Zak Ratajczak, Curriculum Vitae
Division of Biology, Kansas State University
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Appointments

2026-present **Associate Professor**
Division of Biology, Kansas State University

2020-2025 **Assistant Professor**
Division of Biology, Kansas State University

2017-2019 **Post-doctoral research associate**, **funded by Joint Fire Science Program**
Department of Integrative Biology, University of Wisconsin-Madison
advised by Monica Turner

2014-2017 **NSF Post-doctoral fellow in math and biology**
Department of Environmental Sciences, University of Virginia
Grantham Research Institute on Climate Change and the Environ., London School of Economics
Department of Zoology, University of Wisconsin-Madison
advised by Paolo D'Odorico, Alessandro Tavoni, and Monica Turner (respectively)

Education

2010-2014 **Kansas State University, PhD in Biology**
Advisor: Jesse B. Nippert
"Ecological thresholds and abrupt transitions of tallgrass prairie to shrublands and woodlands"

2006-2010 **Vassar College, Bachelor of Arts in Earth Science** (w/honors) and Biology (w/honors)
Advisors: David P. Gillikin (Earth Science) & A. Marshall Pregnall (Biology)
"Dendrochronology and dendrochemistry ($\delta^{13}C$) of coastal loblolly pine (*Pinus taeda*) in relation to climate, hurricanes, and soil salinity"

Fellowships

2014-2017 Post-doctoral fellowship in Biology and Mathematics
Awarded to ZR by the National Science Foundation (U.S.A)

2010-2014 Graduates Addressing Areas of National Need (GAANN) Fellowship,
Awarded by the U.S. Department of Education and Kansas State University Division of Biology

2009 Research Experience for Undergraduates, at the Konza Prairie LTER
Awarded by the National Science Foundation (U.S.A)

Funded Grants

2023 **NSF DEB,** $200K, "Rewilding our understanding of how climate extremes affect grasslands" PI-Zak Ratajczak, Co-PI-Allison Louthan

2022 **NSF EPSCoR First Award,** $141K, "Rewilding and rewallowing grasslands: did the extirpation of bison remove a widespread aquatic microbiome?" PI-Zak Ratajczak

2020 **NSF LTER,** $7.1 mil, “LTER: Manipulating drivers to assess grassland resilience” PI-Jesse B. Nippert, Co-PIs Melinda Smith, Sara Baer, Keith Gido, Lydia Zeglin
*I was the lead writer for ~15% of the project description, receive summer salary and a graduate R.A. from the proposal, and use funds from this grant to execute two long-term experiments

2014 **NSF Post-Doc in Biology: Combining Math and Biology, DBI #1402033**
$236K “Does economic connectedness undermine environmental stability?” PI-Zak Ratajczak

2013 **Cross-site Synthesis Grant**, **Long Term Ecological Research Network**, $20K “Sensitivity of ecosystem properties to winter climate anomalies” PI-Laura Ladwig, CO-PIs Zak Ratajczak, Amber Churchill, Troy Ocheltree

2012 **Cross-site Synthesis Grant**, **Long Term Ecological Research Network**, $12K “Bi-stability in grasslands and shrublands” PI-Zak Ratajczak, CO-PIs Jesse Nippert, Scott Collins

Other funding

2025 ***KSU Foundation, $164K, $82,350 awarded in 2025 with another $82,350 very likely in 2026**, “Tallgrass Legacy Alliance Research Fund” Lead PI—John Blair, PI-Zak Ratajczak
*This funding was the result of a private donation to the College of Agriculture for work on invasive species
NSF DEB, $25K, “LTER Supplement: creating the Konza Prairie faculty fellowship”, Meghan Avolio, Kim Komatsu, Allison Louthan, and Zak Ratajczak. Submitted to NSF by J.B. Nippert and J.H. Rhodes on behalf of the authors.

2024 **NSF Planning: CRISES**, $100K, “Building Collective Action for Sustainable Habitats” PIs-Gary Brase, Kate Nelson, No CO-PIs, Key participants-Trisha Moore, Zak Ratajczak, Lior Shamir

2013 **Green Action Fund**, **Kansas State University**, $9K **“**The Meadow: Informal Learning through Experiences of Landscape and Art” PI- Katie Kingery Page, CO-PIs Linda Duke, Zak Ratajczak

Student-led funding

Emma Greenlee, **$11K in external funding, all non-KSU sources**
Sidney Noble, **$2K in external funding, all non-KSU sources**

Graduate students in my lab

Emma Greenlee, MS Student, graduated winter 2025
Currently working at Midwest Natural Resources (an environmental science consulting company)

Bess Bookout, PhD Student, graduated summer 2025
Currently working at Kansas State University

Sidney Noble, PhD Student, graduated spring 2024
Currently working at the USFS

Brynn Ritchey, MS Student, graduated spring 2023
Currently working at the USGS

Graduate student committees

Graduated: Logan Anderson, Alec Glidden, Sarah Herzog, Rachel Keen, Elle Krellwitz, Michael Madin, Aleah Querns, Jean Ribert, Rachel Rusten, Katy Silber, Jack Sytsma, Emmett “Greg” Tooley, Nicholas Vega Anguiano, Emily Wedel.

Ongoing: Elise Graba, Corina McTigue, Shreya Ojha, Lydia Regier, Sophie Weiland, Catherine Werkmeister, Yao Zheng.

