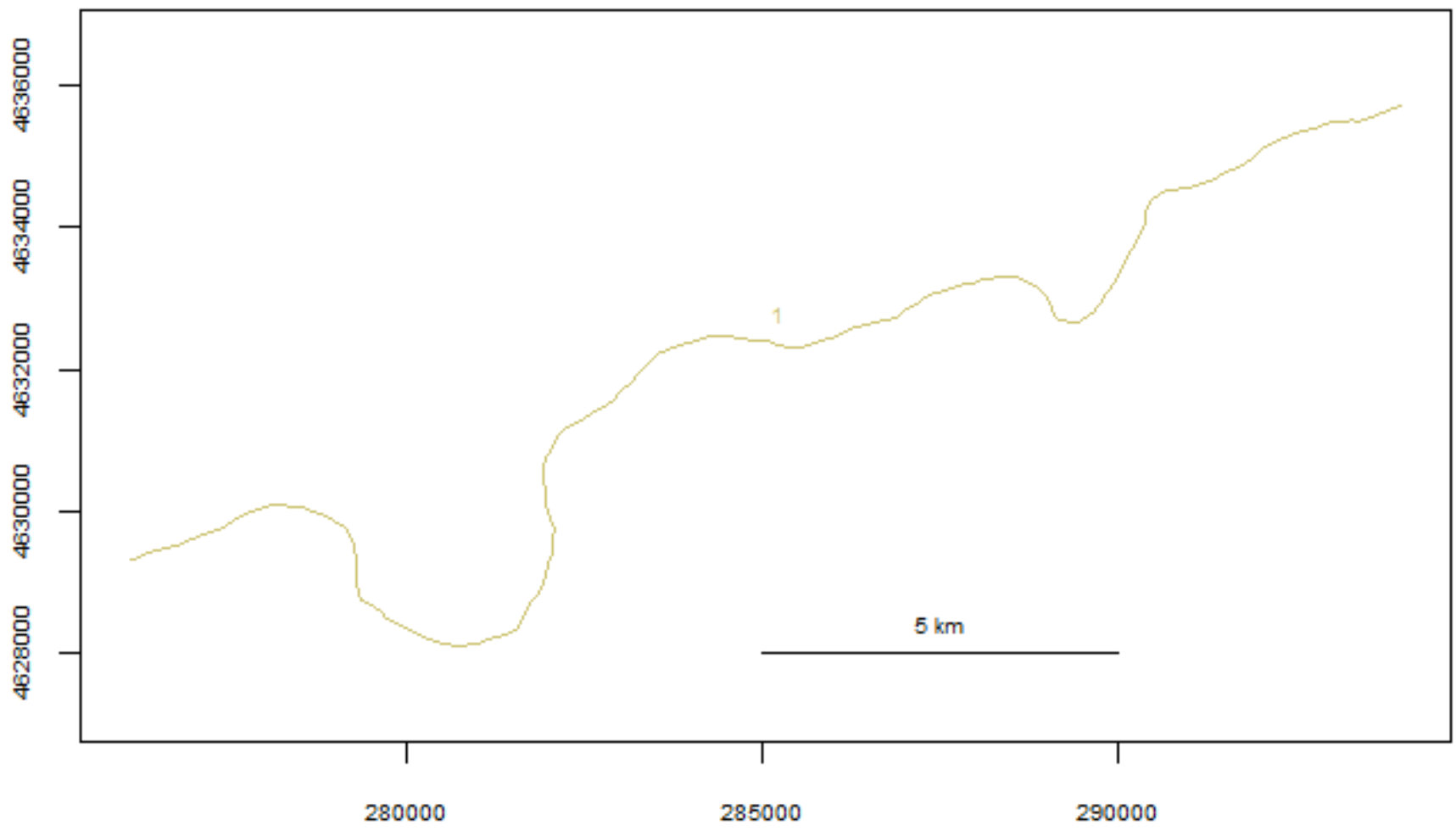
Tracking Results

Substrate

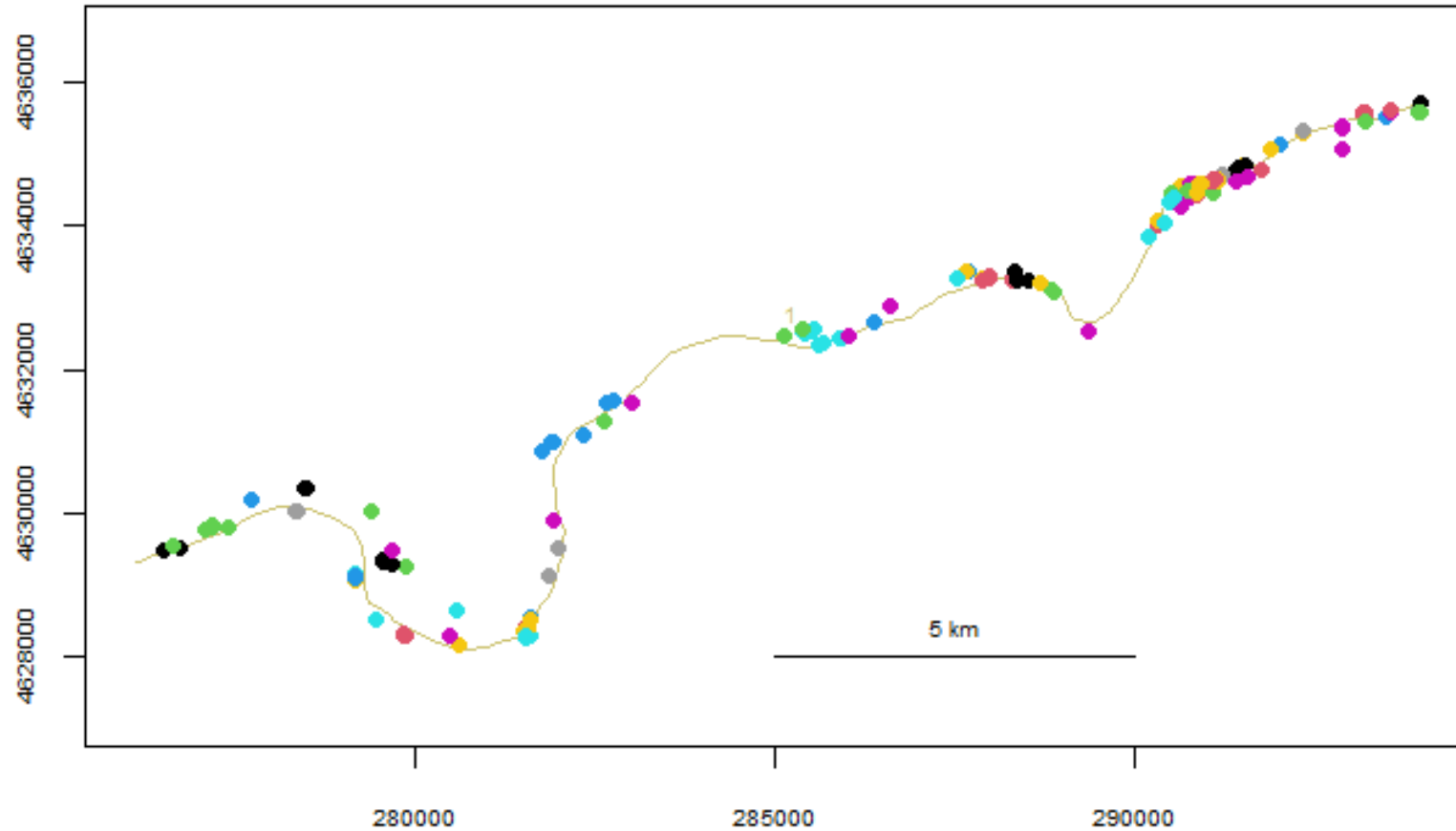


Structured Habitat

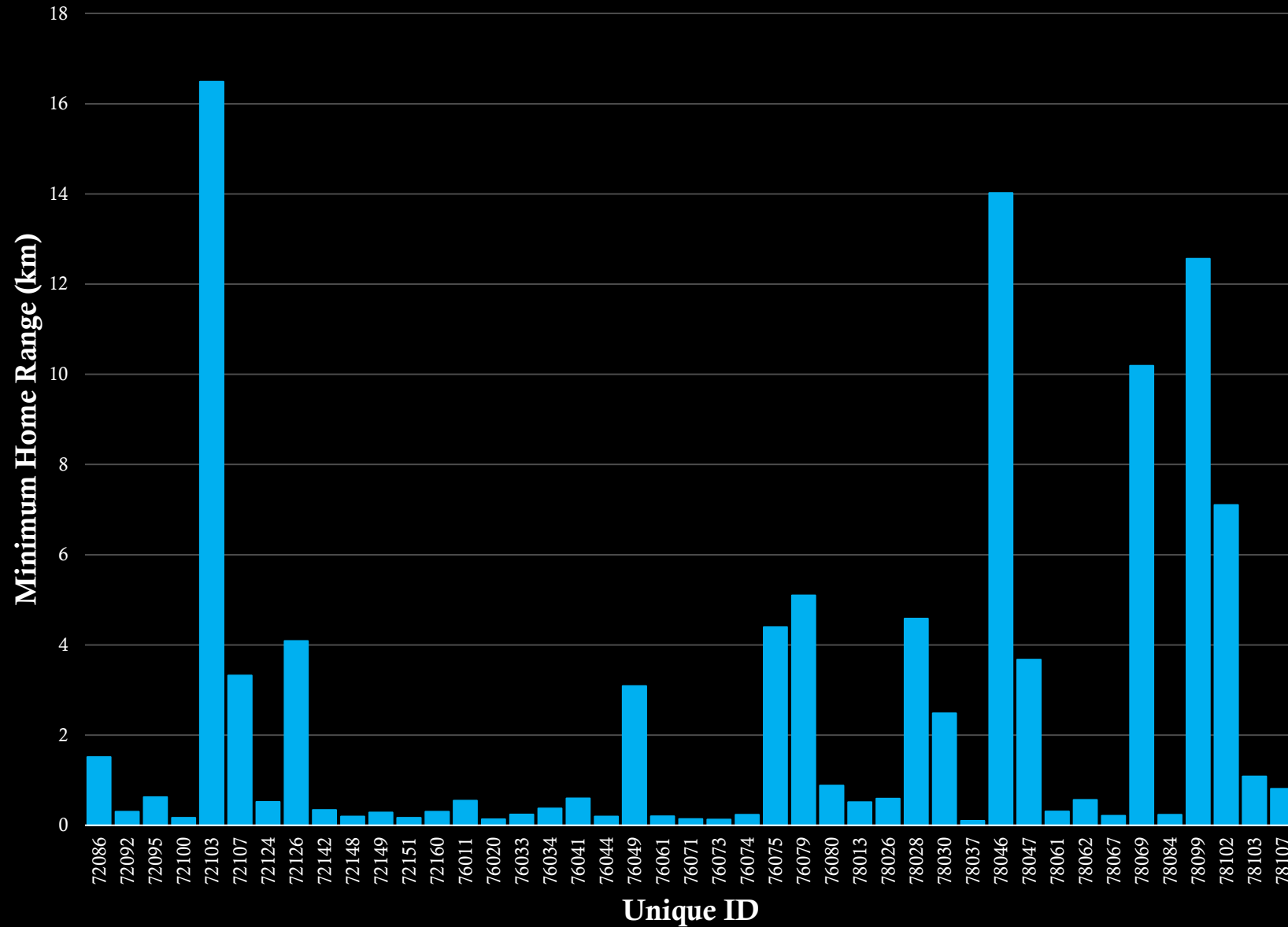




Tagged Fish Locations



