

Kara Andres

Living Earth Collaborative | Washington University in St. Louis | St. Louis, MO 63130

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EDUCATION

Ph.D. in Ecology and Evolutionary Biology, August 2022, *Cornell University*

Advisor: Dr. David Lodge

Master of Science in Biology, May 2017, *Saint Louis University*

Advisor: Dr. Jason Knouft

Bachelor of Science in Biology, December 2014, *Missouri State University*

Honors Thesis Advisor: Dr. John Heywood

RESEARCH APPOINTMENTS

Biodiversity Postdoctoral Research Fellow, *Living Earth Collaborative, Washington University in St. Louis* (2022–present)

Research: Environmental and host-associated microbiomes in native and invasive streamfishes

Advisors: Dr. Fangqiong Ling (WUSTL) and Dr. Jason Knouft (SLU)

Graduate Research Fellow, *Cooperative Institute for Great Lakes Research (CIGLR)* (2021–2022)

Research: Molecular approaches to quantify Round Goby abundance in Great Lakes

Advisors: Dr. Ed Rutherford (NOAA), Dr. Peter Esselman (USGS), and Dr. David Lodge (Cornell)

Research Internship, *Mote Marine Laboratory* (January–May 2015)

Research: Ocean acidification and coral disease

Advisor: Dr. Emily Hall

Research Assistant, *Missouri State University* (August–December 2014)

Research: Interactive effects of aquatic invasive species

Advisor: Dr. John Havel

Research Assistant, *Missouri State University* (2013–2014)

Research: Genetic and phenotypic consequences of pollinator loss

Advisor: Dr. John Heywood

PEER-REVIEWED PUBLICATIONS

9. **Andres, K.J.**, Lodge, D.M., Andrés, J. (2023). Environmental DNA reveals the genetic diversity and population structure of an invasive species in the Laurentian Great Lakes. *Proceedings of the National Academy of Sciences*, 120 (37) e2307345120. DOI: [10.1073/pnas.2307345120](https://doi.org/10.1073/pnas.2307345120)

** highlighted in [*Cornell Chronicle*](#), [*The Ampersand*](#), [*Great Lakes Now*](#)

8. **Andres, K.J.**, Lodge, D.M., Sethi, S.A., Andrés, J. (2023). Detecting and analysing intraspecific genetic variation with eDNA: From population genetics to species abundance. *Molecular Ecology*, 32(15), 4118–4132. DOI: [10.1111/mec.17031](https://doi.org/10.1111/mec.17031)

7. Andrés, J., Czechowski, P., Grey, E., Saebi, M., **Andres, K.J.**, ... , Lodge, D.M. (2023). Global port survey quantifies commercial shipping's effect on biodiversity. *Molecular Ecology*, 32(23), 6696-6709. DOI: [10.1111/mec.16888](https://doi.org/10.1111/mec.16888)
6. **Andres, K.J.**, Lambert, T., Lodge, D.M., Andrés, J., Jackson, R. (2023). Combining sampling gear to optimally inventory species highlights the efficiency of eDNA metabarcoding. *Environmental DNA*, 5, 146-157. DOI: [10.1002/edn3.366](https://doi.org/10.1002/edn3.366)
** highlighted in *Women of Fisheries*
5. Heywood, J.S., Michalski, J.S., McCann, B.K., Russo, A.D., **Andres, K.J.**, Hall, A.R., Middleton, T.C., Chiles, A., Dewey, S. E. (2022). The potential for mating system evolution in mixed-mating *Ruellia humilis* following the loss of hawkmoth pollination. *American Journal of Botany*, 109, 1875–1892. DOI: [10.1002/ajb2.16063](https://doi.org/10.1002/ajb2.16063)
4. **Andres, K.J.**, Sethi, S.A., Lodge, D.M., Andrés, J. (2021). Nuclear eDNA estimates population allele frequencies and abundance in experimental mesocosms and field samples. *Molecular Ecology*, 30, 685-697. DOI: [10.1111/mec.15765](https://doi.org/10.1111/mec.15765)
** highlighted in *Cornell Chronicle*, *Olean Times Herald*
3. **Andres, K.J.**, Sethi, S.A., Duskey, E., Lepak, J., Rice, A., Estabrook, B.J., Fitzpatrick, K., George, E., Marcy-Quay, B., Pauve, M., Perkins, K., Scofield, A. (2020). Seasonal habitat use indicates depth may mediate the potential for trophic impacts of invasive round goby in inland lakes. *Freshwater Biology*, 65, 1337–1347. DOI: [10.1111/fwb.13502](https://doi.org/10.1111/fwb.13502)
2. **Andres, K.J.**, Chien, H., Knouft, J.H. Hydrology induces intraspecific variation in freshwater fish morphology under contemporary and future climate scenarios. (2019). *Science of the Total Environment*, 671, 421–430. DOI: [10.1016/j.scitotenv.2019.03.292](https://doi.org/10.1016/j.scitotenv.2019.03.292)
1. Heywood, J.S., Michalski, J.S., McCann, B.K., Russo, A.D., **Andres, K.J.**, Hall, A.R., Middleton, T.C. (2017). Genetic and environmental integration of the hawkmoth pollination syndrome in *Ruellia humilis* (Acanthaceae). *Annals of Botany*, 119, 1143–1155. DOI: [10.1093/aob/mcx003](https://doi.org/10.1093/aob/mcx003)