Under-graduate student advising, includes only REU, independent studies, and similar

2026	Kiranne Smith, Independent study/honors project
2025	Jamie Parriot, Independent study
	Luke Carney, Independent study
2024	Klara Stevermer, Independent study
2023	Abigail Schmidt, Kansas State University, REU student and Independent study
	Audrey Van Zelfden, REU student
2022	Kalea Nippert, Kansas State University, REU and Independent Study
2022	McKenna John, Kansas State University, Honors student
2021	Khyla Johnson, Marshall University, REU Student

Teaching experience (lead)

2026

***Professor for BIOL 529 Ecology—Fall Semester**
41 students
***Professor for BIOL 890 Community Ecology—Fall Semester**
13 students
***Professor for BIOL 529 Ecology—Spring Semester**
46 students
*Taught the second half of the semester due to parental leave

2025

Professor for BIOL 890 Resilience
6 students, TEVAL "Overall effectiveness as a teach" = 5.0/5.0
Division of Biology at Kansas State University
Professor for BIOL 529 Ecology
53 students, TEVAL "Overall effectiveness as a teacher" = 4.6/5.0
Division of Biology at Kansas State University

2024

Professor for BIOL 890 Community Ecology
10 students, TEVAL "Overall effectiveness as a teacher" = 5.0/5.0
Division of Biology at Kansas State University
Professor for BIOL 529 Ecology
53 students, TEVAL "Overall effectiveness as a teacher" = 4.9/5.0
Division of Biology at Kansas State University

2023

Professor for BIOL 890 Environmental resilience (ongoing)
12 grad. students, TEVAL "Overall effectiveness as a teacher" = 4.8/5.0
Division of Biology at Kansas State University
Professor for BIOL 529 Ecology, Spring Semester
58 ungrad. Students, TEVAL "Overall effectiveness as a teacher" = 4.6/5.0
Division of Biology at Kansas State University

2022

Professor for BIOL 890: Community ecology, Fall Semester
5 grad. students, TEVAL "Overall effectiveness as a teacher" = 4.8/5.0
Division of Biology at Kansas State University
Professor for BIOL 529 Ecology, Spring Semester
45 undergrad. students, TEVAL "Overall effectiveness as a teacher" = 4.9/5.0

Division of Biology at Kansas State University
Professor for BIOL 890 Resilience: theor. appl., Spring Semester
15 grad. students, TEVAL "Overall effectiveness as a teacher" = 4.8/5.0
Division of Biology at Kansas State University

2021 **Professor for BIOL 529 Ecology, Spring Semester**
Division of Biology at Kansas State University
59 undergrad. students, TEVAL "Overall effectiveness as a teacher" = 4.8/5.0

Teaching experience, as teaching assistant or similar

2017 **Helped develop and deliver "Fire and Social-Ecology Resilience" with Monica G. Turner**
Dept. of Integrative Biology at University of Wisconsin Madison
This upper level seminar focused on discussion of primary literature related to fires in social ecological systems around the world.

2014 **Volunteer teacher and research consultant, "EPA Rainworks challenge"**
Dept. of Landscape architecture at Kansas State University
Contributions included meeting with teams of final-year undergraduate students. I met one-on-one with students, as they developed grant proposals for the EPA Rainworks Challenge. EPA Rainworks is a competition to integrate rain gardens into college campuses. As their projects developed, I gave extensive feedback on their writing. In 2014 one of our teams won first prize at the national level (click here).

2013 **Teaching assistant for "Plant Physiology"**
Division of Biology at Kansas State University
Volunteer teacher and research consultant, "EPA Rainworks challenge"
Dept. of Landscape architecture at Kansas State University
Contributions included meeting with teams of final-year undergraduate students. I met one-on-one with students, as they developed grant proposals for the EPA Rainworks Challenge. EPA Rainworks is a competition to integrate rain gardens into college campuses. As their projects developed, I gave extensive feedback on their writing. In 2013, one of our teams received a runner-up award (click here).

2012, fall **Teaching assistant, "Principles of Biology"**
Division of Biology at Kansas State University
This semester I had a double teaching load.

2011, fall **Teaching assistant, "Principles of Biology"**
Division of Biology at Kansas State University
This semester I had a double teaching load.

2011, fall **Teaching assistant, "Principles of Biology"**
Division of Biology at Kansas State University

Citation metrics

Total citations: 4,715
h-index: 28
!10-index: 40

Peer-reviewed publications (published or in press)
***Denotes graduate advisee as primary advisor**
****Denotes graduate advisee as a committee member or similar**

*****Denotes undergraduate advisee**

54. *B. Bookout, **K. Stevermer, **A. Van Zelfden, J. Haukos, **Z. Ratajczak** (*In press*) Reintroducing bison restores landscape diversity, widespread salty ephemeral wetlands, and heterogeneity.

53. Chen, N., Dong, X., Li, X., Huang, L., Huang, H., Li, C., Zhao, Y., Xu, C., Ma, M., **Ratajczak, Z.**, and Zhao, C. (*In press*) Inferring alternative ecosystem states with field survey data. *Methods in Ecology and Evolution.*

52. Yunpeng Zhao, Scott L. Collins, **Z. Ratajczak,** Guozhen Du, Ning Chen, Wei Qi, Hang An, Shuaiwei Luo, Miaojun Ma (*In press*) Abrupt change in alpine grasslands linked to precipitation." *Ecology.*

51. ***Nippert-Churchmann, K., ***A. Schmidt, and **Z. Ratajczak**. (*In press*) High-intensity fire and long-term destocking causes top kill but fails to reverse encroachment and restore biodiversity. *Ecological Applications*

50. Nippert, J.B., Ahlering, M., Fuhlendorf, S., Helzer, C., McMillan, N., & **Ratajczak, Z.** (2026). Rethinking Grassland Management in the Great Plains during the Era of Woody Plant Encroachment. *BioScience,* biag033.

49. *Noble, S. & **Ratajczak, Z.** (2026) Effects of grazer identity (bison versus cattle) and woody encroachment in mixed grass prairies in adjacent National Parks and National Grasslands. *Natural Areas Journal* 16: 2-12.
*Cover image for its volume

48. Hope, A., Speck, S., & **Z. Ratajczak** (2026) Leveraging long-term ecological research initiatives into the One Health synthesis. *Ecology and Evolution* 16: e72982.

47. *Noble, S. & **Ratajczak, Z.** *(*2025) Restoring frequent fire and bison grazing results in habitat improvement for bison but minimal early reduction of woody encroachment. *Ecological Restoration* 43: 288-301.
*Cover image for its volume

46. Komatsu, K., Avolio, M., Blair, J., Koerner, S., **Ratajczak, Z.**, Smith, M., Welti, E., Wilcox, K. & Zeglin, L. (2025) Consistent timelines, divergent end points: plant community change in multiple tallgrass nitrogen addition experiments. *Oecologia* 207: 178.

