

# ZACHERY D. ZBINDEN

Postdoctoral Research Associate

Department of Biological Sciences, University of Arkansas

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## EDUCATION

- 2022 **Ph.D. in Biology, University of Arkansas, Fayetteville, AR**  
Dissertation – *Riverscape community genomics of Ozark fishes: A comparative framework to infer ecological and evolutionary determinants of genetic diversity.*  
Advisors: Marlis R. Douglas & Michael E. Douglas
- 2016 **M.S. in Biology, University of Oklahoma, Norman, OK**  
Thesis – *Beta diversity of stream fish communities: partitioning variation between abiotic and spatial factors.* Advisor: William J. Matthews
- 2013 **B.S. in Ecology and Evolution, University of Pittsburgh, Pittsburgh, PA**

## APPOINTMENTS

- 2022– Postdoctoral Research Associate, Dept. of Biological Sciences, Univ. of Arkansas
- 2020–2022 Chancellor's Fellow, Dept. of Biological Sciences, Univ. of Arkansas
- 2016–2020 Distinguished Doctoral Fellow, Dept. of Biological Sciences, Univ. of Arkansas
- 2013–2016 Graduate Assistant, Dept. of Biology, Univ. of Oklahoma
- 2011–2013 Undergraduate Research Assistant, Pymatuning Lab of Ecology, Univ. of Pittsburgh

## RESEARCH AND TEACHING INTERESTS

Ecology	biogeography   community ecology   spatial ecology
Evolution	landscape genetics   phylogeography   population genetics
Conservation	fisheries   conservation genomics   ecological forecasting
Zoology	ichthyology   taxonomy   phylogenetics
Quantitative bio	spatial analysis   programming   bioinformatics   multivariate statistics

## GRANTS AND FELLOWSHIPS

\* Grant submitted while a student

- 2023 Arkansas Game and Fish Commission, \$93,879  
*Habitat associations and population genetic structure of the endemic Beaded Darter *Etheostoma clinton* in the upper Ouachita River system.* **Co-PI**
- 2022 Arkansas Game and Fish Commission, \$135,955  
*Developing genetic approaches for sustainable long-term monitoring and modeling CWD spread in white-tailed deer.* **Major Contributor \***
- 2021 Arkansas Game and Fish Commission, \$301,687  
*Genomic and Geometric Morphometric Diversity in Smallmouth Bass and their Admixtures Within the Interior Highlands of North America.* **Major Contributor \***
- Kansas Department of Wildlife, \$42,593  
*Genetic Diversity of the Neosho Madtom (*Noturus placidus*).* **Major Contributor \***
- 2020 Univ. of Arkansas & AR Game and Fish Commission, Leggett Chancellor's Fellowship, \$48,000
- 2016 Univ. of Arkansas Graduate School, Distinguished Doctoral Fellowship, \$88,000
- 2012 Howard Hughes Medical Institute, Undergraduate Research Fellowship, \$5,000
- Pending grant applications*
- 2023 National Science Foundation, Division of Environmental Biology, \$696,812  
*Integrating genomic data to predict climate change resilience in freshwater communities.* **Co-PI**

## PUBLICATIONS

[Scholar Profile](#)

*Refereed journal articles*

- 2023 **Zbinden**, Douglas, Chafin & Douglas. A community genomics approach to natural hybridization. [Proceedings of the Royal Society B: Biological Sciences](#), 290: 20230768. [PDF](#)
- Zbinden**, Douglas, Chafin & Douglas. Riverscape community genomics: A comparative analytical approach to identify common drivers of genetic structure. [Molecular Ecology](#), 0(0): 0-0. *In press—to be highlighted with perspective article.* [PDF](#)
- Regmi, Douglas, Wangchuk, Chafin, **Zbinden**, Edds, Tshering & Douglas. The Himalayan uplift and evolution of aquatic biodiversity across Asia: Snowtrout (Cyprininae: Schizothorax) as a test case. *PLOS ONE*, 0(0): 0-0. *In press.* [Preprint](#)
- Zbinden**, Douglas, Chafin & Douglas. Traits and relatedness associated with variability of genetic diversity among freshwater fish across an Ozark riverscape. *Molecular Ecology*. *In revision.* [Preprint](#)

Shepherd, Matthews, Geheber, **Zbinden**, Tobler, Marsh-Matthews & Nairn. Re-establishment of fish communities following implementation of ecologically engineered passive treatment systems to remediate mine drainage. *Freshwater Biology*. *In revision*.

