KATHY ZELLER

Massachusetts Cooperative Fish and Wildlife Research Unit
160 Holdsworth Way
Amherst, MA 01003-9285
(406) 546-4154
kathyzeller@gmail.com

ACADEMIC EMPLOYMENT & EDUCATION

Postdoctoral Researcher 2017 – present
Massachusetts Cooperative Fish and Wildlife Research Unit
University of Massachusetts, Amherst
"Modeling black bear and moose habitat use and movement in response to human development"

Postdoctoral Researcher 2016 - 2017
Biology Department
San Diego State University
"Planning for Wildlife Movement Across SR-67, San Diego County, California, USA"

Ph.D. in Wildlife, Fish and Conservation Biology 2016
Department of Environmental Conservation
University of Massachusetts, Amherst
"Evaluating resistance surfaces for modeling wildlife movement and connectivity"

M.S. in Environmental Studies 2003
Department of Environmental Studies
University of Montana
"Using the Jaguar (*Panthera onca*) for Biodiversity Conservation Planning in Central America"

B.S. in Biology 1997
Tufts University

PUBLICATIONS

Peer-Reviewed Articles

Jennings, M.K., **K.A. Zeller**, R. Lewison. *In review*. Comprehensive multi-species connectivity planning: Putting available data to work.

Bosco, L., S.A. Cushman, H.Y. Wan, **K.A. Zeller**, R. Arlettaz, A. Jacot. *In review*. Habitat amount modulates the effects of fragmentation: the conservation perspective from a farmland passerine.

Zeller, K.A., D.W. Wattles, S. DeStefano. 2019. American black bears (*Ursus americanus*) alter movements in response to anthropogenic features with time of day and season. *Movement Ecology*. https://doi.org/10.1186/s40462-019-0166-4

Zeller, K.A., D.W. Wattles, S. DeStefano. 2018. Predicting moose-vehicle collisions in Massachusetts, USA: Incorporating road crossing data into collision risk models. *Environmental Management* 62: 518-528. https://doi.org/10.1007/s00267-018-1058-x

Wattles, D.W., **K.A. Zeller**, S. DeStefano. 2018. Range expansion in unfavorable environments through behavioral adaptation to microclimates: moose (*Alces americanus*) as the model. *Mammalian Biology*. https://doi.org/10.1016/j.mambio.2018.05.009

Zeller, K.A., M.K. Jennings, T.W. Vickers, H.B. Ernest, S.A. Cushman, W.M. Boyce. 2018. Are all data types and connectivity models created equal? Validating connectivity approaches with dispersal data. *Diversity and Distributions* 24: 868-879. https://doi.org/10.1111/ddi.12742
*** Paper selected as Editor's Choice*

Jędrzejewski, W., H.S. Robinson, M. Abarca, **K.A. Zeller**, G. Velasquez, E. Paemelaere, J.F. Goldberg, E. Payan, R. Hoogesteijn, E.O. Boede, K. Schmidt, M. Lampo, A.L. Viloria, R. Carreño, N. Robinnson, P.M. Lukacs, J.J. Nowak, R. Salom-Pérez, F. Castañeda, V. Boron, H. Quigley. 2018. Estimating large carnivore populations at global scale based on spatial predictions of density and distribution – application to the jaguar (*Panthera onca). PLoS ONE* 13(3): e0194719. https://doi.org/10.1371/journal.pone.0194719

Wattles, D.W., **K.A. Zeller**, S. DeStefano. 2018. Response of moose to a high-density road network. *Journal of Wildlife Management* 82: 929-939. https://doi.org/10.1002/jwmg.21459

Petracca, L., J. Frair, J. Cohen, A.P. Calderón, J. Carazo-Salazar, F. Castañeda, D. Corrales-Gutiérrez, R. Foster, B. Harmsen, S. Hernández-Potosme, L. Herrera, M. Olmos, S. Pereira, H. Robinson, N. Robinson, R. Salom-Pérez, Y. Urbina, **K.A. Zeller**, H. Quigley. 2018. Robust inference on large-scale species habitat use using interview data: The status of jaguars outside protected areas in Central America. *Journal of Applied Ecology* 55: 723-734. https://doi.org/10.1111/1365-2664.12972

Zeller, K.A., T.W. Vickers, H.B. Ernest, W.M. Boyce. 2017. Multi-level, multi-scale resource selection functions and resistance surfaces for conservation planning: pumas as a case study. *PLoS ONE* 12(6): e0179570. https://doi.org/10.1371/journal.pone.0179570

