

# Robert K. Shriver

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## Education

**Duke University**, Ph.D. Ecology 2017  
Committee: William F. Morris (Chair), James S. Clark, Kathleen Donohue, Justin P. Wright

**University of Wyoming**, B.S. Biology with minor in Environment and Natural Resources, 2011

## Positions

Assistant Professor  
Department of Natural Resources and Environmental Science  
**University of Nevada, Reno** 2020

USDA NIFA Postdoctoral Fellow  
**Utah State University**, Ecology Center 2019–2020  
Mentor: Peter Adler

Research Ecologist (Postdoctoral)  
**U.S. Geological Survey**, Southwest Biological Science Center 2017–2019  
Mentor: John Bradford

## Publications (36)

Underline indicates mentored student or postdoc.

Lowman, H., **R.K. Shriver**, , Hall, R.O., Harvey, J.W., Savoy, P., Yackulic, C.B., & J.R. Blaszczak. Macroscale controls determine the recovery of river ecosystem productivity following flood disturbances. *In Press Proceedings of the National Academy of Sciences*.

Parker, T.H., A. Gerber, E. Campbell, M. Simonson, **R. K. Shriver**, L. Persico. 2024. Solar Radiation Drives Potential Demographic Collapse in a Perennial Bunchgrass via Dramatically Reduced Seedling Establishment. **Rangeland Ecology and Management** 92.

Schultz, E. S.K. Filippelli, J.C. Vogeler, **R.K. Shriver**. Density-dependent dynamics help explain the simultaneous expansion and decline of woodlands in the western US. *In Press Forest Ecology and Management*

Noel, A.R., **R.K. Shriver**, S.D. Crausbay, J.B. Bradford. 2023. Where can managers effectively resist climate-driven ecological transformation in pinyon-juniper woodlands of the US Southwest? **Global Change Biology** [<https://doi.org/10.1111/gcb.16756>]

Ensley-Field, M. **R. K. Shriver**, S.Law, P.B. Adler. 2023. Combining field observations and remote sensing to forecast fine fuel loads. **Rangeland Ecology and Management**. [<https://doi.org/10.1016/j.rama.2023.04.008>]

Blaszczak, J.R., C.B. Yackulic, **R.K. Shriver**, and R.O.Hall Jr, 2023. Models of underlying autotrophic biomass dynamics fit to daily river ecosystem productivity estimates improve understanding of ecosystem disturbance and resilience. **Ecology Letters**. [<https://doi.org/10.1111/ele.14269>]

Thomas, C.J, **R.K. Shriver**, F. Nippgen, M. Hepler, M.R.V. Ross. 2023. Mines to Forests? Analyzing long-term recovery trends for surface coal mines in Central Appalachia. **Restoration Ecology** 31:5. [<https://doi.org/10.1111/rec.13827>]

Felton, A.J\*, **R.K. Shriver**\*, M. Stemkovski, J.B. Bradford, K.N. Suding, and P.B. Adler\*. 2022. Climate disequilibrium dominates uncertainty in long-term projections of primary productivity. **Ecology Letters** 25:12. [<https://doi.org/10.1111/ele.14132>]

\* Equal Contributions

Doak, D.F., Waddle, E., Langendorf, R.E., Louthan, A.M., Chardon, N.I., Dibner, R., **Shriver, R.K.**, Linares, C., Garcia, M.B., Fitzpatrick, S.W. and Morris, W.F. 2022. A critical comparison of integral projection and matrix projection models for demographic analysis: Reply. **Ecology**, p.e3822. [<https://doi.org/10.1002/ecy.3822>]

**Shriver, R.K.**, C.B. Yackulic, D.M. Bell, J.B. Bradford. 2022. Dry forest decline is driven by both declining recruitment and increasing mortality in response to warm, dry conditions. **Global Ecology and Biogeography** 31:11. [<https://doi.org/10.1111/geb.13582>]

McClinton, J., **R.K. Shriver**, E.A. Leger. 2022. Ecology of *Eriogonum tiehmii*, a rare soil specialist: arthropod diversity, soil preferences, and demography. **Ecosphere** [<https://doi.org/10.1002/ecs2.4187>]