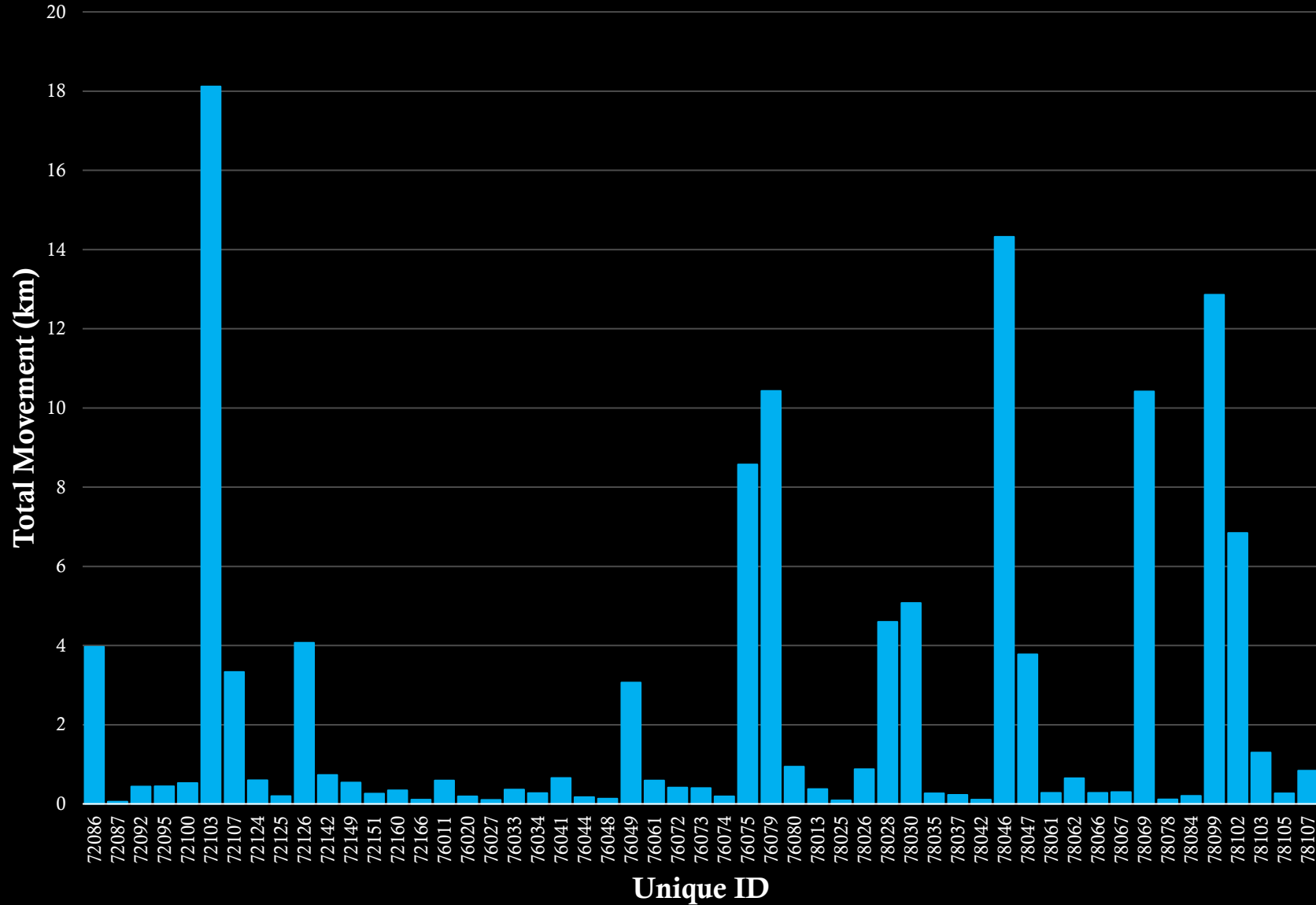
Minimum Home range



N= 43

Average = 2.4km

Total Movement



N= 53

Average = 2.36km

58 tags only
located once

Stationary Receivers

- ◆ Determine amount of movement over dams between adjacent reaches and environmental conditions contributing to those movements.

Fish:166.776-84

Tagged: Oct-14-2020

Length: 896mm (35.3 Inches)

