

**PROFESSIONAL ADDRESS**

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**EDUCATION**

Ph.D. December 1996. Wildlife Ecology, Department of Wildlife Ecology, University of Maine, Orono (with William B. Krohn)  
Thesis title: *An Assessment of Terrestrial Vertebrate Diversity in Maine*

M.S. December 1991. Wildlife Management, Department of Wildlife Ecology, University of Maine, Orono (with Raymond J. O'Connor)  
Thesis title: *Construction of A Database Used in Analyses of Bird Populations and Agriculture, with a Study of Density Dependence*

B.S. May 1986. Wildlife Science, Department of Fisheries and Wildlife, Oregon State University, Corvallis. Minor: Computer science

**PROFESSIONAL EMPLOYMENT**

Professor – July 2014 – Present  
Department of Ecosystem Science and Sustainability, Colorado State University

Senior Research Scientist – February 2019 – Present  
Natural Resource Ecology Laboratory, Colorado State University

Associate Professor – July 2011 – June 2014  
Department of Ecosystem Science and Sustainability, Colorado State University

Associate Professor – August 2010 – June 2011  
Department of Forestry, Rangeland, and Watershed Stewardship,  
Colorado State University

Research Scientist – September 2000 – January 2019  
Natural Resource Ecology Laboratory, Colorado State University

And affiliations:

Faculty member of the Graduate Degree Program in Ecology  
Colorado State University (March 2007 – Present)

Affiliate Associate Professor of Anthropology  
Colorado State University (February 2012 – Present)

Scholar, School of Global Environmental Sustainability  
Colorado State University (December 2008 – Present)

Research Associate – July 1998 – August 2000  
Employer: Natural Resource Ecology Laboratory, Colorado State University

## **OTHER PROFESSIONAL EXPERIENCE**

### **Select manuscripts and proposals reviewed**

Ecological Applications	Global Ecology and Biogeography
Human Ecology	Journal of Biogeography
PNAS	US Environmental Protection Agency
Northeastern Naturalist (Guest Editor)	Landscape Ecology
Ecological Modelling	US National Science Foundation
Rangeland Ecology & Management	Oikos
Ecology	Ecological Applications
Journal of Arid Environments)	

### **Consulting experience**

Compensated reviewer of proposals for the U.S. Environmental Protection Agency's High Performance Computing and Communications research program and their STAR research program. Also for the Texas Higher Education Coordinating Board Advanced Research Program

Paid consultant designing World-Wide Web pages

Paid consultant conducting ecosystem modeling of East African conservation areas.

Paid consultant creating a global rangeland model, G-Range

### **Computing experience**

More than twenty years experience with GIS technologies, including “Introductory” and “Advanced” training in Arc/Info supplied by ESRI, Inc.

Experience with remote sensing, especially NDVI and Landsat imagery.

Programmed in: NetLogo, Visual Basic, FORTRAN, Java, C, Pascal.

Many software packages used, including versions of Office, SYSTAT, R, Paint Shop Pro.

Experience in HTML, web, and graphic design, and expertise in image manipulation.

## **AWARDS**

Teamsmanship Award, Warner College of Natural Resources, 2022

ESA Sustainable Science Award (for Reid et al. 2009), Ecological Society of America

Art and Science Exhibition 2009, Colorado State University, Honorable Mention of work

Best Invited Paper (for Boone and Hobbs 2004), Grassland Society of Southern Africa

Natural Resource Ecology Laboratory Outstanding Post Doctoral Fellow, 1999

Department of Wildlife Ecology Outstanding Graduate Student Award, 1996

## **PROFESSIONAL AFFILIATIONS**

IUCN Species Survival Commission Equid Specialist Group

## **PROFESSIONAL HONOR SOCIETY**

Alpha Zeta Honor Fraternity

## TRAINING, MENTORING, AND TEACHING

Current and recent courses include:

LIFE 320, *Ecology*  
LIFE 320-220, *Ecology Honors*  
ESS 554 / ANTH 554, *Ecological and Social Agent-based Modeling*  
ESS 486, *Ecosystem Science Practicum* (with J. Moore)  
ESS 211, *Fundamentals of Ecosystem Science* (with D. Ojima)  
NR 322, *Introduction to GIS*  
NR 505, *Concepts in GIS* (for M. Laituri)  
ECOL 693, *Research Seminar, Enhancing Proposal Writing Skills*

I currently serve on sixteen graduate student committees, include three for which I serve as advisor. I have mentored one visiting Ph.D. student. Four M.S. students and two Ph.D. student completed their degrees under my advising. I have mentored eight undergraduate students in their research.

