

# BioAcoustic Fish Fence (BAFF) Effectiveness Study



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Disclaimer: This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science.



# BAFF Effectiveness Study



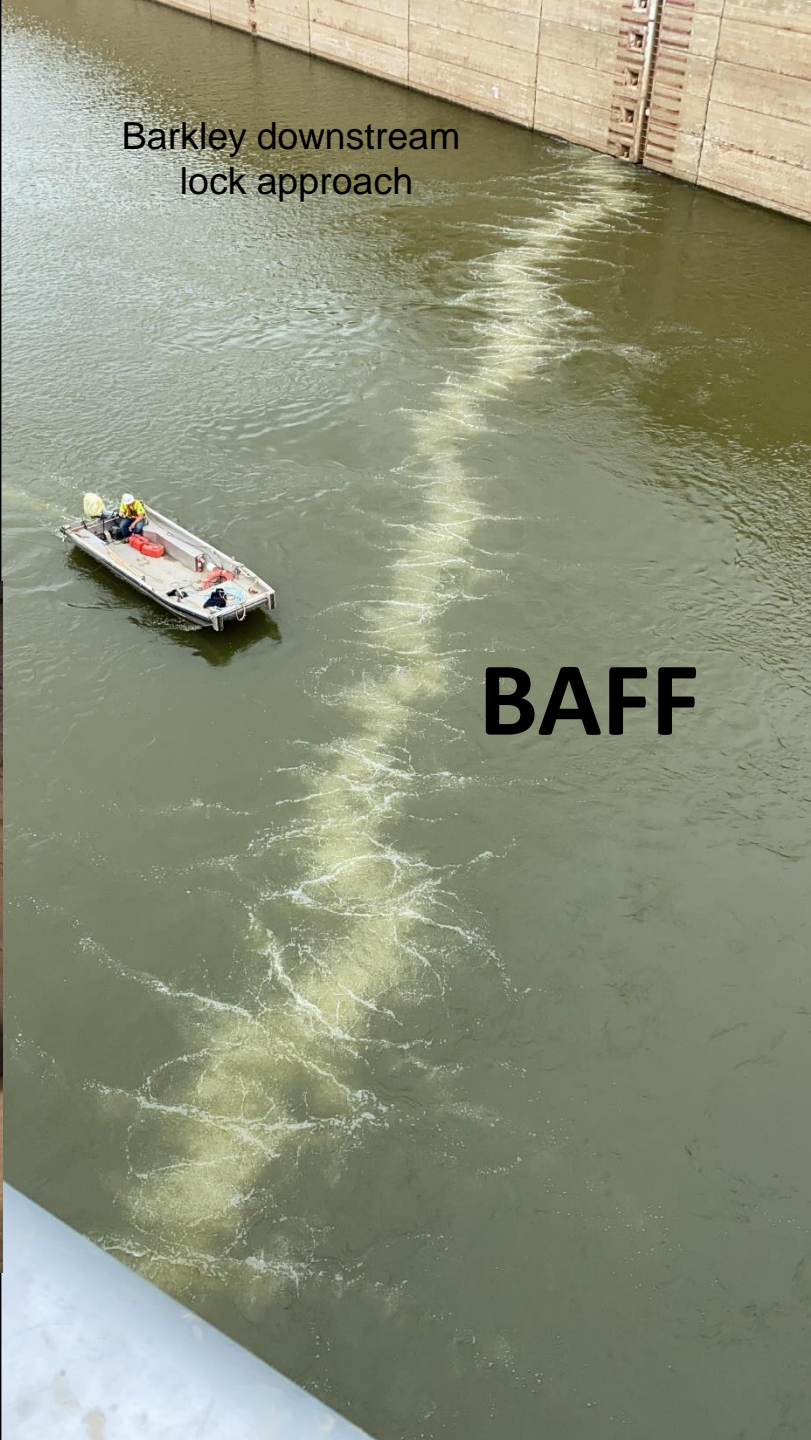
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# Objective:

Determine effectiveness of the BAFF for deterring translocated Silver Carp



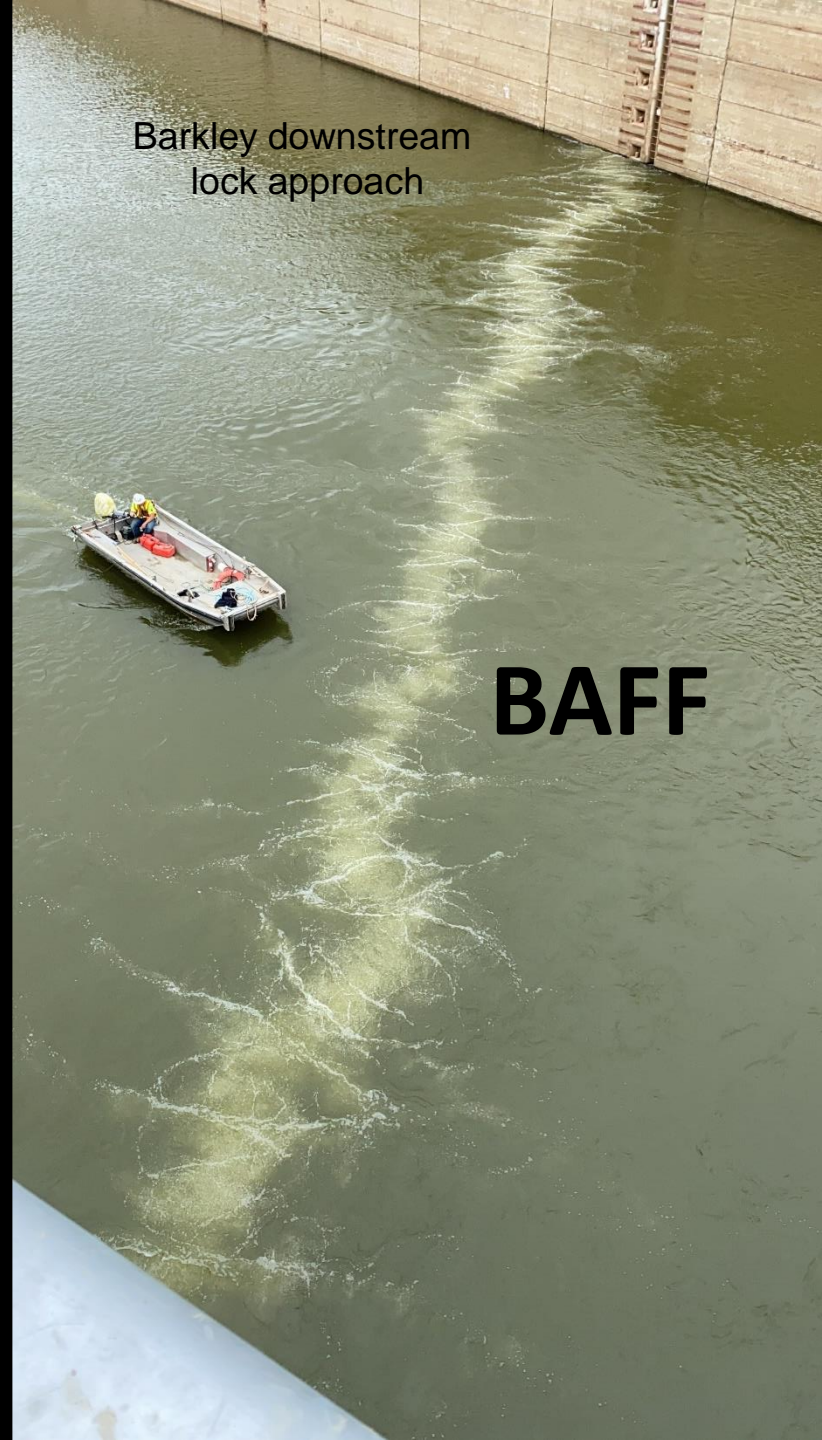
Barkley downstream lock approach

**BAFF**



# Objective:

Determine effects of the BAFF on native species



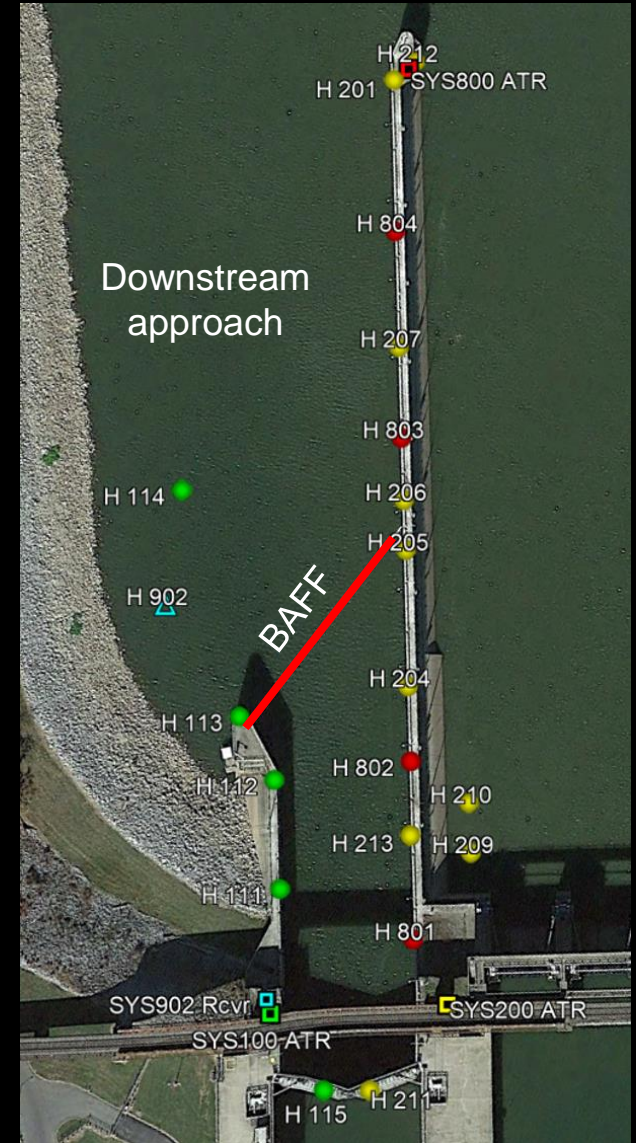
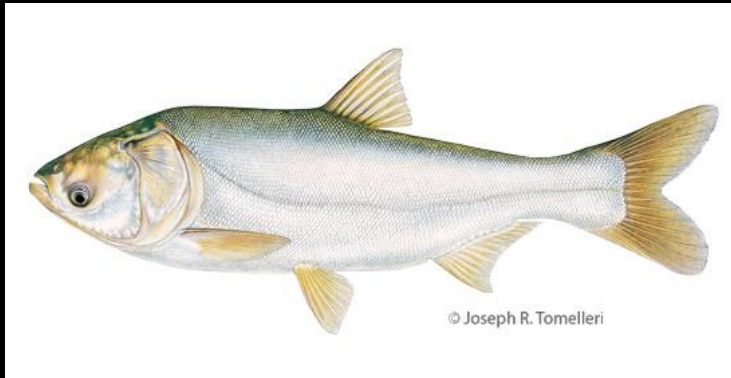
Barkley downstream  
lock approach

