

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, Fayetteville

RESEARCH INTERESTS

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

EDUCATION

- Ph.D., Biology** (exp) 2022
University of Arkansas, Fayetteville
Dissertation title: "Comparative methods to study ecology and evolution across a riverscape."
Committee: Adam Siepielski, Jeremy Beaulieu, Michael Douglas, Marlis Douglas (Chair)
- M.S., Biology** 2016
University of Oklahoma, Norman
Thesis title: "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

RESEARCH APPOINTMENTS

- Research Assistant**—Genetic Connectivity & Chronic Wasting Disease in Deer 2019-2020
P.I.s: Marlis Douglas & Michael Douglas (Univ. of Arkansas)
Funding: Arkansas Game and Fish Commission
Role: RAD-seq, landscape genetics, multivariate and resistance surface analysis
- Project Leader**—White River Fish Comparative Population Genetics 2017-2022
P.I.s: Marlis Douglas & Michael Douglas (Univ. of Arkansas)
Funding: 21st Century Chair in Global Change Biology Endowment
Role: Fish collecting, RAD-seq, bioinformatics, population genetics, & comparative phylogenetics
- Research Assistant**—Population Genetics of Prairie Chub 2016
P.I.: Richard Broughton (Univ. of Oklahoma)
Role: Targeted fish collecting expeditions
- Research Assistant**—Stream Ecology of Freshwater Mussel and Fish Community Interactions 2016
PI: Caryn Vaughn (Oklahoma Biological Survey)
Funding: National Science Foundation
Role: Fish and freshwater mussel collecting expeditions, & environmental surveys of streams

- Project Leader**—Fish Survey of SE Oklahoma 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 expeditions; environmental surveys, fish identification, & multivariate analyses
- 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 Cooperative
 Data retrieval from museum archives
- Research Assistant**—Ecotoxicology of wetland ecosystems 2011-2013
 P.I.: 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: *Scientific Reports*.
- 7) **Zbinden, Z.D.**, A.D. Geheber, R.J. Lehrter, E. Marsh-Matthews, and W.J. Matthews. 2021. Spatio-environmental factors explain landscape-level variation in multiple facets of stream fish alpha and beta diversity (taxonomic, functional, and phylogenetic). 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. Population genomics reveal the genetic footprint of historical translocation and contemporary gene flow in white-tailed deer (*Odocoileus virginianus*). In press: *Evolutionary Applications*.
- 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. In press: *Journal of Fish Biology*.
- 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.** 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>

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)

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, 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 applied genetic methods	
Duties: lectures, designing exercises	
Global Change Biology–Recitation Leader (Univ. of Arkansas)	2017, '18
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) Introductory laboratory course for non-majors Duties: lectures, monitoring lab activities, exam design	2016, '17, '20
Zoology–Lab Instructor (Univ. of Oklahoma) Introduction to organisms and laboratory practice Duties: lectures, monitoring experimental design, quiz design	2016
Ichthyology–Lab Instructor (Univ. Oklahoma/Univ. of Arkansas) Introduction to fish systematics, biology, and ecology Duties: curriculum design, lectures, monitoring lab activities, field expeditions, exam design	2015, '19, '21
Quantitative Biology–Teaching Assistant (University of Oklahoma) Introductory statistics for Biology majors Duties: grading, homework design, computer lab activities	2015
Evolution, Ecology and Diversity–Lab Instructor (University of Oklahoma) Second semester, Introductory Biology laboratory course Duties: lectures, monitoring lab activities	2014
Molecules, Cells and Physiology–Lab Instructor (University of Oklahoma) First semester, Introductory Biology laboratory course Duties: lectures, monitoring lab activities	2013, '14

STUDENTS MENTORED

• Kevin Hollar, honors thesis: "Population structure of rainbow darter (<i>Etheostoma caeruleum</i>)"	2019-2021
• 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-
• Distinguished Doctoral Fellowship (\$88,000) Univ. of Arkansas Graduate College	2016-2020
• Jimmie Pigg Memorial 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 in Biological Sciences (\$2,300) 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

ACADEMIC SERVICE

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

PEER-REVIEWER FOR:

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| • <i>PLOS One</i> (7) | • <i>Southwestern Naturalist</i> (1) | • <i>Diversity & Distributions</i> (1) |
| | • <i>Journal of Biogeography</i> (1) | • <i>Ecology & Evolution</i> (1) |

PROFESSIONAL SOCIETIES

- 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 | 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 | jmbeauli@uark.edu |
| • Dr. Adam Siepielski | Associate Professor, Univ. of Arkansas | amsiepie@uark.edu |
| • Dr. Edie Marsh-Matthews | Professor Emeritus, Univ. of Oklahoma | emarsh@ou.edu |
| • Dr. Caryn Vaughn | Presidential Professor, Univ. of Oklahoma | cvaughn@ou.edu |
| • Dr. Richard Broughton | Professor & Chair, Univ. of Oklahoma | rbroughton@ou.edu |
| • Dr. Rick Relyea | Professor & Endowed Chair, Rensselaer Poly | relyer@rpi.edu |