

LUCIA COMBRINK

MS Student | University of Wyoming | 805-456-9228 | lcombrin@uwyo.edu
<https://www.luciacombrink.com/>

EDUCATION

University of Wyoming, Laramie, WY — (GPA 4.0, *Expected graduation May 2022*)
Master of Science, Focus on Evolutionary Biology and Genetics, Fisheries Science

Westmont College, Santa Barbara, CA — (GPA 3.96, *Summa Cum Laude*)
B.S. in Biology, Ecology, Evolution, and Natural History
B.S. in Psychology, Behavioral Neuroscience
Minor in Chemistry

RESEARCH PROJECTS

MSc Thesis Project: The Tempo of Ecological and Evolutionary Change: Response to Predator Introduction in Alpine Lakes of the Wind River Range **2019-2022**

Committee: Dr. Catherine (Katie) Wagner; Dr. Annika Walters; Dr. Bryan Shuman; Dr. Amy Catherine Krist, Dr. Alex Buerkle

Eco-Evolutionary Feedback Between Predator and Prey: This interdisciplinary project uses population genomic and morphological data to examine the potential for rapid adaptation of non-native stocked trout in the alpine lakes of the Wind River Range, WY. Previous research has demonstrated that stocked trout drive a decrease in zooplankton size due to selective predation. This in turn may drive an eco-evolutionary feedback loop where these predators undergo rapid adaptation of feeding morphology in order to exploit smaller and smaller zooplankton as prey. I hypothesize **1)** an increase in gill raker number and **2)** a decrease in gill raker spacing in historically stocked lakes, and will use a combination of field work, genetic data, morphological, and modeling techniques to examine this.

Hybridization and Population Genomic Structure in Historic Trout Populations: Using next generation sequencing based methods and cluster analysis with hierarchical Bayesian models, I aim to identify ancestral origins of historic, self-sustaining trout populations and to examine genetic diversity between and within populations and the extent of inbreeding in small historic populations.

Diet Niche Partitioning via Stable Isotope Analysis: I am also investigating the potential occurrence of intraspecific diet niche partitioning in a population of stocked trout in a resource-poor, oligotrophic lake. Using a combination of stable isotope data and stomach content analyses, I plan to demonstrate preferential long-term selection of either zooplankton or aquatic insects in a population of trout where competitive interactions are likely high.

BS Major Honors Project: Current and Time-Lagged Effects of Climate on Innate Immunity in Two Sympatric Snake Species. **2017-2019**

Committee: Dr. Amanda Sparkman (chair), Dr. Jeff Schloss, Dr. Ronald See

This NSF-funded study examined the impact of the California drought and differing life-history strategies on innate immune response in two species of garter snakes (*Thamnophis sirtalis* and *T. elegans*). Immune function assays were performed on plasma samples collected from wild snakes in the 2017 and 2018 field seasons and were used to perform immune function assays. Results were published in *Ecology & Evolution*.

BS Semester Research Project: Dive Response in Two Species of Garter Snakes **Fall 2019**

Advisor: Dr. Amanda Sparkman

Examined the presence of a dive response in semi-aquatic garter snakes by recording pronounced bradycardia after head submergence using a field portable ultrasound.

BS Research & Field Assistant to Dr. Amanda Sparkman: Channel Islands Reptile Dwarfism & Garter Snake Life History Strategies Project **2017 - 2018**

Participated in NSF REU for two consecutive years (2017-2018) that involved collecting field data from reptiles. Skills include using a field-portable ultrasound to count and measure eggs in lizards and snakes, palpating for eggs, weighing, measuring, marking and blood sampling several snake and lizard species.

BS Psychology Senior Research Project: Examining the Role of Religiosity in Attitudes Towards the Environment and Pro-Social Behavior **Fall 2019**

Advisor: Dr. Brenda Smith

Investigated how implicit religious priming influences attitudes toward the environment and whether 'utilization' or 'dominion' beliefs impact subsequent pro-environmental behavior.

PUBLICATIONS AND PRESENTATIONS

Journal Publications

Combrink, L. L., Golcher Benavides, J., Lewanski, A., Rick, J.A., Rosenthal, W.C., Wagner, C.E. (2022) Population Genomics of Adaptive Radiations. *In preparation for November 2021 submission to Molecular Ecology Reviews.*

Combrink, L. L., Walters, A., Krist, A., Buerkle, A. Shuman, B., & Wagner, C.E. (2022). Eco-evolutionary feedback drives rapid adaptation of trout introduced to a novel ecosystem. *In preparation.*

Combrink, L. L., Wagner, C.E. (2022) Stable isotope analysis reveals intraspecific dietary niche partition of stocked trout in high-elevation alpine lakes. *In preparation.*

Combrink, L. L., Brummet, L. J., Bronikowski, A. M., Miller, D. A., & Sparkman, A.M. (2021). Current and Time-Lagged Effects of Climate on Innate Immunity in Two Sympatric Snake Species. *Ecology and Evolution.*

Evans, K. E., Brummett, L., **Combrink, L.**, Holden, K., Catalina, G., Farrar, S., ... & Sparkman, A. M. (2021). Embryonic heart rate correlates with maternal temperature and developmental stage in viviparous snakes. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*, 253, 110874

Brummet, L. J.*, **Combrink, L. L.***, & Sparkman, A.M. (2022). Bradycardia during voluntary submergence in two species of semi-aquatic garter snakes. *In preparation.*

* Both authors share first authorship

Sparkman, A. M., Clark, A. D., Brummett, L. J., Chism, K. R., **Combrink, L. L.**, Kabey, N. M., & Schwartz, T. S. (2018). Convergence in reduced body size, head size, and blood glucose in three island reptiles. *Ecology and Evolution*, 8(12), 6169-6182.

