

John A. Vucetich

*Assistant Professor, School of Forest Resources and Environmental Science,
Michigan Technological University, Houghton, MI 49931 USA
Phone: (906) 487-1711 FAX: (906) 487-2915 E-mail: javuceti@mtu.edu*

Research Interests

Demographic and genetic elements of population biology
Ecology of wolves and moose

Education

Ph.D., Forest Science, Michigan Technological University, 1999.
B.S., Biology, Michigan Technological University, 1994.

POSITIONS HELD

2006 – Research Assistant Professor, School of Forest Resources and Environmental Science, Michigan Technological University.
1999 – 2006: Research Assistant Professor, School of Forest Resources and Environmental Science, Michigan Technological University.
1996 – Visiting Scholar, Department of Zoology, Ohio State University, (Sponsor: Dr. P. Parker).

University Teaching Experience

Please see last page of CV for summary of teaching evaluations.

Isle Royale Field Ecology Camp (FW 4630), School of Forestry, 2000 – present.
Ecological Modeling (FW 4140), School of Forestry, 1999 – 2001.
Perspectives on Extinction & Loss of Biodiversity: a Freshman Seminar (UN1001), Fall 2000.
Conservation Biology (FW 341), School of Forestry, Spring 1998.
College Algebra (MA 130), Department of Mathematics, 1994 – 1996
Trigonometry (MA 131), Department of Mathematics, 1994 – 1996.

OUTREACH ACTIVITIES

- In 2004, I delivered public lectures on Isle Royale wolf-moose ecology to >500 people from the general public, including several high school venues.
- Developed and currently maintain a webpage on Isle Royale wolf-moose ecology. The webpage is used by many educators and people from the general public.
- Co-Director/Coordinator for the Michigan Summer Institute for Wildlife and Forest Ecology, 1998, 1999, 2000. (As a result of this experience, several high school participants eventually enrolled at MTU).
- Instructor for the USDA Forest Service Program of Advanced Studies in Silviculture, May 1998, 2000, 2002.
- Leader of Earthwatch expeditions investigating wolf-moose biology in Isle Royale Nat. Park.
- Founder and President of the Michigan Tech. Univ. Chapter of the Society for Conservation Biology, 1997-1998.

Professional ACADEMIC experiences

- 2004, Visiting Scholar, Yellowstone National Park (D. Smith)
- 2003, invited to participate in a working group at the National Center for Ecological Analysis and Synthesis (NCEAS, Santa Barbara, CA). Working group topic: *foodweb dynamics*
- 2002-03, invited to participate in a working group at the National Center for Ecological Analysis and Synthesis (NCEAS, Santa Barbara, CA). Working group topic: *ungulate population dynamics*
- Invited talks:
 - 2005, International Wolf Conference, Colorado Springs, Co.
 - 2005, Nat'l Marine Fisheries Serv, Santa Cruz Laboratory & Univ Calif, Santa Cruz (M Mangel)
 - 2005, Dept of Biology, Central Michigan University (B Swanson)
 - 2004, Dept of Theoretical Ecology, Lund University (P Lundberg)
 - 2004, Dept of Conservation Biology, Uppsala Univ (O Liberg),
 - 2004, Dept of Philosophy, Univ Wis-SP (M Nelson)
 - 2001, Canid Conservation Conference, IUCN/SSC Canid Specialist Group, London (D. MacDonald)
- Peer-reviewer – In a typical year, I review 6 manuscripts or proposals. Some of the Journals and Agencies for which I reviewed include: National Science Foundation, Ecology, Animal Conservation, Bioscience, Conservation Biology, Conservation Genetics, Journal of Wildlife Management, Proceedings of the Royal Society of London.
- Currently, I co-curate the world's largest collection of moose skeletal material (skulls or other bones from more than 3500 moose). The collection is widely known among mammal researchers and a potential source of much future research.
- Awarded “Outstanding Graduate Student Research Award” by the Dept of Mathematical Sciences, MTU, 1994-95.
- Awarded “Outstanding Contribution to Wildlife Management by an Undergraduate” by the Mich Chapter of Wildlife Society, 1992.

Professional MANAGEMENT experiences

- 2003 – present, Current member of the USFWS's Mexican Wolf Recovery Team – this team fulfills requirements stipulated by the Endangered Species Act to develop recovery criteria and a recovery plan.
- 2000-present, Serve the Michigan DNR in monitoring annual rates of human-caused mortality on wolves in Upper Michigan.
- 2000-2001, Served the IUCN's Conservation Breeding Specialist Group in public forums and data analyses that ultimately lead to the institution of a buffer zone surrounding Algonquin provincial park.
- 2000, Served the IUCN's Conservation Breeding Specialist Group in public forums and data analyses to assess the biological and social feasibility of reintroducing wolves to the Southern Rocky Mountain region.