Zeller, K.A., K. McGarigal, S.A. Cushman, P. Beier, T.W. Vickers, W.M. Boyce. 2017. Sensitivity of resource selection and connectivity models to landscape definition. *Landscape Ecology*. https://doi.org/10.1007/s10980-017-0489-8

Olsoy, P.J., **K.A. Zeller**, J.A. Hicke, H.B. Quigley, A.R. Rabinowitz, D.H. Thornton. 2016. Quantifying the effects of deforestation and fragmentation on a range-wide conservation plan for jaguars. *Biological Conservation* 203: 8-16. https://doi.org/10.1016/j.biocon.2016.08.037

Zeller, K.A., K. McGarigal, P. Beier, S.A. Cushman, T.W. Vickers, W.M. Boyce. 2016. Using step and path selection functions for estimating resistance to movement: pumas as a case study. *Landscape Ecology* 31: 1319-1335. https://doi.org.10.1007/s10980-015-0301-6

McGarigal, K., **K.A. Zeller**, S.A. Cushman. 2016. Multi-scale habitat selection modeling: Introduction to the special issue. *Landscape Ecology* 31: 1157-1160. https://doi.org/10.1007/s10980-016-0388-4

McGarigal, K., H.Y. Wan, **K.A. Zeller**, B.C. Timm, S.A. Cushman. 2016. Multi-scale habitat modeling: A review and outlook. *Landscape Ecology* 31: 1161-1175. https://doi.org/10.1007/s10980-016-0374-x

Zeller, K.A., T. G. Creech, K.L. Millette, R.S. Crowhurst, R.A. Long, H.H. Wagner, N. Balkenhol, E.L. Landguth. 2016. Using simulations to evaluate Mantel-based methods for assessing landscape resistance to gene flow. *Ecology and Evolution* 6 (12): 4115-4128. https://doi.org/10.1002/ece3.2154

Thornton, D., **K.A. Zeller**, C. Rondinini, L. Boitani, K. Crooks, C. Burdett, H. Quigley. 2016. Assessing the umbrella value of a range-wide conservation network for jaguars (*Panthera onca*). *Ecological Applications* 26: 1112-1124. https://doi.org/10.1890/15-0602

Zeller, K.A., K. McGarigal, P. Beier, S.A. Cushman, T.W. Vickers, W.M. Boyce. 2014. Sensitivity of landscape resistance estimates based on point selection functions to scale and behavioral state: pumas as a case study. *Landscape Ecology* 29: 541-557. https://doi.org/10.1007/s10980-014-9991-4

Zeller, K.A., K. McGarigal, A. Whiteley. 2012. Estimating landscape resistance to movement: A review. *Landscape Ecology* 27:777-797. https://doi.org/10.1007/s10980-012-9737-0

Zeller, K.A., S. Nijhawan, J. Hines, R. Salom-Perez, S. Hernandez. 2011. Integrating Site Occupancy Modeling and Interview Data for Identifying Jaguar (*Panthera onca)* Corridors: A case study from Nicaragua. *Biological Conservation* 144: 892-901. https://doi.org/10.1016/j.biocon.2010.12.003

Salom-Pérez, R., J. Polisar, H. Quigley, **K.A. Zeller.** 2010. Iniciativa del Corredor del Jaguar: Un Corredor Biológico y un Compromiso a Largo Plazo para la Conservación. *Mesoamericana* 14: 25-34.

Rabinowitz, A., **K. A. Zeller**. 2010. A Range-wide model of landscape connectivity and conservation for the jaguar, *Panthera onca*. *Biological Conservation* 143: 939-945. https://doi.org/10.1016/j.biocon.2010.01.002

Zeller, K.A. 2007. *Jaguars in the New Millennium Data Set Update: The State of the Jaguar in 2006*. Wildlife Conservation Society Report. Bronx, NY.

Book Chapters

Zeller, K.A, A. Rabinowitz, R. Salom-Perez, H.Quigley. 2013. The Jaguar Corridor Initiative: A range-wide conservation strategy. In M. Ruiz-Garcia and J.M. Shostell (Eds.) *Molecular*

Population Genetics, Evolutionary Biology and Biological Conservation of Neotropical Carnivores. Nova Publishers. Pp. 629-658.