McCauley, L.A., J. B. Bradford, M. D. Robles, **R.K. Shriver**, T. J. Woolley, C. A. Andrews. 2022. Landscape-scale forest restoration decreases drought mortality under climate change in Southwest US ponderosa forest. **Forest Ecology and Management** 509. [<https://doi.org/10.1016/j.foreco.2022.120088>]

Bradford, J.B, **R.K. Shriver**, M.D. Robles, L.A. McCauley, T.J. Woolley, C.A. Andrews, M. Crimmins, D.M. Bell. 2022. Tree mortality response to drought-density interactions suggests opportunities to enhance drought resistance. **Journal of Applied Ecology** 59 (2) [<https://doi.org/10.1111/1365-2664.14073>]

Felton, A.J, R. Snyder, **R.K. Shriver**, K.N. Suding, and P.B. Adler. 2021 The influence of life history strategy on ecosystem sensitivity to resource fluctuations. **Journal of Ecology** 109 (12). [<https://doi.org/10.1111/1365-2745.13779>]

Barnard D.M., M.J. Germino, J.B. Bradford, R.C. O'Connor, C.M. Andrews, **R.K. Shriver**. 2021. Modeling depth-resolved moisture dynamics in dryland soils using a multi-scalar drought index. **Ecological Indicators** 133. [<https://doi.org/10.1016/j.ecolind.2021.108379>]

Ross, M.R.V., F. Nippgen, B.L. McGlynn, C. Thomas, A. Brooks, **R.K. Shriver**, E. Moore, E.S. Bernhardt. 2021. Mountaintop mining legacies constrain ecological, hydrological and biogeochemical recovery trajectories. **Environmental Research Letters** 16 (7). [<https://doi.org/10.1088/1748-9326/ac09ac>]

**Shriver, R.K.**, C.B. Yackulic, D.M. Bell, J.B. Bradford. 2021. Quantifying the demographic vulnerabilities of dry woodlands to climate and competition using rangewide monitoring data. **Ecology** 102 (8). [<https://doi.org/10.1002/ecy.3425>]

Schlaepfer, D.R., J.B. Bradford, W.K. Lauenroth, **R.K. Shriver**. 2021. Understanding the future of big sagebrush regeneration: challenges of projecting complex ecological processes. **Ecosphere** 12 (8). [<https://doi.org/10.1002/ecs2.3695>]

Felton, A.J, **R.K. Shriver**, J.B. Bradford, K.N. Suding, B.W. Allred, and P.B. Adler. 2021. Biotic versus abiotic controls on temporal sensitivity of primary production to precipitation across North American drylands. **New Phytologist** 231(6). [<https://doi.org/10.1111/nph.17543>]

Doak, D.F., R. Langendorf, A.L. Louthan, E. Waddle, N. Chardon, R. Dibner, D. Keinath, E. Lombardi, C. Steenbock, **R.K. Shriver**, C. Linares, M.B. Garcia, W.C. Funk, S.W. Fitzpatrick W.F. Morris, M. Peterson. 2021. A critical comparison of integral projection and matrix projection models for demographic analysis. **Ecological Monographs** 91(2). [<https://doi.org/10.1002/ecm.1447>]

**Shriver, R.K.**, E. Campbell, H. Gaya, A. Hill, S. Kuzminski, M. Miller-Bartley, K. Moen, R. Moettus, E. Oschrein, D. Reese, M. Simonson, A. Willson, T.H. Parker. 2021. Local landscape position impacts demographic rates in a widespread steppe bunchgrass. **Ecosphere** 12(1). [<https://doi.org/10.1002/ecs2.3351>]

Peterson, M.L, G. Bailes, S. Bridgham, L. Hendricks, B. Johnson, L. Pfeifer-Meister, P. Reed, **R. K. Shriver**, E. Waddle, H. Wroton, D.F. Doak, B. Roy, W.F. Morris. 2021. Latitudinal gradients in population growth do not predict demographic responses to climate for three perennial bunchgrasses. **Ecological Applications** 31(2). [<https://doi.org/10.1002/eap.2242>]