Six most Significant research contributions

- Vucetich et al. (1997, *Evolution*) significantly advanced theoretical and empirical understanding of how fluctuations in population size affect the rate at which populations lose genetic diversity.
- Vucetich and Waite (1999, *Cons Biol*) developed theory providing the first and only general explanation for the existence of a mechanism necessary (not sufficient) for thinking that genetic deterioration may *generally* be expected to affect extinction risk.
- Vucetich et al. (2000, *Cons Biol*) explained what had been a paradoxical and general observation that populations with increased variability had *reduced* extinction risk.
- Vucetich et al. (2002, *Ecology*) provide the first and only significant demonstration that predator kill rates (functional response) are better described by ratio dependency than by prey dependency for a 'natural' (i.e., non-laboratory) population.
- Vucetich et al. (2004, *Anim Behav*) demonstrated that existing explanations for why wolves live in packs are inadequate, and how species that scavenge wolf-killed prey can explain the benefit of group living among wolves. This paper received press coverage from regional and national media including *Science News*, the CBC production, *Quirks & Quarks*, *Natural History*, & *USA Today*.
- Vucetich and Peterson (2004, *Proc Royal Soc., Lond.*) demonstrated that fluctuations in Isle Royale moose abundance from one year to the next are influenced more by abiotic (climate) factors than by biotic (predation, forage) factors. The result is distinctive, in part, because: *i*) recent research assessments of terrestrial, vertebrate systems have focused on the relative influences among biotic factors, and *ii*) it is based on an unmanipulated system that had been observed for >45 years.
- Vucetich et al. (in press, *Oikos*) demonstrated that wolf predation is not necessary to explain the 50% decline that Yellowstone elk have experienced since wolves were introduced in 1995. Human harvest and drought represent better explanations of the decline. This analysis represents the significant support for managers' planned decision to dramatically reduce harvest of Yellowstone elk.

Peer-reviewed publications

31 peer-reviewed articles published or in press; 4 articles are in-review; 17 senior-authored articles
 These publications have been cited, in total, >200 times.
 Undergraduate, senior-authors are indicated by an '*'.

In preparation:

Vucetich JA & P Lundberg. The consumption theory of populations and food webs. *Target Journal: Oikos*.

Giardina, CP & JA Vucetich. The effect of temperature on soil decomposition: Meta-analysis of field and laboratory results. *Target journal: Ecology*

* Erickson, M, JA Vucetich, LM Vucetich, & RO Peterson. Moose preference for balsam fir in relation to balsam fir abundance and forage quality. *Target Journal: Ecology*.

Brodeur-Campbell, S, C.-J. Tsai, JA. Vucetich, & TA Waite. Insect herbivory on low-lignin transgenic aspen. *Target Journal: Oecologia*.

Huntzinger, BA, JA Vucetich, & RO Peterson. The effect of snow depth and study duration on estimates of winter kill rate by wolves (*Canis lupus*). *Target Journal: Can. J. Zool.*

Kaplan JD, K Tischler, D McCormick, JA Vucetich, & LM Vucetich. The impact of human disturbance on loon fledging rate. *Target Journal: J. Wildlife Manag.*

In review:

Vucetich, JA, RO Peterson, P Outridge, & R Eide. Mercury in moose teeth declines dramatically following enactment of anti-pollution regulations. *Science*.

Vucetich, JA. and MP Nelson. Distinguishing experiential and physical conceptions of wilderness. In Nelson MP and Callicott JB (eds), *The Great New Wilderness Debate*, Vol. 2. University of Georgia Press. (This is an invited essay.)

Published & in press:

Waite, T. A., Vucetich, J., Saurer, T., Kroninger, M., Vaughn, E., Field, K. & Ibarguen, S., 2005. Minimizing extinction risk through genetic rescue. *Animal Biodiversity and Conservation* 28(2): 121–130.

Vucetich, JA, MP Nelson, & MK Phillips. 2006. The normative dimension and legal meaning of 'endangered' and 'recovery' within the United States' Endangered Species Act. *Conservation Biology in press*

Wilmers, CC, ES Post, RO Peterson, & JA Vucetich. 2006. Disease mediated switch from top-down to bottom-up control exacerbates climatic effects on moose population dynamics. *Ecology Letters. In press.*

Theberge JA, Theberge, MT, JA Vucetich, & PC Paquet. 2006. Pitfalls of Applying Adaptive Management to a Wolf Population in Algonquin Provincial Park, Ontario. *J Environ Management, in press.*

Potvin, MJ, T Drummer, J. A. Vucetich, D. E. Beyer, R. O. Peterson, J. H. Hammill. 2005. Monitoring and habitat analysis for wolves in Upper Michigan. *J. Wildl Manag.* 69(4)

Vucetich, JA, DW Smith, & DR Stahler. 2005. Influence of harvest, climate, and wolf predation on Yellowstone elk, 1961-2004. *Oikos, in press.*

Jost, C, G Devulder, JA Vucetich, R Peterson, & R Arditi. 2005. The wolves of Isle Royale display scale-invariant satiation and density dependent predation on moose. *J. Anim. Ecol.*, 74 (5): 809-816

* Potvin, MJ, RO Peterson, & JA Vucetich. 2004. Wolf Homesite Attendance Patterns. *Can. J. Zool* 82:1512-1518.

Lotts, KC, TA Waite, & JA Vucetich. 2004. Reliability of absolute and relative predictions of population persistence based on time series. *Conservation Biology* 18(5):1224-1232.

