

Zachary L. Steel

✉ zlsteel@berkeley.edu 🌐 zack-steel.com | Updated: December 22, 2021

EDUCATION

University of California, Davis, Ph.D. Ecology	2014–2018
University of California, Davis, M.S. Ecology	2008–2011
Whitman College, B.A. Biology	2002–2006

EMPLOYMENT

University of California, Berkeley:	
Post-doctoral Researcher	2019–Present
University of California, Davis:	
Graduate Student Researcher	2014–2018
Jr. Specialist Researcher	2012–2014
Fire Science Consortium Coordinator	2012–2013
US Fulbright Program, Santiago, Chile:	
Research Fellow	2011
University of California, Davis:	
Graduate Student Researcher	2008–2011
University of California, Santa Cruz:	
Assistant Biologist	2007–2008
PRBO Conservation Sciences:	
Biology Technician	2007–2008

PUBLICATIONS

Journal Articles

Levine, J., B. Collins, **Z. Steel**, P. de Valpine, and S. Stephens. *In Press*. “High-severity fire risk heightened both on and near industrially managed forests”. *Frontiers in Ecology and the Environment*.

Steel, Z. L., B. M. Collins, D. B. Sapsis, and S. L. Stephens. 2021. “Quantifying pyrodiversity and its drivers”. *Proc. R. Soc. B* 288:1948.

Steel, Z. L., A. Fogg, R. Burnett, L. J. Roberts, H. D. Safford. 2021. “When bigger isn’t better – implications of large high-severity wildfire patches for avian diversity and community composition”. *Diversity and Distributions*.

Steel, Z. L., M.J. Goodwin, M.D. Meyer, G.A. Fricker, H.S.J. Zald, M.D. Hurteau, and M.P. North. 2021. Do forest fuel reduction treatments confer resistance to beetle infestation and drought mortality? *Ecosphere* 12(1):e03344.

Jager, H., J. Long, R. Malison, B. Murphy, A. Rust, L. Silva, R. Sollman, **Z. Steel**, M. Bowen, J. Dunham, J. Ebersole, and R. Flitcroft. 2021. “Resilience of terrestrial and aquatic fauna to historical and future wildfire regimes in western North America”. *Ecology and Evolution*.

Stephens, S., S. Thompson, G. Boisrame, B. Collins, L. Ponisio, K. Rakhmatulina, **Z. Steel**, J. Stevens, K. Wilken, and J. van Wagtenonk. 2021. "Fire, water, and biodiversity in the Sierra Nevada: A possible triple win". *Environmental Research Communications* 3(08):1004.

Steel, Z. L., D. Foster, M. Coppoletta, J. M. Lydersen, B. Wing, S. L. Stephens, and B. M. Collins. 2021. "Ecological resilience and vegetation transition in the face of multiple large wildfires". *Journal of Ecology* 109(9):3340-3355.

Steel, Z. L., B. Campos, W. Frick, R. Burnett, and H. D. Safford. 2019. "The effects of wildfire severity and pyrodiversity on bat occupancy and diversity in fire-suppressed forests". *Scientific Reports* 9, 16300.

Wilkins, L. G. E., K. R. Matthew, **Z. L. Steel**, S. C. Nussle, and S. M. Carlson. 2019. "Population dynamics of *Rana sierrae* at Dusy Basin: Influence of non-native predators, drought, and restoration potential". *Ecosphere* 10(11):e02951.

Steel, Z. L., M. Koontz, and H. Safford. 2018. "The changing landscape of wildfire: Burn pattern trends and implications for California's yellow pine and mixed conifer forests". *Landscape Ecology* 33(7), 1159-1176.

Steel, Z. L., A. E. Steel, J. Williams, J. H. Viers, P. Marquet, and O. Barbosa. 2017. "Patterns of bird diversity and habitat use in mixed vineyard-matorral landscapes of Central Chile". *Ecological Indicators* 73:345-357.

Grof-Tisza, P., **Z. L. Steel**, E. Cole, M. Holyoak, and R. Karban. 2017. "Testing predictions of movement behavior in a hilltopping moth". *Animal Behavioral* 133:161-168.

Grof-Tisza, P., **Z. L. Steel**, and R. Karban. 2017. "The spatial distribution and oviposition preference of the Ranchman's tiger moth, *Platyrepia virginalis* (Lepidoptera: Arctiidae)". *Journal of the Lepidopterists' Society* 71(1):16-19.

Steel, Z. L., H. D. Safford, and J. H. Viers. 2015. "The fire frequency-severity relationship and the legacy of fire suppression in California forests". *Ecosphere* 6(1):1-23.

Schwartz, M.W., L. B. Smith, and **Z. L. Steel**. 2013. "Conservation investment for rare plants in urban environments". *PLOS ONE* 8(12):e83809.

Siegel, R. B., R. L. Wilkerson, J. F. Saracco, and **Z. L. Steel**. 2011. "Elevational distribution of common bird species on the Sierra Nevada's west slope". *Western Birds* 42:2-26.