## EXTRAMURAL FUNDING

- “Addressing climate changes to agriculture and water quality in the New York City watershed.” Columbia University (USDA). 2023-2026. Co-PI, \$265,000.
- “Integrating community and modeling efforts to evaluate the impacts and tradeoffs of food systems interventions.” FFAR. 2023-2025. Co-PI (R. Jablonski, PI), \$954,554.
- “Rangeland modeling: spatial and temporal variability of livestock grazers and ecosystem interactions.” USDA AFRI. 2022-2025. PI, \$159,000.
- “Understanding the impacts of climate on livestock.” Univ. Florida/GTAP. 2022-2023, PI, \$39,568.
- “Adaptive human migration in changing environments: leveraging geographic sciences to advance new models of migration decision making.” NSF. 2021-2024. Co-PI, \$399,940.
- “Cross-scale impacts of SDG 15 achievement: household decisions, ecosystem change, and atmospheric water recycling.” NASA. 2021-2023. Co-PI (P. Keys, PI), \$99,169.
- “CNH2-L: Social, ecological, and institutional dynamics of human-wildlife relations.” NSF. 2020-2024. Co-PI, \$1,562,128.
- “Rangeland modeling: forage forecasting, livestock behavior, and performance.” USDA AFRI. 2020-2023. PI, \$96,229.
- “Integrating community and modeling efforts to evaluate health and socio-economic impacts and tradeoffs of food systems.” FFAR. 2020-2022. Co-PI, \$100,000.
- “Cross-scale impacts of SDG 15 achievement: household decisions, ecosystem change, and atmospheric water recycling.” NASA. 2018-2021. Co-PI (P. Keys, PI), \$744,808
- “Who changes the rain? Linking the social dynamics of pastoralism and atmospheric water recycling to enable Sustainable Development Goal achievement.” Colorado State University Water Center. 2018-2019. Co-PI (P. Keys, PI), \$22,500.
- “Integrating community and modeling efforts to evaluate impacts and tradeoffs of food system interventions.” Foundation for Food and Agriculture Research. 2018-2021. Co-PI (B. Jablonski, PI), \$999,990.

- “Rangeland modeling forage forecasting, livestock behavior and performance.” US Department of Agriculture. 2018-2020. PI, \$192,360.
- “CIP: Rural wealth creation: exploring interactions between food systems and community development.” CSU Office of the Vice President for Research. 2018-2020. Co-PI (B. Jablonski and M. Carolan), \$200,000.
- “Community based conservancies: investigating the prospects for cooperation and conflict”, National Science Foundation. 2017-2019. Co-PI (C. Lesorogol, PI), \$275,115.
- “Predict condor range expansion to reduce development threats”, Western National Parks Association. 2017-2018. PI, with student Adrianna Punzalan, \$15,000.
- “Ecology of Wild Horses and Burros in the Rocky Mountain Region and Western USA; Research to provide ecological information and tools to improve management.” Bureau of Land Management. 2016-2020. Co-PI (S. King, PI), \$1,346,432.
- “Predict condor range expansion to reduce development threats”, US National Park Service. 2016-2019. PI, with student Adrianna Punzalan, \$95,763.
- “CNH-S: Andes, bofedales, and cattle: the impacts of changing hydrology and glacial retreat on community livelihoods in Peru's Cordillera Blanca”, National Science Foundation, 2016-2021. Co-PI (G. Bowser, PI), \$499,992.
- “DD: Comp Hydro: integrating data, computation, and visualization for model-based water literacy”, National Science Foundation. 2015-2018. Scientific Investigator (J. Moore, PI), \$2,199,999.
- “IRES: Student-led social-ecological research in the Kenyan drylands”, National Science Foundation. 2015-2018. Co-PI (S. Lynn, PI) \$249,994.
- “Agent-based modeling of subsistence tradeoffs” Service for National Science Foundation project, University of Alaska, Fairbanks (Kofinas, PI) 2013-2014. PI on service agreement. \$32,278.
- “Pathways to Environmental Science and Sustainability”, National Science Foundation. 2014-2018. Co-PI (J. Moore, PI) \$608,165.
- “CNH: Assessing vulnerability of provisioning services in the southern highlands of Ethiopia”, National Science Foundation. 2013-2015. Co-PI (P. Evangelista, PI) \$250,000.
- “Modeling avian responses to climate change using evolving occurrence models” National Science Foundation. 2013-2015. PI. \$142,452.
- “Quantifying lost livelihoods by defining risk thresholds of productive assests among urban-proximate pastoral communities in southern Kenya” Center for Sustainable Dryland Ecosystems and Societies, University of Nairobi. 2013-2014. Co-PI (L. MacOpiyo, PI) \$8,000.
- “Centre for Sustainable Drylands: a university collaboration for transforming higher education in Africa at the University of Nairobi” US Higher Education Initiative, USAID. 2011-2013. Co-PI (R. Reid, PI). \$1,100,100.
- “Cougar prey distribution: probability of occurrence data surfaces for ungulates and meso-carnivores in the Front Range of Colorado” Colorado Parks and Wildlife. 2012-2013. PI, with student Kevin Blecha. \$42,007.
- “Black Ridge desert bighorn sheep habitat project” USDI Bureau of Land Management. 2011-2016. PI, with student Ben Wilson. \$90,000.
- “Hydrology, ecology, and pastoralism in the Sahel: ephemeral and perennial water sources in a dynamic coupled system” National Science Foundation. 2010-2014. PI. \$411,011