MANUSCRIPTS SUBMITTED & IN ADVANCED STAGES OF PREPARATION

2. **Andres, K.J.**[†], Liu, B.[†], Johnson, L.E., Kapuscinski, K.L., Moerke, A.H., Ling, F., Knouft, J.H. Life stage and vaccination shape the gut microbiome of hatchery-reared Atlantic salmon (*Salmo salar*). Under revision. Preprint available: [10.1101/2023.02.21.529474](https://doi.org/10.1101/2023.02.21.529474)
1. Deiner, K., **Andres, K.J.**, Li, Y., Lopez, J., Renshaw, M., Lodge, D.M., Pfrender, M., McIntyre, P., Wagner, C. Comparative metaphylogeography of Lake Tanganyika Cichlids using environmental DNA. Manuscript in preparation.

GRANTS AND FELLOWSHIPS

2023	SLU Science and Engineering President's Research Fund (\$25,000)
2022	Living Earth Collaborative Biodiversity Postdoctoral Fellowship (\$132,000)
2022	International Association for Great Lakes Research travel grant

2021– 2022	Cooperative Institute for Great Lakes Research Graduate Fellowship (\$25,000)
2020, 2021	Ecological Society of America Registration Grant
2019	Robert Bouma Fund Research Award (\$800)
2019	Society for Freshwater Science Endowment Award (\$1,000)
2019	Cornell Sigma Xi Research Grant (\$800)
2018–2022	Cornell Atkinson Center Research Fellow
2018, 2021	Cornell University Graduate School Travel Grant (\$1000)
2018	Atkinson Center Sustainable Biodiversity Grant (\$7,000)
2018	Andrew W. Mellon Student Research Grant (\$1,000)
2018	Einaudi Center International Research Travel Grant (\$1,000)
2015	Mote Marine Laboratory Scholarship (\$2,000)
2013	Public Affairs Grant, <i>Missouri State University</i> (\$4,000)
2012–2014	Student Government Association Scholarship (\$6,000)
2012–2014	MSU Departmental Biology Scholarships (\$1,500)
2010–2014	MSU Board of Governors Scholarship (\$25,000)
2010–2014	Missouri Bright Flight Scholarship (\$12,000)

AWARDS AND HONORS

2021	Best Student Talk, ESA Aquatic Ecology Section
2019	IAGLR Science Communication Scholar
2019	Cornell CALS Outstanding Teaching Assistant Award
2018	Cornell Trustee Council Sustainability Competition, 3 rd place presentation
2017	EEB December Symposium Book Award, 1 st place presentation
2016	Saint Louis University Graduate Research Symposium, 2 nd place poster
2013	Junior of the Year, a campus-wide student recognition award
2012	Student Government Association Director of the Year

TEACHING EXPERIENCE

Washington University in St. Louis

2023	Guest lecturer, Aquatic Ecology
2023	Guest lecturer, Environmental Data Science

Cornell University

2021, 2022	Guest lecturer, Molecular Tools in Ecology and Conservation
2018	Head Teaching Assistant, Ecology and the Environment
2017–2018	Teaching Assistant, Ecology and the Environment