**BAFF**

# Methods and study design

## Translocated Silver Carp

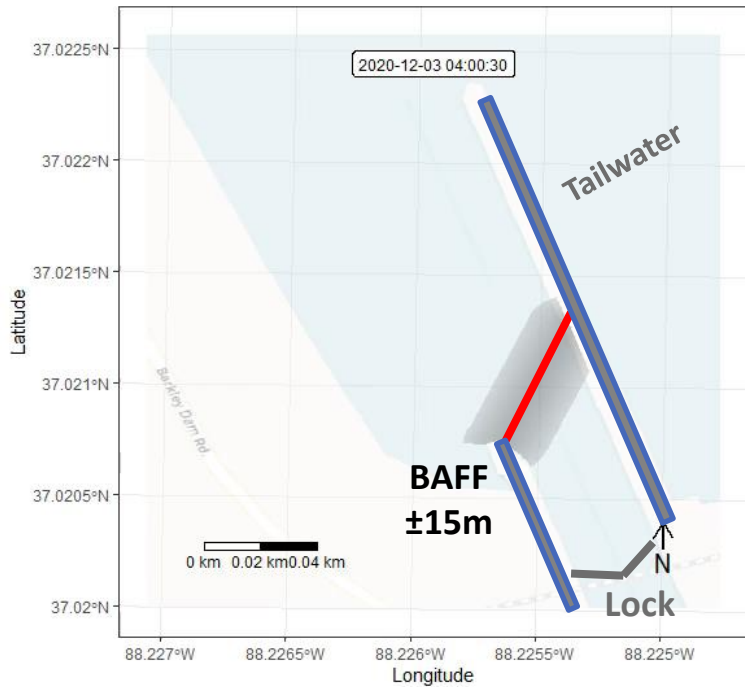
- HTI Telemetry
- 2D positioning in dwnstrm approach
- 254 in fall 2020; 400 in spring 2021
- Tag through spring 2023
- BAFF operated week off – week on