- (Subaward from South Dakota State University, Brookings, SD, N. Hanan, PI. \$1,300,000)
- “Scaling from local to global: teacher professional development to provide a framework for classroom instruction on climate change and associated environmental consequences for the region” National Aeronautics and Space Administration. Co-PI (J. Moore, PI). \$399,365.
- “Wildebeest forage acquisition in fragmented landscapes under variable climates” National Science Foundation. 2009-2012. PI. \$658,524
- “Bayesian hierarchical modeling of disease dynamics – a case example using chronic wasting disease” National Science Foundation. 2009-2014. Co-PI (N.T. Hobs, PI). \$2,499,935.
- “Developing resource management and monitoring protocols for areas of extensive energy extraction” Bureau of Land Management. 2009-2011. Co-PI (D.M. Swift, PI). \$108,603.
- “Adaptation of dryland peoples and ecosystems to global change: a collaborative proposal to link African and US universities.” Higher Education for Development. 2009. Co-PI (R.S. Reid, PI). \$50,000.
- “Land use on privatized pastoral land in Kenya: the impact of household strategies on livelihoods and the environment” National Science Foundation. 2009-2011. PI. \$115,016 (Subaward from Washington University, St. Louis, MO, C. Lesorogol, PI, \$226,575)
- “Development of a long-term research, education and outreach program in coupled human-natural systems in Africa” Warner Mini-Grant, Warner College of Natural Resources, Colorado State University. Co-PI (R.S. Reid, PI). \$9930.
- “People in Places” Western Association of Fish and Wildlife Agencies. Co-PI (M.J. Manfredo, PI). \$157,322
- “Habitat Assessment Modeling through the Habitat Partnership Program” Colorado Division of Wildlife. 2006-2009. PI. \$250,000.
- “Extreme weather events, state interventions, and pastoral livelihoods: social and ecological impacts of spring snowstorms on the Tibetan Plateau” National Science Foundation. 2006-2009. Co-PI (J.A. Klein, PI). \$618,999.
- “DRU: Decision-making in rangeland systems: an integrated ecosystem-agent-based modeling approach to resilience and change (DREAMAR)” National Science Foundation. 2005-2009. Co-PI (K.A. Galvin, PI). \$630,000.
- “Optimizing aspects of land use intensification in southern Kajiado District, Kenya” International Livestock Research Institute, Nairobi, Kenya. 2005-2006. PI (Subaward from International Livestock Research Institute, R.S. Reid, PI). \$14,250.
- “Diversified market development strategies for sheep, goats and fiber.” Global Livestock Collaborate Research Support Program. 2004-2005. Co-PI (K.A. Gavin, PI, Subaward from University of Wyoming, R.H. Stobart, PI). \$71,256.
- “Biocomplexity, spatial scale and fragmentation: Implications for arid and semi-arid ecosystems (SCALE).” National Science Foundation. 2002-2006. Co-PI (N.T. Hobbs, PI). \$1,900,002.
- “Effects of forest fragmentation on community structure and metapopulation dynamics of amphibians.” US Environmental Protection Agency. 2000-2003. PI. \$38,497 (Subaward from Natural Resource Research Institute, Duluth, MN, L. Johnson, PI, \$769,623).

## PUBLICATIONS

### Refereed Publications

86. Awad, M.M. and **R.B. Boone**. 2023. Assessment of spatial variations in pesticide, heavy metal, and selenium residues in honey bee (*Apis mellifera* L.) products. *Sci* 5:24.
85. Cheng, G., R.D. Harmel, L. Ma, J.D. Derner, D.J. Augustine, P.N.S. Bartling, Q.X. Fang, J.R. Williams, C.J. Zilverberg, **R.B. Boone**, and Q. Yu. 2022. Evaluation of the APEX cattle weight gain component for grazing decision-support in the Western Great Plains. *Rangeland Ecology & Management* 82:1-11.
84. Zhou, J., G.P. Kofinas, K. Kielland, **R.B. Boone**, L. Prugh, and K.D. Tape. 2022. Climate change, moose, and subsistence harvest: social-ecological assessment of Nuiqsut, Alaska. *Ecology and Society* 27(3):29.
83. Stabach, J.A. L.F. Hughey, R.D. Crego, C.H. Felming, J.G.C. Hopcraft, P. Leimgruber, T.A. Morrison, J.O. Ogutu, R.S. Reid, J.S. Worden, and **R.B. Boone**. 2022. Increasing anthropogenic disturbance restricts wildebeest movement across East African grazing systems. *Frontiers in Ecology and Evolution* 10:846171.
82. Steger, C., **R.B. Boone**, B. Warkineh Dullo, P. Evangelista, S. Alemu, K. Gebrehiwot, and J.A. Klein. 2022. Collaborative agent-based modeling for managing shrub encroachment in an Afroalpine grassland. *Journal of Environmental Management* 316:115040
81. Broekman, M.J.E., J.P. Hilbers, M.A.J. Huijbregts, T. Muller, et al., **R.B. Boone**, et al. 2022. Evaluating expert-based habitat suitability information of terrestrial mammals with GPS-tracking data. *Global Ecology and Biogeography* 31:1526-1541.
80. Keys, P.W., R. Warrier, R.J. van der Ent, K.A. Galvin, and **R.B. Boone**. 2022. Analysis of Kenya's atmospheric moisture sources and sinks. *Earth Interactions* 26:139-150.
79. Fang, Q.X., R.D. Harmel, L. Ma, P.N.S. Bartling, J.D. Derner, J. Jeong, J.R. Williams, and **R.B. Boone**. 2022. Evaluating the APEX model for alternative cow-calf grazing management strategies in Central Texas. *Agricultural Systems* 195:103287. doi:10.1016/j.agsy.2021.103287.
78. Dong, S., Z. Shang, J. Gao, and **R.B. Boone**. 2022. Enhancing the ecological services of the Qinghai-Tibetan Plateau's grasslands through sustainable restoration and management in era of global change. *Agricultural Ecosystems & Environment* 326:107756. doi:10.1016/j.agee.2021.107756.
77. Esmacili, S., B.R. Jesmer, S.E. Albeke, E.O. Aikens, K.A. Shoenecker, ..., **R.B. Boone**, et al. 2021. Body size and digestive system shape resource selection by ungulates: a cross-taxa test of the forage maturation hypothesis. *Ecology Letters* 24:2178-2191.
76. Morrison, T.A., J.A. Merkle, J.G.C. Hopcraft, E.O. Aikens, J.L. Beck, **R.B. Boone**, et al. 2021. Drivers of site fidelity in ungulates. *Journal of Animal Ecology* 90:955-966. doi:10.1111/1365-2656.13425
75. Cheng, G., R.D. Hamel, L. Ma, J.D. Derner, D.J. Augustine, P.N.S. Bartling, Q.X. Fang, J.R. Williams, C.J. Zilverberg, **R.B. Boone**, D. Hoover, and Q. Yu. 2021. Evaluation of APEX modifications to simulate forage production for grazing management decision-support in the Western US Great Plains. *Agricultural Systems* 191:103139. doi:10.1016/j.agsy.2021.103139.

