Seasonal Habitat use, Movement, and Exploitation of Sauger (*Sander canadensis*) in the Arkansas River

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Fisheries and Wildlife Science

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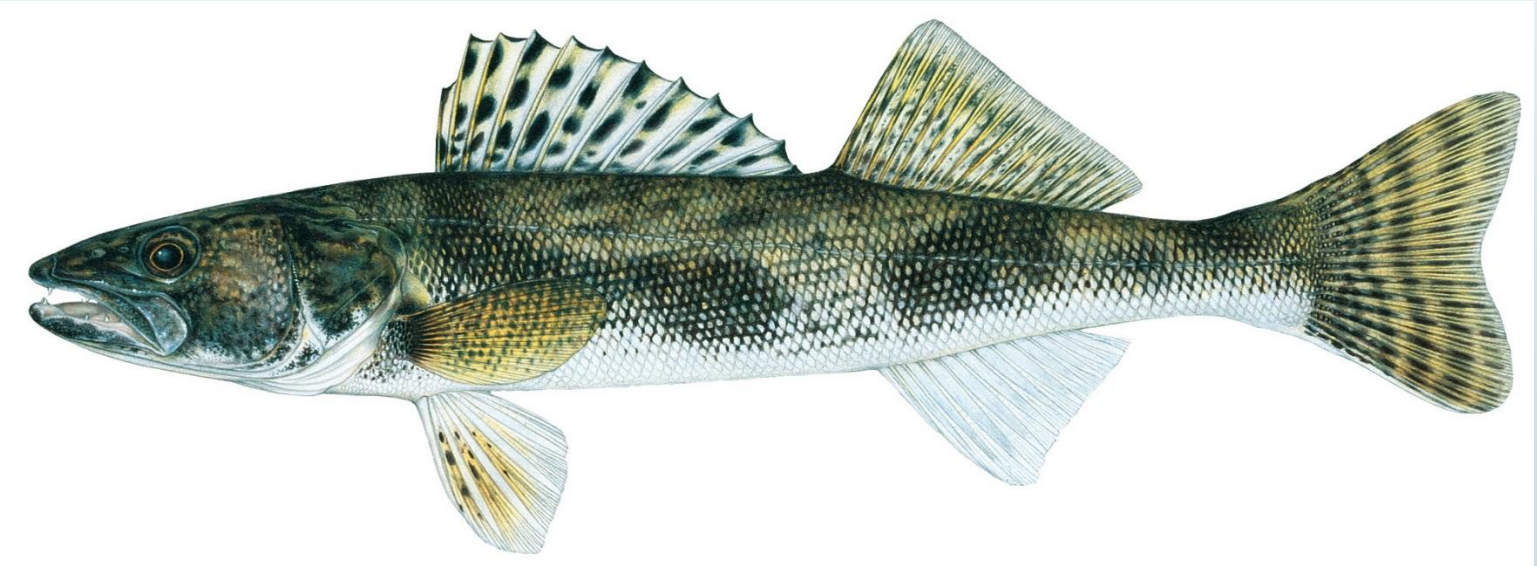
Introduction

- **Sauger are native throughout central N. America**
- **They are found in several rivers in Arkansas including the Mississippi, White, St. Francis, Strawberry, Saline and Arkansas**
- **Population declines from barriers**
- **Sauger left vulnerable to overharvest**

Photo courtesy of Megan Holland

- Maturity at age-2, size ranges from 370-425mm
- “Growth overfishing” likely to occur around 25% exploitation
- Exploitation rate is unknown
- Current management has no MLL



- Little is know about seasonal movement
- There is also a lack of knowledge about dispersal from barriers
- There is a need for a telemetry study

Exploitation Objectives

- **Determine exploitation of Sauger in Lake Dardanelle and Winthrop Rockefeller Lake**
- **Determine which months Sauger are most susceptible to harvest**
- **Determine if management regulations of Sauger in the Arkansas River should be altered (MLL)**

