

## Joshua Mouser

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### EDUCATION

#### **Ph.D. in Fisheries and Wildlife Sciences**

Virginia Polytechnic Institute and State University, Blacksburg, Virginia  
(Graduation expected Fall 2023, 4.00 GPA)

#### **M.S. in Natural Resource Ecology and Management—Fisheries and Aquatic Ecology**

Oklahoma State University, Stillwater, Oklahoma  
(2019, 3.82 GPA)

#### **B.S. in Natural Resource Ecology and Management—Wildlife Ecology and Management**

Oklahoma State University, Stillwater, Oklahoma  
(2016, 3.97 GPA, *Summa Cum Laude*, Honors College Degree)

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### EXPERIENCE

#### **Virginia Cooperative Fish and Wildlife Research Unit**

*Graduate Research Assistant*

June 2019–Present

PI: Paul Angermeier, Ph.D.

My doctoral research uses an interdisciplinary approach to investigate the efficacy of agricultural best management practices (BMPs) for protecting stream health. Efficacy of BMPs is controlled by interactions among landscape conditions, ecological responses, and social factors; however, these factors are often not considered when installing BMPs. My research focuses on integrating watershed modeling, stream ecology, and social science to understand BMP effectiveness. I am using the Soil and Water Assessment Tool to estimate pollutant yields to streams within southwest Virginia. This coarse-scale assessment will be supplemented with macroinvertebrate, stream habitat, and water quality surveys at 31 sites that represent a range of estimated pollutant yields and BMP implementation intensities. I will survey landowners to determine persistence in maintaining and using BMPs after cost-share contracts end and identify landowner (e.g., environmental attitudes) and landscape characteristics (e.g., flooding frequency) associated with persistence. Lastly, I will develop potential BMP implementation scenarios (e.g., increasing BMP persistence, increasing BMP adoption in locations with high pollutant yields) at the watershed scale to assess which tactics are most effective for restoring stream health. This research is conducted with the Natural Resource Conservation Service and Soil and Water Conservation Districts so that results can guide future BMP placement.

#### **Virginia Polytechnic Institute and State University**

*Graduate Teaching Assistant (GTA)*

Fall 2021

Instructor: Leandro Castello, Ph.D.

I was a GTA for Fisheries Techniques (FIW3154). I co-led the laboratory section which involved field trips to local streams to teach students how to use standard fisheries gears to collect biophysical data. I also gained valuable teaching experience by designing and presenting a lecture about techniques for obtaining age and growth data for fishes. My lecture consisted of a

PowerPoint presentation that introduced key concepts and a hands-on activity where students had the opportunity to age images of otoliths and receive instructor feedback during the activity.

**Virginia Polytechnic Institute and State University**

*Graduate Teaching Assistant (GTA)*

Fall 2020

Instructor: Ashley Dayer, Ph.D.

I was a GTA for Human Dimensions of Fisheries and Wildlife (FIW4464). I graded half of the exams, homework, and projects and was solely in charge of maintaining all class participation records for almost 80 students. I also gained valuable teaching experience by designing and presenting a lecture about interdisciplinary science and how to appropriately integrate social science into ecological research projects. My lecture consisted of a PowerPoint presentation that introduced key concepts and a hands-on activity where students had to explain how social science could be integrated into several hypothetical ecological studies. In addition, to gaining valuable teaching experience, this class was my first chance to learn social science methods and truly increase my skills as an interdisciplinary researcher.

**Oklahoma Cooperative Fish and Wildlife Research Unit**

*Graduate Research Assistant*

January 2017–May 2019

PI: Shannon Brewer, Ph.D.

My master's research focused on applying novel techniques for studying cavefishes and cave crayfishes. Visual surveys are traditionally used to sample cavefishes and cave crayfishes, but improved methods can augment information gained from visual surveys. Additionally, we know little about the ecology and life history of many stygobiont species. I sampled 40 caves, springs, and wells using both novel environmental DNA surveys and traditional visual surveys. In a single cave, I focused on understanding the habitat use, life history, and longevity of bristly cave crayfish *Cambarus setosus*. The latter effort was paired with a controlled laboratory experiment on a common surface species (ringed crayfish *Faxonius neglectus*) to assess the validity of using gastric mills to age crayfishes and the effects of temperature on annual band formation.

**Oklahoma Cooperative Fish and Wildlife Research Unit**

*Research Technician*

May 2013–December 2016

PI: Shannon Brewer, Ph.D.

