

William Rosenthal

DEPARTMENT OF BOTANY · CE WAGNER LAB

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Education

University of Wyoming

PH.D. ECOLOGY AND EVOLUTION

Advisor: Dr. Catherine Wagner

Laramie, Wyoming

May 2021 - May 2025 (anticipated)

University of Wyoming

M.S. BOTANY, THESIS TITLE: "EFFECTS OF FITNESS IN A HYBRIDIZING TROUT POPULATION"

Advisor: Dr. Catherine Wagner

Laramie, Wyoming

Sep. 2018 - May 2021

University of Wisconsin-Madison

B.S. GENETICS AND WILDLIFE ECOLOGY

Advisors: Dr. Peter McIntyre and Dr. Sean Schoville

Madison, Wisconsin

September 2014 - May 2018

Career goals

I endeavor to contribute towards a better integration of evolutionary biology into conservation practice, as I believe this will give freshwater biodiversity the greatest chance of persistence into an uncertain future. Additionally, I hope to use the stories inherent in natural history to communicate the intrinsic value of biodiversity in ways that are effective to both scientists and laypeople.

Freshwater fish hold a dear place in my heart, partially because their diversity, relative obscurity, and sensitivity to alterations across the entire landscape make them very well suited to conservation narratives. I am not particular about what line of work I end up in after graduation so long as it allows me to pursue these interests and help make meaningful change in the way we interact with and relate to our environment.

Publications

Mooney, R., E. Stanley, **W. Rosenthal**, P. Esselman, A. Kendall, P.B. McIntyre. (2020). A day in the life of a Great Lake: Outsized nutrient contributions from small tributaries. *Proceedings of the National Academy of Sciences of the United States of America*.

Rosenthal, W., P.B. McIntyre, K. Moody, R. Prather, P. Lisi, M. Blum, J.D. Hogan, S. Schoville. (2021). Rapid evolution and invasion history in guppy (*Poecilia reticulata*) populations across the Hawaiian archipelago. *Evolutionary Applications*.

Rosenthal, W., J. Fennell, E. Mandeville, J. Burckhardt, A. Walters, C. Wagner. (2022). Hybridization decreases native cutthroat trout reproductive fitness. *Molecular Ecology*.

Fennell, J., **W. Rosenthal**, C. Wagner, J. Burckhardt, A. Walters. (2023). Temporal segregation in spawning between native Yellowstone cutthroat trout and introduced rainbow trout. *Ecology of Freshwater Fish*.

L. Combrink, **W. Rosenthal**, L. Boyle, J. Rick, E. Mandeville, A. Krist, A. Walters, C. Wagner. (2023). Parallel shifts in trout feeding morphology suggest rapid adaptation to alpine lake environments. *Evolution*.

In review

Rosenthal, W., E. Mandeville, A. Pilkerton, P. Gerrity, J. Skorupski, A. Walters, C.E. Wagner. Influence of dams on sauger population structure and hybridization with introduced walleye. *Ecology and Evolution*.

Presentations

Rosenthal, W., A. Walters, C.E. Wagner. 2023. Evaluating the evolutionary effects of fish stocking in an imperiled trout. Oral Presentation: National Meeting of the American Fisheries Society, Grand Rapids, MI.

Rosenthal, W., J. Fennell, E. Mandeville, J. Burckhardt, A. Walters, C.E. Wagner. 2023. Hybridization decreases native Cutthroat Trout fitness. Oral Presentation: Coastwide Salmonid Genetics Conference, Boise, ID.

Rosenthal, W., J. Fennell, E. Mandeville, J. Burckhardt, A. Walters, C.E. Wagner. 2022. Reproductive fitness in a hybridizing wild trout population. Oral Presentation: Colorado-Wyoming Chapter of the American Fisheries Society Annual Meeting, online conference.

Rosenthal, W., J. Fennell, J. Burckhardt, E. Mandeville, A. Walters, C.E. Wagner. 2020. Evaluating Causes of Reproductive Isolation in Hybridizing Trout. Oral Presentation: American Fisheries Society Virtual Annual Meeting, online conference.