45. * Noble, S. **Ratajczak, Z.**, *Noble, B. (2025) Native megafauna (Bison bison) act as a surprising inhibitor of cedar tree expansion in a Great Plains grassland. *Ecological Applications*, 35: e70108.

44. ¤*Noble, B. & ¤**Ratajczak, Z.** (2025) Combining Open-Source Machine Learning and Publicly Available Aerial Data (NAIP and NEON) to Achieve High-Resolution High-Accuracy Remote Sensing of Grass–Shrub–Tree Mosaics. *Remote Sensing* (13) 2224. ***https://doi.org/10.3390/rs17132224***
¤ Denotes equal contribution
Covered by Kansas Public Radio and Regional NPR:
https://nebraskapublicmedia.org/en/news/news-articles/scientists-put-ai-to-work-in-the-fight-to-save-north-american-prairies/

43. *Bookout, B., Herzog, S., & **Z. Ratajczak, Z.** (2025) Resilience of grazed and ungrazed Great Plains grassland plant communities to severe drought. *Biological conservation* (305) 111088.

42. **Wedel, E., **Ratajczak, Z.**, **E. Tooley, E., & J.B. Nippert, J.B. (2025) Divergent resource-use strategies of encroaching shrubs: Can traits predict encroachment success in tallgrass prairie? *Journal of Ecology* (113*)* 339-352.

41. Thom D., and 26 others, including **Ratajczak, Z.** (2024) Parameters of 150 temperate and boreal tree species and provenances for an individual-based forest landscape and disturbance model**.** *Data in Brief* (55) 110662.

40. Sutton, A., **Ratajczak, Z.,** & Louthan, A. (2024) High among-species variability in the context dependence of herbivory across three abiotic gradients. *Journal of Ecology* (112) 2237-2248.

39. **Tooley, E.J., Nippert, J.B., & **Ratajczak, Z.** (2024) Evaluating methods for measuring the leaf area index of encroaching shrubs: from leaves to 3-D scanning and aerial observation. *Agriculture and Forest Meteorology* (349) 109964.

38. **Silber, K., Hefley, T., Castro-Miller, H., **Ratajczak, Z.,** & Boyle, A. (2024) The long shadow of woody encroachment: an integrated approach to modeling grassland songbird habitat. *Ecological Applications,* (34) e2954.

37. *Noble, B. & **Ratajczak, Z.** (2024) Bison (*Bison bison*) dung decays slowly but can still be used to track short and long-term habitat usage. *Transactions of the Kansas Academy of Sciences,* 126, 91-101.

36. Ramiadantsoa, T., **Ratajczak, Z.,** & Turner, M.G. (2023) Regeneration strategies and forest resilience to changing fire regimes: insights from a Goldilocks model. *Ecology*, 104(36), e4041

35. Dodds, W.K., **Ratajczak, Z.,** Keen, R.M., Nippert, J.B., Grudzinski, B., Veach, A., Taylor, J.H., & Kuhl, A. (2023) Trajectories and state changes of a grassland stream and riparian zone after a decade of woody vegetation removal. *Ecological Applications*, e2830

34. **Keen, R.M., Nippert, J.B., Sullivan, P.L., **Ratajczak, Z.**, Ritchey, B., O'Keefe, K., and Dodds, W.K. (2023) Removal of riparian woody trees does not alter hydrology in a tallgrass prairie watershed. *Ecosystems,* 26, 290-301.

33. **Ratajczak, Z.,** Collins, S.L., Blair, J.M., Koerner, S.E., Louthan, A.M., Smith, M. D., Taylor, J., & Nippert, J. B. (2022) Reintroducing bison results in long-running and resilient increases in grassland diversity. *Proceedings of the National Academy of Sciences U.S.A.,* 119(36), e2210433119.

***Covered in national/international print and online news: National Geographic, NPR, Nature, Popular Science, Yahoo!, MSN**
Television: The Weather Channel, Fox News Weather
Local news: Manhattan Mercury and AM Radio

32. Turner, M.G., Braziunas, K.H, Hansen, W.D., Hoecker, T.J., Rammer, W., **Ratajczak, Z.**, Westerling, A.L., and Seidl, R. (2022) The magnitude, direction and tempo of forest change in Greater Yellowstone in a warmer world with more fire. *Ecological Monographs* 92: e01485.

31. W., Rammer, Braziunas, K.H., Hansen, W.D., **Ratajczak, Z.**, Westerling, A.L., Turner, M.G., and Seidl, R. (2021) Widespread regeneration failure in forests of Greater Yellowstone under scenarios of future climate and fire. *Global Change Biology* 27: 4339-4351.

30. Ma M., Collins, S.L., **Ratajczak, Z**. (2021) Soil seed banks, alternative stable state theory and ecosystem resilience. *Bioscience* 71: 697-707.

29. Collins, S.L., Nippert, J., Blair, J.B., Briggs, J.B., Blackmore, P, and **Ratajczak, Z**. (2021) Fire frequency, state change and hysteresis in tallgrass prairie. *Ecology Letters* 24: 636-647.

28. **Albrich, K., Braziunas K.B., Hansen W., Rammer W., **Ratajczak Z.**, Turner M.G., and Seidl R. (2020) Simulating forest resilience: a review. *Global Ecology and Biogeography* 29: 2082-2096.

27. Turner, M.G., Calder W.J., Cumming G.S., Hughes T.P., Jentsch A., LaDeau S.L., Lenton T.M., Shuman B.N., Turetsky M.R., **Ratajczak Z.**, Williams J.W., Williams A.P., and Carpenter S.C. (2020) Climate Change, Ecosystems, and Abrupt Change: A Science Agenda. *Proceedings of the Royal Society B Biological Sciences* 375: 20190105.