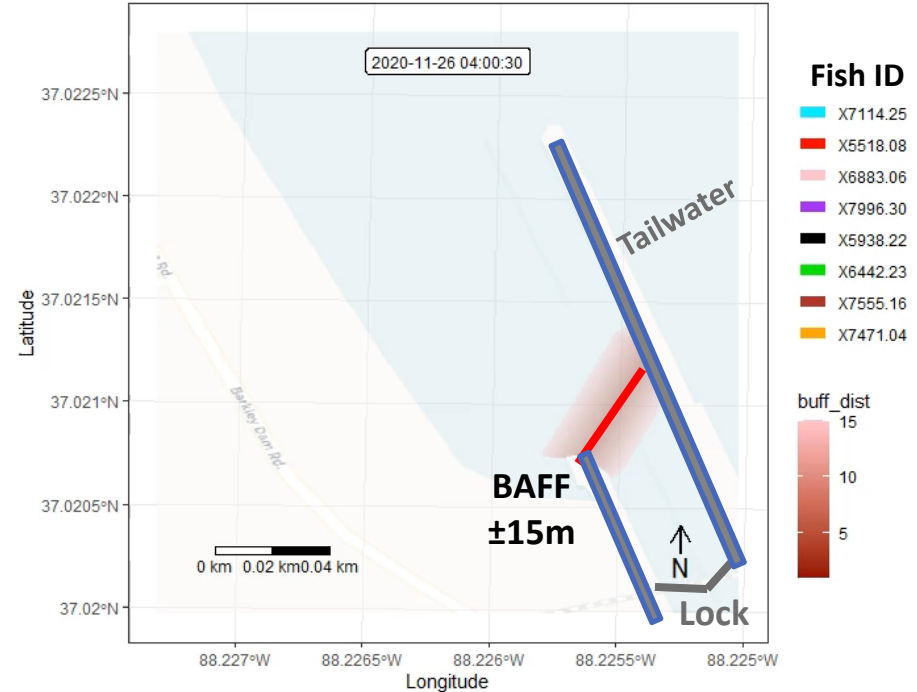
HTI receiver array

# Silver Carp in downstream approach at Barkley Dam

## BAFF OFF



## BAFF ON

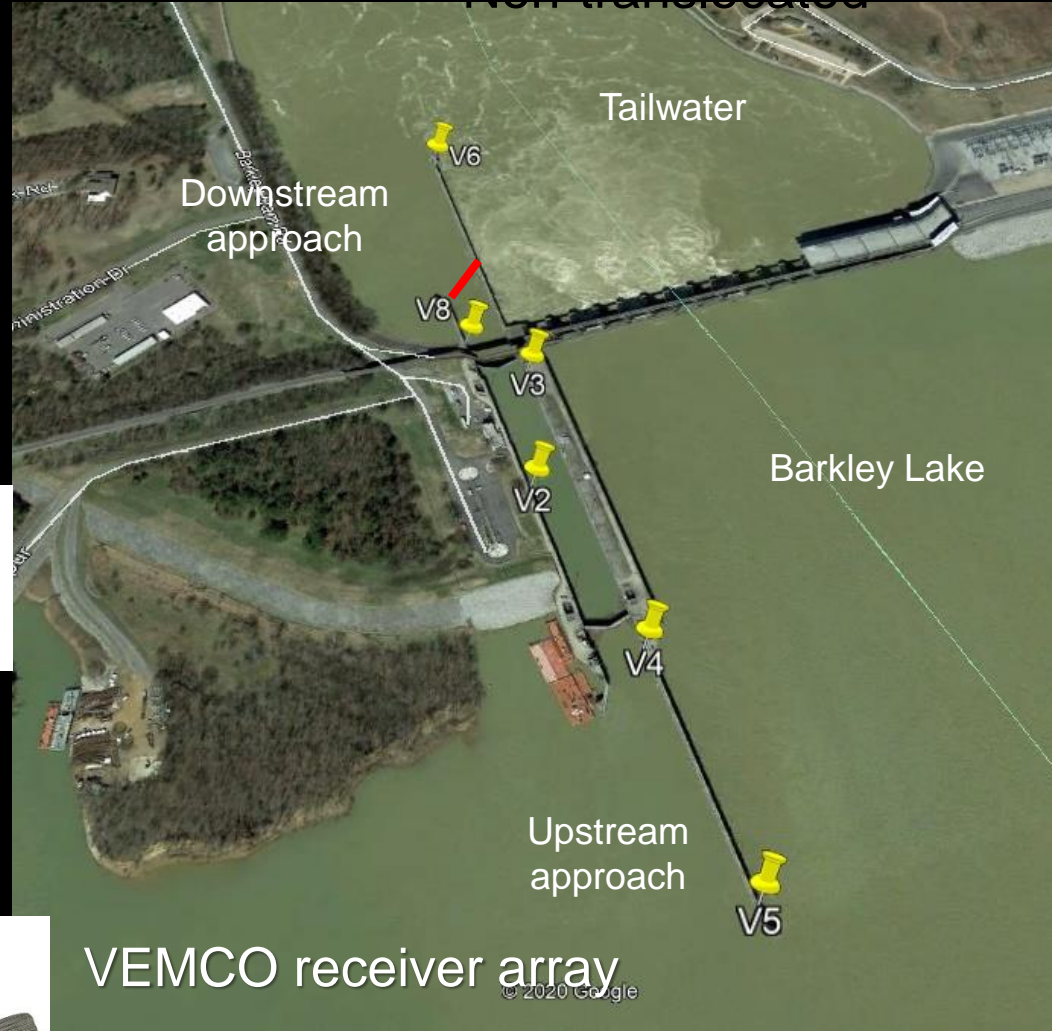
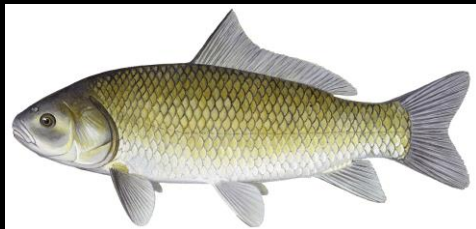
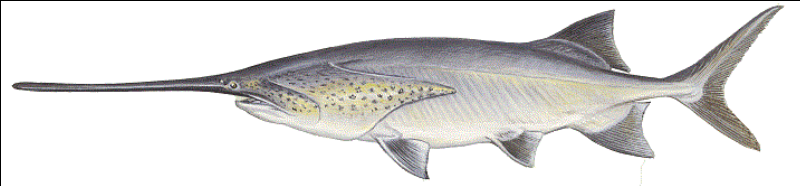