Saint Louis University

2016–2017	Workshop Instructor, GIS in Aquatic Ecology and Evolutionary Biology
2017	Teaching Assistant, Biology of Fishes

2016 Teaching Assistant, GIS in Biology
2015–2016 Teaching Assistant, Introductory Biology

UNDERGRADUATE AND GRADUATE RESEARCH MENTORING

2023 Yirong Xu, WashU Graduate Student
2023 Bonnie David, Senior Thesis Committee Member
2019 George Rogalskyj, Undergraduate Research Assistant
2019 Diana Tapia, Research Assistant with ESA Strategies for Ecology, Education, Diversity and Sustainability (SEEDS)
2019 Maria Hailellassie, Research Assistant with ESA SEEDS
2018 Amanda Wong, Research Assistant with ESA SEEDS

TEACHING TRAINING AND DEVELOPMENT

2020 Diversity, Equity, and Inclusion in STEM: Science Behind the Bias (Graduate course)
2019–2021 Cornell University Center for Teaching Innovation Workshops:

- Backward Course Design: Developing LOs
- Developing a Syllabus from Scratch
- Designing Learning Activities
- Teaching & Learning in the Diverse Classroom

INVITED SEMINARS

2023 Saint Louis University, Department Seminar, St. Louis, MO
2022 Saint Louis University, Department Retreat alumnus spotlight, St. Louis, MO
2022 Washington University in St. Louis, Living Earth Collaborative seminar, St. Louis, MO
2022 USGS Great Lakes Science Center, Research Seminar, Ann Arbor, MI
2021 University of Maine, Maine-eDNA seminar series, Orono, ME

SELECTED PRESENTATIONS

2023 **Andres, K.J.**, Lodge, D.M., Andrés, J, Esselman, P. Estimating invasive species abundance using advanced survey methods: A comparison of AUV imaging and eDNA assessments. *Ecological Society of America Annual Meeting*.

2022 **Andres, K.J.**, Lodge, D.M., Andrés, J. Detecting and analyzing intraspecific genetic variation from eDNA. *Joint Aquatic Sciences Meeting (JASM)*.

2021 **Andres, K.J.** Using nuclear eDNA to study population genetics and quantify abundance of the round goby. *CIGLR All-partners Annual Meeting*.

2021 **Andres, K.J.**, Lodge, D.M., Andrés, J. Using nuclear eDNA to detect population genetic structure of an invasive species. *American Fisheries Society Annual Meeting*.

2021 **Andres, K.J.**, Lodge, D.M., Andrés, J. Beyond presence-absence: Using environmental DNA to detect population genetic structure of an invasive species with nuclear markers. *Ecological Society of America Annual Meeting*.

