Shovelnose Sturgeon and Paddlefish populations and movements in the Minnesota River

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DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

LCCMR & ENRTF

Legislative-Citizen Commission on Minnesota Resources:
Committee whose primary function is to make funding recommendations to the Minnesota legislature for special ENRTF projects, and provide oversight for all funded projects.

Environment and Natural Resources Trust Fund: *Created to provide a long-term, consistent, and stable source of funding for innovative activities directed at protecting and enhancing Minnesota's environment and natural resources for the benefit of current citizens and future generations. Seven cents from every dollar spent on playing the Minnesota lottery is contributed to the trust fund.*

The Minnesota River is being impacted by changing land use, climate, invasive species, and conservation efforts

Invasive Species

Climate Change
Land Conversion
Conservation Practices

Predation

Competition

Temperature

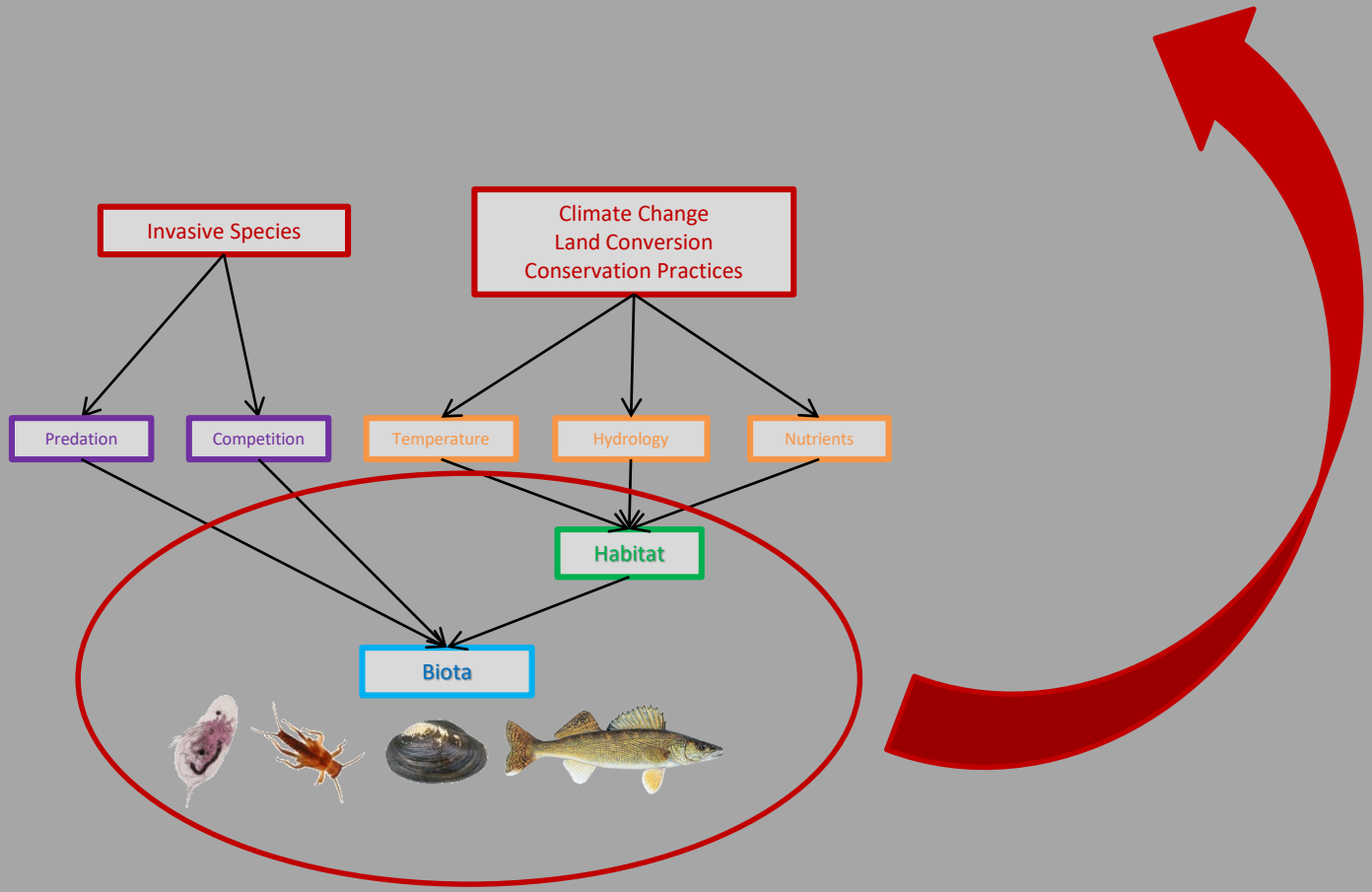
Hydrology

Nutrients

Habitat

Biota

Problem: There are hypothesized and anticipated impacts to the Minnesota River ecosystem (biota and habitat), but we lack the data and understanding to adequately predict and quantify these future impacts



How will

impact

in the Minnesota River ecosystem?

How will

IMPACT

in the Minnesota River ecosystem?

Evaluate population dynamics, movement, and habitat use of sensitive fish species (Shovelnose Sturgeon and Paddlefish)

Sturgeon and Paddlefish Background

27 unique species with ancient origins

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Some endangered and all in need of conservation

MN River SLS & PAH Background

Thought to be historically abundant in the MN River

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Few studies have targeted PAH or SLS

Studies that targeted SLS caught relatively few

Incidental catches have increased in recent years

Objectives

Evaluate population dynamics and movements of Shovelnose Sturgeon and Paddlefish in the Minnesota River

Project Outline

Establish stationary receiver array

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Sample Shovelnose Sturgeon and Paddlefish throughout the Minnesota River

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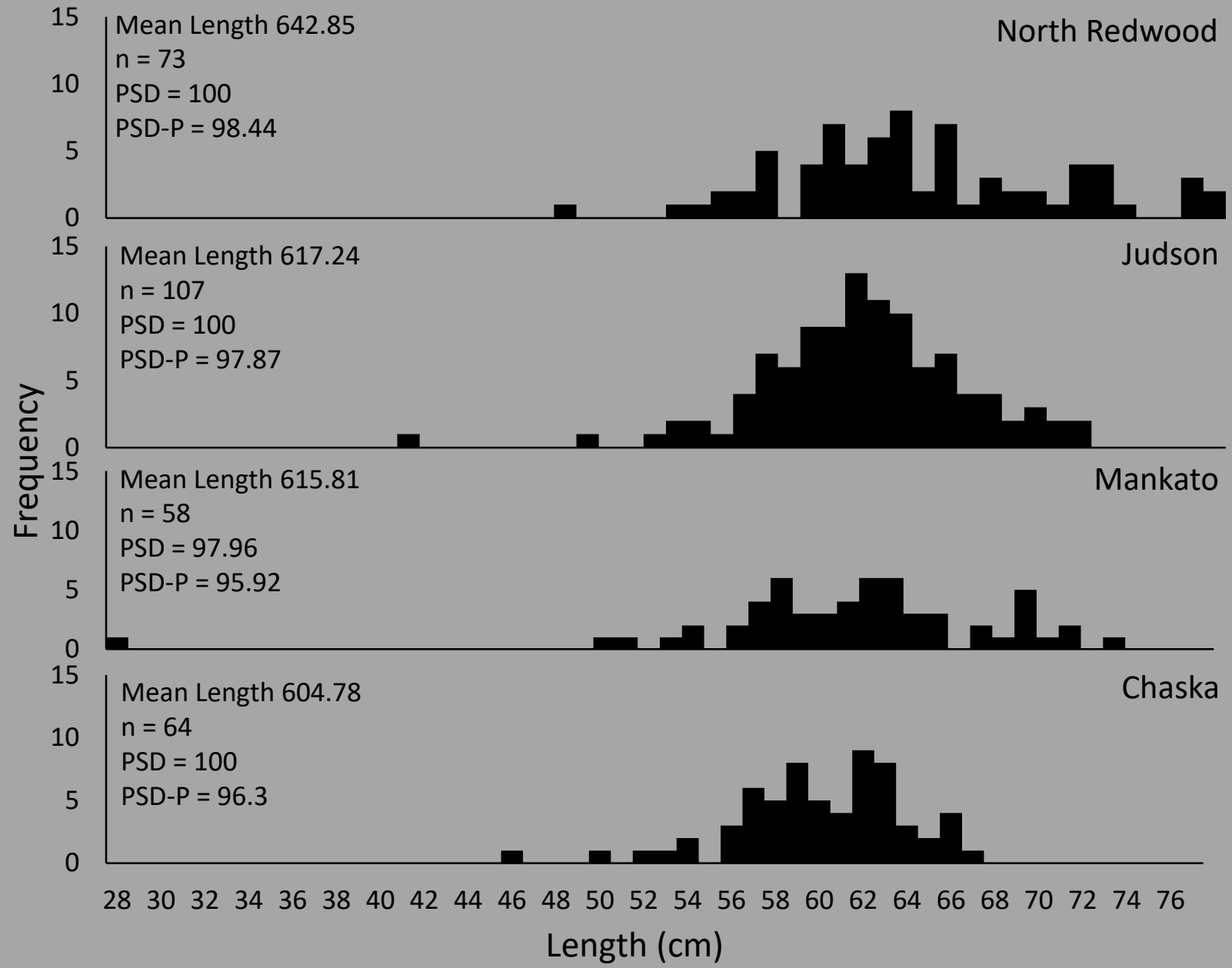
Age Sturgeon and organize data

Sturgeon & Paddlefish Sampling

Site	Shovelnose Sturgeon	Paddlefish
Upper Sioux Agency State Park		10
North Redwood	73	
Judson	107	
Mankato	58	6
St. Peter		50
Chaska	64	

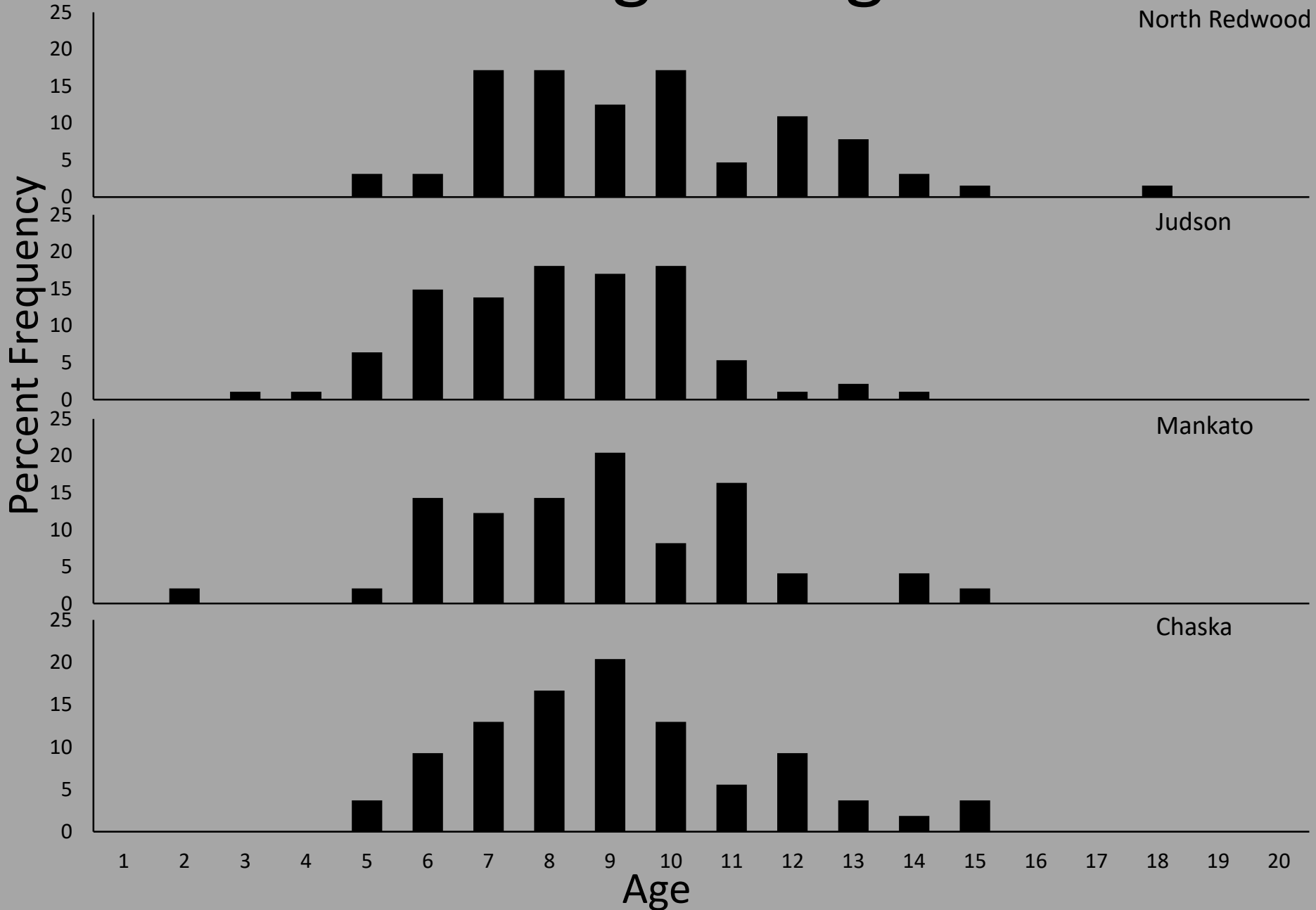
Sturgeon Sampling



Sturgeon aging

- Difficult to age
- Typically a high degree of disagreement between readers
- We found 87.4% agreement within 1 year and 98.9% agreement within 2 years

