

COMMITTEE ON NATURAL RESOURCES
114th Congress Disclosure Form
As required by and provided for in House Rule XI, clause 2(g)(5)

September 21, 2016

“The Status of the Federal Government’s Management of Wolves”

For Individuals:

Name: **John A. Vucetich**

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For Witnesses Representing Organizations:

Name:

Name of Organization you are Representing at the Hearing:

Business Address:

Business Email Address:

Business Phone Number:

* * * * *

For Nongovernment Witnesses ONLY:

1. Please attach/include current curriculum vitae or resume.

My CV is attached to the 16 Sep 2016 email message to Megan Olmstead..

2. Please list any federal grants or contracts (including subgrants or subcontracts) related to the subject matter of the hearing that were received in the current year and previous two calendar years by you or the organization(s) you represent at this hearing, including the source and amount of each grant or contract.

National Science Foundation DEB-0918247

National Science Foundation DEB-1245335

Isle Royale National Park CESU Task Agreement No. P11AC90808

McIntyre-Stennis Grant USDANifa #224870 and USDA-Nifa#1004363

3. Please list any contracts or payments originating with a foreign government related to the subject matter of the hearing that were received in the current year and previous two calendar years by you or the organization(s) you represent at this hearing, including the amount and country of origin of each contract or payment.

JOHN A. VUCETICH

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I. SCHOLARLY PURSUITS

population biology, wolves and moose of Isle Royale, wolf-prey relationships

II. EDUCATION

1995 B.S., Biological Sciences, Michigan Technological University.

1999 Ph.D., Forest Sciences, Michigan Technological University.

(Dissertation topic: Demographic and genetic components of extinction risk.)

III. POSITIONS HELD

2015- present: Professor, Michigan Technological University, School of Forest Resources and Environmental Science

2011 – 2015: Associate Professor, Michigan Technological University, School of Forest Resources and Environmental Science

2006 – 2011: Assistant Professor, Michigan Technological University, School of Forest Resources and Environmental Science

2010 – present: Adjunct Faculty, Michigan State University, Department of Fisheries & Wildlife

1999 – 2006: Research Assistant Professor, Michigan Technological University, School of Forest Resources and Environmental Science

2004 – Visiting Scholar, Yellowstone National Park (worked in the park for 4 weeks with D. Smith)

1996 – Visiting Scholar, Department of Zoology, Ohio State University, (worked at OSU for one semester; Sponsor: Dr. P. Parker).

IV. UNIVERSITY TEACHING

A. Courses taught

Ethics, Natural Resources and the Environment (FW3115), School of Forest Resources & Environmental Science, MTU, 2013 – present.

Conservation Ethics (FW5180), School of Forest Resources & Environmental Science, MTU, 2006 – present (taught in alternate years).

Population Ecology (FW4260), School of Forest Resources & Environmental Science, MTU, 2006 – present.

Wildlife Ecology and Management (FW4610), School of Forest Resources & Environmental Science, MTU, 2011 – present.

Mammalogy (FW4240), School of Forest Resources & Environmental Science, MTU, 2006 – 2010.

Isle Royale Field Ecology Camp (FW4630), School of Forestry, MTU, 2000 – 2003.

Ecological Modeling (FW4140), School of Forestry, MTU, 1999 – 2001.

Perspectives on Extinction & Loss of Biodiversity: a Freshman Seminar (UN1001), MTU, Fall 2000.

Conservation Biology (FW341), School of Forestry, MTU, Spring 1998.

College Algebra (MA130), Department of Mathematics, MTU, 1994 – 1996.

Trigonometry (MA131), Department of Mathematics, MTU, 1994 – 1996.

B. Teaching Evaluations

This table reports overall average response of students to thirteen courses that I have instructed, FW4260 (2008-2013), FW4240 (2006-2010), FW4610 (2011), FW5180/FW4500 (2009, 2013). The scale is from 1 to 5.

4.7	class sessions were thought provoking	4.8	instructor welcomed student questions in class
4.2	grading policies were fair	4.8	instructor was enthusiastic about teaching the course material
4.4	instructor communicated course material clearly	4.4	instructor provided timely feedback on my work
4.4	instructor made students aware of specific course goals	4.1	I am more interested in this subject now than before I had taken this course
4.6	instructor explained importance of course material	4.5	taking everything into account, I consider this instructor to be an excellent teacher

C. Graduate Students & Post Doctoral Researchers, Supervised

Joseph Kaplan (graduated with M.S. in 2003)

- *Thesis*: Human recreation and loon productivity in a protected area, Isle Royale National Park.
- Kaplan's thesis was used to guide management decisions related to Isle Royale loons.
- *Current position*: Co-Director of Common Coast, a non-profit agency devoted to Loon research and Conservation.

