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Paul C. Cross

Paul Chafee Cross

U.S. Geological Survey	Work: 406-994-6908
Northern Rocky Mountain Science Center	Cell: 406-581-1763
2327 University Way, Suite 2	pcross@usgs.gov
Bozeman, MT 59715 ht	tp://www.norock.usgs.gov/staff/pcross

Education

2005 **Ph.D. Envi. Sci., Policy & Mang.**, *University of California*, Berkeley, CA 1998 **B.A., Environmental Science**, *University of Virginia*, Charlottesville, VA

RESEARCH EXPERIENCE

WILDLIFE HEALTH RESEARCHER, USGS - BOZEMAN, MT 2005-present RESEARCH FELLOW, WILDLIFE CONSERVATION SOCIETY 2009-present FACULTY AFFILIATE, MONTANA STATE UNIVERSITY 2006-present RESEARCH FELLOW, MAMMAL RESEARCH INSTITUTE, UNIV. OF PRETORIA 2007-2010 GRADUATE STUDENT RESEARCHER, UC BERKELEY 1999-2005 RESEARCH ASSISTANT, UNIV. OF BOTSWANA Summer 1998 FIELD ASSISTANT, SMITHSONIAN INSTITUTE Summer 1997

PUBLICATIONS

Grey Literature Ebinger, MR & PC Cross. 2008. Surveillance for brucellosis in Yellowstone bison: The power of various strategies to detect vaccination effects. National Park Service, Mammoth, WY, YCR-2008-04. 69 pages. Conner, MM, JE Gross, PC Cross, MD. Samuel, DT McKinnon, MM Miller, & MR Ebinger. 2007. Scale-dependent approaches to modeling spatial epidemiology of chronic wasting disease. E-book publication. Utah Division of Wildlife Resources. <http://wildlife.utah.gov/diseases/cwd/e-book/> Cross, PC, S Creel, WH Edwards, V Ezenwa, E Maichak, B Scurlock, J. Rogerson. 2006. Ecology and epidemiology of elk brucellosis. In 2005 Greater Yellowstone Interagency Brucellosis Committee Annual Report. Pg 14-15. <http://gyibc.com>

PUBLISHED DATABASES

Cross, P.C. D. M. Heisey, J. A. Bowers, C. T. Hay, J. Wolhuter, P. Buss, M. Hofmeyr, A. Michel, R. Bengis, T. Bird, I. J. Whyte, J. T. Du Toit, and W. M. Getz. 2009. Buffalo herd tracking with VHF and GPS data. Movebank.org.

Cross PC, Heisey DM, Bowers JA, Hay CT, Wolhuter J, Buss P, Hofmeyr M, Michel AL, Bengis RG, Bird TLF, Du Toit JT, Getz WM (2008) Data from: Disease, predation and demography: assessing the impacts of bovine tuberculosis on African buffalo by monitoring at individual and population levels. Dryad Digital Repository. [doi:10.5061/dryad.5hh3h](https://doi.org/10.5061/dryad.5hh3h)

Gorsich EE, Ezenwa VO, Cross PC, Bengis RG, Jolles AE (2015) Data from: Context-dependent survival, fecundity, and predicted population-level consequences of brucellosis in African buffalo. Dryad Digital Repository. <http://dx.doi.org/10.5061/dryad.p6678>

STUDENTS

Angela Brennan. 2014. Broad-scale determinants of elk aggregation and brucellosis seroprevalence. Montana State University. Co-supervisor: Scott Creel. Tyler Creech. 2011. Heterogeneity in the fine-scale contact patterns of elk as determined by proximity collars. Montana State University. Co-supervisor: Scott Creel Victoria Forristal (formerly Patrek). 2009. Masters. Fat but not happy: The Effects of Supplemental Feeding on Stress Hormone Levels in Elk. Montana State University. Co-supervisors: Mark Taper, Scott Creel Craig Hay. 2006 Choice of Social environment of male buffalo (*Syncerus caffer*) in the Kruger National Park, South Africa. Tshwane University of Technology. South Africa. Co-supervisor: Paul Funston Chris Oosthuizen. 2006. Honour's thesis: Chemical immobilization of African buffalo (*Syncerus caffer*) in Kruger National Park: Evaluating effects on survival and reproduction. University of Pretoria. South Africa. Co-supervisor: Elissa Cameron