# Methods and study design

## Non-translocated native fish

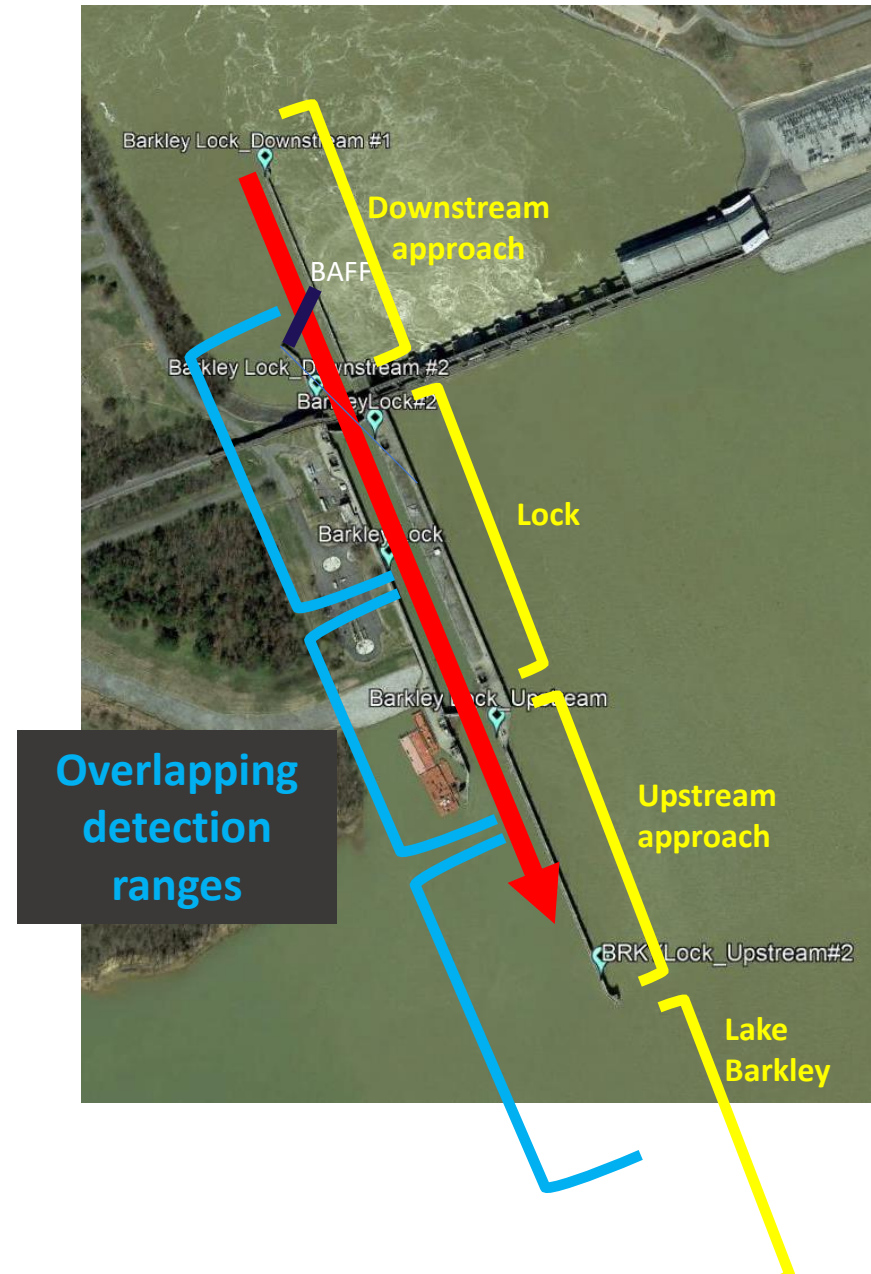
- VEMCO Telemetry
- 20 PDFH, SMBF, FWDM
- Fall & Spr through Spr 2023