74. Chimner, R.A., **R.B. Boone**, G. Bowser, L.L. Bourgeau-Chavez, et al. 2020. Andes, bofedales, and the communities of Huascarán National Park, Peru. *The Society of Wetland Scientists Bulletin* 37:246-254.
73. **Boone, R.B.** 2020. Hierarchical global plant biophysical regions as potential analysis units. 2020. *Global Change Biology* 26(6):3689-3697.
72. Godde, C.M., **R.B. Boone**, A.J. Ash, K. Waha, L.L. Sloat, P.K. Thornton, and M. Herrero. 2020. Global rangeland production systems and livelihoods at threat under climate change and variability. *Environmental Research Letters* 15:044021.
71. Ogotu, J.O., Moehlman, P.D., H.-P. Piepho, V.A. Runyoro, M.B. Coughenour, and **R.B. Boone**. 2020. Long-term historical and projected herbivore population dynamics in Ngorogoro Crater, Tanzania. *PLoS ONE* 15(3):e0212530.
70. Noonan, M.J., C.H. Fleming, M.A. Tucker, R. Kays, et al. **R.B. Boone**, et al.. 2020. Effects of body size on estimation of mammalian area requirements. *Conservation Biology* 34:1017-1028.
69. Jablonski, K.E., **R.B. Boone**, and P.J. Meiman. 2020. Predatory plants and patchy cows: modeling cattle interactions with toxic larkspur amid variable heterogeneity. *Rangeland Ecology & Management* 73:73-83
68. Dong, S., Z. Shang, J. Gao, and **R.B. Boone**. 2020. Enhancing sustainability of grassland ecosystems through ecological restoration and grazing management in an era of global change on Qinghai-Tibetan Plateau. *Agriculture, Ecosystems, and Environment* 287:106684.
67. Sircely, J., R.T. Conant, and **R.B. Boone**. 2019. Simulating rangeland ecosystems with G-Range: model description and evaluation at global and site scales. *Rangeland Ecology & Management* 72:846-857.
66. Klein, J.A., C.M. Tucker, A.W. Nolin, K.A. Hopping, R.S. Reid, C. Steger, A. Grêt-Regamey, S. Levorel, B. Müller, E.T. Yeh, **R.B. Boone**, P. Bourgeron, V. Butsic, E. Castellanos, X. Chen, S.K. Dong, G. Greenwood, M. Keiler, R. Marchant, R. Seidle, T. Spies, J. Thorn, K. Yager, and the Mountain Sentinels Network. 2019. Catalyzing transformations to sustainability in the World's mountains. *Earth's Future* 7:547-557. =
65. Klein, J.A., C.M. Tucker, C.E. Steger, A. Nolin, R. Reid, K.A. Hopping, E.T. Yeh, M.S. Pradhan, A. Taber, D. Molden, R. Ghate, D. Choudhury, I. Alcántara-Ayala, S. Lavorel, B. Müller, A. Grêt-Regamey, **R.B. Boone**, P. Bourgeron, E. Castellanos, X. Chen, S. Dong, M. Keiler, R. Seidle, J. Thorn, K. Yager. 2019. An integrated community and ecosystem-based approach to disaster risk reduction in mountain systems. *Environmental Science & Policy* 94:143-152. 69. Jablonski, K., P. Meiman, and **R.B. Boone**. In press. Predatory plants and patchy cows: modeling cattle interactions with toxic larkspur amid variable heterogeneity. *Rangeland Ecology & Management*
64. Jablonski, K.E., **R.B. Boone**, and P.J. Meiman. 2018. An agent-based model of cattle grazing toxic Geyer's larkspur. *PLOS One* 13(3):e0194450
63. Blecha, K., **R.B. Boone**, and M. Alldredge. 2018. Hunger mediates apex predator's risk avoidance in wildlife-urban interface. *Journal of Animal Ecology* 87:609-622.
62. Motallebi, M., D. Hoag, A. Tasdighi, M. Arabi, D. Osmond, and **R.B. Boone**. 2018. The impact of relative individual ecosystem demand on stacking ecosystem credit markets. *Ecosystem Services* 29:137-144.

