

# Andy Kleinhesselink

*Quantitative Ecologist*

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## Education and Experience

- 2017-2020 Postdoctoral Researcher: Higher order interactions and trait-based models of competition. Department of Ecology and Evolutionary Biology, UCLA.** *Advisors: Nathan Kraft of UCLA and Jonathan Levine of Princeton.*
- Formulated a new general definition for competitive higher order interactions.
  - Developed trait-based models of competition in annual plant communities.
- 2017 Ph.D. Ecology. Utah State University, Logan, UT.** *Advisor: Peter Adler. Dissertation: "Direct and indirect effects of climate change on plant populations and communities in sagebrush steppe."*
- 2011 M.S. Biology. Sonoma State University, Rohnert Park, CA.** *Advisor: Hall Cushman. Thesis: "Community-level effects of a dominant shrub across an environmental gradient: variable responses of native and exotic plants."*
- 2006-2009 Restoration Science Technician. Presidio Trust, San Francisco, CA.**
- Successfully managed native plant restoration at several remediation sites.
  - Led field-based education and volunteering programs.
- 2005 B.A. Biology. Carleton College, Northfield, MN.** *Magnum Cum Laude.*

## Awards, Fellowships and Grants

- 2014 Graduate Student Researcher of the Year. Quinney College of Natural Resources, Utah State University.**
- 2013 Utah State University Dissertation Improvement Grant, (\$9000).** Impact of cold season fungal pathogens on range limits of sagebrush (*Artemisia spp.*)
- 2013 Ecology Center Research Support Award, Utah State University. (\$3000).** The effect of competition on sagebrush (*Artemisia spp.*) range limits.
- 2011 National Science Foundation Graduate Research Fellowship.**
- 2011 Utah State University, Quinney Wildland Resources PhD Fellowship.**
- 2010 Sigma Xi Grants in Aid of Research.** Moss facilitation of invasive annual grasses in coastal dunes

## Publications

- 2020** Durso, A., Bolon, I., **Kleinhesselink, A.R.**, et al. Crowdsourcing snake identification with online communities of professional herpetologists and avocational snake enthusiasts. *Under Review at Royal Society Open Science.*

- 2020** Kleinhesselink, A.R. 2020. Evidence Is Growing That Alternative Stable States in Semiarid Grasslands Are the Exception, Not the Rule. *Journal of Geophysical Research: Biogeosciences*. 125:5.
- 2019** Kleinhesselink, A.R., N.J.B. Kraft and J.M. Levine. Mechanisms underlying higher order interactions: from quantitative definitions to ecological processes. *bioRxiv*:857920. <https://doi.org/10.1101/857920>
- 2019** Smull, D. M., *N. Pendleton\**, A.R. Kleinhesselink, and P. B. Adler. Climate change, snow mold and the Bromus tectorum invasion: mixed evidence for release from cold weather pathogens. *AoB Plants* 11. *\*undergraduate mentee*
- 2019** Kleinhesselink, A.R., and J. H. Cushman. Effects of native bryophytes on exotic grass invasion across an environmental gradient. *Ecosphere* 10:e02769.
- 2019** Firn, J., and others (...A.R. Kleinhesselink...). Leaf nutrients, not specific leaf area, are consistent indicators of elevated nutrient inputs. *Nature Ecology & Evolution* 3:400.
- 2018** Kleinhesselink, A.R., and P. B. Adler. The response of big sagebrush (*Artemisia tridentata*) to interannual climate variation changes across its range. *Ecology* 99:1139–1149.
- 2018** Adler, P. B., A.R. Kleinhesselink, G. Hooker, J. B. Taylor, B. Teller, and S. P. Ellner. Weak interspecific interactions in a sagebrush steppe? Conflicting evidence from observations and experiments. *Ecology* 99:1621–1632.
- 2018** Renwick, K. M., C. Curtis, A.R. Kleinhesselink, D. Schlaepfer, B. A. Bradley, C. L. Aldridge, B. Poulter, and P. B. Adler. Multi-model comparison highlights consistency in predicted effect of warming on a semi-arid shrub. *Global Change Biology* 24:424–438.
- 2018** Tredennick, A. T., A.R. Kleinhesselink, J. B. Taylor, and P. B. Adler. Ecosystem functional response across precipitation extremes in a sagebrush steppe. *PeerJ* 6:e4485.
- 2016** Tredennick, A. T., M. B. Hooten, C. L. Aldridge, C. G. Homer, A.R. Kleinhesselink, and P. B. Adler. Forecasting climate change impacts on plant populations over large spatial extents. *Ecosphere* 7:e01525.
- 2016** Chu, C., A.R. Kleinhesselink, K. M. Havstad, M. P. McClaran, D. P. Peters, L. T. Vermeire, H. Wei, and P. B. Adler. Direct effects dominate responses to climate perturbations in grassland plant communities. *Nature Communications* 7:11766.
- 2015** Kleinhesselink, A.R., and P. B. Adler. Indirect effects of environmental change in resource competition models. *The American Naturalist* 186:766–776.
- 2014** Kleinhesselink, A.R., S. M. Magnoli, and J. H. Cushman. Shrubs as ecosystem engineers across an environmental gradient: effects on species richness and exotic plant invasion. *Oecologia* 175:1277–1290.
- 2013** Magnoli, S. M., A.R. Kleinhesselink, and J. H. Cushman. Responses to invasion and invader removal differ between native and exotic plant groups in a coastal dune. *Oecologia* 173:1521–1530.
- 2013** Adler, P. B., A. Fajardo, A.R. Kleinhesselink, and N. J. Kraft. Trait-based tests of coexistence mechanisms. *Ecology Letters* 16:1294–1306.