26. McWethy D.B., Schoennagel T., Higuera P.E., Krawchuk M., Harvey B.J., Metcalf E.C., Schultz C., Miller C., Metcalf A.L., Buma B., Vorapongse A., Kulif J.C., Stedman R.C., **Ratajczak Z.**, Nelson C.R., and Kolden C. (2019) Rethinking resilience to wildfire. *Nature Sustainability* 2: 797-804.

25. **Ratajczak Z.**, Churchill A., Ladwig L, Taylor J.H. and Collins S.L. (2019) The combined effects of an extreme heatwave and wildfire on tallgrass prairie vegetation. *Journal of Vegetation Science* 30: 687-697.

24. **Ning C., Yu K., and **Ratajczak Z.** (2019) A dryland re-vegetation in northern China: Success or failure? Quick transitions or long lags? *Ecosphere* 10: e02678.

23. Higuera P.E., Metcalf A.L., Miller C., Buma B., McWethy D.B., Metcalf E.C., **Ratajczak Z.**, Nelson C.B., Chaffin B.C., Stedman R.C., McCaffrey S., Schoennagel T., Harvey B.J., Hood S.H., Schultz C.A., Black A.E., Campbell D., Haggerty J.H., Keane R.E., Krawchuk M.A., Kulig J.C., Rafferty R., and Virapongse A. (2019) Integrating subjective and objective dimensions of resilience in fire-prone landscapes. *BioScience* 68: 379-388.

22. **Ratajczak Z.** and Ladwig L. (2019) Will climate change push grasslands past critical thresholds? Book chapter for "*Grasslands and Climate Change*" Gibson D. and Newman J. (eds) British Ecological Society and Cambridge University Press, Cambridge UK. Pages 98-114.

21. Stegner, A.M., **Ratajczak Z.**, Carpenter S., and Williams J, (2019) Inferring critical transitions in paleoecological time series with irregular sampling and variable time-averaging. *Quaternary Science Reviews* 207, 49-63.

20. **Ratajczak Z.**, Carpenter S., Ives A., Kucharik K., Ramiadantsoa T., Stegner A.M., Williams J., Zhang J., and Turner M.G. (2018) Abrupt change in ecological systems: diagnosis and inference. *Trends in Ecology and Evolution* 33: 513-526.

19. ******Miller J.E.D., Damschen E.I., **Ratajczak Z.** and Özdoğan M. (2017) Holding the line: prescribed fire halts but does not reverse 75 years of woody encroachment. *Landscape Ecology* 32: 2297-2230.

18. **Ratajczak Z.**, D'Odorico P. and Yu K. (2017) The enemy of my enemy: why coexisting with grasses might be an adaptive strategy for savanna trees. *Ecosystems* 20: 1278-1295.

17. Brunsell N., Van Vleck E.S., Nosshi M., **Ratajczak Z.**, Nippert J.B. (2017) Assessing the roles of fire frequency and precipitation in determining woody plant expansion in central U.S. grassland. *Journal of Geophysical Research Biogeosciences* 112: https://doi.org/10.1002/2017JG004046

16. **Ratajczak Z.**, D'Odorico P., Collins S.L, Bestelmeyer B., Isbell F. and Nippert J.B. (2017) The interactive effects of press/pulse intensity and duration on regime shifts at multiple scales. *Ecological Monographs* 87: 198-218.

15. Seakell D. Carr J., Dell'Angelo J., Gephart J., Kummu M., Magliocca N., Porkka M., Prell P., Puma M.J., **Ratajczak Z.**, Rulli M.C., Seekell D.A., Suweis S., Tavoni A., D'Odorico P. (2017) Conceptualizing and quantifying resilience in the global food system. *Environmental Research Letters* 12: 025010.

***Used in the Food and Agriculture Organization (FAO): "report: The State of Food and Agriculture in 2021 and several other governmental and NGO reports on Agriculture and food security (see here)**

14. ******Jing G., Wei L.I., Yu K., **Ratajczak Z.**, Kallenbach R.L. and Cheng J. (2017) Effects of fertilization, burning, and grazing on plant community in the long-term fenced grasslands. *Plant, Soil and the Environment* 4: 171-176.

13. **Ratajczak Z.**, D'Odorico P.D., Nippert J.B., Collins S.L., Brunsell N. and Ravi S. (2017) Changes in spatial variance during a grassland to shrubland state transition. *Journal Ecology* 105: 750-760.

12. Klodd A.E, Nippert J.B., **Ratajczak Z.**, Waring H. and Phoenix G. (2016) Tight coupling of leaf area index to canopy nitrogen and phosphorus indicate co-limitation across heterogeneous tallgrass prairie communities. *Oecologia* 182: 889-898.

11. Marchand P., Carr J., Dell'Angelo J., Gephart J., Kummu M., Magliocca N., Porkka M., Prell P., Puma M.J., **Ratajczak Z.**, Rulli M.C., Seekell D.A., Suweis S., Tavoni A., D'Odorico P. (2016) Reserves and trade jointly determine exposure to food supply shocks. *Environmental Research Letters* 11: 095009.

***Used by the UN in 2022 to describe the state of Global Food and Natural Resources**

10. ******Honglin L., Kailiang Y., **Ratajczak Z.**, Nippert J.B. and Guozhen D. (2016) When variability outperforms the mean: trait plasticity predicts plant performance in an alpine wetland. *Plant and Soil* 407: 401-415.

9. Fader, M., Rulli M.C., Carr J., Dell'Angelo J., D'Odorico P., Gephart J., Kummu M., Magliocca N., Porkka M., Prell P., Puma M.J., **Ratajczak Z.**, Seekell D.A., Suweis S., Tavoni A. (2016) Past and present biophysical redundancy of countries as a buffer to changes in food supply. *Environmental Research Letters* 11: 055008.

8. **Ratajczak Z.**, Briggs J.M., Goodin D.G., Luo L., Mohler R.L., Nippert J.B. and Obermeyer B. (2016) Assessing the potential for transitions from tallgrass prairie to woodlands: are we operating beyond critical fire thresholds?. *Journal of Rangeland Ecology and Management* 69: 280-287.