- **Winner of the Best Student Talk in Aquatic Ecology**

- 2021 **Andres, K.J.**, Lodge, D.M., Andrés, J. Beyond presence-absence: Using environmental DNA to detect population genetic structure of an invasive species. *Society for Freshwater Science Annual Meeting*.
- 2020 **Andres, K.J.**, Lodge, D.M., Andrés, J. Is environmental DNA ready for population genetics? Estimating genetic diversity and population structure of an invasive species. *DOD SERDP and ESTCP Symposium*.
- 2020 **Andres, K.J.**, Sethi, S.A., Lodge, D.M., Andrés, J. Is eDNA ready for population genetics? Estimating genetic diversity and absolute abundance of an invasive species with nuclear eDNA. *Ecological Society of America Annual Meeting*.
- 2019 **Andres, K.J.**, Sethi, S.A., Lodge, D.M., Andrés, J. Estimating Genetic Diversity in Environmental DNA Samples Using Microsatellites. *DOD SERDP and ESTCP Symposium*.
- 2019 **Andres, K.J.**, Sethi, S.A., Lodge, D.M., Andrés, J. Novel eDNA methods for monitoring population genetics of an invasive species. *International Association of Great Lakes Research Annual Meeting*.
- 2019 **Andres, K.J.**, Sethi, S.A., Lodge, D.M., Andrés, J. Novel eDNA methods for monitoring population genetics of an invasive species. *Society for Freshwater Science Annual Meeting*.
- 2018 **Andres, K.J.**, Flecker, A., Andrés, J., Lodge, D. Detecting aquatic biodiversity in the Amazon Basin using environmental DNA. *Cornell Atkinson Sustainability Project Pitch Competition*.
- 3rd place presentation
- 2018 **Andres, K.J.**, Flecker, A., Andrés, J., Lodge, D. Characterizing aquatic biodiversity in the Amazon Basin using environmental DNA. *Tropical Biology and Conservation Symposium, Cornell University*.
- 2018 **Andres, K.J.**, Chien, H., Knouft, J.H. Predicted morphologic responses to climate-induced hydrologic changes vary among populations of freshwater fishes. *Ecological Society of America Annual Meeting*.
- 2018 **Andres, K.J.**, Chien, H., Knouft, J.H. Predicted morphologic responses to climate-induced hydrologic changes vary among populations of freshwater fishes. *Society for Freshwater Science Annual Meeting*.
- 2016 **Andres, K.J.**, Krause, K.P., Chien, H., Knouft, J.H. Assessment of the relationship between geographic range size, environmental niche characteristics, and body size of freshwater fishes at a regional scale. *Saint Louis Ecology, Evolution, and Conservation conference*.
- 2016 **Andres, K.J.**, Krause, K.P., Knouft, J.H. Geographical range size, environmental niche characteristics, and body size of freshwater fishes. *Saint Louis University Graduate Research Symposium*.
- 2nd place poster

- 2014 **Andres, K.J.** Inbreeding depression and heritability of growth patterns in *Ruellia humilis*. *Missouri State University Undergraduate Research Fair*.
- 2013 **Andres, K.J.** Practical solutions to energy consumption concerns: a proposal to establish renewable energy measures on campus. *Missouri State University Board of Governor's Meeting*.

PROFESSIONAL SERVICE AND ACTIVITIES

Journal reviews

Molecular Ecology, Environmental Biology of Fishes, Ecology of Freshwater Fish, Molecular Ecology Resources, Environmental DNA, PLOS One, Science of the Total Environment, Evolutionary Applications

Grant Reviews

- 2023 UW-Milwaukee's Discovery and Innovation Grant
- 2023 Living Earth Collaborative Postdoctoral Fellowship
- 2019–2020 Atkinson Center for a Sustainable Future Sustainable Biodiversity Fund

Institutional and departmental service

- 2022–present Living Earth Collaborative Seminar Organizer
- 2019–2022 Cornell Atkinson Research Fellows, Student events coordinator
- *I coordinated monthly events, workshops, and career panels for 250+ graduate and professional students associated with the Cornell Atkinson Center for Sustainability.*
- 2021–2022 Lunch Bunch (department peer review & skills-shares), Committee head
- 2019–2022 Cornell EEB New Student Launch Committee, Peer mentor
- 2020 Limnology faculty search committee, Student representative
- 2017–2019 Expanding Your Horizons, Volunteer Recruitment chair
- 2012–2014 Student Government Association, Sustainability Commissioner
- 2011–2012 Student Government Association, Director of Sustainability
- *I authored and managed campus sustainability proposals. Total funding awarded for proposals exceeded \$100,000.*
- 2011–2013 Students for a Sustainable Future, President; Secretary
- 2011–2014 Sustainability Advisory Board of Springfield, MO, Student representative
- 2011 Sustainability Minor Proposal Committee, Student representative

Diversity, Equity, and Inclusion

- 2020–2022 Increasing Diversity in Graduate Recruitment, EEB Working Group
- 2018–2021 Cornell Diversity Preview Weekend, Department co-chair
- *DPW invites students from underrepresented backgrounds who are interested in pursuing graduate school to participate in training in preparation for the application process. I co-coordinated the organization of the entire weekend and authored a funded proposal to the Cornell College Deans to institutionalize the program across all graduate fields.*

2018–2021 Cornell Diversity Preview Weekend, Workshop Leader (4 workshops) & Volunteer
2018–2020 Cornell Diversity Preview Weekend, Student Mentor to four attendees

PROFESSIONAL SOCIETY MEMBERSHIPS

Ecological Society of America, Society for Freshwater Science, Society for Conservation Biology,
International Association for Great Lakes Research, American Fisheries Society