# Upstream BAFF-crossing criteria - VEMCO

## Sequence of detections:

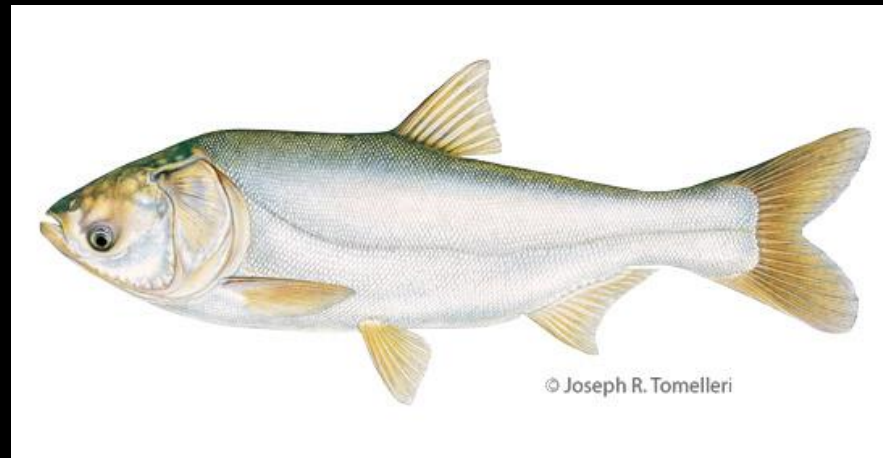
- downstream approach ->
- lock ->
- upstream approach or above





# Translocated HTI Silver Carp

- 254 Silver Carp tagged Nov 2020
- Tracked Nov 1, 2020 – Feb 13, 2021



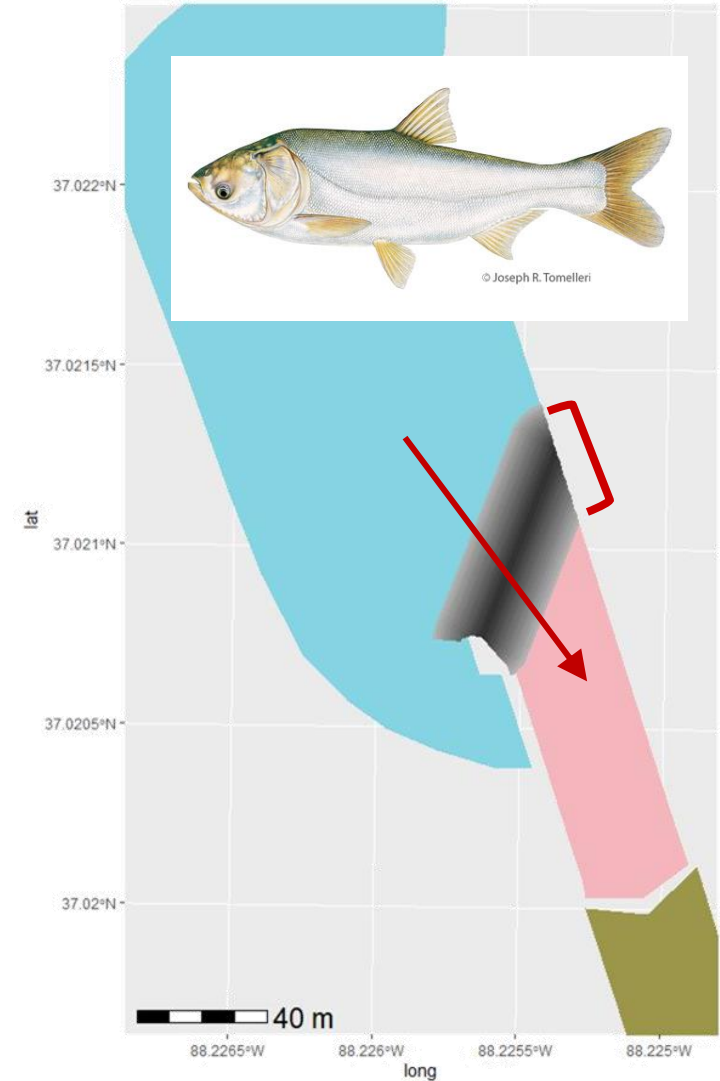
Disclaimer: The data and information presented here is preliminary, deliberative, and pre-decisional.

# Upstream BAFF crosses fall-winter

Status	Crosses (fish)
BAFF OFF	129 (57)
BAFF ON	7 (4)

18:1 per cross basis

14:1 per fish basis





# Translocated HTI Silver Carp

- 400 Silver Carp tagged late April; 80 Silver Carp previously tagged
- Tracked Apr 8, 2021 – Aug 5, 2021