Vucetich, JA & RO Peterson. 2004. The influence of prey consumption and demographic stochasticity on population growth rate of Isle Royale wolves (*Canis lupus*). *Oikos* 107:309-320.

Vucetich, JA, & RO Peterson. 2004. The influence of top-down, bottom-up, and abiotic factors on the moose (*Alces alces*) population of Isle Royale. *Proceeding Royal Soc Lond, B* 271:183-189.

Vucetich, JA, RO Peterson, & TA Waite. 2004. Raven scavenging favours group foraging in wolves. *Animal Behaviour* 67:1117-1126.

Vucetich, JA & RO Peterson. 2004. Long-term population and predation dynamics of wolves on Isle Royale. Pages 281-292 in *Biology and Conservation of Wild Canids*, edited by D. Macdonald & C. Sillero-Zubiri, Oxford University Press.

Peterson, RO, JA Vucetich, RE Page, & A Chouinard. 2003. Temporal and spatial aspects of predator-prey dynamics. *Alces*, 39:215-232.

Vucetich, JA & TA Waite. 2003. Spatial patterns of demography and genetic processes across the species' range: Null hypotheses for landscape conservation genetics. *Conservation genetics* 4(5): 639-645.

- Nagel, LM, JA Vucetich, DD Reed, GD Mroz, & H Parn. 2003. Woody biomass and annual production across a latitudinal gradient in northern Scots pine (*Pinus sylvestris*) forests. *Polish J Ecology* 51(4):471-479.
- Oelfke J, RO Peterson, JA Vucetich, & LM Vucetich. 2003. Wolf handling at Isle Royale: Can we find another approach? *George Wright Society* 20(3):50-58.
- Post ES, N.-C. Stenseth, RO Peterson, JA Vucetich & Ellis. 2002. Phase dependence and population cycles in a large mammal predator-prey system. *Ecology* 83(11): 2997-3002.
- Vucetich, JA, RO Peterson, & CL Schaefer. 2002. The effect of prey and predator densities on wolf predation. *Ecology* 83(11): 3003-3013.
- Krzys, G, TA Waite, M Stapanian, & JA Vucetich. 2002. Assessing avian richness in remnant wetlands: towards an improved methodology. *Wetlands* 22(1):186-190.
- Vucetich, JA & TA Waite. 2001. Migration and inbreeding: the importance of recipient population size for genetic management. *Conservation Genetics* 2(2):167-171.
- Vucetich, LM, Vucetich, JA, Cleckner, LB, Gorski, PR, & RO Peterson. 2001. Mercury concentrations in deer mouse (*Peromyscus maniculatus*) tissues from Isle Royale National Park. *Environmental Pollution* 14(1):113-118.
- Vucetich, LM, Vucetich, JA, Waite, TA, Joshi, CP, & RO Peterson. 2001. Genetic (RAPD) diversity in *Peromyscus maniculatus* in a naturally fragmentation landscape. *Molecular Ecology* 10(1):35-40.
- Vucetich, JA & TA Waite. 2000. Is one migrant per generation sufficient for the genetic management of fluctuating populations? *Animal Conservation* 3:261-266.
- Vucetich, JA, TA Waite, L Qvarnemark, & S Ibarguen. 2000. Population variability and extinction risk. *Conservation Biology* 14(6):1704-1714.
- Vucetich, JA, DD Reed, A Breyermeier, M Degorski, GD Mroz, J Solon, E Roo-Zielinska, & R Noble. 2000. Carbon pools and ecosystem properties along a latitudinal gradient in high latitude Scots pine (*Pinus sylvestris*) forests. *Forest Ecology & Management* 136:135-145.
- Vucetich, JA, & S Creel. 1999. Ecological interactions, social organization, and extinction risk in African wild dogs. *Conservation Biology*. 13(5): 1172-1182.
- Vucetich, JA & TA Waite. 1999. Erosion of heterozygosity in fluctuating populations. *Conservation Biology* 13(4):860-868.
- Vucetich, JA & TA Waite. 1998. On the interpretation and application of mean times to extinction. *Biodiversity and Conservation*. 7:1539-1547.
- Vucetich, JA & TA Waite. 1998. The number of censuses required for demographic estimation of the effective population size. *Conservation Biology* 12:1023-1030.
- Peterson, RO, NJ Thomas, JM Thurber, JA Vucetich, & TA Waite. 1998. Population limitation and the wolves of Isle Royale. *Journal of Mammalogy* 79(3):487-841.
- Vucetich, JA, TA Waite, & L Nunney. 1997. Fluctuating population size and the ratio of effective to census population size (N_e/N). *Evolution* 51(6):2017-2021.
- Vucetich, JA, RO Peterson, & TA Waite. 1997. Effects of social structure and prey dynamics on extinction risk in gray wolves. *Conservation Biology* 11:957-965.
- Thurber, JM, RO Peterson, JD Woolington, & JA Vucetich. 1992. Coyote coexistence with wolves on the Kenai Peninsula, Alaska. *Canadian Journal of Zoology* 70:2494-2498.