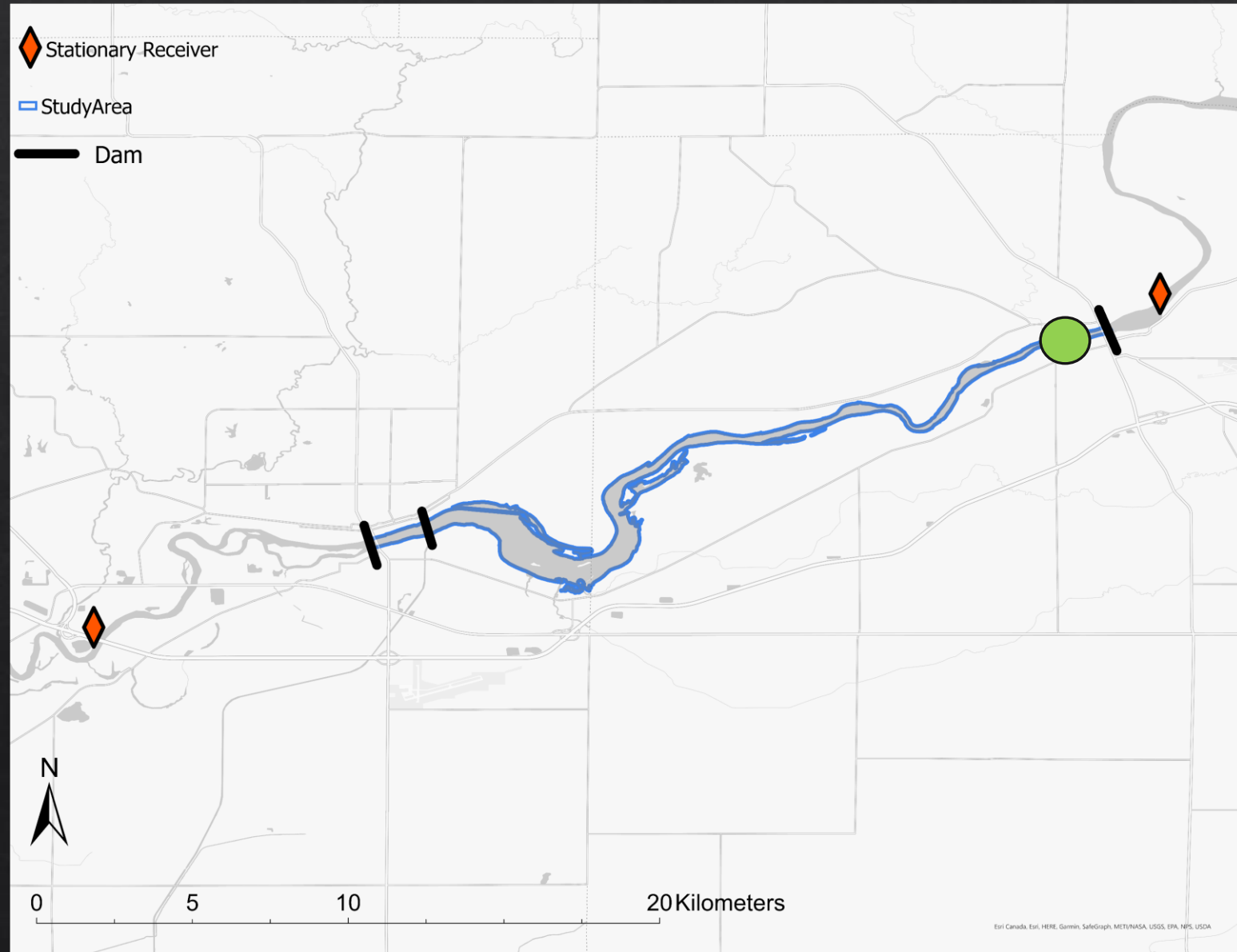
Weight: 9.25kg (20.4 lbs)