Shovelnose Sturgeon Age Structure



Stationary Receivers

Each receiver is uploaded every spring and fall

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Pool 2

1 Paddlefish
1 White Bass
2 Common Carp
2 Smallmouth Buffalo
6 Bigmouth Buffalo

Pool 3

1 Paddlefish

St Croix

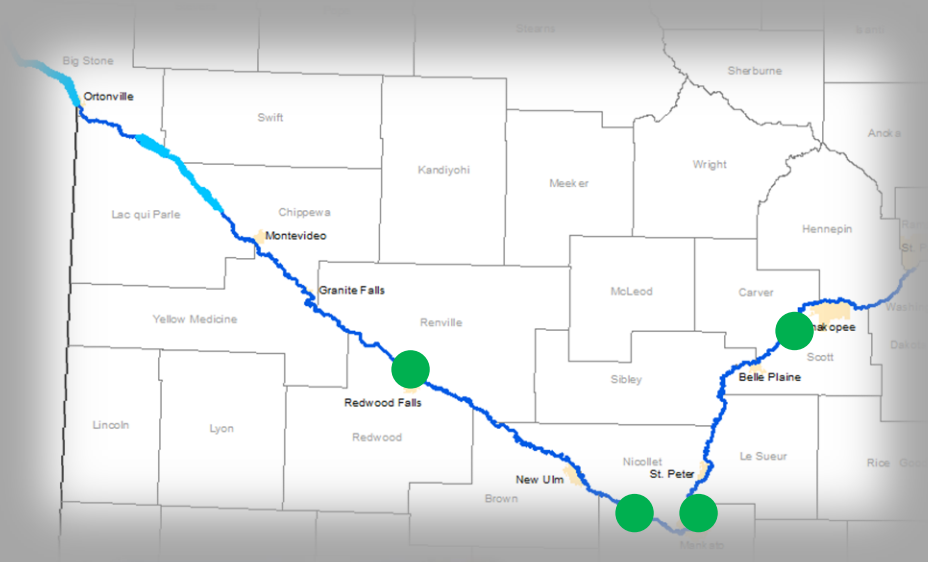
1 Paddlefish

MN River

6 Paddlefish
17 Shovelnose Sturgeon

Shovelnose Sturgeon Telemetry

- 36 implanted in Fall 2016 and Spring 2017 at 4 sites
  - North Redwood
  - Judson
  - Mankato
  - Chaska
- Sites were spaced along 170 river miles
- Tagging sites were monitored by drifting through the area with a Vemco VR100



Shovelnose Sturgeon Telemetry

- Most fish stayed near tagging sites
- 2 made medium scale upstream movements (less than 10 miles)
- 3 made largescale movements (over 50 miles)
  - 2 downstream
  - 1 upstream

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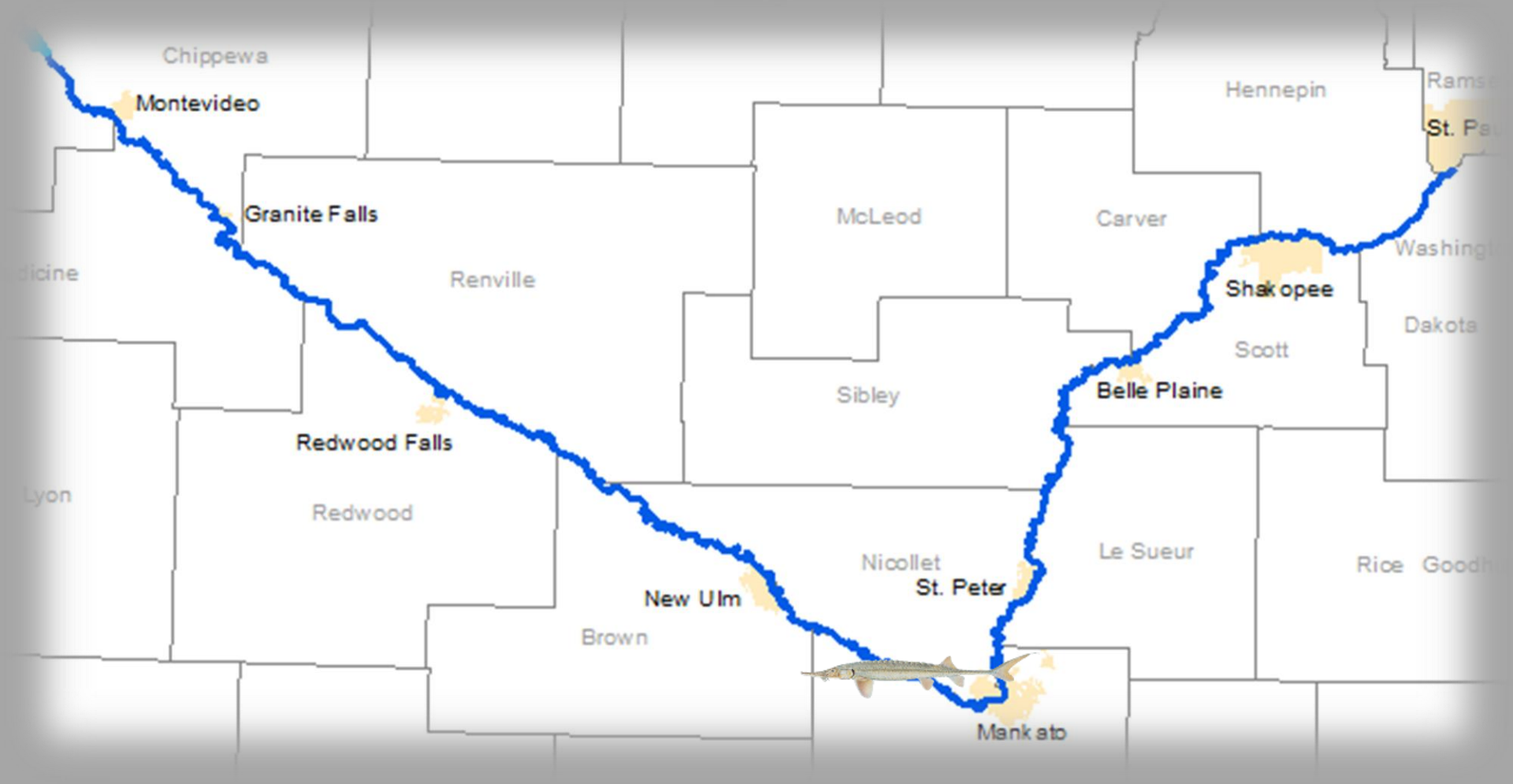
Shovelnose Sturgeon #52309



Tagged 10/12/16 and detected 10/19/16, 10/28/16 and 5/9/17

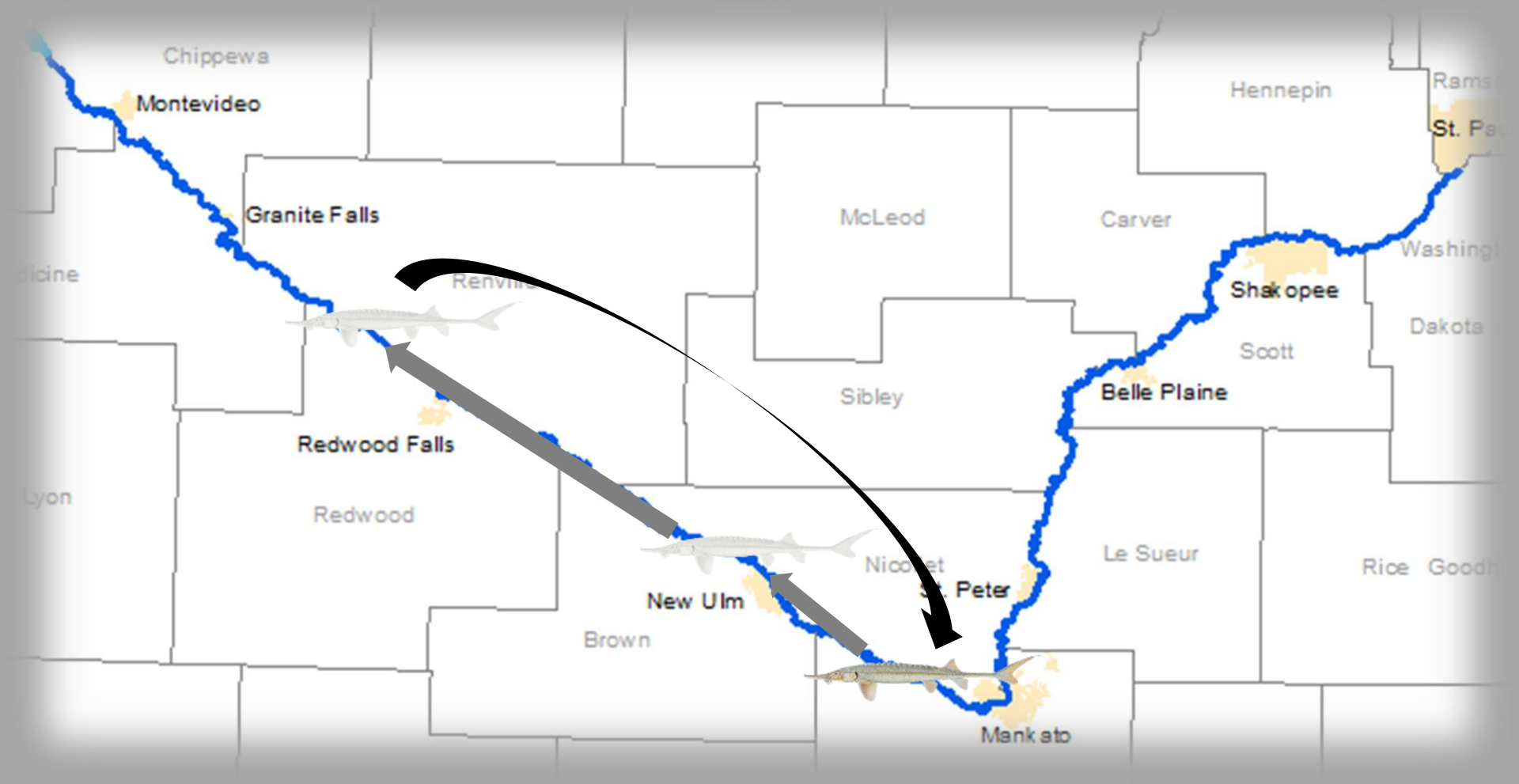
Shovelnose Sturgeon #52309

Detected 6/9/17

Shovelnose Sturgeon #52309

Detected 7/5/17

Shovelnose Sturgeon #52309



Detected 8/8/17

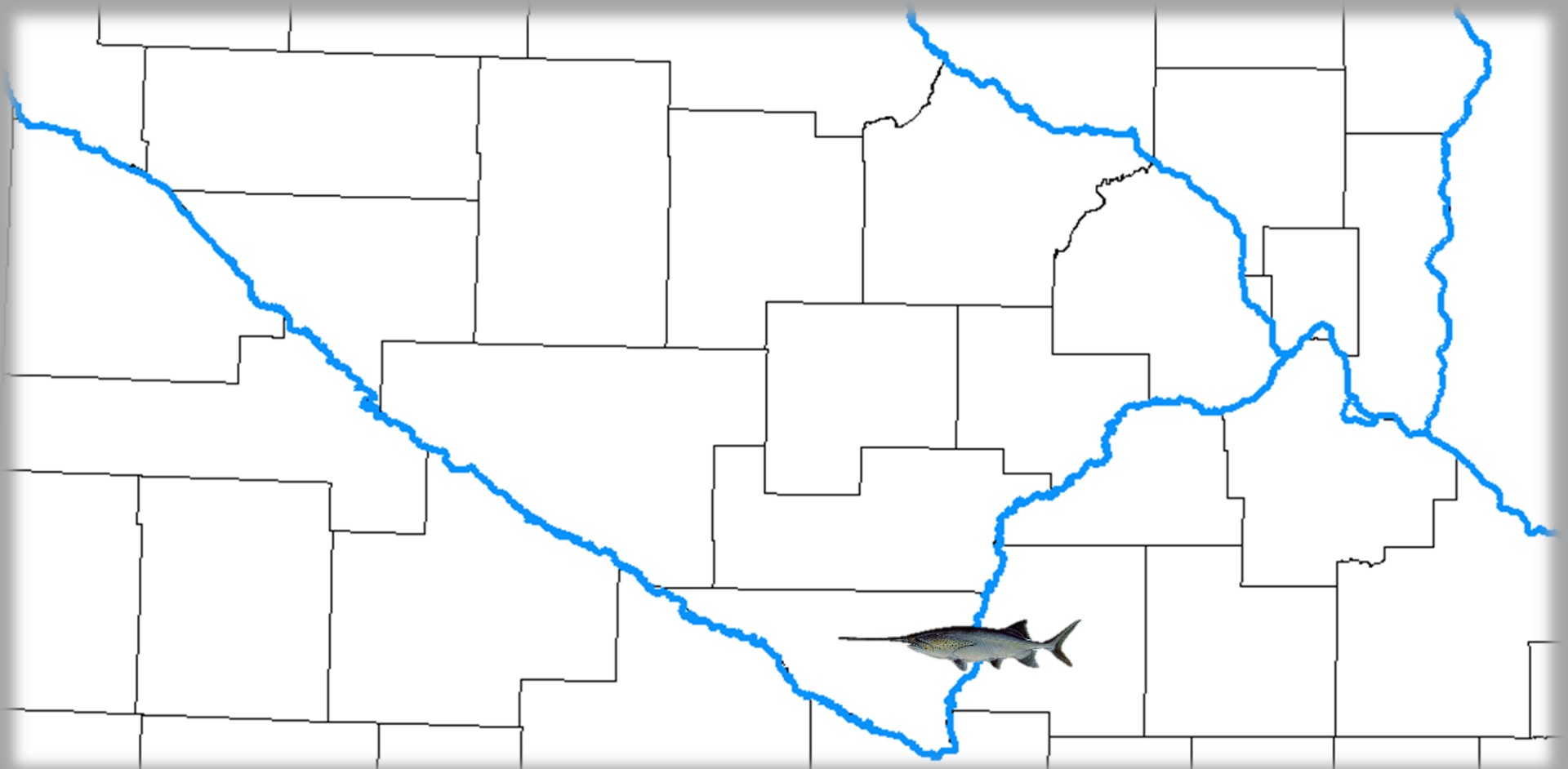
Paddlefish Telemetry

- Initially implanted 4 near St. Peter in August 2016
- Implanted 7 near Upper Sioux Agency State Park in June 2017
- Implanted 3 near St. Peter in September 2017
- Tagging sites were monitored by drifting through the area with a Vemco VR100

