

Zachery D. Zbinden

Science and Engineering Hall - 850 W. Dickson St., Room 601, Fayetteville, AR 72701

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EDUCATION

- Ph.D., Biology** 2022 (expected)
University of Arkansas, Fayetteville, AR
Dissertation title: "Comparative Methods for Study of Ecology and Evolution of Fish Across a Riverscape"
Committee: Adam Siepielski, Jeremy Beaulieu, Michael Douglas, Marlis Douglas (Chair)
- M.S., Biology** 2016
University of Oklahoma, Norman, OK
Thesis title: "Beta Diversity of Stream Fish Communities: Partitioning Variation Between Abiotic and Spatial Factors"
Committee: Caryn Vaughn, Edith Marsh-Matthews, William Matthews (Chair)
- B.S., Ecology & Evolution** 2013
University of Pittsburgh, Pittsburgh, PA

RESEARCH APPOINTMENTS

- Research Assistant**—White-tailed Deer in Arkansas: Genetic Connectivity & Chronic Wasting Disease 2019 - current
P.I.s: Marlis Douglas, Michael Douglas (Univ. Arkansas)
Funding: *Arkansas Game and Fish Commission*
Modelled spread of a prion pathogen using landscape genetics and resistance surface analysis
- Project Leader**—White River Fish Comparative Population Genetics 2017 - current
P.I.s: Marlis Douglas, Michael Douglas (Univ. Arkansas)
Funding: 21st Century Chair in Global Change Biology Endowment
Collected and genotyped 3,500+ fish across numerous species from 75 locations across the White River Basin
- Research Assistant**—Population Genetics of Prairie Chub 2016
P.I.: Richard Broughton (Univ. of Oklahoma)
Led field expeditions to collect Prairie Chub in the Red River, OK
- Research Assistant**—Stream Ecology of Freshwater Mussel and Fish Community Interactions 2016
Oklahoma Biological Survey, PI: Caryn Vaughn
Funding: National Science Foundation
Fish biologist for NSF-funded project examining relationship between fish and freshwater mussels
- Project Leader**—Fish Survey of SE Oklahoma Drainages to determine distribution of SGCN species 2013 - 2016
P.I.s: William Matthews, Edie Marsh-Matthews (Univ. of Oklahoma)
Funding: Oklahoma Dept. of Wildlife Conservation State Wildlife Grant
Fish collecting and environmental surveys at 160 locations across three river drainages
- Research Assistant**—Distribution of the Arkansas River Shiner 2013
P.I.: Edie Marsh-Matthews (Sam Noble Museum of Natural History, Univ. of Oklahoma)
Funding: Great Plains Landscape Conservation Coop
Scanning archive data and field notes for information regarding the distribution of Arkansas River Shiner
- Research Assistant**—Ecotoxicology of wetland ecosystems 2011 - 2013
P.I.: Rick Relyea (Pymatuning Laboratory of Ecology, Univ. of Pittsburgh)
Sampled aquatic invertebrates and amphibians, and assisted with toxicology experiments

PEER-REVIEWED PUBLICATIONS

- 6.) **Zbinden, Z.D.**, A.D. Geheber, R.J. Lehrter, E. Marsh-Matthews, and W.J. Matthews. **2020**. Multi-faceted spatial biodiversity of fish assemblages: the role of space, environment, and components of beta-diversity. In review: *Journal of Biogeography*.
- 5.) Chafin, T.K., **Z.D. Zbinden**, B.T. Martin, C.M. Middaugh, C. Gray, J. Ballard, M.E. Douglas, M.R. Douglas. **2020**. Population genomics reveal the genetic footprint of historical translocation and contemporary gene flow in white-tailed deer (*Odocoileus virginianus*). In review: *Evolutionary Applications*.
- 4.) Chafin, T.K., M.R. Douglas, B.M. Martin, **Z.D. Zbinden**, C.M. Middaugh, J. Ballard, C. Gray, M.E. Douglas. **2020**. Age structuring and spatial heterogeneity in prion protein gene (*PRNP*) polymorphism in Arkansas white-tailed deer. In Review: *Prion*.
- 3.) **Zbinden, Z.D.** **2020**. Riverscape frameworks for identifying non-random species associations and statistically deducing mechanisms using spatial and environmental data. In Review: *Ecology of Freshwater Fish*.
- 2.) **Zbinden, Z.D.** **2020**. Temporal dynamics of stream fish assemblages and the role of spatial scale in quantifying change. *Ecology and Evolution*, 10(2): 952-961. <https://doi.org/10.1002/ece3.5954>
- 1.) **Zbinden, Z.D.** and W.J. Matthews. **2017**. Beta diversity of stream fish assemblages: partitioning variation between environmental and spatial factors. *Freshwater Biology*, 62(8): 1460-1471. <https://doi.org/10.1111/fwb.12960>