I was involved in many projects as a technician in Dr. Brewer's laboratory. I assisted graduate students with the field and laboratory portions of their research. Field research focused on sampling streams for fish and crayfish using multiple gears/techniques (e.g., seining, snorkeling, electrofishing) and measuring environmental variables. Laboratory work included fish and crayfish husbandry, use of many types of software (e.g., ArcMap), and fish and crayfish identification. During the last 2 years of my position, I trained and supervised new technicians. In addition to assisting graduate students, I identified and recorded fish samples for the U.S. Fish and Wildlife Service and assisted with report preparation.

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## PEER-REVIEWED PUBLICATIONS

### *Manuscripts accepted*

- **Mouser, J.B.**, D.C. Ashley, D.L. Zentner, and S.K. Brewer. 2022. Seasonal context of bristly cave crayfish *Cambarus setosus* life history and habitat use. *Journal of Cave and Karst Studies*.
- Mollenhauer, R., **J.B. Mouser**, V.L. Roland, and S.K. Brewer. 2022. Increased landscape disturbance and streamflow variability threaten fish biodiversity in the Red River catchment, USA. *Diversity and Distributions*.
- **Mouser, J.B.**, S.K. Brewer, M.L. Niemiller, R. Mollenhauer, and R.A. Van Den Bussche. 2021. Refining sampling protocols for cavefishes and cave crayfishes to account for environmental variation. *Subterranean Biology*. 39:79–105.
- DiStefano, R.J., D. Ashley, S.K. Brewer, **J.B. Mouser**, and M.L. Niemiller. 2020. Preliminary investigation of the critically imperiled Caney Mountain cave crayfish *Orconectes stygocaneyi* (Decapoda: Cambaridae) (Hobbs III 2001) in Missouri, USA. *Freshwater Crayfish*. 25:47–57.
- **Mouser, J.B.**, J. Glover, and S.K. Brewer. 2020. Gastric mill age estimates for ringed crayfish *Faxonius neglectus neglectus* (Faxon) and the influence of temperature on band formation. *Freshwater Crayfish*. 25:59–67.
- Brewer, S.K., **J.B. Mouser**, and R.A. Van Den Bussche. 2020. Using environmental DNA (eDNA) to assess the presence of cavefish and cave crayfish populations in the Ozark Highlands. U.S. Department of Interior, Fish and Wildlife Service, Cooperator Science Series FWS/CSS-135-2020, Washington, D.C.
- **Mouser, J.B.**, R. Mollenhauer, and S.K. Brewer. 2019. Relationships between landscape constraints and a crayfish assemblage with consideration of competitor presence. *Diversity and Distributions*. 25:61–73.
- **Mouser, J.B.**, D.C. Ashley, T. Aley, and S.K. Brewer. 2019. Subterranean invasion by gapped ringed crayfish: Effectiveness of a removal effort and barrier installation. *Diversity*. 11:3.
- Mollenhauer, R., **J.B. Mouser**, and S.K. Brewer. 2018. Sampling the stream landscape: improving the applicability of an ecoregion-level capture probability model for stream fishes. *Canadian Journal of Fisheries and Aquatic Sciences*. 75:1614–1625.
- Musselman, C., T. Worthington, **J. Mouser**, D. Williams, and S.K. Brewer. 2017. Passive integrated transponder (PIT) tags: A review of current studies on warmwater fishes with notes on additional species. *Journal of Fish and Wildlife Management*. 8:353–364.
- Dyer, J., **J. Mouser**, and S.K. Brewer. 2016. Habitat use and growth of the western painted crayfish *Orconectes palmeri longimanus* (Faxon, 1898) (Decapoda: Cambaridae). *Journal of Crustacean Biology*. 36:172–179.

*Manuscripts in preparation*

- **Mouser, J.B.**, S.K. Brewer, M.L. Niemiller, R. Mollenhauer, and R.A. Van Den Bussche. In Review. Drivers of cavefish and cave crayfish distributions in the Ozark Highlands ecoregion. *Nature Communications*.
- Walker, R.H., A.C. Belvin, **J.B. Mouser**, A. Pennino, S. Plont, C.D. Robinson, L.B. Smith, J. Thapa, C.E. Zipper, P.L. Angermeier, S.A. Entekin. In Review. Rubbing salt in wounded ecosystems: a global synthesis of animal responses to freshwater salinization. *Science of the Total Environment*.
- **Mouser, J.B.**, Z.J. Loughman, and E. Frimpong. In Prep. Drivers of the distributions of stream-dwelling crayfishes in the New River, Virginia, USA. *Freshwater Biology*.
- **Mouser, J.B.**, A. Dayer, S. Ciparis, and P. Angermeier. In Prep. An interdisciplinary framework for understanding BMP effectiveness.
- **Mouser, J.B.**, M.L. Niemiller, and S.K. Brewer. In Prep. A fisherman's tale: An unusual observation of the Ozark cavefish *Troglichthys rosae* (Eigenmann, 1898). *Southeastern Naturalist*.