Paddlefish Telemetry

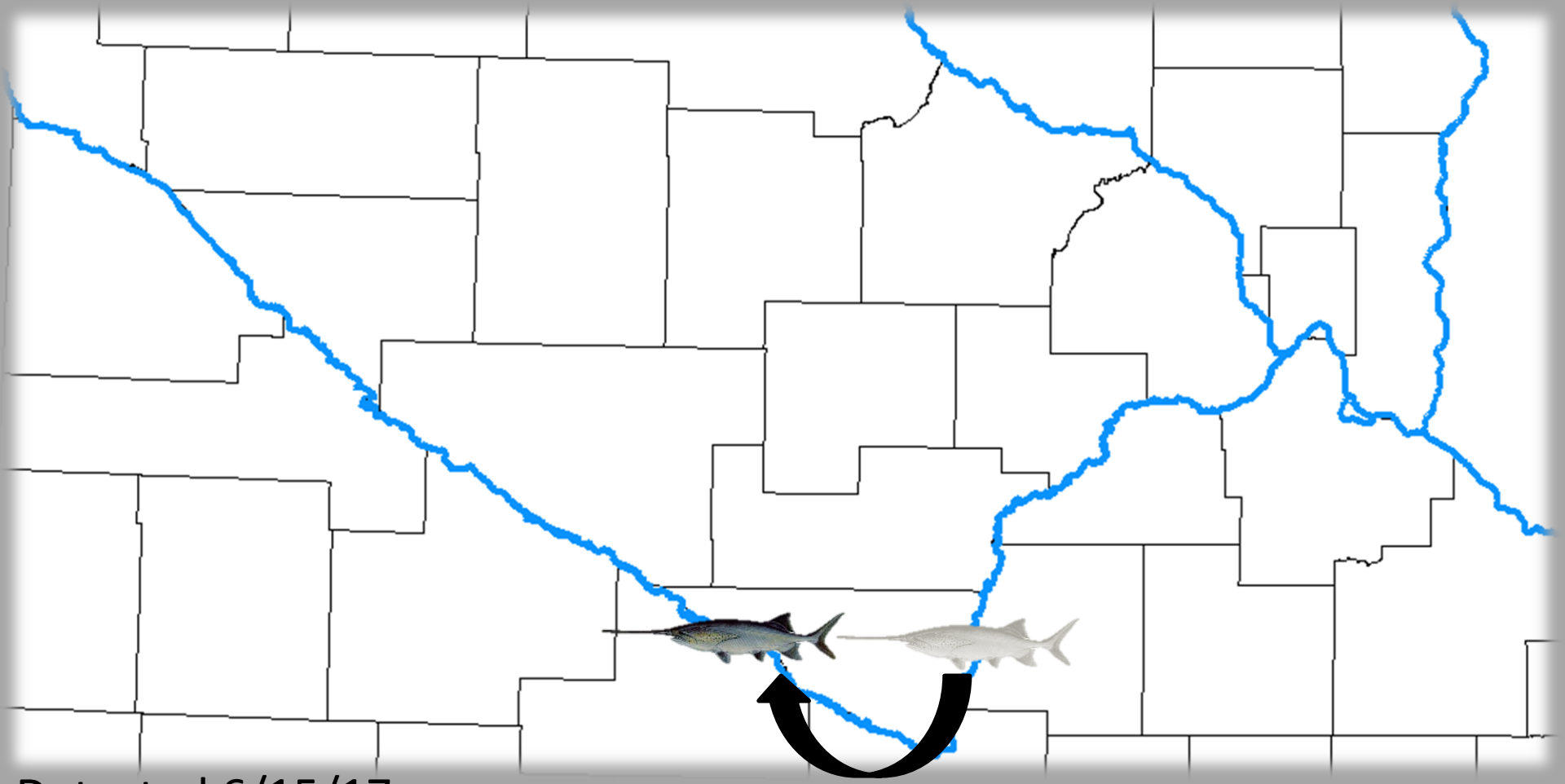
- 6 paddlefish have been documented outside their tagging site
- 5 made largescale movements including
  - 2 paddlefish leaving the Minnesota River
- Movements have been both up and downstream during different times throughout the year
- 3 Paddlefish from other systems have also been detected in the Minnesota River
  - 2 tagged in the Mississippi River (Pools 2 and 3)
  - 1 tagged in the St. Croix River
  - 1 spent over three years in the MN River and was caught near St. Peter this fall

Paddlefish #52315



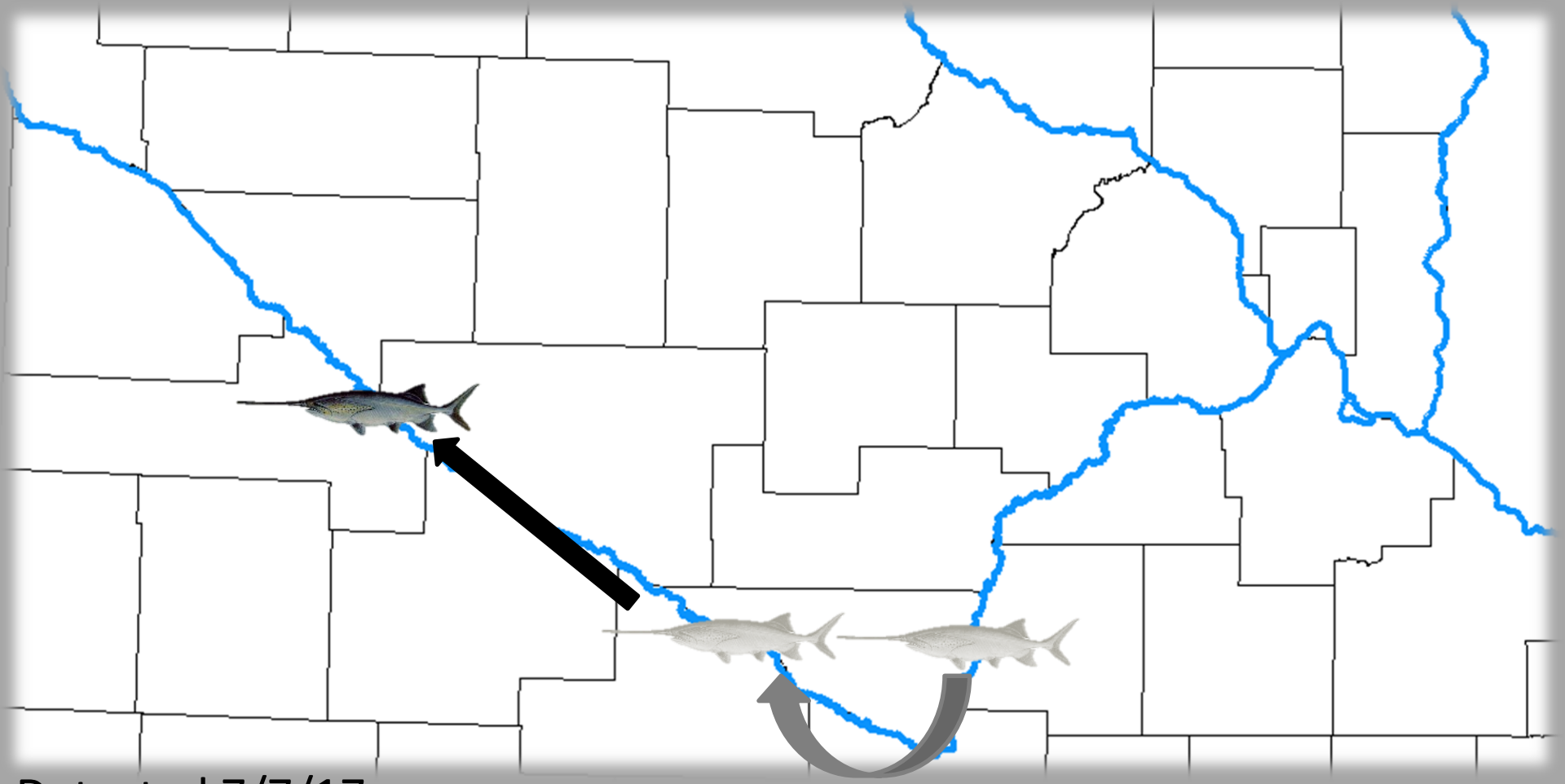
Tagged 9/13/16. Then detected 10/28/16, 12/1/16 and 3/6/17