*__Used in the 2017 EPA assessment of prescribed burning in the Flint Hills__

7. Ladwig L.M., **Ratajczak Z.**, Ocheltree T.W., Hafich K., Churchill A.C., Frey S.J.K., Fuss C.B., Kazanski C.E., Muñoz J.D., Petrie M., Reinmann A.B. and Smith J.G. (2016) Beyond arctic and alpine: the influence of winter climate on temperate ecosystems. *Ecology* 92: 372-382.

6. **Ratajczak Z.**, Blair J.B., Nippert J.B. and Briggs J.M. (2014) Fire dynamics distinguish grasslands, shrublands, and woodlands as alternative attractors in the Central Plains. *Journal of Ecology* 102: 1374-1385.

5. **Ratajczak Z.**, Nippert J.B. and Ocheltree T.W. (2014) Abrupt shift of mesic grassland to shrubland: multiple lines of evidence for thresholds, alternative attractors, and regime shifts. *Ecology* 95: 2633-2645.

4. Nippert J.B., Ocheltree T.W., Orozco G., **Ratajczak Z.,** Ling B., and Skibbe A. (2013) Evidence of physiological decoupling from grassland ecosystem drivers by an encroaching woody shrub. *PLoS ONE* 8: e81630.

3. **Ratajczak Z.** and Nippert J.B. (2012) Technical Comment 'Global Resilience of Tropical Forest and Savanna to Critical Transitions'. *Science* 336: 541-c.

2. **Ratajczak Z.**, Nippert J.B., and Collins S.L. (2012) Woody encroachment decreases diversity across North American grasslands and savannas. *Ecology* 93: 697-703.

*__Featured Article of Volume 93 of Ecology__

1. **Ratajczak Z.**, Nippert J.B., Hartman J.C. and Ocheltree T.W. (2011) Positive feedbacks amplify rates of woody encroachment in tallgrass prairie. *Ecosphere* 2: art121.

*__Covered in an ESA blog and podcast__

Manuscripts in submitted, in review, in revision and tertiary preparation
*Graduate Student, **Undergraduate student

1. K.B. Gido, S.M. Bonjour, L.A. Bruckerhoff, S.J. Gido, S.C. Hedden, G.W. Hopper, E.C. Martin, P.J. Pfaff, C.A. Pennock, J.S. Perkin, **Z. Ratajczak**, E.A. Renner, J.E. Whitney. Cascading effects of woody encroachment on grassland stream macroconsumer communities. Submitted to Freshwater Biology.
2. S. Blake, V. Sagan, F. Giacomelli, **Z. Ratajczak**, M. Wikelski, G. Bastille-Rousseau. Range restricted plains bison don't surf green waves – instead, they hop among green islands. Submitted to Ecological Monographs.
3. E. Greenlee, E.A.R. Welti, A. Zarate, M. Arduser, T. Messerly, **Z. Ratajczak**. Pollinator community and floral resource responses to cattle, bison, and prairie dog grazing regimes. Revised version in review at Insect Conservation and Diversity.
4. *B. Noble, **Z. Ratajczak**. Emergence of a wildfire-prone wildland-urban interface (WUI) through exurban expansion into grasslands and evergreen encroachment: results from high-resolution sensing and machine learning. In revision for resubmission to Rangeland Ecology and Management.
5. *A. Glidden, **Z. Ratajczak**, J. Taylor, J. Blair. Long-term plant community responses to prescribed burning in tallgrass prairie vary with season of fire. In revision for resubmission to Ecological Applications.
6. *B. Bookout, **Z. Ratajczak**, L. Zeglin. Bison wallows as biogeomorphic disturbances: impacts on soil, microbes, and vegetation. Expected submission to Ecology or a similar journal.
7. **Z. Ratajczak**, E.J. Raynor, J.B. Nippert, *B. Ritchey, *B. Bookout, *S. Noble, J.B. Blair, S.C. Collins, G. Inisarri, A.L. Louthan, S. Koerner, K. Komatsu, J.T. Taylor. Navigating sharp vs. linear tipping points and biodiversity-invasion trade-offs: insights from long-term fire and grazing experiments. *In revision for submission to Ecology Letters.*

Presentations, only those presented by ZR

* denotes invited talks

2026 ***GRAS-SES RCN (webinar) "**Fire, resilience, and research opportunities for social-ecological systems in the Great Plains"
Natural Areas Association Conference "Halting woody encroachment in the 21st century requires more aggressive fire regimes: results from a long-term patch-burn grazing experiment"
***Kansas Rural Center**, "Effects of reintroducing bison in tallgrass prairie: 30 years of lessons from Konza Prairie Biological Station"
***Great Plains Fire Summit, Biennial meeting**, "Drivers and patterns of clonal shrub encroachment in the Central Great Plains"
Kansas Natural Resource Council, Annual Meeting, "Preventing woody encroachment in tallgrass prairie requires more frequent fires than occurred historically: results of a 13-year patch-burn grazing experiment.

2025 **KSU Extension office Phillipsburg KS,** "Using aerial observation to monitor and manage woody encroachment"
America's Grasslands hosted by the World Wildlife Fund, "Causes and Consequences of woody plant encroachment in the Great Plains" and "Rethinking grassland management in the era of woody plant encroachment", *These were co-presented between Jesse Nippert, Chris Helzer (The Nature Conservancy), and Zak Ratajczak
***"Restoration and resilience of tallgrass prairie: insights from long-term large-scale experiments"** National Wildfire Coordinating Group (NWCG) Fire Refresher (RT-130)

2024 ***Webinar of Forum of Chinese Forest Biodiversity Monitoring Network,** "Restoration and resilience of a grassland based on large-scale long-term experiments
***Symposia Talk at Natural Areas Conference,** Declining resilience of tallgrass prairie to woody encroachment without novel interventions
Kansas Natural Resource Council, Annual Meeting, Can grazed tallgrass prairie remain resilient to woody encroachment?