- 2022 **Zbinden**, Geheber, Lehrter & Matthews. Multifaceted assessment of stream fish alpha and beta diversity using spatial models. *Hydrobiologia*, 849(8): 1795–1820. [PDF](#)

**Zbinden**. A needle in the haystack? Applying species co-occurrence frameworks with fish assemblage data to identify species associations and sharpen ecological hypotheses. *Journal of Fish Biology*, 100(2): 339–351. [PDF](#)

- 2021 Chafin, **Zbinden**, Douglas, Martin, Middaugh, Gray, Ballard & Douglas. Spatial population genetics in heavily managed species: separating patterns of historical translocation from contemporary gene flow in white-tailed deer. *Evolutionary Applications*, 14(6): 1673–1689. [PDF](#)

**Zbinden**, Geheber, Matthews & Marsh-Matthews. Fish communities, species of greatest conservation need, and potential protected areas in southeastern Oklahoma, 2014–2016. *Proceedings of the Oklahoma Academy of Science*, 101: 14–32. [PDF](#)

- 2020 Chafin, Douglas, Martin, **Zbinden**, Middaugh, Ballard, Gray & Douglas. Age structuring and spatial heterogeneity in prion protein gene (*PRNP*) polymorphism in Arkansas white-tailed deer. *Prion*, 14(1): 238–248. [PDF](#)

**Zbinden**. Temporal dynamics of stream fish assemblages and the role of spatial scale in quantifying change. *Ecology and Evolution*, 10(2): 952–961. [PDF](#)

- 2017 **Zbinden** & Matthews. Beta diversity of stream fish assemblages: partitioning variation between environmental and spatial factors. *Freshwater Biology*, 62(8): 1460–1471. [Cover article](#). [PDF](#)

#### *Technical reports and non-refereed publications*

- 2023 Douglas, **Zbinden**, Chafin, Martin, Tiemann, Edds & Douglas. Genetic Diversity of the Neosho Madtom (*Noturus placidus*). *Final Report*. Kansas Department of Wildlife and Parks, Pratt, KS.
- 2022 Douglas, **Zbinden**, Chafin, Martin & Douglas. Screening SNP variation to model deer dispersal in Arkansas. *Final Report*. Arkansas Game and Fish Commission, Little Rock, AR.
- 2021 **Zbinden**. With great diversity comes great responsibility: what we can do to better archive the rich biodiversity of Arkansas. *University of Arkansas Museum Campus Contributions*.
- 2020 Douglas, Chafin, **Zbinden**, Martin & Douglas. White-tailed deer in Arkansas: genetic connectivity and chronic wasting disease susceptibility. *Final Report*. Arkansas Game and Fish Commission, Little Rock, AR.

- 2016 Matthews, Marsh-Matthews & **Zbinden**. Survey of Clear Boggy, Muddy Boggy, Kiamichi and Little River drainages in Oklahoma to determine current distribution and status of fish species of greatest conservation need and potential change in fish communities. [Final Report](#). Oklahoma Department of Wildlife Conservation, Oklahoma City, OK.

## SEMINARS AND CONFERENCE PRESENTATIONS

*As presenting author*

- 2023 A community genomics approach to natural hybridization. *Joint Meeting of Ichthyologists and Herpetologists*, Norfolk, VA.
- 2022 Riverscape community genomics: Intraspecific genetic structure driven by common processes. *American Fisheries Society*, Spokane, WA.
- 2021 Hybridization between fish species in nature: a multispecies population genomic examination. *American Fisheries Society*, Baltimore, MD.
- 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.
- 2019 Community genomics of stream fish: multispecies, comparative population genetics spanning the White River Basin. *American Fisheries Society*, Reno, NV.
- Spatiotemporal dynamics of stream fish assemblages over four decades. *American Fisheries Society*, Reno, NV.
- 2018 DNA barcoding the Himalayan torrent ichthyofauna of Bhutan. *International Mahseer Conference*, Paro, Bhutan.
- Micro- and macroevolutionary consequences of dispersal differential among species. *EEB Seminar*, University of Arkansas, Fayetteville, AR.
- 2017 Beta diversity of stream fish assemblages: partitioning variation between environmental and spatial factors. *Joint Meeting of Ichthyologists and Herpetologists*, Austin, TX.
- 2016 A comparison of fish community structure between Clear Boggy and Muddy Boggy Creeks. *Oklahoma Natural Resource Conference*, Oklahoma City, OK.
- 2015 A contemporary fish survey of the Muddy Boggy Drainage, southeast Oklahoma, USA. *Joint Meeting of Ichthyologists and Herpetologists*, Reno, NV.