OFFICIAL REPORTS

- 1.) Douglas, M.R., T.K. Chafin, **Z.D. Zbinden**, B.T. Martin, and M.E. Douglas. **2019**. White-tailed deer in Arkansas: genetic connectivity and chronic wasting disease susceptibility. *Arkansas Game and Fish Commission Official Report*.

ORAL PRESENTATIONS

- 5.) **Zbinden, Z.D.**, M.R. Douglas, T.K. Chafin, M.E. Douglas. **2020**. A comparative population genetic approach for testing traits associated with variation in population connectivity across species in the White River Basin. –Southern Division American Fisheries Society, Little Rock, AR.
- 4.) **Zbinden, Z.D.**, M.R. Douglas, T.K. Chafin, M.E. Douglas. **2019**. Community genomics of stream fish: a framework for multi-species, comparative population genetics spanning the White River Basin. – American Fisheries Society, Reno, NV.
- 3.) **Zbinden, Z.D.**, **2018**. Micro- and macroevolutionary consequences of dispersal differential among species. –EEB Seminar, University of Arkansas, Fayetteville, AR.
- 2.) **Zbinden, Z.D.** and W.J. Matthews. **2017**. Beta diversity of stream fish assemblages: partitioning variation between environmental and spatial factors. – Joint Meeting of Ichthyologists and Herpetologists, Austin, TX.
- 1.) **Zbinden, Z.D.**, W.J. Matthews, and E. Marsh-Matthews. **2016**. A comparison of fish community structure between Clear Boggy and Muddy Boggy Creeks. – Oklahoma Natural Resource Conference, Oklahoma City, Oklahoma.

POSTER PRESENTATIONS

- 3.) **Zbinden, Z.D.** **2019**. Spatiotemporal dynamics of stream fish assemblages over four decades. – American Fisheries Society, Reno, NV.
- 2.) **Zbinden, Z.D. et al.** **2018**. DNA barcoding the Himalayan torrent ichthyofauna of Bhutan. –International Mahseer Conference, Paro, Bhutan
- 1.) **Zbinden, Z.D.**, A. Geheber, W.J. Matthews, and E. Marsh-Matthews. **2015**. A contemporary fish survey of the Muddy Boggy Drainage, southeast Oklahoma, USA. – Joint Meeting of Ichthyologists and Herpetologists, Reno, NV.

TEACHING EXPERIENCE

Conservation Genetics—Computer Lab Instructor (Univ. of Arkansas)	2020
Graduate and upper-level undergrad computer lab focused on application of genetic methods Duties: Lectures, designing exercises	
Global Change Biology—Recitation Leader (Univ. of Arkansas)	2017, 2018
Upper-level seminar with emphasis on debate and argumentative essay writing. Duties: moderating discussion, writing workshops, essay critique and writing development.	
Principles of Biology—Lab Instructor (Univ. of Arkansas)	2016, 2017, 2020
Introductory laboratory course for non-majors. Duties: lectures, monitoring lab activities, grading, exam design	
Zoology—Lab Instructor (Univ. of Oklahoma)	2016
Introduction to organisms and laboratory practice. Duties: lectures, monitoring experimental design, grading, quiz design.	
Ichthyology—Lab Instructor (Univ. Oklahoma/Univ. Arkansas)	2015, 2019
Introduction to fish systematics, biology, and ecology. Duties: curriculum design, lectures, monitoring lab activities, exam design, grading.	
Quantitative Biology—Teaching Assistant (University of Oklahoma)	2015
Introductory statistics for Biology majors. Duties: grading, homework design, led computer lab activities.	
Evolution, Ecology and Diversity—Lab Instructor (University of Oklahoma)	2014
Second semester, Introductory Biology laboratory course. Duties: lectures, monitoring lab activities, grading.	
Molecules, Cells and Physiology—Lab Instructor (University of Oklahoma)	2013, 2014
First semester, Introductory Biology laboratory course. Duties: lectures, monitoring lab activities, grading.	