Paddlefish #52315



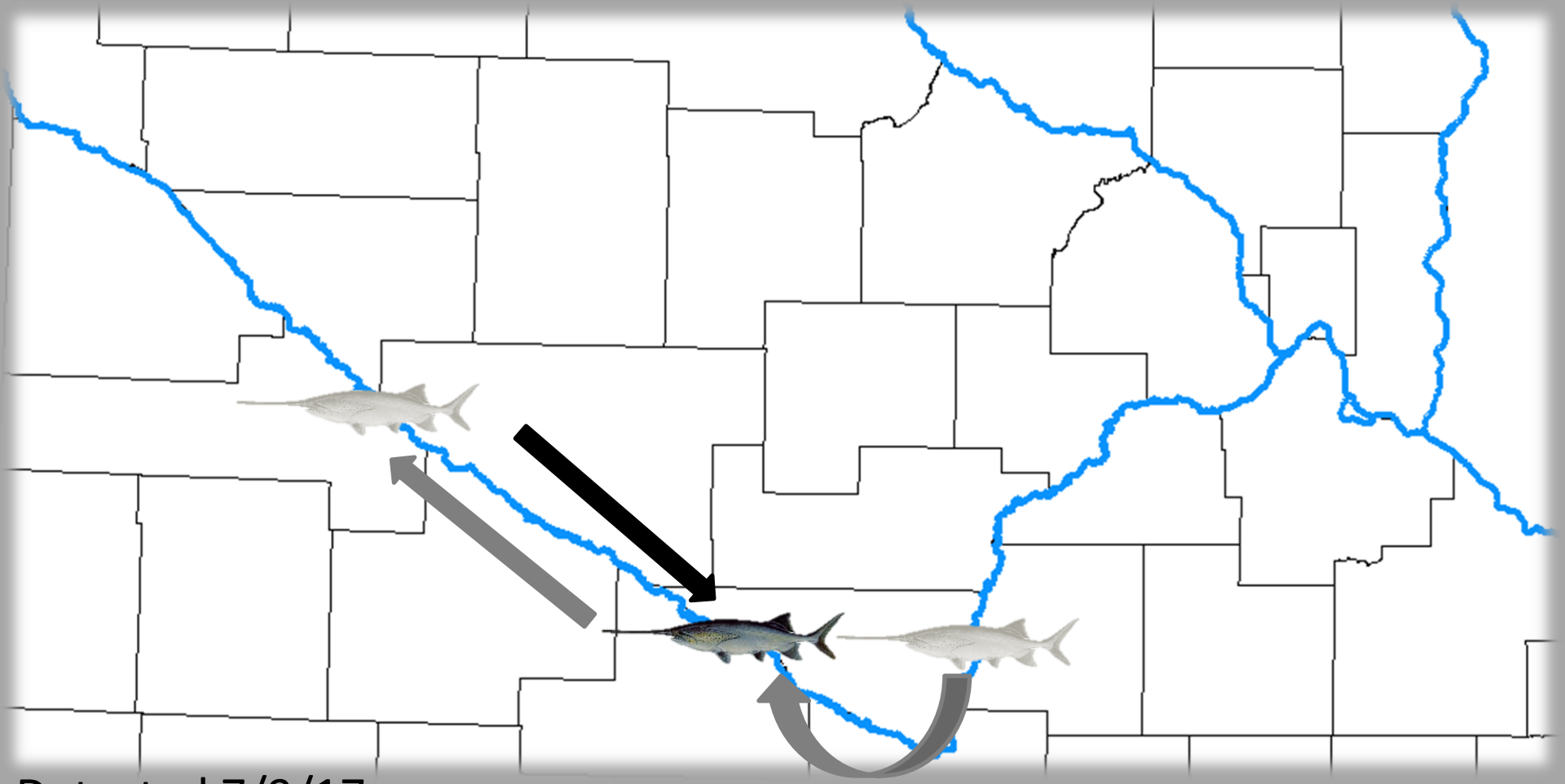
Detected 6/15/17

Paddlefish #52315



Detected 7/7/17

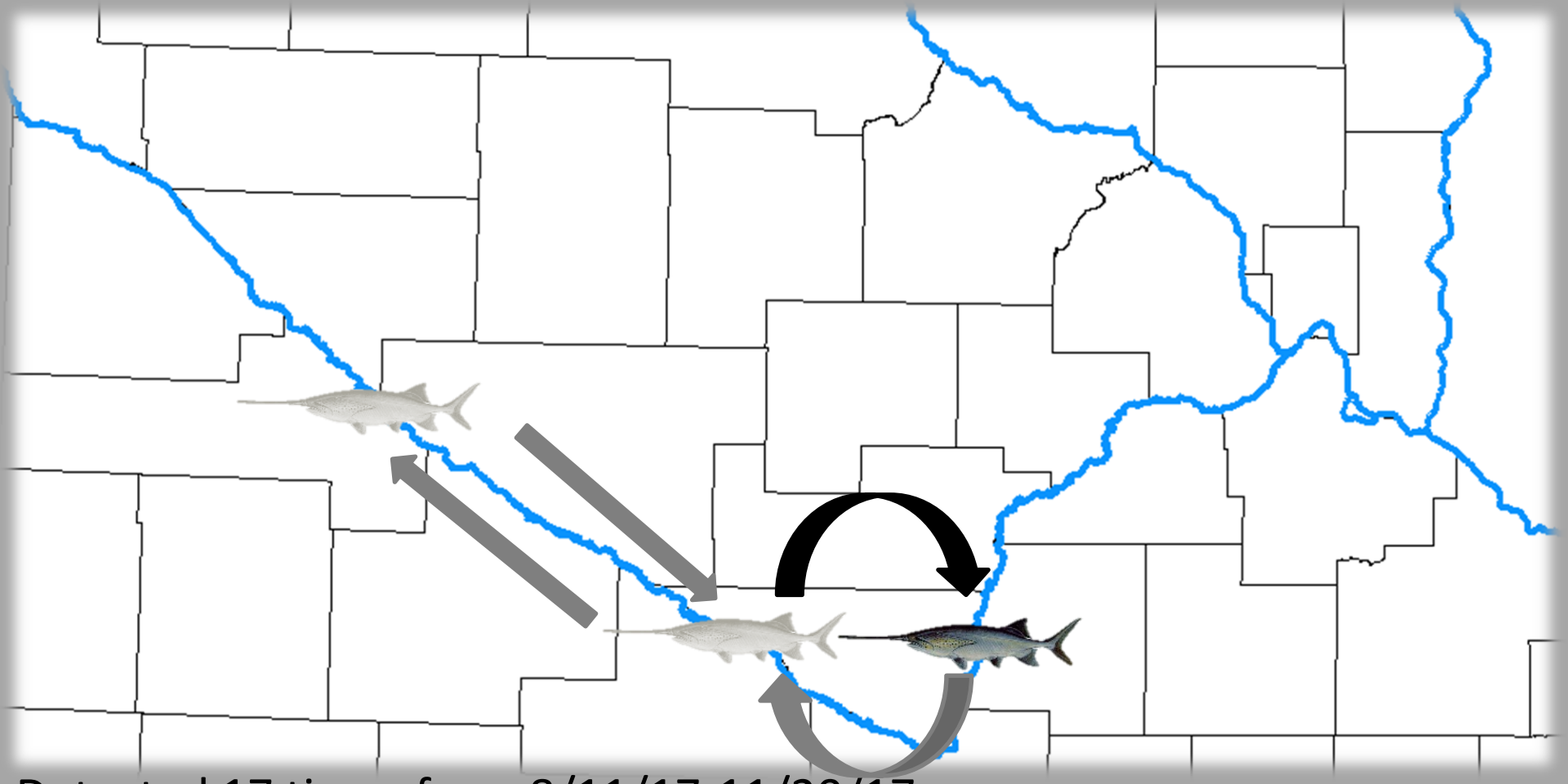
Paddlefish #52315



Detected 7/9/17

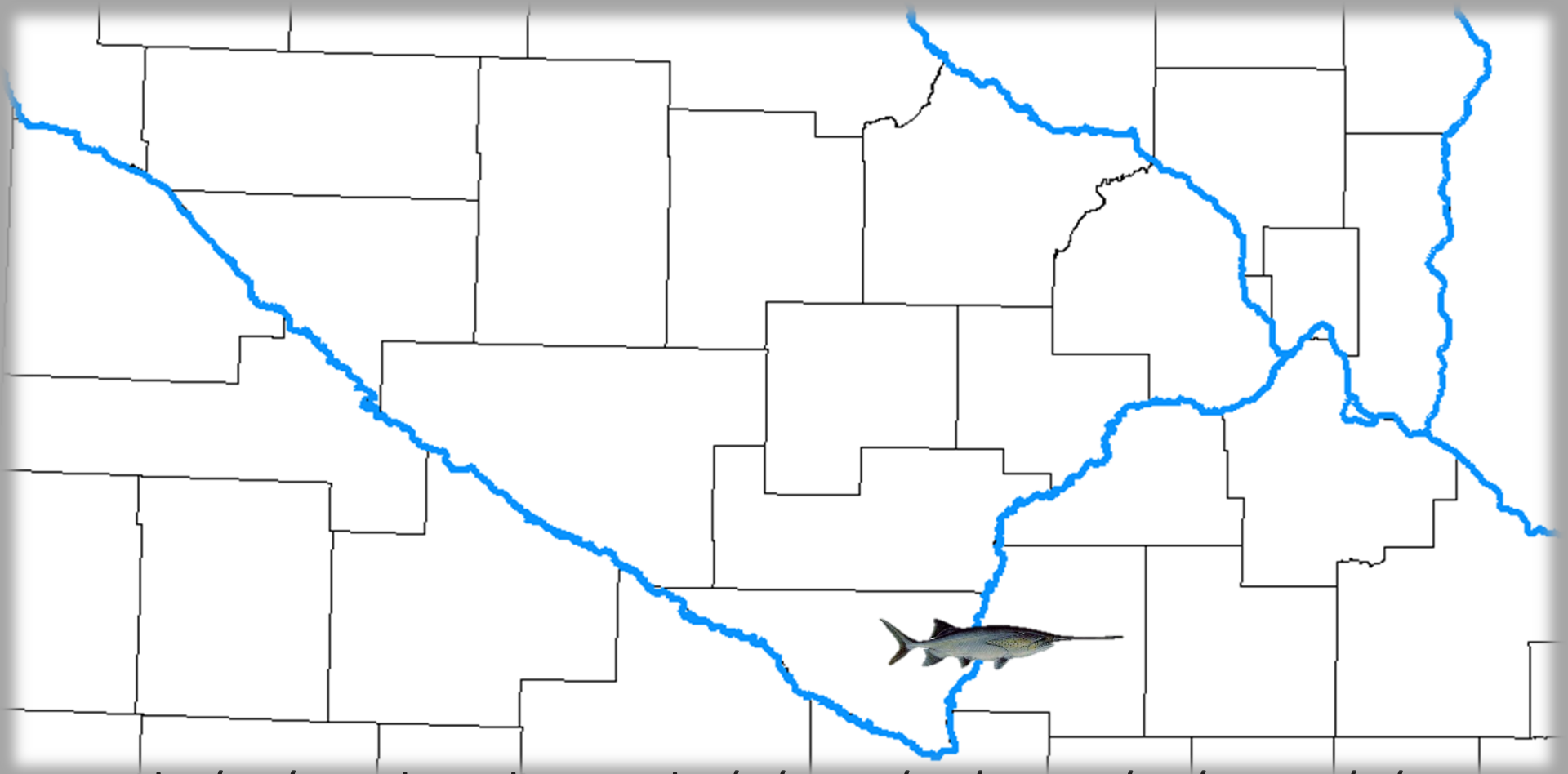
Paddlefish #52315

- Traveled >120 river miles upstream during early summer and returned to original tagging site
- Presumably spent 275 days near St. Peter or 63% of the time since it was tagged



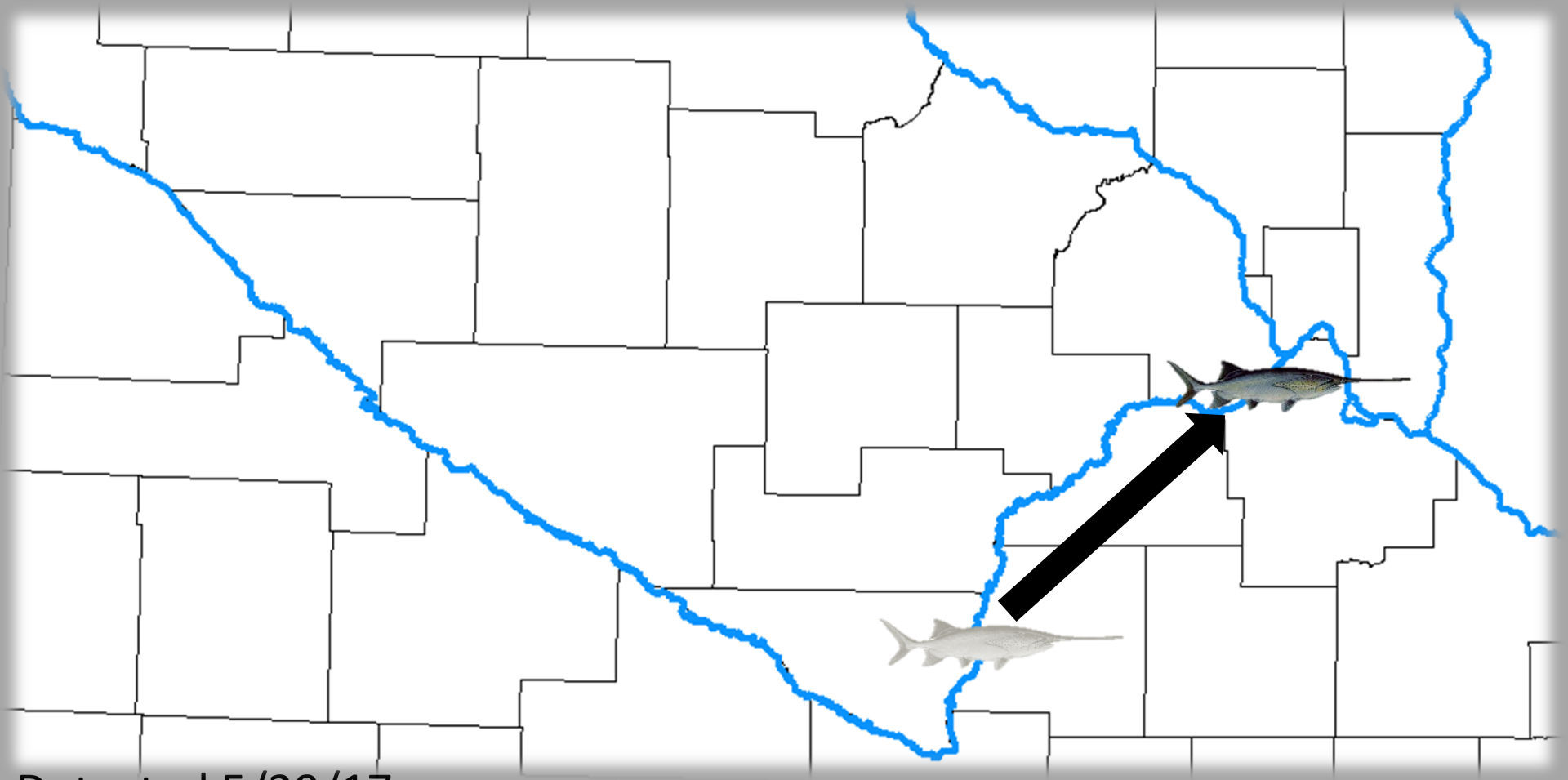
Detected 17 times from 8/11/17-11/20/17

Paddlefish #52318



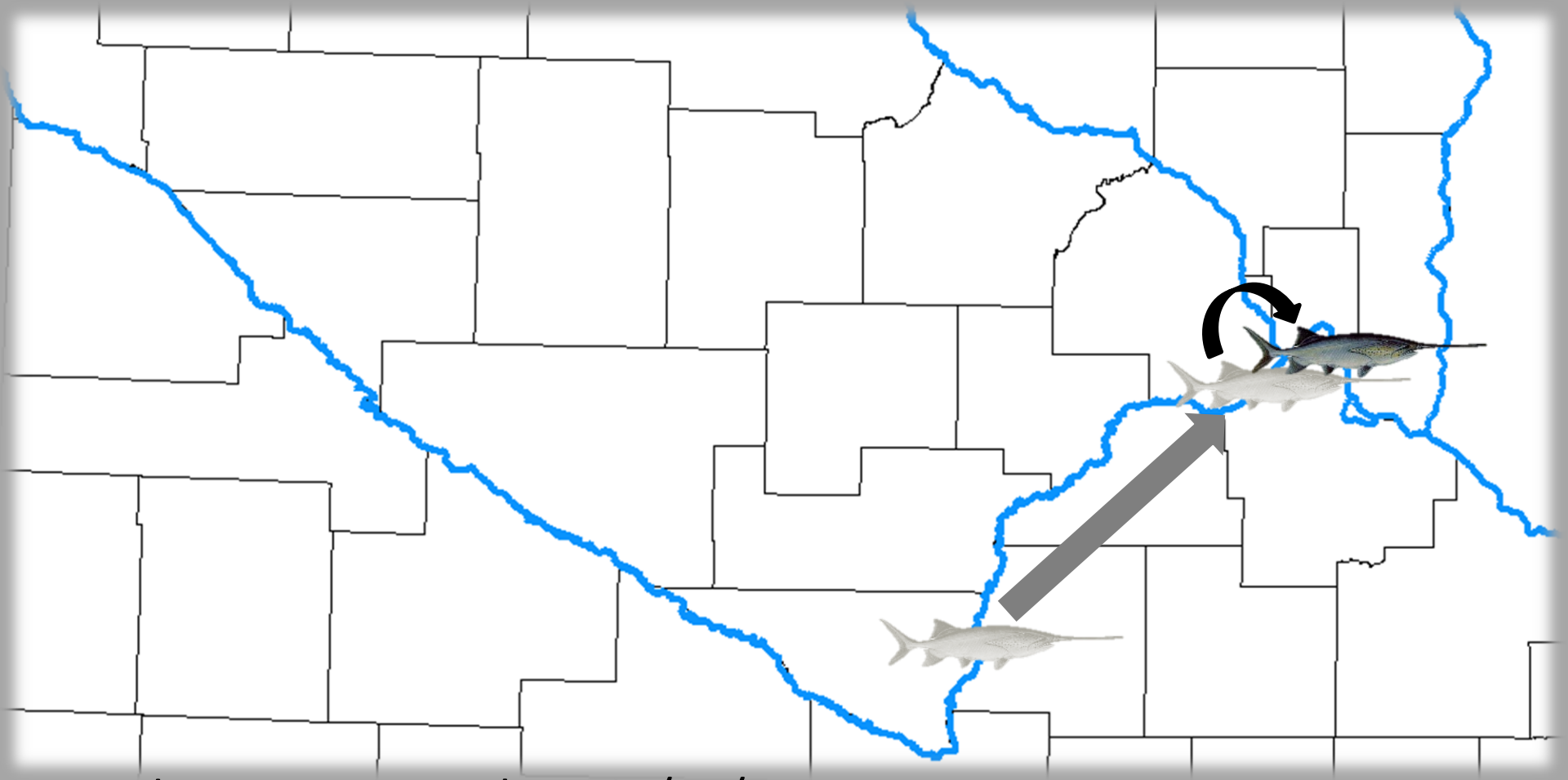
Tagged 8/31/16. Then detected 9/2/16, 9/13/16, 10/28/16, 12/1/16