Sarah Brodeur-Campbell (co-advised w/C.-J. Tsai, graduated with M.S. in 2004)

- *Thesis*: Insect herbivory on low-lignin transgenic aspen.
- Brodeur-Campbell's thesis resulted in Brodeur-Campbell et al. 2006. Environ. Entom. 35(6): 1696-1701.
- *Current position*: unknown.

Brett Huntzinger (co-advised w/Peterson, graduated with M.S. in 2006)

- *Thesis*: Sources of variation in wolf kill rates of white-tailed deer during winter in the U.P. Michigan.
- Huntzinger's thesis is the basis for a substantial portion of a manuscript that is currently in review at *Oecologia*: Vucetich, Huntzinger, Peterson, Hammill, Beyer. Intra-seasonal variation in kill rates and prey selection by wolves in Michigan. *Oecologia*.
- *Current position*: Field technician, U.S. Forest Service.

Melissa Watkins (graduated with M.S. in Dec 2009)

- Plan C, Course work degree.
- *Current position*: unknown.

Matt Metz (graduated with M.S. in April 2010)

- *Thesis*: Seasonal patterns in foraging and predation of gray wolves in Yellowstone National Park.
- Metz's thesis is the basis for a manuscript that was published in *Journal of Animal Ecology*: Metz, Vucetich, Smith, Stahler, Peterson. Effect of sociality and season on gray wolf foraging behavior: implications for estimating kill rate.
- *Current position*: Research Associate, Yellowstone Wolf Project.

Dan MacNulty (Post doctoral researcher, Mar 2007 – Mar 2010)

- *Research*: The population ecology of Yellowstone wolves.
- *Current Position*: Assistant Professor, Utah State University.

Jennifer Adams (Post doctoral researcher, Sept 2007- Aug 2010)

- *Research*: The population genetics of Isle Royale wolves.
- *Current Position*: Lab Manager, Lisette Waits Lab, Idaho State University.

Mark Romanski (graduated with M.S. in April 2010)

- *Thesis*: Double-count surveys and unexpectedly misleading estimates of sightability for beaver colonies.
- Romanski's thesis is the basis for a manuscript that is currently in review at *Wildlife Biology*: Romanski, Vucetich, Peterson, Smith. Double-count surveys and unexpectedly misleading estimates of sightability for beaver colonies.
- *Current Position*: Lead Biotechnician, National Park Service.

Ben Betterly (graduated with M.S. in Aug 2011)

- *Thesis topic*: The life history of compensatory growth in male and female moose.

Alessia Uboni (graduated with PhD in Dec 2012)

- *Thesis topic*: Habitat preferences of Yellowstone wolves.

Grace Parikh (graduated with M.S. in 2015)

- *Thesis topic*: The influence of diet composition and diversity on the nutritional status of moose – a polyphagus herbivore.

Andy Von Duyke (PhD student, 2012-present)

- *Thesis topic*: The foraging behavior of Isle Royale moose.

John Henderson (PhD student, 2013 - present)

- *Thesis topic*: Life history trade-offs and the foraging ecology of moose – a polyphagus herbivore.

Sarah Hoy (Post doctoral researcher, Sept 2015-present)

- *Research*: The population ecology of wolf-prey relationships in Yellowstone.

D. Other significant contributions to teaching

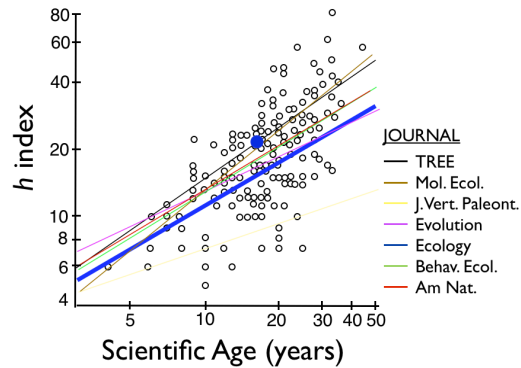
- In Fall 2014, I developed a flipped classroom design for FW4260 (Population Ecology) and FW3115 (*Ethics, Natural Resources and the Environment*). Approximately 85% of the material is delivered to the students in the form of pre-recorded lectures that I've prepared and posted in the internet. Class time is largely devoted to working on projects and exercises that apply the material.