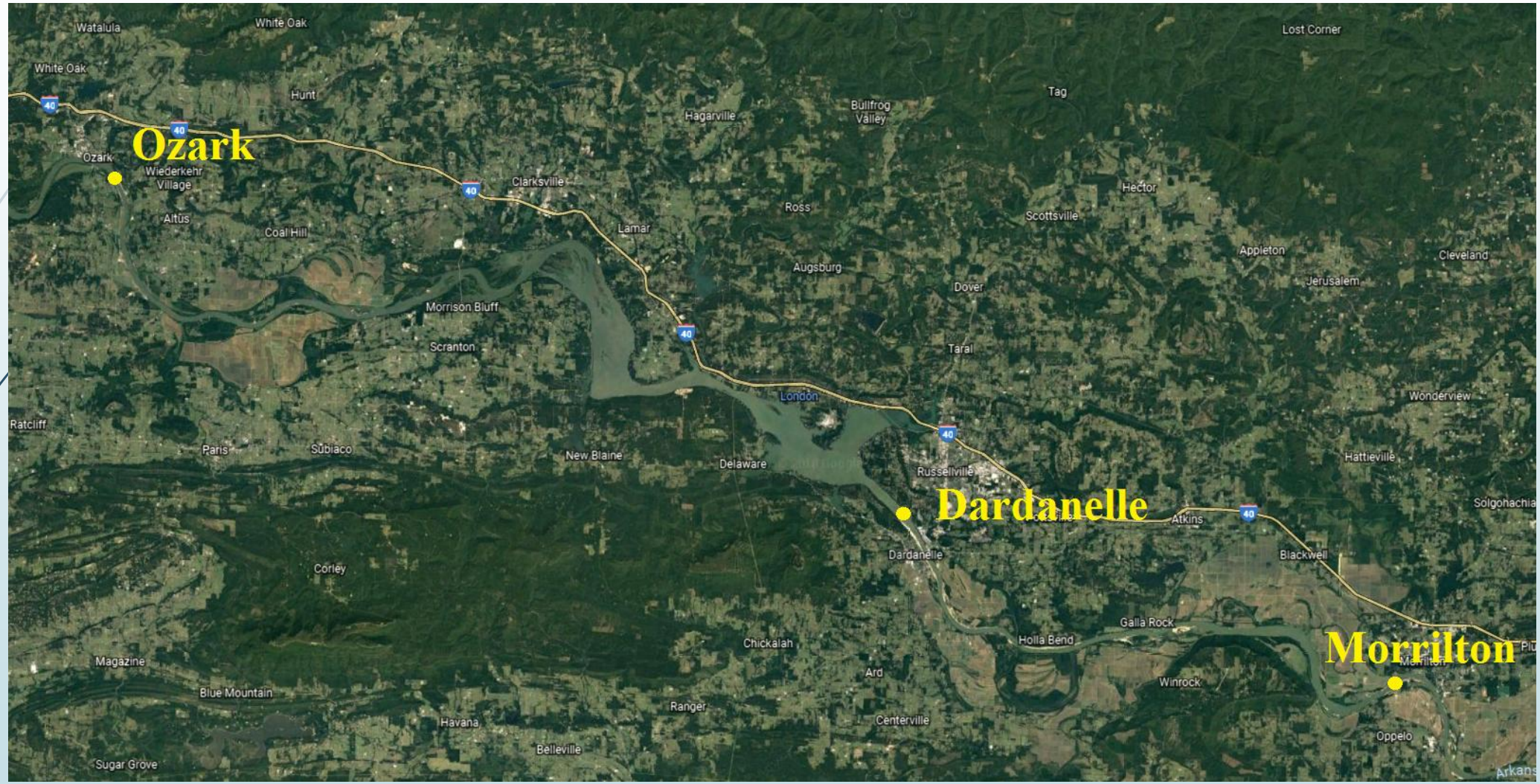
Telemetry Objectives

- **Understand Sauger seasonal macro habitat use and home range**
- **Understand movement patterns and dispersal from aggregations near dams**
- **Determine natural mortality through known-fate models**