2023 **Ecology and Evolution Seminar, Kansas State University Division of Biology,** "Bison, fire, climate change, and resilience of tallgrass prairie"
Ecological Society of America Annual Meeting, "Fire, bison, and tipping points in a tallgrass prairie"
LTER All Scientists Meeting at Kellog Biological Station, "Scaling and remote sensing at Konza Prairie LTER"
***Plenary talk at Midwest fish and wildlife annual meeting,** "The Effects of Reintroducing Bison to a Tallgrass Prairie: Resilience, Biodiversity, and Herd Viability"
American Association of Geographers (AAG) Annual meeting, "How did the removal of bison and fire impact Great Plains resilience and biodiversity: insights from a 30-year experiment"

2021 ***University of Kansas, Department of Geography and Meteorology**
"Impacts of great plains bison on tipping points between fire and grassland vegetation"
***Kansas Biological Survey & Center for Ecological Research**
"Effects of bison on tallgrass prairie resilience to changing fire and climate"
Available at: https://www.youtube.com/watch?v=OcoSKVVbr4c
***University of Houston, Department of Biology and Biochemistry**
"Impacts of a long-term megagrazer rewilding on grassland diversity and resilience"
***Beach Museum of Art at Kansas State University**
"Mapping prairie futures"
Available at: https://www.youtube.com/watch?v=9hc0fsewxqA
Ecological Society of America Annual Meeting

“Megagrazer rewilding results in long-running and resilient biodiversity gains in a Great Plains grassland”

2020 **Ecological Society of America Annual Meeting, Organized oral session**
“Tipping points in Greater Yellowstone forests with increasing wildfire activity”

2018 ***Kansas State University, Division of Biology**
“Advancing how we understand, monitor, and manage resilience in fire-prone ecosystems”
***Ecological Society of America Annual Meeting, Organized oral session**
Abrupt change in ecological systems: inference and diagnosis
Organized “inspire” session, Ecological Society of America Annual Meeting
Does functional diversity increase the resilience to more extreme wildfires in subalpine forests?
***University of Wyoming, Department Ecosystem Sciences and Management**
“Rangeland resilience: non-equilibrium and spatial interactions”

2017 ***University of Wisconsin Madison, Nelson Institute: Center for Climatic Research**
"Avoiding abrupt losses of central plains grasslands: the roles of local fire management and a changing climate"
University of Wisconsin Madison, Department of Integrative Biology
“Making sense of abrupt ecological change”
***University of Wisconsin Madison, Department of Physics, Chaos and Complexity Series**
“Resilience of complex systems driver pulses: the role of spatial heterogeneity and connectivity”

2016 ***Ecological Society of America Annual Meeting, Organized oral session,**
“Spatial properties and ecological resilience to extreme driver pulses”
Konza Prairie LTER Annual Meeting
“Relationships between grassland resilience, diversity, and heterogeneity”

2015 ***Global Forum on Urban and Regional Resilience**
“Can we learn to recognize when ecosystem are in the middle of a slow motion collapse?”
Americas Grasslands, World Wildlife Foundation and others
“Mapping the potential for fire induced transitions of tallgrass prairie to shrubland and woodland: are we near a tipping point?”
Ecological Society of America Annual Meeting
“The temporal dimension of regime shifts: How long can ecosystems operate beyond critical thresholds before transitions become irreversible?”

2014 ***Jones Research Center**
“Fire Frequency Tipping Points in Grasslands, Shrublands, and Woodlands: a long term, large-scale assessment”; Ignite Talk
Ecological Society of America Annual Meeting
“Quantifying strength and scale of feedback mechanisms to prevent terrestrial regime shifts”

2013 ***University of Kansas, Biology Department**
"Catastrophic shift of grasslands to shrublands: ecological and social resilience of the Central Great Plains"
***University of Missouri, Biology Department**
“Catastrophic shift of grassland to shrubland: merging ecological theory and conservation”
***Organized oral session, Ecological Society of America Annual Meeting**
“Leading—and misleading—indicators of grassland-shrubland transitions”
Annual Savanna Science Networking Meetings, South Africa National Parks
“Abrupt shifts from grasslands to woodlands: understanding their causes and developing warning signs”

2012 **LTER All Scientists Meeting, Dormant Season Ecology Working Group**
"The Critical Climate Period Approach"
***Organized oral session, Ecological Society of America Annual Meeting**
"Bi-stability, compromised resilience, and state-shift indicators: abrupt shift of tallgrass prairie to degraded shrubland"
Konza Prairie LTER Annual Meeting
"Grasslands and shrublands as alternative stable states: mechanisms and multi-scale evidence"
Kansas State University BioForum
"The effects of woody encroachment on global biodiversity: a meta-analysis"

2011 ***Sheffield University Plant Ecology and Arctic Research group**
"Positive feedbacks, demographic bottlenecks and the transformation of tallgrass prairie to savanna/forest"

Posters (only those presented by ZR)

2022 **LTER All Scientists Meeting,** "Reintroducing bison results in long-running and resilient biodiversity gains"

2016 **After the extreme—what happens when thresholds are crossed? INTERFACE/CLIMANI Workshop, Florence Italy**
"Tripping ecosystem thresholds: the role of extreme event duration versus magnitude"

2015 **All Scientists Meeting, LTER Network Meeting**
"Are critical ecosystem thresholds defined by the magnitude or duration of exogenous forcing?"

