

CURRICULUM VITAE

ZACHERY D. ZBINDEN

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Distinguished Doctoral Fellow, Leggett Chancellor's Fellow, & PhD Candidate
Department of Biological Sciences, University of Arkansas

RESEARCH INTERESTS

Community Ecology, Community Genetics, Comparative Phylogenetics, Evolutionary Ecology, Ichthyology, Molecular Ecology, Riverscape Genetics, Spatial Ecology

EDUCATION

Ph.D., Biology (exp) 2022

University of Arkansas, Fayetteville, AR

Dissertation: "Comparative methods to study ecology and evolution across riverscapes."

Committee: Adam Siepielski, Jeremy Beaulieu, Michael Douglas, Marlis Douglas (Chair)

M.S., Biology 2016

University of Oklahoma, Norman, OK

Thesis: "Beta diversity of stream fish communities: partitioning variation between abiotic and spatial factors"

Committee: Caryn Vaughn, Edie Marsh-Matthews, William Matthews (Chair)

B.S., Ecology & Evolution 2013

University of Pittsburgh, Pittsburgh, PA

RESEARCH APPOINTMENTS

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

- Research Assistant**—Population Genetics of Prairie Chub 2016
 PI: Richard Broughton (Univ. of Oklahoma)
 Role: Targeted fish collecting expeditions
- 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
- Research Assistant**—Distribution of the Arkansas River Shiner 2013
 PI: Edie Marsh-Matthews (Sam Noble Museum of Natural History, Univ. of Oklahoma)
 Data retrieval from museum archives
- 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

- 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. 2021. Did the Himalayan uplift drive evolution of aquatic biodiversity across Asia? Snowtrout (Cyprinidae: *Shizothorax*) as a test case. In review: *Freshwater Biology*.
- 7) **Zbinden, Z.D.**, A.D. Geheber, R.J. Lehrter, W.J. Matthews. 2021. 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. In review: *Journal of Biogeography*.
- 6) **Zbinden, Z.D.**, A.D. Geheber, W.J. Matthews, E. Marsh-Matthews. 2021. Fish communities, species of greatest conservation need, and potential protected areas in southeastern Oklahoma, 2014-2016. In review: *Proceedings of the Oklahoma Academy of Sciences*.
- 5) Chafin, T.K., **Z.D. Zbinden**, B.T. Martin, C.M. Middaugh, C. Gray, J. Ballard, M.E. Douglas, M.R. Douglas. 2021. Spatial population genetics in heavily managed species: separating patterns of historical translocation from contemporary gene flow in white-tailed deer. *Evolutionary Applications*, 2021;00:1-17. <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

- 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)

- 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/>

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: 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, OK.

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

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| Conservation Genetics–Computer Lab Instructor (Univ. of Arkansas) | 2020 |
| Graduate/undergraduate computer lab focused on applied genetics methods | |
| Duties: lectures, designing exercises | |

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

STUDENTS MENTORED

- 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 |
| • 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 (\$2,300) Univ. of Arkansas, Dept. Biology 2017
- Doctoral Student Travel Grant (\$1,000) Univ. of Arkansas Graduate College 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

ACADEMIC SERVICE

- Committee for Graduate Studies, Univ. of Arkansas, Dept. Biology 2020
- Museum Advisory Council, Univ. of Arkansas 2020-2021
- Fundraising sub-committee, Museum Advisory Council, Univ. of Arkansas 2020-2021
- Fundraising sub-committee Chair, Museum Advisory Council, Univ. of Arkansas 2020-2021

PEER-REVIEWER FOR:

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| <i>PLOS One</i> | <i>Southwestern Naturalist</i> | <i>Journal of Biogeography</i> |
| <i>Diversity & Distributions</i> | <i>Ecology & Evolution</i> | |

PROFESSIONAL SOCIETIES

- The American Society of Naturalists
- Society for the Study of Evolution
- American Fisheries Society
- American Society of Ichthyologists & Herpetologists

REFERENCES

- | | | |
|------------------------|--|-------------------|
| • Dr. Marlis Douglas | Professor & Endowed Chair, Univ. of Arkansas | mrd1@uark.edu |
| • Dr. William Matthews | Professor Emeritus, Univ. of Oklahoma | wmatthews@ou.edu |
| • Dr. Michael Douglas | Professor & Endowed Chair, Univ. of Arkansas | med1@uark.edu |
| • Dr. Jeremy Beaulieu | Assistant Professor, Univ. of Arkansas | jmbearli@uark.edu |
| • Dr. Adam Siepielski | Associate Professor, Univ. of Arkansas | amsiepie@uark.edu |