- In 2013, I developed a course on Ethics of the Environment and Natural Resources (FW3115). It is the first such course to be offered at our university. Students develop basic skills in critical thinking and argument analysis to address the ethical dimension of conservation, sustainability, and natural resource management. Critical thinking skills and ethical knowledge are broadly considered to require better treatment in university curricula.

- In 2011, I developed a web-based course on the wolves and moose of Isle Royale. The course is intended to be a broad overview of ecology, relevant to those majoring in ecologically-oriented fields of study, but also accessible to non-majors. The course has potential for large enrollments if properly promoted to off-campus students.

V. SCIENTIFIC PUBLICATIONS

I have authored or co-authored more than 80 peer-reviewed articles that have been collectively cited more than 1,600 times. My *H index* is 25. The graph illustrates my *H index* (blue circle) in relationship to my “scientific age” which is the number of years since my first senior-authored paper. The other symbols represent 187 editorial board members for the journals listed in the figure legend. My position on this graph (blue circle) is above the expected value for Ecology (blue line), the field with which I self-identify. Source: TREE 21(4): 167-170.



A. Journal Articles

1. Bruskotter, J.T., Nelson, M.P. and Vucetich, J.A., 2015. Hunted predators: Intrinsic value. *Science (New York, NY)*, 349(6254), p.1294.
2. Peterson, R.O., Killian, M.L., Vucetich, J.A. and Vucetich, L.M., 2015. Joint biomechanics and bone material properties relative to OA risk in wild moose (*Alces alces*). *Osteoarthritis and Cartilage*, 23, pp.A97-A98.
3. Vucetich, J.A., Bruskotter, J.T. and Nelson, M.P., 2015. Evaluating whether nature's intrinsic value is an axiom of or anathema to conservation. *Conservation Biology*, 29(2), pp.321-332.
4. Uboni, A., Smith, D.W., Mao, J.S., Stahler, D.R. and Vucetich, J.A., 2015. Long-and short-term temporal variability in habitat selection of a top predator. *Ecosphere*, 6(4)
5. Peterson R, Vucetich JA, Bump J, Smith DW. (Invited paper) (2014). Trophic cascades in a multi-causal world: Isle Royale and Yellowstone. *Annual Review of Ecology and Systematics*. DOI: 10.1146/annurev-ecolsys-120213-091634.
6. Uboni, A., Vucetich, J. A., Stahler, D. R., & Smith, D. W. (2014). Interannual variability: a crucial component of space use at the territory level. *Ecology*. <http://dx.doi.org/10.1890/13-2116.1>
7. Hedrick, P.W., Peterson, R.O., Vucetich, L.M., Adams, J.R., & Vucetich, J.A. (2014). Genetic rescue in Isle Royale wolves: genetic analysis and the collapse of the population. *Conserv. Genet.* DOI 10.1007/s10592-014-0604-1
8. Montgomery RA, Vucetich JA, Roloff GJ, Bump JK, Peterson RO. 2014. Where Wolves Kill Moose: The Influence of Prey Life History Dynamics on the Landscape Ecology of Predation. *PLoS ONE* 9(3): e91414. doi:10.1371/journal.pone.0091414
9. Vucetich JA, RO Peterson, MP Nelson. 2013. Response to Gostomski. *George Wright Forum* 30(1):101-102.
10. Bruskotter JT, JA Vucetich, S Enzler, A Treves, and MP Nelson. 2013. Removing protections for wolves and the future of the U.S. Endangered Species Act (1973). *Conservation Letters*. DOI: 10.1111/conl.12081
11. Räikkönen J, Vucetich JA, Peterson RO, Nelson MP, Vucetich LM. 2013. What the inbred Scandinavian wolf population tells us about the nature of conservation. *PLOS ONE* 8(6): e67218. doi:10.1371/journal.pone.0067218. (June 2013)
12. Peterson RO, JA Vucetich and LM Vucetich. 2013. Osteoarthritis in nature: osteoarthritis phenotypes are sexually dimorphic in moose (*Alces alces*). *Osteoarthritis and Cartilage* 21:S69.
13. Montgomery RA, JA Vucetich, RO Peterson, GJ Roloff, KF Millenbach. 2013. The influence of winter severity, predation and senescence on moose habitat use. *Journal of Animal Ecology* 82(2):301-309. (March 2013)
14. Frelich LE, Peterson RO, Dovčiak M, Reich PB, Vucetich JA, Eisenhauer N. 2012. Trophic cascades, invasive species and body-size hierarchies interactively modulate climate change responses of ecotonal temperate-boreal forest. *Phil Trans R Soc B* 367:2955-2961 (doi:10.1098/rstb.2012.0235).(Nov 2012)
15. Bach LA, Pertoldi C, Vucetich JA, Loeschcke V, Lundberg P. 2012. Diminishing return of investment in genetic diversity. *Evolutionary Ecology Research* 14(7):793-801.