Study Sites

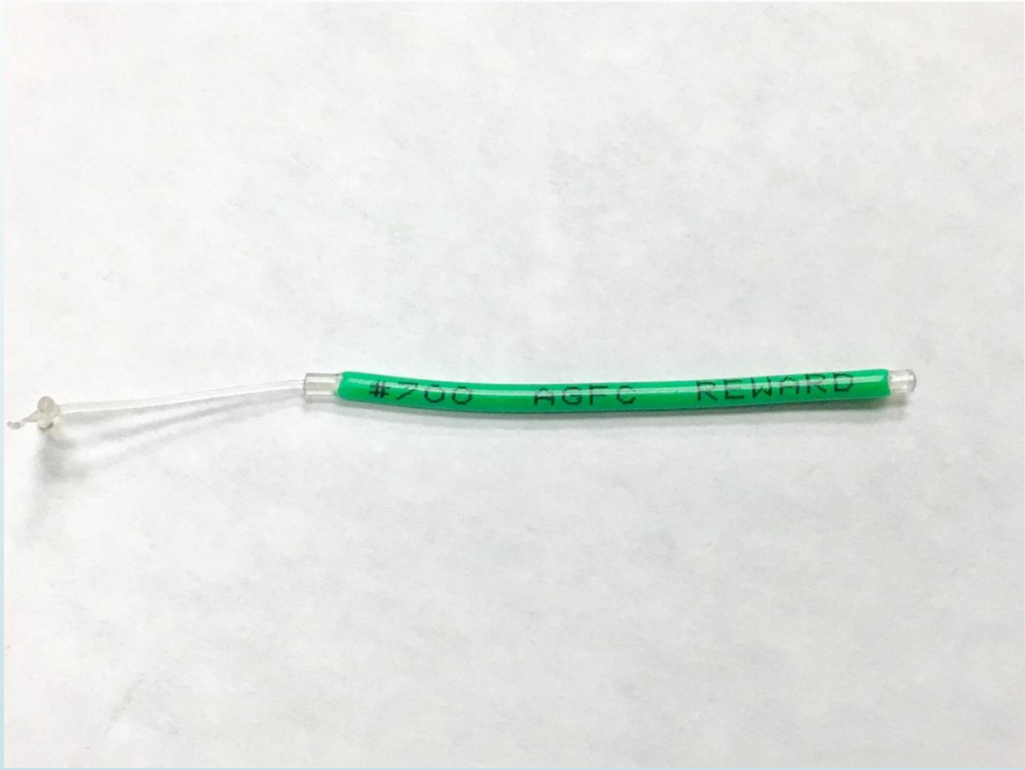
- **Lake Dardanelle/Pool 10 and 11 (13,887 ha.) and Winthrop Rockefeller Lake/Pool 9 (1988 ha.) on the Arkansas River**
- **Part of the McClellan-Kerr Arkansas Navigation System (MKARNS)**
- **Both dams discharge regularly through generators**

Study Site


Ozark
Dardanelle
Morrilton
Watalula
White Oak
White Oak
Hunt
Ozark
Wiederkehr Village
Altus
Coal Hill
Clarksville
Hagarville
Bullfrog Valley
Ross
Lamar
Augsburg
Morrison Bluff
Scranton
Dover
Taral
London
Tag
Lost Corner
Hector
Scottsville
Appleton
Cleveland
Jerusalem
Wonderview
Hattieville
Ratcliff
Paris
Subiaco
New Blaine
Delaware
Russellville
Atkins
Dardanelle
Blackwell
Solgohachia
Corley
Chickalah
Holla Bend
Galla Rock
Magazine
Blue Mountain
Ard
Winrock
Ranger
Havana
Centerville
Belleville
Oppelo
Sugar Grove

Exploitation Study Methods

- **Use experimental gillnets**
- **300 sauger from each dam**
- **Net evenings from 4pm-11pm**
- **Floy tag (FD94 Anchor tags) all sauger with either a red or green tag**



Exploitation Methods

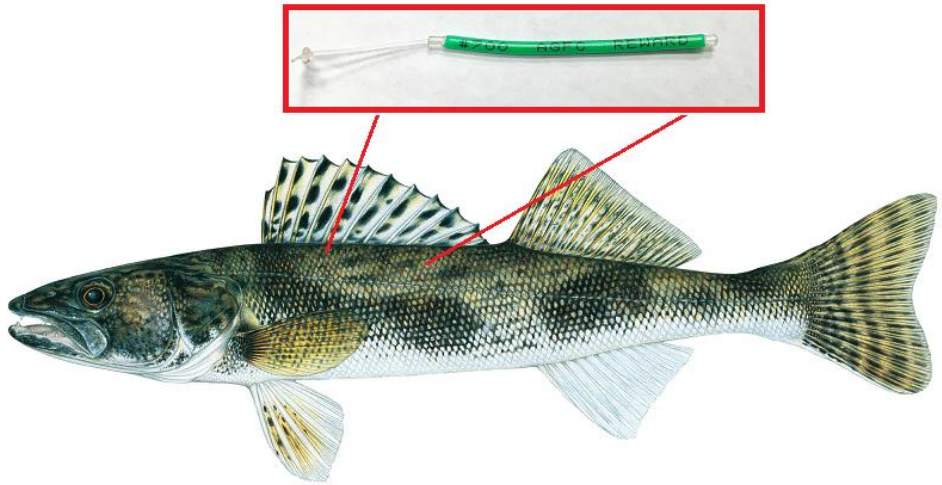
- **250 standard green tags**
- **50 high reward red tags**
- **20% of fish will be double tagged**

Poster

REWARD

Arkansas River Sauger Exploitation Study
Please help us collect this information:

1. Tag 2. Length 3. Number Sauger Caught 4. Date 5. Location



$10 to $50: amount chosen randomly

Red "High Reward" tags are $100 guaranteed

Please Contact AGFC at 1-877-967-7577 with your information.


