

## Darwin Scott Rinnan

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## EDUCATION

**Ph.D., Quantitative Ecology and Resource Management (QERM)**, University of Washington, June 2018  
Title: "Modeling population dynamics and species interactions in a changing climate"  
Committee: Joshua Lawler (chair), Mark Kot, Laura Prugh, Trevor Branch, Janneke Hille Ris Lambers

**M.S., QERM**, University of Washington, March 2015  
Title: "Quantifying sensitivity and exposure to climate change in Western North American species"

**B.S., Mathematics**, The Evergreen State College (TESC), June 2005

## PUBLICATIONS

- In review* Pazdral RS, Lawler JJ, **Rinnan DS**, Michalak JL, Carroll C. Protecting geophysical diversity as a strategy for biodiversity conservation and land prioritization in the face of climate change in western North America.
- In review* **Rinnan DS**, Jetz W. Terrestrial conservation opportunities and inequities revealed by global multi-scale prioritization. Available on bioRxiv. <https://doi.org/10.1101/2020.02.05.936047>
- 2020 Lawler JJ, **Rinnan DS**, Michalak JL, Withey JC, Randels CR, Possingham HP. Planning for climate change through additions to a national protected area network: implications for cost and configuration. *Philosophical Transactions of the Royal Society B*, 375(1794). <https://doi.org/10.1098/rstb.2019.0117>
- 2019 **Rinnan DS**, Lawler JJ. Climate niche factor analysis: a spatial approach to quantifying species vulnerability to climate change. *Ecography*, 42(8) 1494-1503. <https://doi.org/10.1111/ecog.03937>
- 2018 **Rinnan DS**. Population persistence in the face of climate change and competition: a battle on two fronts. *Ecological Modelling*, 385, 78-88. <https://doi.org/10.1016/j.ecolmodel.2018.07.004>
- 2018 **Rinnan DS**. The dispersal success and persistence of populations with asymmetric dispersal. *Theoretical Ecology*. 11(1), 55-69. <https://doi.org/10.1007/s12080-017-0348-x>
- 2017 Harsch MA, Phillips A, Zhou Y, Leung MR, **Rinnan DS**, Kot M (2017). Moving forward: insights and applications of moving-habitat models for climate change ecology. *Journal of Ecology*, 105(5), 1169-1181. <https://doi.org/10.1111/1365-2745.12724>

## PROFESSIONAL EXPERIENCE

- Postdoctoral Associate**, Yale Center for Biodiversity and Global Change, Yale University, 2018 – present
- Project title: "Reserve network design for the global conservation of terrestrial vertebrates"
- Co-Instructor**, Ecology & Evolutionary Biology Department, Yale, 2019
- Course title: Biodiversity Change Research in the Age of Big Data
- Instructor**, Professional and Continuing Education Program, UW, 2016 – 2018
- Course title: Data Analysis and Modeling with R
- Research Assistant**, UW, 2011 – 2018
- Project title: "Measuring habitat outcomes of state acquisitions and regulations"
  - Project title: "Assessing return on conservation investment in the face of climate change"
  - Project title: "Modeling the effects of species range shifts"
  - Project title: "Pacific Northwest climate change vulnerability assessment"
- Teaching Assistant**, Professional and Continuing Education Program, UW, 2014 – 2016

- Course title: Intro to Statistical Analysis with R
- Course title: Data Analysis and Modeling with R
- Course title: Advanced R Programming and Graphics

**Tutor**, self-employed, 2006 – 2011

- Subjects included mathematics, physics, chemistry, English, Spanish

**Teaching Assistant**, TESC, Olympia, WA, 2004 – 2005

- Program title: Methods of Applied Mathematics. Courses included nonlinear dynamics, linear algebra, mathematical biology, differential equations

**Tutor**, Quantitative Reasoning Center, TESC, Olympia, WA, 2004 – 2005

- Subjects included mathematics, physics, chemistry, biology

## SOFTWARE

**CENFA package for R**: tools for climate- and environmental- niche factor analysis of spatial data, including methods for visualization of spatial variability of species sensitivity, exposure, and vulnerability to climate change. Available at <https://cran.r-project.org/package=CENFA>.

## HONORS, AWARDS, FELLOWSHIPS & GRANTS

**UW Student Technology Fee Grant**, \$47,442 for proposal of high-performance remote servers for QERM program, June 2015

**ANIMOVE Summer School Fellowship**, Max Planck Institute for Ornithology, Germany, August 2013

**STATMOS Visualization of Climate Data Fellowship**, National Center for Atmospheric Research, May 2013

**Best Student Presentation**, QERM Seminar, UW, March 2013

**Hall-Ammerer-WRF Top Scholar Award**, UW, September 2011 – June 2012

**Computer Science, Engineering, and Mathematics Scholar**, National Science Foundation, 2004 – 2005

**Scholastic Achievement Award**, TESC, September 2003 – June 2005

## PRESENTATIONS

### Talks:

**Half-Earth Day Conference: Pathways to a Half-Earth Future**, Berkeley, CA, October 2019.

- "Which half? Global priorities for terrestrial vertebrate conservation," (Global and Regional Conservation Priorities in Oceans and on Land session)
- "Spatial reserve design for global conservation" (Half-Earth Project Educator Ambassador Institute workshop)