Paddlefish #52318



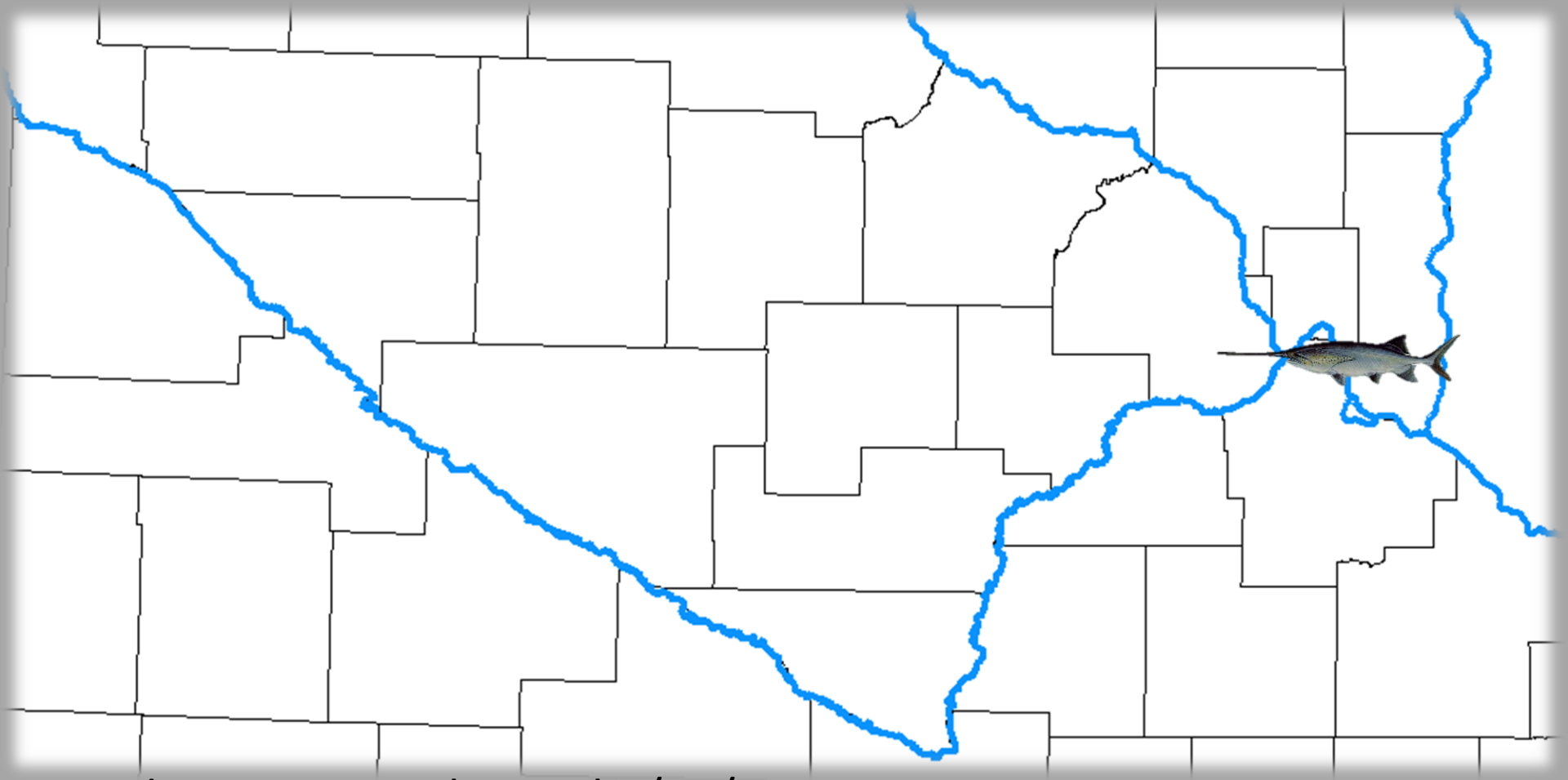
Detected 5/29/17

Paddlefish #52318



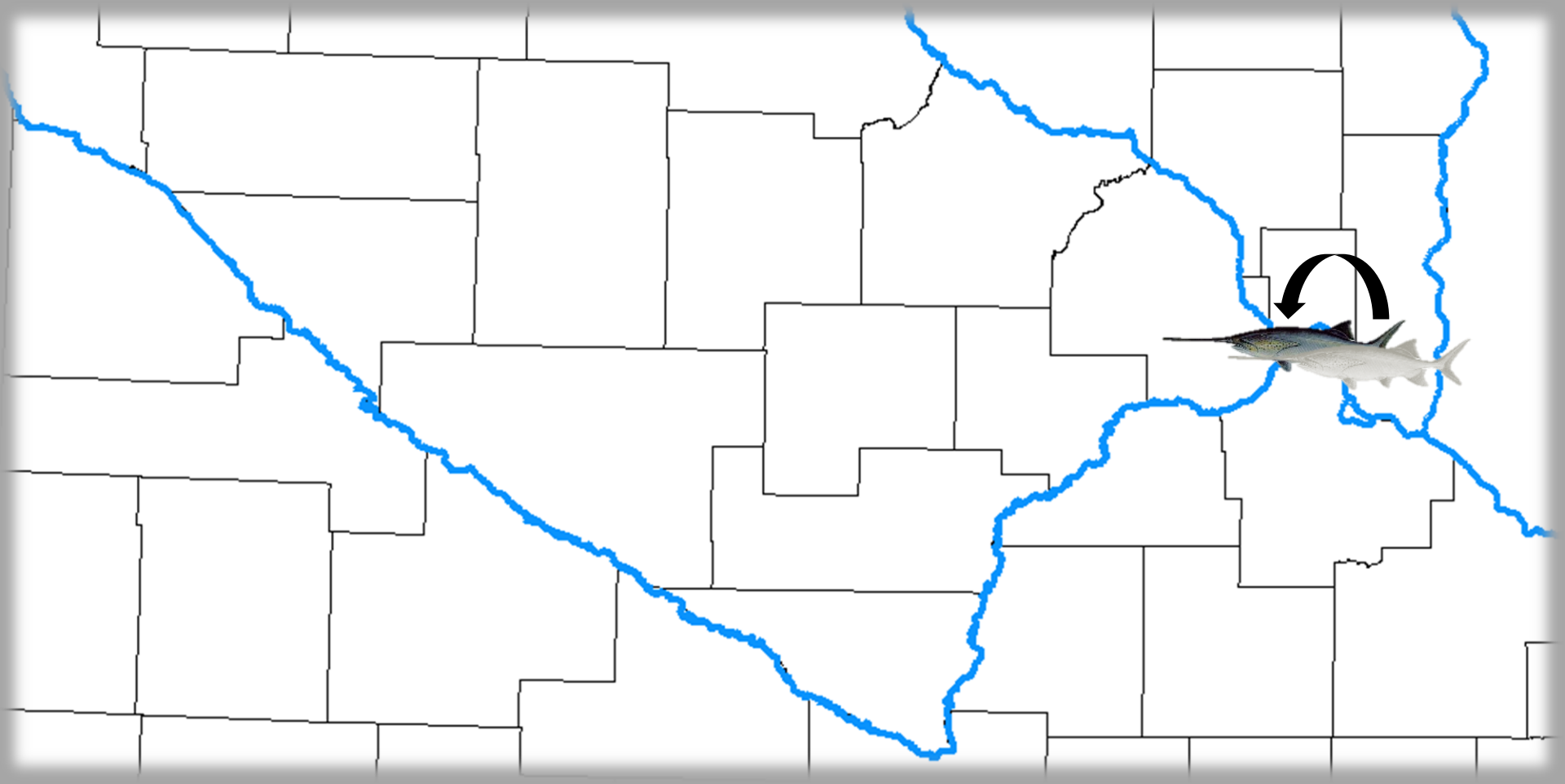
Moved into Pigs Eye Lake on 5/29/17

Paddlefish #52318



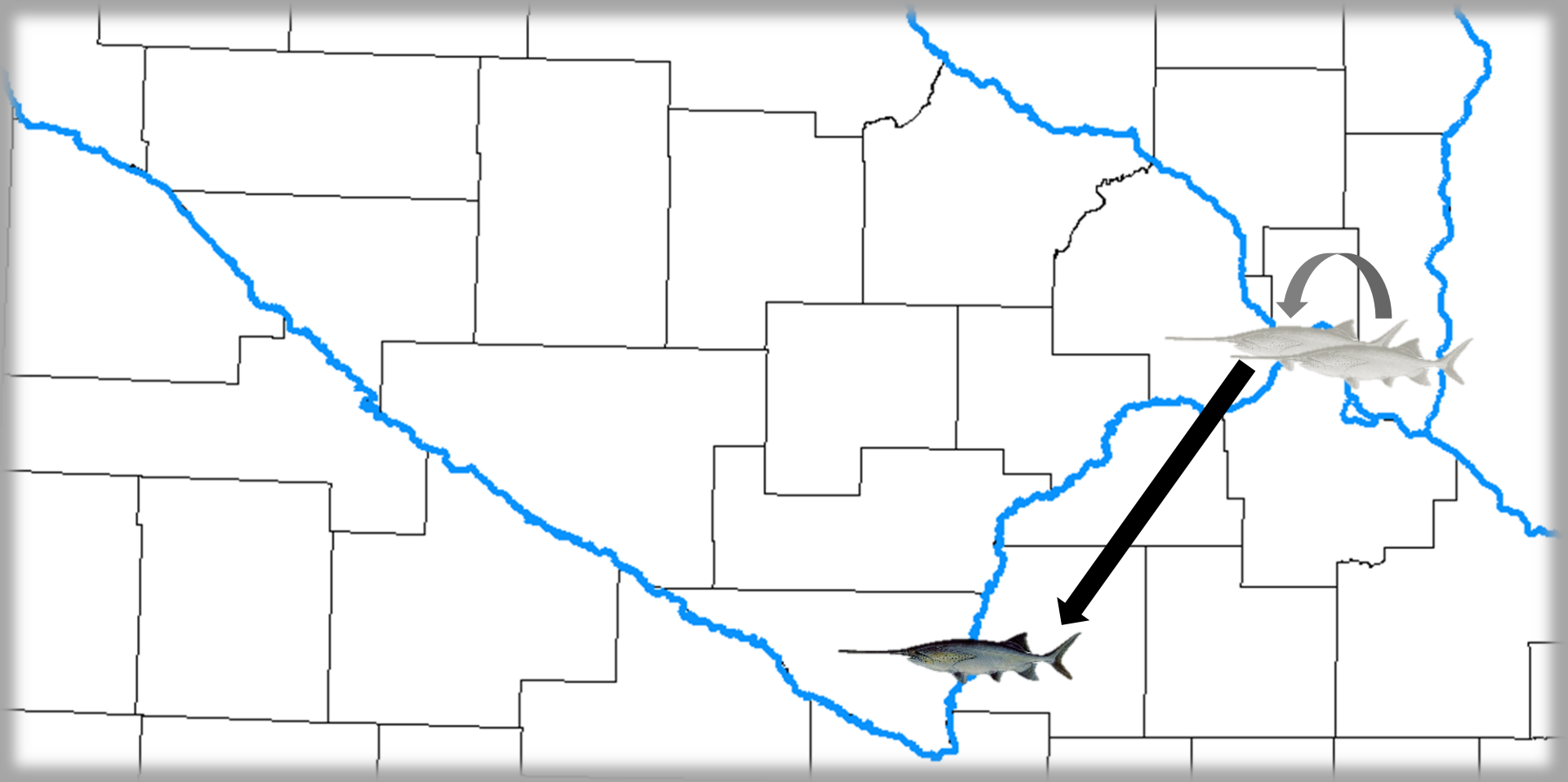
Stayed in Pigs Eye Lake until 6/12/17

Paddlefish #52318



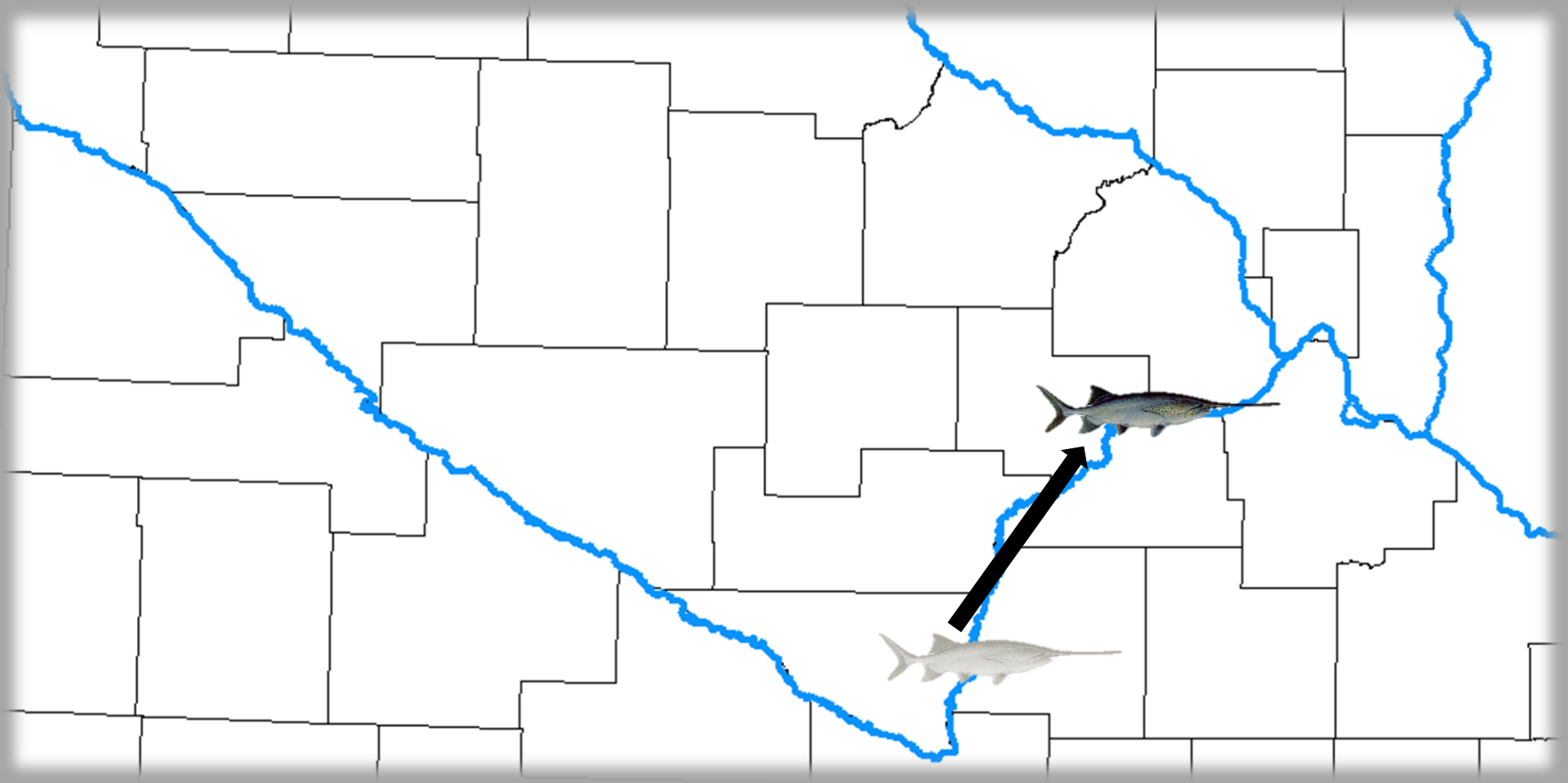
Detected multiple times around the confluence of the MN River and Mississippi River until 6/17/17