2013 **America's Grasslands Conference**
*"*Indicators that tallgrass prairie is becoming susceptible to rapid expansion by native shrubs"
Annual Savanna Science Networking Meetings, South Africa National Parks
"The effect of woody encroachment on plant diversity in global grasslands and savannas: a meta-analysis"

2012 **LTER All Scientists Meeting**
"Widespread abrupt shifts of grasslands to a wooded state: woody encroachment in a stable state and socio-economic framework"
Konza Prairie LTER Annual Meeting
"Woody encroachment decreases diversity across North American grasslands"

2011 **Grasslands in a global context, Institute for Grassland Studies**
"Woody encroachment decreases diversity across North American grasslands"
Konza Prairie LTER Site Review and Annual Meeting
"Biological feedbacks and the transformation of tallgrass prairie to savanna/forest"
Role of Stable isotopes in water cycle research
"Biological feedbacks and the transformation of tallgrass prairie to savanna/forest"

2010 **Geological Society of America Northeast Chapter Meeting**
"The direct and interactive effects of precipitation, salinity and hurricanes on tree-ring $\delta^{13}C$ of coastal pine"

Presentations and posters by students in my lab, starting in 2021

*denotes invited talks

2025 **Annual meeting of the American Botanical Society**, Bess Bookout
Haskel University, Bess Bookout
Haskel University, Emma Greenlee

2024 **Annual meeting of the Ecological Society of America,** Presentation, Bess Bookout
Annual meeting of the Society of Rangeland Management, Presentation, Sidney Noble

Natural Areas Conference, Presentation, Bess Bookout
Natural Areas Conference, Poster, Klara Stevermer
Natural Areas Conference, Poster, Emma Greenlee
Kansas Department of Natural Resources, Presentation, Kalea Nippert
Kansas Department of Natural Resources, Presentation, Bess Bookout
Kansas Department of Natural Resources, Poster, Abigail Schmidt
Kansas Department of Natural Resources, Poster, Klara Stevermer

2023 **Ecological Society of America Annual meeting,** Presentation, Sidney Noble
Ecological Society of America Annual Meeting, Poster, Kalea Nippert
American Botanical Society, Presentation, Bess Bookout
American Association of Geographers, Presentation, Brynn Noble
Kansas Department of Natural Resources, Presentation, Brynn Noble
Kansas Department of Natural Resources, Presentation, Sidney Noble
Kansas Department of Natural Resources, Poster, Kalea Nippert

2022 **Konza Prairie Annual Meeting,** Poster, Bess Bookout
American Association of Botany Annual Meeting, Presentation, Bess Bookout
Biology Graduate research forum at the KSU Division of Biology, Presentation, Bess Bookout
Biology Graduate research forum at the KSU Division of Biology, Presentation, Brynn Noble
Biology Graduate research forum at the KSU Division of Biology, Presentation, Sidney Noble
Kansas State Office of Undergraduate Research and Creative Inquiry (KSOURCI)
Undergraduate research showcase, Poster, Kalea Nippert

2021 **Ecological Society of America Annual Meeting,** Presentation, Sidney Noble
Midwest Ecology and Evolution Conference, Presentation, Sidney Noble
Konza Prairie LTER Annual Meeting, Presentation, Sidney Noble
Konza Prairie LTER Annual Meeting, Poster, Bess Bookout
Konza Prairie LTER Annual Meeting, Poster, Brynn Ritchey

Awards

2025 **Roots of Research award for "Demonstrated a sustained and impactful commitment to advancing knowledge at K-State"**
Kansas State University

2024 **Biological Graduate Student's award for Outstanding Graduate Faculty**
Kansas State University, Division of Biology

2014 **Michael Scott Watkins Award for Excellent Graduate Student Teaching**
Kansas State University, Division of Biology
H. Henley Haymaker Award for outstanding presentation by a Graduate Student
Kansas State University, Division of Biology
Chris Edler Award for Outstanding Research on Konza Prairie
Kansas State University, Division of Biology

2013 **Best Short Talk**
Kansas State University, Division of Biology

2012 **John C. Frazer Award for Excellence in Graduate Research in Plant Biology**
Kansas State University, Division of Biology

2010 **Virginia Swinburne Brownell Prize for excellence in Biology**
Outstanding Thesis in Biology, Vassar College

Erminie Smith Prize for excellence in Geology
Earth Science Thesis Award, Vassar College
Sigma XI, Honorary Vassar Chapter Membership
Vassar College
Young Botanist Award
Botanical Society of America

2008 **Harriet Van Gurnee Allen Award**
Outstanding Sophomore Biology student, Vassar College

Professional activities

2021-2024 **Konza LTER Diversity Inclusion and Equity Committee**
Active member and part of the sub-committee on recruiting and retaining students from under-represented groups

2018 **Ecological Society of America, 2018 Annual Meeting**
Co-organized the inspire session entitled "Understanding Extreme Events: Linking Empirical Observation to Concepts and Theory"

2017 **Social-ecological resilience of forests, University of Montana.** Attended a workshop funded by the Joint Fire Science Program, that brought together social scientists and natural scientists to refine the definition and criteria for managing for resilience in forest ecosystems.

2016 **Participated in "After the extreme—what happens when thresholds are crossed?"**
A workshop hosted by INTERFACE/CLIMANI in Florence Italy, organized around measuring responses to climate extremes across a diverse set of ecosystems.
Ecological Society of America, 2016 Annual Meeting
Co-organized the inspire session entitled "Extreme Climate Events Across Diverse Ecosystems"

2015 **Participated in the "Frequent Fire Conifer Ecosystems" Synthesis Workshop** involving private sector, government researchers, and academics, addressing evolving ecological and social issues in frequent fire forests (hosted by Jones Research Center and USFS).

2014-2015 **Participated in three syntheses workshops on the topic of "The effects of international trade and land grabbing on food security"** at the NSF funded synthesis center for synthesis in social-ecological systems (SESYNC). I contributed to the analysis of large data-sets and study design (see three resulting papers in "Environmental Research Letters").

2013 to 2015 **Student Site Representative for Konza Prairie LTER Prairie Studies Institute**
Acted as the point of contact for Konza Prairie LTER.
Prairie Research Institute, Steering Committee and Founding Member
Trans-disciplinary graduate and faculty course in Art, Architecture, Performing Arts, Humanities, and Science. Click here for website.

2013 **Co-organized a 4-day synthesis workshop at the Sevilleta LTER** on the topic of "Sensitivity of ecosystem structure/function to winter climatic variation".