Rosenthal, W. & Pilkerton, A., E. Mandeville, J. Skorupski, P. Gerrity, A. Walters, C.E. Wagner. 2020. Sauger Population Structure and Hybridization with Introduced Walleye. Poster: Colorado-Wyoming Chapter of the American Fisheries Society Annual Meeting, Laramie, WY.

Rosenthal, W., J. Fennell, J. Burckhardt, E. Mandeville, A. Walters, C.E. Wagner. 2019. Effects of hybridization on fitness in *Oncorhynchus* of the North Fork Shoshone River drainage. Poster: Colorado-Wyoming Chapter of the American Fisheries Society Annual Meeting, Fort Collins, CO.

Rosenthal, W., P.B. McIntyre, S. Schoville. 2018. Evidence for guppy (*Poecilia reticulata*) adaptation in Hawaii. Oral presentation: College of Agriculture and Life Sciences Undergraduate Research Symposium, Madison, WI.

Honors & Awards

2023	James E. Wright Graduate Award , American Fisheries Society Genetics Section	\$1,000
2023	Coastwide Salmonid Genetics Conference Student Travel Award , Coastwide Salmonid Genetics Conference	\$500
2022	Aven Nelson Fellowship in Systematic Botany , University of Wyoming Dept. of Botany	\$500
2020	NSF GRFP Honorable Mention , National Science Foundation	
2020	Vern Bressler Fisheries Fund , University of Wyoming Dept. of Zoology	\$1,000
2020	Outstanding TA Award , University of Wyoming Dept. of Botany	\$300
2019	Northen - Porter Summer Fellowship , University of Wyoming Dept. of Botany	\$1,200
2017	Zoology Undergraduate Summer Research Award , UW-Madison Dept. of Integrative Biology	\$3,000
2017	Holstrom Environmental Scholarship , Nelson Institute for Environmental Studies	\$3,000
2017	Chase-Noland Research Fellowship , UW-Madison Center for Limnology	\$5,000
2015	Ruth and Carl Miller Academic Merit Award , UW-Madison College of Agriculture and Life Sciences	\$1,500
2014-2018	National Merit Scholarship , National Merit Scholarship Corporation & Sentry Insurance	\$20,000
2014-2018	Wisconsin Academic Excellence Scholarship , Wisconsin Higher Educational Aids Board	\$10,000

Research Experience

Rangewide Yellowstone Cutthroat Trout Genetics Assessment, CE Wagner Lab

University of Wyoming

GRADUATE RESEARCH ASSISTANT

May 2021 - Present

- Coordinated the collection, organization, and processing of over 5,000 tissue and extracted DNA samples from state and federal partners.
- Analyzing data with the intent to inform management actions across the subspecies range as well as answer more general questions in riverine fish evolution.
- Developing pipelines to facilitate efficient management and analysis of large quantities of genomic data.
- Further developed skills as an efficient and effective communicator to ease execution of a large multi-agency project.

Sauger Hybridization, CE Wagner Lab

University of Wyoming

GRADUATE RESEARCH ASSISTANT

Jan. 2019 - Present

- Analyzed genetic data from sauger and walleye to identify the extent of hybridization and population structure in the Bighorn and Wind River drainages (funded by a grant from the Wyoming Game and Fish Department).

Yellowstone cutthroat trout hybridization, CE Wagner Lab

University of Wyoming

MS STUDENT

Sept. 2018 - May 2021

- Used genomic data to identify factors contributing to reproductive isolation between native Yellowstone cutthroat trout and introduced rainbow trout in the North Fork of the Shoshone River.
- Rigorous sampling elucidated the relationship between individual genetic ancestry and mate choice, reproductive success, and migration timing.

Molecular Ecology Lab

UW-Madison

UNDERGRADUATE RESEARCH ASSISTANT

Dec. 2016 - July 2018

- In conjunction with the McIntyre Lab, organized and funded a project examining the population structure, invasion history, and rapid evolution of invasive guppies (*Poecilia reticulata*) in the Hawaiian archipelago.
- Learned to use R and a variety of Unix-based programs for the analysis of genetic data.
- Coordinated with a team of researchers from across the country.