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**ORGANIZATIONS**

*American Fisheries Society*

- Member of the Virginia Tech Chapter 2019–Present
  - Treasurer (2020–2021)
- Member of the National Chapter 2016–Present
- Member of the Oklahoma Chapter 2016–2019
- Member of Oklahoma State University Student Chapter 2015–2019

*Fish and Wildlife Graduate Student Association at Virginia Tech*

- Member 2019–Present
  - Orientation Chair (2021–2022)

*Interfaces of Global Change Graduate Student Organization*

- Member 2020–Present
  - Treasurer (2021–2022)

*International Association of Astacology*

- Member 2018–Present

Virginia Lakes and Watersheds Association

- Member 2021–Present

*The Wildlife Society*

- Member of the Oklahoma State University Student Chapter 2012–2016
  - Liaison to the Oklahoma Chapter (2015–2016)
- Member of the National and Oklahoma Chapters 2015–2016

*Oklahoma State University Honors College Student Association*

- Member 2015–2016
  - Founding member

- Treasurer (2015–2016)

*Phi Kappa Phi*

- Member

2014–Present

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## GRANTS RECEIVED

\* Unofficial co-principal investigator due to application policies

- \***Mouser, J.B.**, P. Angermeier, A. Dayer, and J. Czuba. 2021. Coupling social science and watershed modeling to improve ecological health of streams in agricultural landscapes. Global Change Center at Virginia Tech Seed Grant. (\$15,000)
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## PRESENTATIONS

Presenter is listed first

\*Poster presentation

\*\*Co-presented

*Scientific conferences*

- **Mouser, J.B.**, S. Ciparis, and P.L. Angermeier. 2022. Responses of stream health to agricultural best management practices. Joint Aquatic Sciences Meeting.
- Walker, R.H., A.C. Belvin, **J.B. Mouser**, A. Pennino, S. Plont, C.D. Robinson, L.B. Smith, J. Thapa, C.E. Zipper, and P.L. Angermeier. 2022. Rubbing salt in wounded ecosystems: a global synthesis of animal responses to freshwater salinization. Joint Aquatic Sciences Meeting.
- Entrekin, S.A., A.C. Belvin, **J.B. Mouser**, A. Pennino, S. Plont, C.D. Robinson, L.B. Smith, J. Thapa, C.E. Zipper, P.L. Angermeier, and R.H. Walker. 2022. Aquatic insect responses to salinization across ecosystems, taxa, and ions: a review. Joint Aquatic Sciences Meeting.
- Belvin, A.C., **J.B. Mouser**, A. Pennino, S. Plont, C.D. Robinson, L.B. Smith, J. Thapa, C.E. Zipper, P.L. Angermeier, S.A. Entrekin, and R.H. Walker. 2022. Rubbing salt in wounded ecosystems: An ICG capstone review of animal responses to anthropogenic salinization. Interfaces of Global Change Graduate Research Symposium.
- **Mouser, J.B.**, A. Dayer, S. Ciparis, and P. Angermeier. 2022. Using an interdisciplinary approach to assess effects of agricultural best management practices on stream health. Virginia Lakes and Watersheds Association.
- **Mouser, J.B.**, S. Ciparis, and P. Angermeier. 2021. Assessing efficacy of agricultural best management practices for restoring stream health. Interfaces of Global Change Graduate Research Symposium.
- **Mouser, J.B.**, R. Walker, S. Entrekin, and P. Angermeier. 2021. Influence of salinization on freshwater crustaceans (Decapoda: Amphipoda, Astacidea, Brachyura, Caridea, and Isopoda). Southern Division American Fisheries Society.
- **Mouser, J.B.**, A. Dayer, S. Ciparis, and P. Angermeier. 2021. An interdisciplinary approach for determining efficacy of agricultural best management practices. Virginia Lakes and Watersheds Association.

