

# Andy Kleinhesselink

*Quantitative Ecologist*

*Ecology and Evolutionary Biology, UCLA*  
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## Education and Experience

- 2017-present** **Postdoctoral Researcher: Higher order interactions and trait-based models of competition.** Department of Ecology and Evolutionary Biology, UCLA, Los Angeles, CA. *Advisors: Nathan Kraft of UCLA and Jonathan Levine of Princeton.*
- Formulated a new general definition for competitive higher order interactions.
  - Tested hypothesis for the origin of higher order interactions using simulation models.
  - Built new model of annual plant competition based on functional traits.
- 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.”
- 2010** **Lab Technician. University of California Davis, Davis, CA.** *Supervisor: Susan Harrison.*
- Collected data on the functional traits of serpentine endemic flora of CA.
- 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.
- 2005-2006** **Ecological Restoration Intern, Golden Gate National Recreation Area, San Francisco, CA.**
- Developed invasive plant removal plan for wildland urban interface.
  - Led environmental education and volunteer restoration activities.
- 2005** **B.A. Biology. Carleton College, Northfield, MN.** *Magnum Cum Laude.*

## Awards, Fellowships and Grants

- 2014** **Utah State University, Quinney College of Natural Resources Graduate Student Researcher of the Year.**
- 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

- 2019 **Kleinhesselink, A.R.**, N.J.B. Kraft and J.M. Levine. Mechanisms underlying higher order interactions: from quantitative definitions to ecological processes. *In revision for American Naturalist*. pre-print: <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

**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/>

**2012-2017- present 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

**2013-2017- present Peer Reviewer. [Link to Publons Profile.](#)**

- Reviewer for 17 journals including: *Ecology Letters*, *Ecography*, *Ecology*, *The American Naturalist*, *New Phytologist*, *Global Ecology and Biogeography*, *Oecologia*, *Biological Invasions*, *Functional Ecology*
- Reviewer for *NSF DEB* grant proposals.

**2018-2017- present 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.

**2018-2017- present 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. Active 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.