Pyke, D.A., **R.K. Shriver**, R.S. Arkle, D.S. Pilliod, C.L. Aldridge, P.S. Coates, M.J. Germino, J.A. Heinrichs, M.A. Ricca, S.E. Shaff. 2020. Postfire growth of seeded and planted big sagebrush—strategic designs for

restoring greater sage-grouse nesting habitat. **Restoration Ecology** 28(6). [<https://doi.org/10.1111/rec.13264>]

Massatti, R., **R.K. Shriver**, D. Winkler, B. Richardson, J.B. Bradford. 2020. Comprehensive genetic and climatic information makes for better seed transfer decisions. **Restoration Ecology** 28(3):485-493. [<https://doi.org/10.1111/rec.13142>]

O'Connor, R.C., M.J. Germino, D.M. Barnard, C.M. Andrews, J.B. Bradford, D.S. Pilliod, R.S. Arkle, **R.K. Shriver**. 2020. Small-scale water deficits after wildfires create long-lasting ecological impacts. **Environmental Research Letters** 15(4). [<https://doi.org/10.1088/1748-9326/ab79e4>]

Tomasek, B.J., L.T. Burghardt, **R.K. Shriver**. 2019. Filling in the gaps in survival analysis: Using interval-censored field data to infer time-varying survival in response to changing environments. **Ecology** 100(10):1-7. [<https://doi.org/10.1002/ecy.2778>]

**Shriver, R.K.**, C.A. Andrews, R.S. Arkle, D.M. Barnard, M.C. Duniway, M.J. Germino, D.S. Pilliod, D.A. Pyke, J.L. Welty, J.B. Bradford. 2019. Transient population dynamics impede restoration and may promote ecosystem transformation after disturbance. **Ecology Letters** 22:1357-1366. [<https://doi.org/10.1111/ele.13291>]

\* *Runner Up-ESA Restoration Ecology Section Early Career Award*

Barnard, D.M., M.J. Germino, R.S. Arkle, J.B. Bradford, M.C. Duniway, D.S. Pilliod, D.A. Pyke, **R.K. Shriver**, J.L. Welty. 2019. Soil Characteristics are associated with the recovery of big sagebrush canopy structure after disturbance. **Ecosphere** 10:1-12. [<https://doi.org/10.1002/ecs2.2780>]

**Shriver, R.K.**, C.M. Andrews, D.S. Pilliod, R.S. Arkle, J.L. Welty, M.J. Germino, M.C. Duniway, D.A. Pyke, J.B. Bradford. 2018. Adapting management to a changing world: Warm temperatures, dry soil, and inter-annual variability limit restoration success of a dominant woody shrub in temperate drylands. **Global Change Biology** 24:4972-4982. [<https://doi.org/10.1111/gcb.14374>]

**Shriver, R.K.** 2017. Rainfall variability and fine-scale life history tradeoffs help drive niche partitioning in a desert annual plant community. **Ecology Letters** 20:1231-1241. [<https://doi.org/10.1111/ele.12818>]

\* *Awarded the ESA Postdoctoral Excellence Award in Plant Population Ecology*

Coverdale, T.C., T.R. Kartzinel, K. Grabowski, **R.K. Shriver**, A. Hassan, J.R. Goheen, T.M. Palmer, R.M. Pringle. 2016. Elephants in the understory: opposing direct and indirect effects of consumption and ecosystem engineering. **Ecology** 97:3219-3230. [<https://doi.org/10.1002/ecy.1557>]

**Shriver, R.K.** 2016. Quantifying how short-term environmental variation leads to long-term demographic responses to climate change. **Journal of Ecology** 104:65-78. [<https://doi.org/10.1111/1365-2745.12490>]

**Shriver, R.K.**, K. Cutler, D.F. Doak. 2012. Comparative demography of an epiphytic lichen: support for general life history patterns and solutions to common problems in demographic parameter estimation. **Oecologia** 170:137-146. [<https://doi.org/10.1007/s00442-012-2301-4>]