2013 **Organized a 4-day synthesis workshop at the Konza LTER** on the topic of "Early warning signs for grassland to woodland transitions".

2012 **Participated in the South American Resilience and Sustainability (SARAS^2) Workshop** on "Causes and Consequences of Grassland-Woodland Transitions", a merging of the arts, humanities, and science to address abrupt transitions between grasslands and woodlands (hosted by SARAS).

2012 **Co-organized a graduate Student Working group for the LTER** "All Scientists Meeting" on the topic of "Dormant Season Ecology and Critical Climate Periods".

2012 **Organized a 4-day synthesis workshop at the Sevilleta LTER** on the topic of "Woody Encroachment and Bi-Stability".

Community engagement, outreach, and similar

2025 **KSU and 4-H extension workshop on using remote sensing and machine learning to detect woody encroachment,** Phillipsburg KS extension
"Wild life" at NHK, Japan's closest equivalent to PBS, for content that will be part of 90-minute documentary with the working title "American Bison: Journey of a Great Comeback." I helped plan and execute logistics and content, hosted film crew and director, interviewed in the field for live-action and voice over content.

2024 **Natural Areas Conference Roundtable:** "Woody encroachment—searching for new answers to an old problem," estimated participants = 75, an audience of mostly practitioners, state/federal, NGO, and others
Natural Areas Conference fieldtrip at Konza Prairie Biological Station: "Woody encroachment field trip", estimated participants = 40, an audience of mostly practitioners, state/federal, NGO, and others

2022-present **Konza Prairie Environmental Education Program (KEEP),** My lab has contributed to a initiative led by Jill Haukos (KEEP director) that incorporates research from Konza Prairie Biological Station into K-12 classrooms. Materials from my lab have included filmed interviews, maps, and graphs. Currently this six-week module is being used in classrooms totallign around 650 students per year in Kansas.

2022-2023 **Media contacts and outreach: a paper I led generated substantial media attention.** This included numerous interviews and correspondences (e.g., fact-checking). The result was news coverage in national NPR, National Geographic's website (which was translated into 4 languages), live interviews on TV with The Weather Channel and Fox News Weather, a podcast with KS AM radio, and a wide range of other outlets.

2011-present **"Prairie Restoration on Campus," Kansas State University, Beach Museum of Art and Department of Architecture and Urban Planning:** The goal of this project is to expose students and citizens to ecological restoration, by starting a restoration right at one of the entrances to Kansas State University. Juxtaposed with the campus Art museum, the meadow also serves as a source of merging STEM and Art programs. This was a risky project, because we were afraid that a failed restoration attempt could create a very public example of the possible downsides of deviating from usual landscaping techniques. Therefore, we carefully designed this restoration project, using long-term studies from Konza Prairie LTER and citizen-science data on flowering times in nearby tallgrass prairie. These data sources helped us identify species that would have a higher establishment rate and flowering times that span spring and fall semesters. I helped design and install a restored prairie. Now in its 4 years, there has been high establishment and the campus restoration is frequently used in K-12 education and by undergraduate students taking Plant Physiology. These education opportunities have been enhanced by a grant we obtained to add a large touch-screen interface that allows students to explore tallgrass prairie throughout the region (see grant above with Kingery-Page as PI). Click here for website and see picture below (photo-credit: Katie Kingery-Page).

2010-present **"Konza Prairie Educational Tour Guide" Konza Prairie Biological Station** give educational and interactive tours to college students, GK-12 teachers, and the public. I lead about six tours per year.

2017, 2020 **Organized workshops attended by federal/state land managers and scientists, in Bozeman and Missoula Montana.** These workshops provided updates on "state of the science", an annotated bibliography, and solicited manager input for model development. These meetings were used to gather information on scenarios to include in our modelling of forests in the Northern

Rocky Mountains. We also identified output variables that are of greatest need to managers, such as the spatial distribution of deciduous forests, as a key wildlife habitat.

2016 **Collaborating with Brian Obermeyer at the Nature Conservancy,** we produced an assessment of the potential for transitions from tallgrass prairie to shrubland/woodland based on current fire management. We disseminated this knowledge by publishing this work in a journal frequently stocked by rangeland managers, the Journal of Rangeland Ecology (formerly the "Journal or Rangeland Ecology and Management") (see Ratajczak et al. 2016 in "Publications") and presenting the results at conference attended by private, NGO, and governmental stakeholders (see "America's Grasslands" in presentations).

2015 **Participated in the "America's Grasslands" Conference and Symposium** a meeting that brought together farmers, ranchers, policy advocates, industry, and scientists (Hosted by World Wildlife Foundation, Colorado State University and USDA-ARS).

2013 **Participated in the "America's Grasslands" Conference and Symposium** a meeting that brought together farmers, ranchers, policy advocates, industry, and scientists (Hosted by World Wildlife Foundation and Kansas State University).

2011-2013 **Stillwater Elementary School, Stillwater NY** lead reoccurring lectures & activities in two 6th grade classrooms, helping them with 'Model Unite Nations' exercises. I also act as in a more in depth mentor for students working in Africa and Russia.

Journals reviewed for

Advances in Water Resources, Agricultural and Forest Meteorology, Austral Ecology, Bioscience, Bulletin of Mathematical Biology, Cambridge University Press, Carbon Balance and Management, Crop and Pasture Science, Earth's Future, Ecological Applications, Ecology, Ecology Letters, Ecosphere, Ecosystems, Fire Ecology, Frontiers in Ecology and the Environment, Geophysical Research Letters, Global Change Biology, Journal of Applied Ecology, Journal of Ecology, Journal of Arid Environments, Journal of Ecology, Journal of Vegetation Science, International Journal of Climatology, Oecologia, Oikos, Nature Climate Change, Nature Ecology and Evolution, PLoS ONE, PNAS, Proceedings of the Royal Society B, Remote Sensing, Science, Scientific Reports

Grant and Panel Services

NSF PCE core solicitations, NSF LTER Renewal proposals, TNC Nachusa Grasslands grazing program

Professional references

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