## Teaching and Mentoring

- 2020**     **Pritzker Education Fellow**, Institute of Environment and Sustainability, UCLA, Los Angeles CA.
- Advised undergraduate capstone project, “Creating a living seed bank for urban restoration in Los Angeles”
  - Taught students methods in species distribution modeling and GIS analysis
- 2018**     **Instructor, Software Carpentry Foundation.** ([www.carpentries.org](http://www.carpentries.org))
- Taught computation and coding skills for research scientists in biology, using R, Python, Git and Shell.
  - Organized and led R workshop for UCLA EEB, April 7<sup>th</sup> 2018. <https://ucla-data-archive.github.io/2018-04-07-ucla-eeb/>
- 2017-2020**     **Undergraduate Mentor**, Kraft Lab, UCLA. Los Angeles, CA.
- Mentor undergraduate independent research projects on plant traits
- 2012-2016**     **Undergraduate Mentor**, Adler Lab, Utah State University, Logan UT.
- Mentor undergraduate research projects on plant competition and plant pathogens.
  - Undergraduate mentee was co-author on recent publication (Smull, et al. 2019. *AoB Plants*).
- 2012**     **Mentor for Ecological Society of America, SEEDS program.** ESA annual meeting in Portland, OR.
- 2009-2011**     **Teaching Assistant**, Department of Biology, Sonoma State University, Rohnert Park, CA.
- Labs for *Biol. 110: “Biological Inquiry”* and *Biol. 121: “Diversity Structure and Function”*
- 2009-2010**     **Vice President. San Francisco Nature Education.** San Francisco CA.
- Led environmental education field trips for students from underserved public schools.
- 2006**     **Mentor for LINC Program.** Golden Gate National Parks Conservancy. San Francisco, CA.
- Mentored high school student interns in botany and habitat restoration.

## Service and Public Outreach

- 2013-2020**     **Peer Reviewer.** [Link to Publons Profile.](#)
- Reviewer for 20 journals including: *Ecology Letters*, *Ecography*, *Ecology*, *The American Naturalist*, *New Phytologist*, *Global Ecology and Biogeography*, *Oecologia*, *Biological Invasions*, *Functional Ecology*
- 2018-2020**     **Field Trip Leader, UCLA Bruin Naturalist Club.**
- Organized and led natural history field trips for undergraduate and graduate students.
  - Taught students how to identify and document biodiversity with iNaturalist.
- 2018-2020**     **Field Trip Leader, co-chair, UCLA Birding Club.**
- Organized and led birdwatching trips in LA.
  - Lead weekly birding trips in the UCLA Botanical Garden.
- 2013-2014**     **Graduate Student Chair, Ecology Seminar Committee.** Utah State University
- Led student committee to invite and host invited seminar speakers in ecology.

## Select Presentations

- 2018** “Climate Change and Competition in Plant Communities” *Invited Seminar, Department of Biology, California State University, Los Angeles. October 18<sup>th</sup> 2018.*
- 2018** “Detecting higher order interactions in mechanistic resource competition models” *Ecological Society of America 103rd Annual Meeting, New Orleans, LA.*
- 2017** “An experimental test of population predictions based on historical climate-demography correlations”, *Ecological Society of America 102<sup>nd</sup> Annual Meeting, Portland, OR.*
- 2016** “Do populations in hot and cold portions of a species’ range differ in response to annual climate variation?” *Ecological Society of America 101<sup>st</sup> Annual Meeting, Fort Lauderdale, FL.*
- 2015** “Home field advantage: Do species’ vital rates decline towards range limits and does competition play a role?” *Ecological Society of America 100th Annual Meeting, Baltimore, MD.*
- 2014** “Niche overlap predicts the magnitude of the indirect effects of environmental change in a mechanistic resource competition model” *Ecological Society of America 99th Annual Meeting, Sacramento, CA.*
- 2012** “Testing the stress gradient hypothesis at the community level: Effects of shrub facilitation across a dune stress gradient” *Ecological Society of America 97th Annual Mtg, Portland, OR.*

## Skills and Expertise

- **Expert in R for statistical analysis, data visualization and simulation modeling.**
- **Bayesian Modeling with STAN and rStan.**
- **Git for collaboration and publishing code. Github: <https://github.com/akleinhesselink>.**
- **Python: Numpy, and ScikitLearn**
- **Botanical field identification of common plant species and genera in California floristic province.**
- **Birding. Expert in field identification of West Coast birds by sight and sound. Link to eBird profile: <https://ebird.org/profile/MTM5OTI2/US-CA-037>**
- **West Coast Natural History. Prolific contributor to iNaturalist ( >3500 observations). Profile: <https://www.inaturalist.org/people/andy71>**

## References

- **Dr. Peter Adler.** Professor, Department of Wildland Resources, Utah State University. [peter.adler@usu.edu](mailto:peter.adler@usu.edu); **435-797-1021.**
- **Dr. Nathan Kraft.** Associate Professor, Department of Ecology and Evolutionary Biology, UCLA. [nkraft@ucla.edu](mailto:nkraft@ucla.edu); **(301) 825-3593**
- **Dr. Jonathan Levine.** Professor, Department of Ecology and Evolutionary Biology. Princeton University. [levinej@princeton.edu](mailto:levinej@princeton.edu); **(609) 258-8256.**