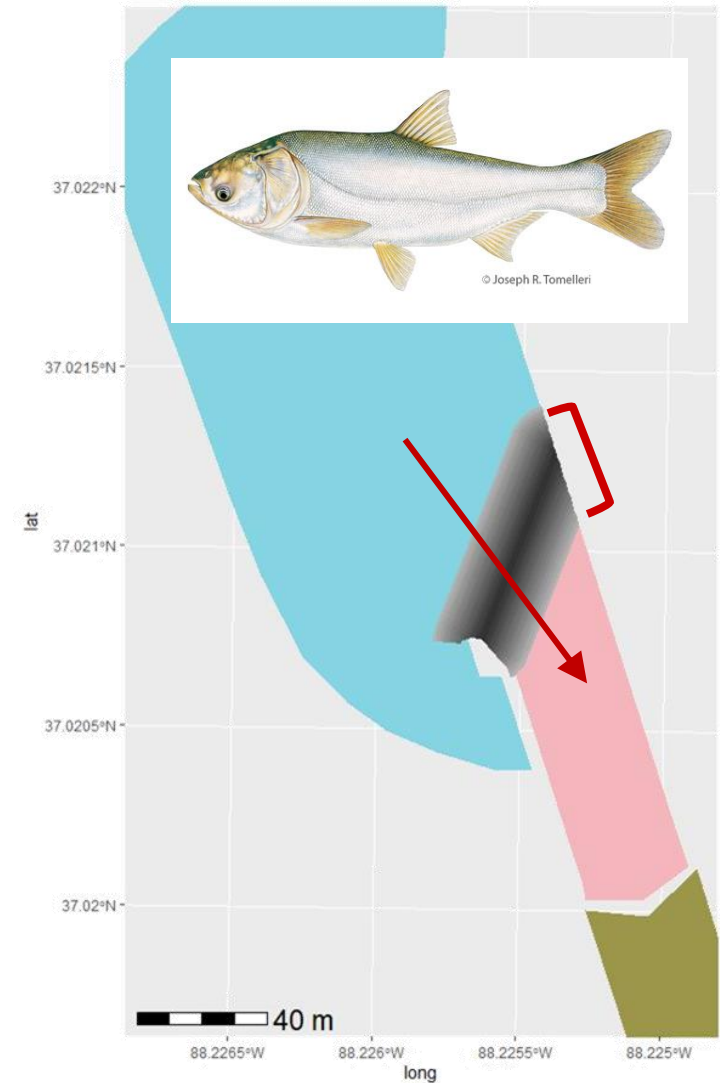
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# Upstream BAFF crosses spring-summer

Status	Crosses (fish)
BAFF OFF	539 (190)
BAFF ON	163 (82)

3:1 per cross basis

2:1 per fish basis





Off:On

BAFF crosses fall-winter

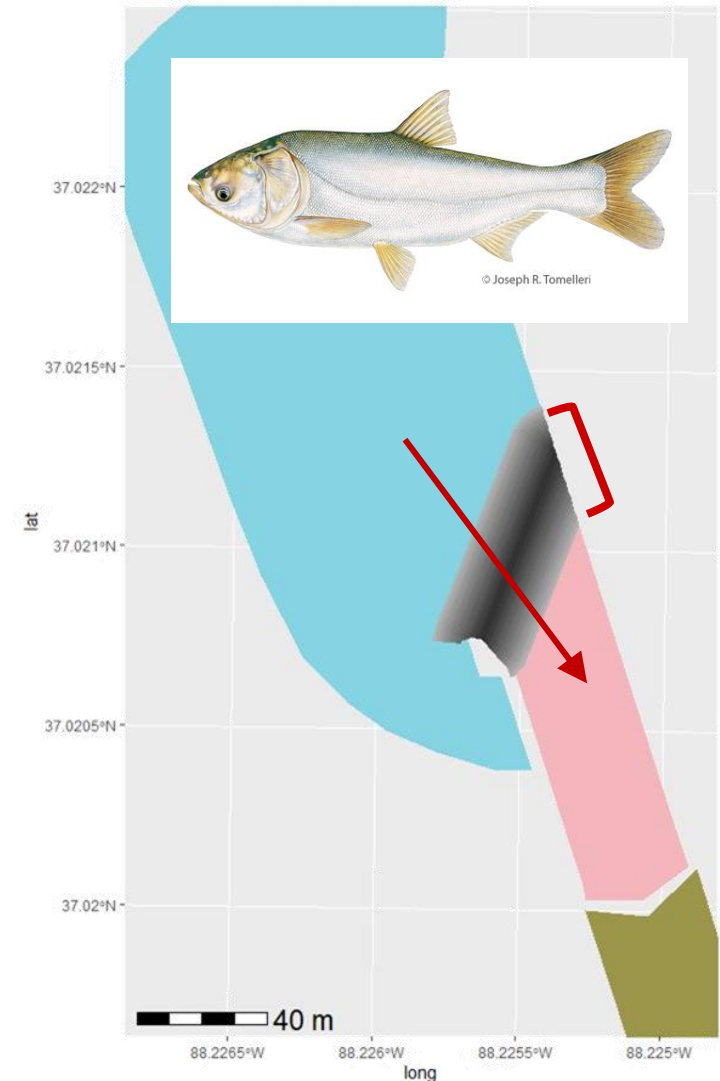
18:1 per cross basis

14:1 per fish basis

BAFF crosses spring-summer

3:1 per cross basis

2:1 per fish basis



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# Non-translocated native species with VEMCO telemetry



- Tailwater-captured fish (not translocated)
- Takes advantage of an ongoing study
- Passage through lock to confirm BAFF crossing

