Andy Kleinhesselink

Quantitative Ecologist

Ecology and Evolutionary Biology, UCLA
+1 541 973-1725
arklein@ucla.edu

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 reponses 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)**

- 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 7th 2018. https://ucla-data-archive.github.io/2018-04-07-ucla-eeb/

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-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-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-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 18th 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 102nd 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 101st 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; 435-797-1021.**
- **Dr. Nathan Kraft.** Associate Professor, Department of Ecology and Evolutionary Biology, UCLA. **nkraft@ucla.edu; (301) 825-3593**
- **Dr. Jonathan Levine.** Professor, Department of Ecology and Evolutionary Biology. Princeton University. **levinej@princeton.edu; (609) 258-8256.**