Fish:166.776-43

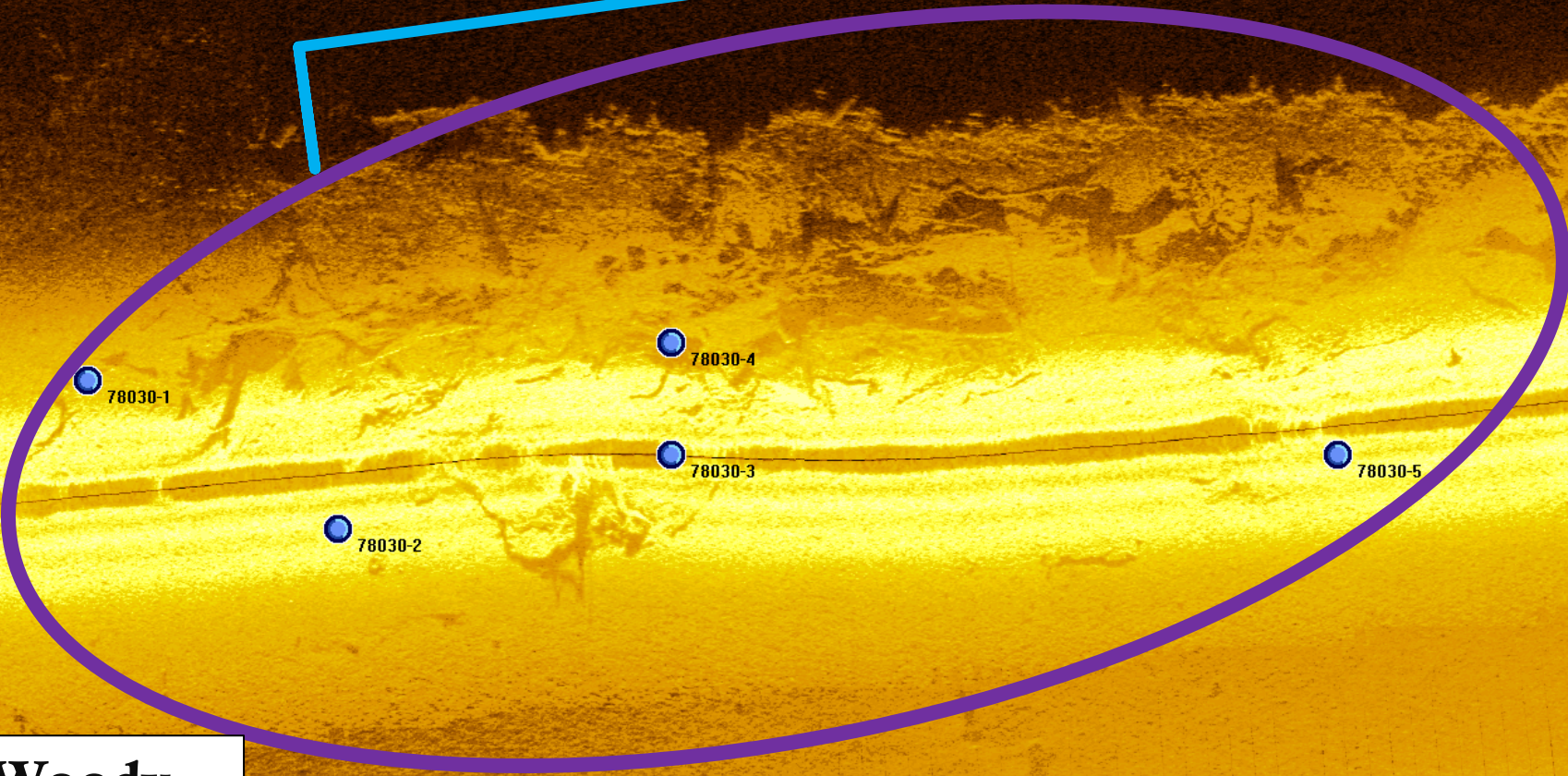
Tagged: Oct-16-2020

Length: 688mm (27 Inches)

Weight: 3.48kg (7.7 lbs)



Rip-Rap

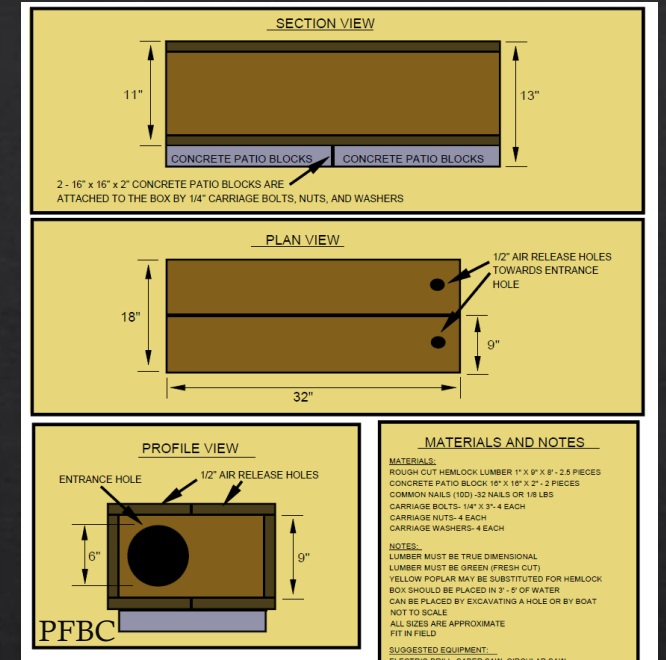


**Course Woody
Debris**

◇ Map river bottom in reach to identify and associate natural nesting areas and habitat use.

Future Ideas

Current Design



Looking Forward

N=23

Length Range: 23.8 - 42.4 inches

Weight Range: 5.4 – 40.6 lbs

Flathead Catfish Head Widths
(inches)