61. **Boone, R.B.**, R.T. Conant, J. Sircely, P.K. Thornton, and M. Herrero. 2018. Climate change impacts on selected global rangeland ecosystem services. *Global Change Biology* 24:1382-1393.
60. **Boone, R.B.**, 2017. Evolutionary computation in zoology and ecology. *Current Zoology* 63:675-686.
59. Lesorogol, C.K. and R.B. **Boone**. 2016. Which way forward? Using simulation models and ethnography to understand changing livelihoods among Kenyan pastoralists in a "new commons". *International Journal of the Commons* 10:747-770.
58. Stabach, J.A., G. Wittemyer, **R.B. Boone**, R.S. Reid, and J.S. Worden. 2016. Variation in habitat selection by white-bearded wildebeest across different degrees of human disturbance. *Ecosphere* 7(8):e01428. 10.1002/ecs2.1428.
57. Milne, E., E. Aynekulu, A. Bationo, N.H. Batjes, **R. Boone**, R. Conant, J. Davies, N. Hanan, D. Hoag, J.E. Herrick, W. Knausenberger, C. Neely, J. Njoka, M. Ngugi, B. Parton, K. Paustian, R. Reid, M. Said, K. Shepard, D. Swift, P. Thornton, S. Williams. 2016. Grazing lands in sub-Saharan Africa and their potential role in climate change mitigation: what we do and don't know. *Environmental Development* 19:70-74.
56. Stabach, J.A., **R.B. Boone**, J.S. Worden, and G. Florant. 2015. Habitat disturbance effects on the physiological stress response in resident Kenyan white-bearded wildebeest (*Connochaetes taurinus*). *Biological Conservation* 182:177-186.
55. Galvin, K.A., T.A. Beeton, **R.B. Boone**, and S.B. BurnSilver. 2015. Nutritional status of Maasai pastoralists under change. *Human Ecology* 43:411-424.
54. de Pinho, J.R., C. Grilo, **R.B. Boone**, K.A. Galvin, and J.G. Snodgrass. 2014. Influence of aesthetic appreciation of wildlife species on attitudes towards their conservation in Kenya agropastoralist communities. *PLOS One* DOI: 10.1371/journal.pone.0088842
53. Klein, J.A., K.A. Hopping, E.T. Yeh, Y. Nyima, **R.B. Boone**, and K.A. Galvin. 2014. Unexpected climate impacts on the Tibetan Plateau: local and scientific knowledge in findings of delayed summer. *Global Environmental Change* 28:141-152.
52. Moore, J.C., **R.B. Boone**, A. Koyama, and K. Holfelder. 2014. Enzymatic and detrital influences on the structure, function, and dynamics of spatially-explicit model ecosystems. *Biochemistry* DOI:10.1007/s10533-013-9932-3.
51. Havas, K.A., **R.B. Boone**, A.E. Hill, and M. Salman. 2013. A brucellosis disease control strategy for the Kekheti region of the country of Georgia: an agent-based model. *Zoonoses and Public Health*, doi:10.1111/zph.12066
50. Hoag, D.L.K., **R.B. Boone**, and C.M.H. Keske. 2011. The cost for agriculture to coexist with wildlife in Colorado. *Human Dimensions of Wildlife* 16:318-329.
49. **Boone, R.B.**, K.A. Galvin, S.B. BurnSilver, P.K. Thornton, D.S. Ojima, and J.R. Jawson. 2011. Using coupled simulation models to link pastoral decision making and ecosystem services. *Ecology and Society* 16(2):6 [online] URL: <http://www.ecologyandsociety.org/vol16/iss2/art6/>
48. **Boone, R.B.** 2010. Simulating species richness using agents with evolving niches, with an example of Galapagos plants. *International Journal of Ecology* 2010:id150606, doi:10.1155/2010/150606
47. Derry, J.F. and **R.B. Boone**. 2010. Grazing systems are a result of equilibrium and non-equilibrium dynamics. *Journal of Arid Environments* 74:307-309.
46. Reid, R., D. Nkedianye, M. Said, D. Kaelo, M. Neselle, O. Makui, L. Onetu, S. Kiruswa, N. Ole Kamuaro, P. Kristjanson, S. BurnSilver, M. Goldman, **R. Boone**, N. Dickson, and W.