Sparkman, A. M., Chism, K. R., Bronikowski, A. M., Brummett, L. J., **Combrink, L. L.**, Davis, C. L., Holden, K.G., Kabey, N. M., & Miller, D. A. (2018). Use of field-portable ultrasonography reveals differences in developmental phenology and maternal egg provisioning in two sympatric viviparous snakes. *Ecology and Evolution*, 8(6), 3330-3340.

Scientific Presentations

2021 American Fisheries Society Colorado/Wyoming Chapter Annual Meeting: The Tempo of Ecological and Evolutionary Change: Response to Trout Introduction in Alpine Lakes of the Wind River Range, WY, **February 23, 2021, 10-minute presentation.**

2021 Western Division of the American Fisheries Society Annual Meeting: The Tempo of Ecological and Evolutionary Change: Response to Trout Introduction in Alpine Lakes of the Wind River Range, WY, **May 2021, 10-minute presentation.**

2021 Virtual Evolution Conference Annual Meeting: The Tempo of Ecological and Evolutionary Change: Response to Trout Introduction in Alpine Lakes of the Wind River Range, WY, **June 21, 2021, 10-minute presentation.**

2020 Annual PiE (Program in Ecology) Symposium, University of Wyoming: The Tempo of Ecological and Evolutionary Change: Response to Trout Introduction in Alpine Lakes of the Wind River Range, WY, **February 19, 2021, 3-minute thesis presentation competition.**

2019 Major Honors Thesis Defense, Westmont College: Current and Time-Lagged Effects of Climate on Innate Immunity in Two Sympatric Snake Species. **Spring 2019, 40-minute thesis presentation.**

GRANTS AND FELLOWSHIPS

2021 INBRE Travel for Training Fund , National Institute of Health IDeA Network for Biomedical Research Excellence Program, University of Wyoming	\$620
2021 Vern Bressler Fisheries Fund Scholarship , College of Arts and Sciences, Zoology and Physiology, University of Wyoming	\$1,200
2021 American Fisheries Society Eugene Maughan Scholarship , American Fisheries Society	\$2,500
2020 Avon Nelson Fellowship in Systematic Botany , College of Arts and Sciences, Department of Botany, University of Wyoming	\$700
2020 ASIH Student Scholarships Raney Fund , American Society of Ichthyologists and Herpetologists	\$600
2020 Dean's Graduate Scholars Award , College of Arts and Sciences, Department of Botany, University of Wyoming	\$2,000
2018 Calvin DeWitt Leadership Scholarship , Au Sable Institute	\$5,100

2015-2019 Presidential Scholarship for Full Tuition,
Westmont College

\$53,000

TEACHING EXPERIENCE

Life 3500 Evolutionary Biology Teaching Assistant	Fall 2021
Life 2022 Animal Biology Teaching Assistant	Spring 2020
Botany 1101 Debates in Paleontology Teaching Assistant	Fall 2019

MENTORING AND SERVICE EXPERIENCE

2019-2021 **Rebecca Hinds**, McNair Research Scholar, University of Wyoming
2020-2021 **Andromeda Erickson**, Undergraduate Assistant, University of Wyoming
2021 **Zachary Meyer**, Undergraduate Assistant, University of Wyoming
2018-2019 **Mentoring Returning Study-Abroad Students**, Global Leadership Center, Westmont College. *Served as a Global Student Liaison to mentor students returning from abroad experiences.*
Spring 2019 **Cooking Club Vice President**, Westmont College. *Co-founded a club aimed at building a community for fellow food-enthusiasts.*
2016 & 2019 **International Student Ambassador**, Administration Office, Westmont College. *Planned, led, and hosted an orientation for international students.*

SKILLS

Statistical Software

- R (Proficient User); JMP SAS Institute; Prism; SPSS; Excel

Languages

- **English** (native speaker, reader, and writer); **Afrikaans** (native speaker, novice reading and writing); **Dutch** (intermediate listener and speaker, novice reading and writing)

REFERENCES

Dr. Catherine (Katie) Wagner, Assistant Professor
Department of Botany
University of Wyoming
1000 E University Ave, 82071, Laramie, WY.
Email: catherine.wagner@uwyo.edu

Dr. Amy Krist, Associate Professor of Zoology and Physiology
Department of Zoology and Physiology; University of Wyoming
1000 E University Ave, 82071, Laramie, WY.
Email: kirst@uwyo.edu

Dr. Amanda Sparkman, Associate Professor of Biology
Biology Department
Westmont College
955 La Paz Rd, 93108, Santa Barbara, CA
Email: sparkman@westmont.edu
Phone: (805) 565-6283