Average: 6.7

Max: 10

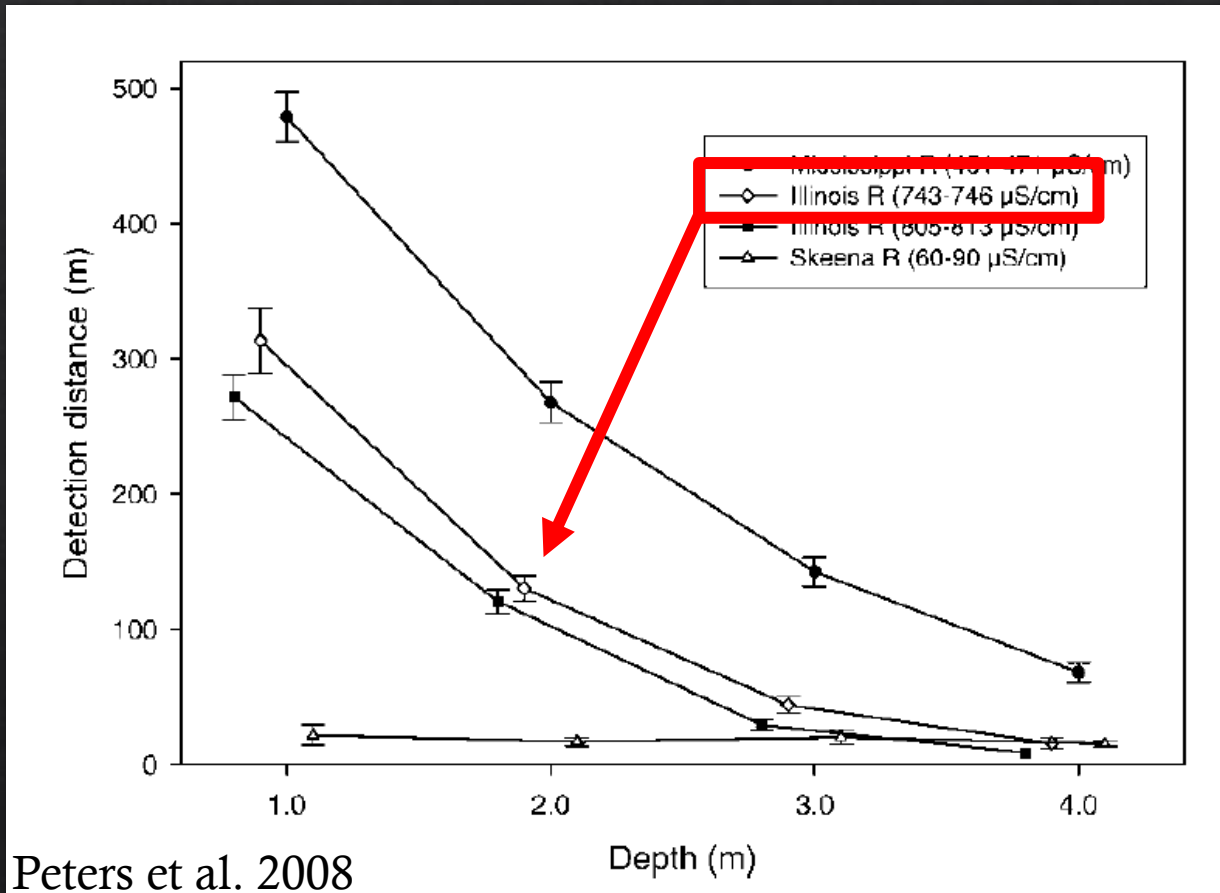
Min: 4.5



Questions/Discussion

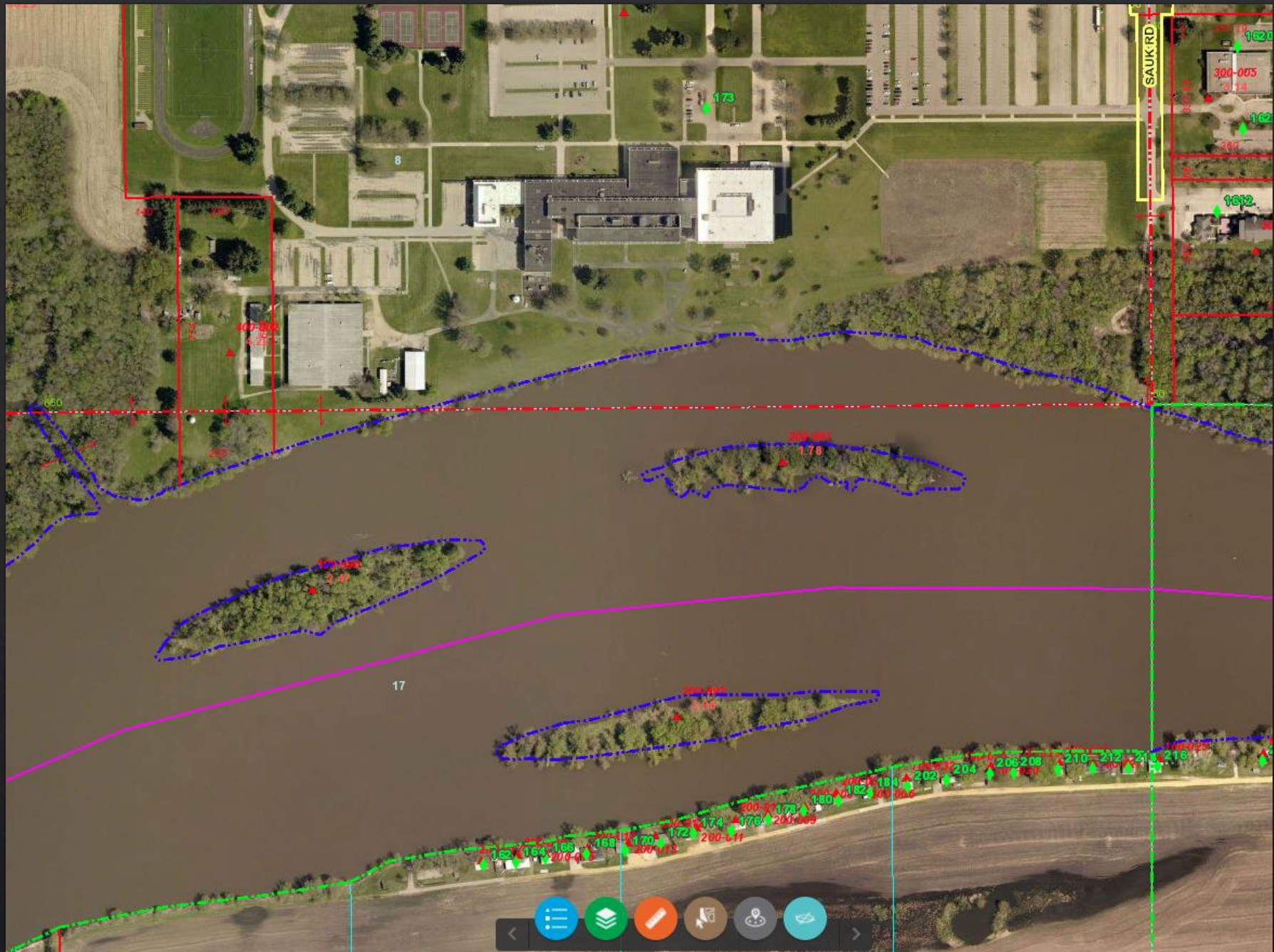