- Clark. 2009. Evolution of models to support communities and policy makers with science: balancing pastoralism and wildlife conservation in East Africa. *Proceedings of the National Academy of Science* doi:10.1073/pnas.0900313106
45. Wang, G., N.T. Hobbs, S. Twombly, **R.B. Boone**, A.W. Illius, I.J. Gordon, and J.E. Gross. 2008. Density dependence in northern ungulates: interactions with predation and resources. *Population Ecology* 51:123-132.
  44. Hobbs, N.T., K.A. Galvin, C.J. Stokes, J.M. Lockett, A.J. Ash, **R.B. Boone**, R.S. Reid, and P.K. Thornton. 2008. Fragmentation of rangelands: implications for humans, animals, and landscapes. *Global Environmental Change* 18:776-785.
  43. Bulte, E.H., **R.B. Boone**, R. Stringer, and P.K. Thornton. 2008. Elephants or onions? Paying for nature in Amboseli, Kenya. *Environmental and Development Economics* 13:395-414.
  42. Thayn, J.B., K.P. Price, and **R.B. Boone**. 2008. Satellite-based metrics of rangeland complexity and cattle stocking rates in Kansas. *Transactions of the Kansas Academy of Science* 111:292-300.
  41. **Boone, R.B.** 2007. Effects of fragmentation on cattle in African savannas under variable precipitation. *Landscape Ecology* 22:1355-1369.
  40. Thornton, P.K., **R.B. Boone**, K.A. Galvin, S.B. BurnSilver, M.M. Waithaka, J. Kuyiah, S. Karanja, E. Gonzalez-Estrada, and M. Herrero. 2007. Coping strategies in livestock-dependent households in East and southern Africa: a synthesis of four case studies. *Human Ecology* 35:461-476.
  39. **Boone, R.B.** and G. Wang. 2007. Cattle dynamics in African grazing systems under variable climate. *Journal of Arid Environments* 70:495-513.
  38. **Boone, R.B.**, J.M. Lockett, K.A. Galvin, D.S. Ojima, and C.J. Tucker III. 2007. Links and broken chains: evidence of human-caused changes in land cover in remotely sensed images. *Environmental Science & Policy* 10:135-149.
  37. **Boone, R.B.**, K.A. Galvin, P.K. Thornton, D.M. Swift, and M.B. Coughenour. 2006. Cultivation and conservation in Ngorongoro Conservation Area, Tanzania. *Human Ecology* 34:809-828.
  36. **Boone, R.B.**, C.M. Johnson, and L.B. Johnson. 2006. Simulating wood frog movement in central Minnesota, USA using a diffusion model. *Ecological Modelling* 198:255-262.
  35. **Boone, R.B.**, S.J. Thirgood, and J.G.C. Hopcraft. 2006. Serengeti wildebeest migratory patterns modeled from rainfall and new vegetation growth. *Ecology* 87:1987-1994.
  34. **Boone, R.B.**, C.M. Johnson, and L.B. Johnson. 2006. Simulating vernal pool hydrology in central Minnesota. *Wetlands* 26:581-592.
  33. Galvin, K.A., P.K. Thornton, J.R. de Pinho, J. Sunderland, and **R.B. Boone**. 2006. Integrated modeling and its potential for resolving conflicts between conservation and people in the rangelands of East Africa. *Human Ecology* 34:155-183.
  32. Wang, G., N.T. Hobbs, **R.B. Boone**, A.W. Illius, I.J. Gordon, J.E. Gross, and K.L. Hamlin. 2006. Spatial and temporal variability modify density dependence in populations of large herbivores. *Ecology* 87:95-102.
  31. Thornton, P.K., S.B. BurnSilver, **R.B. Boone**, and K.A. Galvin. 2006. Modelling the impacts of group ranch subdivision on agro-pastoral households in Kajiado, Kenya. *Agricultural Systems* 87:331-356.

30. **Boone, R.B.**, S.B. BurnSilver, P.K. Thornton, J.S. Worden, and K.A. Galvin. 2005. Quantifying declines in livestock due to subdivision. *Rangeland Ecology & Management* 58:523-532.
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## Books

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## Book Chapters

25. **Boone, R.B.**, R.G. Woodmansee, J.K. Detling, D. Binkley, T.J. Stohlgren, M.E. Rocca, W.H. Romme, P.H. Evangelista, S. Kumar, and M.G. Ryan. 2021. Emergence of cross-scale structural and functional processes in ecosystem science. *In: Natural Resource*

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- Boone, R.B.**, R.T. Conant, and T.E. Hilinski. 2011. G-Range: Development and use of a beta global rangeland model. Final report to the International Livestock Research Institute, Nairobi, Kenya
- Boone, R.B.**, J.J. Taylor, D.M. Swift, P.H. Evangelista, and E. Hollowed. 2011. Developing a Resource Management and Monitoring Protocol for a Semiarid Landscape with Extensive Oil and Gas Development Potential. Technical Note 439. U.S. Department of the Interior. Bureau of Land Management, National Operations Center, Denver, Colorado.
- McCloskey, J.T., R.J. Lilliehold, **R. Boone**, R. Reid, D. Nkedianye, S. Sader, M. Said, and J. Worden. 2011. A participatory approach for modeling alternative future land use scenarios around Nairobi National Park using Bayesian belief networks. *In* Ecology and the Environment (Y. Villacampa and C.A. Brebbia, eds.), WIT Press 144:43-57.
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- Ojima, D.S., D.H. Wall., J. Moore, K. Galvin, N.T. Hobbs, W.H. Hunt, K. Paustian, D. Swift, **R.B. Boone**, R.T. Conant, J. Klein, L. Christensen, M. Sankaran, J. Ratnam, E. Ayres, H. Steltzer, B. Simmons, and G. Williams. 2006. Don't sell social science short. *Science* 312:1470.
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- Boone, R.B.** and S.B. BurnSilver. 2002. Integrated assessment results to support policy decisions in Ngorongoro Conservation Area, Tanzania. Report from the POLEYC Project to the Global Livestock Collaborative Research Support Program, University of California, Davis, California.
- Galvin, K.A., R.S. Reid, S. BurnSilver, and **R.B. Boone**. 2002. Linking communities and households to climate variability and land cover/land use change at different scales in farming and pastoral systems of East Africa. Paper published by the Workshop on Linking Household and Remotely Sensed Data: Methodological and Practical Problems, Honolulu, Hawaii.
- Boone, R.B.** and Michael B. Coughenour (eds.). 2001. A system for integrated management and assessment of East African pastoral lands: balancing food security, wildlife conservation, and ecosystem integrity. Final report to the Global Livestock Collaborative Research Support Program, University of California, Davis, California.
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- Ellis, J., M. Coughenour and **R. Boone**. 2001. Promoting livestock production and wildlife conservation. *Cattle Guard: Colorado Cattleman's Association* 50:12.
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- Hepinstall, J.A., S.A. Sader, W.B. Krohn, **R.B. Boone**, and R.I. Bartlett. 1999. Development and testing of a vegetation and land cover map of Maine. *Maine Agriculture and Forest Experiment Station Technical Bulletin* 173, University of Maine, Orono. 104 pp.
- Krohn, W.B., **R.B. Boone**, S.A. Sader, J.A. Hepinstall, S.M. Schaefer, and S.L. Painton. 1998. Maine Gap Analysis - a geographic analysis of biodiversity. Final contract report to USGS Biological Resources Division, Gap Analysis Program, Moscow, Idaho. 123 pp. plus appendices.
- Boone, R.B.**, and W.B. Krohn. 1998a. Maine gap analysis vertebrate data - Part I: distribution, habitat relations, and status of amphibians, reptiles, and mammals in Maine. Part of final