Cushman, S.A., B. McRae, F. Adriaensen, P. Beier, M. Shirley, **K.A. Zeller**. 2013. Biological Corridors and Connectivity. In D. MacDonald and K. Willis (Eds.) *Key Topics in Conservation Biology 2.* Wiley-Blackwell. Pp. 384-404.

Zeller, K.A., A. Rabinowitz. 2011. Using Geographic Information Systems for Range-wide Species Conservation Planning. In C.J. Dawsen (Ed.) *Geographic Information Systems*. Nova Publishers. Pp. 85-105.

Popular Articles/Chapters

Zeller, K.A. M.K. Jennings, T.W. Vickers, H.B. Ernes, S.A. Cushman, W.M. Boyce. 2018. How should we be modeling connectivity for wild felids? Wild Felid Monitor. Summer, 2018.

Zeller, K.A. *2018.* Which data types and connectivity algorithms best capture individual movement? Conservation Corridor. April 17, 2018. https://conservationcorridor.org/2018/04/which-data-types-and-connectivity-algorithms-best-capture-individual-movement/

Zeller, K.A. 2016. What is the best approach to estimate resistance? *Conservation Corridor*. May 10, 2016. http://conservationcorridor.org/2016/05/what-is-the-best-approach-to-estimate-resistance/.

Zeller, K.A. 2009. Mountain lions in Iowa? Maybe next year. *The Huffington Post*. December 18, 2009. http://www.huffingtonpost.com/alan-rabinowitz/mountain-lions-in-iowa-ma_b_397106.html.

Zeller, K.A. 2009. Panthera launches Jaguar Corridor Initiative. *Cat News* 50: 28-29.

Marieb, K.A. 2006. Tracking Hope. In J. Bove (Ed.) A Mile in Her Boots: *Women Who Work in the Wild.* Solas House, Palo Alto, California. pp. 160-166.

PRESENTATIONS

Invited Presentations – Scientific Meetings

Zeller, K.A., M.K. Jennings, T.W. Vickers, H.B. Ernest, S.A. Cushman, W.M. Boyce. A comparison of data types and connectivity models for capturing dispersal movement in large carnivores. The Wildlife Society Annual Conference. October 7-11, 2018, Cleveland, Ohio, U.S.

Zeller, K.A., M. Jennings. Capturing species-specific connectivity with land facets. The Wildlife Society Annual Conference. September 23-27, 2017, Albuquerque, New Mexico, U.S.

Zeller, K.A., M. Jennings, T.W. Vickers, W.M. Boyce. From ensemble species distribution models to ensemble corridors: A case study from San Diego County. International Urban Wildlife Conference. June 4-7, 2017, San Diego, California, U.S.

Zeller, K.A. K. McGarigal, P. Beier, S.A. Cushman, T.W. Vickers, W. Boyce. Sensitivity of Step Selection Functions and Resistance Estimates to GPS Collar Sampling Intensity. North American Congress for Conservation Biology. July 13-16, 2014, Missoula, Montana, U.S.

Zeller, K.A., S. Nijhawan, J. Hines, R. Salom-Perez, S. Hernandez. Field validation of corridor models. Corridor Workshop, WildCRU. June 8-9, 2010, Oxford, UK.

Zeller, K.A. Assessing Jaguar Corridors In Central America. Plan de Conservacion Jaguares en Panama. February 23-24, 2010, City of Knowledge, Panama.

Zeller, K.A. 2008. Tiger Corridor Modelling. Tigers Forever Conference. July 26 - 31, 2008, Huai Kha Khaeng, Thailand.

Presentations – Scientific Meetings

Zeller, K.A., S.A. Cushman, C. Vojta. Multi-scale habitat associations for eight species in the Great Basin Ecoregion. North American Regional Association of the International Association for Landscape Ecology. April 7-11, 2019, Fort Collins, Colorado. U.S.

Zeller, K.A., D. Wattles, S. DeStefano. Modeling road crossings for moose (*Alces americanus*) and black bear (*Ursus americanus*) in Massachusetts, USA. Northeast Transportation and Wildlife Conference. September 10-12, 2018, Amherst, Massachusetts, U.S.

Zeller, K.A., T.W. Vickers, H.B. Ernest, W.M. Boyce. Integrating habitat use and movement across space and time to create a multi-level, multi-scale conservation plan for puma in Southern California. International Urban Wildlife Conference. June 4-7, 2017, San Diego, California, U.S.