Minckley, T.A., **R.K. Shriver**, B. Shuman. 2012. Resilience and regime change in a southern Rocky Mountain ecosystem during the past 17,000 years. **Ecological Monographs** 82:49-68. [<https://doi.org/10.1890/11-0283.1>]

**Shriver, R.K.**, T.A. Minckley. 2012. Late-holocene response of limber pine (*Pinus flexilis*) forests to fire disturbance in the Pine Forest Range, Nevada, USA. **Quaternary Research** 78:465-473. [<https://doi.org/10.1016/j.yqres.2012.07.010>]

Minckley, T.A., **R. K. Shriver**. 2011. Vegetation Responses to Changing Fire Regimes in a Rocky Mountain Forest. **Fire Ecology** 7:66-80. [<https://doi.org/10.4996/fireecology.0702066>]

## Grants and Contracts

Total: c.\$4.40 million, As Lead PI: c. \$700,000

- Sole-PI, GBCEUSU: Understanding potential threats to Nevada's rarest plants: science to support management decision making for Nevada endemics. US Fish and Wildlife Service 2022-2023 \$19,718

- Sole-PI, Restoration in Great Basin Ecosystems. USDA Forest Service. 2022-2025. \$139,571
- Co-PI (Lead PI Ramesh Goel, University of Utah) , URoL:EN: Understanding the rule of life facilitating the proliferation of toxic cyanobacterial benthic mats in flowing freshwaters. National Science Foundation, Rules of Life: Emerging Networks, 2023-2027. Total: \$3.1m, UNR award: \$862,582
- Sole-PI, Quantifying the status, trends, and demography of Tahoe draba (*Draba asterophora*), a Lake Tahoe Basin rare alpine plant. Nevada Division of State Lands, 2022-2024. \$58,031
- Lead-PI, Understanding climate driven changes in western dry forests using 70 years of aerial imagery. USDA-NIFA, 2021-2023 \$299,987
- Co-PI (Lead PI Thomas Parchman, UNR), Opportunities to increase restoration success in the Great Basin. Bureau of Land Management, 2021 \$116,000
- Sole-PI, Linking population dynamics to ecosystems: Identifying the drivers of plant productivity to improve rangeland management. USDA-NIFA, 2020 \$100,000
- Lead-PI, Forecasting Sagebrush Resilience And Recovery Potential In The Great Basin Using Structured Population Models, Nevada Agriculture Experiment Station Hatch Grant, 2020 \$87,500.
- Co-PI (Lead PI Elizabeth Leger, UNR), *Eriogonum tiehmii* Population and Demographic Monitoring, Ioneer USA, 2020 \$168,056
- Co-PI (Lead PI Matthew Germino, USGS), North-Central Climate Adaptation Science Center, Ecological drought risk and post-fire adaptive management in sagebrush steppe rangelands. 2018 \$338,916

## Fellowships

- USDA-NIFA Postdoctoral Fellowship, 2019-2020
- Dissertation Fellowship, Department of Biology, Duke University, 2016
- National Science Foundation Graduate Research Fellowship, 2011-2014
- Grant-in-Aid, Department of Biology, Duke University, 2012, 2013, & 2014
- Native Plant Society of New Mexico Grant, 2012
- W. D. Billings Plant Ecology Fellowship, Duke University, 2012
- James B. Duke Fellowship, Graduate School, Duke University, 2012
- NASA WSGC Research Fellowship, 2010
- NASA WSGC Research Fellowship, 2009

## Awards & Honors

- Runner-Up, Early Career Publication Award, Ecological Society of America Restoration Ecology Section 2020
- Postdoctoral Excellence Award, Ecological Society of America Plant Population Ecology Section 2018
- Highlighted Young Member, ESA Plant Population Ecology Section 2016
- Conference Travel Award, Graduate School, Duke University 2014, 2015 & 2016
- Student Keynote Speaker, Ecology Across Scales Symposium, Duke University 2014
- Outstanding Graduate, College of Arts and Sciences, University of Wyoming 2011  
(Top 20 graduate of the College of Arts and Sciences)

## Teaching & Mentoring

### *Instructor*

Ecological Forecasting (NRES 701A), University of Nevada Reno, Spring 2022, 2023

Principles of Restoration Ecology (NRES 460/660 Lecture and Lab), University of Nevada Reno, Fall 2021, 2022