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- Boone, R.B.** and W.B. Krohn. 1997. Species occurrence: what, why, and where? Gap Analysis Bulletin No. 6.
- Hagan, J.M. and **R.B. Boone**. 1997. Harvest rate, harvest configuration, and forest fragmentation: A simulation of the 1989 Maine Forest Practices Act. Manomet Center for Conservation Sciences, Division of Conservation Forestry. Report No. MCDCF-97001.
- O'Connor, R.J., **R.B. Boone**, H. Devaul, M.T. Jones, and T.B. Lauber. 1991. A retrospective study of bird populations and agriculture: effects of agricultural practices on bird populations. Contract report to a consortium of six agricultural companies.

#### **SELECTED PRESENTATIONS** (since 2010)

- Boone, R.B.** 2022. Climate change and birds. Fort Collins Audubon Society, Fort Collins, Colorado.
- Boone, R.B.** 2022. Climate change and birds. International Wildlife Rehabilitation Council (virtual).
- Love, E., S. Berganini, J. Hale, and **R.B. Boone**. 2022. An anthropologist, a sociologist, and an economist walk into a barn: applications of interdisciplinary agent-based modeling for farmer behavior change. Food Distribution Research Society Annual Conference.
- Warrier, R., P. Keys, K. Galvin, and **R.B. Boone**. 2021. Exploring impacts of protected area management on food security of pastoral communities in Kenya. Ecological Society of America (virtual).
- Keys, P., R. Warrier, K.A. Galvin, and **R.B. Boone**. 2021. Understanding Kenya's atmospheric water cycle to enable progress toward the Sustainable Development Goals. Ecological Society of America (virtual).
- Zarria, M. and **R.B. Boone**. 2021. Impacts of drivers on change in high mountain socio-ecological systems. GradShow, Colorado State University.
- Boone, R.B.** and R. Warrier. 2021. Quantifying rangeland ecosystem services through simulation. Society of Range Management, Minneapolis, Minnesota
- Warrier, R., P. Keys, K. Galvin, and **R.B. Boone**. 2020. SPIRALL: An agent-based model for simulating populations in rural and land-based livelihood communities in Eastern Africa. Ecological Society of America (virtual).
- Godde, C., **R.B. Boone**, et al. 2020. Global rangeland systems at threat under climate change and variability. Joint XXIV International Grassland Congress and XI International Rangeland Congress.
- Warrier, R., P. Keys, K. Galvin, and **R.B. Boone**. 2020. Exploring the nexus between pastoral food security and carbon sequestration in Kenyan rangelands. AGU, San Francisco, California.



