

**POPULATION CHARACTERISTICS OF
SMALLMOUTH BASS AND ROCK BASS
IN THE LITTLE RIVER, BLOUNT COUNTY, TENNESSEE**

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evergreen packaging

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ROCKY MOUNTAIN FISHERIES

TENNESSEE WILDLIFE RESOURCES AGENCY


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Introduction

- TWRA statewide study
- Riverine smallmouth bass (SMB)
- Statewide
 - 3,183 SMB
 - 3,006 aged via otoliths
- Region IV (East TN)
 - 1,564 SMB/22 pops

(Fiss et al., 2001)

Population characteristics of riverine smallmouth bass in Tennessee, simulated effects of length limits, and management recommendations.



Fisheries Report 01 - 19

by
Frank C. Fiss
Tim A. Christoff
Bret D. Cook
Rick D. Swann
Jack M. Swannigan
July 2001
Tennessee Wildlife Resources Agency

Past Data

- 2 years (1996-97)
- 4 sites
- 21 fish/21 otoliths
- SMB study, Little River within GSMNP

(Fiss et al., 2001; Shaffer and Cook, 2003)

Little River Quotes

- “[Little] River represents an outstanding resource in the quality of the water and the species that inhabit it.” (Carter et al., 2012)
- “....serves as a benchmark in evaluating other streams of similar size and character.” (Carter et al., 2012)
- “TN has the richest fauna of freshwater fish in the US.” (Enler and Starnes, 1993)
- “one of richest darter faunas in East TN.” (Jett, 2010)

Tennessee Wildlife Resources Agency (TWRA)

Mission:


“...is to preserve, conserve, **manage**, protect, and **enhance** the fish and wildlife of the state and their habitats for the use, benefit, and enjoyment of the citizens of Tennessee and its visitors.” (<http://www.tn.gov/twra/>)

Index of Biological Integrity (IBI)

- 12 metrics modified for TN (TWRA, TVA, TTU) (Karr et al., 1986; Carter et al., 2012)
- Measure stream health
- Total Score:
 - Excellent = 58-60
 - Good = 48-52
 - Fair = 40-44
 - Poor = 28-34
 - Very Poor = 12-22
 - No Fish
- 2005-11, IBI average = 56 (Good/Excellent) (Carter et al., 2012)


Little River

- Blount County, TN
- Originates Clingmans Dome (GSMNP)
- Flows ~59 miles (95 km)
- Watershed ~379 mi² (982 km²)
- TN River Tributary
- Topside Rd/Alcoa Hwy



Study Area

Confluence with TN River




GSMNP Boundary

Fish Species


Smallmouth bass (SMB)

Micropterus dolomieu
(Lacepede)
(Etnier and Starnes, 1993)




Rock bass (RB)

Ambloplites rupestris
(Rafinesque)
(Etnier and Starnes, 1993)




Fish Species

Largemouth bass (LMB)
Micropterus salmoides
(Lacepede)
(Etnier and Starnes, 1993)



Spotted bass (SB)
Micropterus punctulatus
(Rafinesque)
(Etnier and Starnes, 1993)



Justification

- Requested by TWRA (Carter et al., 2012; Fiss et al., 2001)
- Reference site
- Multiple non-game (Jett, 2010; Heacock, 1995; Power and Maiden, 2002)
- Lack sport fish study
- Baseline data for management decisions

Objectives

1. Evaluate growth, mortality, recruitment in SMB & RB
2. Assess size structure of SMB & RB populations
3. Proportional Stock Density (PSD) (Gabelhouse, 1984)

Relative Stock Density (RSD) (Gabelhouse, 1984)

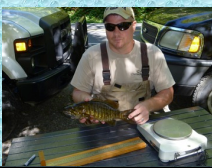

Objectives

- 4. Compare w/ local rivers
- 5. Evaluate Protected Length Range (PLR) of SMB
 - "Slot Limit"
 - Implemented March 1, 2009
 - 13 – 17 inch PLR
 - 5 Bass Daily Creel Limit (DCL)
 - Only 1 of DCL 17+ inch

(Carter et al., 2012)

Methods

- March-April 2013
- Short sample period
- Little River Mile (LRM) 0.0 – 35.0
- Weight & Length:
 - Largemouth bass
 - Spotted bass




Methods

- Boat Electrofishing
- Backpack Electrofishing
- Angling

Boat Electrofishing

- 14' Jon boat
- Pulsed-DC current




Methods

Boat Electrofishing


Backpack Electrofishing

Angling



Backpack Electrofishing

- Mostly shoreline
- Smaller fish



Methods

Boat Electrofishing

Backpack Electrofishing

Angling

Angling

- Larger fish
- "Good" method (Bennett, 1971)

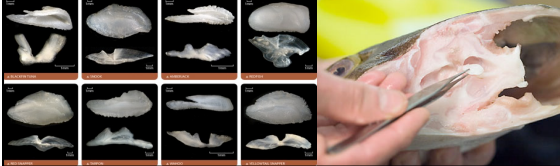


Data Collected

- 5 fish/size class (SMB/RB)
- Size class = 1 inch
- Goal 0-20 inch "Total" Length
- Length (± 1 mm)
- Weight (± 1 g)

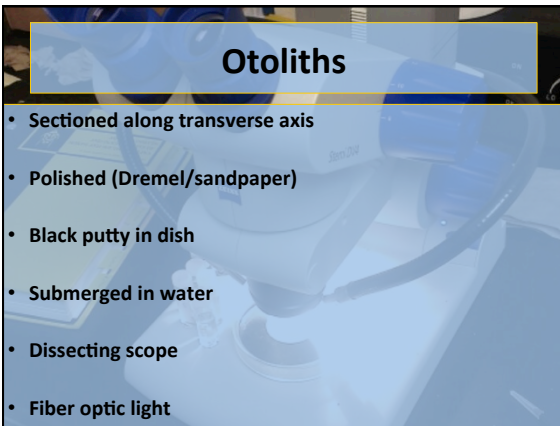
Otoliths

- Otolith = "ear stone"
- Used to age fish
- Extract otoliths (2) from each fish
- Sagittal otolith (largest, easiest removal)



Otoliths

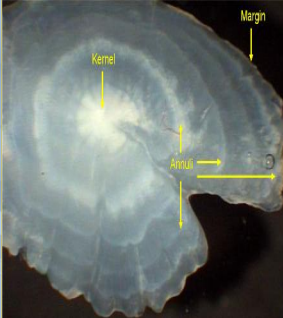
- Sectioned along transverse axis
- Polished (Dremel/sandpaper)
- Black putty in dish
- Submerged in water
- Dissecting scope
- Fiber optic light



Otoliths

- Read inside-out
- Annuli = new growth year
- Two annuli = age 2+
- Sample season is factor
- Ages significantly more precise
- Other structures
 - scales, vertebrae, opercles

(LaBay and Lauer, 2006; Beamish and McFarlane, 1987)



Benefits

- TWRA
 - Management decisions
 - Slot limits
- Close data gap
- Provide a baseline for what a stream “could be”

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Picture References

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TWRA

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Questions?