Paddlefish #52318



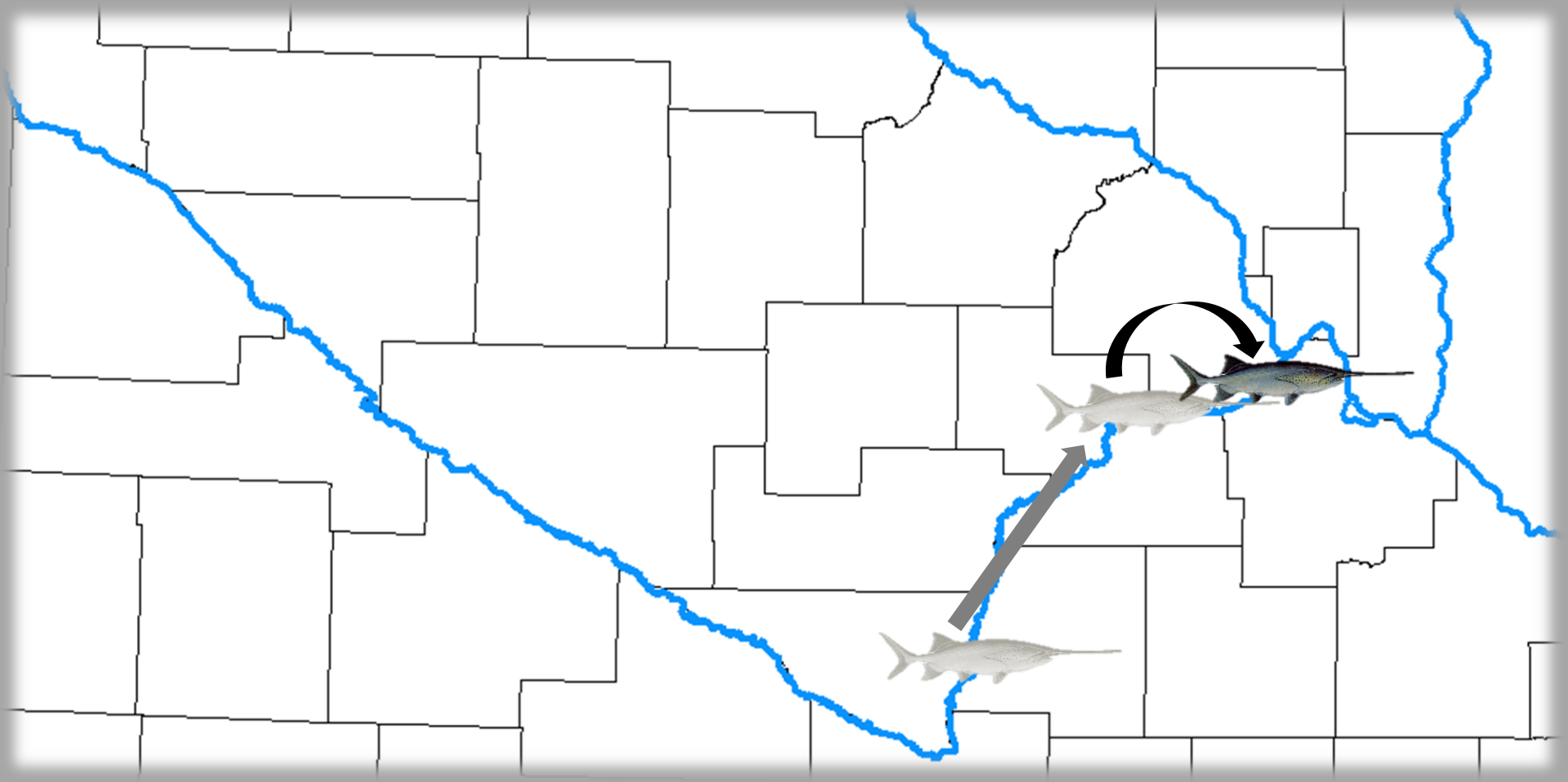
Detected 8/12/17

Paddlefish #52318



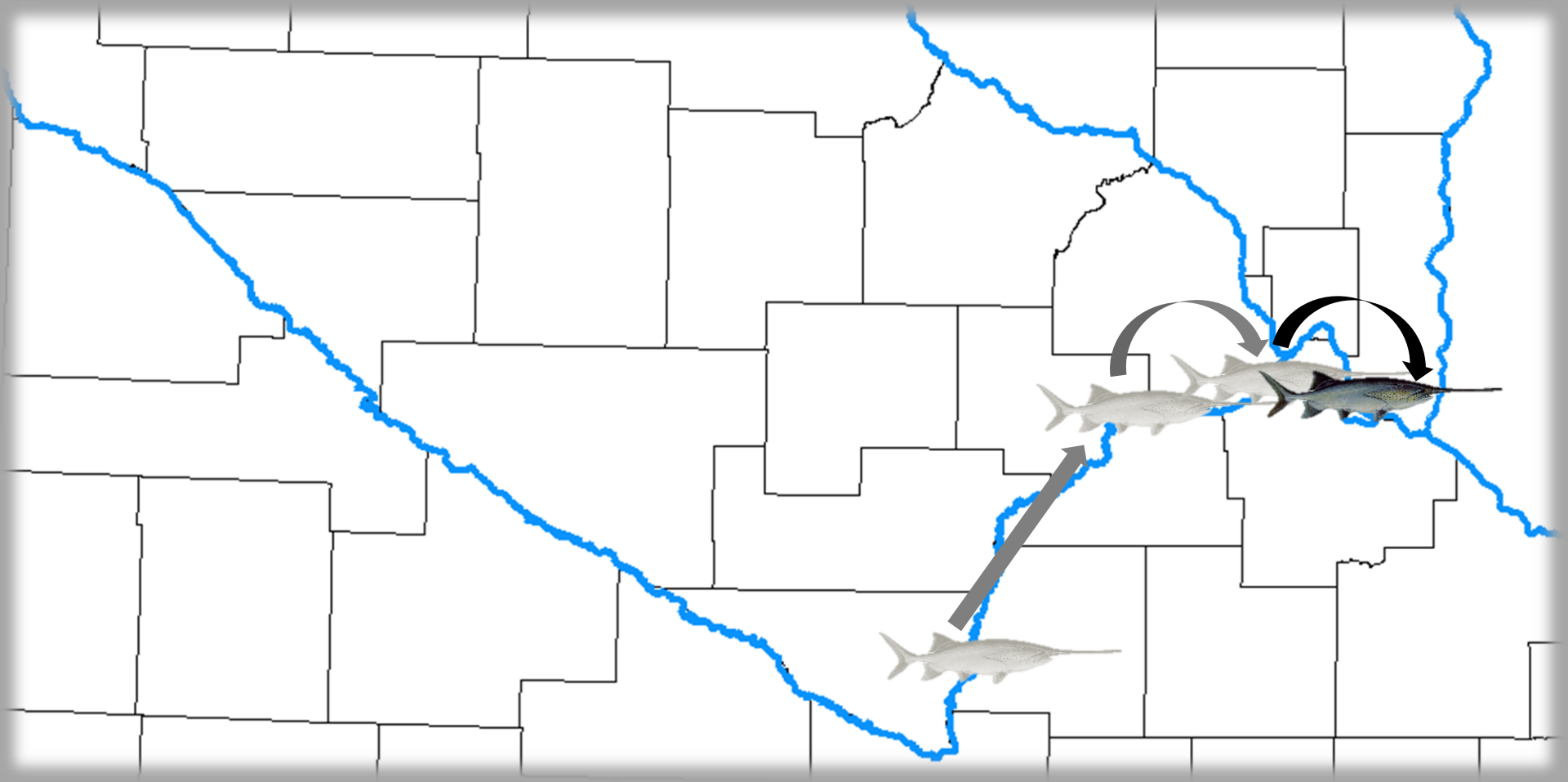
Detected 8/21/17

Paddlefish #52318



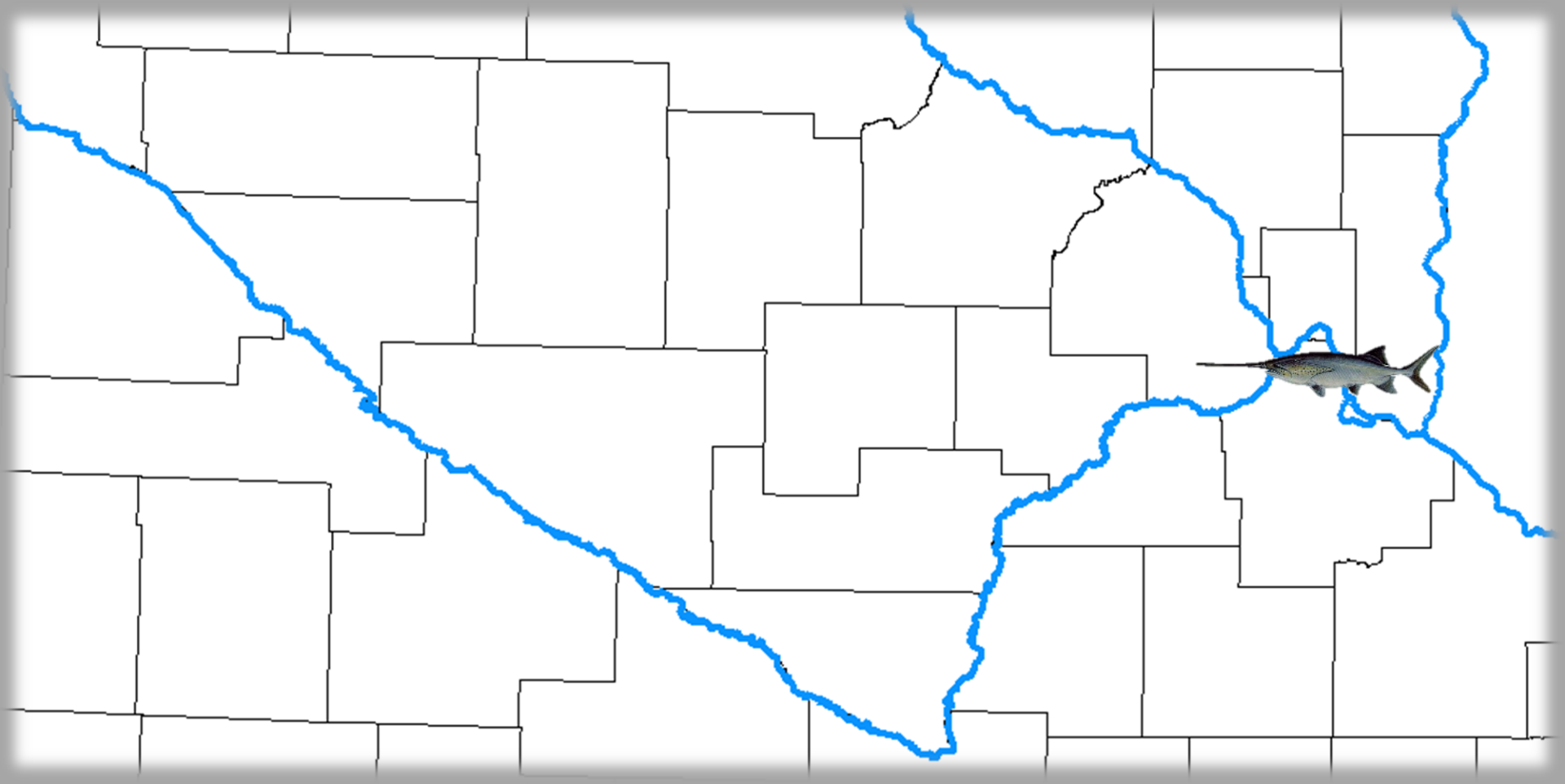
Detected 8/22/17

Paddlefish #52318



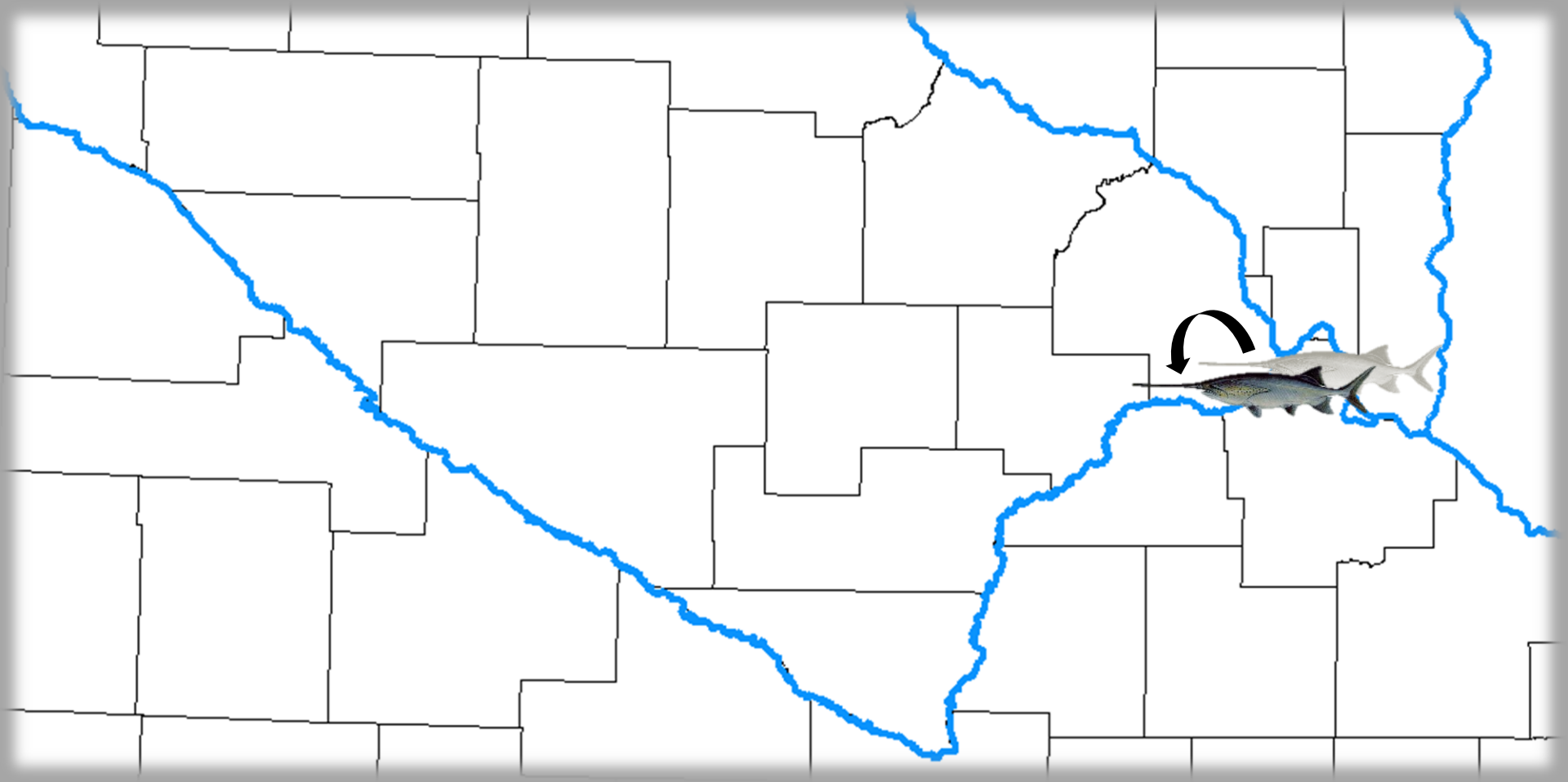
Detected 8/23/17

Paddlefish #52318



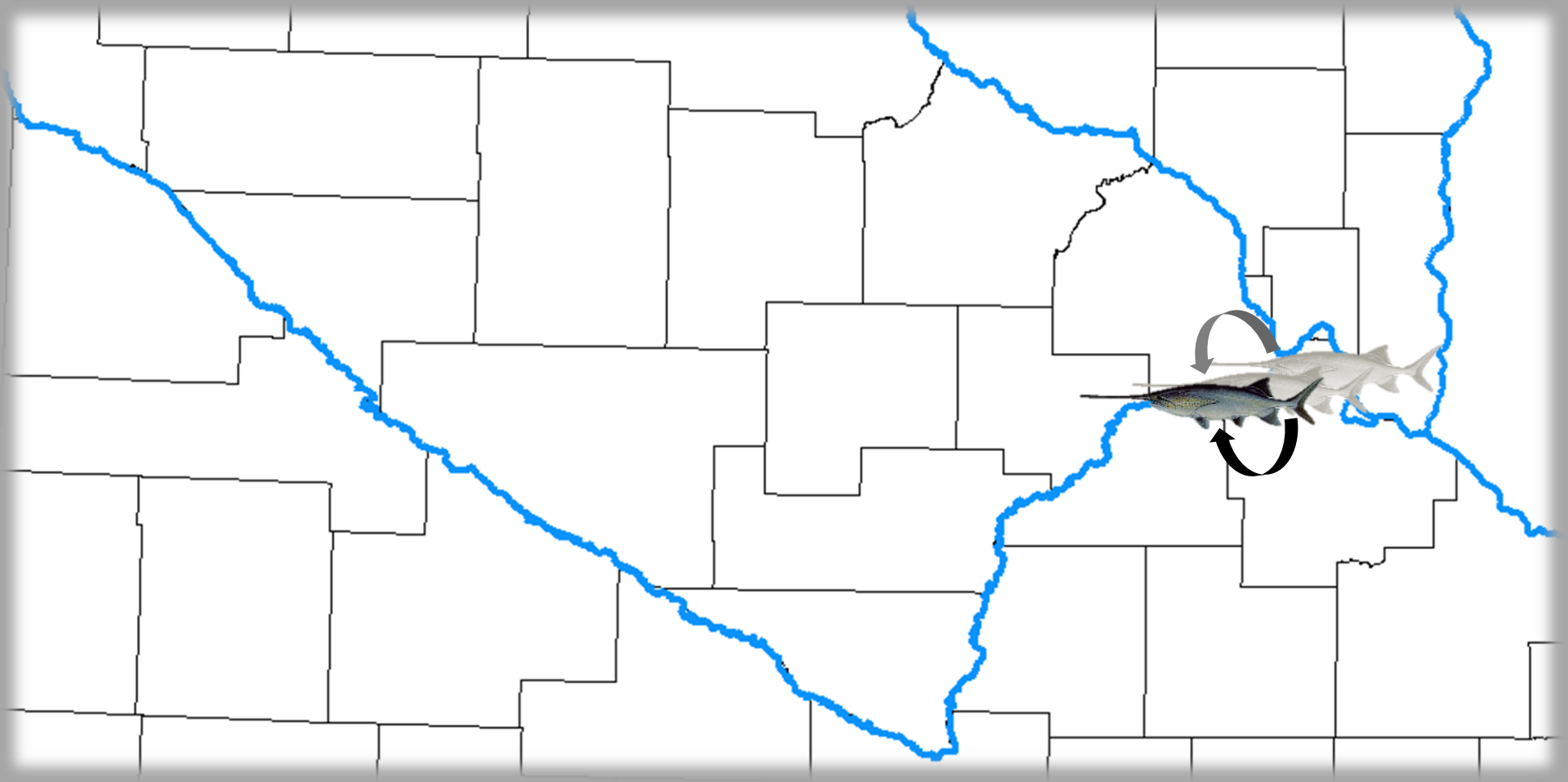
Moved into Pigs Eye lake on 8/26/17 and stayed there until 9/3/17