Field Supervisor Almberg, ES. Current PhD. Penn State University. Supervisor: Peter Hudson Manlove, K. Current PhD. Penn State University. Supervisor: Peter Hudson Bowers, JA. 2006. Master's thesis: Feeding patch selection of African Buffalo (*Syncerus caffer caffer*) in the central region of the Kruger National Park. Tshwane University of Technology. South Africa Tania Bird. 2004. Master's thesis: Influence of bovine tuberculosis (*Mycobacterium bovis*) on condition and reproductive success of females African buffalo (*Syncerus caffer*) in Kruger National Park. University of Pretoria. South Africa Shane Abeare. 2004. Master's thesis: Dry season habitat and patch selection by African buffalo herds: test of a new home range estimator. University of Pretoria. South Africa Valerio Macandza 2002. Master's thesis: Forage selection by African buffalo in the late dry season in two landscapes. Witwatersrand University. South Africa Alex Caron. 2001. Master's thesis: Ecological implications of bovine tuberculosis in African Buffalo. University of Pretoria. South Africa

TEACHING

Data Analysis and Multi-level / Hierarchical Modeling in Ecology (1 credit) Fall 2009. MSU. Modeling Infectious Disease (3 day workshop) 2009. Univ. of Montana. EcoLunch Seminar (1 credit) Fall 2008. MSU. I initiated this class to provide a venue for graduate students to get practice giving seminars and provide feedback on ongoing projects. Plant-Disease Invasion Seminar (informal graduate seminar). Fall 2006. MSU. Compared the approaches of plant and disease ecologists to non-native invasions. Wildlife Ecology (4 credits with lab) Spring 2005. Co-Lecturer UC Berkeley. Disease Ecology (1 credit) 2004. Co-supervised graduate seminar on disease ecology, UC Berkeley Modeling Infectious Disease (1 week short-course) 2001. Univ. of Witwatersrand, South Africa

Invited Classes Diseases of the GYE. 1 lectures per year for an introductory class on the GYE. MSU. Disease Ecology. 2 lectures per year for upper-level ecology students. MSU Philosophy of Science. 2007. 2 classes. MSU.

Teaching Assistant Natural Resource Modeling (3 credits) 2003. UC Berkeley

GRANTS & AWARDS

2014 USGS Performance Award 2013 USGS Performance Award National Institute for Mathematical and Biological Synthesis (NIMBioS) Workshop (Co-PI) ~\$60,000 NSF Dissertation Improvement Grant (Co-PI) \$19,343 USGS, PI \$ 98,000 Greater Yellowstone ecosystem disease research 2012 USGS Powell Center Grant, Co-PI (declined) USGS Performance Award USGS, PI \$75,000, Disease effects on Yellowstone Wolves. USFWS, PI\$45,000, Elk space-use of the National Elk Refuge. Morris Animal Foundation, Co-PI \$ 75,000, Developing an evidence base for managing bighorn sheep pneumonia. 2011 USGS Best Paper in Biology USGS Grade Promotion 2010 NSF-NIH Ecology of Infectious Disease Program, co-PI \$1,971,033, Effects of land-use, predation and management on wildlife contact and Brucella transmission in the Yellowstone Ecosystem USGS, PI \$75,000, Park Oriented Biological Support Grant: Effects of Sarcoptic Mange on Gray Wolves in Yellowstone National Park USGS Star Award for Performance 2009 USGS, PI \$39,000, Modeling environmental transmission of Chronic Wasting Disease USGS Star Award for Performance 2008 USGS, Co-PI \$320,000, Global Climate Change Initiative Co-PI \$112,180, Wyoming Livestock-Wildlife Disease Initiative Co-PI \$281,000, Wyoming Game and Fish Department: Tracking elk movements around the supplemental feedgrounds. 2007 USGS, Co-PI \$750,000 with Mary Poss (Penn State): Viral tracking of mule deer and elk. NPS, PI \$10,000: Brucellosis in Yellowstone National Park USGS Star Award 2006 USGS, PI \$210,000 for chronic wasting disease research. 2004, 2005 Graduate Assembly Travel Grant 2002-2004 Student Travel Grant 1999 NSF-NIH Ecology of Infectious Disease Grant. \$1.8 million. Initiated, co-authored, and developed the research program with Dr. Wayne Getz.