16. Nelson, MP & JA Vucetich. 2012. The ethics of sustainability science. *Nature Education Knowledge* 3(10):12 (<http://www.nature.com/scitable/knowledge/library/sustainability-science-ethical-foundations-and-emerging-challenges-24319566>)
17. Marucco F, Vucetich LM, Peterson RO, Adams JR, Vucetich JA. 2012. Evaluating the efficacy of non-invasive genetic methods and estimating wolf survival during a ten-year period. *Conservation Genetics* (DOI 10.1007/s10592-012-0412-4) (Sept 2012) 13(6):1611-1622.
18. Witt JC, Webster CR, Froese RE, Drummer TD, and Vucetich, JA. 2012. Scale-dependent drivers of ungulate patch use along a temporal and spatial gradient of snow depth. *Can J Zool* 90(8): 972-983 (DOI 10.1139/z2012-065) (July 2012)
19. Vucetich JA, Huntzinger BA, Peterson RO, Vucetich LM, Hammill JH, Beyer DE. 2012. Intra-seasonal variation in wolf *Canis lupus* kill rates. *Wildlife Biology* 18:1-12. (July 2012)
20. Vucetich JA, Nelson MP, Peterson RO. 2012. Managing wolves on Isle Royale: What should be done if an icon of wilderness culture dies out? *The George Wright Forum*, 29(1): 126–147 (April 2012).
21. Sand H, Vucetich JA, Zimmermann B, Wabakken P, Wikenros C, Pederson H, Peterson RO, Liberg O. 2012. Assessing the influence of prey–predator ratio, prey age structure and pack size on wolf kill rates. *Oikos*. (doi: 10.1111/j.1600-0706.2012.20082.x) (April 2012)
22. Peterson RO, Vucetich JA, Beyer D, Schrage M, Räikkönen J. 2011. Phenotypic Variation in Moose: The island rule and the moose of Isle Royale. *Alces* 47:125-133. (Dec 2011)
23. Vucetich JA, Vucetich LM, Peterson, RO. 2012. The causes and consequences of partial prey consumption by wolves preying on moose. *Behavioral Ecology and Sociobiology* 66: 295-303, DOI: 10.1007/s00265-011-1277-0. (on-line Oct 2011; print Feb 2012).
24. Metz M, Smith D, Vucetich J, Stahler D, Peterson R. 2012. Seasonal patterns of predation for gray wolves in the multi-prey system of Yellowstone National Park. *Journal of Animal Ecology* 81(3):553-563, DOI:10.1111/j.1365-2656.2011.01945.x (Jan 2012).
25. Hedrick P, J Adams, JA Vucetich. 2011. Genetic Rescue: Re-evaluating and Broadening the Definition. *Conservation Biology* (Dec 2011).
26. Geffen et al. 2011. Kin encounter rate and inbreeding avoidance in canids. *Molecular Ecology* 20: 5348–5358. (doi: 10.1111/j.1365-294X.2011.05358.x online Nov 2011).
27. Vucetich JA, Hebblewhite M, Smith DW, Peterson RO. 2011. Predicting Prey population dynamics from kill rate, predation rate and predator-prey ratios in three wolf- ungulate systems. *Journal of Animal Ecology* 80:1236-1245. (Nov 2011) (May 2011-doi: 10.1111/j.1365-2656.2011.01855.x).
28. Gore ML, Nelson MP, Vucetich JA, Smith AM, Clark MA. 2011. Exploring the ethical basis for conservation policy: the case of inbred wolves on Isle Royale, USA. *Conservation Letters* 4(5):394-401. (Oct/Nov 2011)
29. MacNulty D, D Smith, D Mech, JA Vucetich, C Packer. 2011. Nonlinear effects of group size on the success of wolves hunting elk. *Behavioral Ecology* doi: 10.1093/beheco/arr159 (Sept, 2011).
30. Nelson, MP, JA Vucetich, PC Paquet, JK Bump. 2011. North American Model: An Inadequate Construct? *The Wildlife Professional* 58-60 (May 2011).
31. Adams JR, LM Vucetich, PW Hedrick, RO Peterson, JA Vucetich. 2011. Genomic sweep and potential genetic rescue during limiting environmental conditions in an isolated wolf population. *Proceedings Royal Soc B* 278:3336-3344 (doi:10.1098/rspb.2011.0261) (March 2011).
32. Metz, MC, JA Vucetich, DW Smith, DR Stahler, RO Peterson. 2011. Effect of Sociality and Season on Gray Wolf (*Canis lupus*) Foraging Behavior: Implications for Estimating Summer Kill Rate. *PLoS ONE* 6(3)e17332 (March 2011).
33. Nelson, MP, JA Vucetich, RO Peterson, LM Vucetich. 2011. The Isle Royale Wolf-Moose Project (1958-present) and the Wonder of Long-Term Ecological Research. *Endeavour* 35(1):30-38 (Feb 2011).
34. Silvia, WJ, RO Peterson, WF Silvia, JA Vucetich, AW Silvia. 2011. The occurrence and morphology of a lateral metatarsal splint bone in moose (*Alces alces*). *The Anatomical Record* 294(2):231-235 (Feb 2011).
35. Peterson, RO, JA Vucetich, G Fenton, TD Drummer, CS Larsen. 2010. The ecology of arthritis. *Ecology Letters* doi: 10.1111/j.1461-0248.2010.01504.x (Sept 2010).
36. Vucetich JA, Nelson MP. 2010. Sustainability: virtuous or vulgar? *Bioscience* 60(7):539-544 (July, 2010).
37. Carroll, C, Vucetich, JA, Nelson, MP, Rohlf, DJ, Phillips, MK. 2010. Geography and Recovery under the U.S. Endangered Species Act. *Conservation Biology*, 24(2):395-403.
38. John A. Vucetich, Michael P. Nelson, Jannikke Räikkönen, Rolf O. Peterson. 2009. On-line & In Press. The Logic of Persistence. *Biological Conservation* 143(3):533-534.