## TEACHING AND MENTORING

### *University of Arkansas*

- 2020 Conservation Genetics – Computer Lab Instructor (senior/graduate-level)
- 2019-2021 Ichthyology – Lab Instructor (senior/graduate-level)
- 2017-2018 Global Change Biology – Recitation Leader (senior-level)
- 2016-2020 Principles of Biology – Lab Instructor (freshman-level, non-majors)

### *University of Oklahoma*

- 2016 Zoology – Lab Instructor (freshman-level, non-majors)
- 2015 Ichthyology – Lab Instructor (senior/graduate level)
- 2015 Quantitative Biology – Teaching Assistant (junior/senior-level)
- 2014 Evolution, Ecology, and Diversity – Lab Instructor (freshman/sophomore-level)
- 2013-2014 Molecules, Cells, and Physiology – Lab Instructor (freshman/sophomore-level)

### *Undergraduate and graduate mentees*

\* Completed Thesis / Dissertation

<sup>P</sup>Published

- 2023- Carson Neal, Undergraduate Biological Sciences, Univ. of Arkansas
- 2023- Carter White, Graduate Biological Sciences, Univ. of Arkansas
- 2023- Lane Laroche, Honors Biological Sciences, Univ. of Arkansas
- 2023-2023 Hyatt Fox, Undergraduate Biological Sciences, Univ. of Arkansas
- 2022-2023 Timothy Goodhart, Graduate Biological Sciences, Univ. of Arkansas
- 2019-2021 Kevin Hollar, Honors Biological Sciences, Univ. of Arkansas \*
- 2018-2020 Mackenzie Reed, Honors Biological Sciences, Univ. of Arkansas \*
- 2017-2019 McKenna George, Honors Biological Sciences, Univ. of Arkansas \*
- 2014-2016 Richard Lehrter, Undergraduate Biological Sciences, Univ. of Oklahoma <sup>P</sup>

## AWARDS AND HONORS

- 2022 James E. Wright Graduate Award, American Fisheries Society
- 2020 Jimmie Pigg Student Achievement Award, Southern Division of American Fisheries Society
- 2017 G.T. Johnson Memorial Scholarship Outstanding 1<sup>st</sup> Year Student, Univ. of Arkansas
- 2016 Teaching Excellence Award, Univ. of Oklahoma
- 2015 L.G. Hill Graduate Excellence Award, Univ. of Oklahoma
- 2014 L.G. Hill Graduate Excellence Award, Univ. of Oklahoma

## ADDITIONAL TRAINING

- 2022 Faculty Peer Mentoring Program, Univ. of Arkansas
- 2022 Equity 101: Building Understanding/ Engaging in Action, IDEALS Institute, Univ. of Arkansas

- 2022 Writing a Land Acknowledgement, Multicultural Center, Univ. of Arkansas
- 2022 Gender Bias: Building Understanding/ Creating Allies, IDEALS Institute, Univ. of Arkansas
- 2022 Safe Zone Allies Training, Multicultural Center, Univ. of Arkansas
- 2022 OUCH! That Stereotype Hurts Training, Division of DEI, Univ. of Arkansas
- 2022 Facing Bias: Exposing Blind Spots/ Engaging in Action, IDEALS Institute, Univ. of Arkansas
- 2022 Diversity & Inclusion, Employee Development Program, Univ. of Arkansas
- 2022 Principles of Diversity, Equity, & Inclusion, IDEALS Institute, Univ. of Arkansas

## SERVICE

- 2022 Project Judge, Undergraduate Research Competition, Univ. of Arkansas
- 2021 Planning Committee, Univ. of Arkansas, Dept. Biological Sciences
- 2020 Museum Advisory Council, Univ. of Arkansas
- 2020 Fundraising Committee Chair, Museum Advisory Council, Univ. of Arkansas
- 2020 Graduate Studies Committee, Univ. of Arkansas, Dept. Biological Sciences
- 2018 Rapporteur, International Mahseer Conference

## *Manuscript referee*

*Aquatic Sciences* (1) – *Biological Conservation* (1) – *Diversity & Distributions* (1) – *Ecology & Evolution* (2) – *Freshwater Biology* (1) – *Journal of Biogeography* (1) – *Molecular Ecology* (1) – *PLOS One* (5) – *The Southwestern Naturalist* (1)

## PROFESSIONAL SOCIETIES

American Fisheries Society – American Society of Ichthyologists & Herpetologists – American Society of Naturalists – Society for Conservation Biology – Society for the Study of Evolution

## REFERENCES

- |                         |  |
|-------------------------|--|
| Dr. Marlis R. Douglas   | Ph.D. Co-advisor<br>Professor & Endowed Chair, University of Arkansas<br>mrd1@uark.edu |
| Dr. Michael E. Douglas  | Ph.D. Co-advisor<br>Professor & Endowed Chair, University of Arkansas<br>med1@uark.edu |
| Dr. William J. Matthews | M.S. Advisor<br>Professor Emeritus, University of Oklahoma<br>wmatthews@ou.edu         |

Dr. Jeremy M. Beaulieu      Ph.D. Committee member  
Associate Professor, University of Arkansas  
jmbeauli@uark.edu

Dr. Adam M. Siepielski      Ph.D. Committee member  
Associate Professor, University of Arkansas  
amsiepie@uark.edu