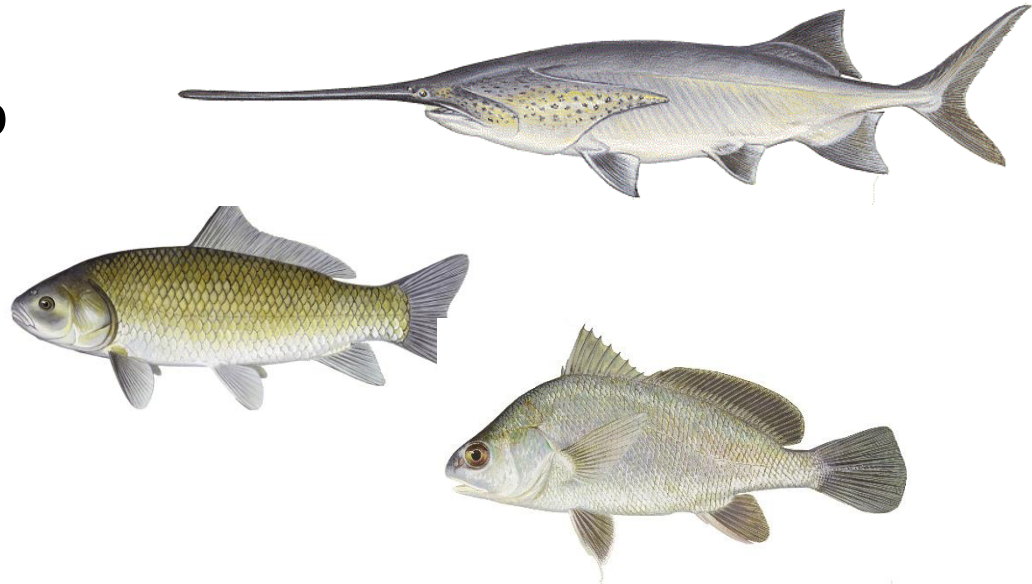


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# Barkley tailwater tagging overview

- ➔ 73 Freshwater Drum
- ➔ 53 Paddlefish
- ➔ 102 Smallmouth Buffalo



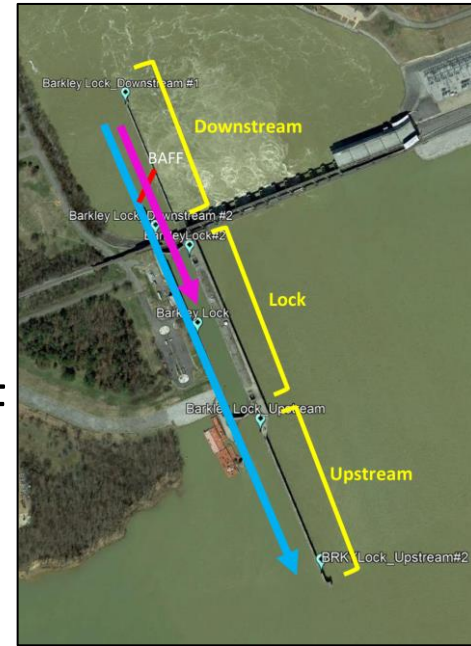
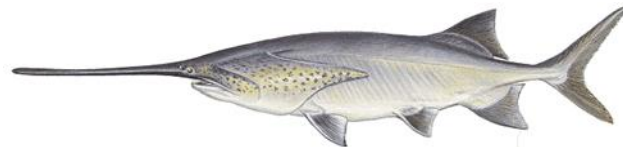
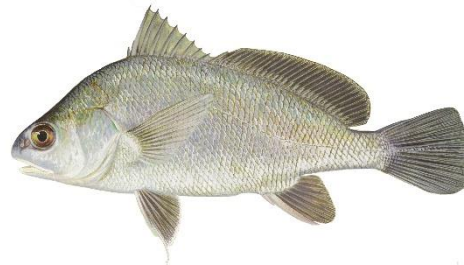
# Upstream BAFF Crossings (Oct 1, 2020 – Aug 12, 2021)

- 9 Freshwater Drum moved upstream across the BAFF  
OFF = 7 : ON = 2
- 15 Paddlefish moved upstream across the BAFF  
OFF = 8 : ON = 7
- 1 Smallmouth Buffalo moved upstream across the BAFF  
OFF = 0 : ON = 1

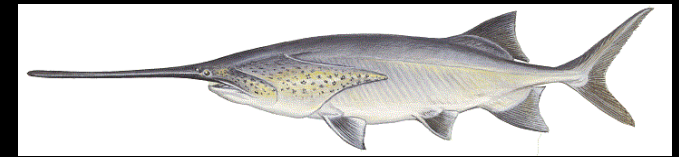
4:1 per fish basis

1:1 per fish basis

0:1 per fish basis



# What's next?



- Continue the study
  - Additional Silver Carp and adding some Grass Carp
  - Additional numbers of our 3 native species
- Model results with time-to-event
  - Environmental factors
- Evaluate fine-scale behaviors
  - Individual fish behavior



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