- Keys, P., R. Warrier, K.A. Galvin, and **R.B. Boone**. 2020. Understanding Kenya's atmospheric water cycle to enable progress toward the Sustainable Development Goals. AGU, San Francisco, California.
- Boone, R.B.** 2020. Exploring our Roots. Soup and Science, Colorado State University, Fort Collins, Colorado.
- Enahoro, D.K., J. Sircely, **R. Boone**, S. Oloo, S.T. Bahta, et al. 2020. Climate impacts on livestock production in a southern African region: model projections to 2050. PIL Program, International Livestock Research Institute, Nairobi, Kenya.
- Jablonski, K., P. Meiman, and **R.B. Boone**. 2019. Agent-based modeling of livestock grazing distribution. Society for Range Management, Minneapolis, Minnesota.
- Berkowitz, A.R., B. Caplan, B.A. Covitt, K.L. Gunckel, G. Love, J.C. Moore, and **R.B. Boone**. 2019. Empowering diverse students with scientific and computational thinking tools to address local water challenges. Ecological Society of America, Louisville, Kentucky
- Boone, R.B.** and M. Zarría. 2019. Addressing sustainability in ecological and social systems using process- and agent-based models. Congress on Rangelands and Natural Protected Areas, Lima, Peru.
- Boone, R.B.** 2019. Agent-based modeling for natural resource management. Congress on Rangelands and Natural Protected Areas, Lima, Peru.
- Jablonski, K., P. Meiman, and **R.B. Boone**. 2018. An agent-based model of cattle grazing in Geyer larkspur habitat. Rangelands Conference, Sparks, Nevada.
- Boone, R.B.** 2018. Addressing sustainability in ecological and social systems using process- and agent-based modeling. Smithsonian, Virginia (Invited presentation)
- Boone, R.B.** 2017. Ecological and social simulation to address questions of sustainability. Anhui Agricultural University, Hefei, China. (Invited presentation)
- Blecha, K., **R.B. Boone**, and M. Aldridge. 2017. Hunger mediates apex predator's risk avoidance in wildlife-urban interface. 12<sup>th</sup> Mountain Lion Workshop, Estes Park, Colorado.
- Walton, T. and **R.B. Boone**. 2016. Analyzing wildlife behavior and effects of humans on activity in southwest Kenya. CSU Celebrate Undergraduate Research and Creativity, Fort Collins, Colorado.
- Boone, R.B.** 2016. Using coupled ecosystem and household simulation models to link pastoral decision making and ecosystem services. Ecological Society of America, Fort Lauderdale, Florida. (Invited presentation)
- Boone, R.B.** 2016. Exploring semi-arid and arid rangeland dynamics across scales through simulation. University of Queensland, Brisbane, Australia. (Invited presentation)
- Lesorogol, C., L. Iannotti, and **R. Boone**. 2016. Strengthening pastoralist resilience in Kenya using improved dairy goats. Society for Economic Anthropology, Athens, Georgia.
- Boone, R.B.** 2016. Introduction to remote sensing. BANR Teaching Seminar, Fort Collins, Colorado. (Invited presentation)
- Hatcher, E., M.M. Glantz, **R.B. Boone**, and A. Bliss. 2016. An agent-based approach: simulating ancient human dispersal in Pleistocene Eurasia. American Association of Physical Anthropologists, Atlanta, Georgia.
- Boone, R.B.**, J. Stabach, and C. Lesorogol. 2015. Effects of fragmentation on large herbivores under variable climates. Ecological Society of America, Baltimore, Maryland. (
- Moore, J., **R.B. Boone**, and P. de Ruiter. 2015. Complexity and stability in trophic networks. Ecological Society of America, Baltimore, Maryland.

- Stabach, J.A., **R.B. Boone**, J.S. Worden, and G. Florant. 2015. Habitat disturbance effects on the physiological stress response in resident white-bearded wildebeest. Ecological Society of America, Baltimore, Maryland.
- Boone, R.B.** 2015. Effects of fragmentation on rangelands. Workshop on Rangeland Management, Qinghai Province, China
- Boone, R.B.** and M. Richmond. 2015. Gnu views on experiences and learning. NREL Spring Seminar Series.
- Blecha, K. and **R.B. Boone**. 2014. Wildlife camera trapping: variables influencing encounter rates in occupancy, relative abundance indices, and habitat selection. Colorado Chapter of the Wildlife Society Annual Winter Meeting, Fort Collins
- Sircely, J., R. Conant, and **R. Boone**. 2014. Site and regional validation of G-Range - a new global ecosystem model for rangelands (J. Sircely, R. Conant, and R. Boone). Solution-based Approaches to Sustainability and Development Symposium, Fort Collins
- Boone, R.**, J. Stabach, R. Lilieholm, M. Johnson, S. Meyer, J. Worden, R. Reid, M. Said, S. Kifugo, and S. Sader. 2014. Modeling effects of fragmentation and drought frequency on wildebeest populations. Solution-based Approaches to Sustainability and Development Symposium, Fort Collins
- Blecha, K.A., **R.B. Boone**, and M.W. Aldridge. 2014. Improvements on GPS location cluster analysis techniques for predicting feeding activities. Eleventh Mountain Lion Workshop, Cedar City, Utah
- Ernakovich, J.G., **R.B. Boone**, C. Boot, K. Deneff, J. M. Lavalley, J. C. Moore, and M.D. Wallenstein. 2014. The SUPER Program: a research-based undergraduate experience. American Geophysical Union, San Francisco, California
- Stabach, J., **R.B. Boone**, G. Wittemyer, and J.G. Hopcraft. 2014. Mixed movement strategies in Kenyan white-bearded wildebeest (*Connochaetes taurinus*). Graybill/ENVR Conference, Fort Collins.
- Boone, R.B.** 2011. Agent-based modeling in ecological and conservation applications. Faculty-Graduate Student Seminar Series, Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, Colorado, November 11.
- Boone, R.B.** 2011. Exploring rangeland futures using coupled natural and human simulation models. Colorado Conference on Earth System Governance, Colorado State University, Fort Collins, Colorado, May 18. (Invited presentation)
- Boone, R.B.** 2010. Spatial analysis to support ecological and social simulation. Presentation at the Innovations in Geographic Information Science (GIS) Retreat, sponsored by the Information Science & Technology Center (ISTeC), Colorado State University, Fort Collins, Colorado, February 8. (Invited presentation)