

## ZACHERY D. ZBINDEN

Distinguished Doctoral Fellow, Leggett Chancellor's Fellow, & PhD Candidate  
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### RESEARCH INTERESTS

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community ecology, community genetics, comparative phylogenetics, conservation biology, evolutionary ecology, ichthyology, molecular ecology, riverscapes, spatial ecology

### EDUCATION

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| Ph.D., Biology, University of Arkansas, Fayetteville, AR                             | (exp) 2022 |
| Committee: Adam Siepielski, Jeremy Beaulieu, Michael Douglas, Marlis Douglas (Chair) |            |
| M.S., Biology, University of Oklahoma, Norman, OK                                    | 2016       |
| Committee: Caryn Vaughn, Edie Marsh-Matthews, William Matthews (Chair)               |            |
| B.S., Ecology & Evolution, University of Pittsburgh, Pittsburgh, PA                  | 2013       |

### RESEARCH APPOINTMENTS

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| Graduate Research Assistant—Genetic Connectivity & Chronic Wasting Disease in Deer | 2019-2020 |
| PIs: Marlis Douglas & Michael Douglas (Univ. of Arkansas)                          |           |
| Role: DNA extraction and RAD-seq library prep, data analysis                       |           |
| Project Leader—White River Fish Comparative Population Genetics                    | 2017-2022 |
| PIs: Marlis Douglas & Michael Douglas (Univ. of Arkansas)                          |           |
| Role: Fish collecting, RAD-seq library prep, bioinformatics, data analysis         |           |
| Graduate Research Assistant—Population Genetics of Prairie Chub                    | 2016      |
| PI: Richard Broughton (Univ. of Oklahoma)  |           |
| Role: Targeted fish collecting expeditions   |           |
| Graduate Research Assistant—Freshwater Mussel and Fish Community Interactions      | 2016      |
| PI: Caryn Vaughn (Oklahoma Biological Survey)                                      |           |
| Role: Fish and freshwater mussel collecting, environmental surveys of streams      |           |
| Project Leader—Fish Survey of SE Oklahoma  | 2013-2016 |
| PIs: William Matthews & Edie Marsh-Matthews (Univ. of Oklahoma)                    |           |
| Fish collecting; environmental surveys, fish identification, multivariate analyses |           |

Undergraduate Research Assistant—Ecotoxicology of wetland ecosystems 2011-2013  
 PI: Rick Relyea (Pymatuning Laboratory of Ecology, Univ. of Pittsburgh)  
 Pond community sampling, toxicology experiments, animal care and husbandry

## PEER-REVIEWED PUBLICATIONS

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- 11) R.W. Nairn, W.J. Matthews, N.L. Shepherd, **Z.D. Zbinden**, A.D. Geheber. *In prep.* Success at a Superfund site: fish assemblages recover following legacy mining contaminant via passive wetland treatment in Tar Creek, Oklahoma.
- 10) **Z.D. Zbinden**, Chafin, T.K., M.R. Douglas, M.E. Douglas. *In prep.* Next generation sequencing reveals low rates of hybridization among species from Ozark fish communities.
- 9) **Z.D. Zbinden**, Chafin, T.K., M.R. Douglas B.T. Martin, C.M. Middaugh, C. Gray, J. Ballard, M.E. Douglas. *In prep.* Environmental factors shape patterns of population genetic divergence in white-tailed deer.
- 8) Regmi, B., M.R. Douglas, D.R. Edds, K. Wangchuk, C. Lu, G. Prasad Khanal, P. Norbu, S. Norbu, S. Dorji, S. Tshering, Z. Angel, T.K. Chafin, **Z.D. Zbinden**, M.E. Douglas. *In review.* Did the Himalayan uplift drive evolution of aquatic biodiversity across Asia? Snowtrout (Cyprinidae: *Shizothorax*) as a test case.
- 7) **Zbinden, Z.D.**, A.D. Geheber, R.J. Lehrter, W.J. Matthews. *In review.* Analysis of stream fish alpha and beta diversity across a riverscape using multifaceted approach coupled with comparison of spatial models supports the riverine ecosystem synthesis.
- 6) **Zbinden, Z.D.**, A.D. Geheber, W.J. Matthews, E. Marsh-Matthews. *In review.* Fish communities, species of greatest conservation need, and potential protected areas in southeastern Oklahoma, 2014-2016.
- 5) Chafin, T.K., **Z.D. Zbinden**, M.R. Douglas B.T. Martin, C.M. Middaugh, C. Gray, J. Ballard, M.E. Douglas. 2021. 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. <https://doi.org/10.1111/eva.13233>
- 4) **Zbinden, Z.D.** 2021. 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*, 2021;00:1-13. <https://doi.org/10.1111/jfb.14752>
- 3) Chafin, T.K., M.R. Douglas, B.T. 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. *Prion*, 14(1): 238-248. <https://doi.org/10.1080/19336896.2020.1832947>

- 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.**, 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>

## TECHNICAL REPORTS

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- 2) 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*.
- 1) Matthews, W.J., E. Marsh-Matthews, and **Z.D. Zbinden**. 2016. 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. *Oklahoma Department of Wildlife Conservation Official Report*.