NOTICE
LARGEMOUTH BASS REGULATIONS
Largemouth bass
STOP AQUATIC HITCHHIKERS!
Prevent the transport of nuisance species.
Clean all recreational equipment.
www.ProtectYourWaters.net
HELP PROTECT ENDANGERED LEAST TERNS
Avoid posted sandbars or areas where terns are present May-August.

Exploitation Analysis

- **Annual exploitation can be estimated with the following formula**

$$u = N_r / [N_o(1-t)(1-m)(\lambda)]$$

- **This accounts for tag loss, tagging mortality, and non-reporting rates**
- **(Pollock's 1991) formula for non-reporting rate**

$$\hat{\lambda} = R_s N_r / (R_r N_s)$$

Telemetry Study Methods

- **50 Sauger will be collected in a similar manner to the exploitation study**
- **25 acoustic telemetry tags (Sonotronics CT-82-2-I) will be surgically implanted in sauger for each pool**
- **Fish must have at least 335mm total length and 475g minimum weight**

Surgical Procedure

- **Anesthesia: Sodium Bicarbonate (2.66g/L) and Acetic Acid (1ml/L) (Peake 1998)**
- **Ventral incision on midline**
- **Absorbable monofilament suture**
- **Recovery tank before release**

Telemetry Methods

- **Sauger will be actively tracked bi-weekly and continuously passively tracked for a span of one year**
- **Passive tracking from SUR's**
- **River habitats will be classified**
- **ARCGIS Fish Tracker program**
- **Known-fate models in MARK**

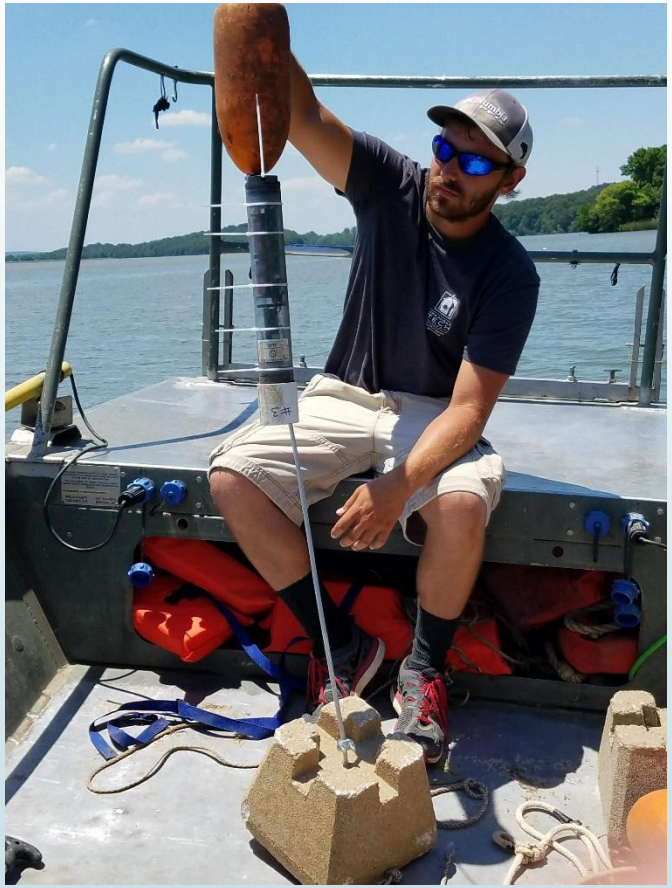


Photo courtesy of Zach Moran

Current Status

- **We have 49 out of 50 acoustic tags implanted**
- **69 Sauger out of our goal of 600 have been tagged**
- **As water temperatures rise to 10ºC, we anticipate catch rate to increase dramatically**

Sauger Sampling on the Arkansas River: Observations after One Sampling Season

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Approved for distribution:_____
Mark Oliver, Assistant Chief

Acknowledgements

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- **Frank Leone and Tony Fernando**
- **District 10**

Questions