Radio Telemetry Factors

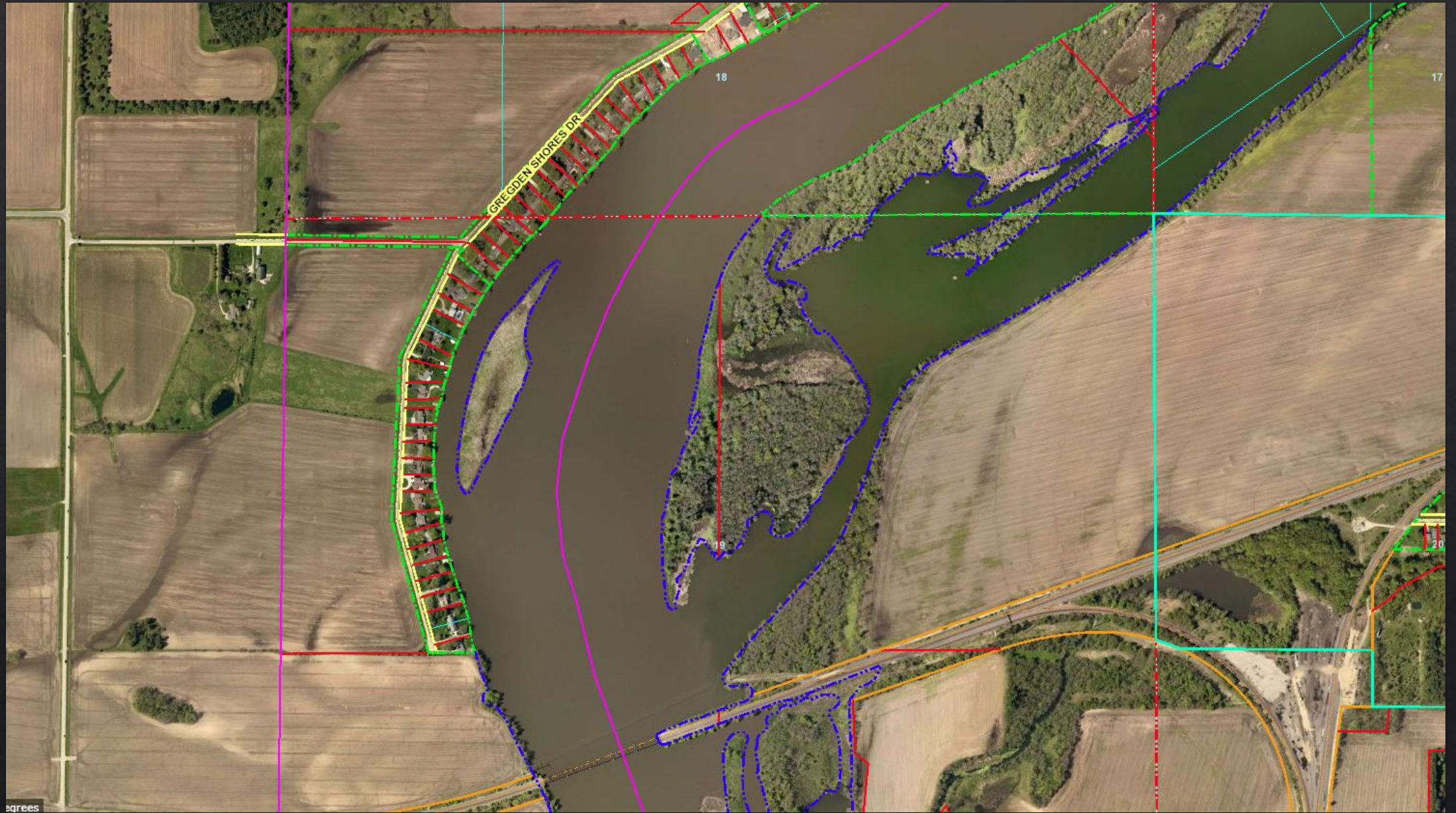


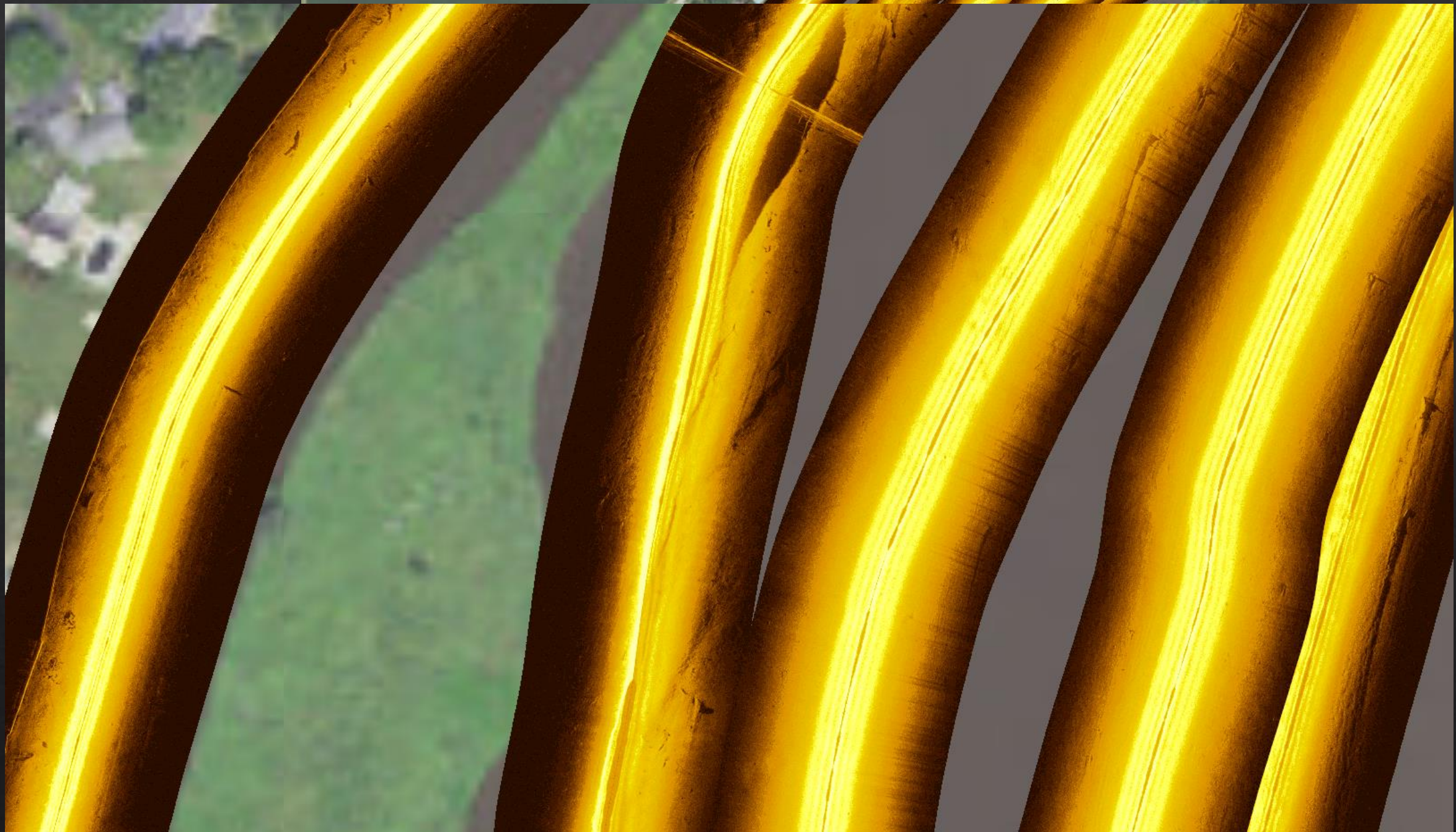
Rock River Conductivity Range:
600-700 $\mu\text{S/cm}$