## GENERAL AUDIENCE ARTICLES (NOT PEER-REVIEWED)

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- 1) **Zbinden, Z.D.** 2021. With great diversity comes great responsibility: what we can do to better archive the rich biodiversity of Arkansas. *University of Arkansas Museum Campus Contributors*. <https://uamuseum.uark.edu/with-great-diversity-comes-great-responsibility/>

## PRESENTATIONS

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- 8) **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.
- 7) **Zbinden, Z.D.**, M.R. Douglas, T.K. Chafin, M.E. Douglas. 2019. Community genomics of stream fish: multi-species, comparative population genetics spanning the White River Basin. American Fisheries Society, Reno, NV.
- 6) **Zbinden, Z.D.** 2019. Spatiotemporal dynamics of stream fish assemblages over four decades. American Fisheries Society, Reno, NV.
- 5) **Zbinden, Z.D. et al.** 2018. DNA barcoding the Himalayan torrent ichthyofauna of Bhutan. International Mahseer Conference, Paro, Bhutan.
- 4) **Zbinden, Z.D.**, 2018. Micro- and macroevolutionary consequences of dispersal differential among species. EEB Seminar, University of Arkansas, Fayetteville, AR.
- 3) **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.

- 2) **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, OK.
- 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 APPOINTMENTS

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| <i>Conservation Genetics</i> —Computer Lab Instructor, Univ. of Arkansas<br>Graduate/undergraduate computer lab focused on applied genetics methods<br>Duties: lectures, designing exercises                               | 2020           |
| <i>Global Change Biology</i> —Recitation Leader, Univ. of Arkansas<br>Upper-level seminar with emphasis on debate and argumentative essay writing<br>Duties: moderating discussion, essay critique and writing development | 2017, '18      |
| <i>Principles of Biology</i> —Lab Instructor, Univ. of Arkansas<br>Introductory laboratory course for non-majors<br>Duties: lectures, monitoring lab activities, exam design   | 2016, '17, '20 |
| <i>Zoology</i> —Lab Instructor, Univ. of Oklahoma<br>Introduction to organisms and laboratory practice<br>Duties: lectures, monitoring experimental design, quiz design  | 2016           |
| <i>Ichthyology</i> —Lab Instructor, Univ. Oklahoma/Univ. of Arkansas<br>Introduction to fish systematics, biology, and ecology<br>Duties: curriculum design, lectures, monitoring lab activities, field expeditions        | 2015, '19, '21 |
| <i>Quantitative Biology</i> —Teaching Assistant, University of Oklahoma<br>Introductory statistics for Biology majors<br>Duties: grading, homework design, computer lab activities   | 2015           |
| <i>Evolution, Ecology and Diversity</i> —Lab Instructor, University of Oklahoma<br>Second semester, Introductory Biology laboratory course<br>Duties: lectures, monitoring lab activities                                  | 2014           |
| <i>Molecules, Cells and Physiology</i> —Lab Instructor, University of Oklahoma<br>First semester, Introductory Biology laboratory course<br>Duties: lectures, monitoring lab activities                                    | 2013, '14      |

## UNDERGRADUATE STUDENTS MENTORED

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- Kevin Hollar, honors thesis: Population structure of rainbow darter (*Etheostoma caeruleum*)
- Mackenzie Reed, honors thesis: Population genetics of common Ozark minnows

- Mason Flurry, undergraduate intern
- McKenna George, honors thesis: Phylogeography of Ozark darters

## FELLOWSHIPS, GRANTS & AWARDS

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| • Leggett Chancellor's Fellowship (\$48,000) Univ. of Arkansas Graduate College   | 2020 |
| • Jimmie Pigg Student Achievement Award (\$275) American Fisheries Society        | 2020 |
| • G.T. Johnson Memorial Scholarship (\$2,300) Univ. of Arkansas, Dept. Biology    | 2017 |
| • Distinguished Doctoral Fellowship (\$88,000) Univ. of Arkansas Graduate College | 2016 |
| • 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 Research Fellowship (\$5,000), Univ. of Pittsburgh, Dept. Biology          | 2012 |

## PROFESSIONAL SERVICE

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|---|-----------|
| • Committee for Graduate Studies, Univ. of Arkansas, Dept. Biology  | 2020      |
| • Museum Advisory Council, Univ. of Arkansas  | 2020-2021 |
| • Fundraising sub-committee Chair, Museum Advisory Council, Univ. of Arkansas   | 2020-2021 |
| • Reviewer for: <i>Diversity &amp; Distributions</i> , <i>Ecology &amp; Evolution</i> , <i>Journal of Biogeography</i> , <i>PLOS One</i> , <i>Southwestern Naturalist</i> |           |

## PROFESSIONAL SOCIETIES

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- Ecological Society of America
- Society for Conservation Biology
- The American Society of Naturalists
- Society for the Study of Evolution
- American Fisheries Society
- American Society of Ichthyologists & Herpetologists

## REFERENCES

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|------------------------|--|--|
| • Dr. Marlis Douglas   | Professor & Endowed Chair, Univ. of Arkansas | <a href="mailto:mrd1@uark.edu">mrd1@uark.edu</a>         |
| • Dr. William Matthews | Professor Emeritus, Univ. of Oklahoma        | <a href="mailto:wmatthews@ou.edu">wmatthews@ou.edu</a>   |
| • Dr. Jeremy Beaulieu  | Associate Professor, Univ. of Arkansas       | <a href="mailto:jmbeauli@uark.edu">jmbeauli@uark.edu</a> |
| • Dr. Adam Siepielski  | Associate Professor, Univ. of Arkansas       | <a href="mailto:amsiepie@uark.edu">amsiepie@uark.edu</a> |
| • Dr. Michael Douglas  | Professor & Endowed Chair, Univ. of Arkansas | <a href="mailto:med1@uark.edu">med1@uark.edu</a>         |