**Ecological Society of America Conference**, Louisville, KY, August 2019. "Which half? A global reserve network for the conservation of every terrestrial vertebrate species"

**Spatial Reserve Design Symposium**, Yale, September 2018. "Incorporating climate change into spatial conservation plans"

**Ecological Society of America Conference**, Portland, OR, August 2017. "The dispersal success and persistence of populations with asymmetric dispersal"

**Quantitative Seminar**, School of Aquatic and Fishery Sciences, UW, April 2016. "Incorporating biological processes into species distribution models"

**Species on the Move Conference**, Hobart, Tasmania, AUS, February 2016. "Incorporating interspecific interactions and dispersal into species distribution models"

**Graduate Climate Conference**, Woods Hole Oceanographic Institute, MA, October 2015. "Population persistence in the face of climate change and competition: a battle on two fronts"

**AniMOVE Symposium**, Max Planck Institute for Ornithology, Radolfzell, Germany, August 2013. "Quantifying sensitivity and exposure to climate change in Western North American species"

**Visualization of Climate Data Workshop**, NCAR, Boulder, CO, May 2013.

### Posters:

**Program on Climate Change Summer Institute**, Friday Harbor Laboratories, WA, September 2017

**Graduate Climate Conference**, Pack Forest Conference Center, WA, October 2016

**Program on Climate Change Summer Institute**, Friday Harbor Laboratories, WA, September 2015

**Graduate Student Symposium**, School of Environmental and Forestry Sciences, UW, March 2014

### Guest Lectures:

**ESRM 441:** Landscape Ecology, UW, October 2017. "An introduction to species distribution modeling"  
**QERM 597:** Current Topics in Quantitative Ecology, UW, March 2017. "Data visualization with Shiny"  
**ESRM 350:** Wildlife Biology and Conservation, UW, November 2015. "Modeling species competition"  
**ESRM 441:** Landscape Ecology, UW, November 2015. "Species distribution modeling with MaxEnt"

## SCIENCE ADVISORY WORK

- 2019 – present** Member of the Nature Map Earth consortium, contributing biodiversity science and expertise to guide policy for the Convention on Biological Diversity's post-2020 framework
- 2019** Scientific consultant for the Rainforest XPRIZE design
- 2019** "Gaining consensus on spatial and temporal biodiversity metrics for informed decision-making", Map of Life representative to the UN Environment World Conservation Monitoring Centre
- 2018 – present** "Which half? A spatial reserve network for the preservation of every terrestrial vertebrate", decision science and education support for the E.O. Wilson Biodiversity Foundation's Half-Earth Project
- 2017** "Measuring habitat outcomes of state acquisitions and regulations", report for the Joint Legislative Audit and Review Committee, Washington State Legislature, coauthor
- 2015 – 2017** "Protecting geophysical diversity as a strategy for biodiversity conservation and land prioritization in the face of climate change in western North America", coauthor and mentor for Rosemary Pazdral, graduated, M.S. student
- 2015 – 2016** "Climate change vulnerability assessment for the Treaty of Olympic Tribes", report for the Quinault Indian Nation, Hoh Tribe, and Quileute Tribe, contributor

## OUTREACH & ACTIVITIES

### Journal reviewer

- One Earth
- Ecology and Evolution
- Journal of Mammalogy
- Theoretical Ecology
- PLOS One

**Grant Review Panelist**, Yale Institute for Biospheric Sciences, 2019

**Member**, Program on Climate Change Graduate Steering Committee, UW, 2017 – 2018

**Project Leader and Senior Editor**, The Public Comment Project, 2016 – present

**Organizer**, Climate Change Video Contest, UW, 2015

**Senator**, Graduate & Professional Student Senate, UW, 2013 – 2015

**Member**, Ecological Society of America, 2011 – present

**Member**, Puget Sound Mycological Society, 2011 – present

**Crew Leader**, Oregon Country Fair Recycling Crew, OR, 2008 – present

## RELEVANT COURSEWORK

Stochastic modeling

Experimental design

Mathematical ecology

Optimization techniques for natural resources

Numerical computing for the natural resources

Ecological scaling

Time series analysis

Geographic information systems

Beautiful graphics in R

Super advanced R

Statistical inference

Multiple ecology seminars

Wildlife biology seminar

Communicating climate change

Applied improvisation for science communications

## SKILLS

**Statistics:** inference, predictive modeling, time series, spatial analysis, Bayesian methods

**Mathematics:** linear algebra, differential equations, nonlinear dynamics, optimization

**Software and programming:** R, GitHub, Google Earth Engine, ArcMap, R package development, LaTeX

**Data visualization**

**Geospatial analysis**

**Pacific Northwest natural history**

**Mushroom identification**

**Proficiency in Spanish**

## REFERENCES

### **Walter Jetz**

Professor

Department of Ecology & Evolutionary Biology

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### **Joshua Lawler**

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