

ZACHERY D. ZBINDEN

Leggett Chancellor's Fellow & Ph.D. Candidate
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RESEARCH INTERESTS

biogeography, community ecology, conservation genetics, comparative phylogeography, ichthyology, molecular ecology, riverscape community genetics, riverscape ecology & evolution

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**
Advisor: Rick A. Relyea

PROFESSIONAL APPOINTMENTS

- Upcoming Postdoctoral Research Associate, Dept. of Biological Sciences, Univ. of Arkansas
- 2016–2022 Graduate Assistant, 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

FELLOWSHIPS & GRANTS

- 2020 Leggett Chancellor's Fellowship, Arkansas Game and Fish Commission, \$48,000
- 2016 Distinguished Doctoral Fellowship, Univ. of Arkansas, \$88,000
- 2012 Howard Hughes Medical Institute Undergraduate Research Fellowship, U. Pitt., \$5,000

PUBLICATIONS

Refereed journal articles

- 2022 **Zbinden**, Geheber, Lehrter & Matthews. Multifaceted assessment of stream fish alpha and beta diversity using spatial models. *Hydrobiologia*, 849: 1795-1820.
- 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.
- 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.
- 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.
- 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.
- Zbinden**. Temporal dynamics of stream fish assemblages and the role of spatial scale in quantifying change. *Ecology and Evolution*, 10(2): 952-961.
- 2017 **Zbinden** & Matthews. Beta diversity of stream fish assemblages: partitioning variation between environmental and spatial factors. *Freshwater Biology*, 62(8): 1460-1471. Cover article.

Manuscripts in submission

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.

Manuscripts in preparation

Zbinden, Douglas, Chafin & Douglas. A community genomics approach to natural hybridization. *Proceedings of the Royal Society B: Biological Sciences*. In prep.

Zbinden, Douglas, Chafin & Douglas. Riverscape community genomics: A comparative analytical framework to identify common drivers of genetic structure. *Molecular Ecology*. In prep.

Zbinden, Douglas, Chafin & Douglas. Traits and relatedness associated with variability of genetic diversity among freshwater fish across an Ozark riverscape. *Molecular Ecology*. In prep.

Regmi, Douglas, Edds, Wangchuk, ChangLu, Khanal, Norbu, Norbu, Dorji, Tshering, Angel, Chafin, **Zbinden** & Douglas. Did the Himalayan uplift drive evolution of aquatic biodiversity across Asia? Snowtrout (Cyprinidae: *Shizothorax*) as a test case. *Freshwater Biology*. In prep.

Technical reports and non-refereed publications

- 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*.
- 2019 Douglas, Chafin, **Zbinden**, Martin & Douglas. White-tailed deer in Arkansas: genetic connectivity and chronic wasting disease susceptibility. *Arkansas Game and Fish Commission Official Report*.
- 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. *Oklahoma Department of Wildlife Conservation Official Report*.

SELECT PRESENTATIONS

- 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 EXPERIENCE

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)

MENTORED UNDERGRADUATES

- 2019–2021 Kevin L. Hollar, Honors Student Biological Sciences, Univ. of Arkansas
2018–2020 Mackenzie L. Reed, Honors Student Biological Sciences, Univ. of Arkansas
2019–2020 Mason N. Flurry, Undergraduate Student Biological Sciences, Univ. of Arkansas
2017–2019 McKenna K. George, Honors Student Biological Sciences, Univ. of Arkansas
2014–2016 Richard J. Lehrter II, Undergraduate Student Biological Sciences, Univ. of Oklahoma

AWARDS & HONORS

- 2022 Nominated to serve on Board of Governors, American Soc. Ichthyologists and Herpetologists
2020 Jimmie Pigg Student Achievement Award, S. Div. American Fisheries Society, \$250
2017 G.T. Johnson Memorial Scholarship Outstanding 1st Year Student, Univ. of Arkansas, \$2,300
2016 Teaching Excellence Award, Univ. of Oklahoma, \$500
2015 L.G. Hill Graduate Excellence Award, Univ. of Oklahoma, \$500
2014 L.G. Hill Graduate Excellence Award, Univ. of Oklahoma, \$500

SERVICE

- 2022 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
2012 Founder and President of Ecology Club, Univ. of Pittsburgh

Manuscript review

Biological Conservation (1), *Diversity & Distributions* (1), *Ecology & Evolution* (1), *Journal of Biogeography* (1), *PLOS One* (7), *The Southwestern Naturalist* (1)

PROFESSIONAL MEMBERSHIPS

American Fisheries Society (National, Southern Division, Genetics Section, Arkansas Chapter)
American Society of Ichthyologists & Herpetologists
Ecological Society of America
Society for Conservation Biology
Society for the Study of Evolution
The American Society of Naturalists

REFERENCES

Dr. Marlis R. Douglas	Ph.D. Advisor Professor & Endowed Chair, University of Arkansas mrd1@uark.edu
Dr. William J. Matthews	M.S. Advisor Professor Emeritus, University of Oklahoma wmatthews@ou.edu
Dr. Michael E. Douglas	Ph.D. Advisor Professor & Endowed Chair, University of Arkansas med1@uark.edu
Dr. Jeremy M. Beaulieu	Ph.D. Committee member Associate Professor, University of Arkansas jmbeauli@uark.edu