STUDENTS MENTORED

• Kevin Hollar, Honors Thesis: Demographic History of White River Stream Fish	2019 -current
• Mackenzie Reed, Honors Thesis: Population genetics of common Ozark minnows	2018 – 2020
• Mason Flurry, Undergraduate Intern	2019
• McKenna George, Honors Thesis: Phylogeography of Ozark darters	2017 - 2018

FELLOWSHIPS, GRANTS & AWARDS

• Harry & Jo Leggett Chancellor's Fellowship (\$48,000) Univ. of Arkansas Graduate College	2020 - current
• Distinguished Doctoral Fellowship (\$88,000) Univ. of Arkansas Graduate College	2016 - 2020
• Jimmie Pigg Memorial Outstanding Student Achievement Award (\$275) Southern Division American Fisheries Society	2020
• Doctoral Student Travel Grant (\$1,000) Univ. of Arkansas Graduate College	2019
• Doctoral Student Travel Grant (\$1,000) Univ. of Arkansas Graduate College	2018
• G.T. Johnson Memorial Scholarship in Biological Sciences (\$1,300) Univ. of Arkansas, Dept. Biology	2017
• Doctoral Student Travel Grant (\$1,000) Univ. of Arkansas Graduate College	2017
• Teaching Excellence Award (\$500) Univ. of Oklahoma, Dept. Biology	2016

- L.G. Hill Graduate Excellence Award (\$500) Univ. of Oklahoma, Dept. Biology 2015
- L.G. Hill Graduate Excellence Award (\$500) Univ. of Oklahoma, Dept. Biology 2014
- HHMI Undergraduate Research Fellowship (\$5,000), Univ. of Pittsburgh, Dept Biology 2012

PROFESSIONAL SERVICE & SYNERGISTIC ACTIVITIES

- Graduate Representative, Committee for Graduate Studies, Dept. of Biology, Univ. of Arkansas 2020
- Museum Student Council, Univ. of Arkansas Museum 2020

PEER-REVIEW

- *PLOS ONE* (7)
- *Southwestern Naturalist* (1)
- *Journal of Biogeography* (1)
- *Diversity & Distributions* (1)

PROFESSIONAL SOCIETIES

- The American Society of Naturalists 2020 – current
- Society for the Study of Evolution 2020 - current
- American Fisheries Society 2019 - current
- American Society of Ichthyologists & Herpetologists 2013 - current

REFERENCES

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|---------------------------|--|--|
| • Dr. Marlis Douglas | Professor, Bruker Professorship in Life Sciences Chair, Univ. Arkansas | mrdr1@uark.edu |
| • Dr. William Matthews | Professor Emeritus, Univ. Oklahoma | wmatthews@ou.edu |
| • Dr. Michael Douglas | Professor, 21 st Century Chair in Global Change Biology, Univ. Arkansas | med1@uark.edu |
| • Dr. Jeremy Beaulieu | Assistant Professor, Univ. Arkansas | jmbeauli@uark.edu |
| • Dr. Adam Siepielski | Associate Professor, Univ. Arkansas | amsiepie@uark.edu |
| • Dr. Edie Marsh-Matthews | Professor Emeritus, Univ. Oklahoma | emarsh@ou.edu |
| • Dr. Caryn Vaughn | Presidential Professor, Univ. Oklahoma | cvaughn@ou.edu |
| • Dr. Richard Broughton | Professor & Chair, Univ. Oklahoma | rbroughton@ou.edu |
| • Dr. Rick Relyea | Endowed Chair, Rensselaer Poly | relyer@rpi.edu |