### *Mentoring*

PhD Students: Otis Clyne (NSF GRFP Recipient,2021-), Elise Pletcher (UNR Dickenson Scholarship Recipient, 2021-). MS Students: Sage Ellis (Nevada Native Plant Society Margaret Williams Research Grant Recipient,2022-), Martin Genova (2023-; Coadvised with Stephanie Yelenik)

Postdocs: Emily Schultz (2021-2022) Now Faculty at Colorado Mountain College, Alison Agneray (USDA-NIFA Postdoc Fellow, Fellowship declined for permanent position)

Committee Member: Elijah Boardman (UNR), Kierstin Acuna (UNR), Taylor Bradford (UNR),Sophia Heston (UNR),Taylor Brown (UNR), Gabriella Mizell (UNR), Rosemary Frederick (UNR), Mira Ensley-Field (Utah State University)

### *Workshops*

Introduction to Bayesian and Hierarchical Bayesian Modeling Applications in Ecology,” Organizer: Drew Peltier. Co-organizers: Robert Shriver and Jessica Guo. Ecological Society of America 2021

Introduction to Bayesian and Hierarchical Bayesian Modeling Applications in Ecology,” Organizer: Drew Peltier. Co-organizers: Robert Shriver and Jessica Guo. Ecological Society of America 2020 (Cancelled due to COVID-19)

### *Teaching Assistant*

Teaching Assistant, Duke University, Introduction to Genetics and Evolution Lecture 2014  
Lab Instructor, Duke University, Introduction to Genetics and Evolution Lab, 2 Sections 2014

### *Guest Lectures*

*Multi-species Distribution Models*, Northern Arizona, Species Distribution Modelling 2018  
*Physiological Responses to Climate Change*, Duke University, Biological Responses to Climate Change 2016

### *Professional development*

Mentoring Mentors Training, UNR, 2020  
Effective Teaching Practices, Association of College and University Educators, 2021-2022

## **Presentations**

### *Selected Invited*

**Shriver, R.K.**, E. Schultz, C.B. Yackulic, D.M. Bell, J.B. Bradford. Anticipating the demographic response of woodland tree species to changing climate using forest inventory data. Ecological Society of America Annual Meeting. 2023.

**Shriver, R.K.** Anticipating aridland plant responses to global change. School of Natural Resources and the Environment, University of Arizona. 2022.

**Shriver, R.K.** Plant resilience in the face of global change: A demographic perspective. Kansas State University EEB Seminar, 2021.

**Shriver, R.K.**, C. Andrews, R. Arkle, D. Barnard, M. Duniway, M. Germino, D. Pilliod, D. Pyke, J. Welty, J. Bradford. Insights into rangeland restoration outcomes from data-driven population models. The 9th World Congress on Ecological Restoration, 2021, (Virtual)

**Shriver, R.K.** Circumventing environmental and demographic constraints on sagebrush restoration with plantings, Society for Range Management Annual Meeting, 2021, (Virtual)

**Shriver, R.K.**, C.A. Andrews, R.S. Arkle, D.M. Barnard, M.C. Duniway, M.J. Germino, D.S. Pilliod, D.A. Pyke, J.L. Welty, J.B. Bradford. Connecting process and pattern in restoration: Insights into rangeland restoration outcomes from data-driven population models, 2020, Ecological Society of America Annual Meeting, (Virtual).

**Shriver, R.K.** Big data reveal demographic surprises in restoration across the Great Basin: (38) implications for adaptive post-fire management, 2018. Boise State University and USGS Forest and Rangeland Ecosystem Science Center.

**Shriver, R.K.**, C.M. Andrews, D.S. Pilliod, R.S. Arkle, J.L. Welty, M.J. Germino, M.C. Duniway, D.A. Pyke, J.B. Bradford. Warm temperatures and dry soil limit restoration of dominant shrubs in drylands: Implications for adaptive management, 2018. Ecological Society of America Annual Meeting, New Orleans, LA.