CONFERENCES & PRESENTATIONS

2014 Invited Speaker, Ecology Seminar, University of Sherbrooke, Canada Speaker, Montana Wildlife Society Meeting, Bozeman MT Invited Speaker, NIH Rocky Mountain Lab, Hamilton MT Invited Speaker, 18^o Congreso Chileno de Medicina Veterinaria, Santiago, Chile Invited Speaker, Dept. Seminar, Univ. Catolica, Valdivia, Chile Public Talk, Emerging wildlife pandemics, Menlo Park, CA 2013 Steering Committee & Invited Speaker. Foreign Animal Disease Preparedness, Shepardstown WV Speaker, Western States Deer and Elk Meeting, Missoula MT Invited Speaker. Interagency Bison Management Plan Meeting. Chico MT 2012 Invited Speaker. European Conservation Biology Meeting, Glasgow UK Poster, NSF Ecology of Infectious Disease Meeting, Berkeley, CA Invited Speaker & Workshop Participant, Bighorn Sheep disease ecology. Penn State Univ. State College PA 2011 Speaker, The Wildlife Society Annual Meeting, Hawaii Invited Speaker, Wildlife disease management workshop, Penn State Univ. Invited Speaker, Ecology and Evolution of Infectious Disease Meeting, Santa Barbara.

Invited Participant, NIH sponsored, Movement and the Spatial Dynamics of Mosquito-Transmitted Diseases Meeting, Washington D.C. 2010 Invited Keynote, Berryman Institute Biennial Meeting, Logan UT. Invited Participant, NIH sponsored, Movement and the Spatial Dynamics of Mosquito-Transmitted Diseases Meeting, Washington D.C. 2009 Kopriva Lecture [Invited] MSU College of

Arts and Science, Bozeman, MT Invited Speaker, Dept. Seminar, Colorado State University, Fort Collins, CO Invited Speaker, EcoHealth Student Chapter, Bozeman, MT Invited Speaker, 10th Biennial Conference of Research on the Colorado Plateau Speaker, Ecological Society of America, Albuquerque, NM 2008 Invited Speaker, Ecology Seminar, Montana State University, Bozeman MT Poster, Society for Conservation Biology Montana Chapter, University of Montana. 2007 Invited Speaker, Social networks in humans and wildlife workshop, Penn State Univ. Speaker, Jackson Hole Cooperative Elk Working Group, Jackson WY 2006 Speaker, Ecological Society of America, Nashville, TN. 2005 Speaker, Departmental Seminar, Montana State University Invited Speaker, International Mammal Conference, Sapporo Japan. 2005 Speaker, Kruger National Park Annual Meeting, South Africa. Speaker, University of California Wildlife Lunch, Berkeley CA. Speaker & Attendee, Chronic Wasting Disease Technical Workshop, Park City UT. Speaker, NSF-NIH Ecology of Infectious Disease Meeting, Falls Church VA. 2004 Best Poster, Wildlife Disease Association, San Diego CA. Attendee, Greater Limpopo Transfrontier Conservation Area AHEAD-WCS Meeting, Maputo, Mozambique 2003 Speaker, Animal Behavior Society, Boise ID. Poster, NSF-NIH Ecology of Infectious Disease Meeting, Bethesda MD. Invited speaker, Conservation Research Center Smithsonian Institute, Speaker, SF Bay Area Conservation Biology Symposium, Berkeley CA. 2002 Speaker, University of Pretoria, Department of Zoology Annual Meeting, Pretoria. Speaker, South African Wildlife Management Association Annual Meeting, Pretoria. Speaker, University of California Wildlife Lunch, Berkeley CA. 2001 Speaker, Wildlife Disease Association, Pilanesburg, South Africa. Speaker, University of Pretoria, Department of Zoology Annual Meeting, Pretoria. 1999 Poster, Wildlife Society, Population Viability Analysis, San Diego CA. 1998 Speaker, University of California Wildlife Lunch, Berkeley CA.