In Review or Revision

Viljur, M. et al.. *In Review*. "The effect of natural disturbances on forest biodiversity: An ecological synthesis", *Biological Reviews*.

Weeks, J. M., H. Safford, J. Miller, **Z. Steel**, E. Batzer. *In Revision*. "High Severity Fire Drives Floristic Homogenization in Human-Altered Forests", *Ecosphere*.

Williams, J., H. Safford, N. Enstice, J. Tangenberg, and **Z. Steel**. *In Revision*. "High severity burn area and proportion exceed historic conditions in forests of Sierra Nevada and adjacent ranges (USA)".

Outreach Documents & Software

USFS Region 5 Climate Change Trend Assessments (8 reports). E.g.:

Wuenschel, A., S. Gross, B. Estes, K. Merriam, H. Safford, S. Sawyer, **Z. Steel**, L. Wolf (2021) Sierra National Forest Climate Change Trend Summary. Unpublished report. USFS Pacific Southwest Region, Vallejo CA.

Steel, Z. L., M. Meyer, A. Wuenschel, S. Ostojka, and M. North. 2020. "Climate-wise reforestation toolkit". Rshiny web application prepared for the US Forest Service, and the California Climate Hub. [Available online](#)

Steel, Z. L., B. R. Campos, and H. D. Safford. 2018. "Bat occupancy in Sierra Nevada wildfire areas and implications for post-fire management". Prepared for US Forest Service, Region 5. [PDF](#)

Campos, B. R., **Z. L. Steel**. FIRE-BAT spatial predictive tool. ArcGIS toolbox prepared for US Forest Service, Region 5. [Users Manual](#)

Campos, B. R., R. D. Burnett, and **Z. L. Steel**. 2017. "Bird and bat inventories in the Storrie and Chips fire areas 2015-2016: Final report to the Lassen National Forest". Point Blue Conservation Science, Petaluma, CA. Point Blue Contribution No. 2142. [PDF](#)

Fogg, A. M., **Z. L. Steel** and R. D. Burnett. 2017. "Avian Monitoring in Freds and Power fires: Final Report". Point Blue Conservation Science, Petaluma, CA. Point Blue Contribution No. 2138. [PDF](#)

Schwartz, M. W., et al. 2013. "Sensitive Animals - Appendix 15 to SEKI Natural Resources Condition Assessment". Natural Resource Report NPS/SEKI/NRCA—2013/665. National Park Service. Fort Collins, Colorado. Assessments within:

Steel, Z. L., E. Reddy and R. Green. The American Pika - *Ochotona princeps*

Steel, Z. L., J. Shields. Sierra Nevada Bighorn Sheep - *Ovis canadensis sierrae*

Copeland, S., K. Dybala, **Z. L. Steel**. California Condor - *Gymnogyps californianus*

Steel, Z. L., Sierra Nevada Chipmunks - *Tamias spp.*

Steel, Z. L., M. L. Bond, R. B. Siegel, and P. Pyle. 2012. "Avifauna of Sierra Nevada Network parks: Assessing distribution, abundance, stressors, and conservation opportunities for 145 bird species". Natural Resource Report NPS/SEKI/NRR—2012/506. National Park Service, Fort Collins, Colorado. [PDF](#)

Steel, Z. L., O. Barbosa, and P. Marquet. 2012. "Biodiversidad de Aves y Carbono en el Paisaje Vinedo". Three reports prepared for landowner partners in the Colchagua Valley, Chile.

Steel, Z. L., M. Wilderson, P. Grof-Tisza, and K. Sulzner. 2011. "Assessing species and area vulnerability to climate change for the Oregon Conservation Strategy: Willamette Valley Ecoregion". Prepared for the Oregon Department of Fish and Wildlife and the Defenders of Wildlife.

TEACHING

Graduate & Post-graduate Teaching:

Guest Lecturer – UCD, Fire Ecology	Winter 2020-2021
Guest Lecturer – UCB, Fire Ecology Seminar	Spring 2020
Co-Instructor – UCD, Fire Ecology	Winter 2018
Guest Lecturer – UCD, Ecogeomorphology	Spring 2014-2018
Certificate of Completion – UCD Foundations of Teaching workshop series	Fall 2017
Guest Lecturer – American River College, Experimental Design	Spring 2017
Teaching Assistant – UCD, Trees and Forests; PLS 144	Fall 2015
Teaching Assistant – UCD, Trees and Forests; PLS 144	Fall 2014

Mentoring:

Undergraduate Mentor – Student research experience	Spring 2019-Present
Undergraduate Mentor – Association for Women in Science Mentoring program	2019
High School Mentor – Student & Landowner Education Stewardship program	2015-2016
Undergraduate Mentor – Student research experience	Summer 2009

Outdoor Education:

Naturalist/Raft Guide – UCD, Outdoor & Watershed Sciences programs	2013-2018
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Teacher/Scientist – Earthwatch citizen science programs	2013
Naturalist/Kayak Guide – San Juan Islands, WA	Summers 2006-2007
<i>Undergraduate Teaching:</i>	
Teaching Assistant – Whitman College, Genetics; BIO 205	Fall 2005
Teaching Assistant – Whitman College, Ecology; BIO 277	Spring 2005

AWARDS

Grants written & funded:

2020-23: *Implications of increasing the scale of managed wildfire on forest carbon stocks and pyrodiversity*. Funded by California Department of Forestry and Fire Protection (CALFIRE). \$422,000

2017-18: *Ecological implications of wildfire and forest restoration on birds and bats (phase II)*. Funded by US Forest Service. \$122,000

2014-17: *Ecological implications of wildfire and forest restoration on birds and bats (phase I)*. Funded by US Forest Service. \$127,000

2011: *Quantifying avian habitat use and carbon stocks in Chilean vineyards*. Funded by US Fulbright Program. \$17,000

Fellowships received:

2014-18 (7 quarters): *Graduate Group of Ecology Fellowship*. Funded by UC Davis. \$79,000

2017: *Ecology Student Endowment*. Funded by UC Davis. \$1500

2010: *Graduate Group of Ecology Fellowship*. Funded by UC Davis. \$11,000

2002-06: *Walter Brattain Merit scholarship*. Funded by Whitman College. \$32,000

2001-02 (2 awards): *Governor's college scholarship*. Funded by State of California. \$2000

PRESENTATIONS

International Fire Ecology and Management Congress (Invited)	2021
<i>Forest resilience and transition in the face of successive large wildfires in California's Sierra Nevada Mountains</i>	

Berkeley EcoLunch Seminar (Invited)	2021
<i>Wildlife and wildfire: a love-hate relationship</i>	

Yosemite National Park Forum (Invited)	2021
<i>Restoring pyrodiversity to benefit Sierra Nevada wildlife communities</i>	

International Association of Landscape Ecology	2021
<i>Quantifying pyrodiversity and its drivers</i>	

Western Section of the Wildlife Society Annual Meeting (Invited plenary)	2021
<i>Implications of changing fire patterns on habitats and wildlife</i>	

Natural Areas Association Annual Meeting (Invited)	2020
<i>Implications of changing fire regimes for Sierra Nevada bat and bird communities</i>	

Ecological Society of America Annual Meeting	2020
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What doesn't kill you makes you stronger - or not: Conifer mortality following forest treatments and drought ([Recording available with ESA access](#))

The Wildlife Society Annual Conference	2019
<i>The Influence of Burn Severity and Pyrodiversity on Bat Communities in Sierra Nevada Forests</i>	
Mediterranean Forest Ecosystems International Conference (MedPine6)	2018
<i>Changing patterns of severe wildfire lead to bird diversity declines & community transitions in conifer forests of California, USA</i>	
Ecological Society of America Annual Meeting	2018
<i>Bat species occupancy varies across a disturbance gradient; implications for a future of extreme wildfire events</i>	
Instituto Politécnico Nacional, CIIDIR-Unidad Oaxaca, Mexico (Invited)	2017
<i>Murcielagos en un paisaje caracterizado por incendios: Impactos en diversidad y uso de habitat</i>	
Ecological Society of America Annual Meeting	2017
<i>The influence of spatial context and successional pathways on bird communities following high-severity wildfire</i>	
Northwest Science Conference (Invited)	2017
<i>The influence of burn severity on bat species occurrence in post-fire landscapes</i>	
Mediterranean Ecosystems Conference (MEDECOS)	2017
<i>Shifting patterns of California fire and forest landscapes in an era of global change</i>	
Natural Areas Conference	2016
<i>The Changing Landscape of California Fire: Trends in Burn Patterns and Post-Fire Forest Heterogeneity</i>	
Universidad Mayor, Santiago, Chile (Invited)	2011
<i>Mercados de carbono: una oportunidad potencial para biodiversidad en agroecosistemas</i>	
Buenos Aires Fulbright Regional Enhancement Seminar	2011
<i>Carbon Sequestration: Risk or tool for biodiversity?</i>	
Bay Area Conservation Biology Symposium	2011
<i>Assessing species vulnerability to climate change in the Willamette Valley Ecoregion</i>	

SERVICE

Professional Society Memberships: Ecological Society of America, The Wildlife Society, Natural Areas Association, International Association of Landscape Ecology, Association for Fire Ecology

Journal Referee: *Global Change Biology, Environmental Research Letters, Landscape Ecology, PLOS One, Ecosphere, Ecography, Diversity and Distributions, Ecology and Society, Forest Ecology and Management, Biological Conservation*

Special Symposium co-organizer: "Toward a comprehensive understanding of pyrodiversity: How landscape- scale heterogeneity in fire history influences biodiversity across taxa, fire regimes, and spatial scales." International Association of Landscape Ecology 2021 meeting, Reno, NV