Zeller K.A., K. McGarigal, S.A. Cushman, P. Beier, T.W. Vickers, W. Boyce**.** Sensitivity of Resource Selection and Connectivity Models to Landscape Definition. US Regional Association of the International Association for Landscape Ecology. April 5-7, 2016, Asheville, North Carolina. U.S.

Zeller, K.A. K. McGarigal, P. Beier, S.A. Cushman, T.W. Vickers, W. Boyce. Evaluating resistance surfaces for wildlife. International Association for Landscape Ecology World Congress. July 5-10, 2015, Portland, Oregon, U.S. ** *Honorable Mention Student Presentation Competition*

Zeller, K.A., K. McGarigal, P. Beier, S.A. Cushman, T.W. Vickers, W. Boyce. The importance of scale and behavioral state in puma resource selection functions. Eleventh Mountain Lion Workshop: Integrating Scientific Findings Into Management. May 12-15, 2014, Cedar City, Utah, U.S.

Zeller, K.A., K. McGarigal, P. Beier, S.A. Cushman, T.W. Vickers, W. Boyce. Effect of GPS collar sampling intensity on habitat selection inference: Mountain lions as a case study. International Congress for Conservation Biology. July 21-25, 2013, Baltimore, Maryland, U.S.

Zeller, K.A., A. Rabinowitz. Range-wide landscape connectivity for the jaguar, Panthera onca. Latin American International Association of Landscape Ecology Conference: Landscape Ecology in Latin America: Challenges and Perspectives. October 4-7, 2009, Campos do Jordao, Brazil.

Zeller, K.A., S. Nijhawan, J. Hines, R. Salom-Perez, S. Hernandez. 2009. A new method for identifying jaguar corridors in the field. MesoAmerican Society for Biology and Conservation. October 26-30, 2009, Belize City, Belize.

Zeller, K.A., J. Polisar, R.Salom-Perez. 2008. Jaguar Dispersal Corridors: Making the maps a reality. Society for Conservation Biology 2008 Annual Meeting. July 13-17, 2008, Chattanooga, Tennessee.

Rabinowitz, Alan, **K.A. Marieb**, K. Conforti. 2006. Connecting the dots: Preserving genetic continuity of the jaguar throughout its range. Carnivores Conference 2006. November 12-15, 2006, St. Petersburg, Florida.

Marieb, K.A. 2006. Jaguars in the New Millennium Data Set and Jaguar Corridor Initiative. Congreso de la Socieded Mesoamericana para la Biología y la Conservación. November 1, 2006, Guatemala City, Guatemala.

Invited Seminars and Lectures

Zeller, K.A. 2019. Estimating Wildlife Connectivity for Conservation Planning. Department of Fish Wildlife and Conservation Biology, Colorado State University, Fort Collins, Colorado.

Zeller, K.A. 2018. Estimating Wildlife Connectivity for Conservation Planning. Department of Biological Sciences, CalPoly, San Luis Obispo, California.

Zeller, K.A. 2018. Modeling moose and black bear movement in Massachusetts. The Nature Conservancy workshop for the Berkshire Wildlife Linkages Partnership. Westfield State University.

Zeller, K.A. 2017. Integrating habitat use and movement across space and time to create multi-level, multi-scale conservation models: A case study for puma in Southern California. Northern Arizona University, Forestry Seminar National Speaker.

Zeller, K.A. 2014, 2015, 2016, 2017, 2018. The future of wildlife conservation. University of Massachusetts, Amherst.

Zeller, K.A. 2015. The Jaguar Corridor Initiative. University of Massachusetts, Amherst.

Zeller, K.A. 2012. The importance of connectivity for genetic health of wildlife populations. University of Massachusetts, Amherst.

Zeller, K.A. 2011. The Jaguar Corridor Initiative. The 92nd Street YMCA. New York, New York.

EMPLOYMENT

University of California, Davis September 2015 – March 2017
Wildlife Biologist; Used GPS telemetry and genetic data to model habitat patches, corridors, and road crossing locations for puma in southern California. Developed a multi-scale conservation network for puma, simulated development scenarios and their impacts to the puma population, and made land use planning and management recommendations to county planners and conservation organizations.

Panthera, New York, New York September 2011 – December 2014
Environmental Consultant, Landscape Analysis Lab; Designed and implemented statistical and geospatial analyses to estimate jaguar habitat use and connectivity for applied conservation efforts.