McIntyre Research Group

UW-Madison

UNDERGRADUATE RESEARCH ASSISTANT

Jan. 2016 - July 2018

- Sorted, dissected, and processed fish and crustacean samples for stable isotope analyses to understand the nutrient cycling effects of invasive species in the Hawaiian archipelago.
- Assisted a graduate student (R. Mooney) in invertebrate and water sample collection from tributaries across Lake Michigan. This sampling occurred annually for three summers.
- Extracted limnological information from figures in historical papers on seldom-studied lakes.

Other Work Experience

Environmental Data Initiative

DATA MANAGEMENT ASSISTANT

- Used R and Python to convert original Long Term Ecological Research data into a standardized format.
- Made converted datasets publicly available, primarily for use in biological community-based meta-analyses.

Madison, WI

May 2018 - Aug. 2018

Wisconsin Union Directorate's Distinguished Lecture Series

DIRECTOR

- Organized a campus-wide lecture series featuring world-class speakers and a budget of over \$150,000.
- Collaborated with a variety of campus organizations to ensure lectures were accessible and well-publicized.
- Emphasized creating a schedule of speakers that would expose students to diverse world-views.
- Supervised groups of student volunteers and provided motivated individuals with opportunities for further involvement and responsibility.

UW-Madison

May 2016 - May 2017

Verso Corporation Chemical Wood Pulp Mill

SEASONAL VACATION RELIEF EMPLOYEE

- Operated heavy machinery in an industrial work environment with an emphasis on safety, effective communication, and teamwork.
- Worked across multiple departments, roles, and shifts (including overnight shifts) with a wide variety of people.

Wisconsin Rapids, WI

Summer 2014, Summer 2015

Outreach and Volunteer Experience

University of Wyoming Program in Ecology & Evolution

PROGRAM CO-PRESIDENT

- Working with faculty and other students to improve the utility of the program to its members.
- Identified and implemented ways to increase program fund availability for student travel funds and incentivize student engagement.
- Manage committees and program members to facilitate timely goal achievement.

Laramie, WY

AY 2023-2024

Native American Summer Institute

VOLUNTEER

- Assisted in organizing and running an outreach event for Native American highschool students
- Taught students about zooplankton, fish anatomy, and alpine lake ecology through hands-on experiences with dissection, microscopes, and art projects.

Laramie, WY

June 2023

Science Kids of Wyoming

VOLUNTEER

- Ran educational programs designed to inform children ages 6-8 about aquatic life in Wyoming in a hands-on setting.
- Educational programs included information on life history strategies and how and why scientists aim to learn more about wild animals.

Cody, WY

June 2019

Teaching Experience

Summer 2022 **McNair Scholar Mentor**, Mentor for Toby Covill investigating skink evolution

Spring 2022 **Graduate Teaching Assistant**, General Ecology

Fall 2018 & 2023 **Graduate Teaching Assistant**, Evolutionary Biology

Spring & Fall 2020 **Graduate Teaching Assistant**, General Genetics

Relevant Coursework

* indicates a graduate-level course

Ecology	Terrestrial Vertebrates: Life History and Ecology, Principles of Wildlife Ecology, Principles of Wildlife Management, Wildlife Management Techniques, Animal Population Dynamics, Behavioral Ecology, Physiological Animal Ecology, Ecology of Fishes, Principles of Ecology*, Advanced Fisheries Management*, Ecological Modeling*, Advanced Approaches in Aquatic Ecology*
Evolution	Evolutionary Biology, Evolution and Extinction, Extinction of Species, Plant Systematics, Macroevolution*, Phylogenetics reading group*
Genetics	General Genetics, Genomics and Proteomics, Population Genetics*, Molecular Ecology*, Conservation Genomics*
Other	Introduction to Data Programming, Computational Biology*, Applied Bayesian Statistics*, Experimental Design*, Hierarchical Modeling for Ecology*, Objective Data Analysis*, Principles of Science Communication*