Peters et al. 2008

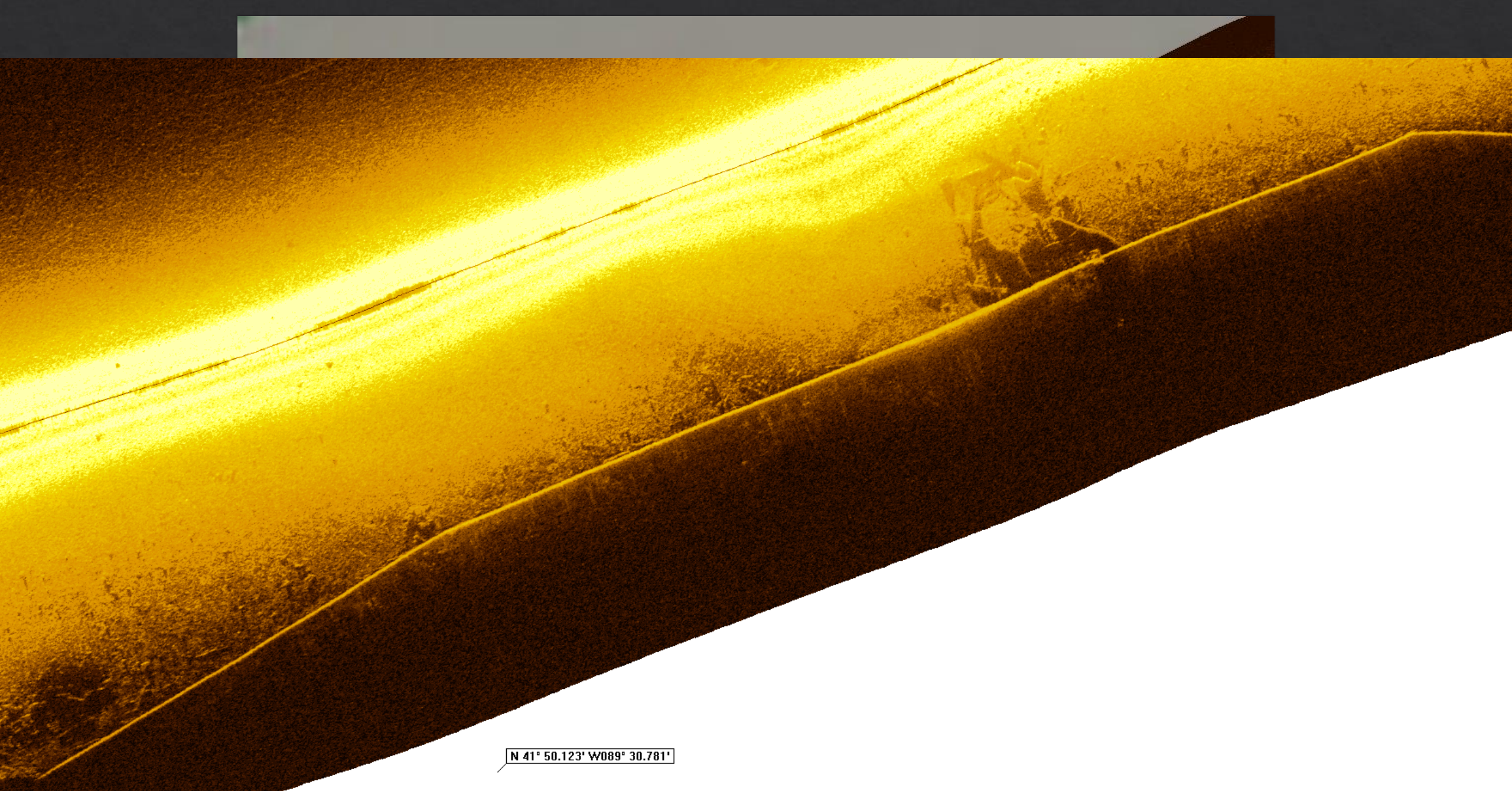












N 41° 50.123' W089° 30.781'