Panthera, New York, New York July 2008 – August 2011
Research Coordinator, Landscape Analysis Lab; Managed geospatial analysis laboratory. Designed and implemented spatial analyses to help develop range-wide conservation strategies for jaguars, snow leopards, tigers, and lions. Aided in the design and application of site-based conservation programs. Supervised and directed multiple project teams in the U.S. and abroad. Managed project budgets.

Wildlife Conservation Society, Bronx, New York January 2004 – June 2008
Wildlife Consultant, Jaguar Conservation Program; Performed geographically-based analysis of jaguar populations and corridors throughout jaguar range. Prioritized areas for site-based conservation efforts.

Whatcom Land Trust, Bellingham, Washington June – August 2002
Environmental Consultant; Developed region-wide habitat conservation plan for the Cascades to Chuckanut Corridor area.

The Sierra Club, Montana Chapter, Missoula, Montana September 2001 – May 2002
Environmental Consultant; Analysis of Kootenai and Lolo National Forests for both non-inventoried and inventoried roadless area value based on elk and grizzly bear habitat needs. Examined National Forest environmental impact statements for post burn salvage logging operations.

Washington State University, Pullman, Washington May – October 2000
Grizzly Bear Research Field Coordinator, School of the Environment; Trained and led field and laboratory research teams in a non-invasive hair sampling survey for grizzly bears in the North Cascades.

United States Forest Service, Glacier, Washington May – October 1999
Field Technician; Set up, checked, and collected hair from scratch pad survey for Lynx in the North Cascades.

Yale University, New Haven, Connecticut May – October 1997
Research Assistant, School of Forestry and Environmental Studies; Participated in ecological baseline study of the Kenai Peninsula and Copper River Delta areas, silvicultural study of salvage logging in beetle killed Sitka spruce forests.

TEACHING EXPERIENCE

Instructor

University of Massachusetts, Amherst, Massachusetts Fall 2018
Co-Instructor, Research Concepts

University of Massachusetts, Amherst, Massachusetts Fall 2017
Co-Instructor, Conservation in Practice

University of Massachusetts, Amherst, Massachusetts Fall 2015
Wildlife Corridors for Conservation

EcoLand Consulting, Amherst, Massachusetts January 2013/2014/2015
Co-Instructor of a 2-week intensive Landscape Ecology course for federally-employed silviculturalists

Wild Rockies Field Institute, Missoula, Montana Seasonal 2004/2005/2006
Lead Field Instructor for college courses in ecology, conservation biology, natural history, and cultural history in both the U.S. and Mexico

Teaching Assistant

University of Massachusetts, Amherst, Massachusetts Fall 2012/2013/2014
Analysis of Environmental Data

University of Massachusetts, Amherst, Massachusetts Spring 2012
Landscape Ecology

University of Massachusetts, Amherst, Massachusetts Spring 2014
Applied Biostatistics

University of Montana, Missoula, Montana Fall 2001
Environmental Science

University of Montana, Missoula, Montana Spring 2002
Environmental Politics and Policy

FELLOWSHIPS & STUDENT AWARDS

Switzer Environmental Fellowship	2015-2016
AAUW Dissertation Fellowship	2015-2016
P.E.O. Scholar Award	2015-2016
University of Massachusetts Graduate School Fellowship	2015-2016
National Science Foundation Graduate Research Fellow	2011-2016
Paula Milner Scholarship	2012, 2016
Kaplan Graduate Award	2011-2015
University of Massachusetts Graduate School Fellowship	2011-2012
B. and B. Dawson Scholarship	2003
Doris Duke Conservation Fellow	2002

PROFESSIONAL AFFILIATIONS AND REFEREE

Officer
Treasurer, 2018-present, Spatial Ecology and Telemetry Working Group, The Wildlife Society

Member
IUCN Connectivity Conservation Specialist Group, IUCN World Commission on Protected Areas, Connectivity Policy Coalition, International Association of Landscape Ecology, Society for Conservation Biology, Wild Felid Research and Management Association, The Wildlife Society

Journal Referee
Biological Conservation, Conservation Biology, Diversity and Distributions, Ecological Applications, Ecological Modelling, Journal of Applied Ecology, Journal of Wildlife Management, Landscape Ecology, Landscape and Urban Planning, Methods in Ecology and Evolution, Molecular Ecology, Movement Ecology, Molecular Ecology Resources, Plos ONE, Wildlife Biology