Paddlefish #52318



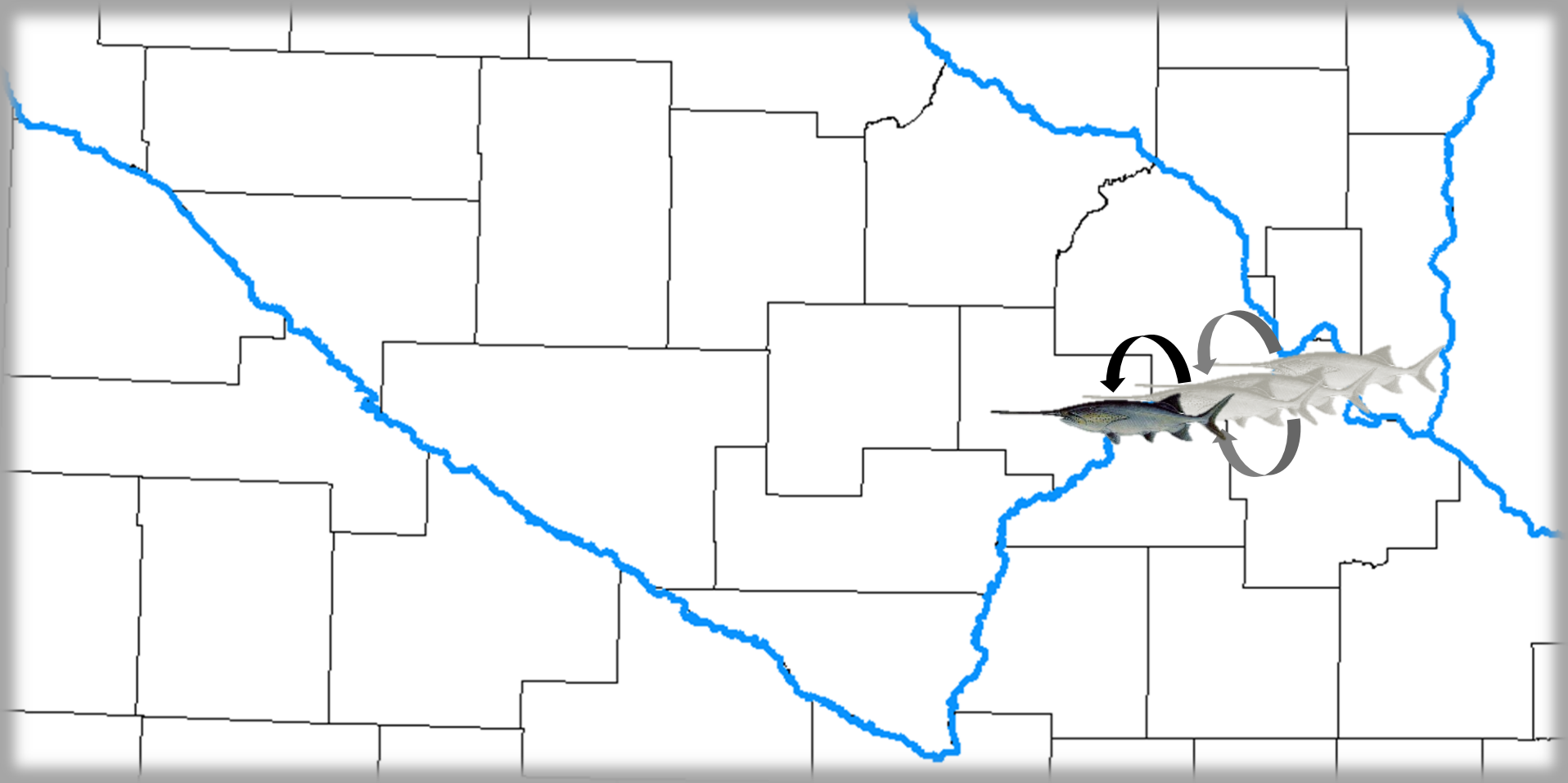
Detected 9/9/17

Paddlefish #52318



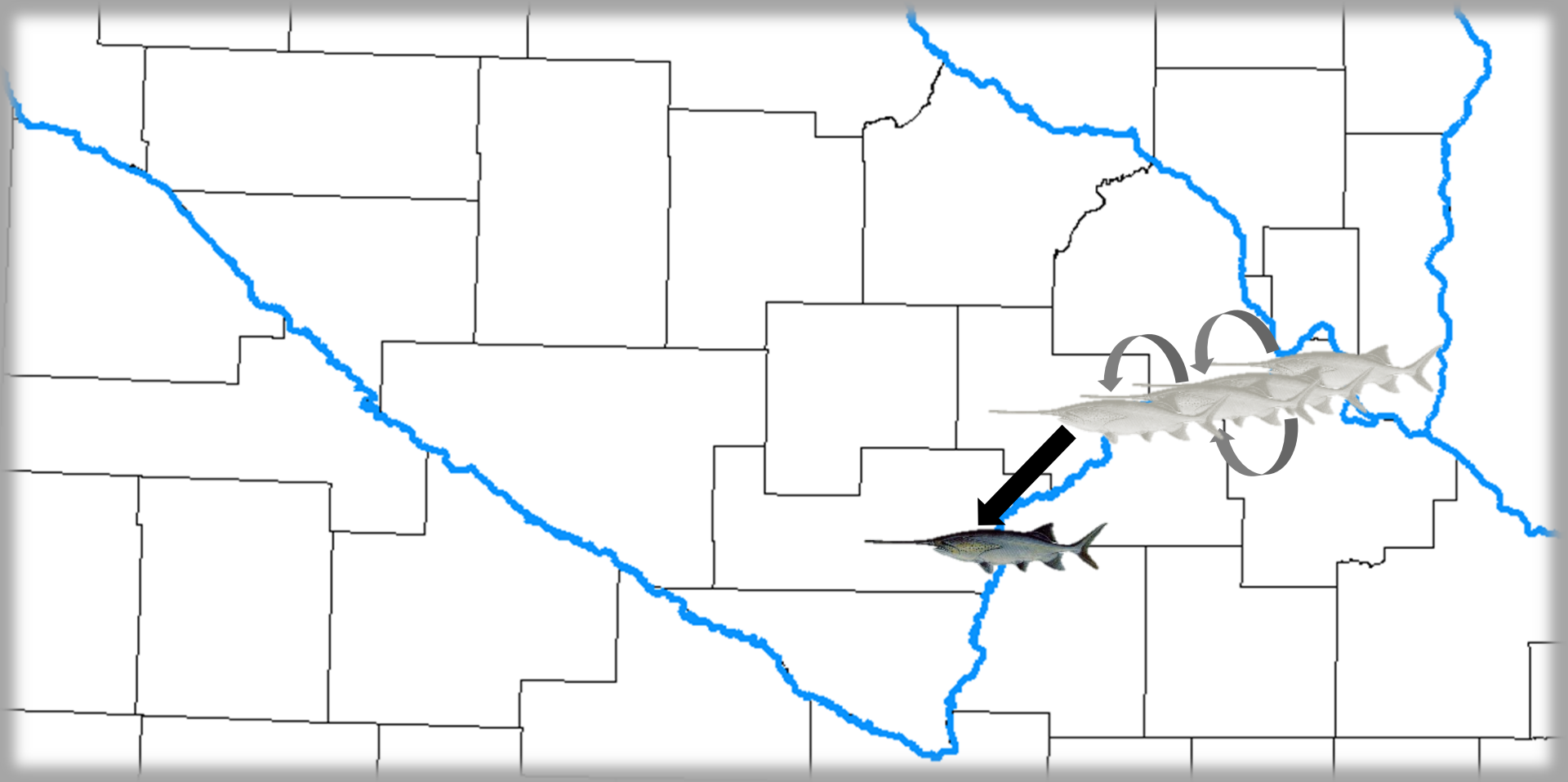
Detected 9/10/17

Paddlefish #52318



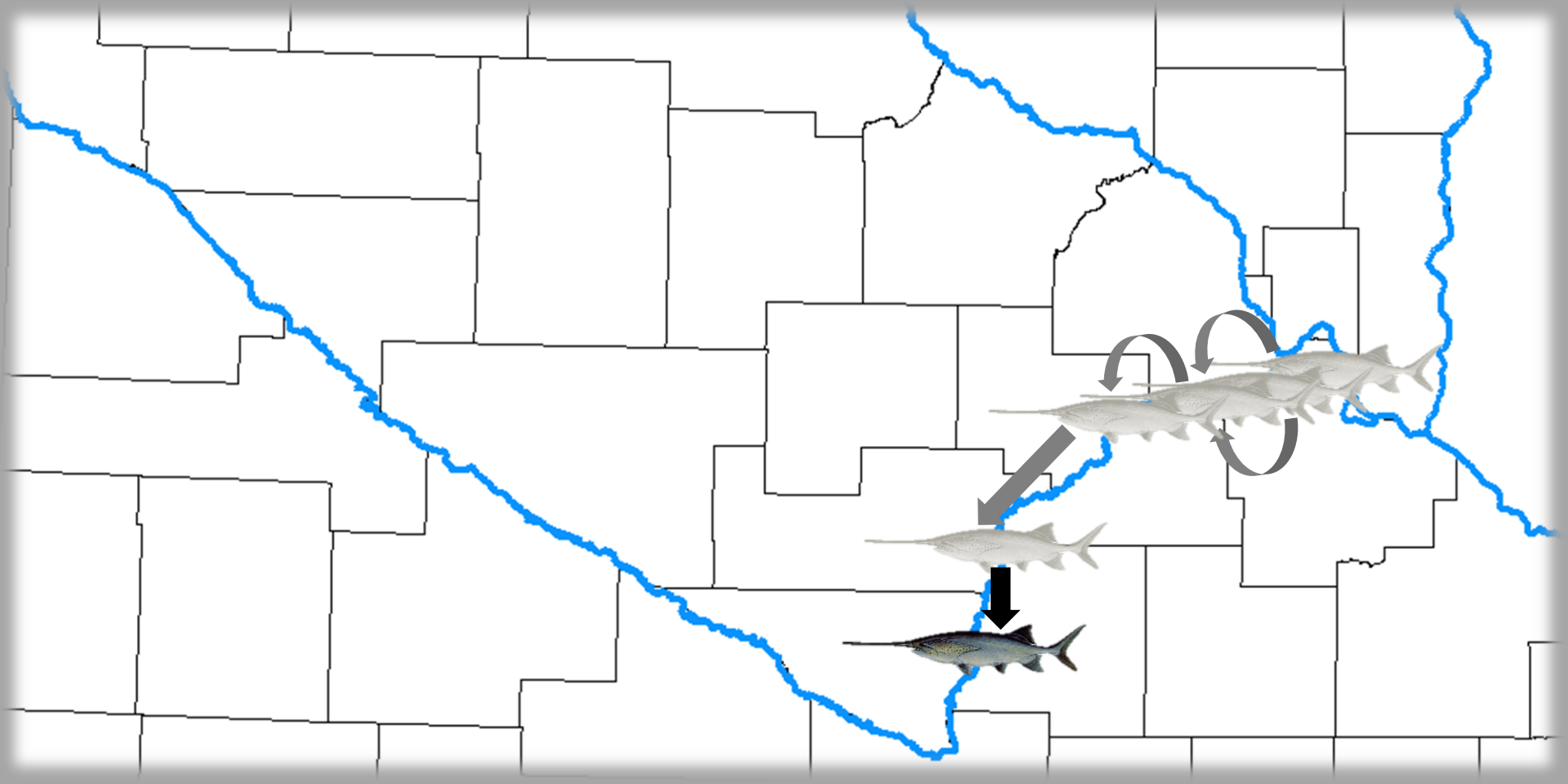
Detected 9/11/17

Paddlefish #52318



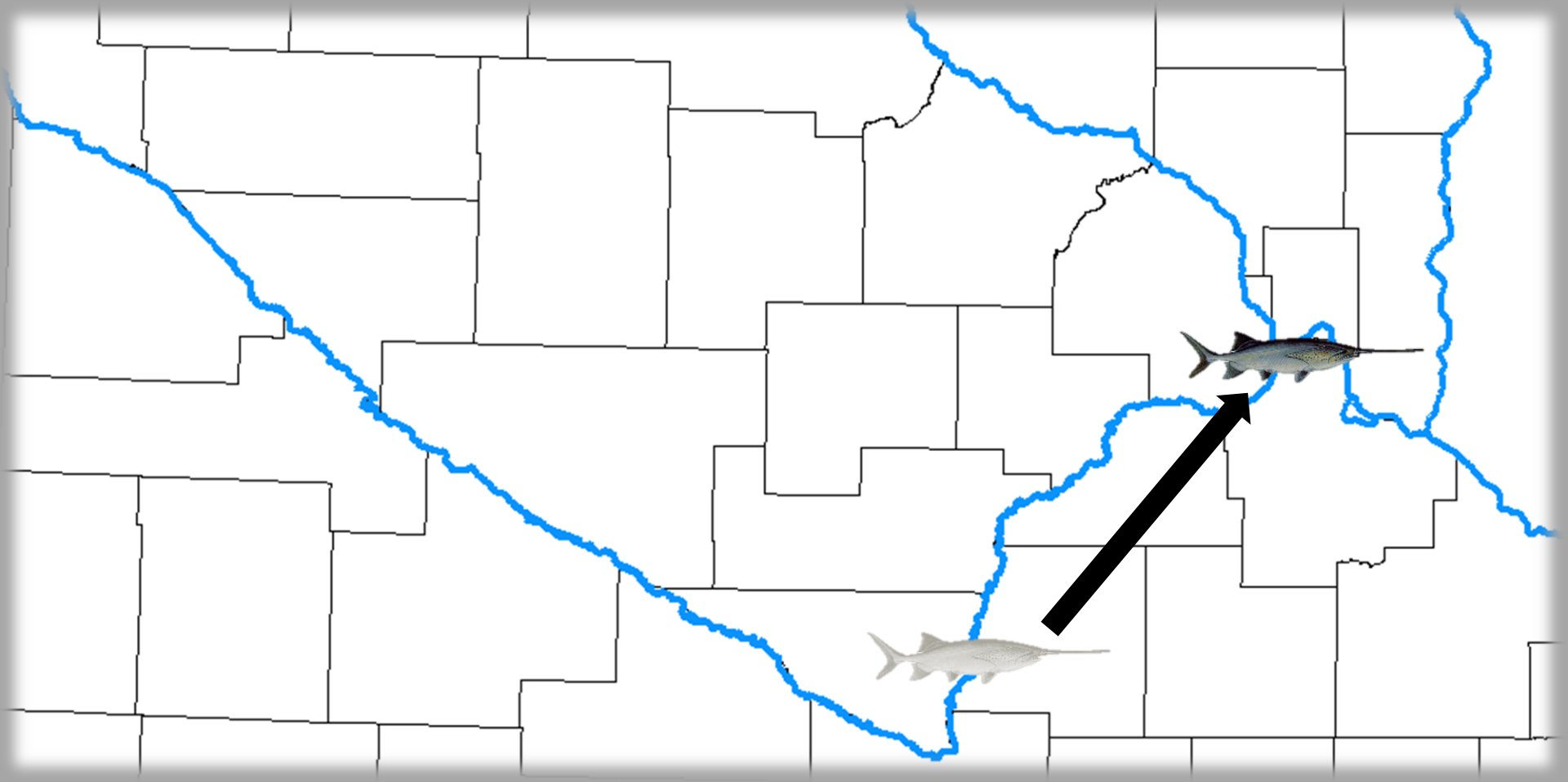
Detected 9/14/17

Paddlefish #52318



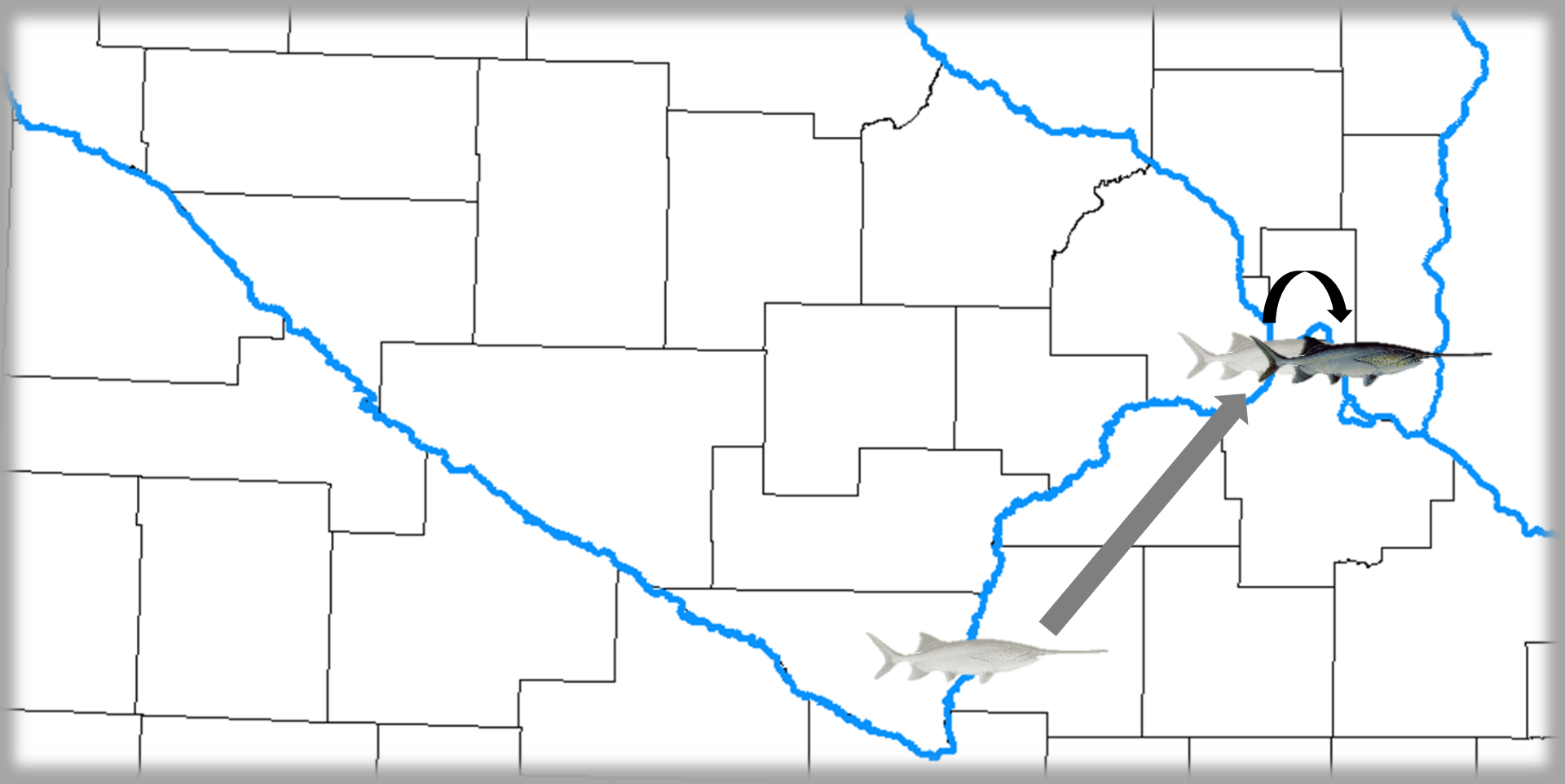
Detected 9/27/17 and 9/28/17

Paddlefish #52318



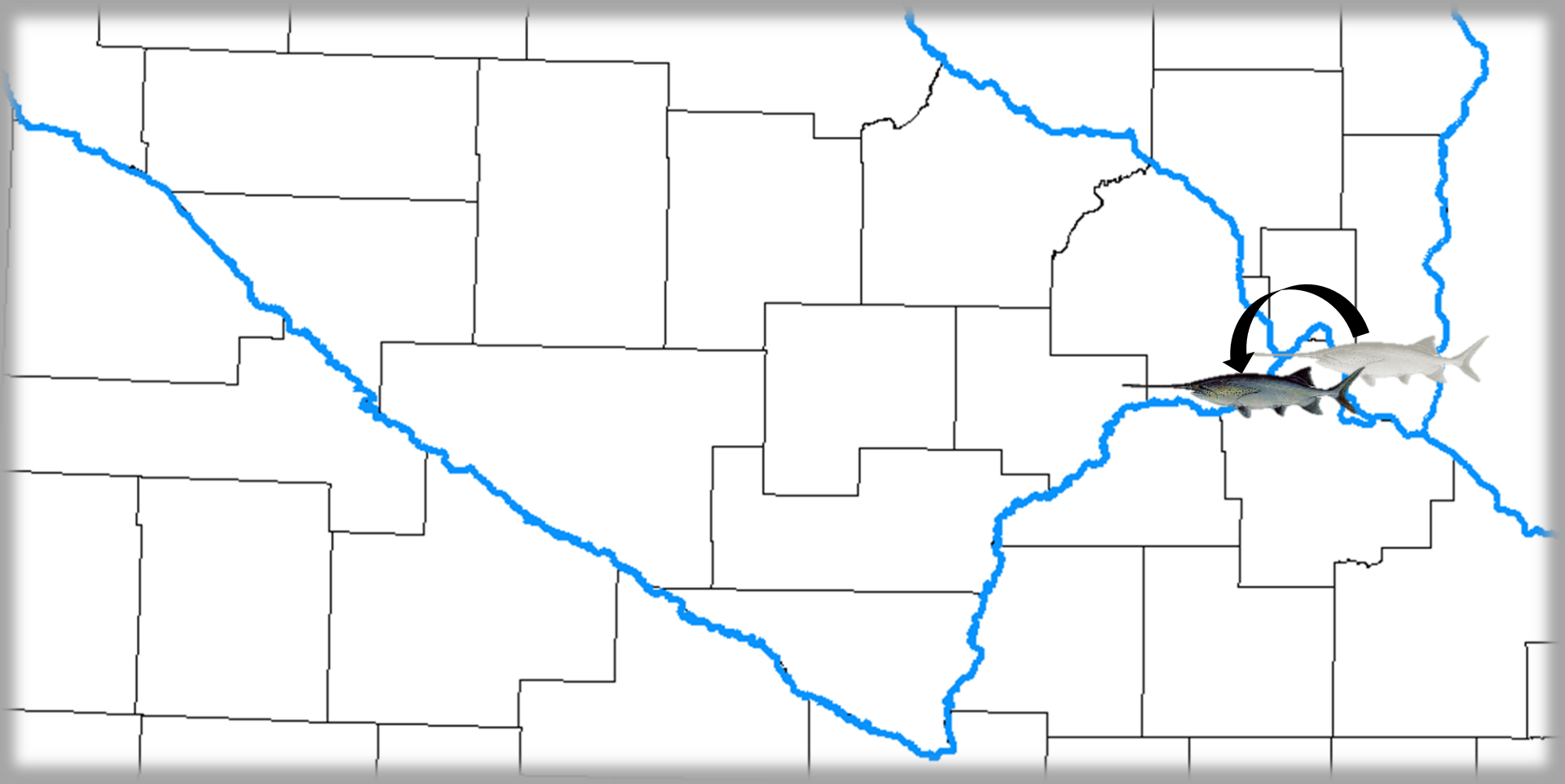
Detected 10/13/17

Paddlefish #52318



Returned to Pigs Eye Lake on 10/14/17 and stayed there until 10/26/17

Paddlefish #52318



Returned to the Minnesota River on 10/27/17

Paddlefish #52318

- Three trips to Pigs Eye Lake and spent almost two weeks each time
  - Each trip is about 100 river miles each way
    - Over 500 river miles since tagging
  - 14, 11 and 12 days for a total of 37 days
- Spent most of its time near St. Peter (~75%)
  - But from May to November of 2017 it spent over half of its recorded time in Pigs Eye Lake (~60%)

Summary

- Paddlefish tagged in our study were bound by three dams
  - Upstream by the Granite Falls dam
  - Downstream by Mississippi River Lock and dam 1 and 2
  - 2 of the 3 PAH to migrate into the MNR passed through the Lock and Dam 2
- St. Peter site could be valuable

Future Directions

- Install final 2 VR2s and continue uploading data
- Continue tracking and sampling
- Attempt to sample small SLS and PAH with Trawling







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