- **Mouser, J.B.**, J. Glover, and S.K. Brewer. 2018. A new technique for determining crayfish population demographics. International Symposium on Freshwater Crayfish.
- **Mouser, J.B.**, J. Glover, and S.K. Brewer. 2018. A new technique for determining crayfish population demographics. Oklahoma Natural Resource Conference.
- Mollenhauer, R., D. Ryter, R. McManamay, D. Moore, **J.B. Mouser**, and S.K. Brewer. 2018. Local colonization and extinction of Red River stream fishes in relation to groundwater contribution. American Fisheries Society Southern Division.
- **Mouser, J.B.**, R.A. Van Den Bussche, M.L. Niemiller, C. Wood, D. Ashley, and S.K. Brewer. 2017. New techniques for determining occurrence and demographics of cave crayfish. National Cave and Karst Management Symposium.
- **Mouser, J.B.**, R. Mollenhauer, A. Miller, and S.K. Brewer. 2016. The invasive ringed crayfish: understanding occurrence patterns in the Ozark Highlands. Oklahoma Natural Resource Conference.
- **Mouser, J.B.**, R. Mollenhauer, A. Miller, and S.K. Brewer. 2016. The invasive ringed crayfish: understanding occurrence patterns in the Ozark Highlands. Student Water Conference (Oklahoma State University).
- **\*Mouser, J.B.**, N. Farless, J. Long, and S.K. Brewer. 2015. The influence of temperature regimes on otolith daily ring deposition in smallmouth bass *Micropterus dolomieu*. Research Symposium (Oklahoma State University).

#### *Workshops led*

- **Mouser, J.B.** 2021. Introductory R workshop for the Virginia Tech Chapter of the American Fisheries Society.

#### *Other presentations*

- **\*\*Martin, Z.**, and **J.B. Mouser**. 2020. Assessing habitat quality for stream biota: Notes from the Copper Creek. Clinch Water Watch.
- **Mouser, J.B.** 2019. Determining occurrence of cavefishes and cave crayfishes. Presentation for the Oklahoma Ecological Services Field Office (USFWS).
- **Mouser, J.B.** 2019. Life in the dark: Determining the occurrence and traits of cavefishes and cave crayfishes. Master's Thesis defense for the Department of Natural Research Ecology and Management (Oklahoma State University).
- **Mouser, J.B.** 2019. Exit light, enter night: Occurrence, life history, and ecology of cave species. Interview seminar for the Department of Fish and Wildlife Conservation (Virginia Polytechnic Institute and State University).
- **Mouser, J.B.** 2019. Investigating new methods for studying stygobionts. Presentation for the Oklahoma State University American Fisheries Society Student Chapter.
- **Mouser, J.B.** 2018. Protecting the well keepers. Three Minute Thesis (Oklahoma State University).
- **Mouser, J.B.** 2017. Cave crayfish, drinking water, and DNA. Three Minute Thesis (Oklahoma State University).

- **Mouser, J.B.**, N. Farless, J. Long, and S.K. Brewer. 2015. The influence of temperature regimes on otolith daily ring deposition in smallmouth bass *Micropterus dolomieu*. Niblack Research Scholars Annual Presentation (Oklahoma State University).
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## **AWARDS AND HONORS**

- Global Change Fellowship, Interfaces of Global Change Interdisciplinary Graduate Education Program (2022) **\$46,000**
  - Robert D. Ross Graduate Scholarship, Virginia Chapter American Fisheries Society (2022) **\$750**
  - Water Center Scholarship, Virginia Water Monitoring Council (2021) **\$40**
  - Leo Bourassa Scholarship, Virginia Lakes and Watersheds Association **\$2500** (2021)
  - Jimmie Pigg Memorial Outstanding Student Achievement Award, Southern Division American Fisheries Society **\$250** (2021)
  - Leo Bourassa Scholarship, Virginia Lakes and Watersheds Association **\$2500** (2020)
  - Distinguished Graduate Student Fellowship, Oklahoma State University **\$2500** (2018)
  - International Association of Astacology Student Travel Award **\$500** (2018)
  - Outstanding Graduate Fisheries Scholarship, Oklahoma State University **\$600** (2018)
  - Third Place Abstract Writing Competition, Oklahoma State University **\$100** (2017)
  - NREM Departmental Honors Award, Oklahoma State University (2016)
  - General Honors Award, Oklahoma State University (2016)
  - Student Employee of the Year Nominee, Oklahoma State University (2016)
  - The Wildlife Society Undergraduate Scholarship **\$500** (2016)
  - Niblack Research Scholarship **\$8000** (2014)
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## **MENTORSHIP**

*Joseph Wood*

Spring 2021

Joseph conducted an undergraduate research project under my guidance. His research focused on using a paired study design to assess BMP effectiveness.

*Kaitlyn Theberge*

Fall 2020

I was Kaitlyn's peer mentor for a student-led program in which experienced graduate students provide guidance to new graduate students during their first semester.

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## **COMMUNITY ACTIVITIES**

Blue Ridge Highlands Regional Science Fair judge (2022)

Western Virginia Regional Science Fair judge (2021)

Roanoke County High School Science Fair judge (2020)

Volunteer wrestling coach (2014, 2019)

Regional Food Bank volunteer (2013, 2014, 2016)