SERVICE

Ongoing

Associate Editor, Journal of Wildlife Management Red Wolf Recovery Implementation Team, USFWS. Northern Yellowstone Cooperative Wildlife Working Group. Chair, USGS Animal Use and Care Committee for NOROCK.

2014 Participant, Wildlife Conservation Society Wildlife Health Program, Internal Strategic Workshop for future research. 2013 Steering Committee, Group Leader & Speaker. Foreign Animal Disease National Preparedness Workshop. USGS/DHS/USDA/CDC. 2011 Member Environmental Health Strategic Science Planning Team Co-coordinator & originator, NIH & DHS RAPIDD Working group on cross-species transmission. 15 participants Participant, NIH & DHS RAPIDD Working group on movement and mosquito-borne diseases. USGS representative. Northern Rockies NEON committee. 2009 Organizer, Greater Yellowstone Brucellosis Research Meeting (2 days), 60 participants, 27 speakers, Bozeman MT Participant, Dept. of Interior Avian Influenza Preparedness workshop, Madison WI Participant, Yellowstone National Park Science Agenda Workshop, Bozeman MT 2008 Acting Chair, Northern Yellowstone Cooperative Wildlife Working Group. 2007 Steering Committee, Yellowstone National Park Wildlife Health Program Meeting. Participant, USDA workshop: The Science of Surveillance, Control and Eradication of Catastrophic Diseases in Wildlife, Pinagree Park CO 2006 Participant, Disease and conservation of mammals, Conservation International 2005-8 USGS representative. Greater Yellowstone Interagency Brucellosis Committee.

REVIEWER

Journals (since 2004): Nature [1], Ecol App [5], J Anim Ecol [1], J App Ecol [6], Proc Roy Soc B [2], Phil Trans Roy Soc B [2], Biol Letters [1], Cons Bio [2], Biol Cons [1], Anim. Cons. [1], Biodiv Cons [1], Behavior [1], Envi. Cons. [1], J Wildl Dis [4], Wildl Bio [2], PloS ONE [6], EcoHealth [2], J. Theo. Bio. [2], SA J Wildl Res [1], Ann Zoo Fennici [1], Ecol Mod [1], USGS FSP [9], USGS Study Plans [4].

Funding Agencies: National Science Foundation [2], Wildlife Conservation Society [1], Wellcome Trust [1], Biotechnology and Biological Sciences Research Council UK [1], Natural Environment Research Council UK [1], South African National Research Foundation [1], Alberta Prion Research Institute [2], National Institutes of Health [1]

PRESS & OUTREACH

Thermal Wolves The Wildlife Professional 2015 New Zealand Herald 2013 Discovery Channel Curiosity X-Ray Yellowstone 2012 Wired Magazine 2012 Science World Scholastic Magazine 2012 Billings Gazette 2010 Examiner.com 2010

www.yellowstonewolf.org www.gyeburcellosis.net

REFERENCES

Dr. Jeffrey Kershner, Center Director, Northern Rocky Mountain Science Center, USGS, 2327 University Way, Suite 2, Bozeman MT 59715. Phone: (406) 994-5304 Email: jkershner@usgs.gov

Mr. Brandon Scurlock, Brucellosis-Feedground-Habitat Supervisor, Wyoming Game and Fish Department, Pinedale Office, PO Box 850, Pinedale, WY 82941 Phone: (307) 367-4347ext224 Email: brandon.scurlock@wgf.state.wy.us

Dr. Doug W. Smith, Yellowstone Center for Resources, Wolf Project, Yellowstone National Park, WY 82190 Phone: (307) 344-2242 Email: doug_smith@nps.gov