**Shriver, R.K.**. Bridging the gap between physiology and demography to understand climate change responses of a desert annual plant community, 2016. Ecological Society of America Annual Meeting, Ft. Lauderdale, FL.

**Shriver, R.K.** Incorporating environmental variability into climate change predictions for desert annual plants, 2014. Ecology Across Scales Symposium, Duke University.

\* *Student Keynote Speaker*

#### *Selected Contributed*

Clyne, M.O., **R.K. Shriver**. Forecasting restoration potential from seed: Predictions over large spatial extents. Ecological Society of America Annual Meeting. 2023.

Pletcher, E., S. Filippelli, P. Williams, M. Shawcroft, J. Vogeler, **R.K. Shriver**. Developing multi-scaled, probabilistic forecasts of woodland dynamics in the Great Basin. Ecological Society of America Annual Meeting. 2023.

Ellis, S.L., **R.K. Shriver**. Tools for conservation: Estimating the population size of heterogeneously distributed plants. Ecological Society of America Annual Meeting. 2023.

Pletcher, E., S. Filippelli, P. Williams, J. Vogeler, M. Shawcroft, and **R.K. Shriver**. Remote Sensing products as demographic data: scaling traditional demographic approaches to quantify woodland expansion and contraction in the Great Basin. Poster. Society for Range Management Annual Meeting. 2023.

\* *Awarded 3rd place in student poster competition*

Clyne, M.O., **R.K. Shriver**. Forecasting sagebrush restoration potential from seed across the Great Basin using structured population models. Poster. Society for Range Management Annual Meeting. 2023.

**Shriver, R.K.**, P. Adler. Linking population dynamics to ecosystems: Identifying controls of ANPP sensitivity to precipitation in dryland ecosystems. Ecological Society of America Annual Meeting. 2021, (Virtual).

**Shriver, R.K.**, J.B. Bradford, C. Andrews, R. Arkle, D. Pilliod. Quantifying the drivers of sagebrush recovery from fire across the Great Basin, 2017. Biennial Conference of Science and Management on the Colorado Plateau and Southwest Region, Flagstaff, AZ.

**Shriver, R.K.** Bridging the gap between physiology and demography to understand climate change responses of a desert annual plant community, 2016. Evolutionary Demography Society Annual Meeting, Charlottesville, VA .

**Shriver, R.K.** Life history and environmental determinants of desert annual plant responses to rainfall variability, 2015. Ecological Society of America Annual Meeting, Baltimore, MD.

**Shriver, R.K.**, W.F. Morris. Incorporating environmental variability and competition into climate change predictions for desert annuals, 2014. Ecological Society of America Annual Meeting, Sacramento, CA.

## **Service**

### **Journal Reviewer**

Agriculture and Forest Meteorology, Ecology, Ecology Letters, Ecosphere, Ecosystems, Forest Ecology and Management, Global Change Biology, Journal of Applied Ecology, Journal of Arid Environments, Journal of Ecology, New Phytologist, Nordic Journal of Botany, Plant Ecology, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B., Rangeland Ecology and Management, Restoration Ecology, Trends in Ecology and Evolution, Western North American Naturalist

### **Grant Reviews**

NSF Graduate Research Fellowship, 2020,2022

### **Membership and Committees**

#### *Society Membership*

Ecological Society of America, Restoration Ecology, Statistical Ecology, and Plant Population Ecology sections  
Society for Rangeland Ecology and Management

#### *Committees*

Web and social media committee, Dept. of Natural Resources and Env. Science, UNR, 2021-

Graduate Student Member, Ecology Faculty Search Committee, Duke Biology, 2016

Co-Chair, Financial Committee, Program in Ecology, Duke University, 2012-2014

**Other Service and Outreach** Interview, “Our Town Reno” (UNR student journalism project), Summer 2022

Student Poster Judge, ESA Annual Meeting Restoration Ecology Section, Summer 2022

Nature Walk Leader, UNR American Indian Alaska Native College Prep Camp, Summer 2022

UNR 3-Minute Thesis Competition, Spring 2021

Faculty Panelist, NRES Graduate School 101 Discussion, Fall 2021