39. Schwartz, Michael; Vucetich, JA. 2009 . Molecules and Beyond: Assessing the Distinctness of the Great Lakes Wolf. *Molecular Ecology* 18(11):2307-2309.
40. MacNulty, DR, DW Smith, JA Vucetich, LD Mech, DR Stahler, C Packer. 2009. Predatory senescence in aging wolves. *Ecology Letter* 12: 1-10.
41. Bump, J.K., Peterson, R.O., & Vucetich, J.A. 2009. Wolves modulate soil nutrient heterogeneity and foliar nitrogen by configuring the distribution of ungulate carcasses. *Ecology* 90(11): 3159 – 3167.
42. Nelson, MP and JA Vucetich. 2009. On Advocacy by Environmental Scientists: What, Whether, Why and How. *Conservation Biology* 23(5):1090–1101. (Oct 2009)
43. Bump J, C Webster, J Vucetich, R Peterson, J Shields, M Powers. 2009. Ungulate carcasses perforate ecological filters & create biogeochemical hotspots in forest herbaceous layers allowing trees a competitive advantage. *Ecosystems*. 12(6): 996-1007. (Sept 2009)
44. Vucetich JA, PM Outridge, RO Peterson, R Eide, & R Isrennd. 2009. Mercury, lead and lead isotope ratios in the teeth of moose (*Alces alces*) from Isle Royale, U.S. Upper Midwest, from 1952 to 2002. *J. Environ. Monit.* 11:1352 – 1359.
45. Räikkönen, J., Vucetich, J.A., Peterson, R.O., Nelson, M.P., 2009. Congenital bone deformities and the inbred wolves (*Canis lupus*) of Isle Royale. *Biological Conservation* 142, (issue 5), 1027-1033.
46. Bump, JK, K Tischler, A Schrank, R Peterson, & JA Vucetich. 2009. Large herbivores & aquatic-terrestrial links in southern boreal forests. *J Anim Ecol.* 78(2):338-45.
47. Nelson, MP, RO Peterson, & JA Vucetich. 2008. The Isle Royale Wolf-Moose Project, 50 Years of Challenge & Insight. *George Wright Society* 25, 98-113. [Invited Essay]
48. Bump, JK, K. Fox-Dobbs, JL. Bada, PL. Koch, RO Peterson & J.A. Vucetich. 2007. Stable isotopes, ecological integration & environmental change, wolves record atmospheric carbon isotope trend better than tree rings. *Proc R. Soc, Lond B*, 274: 2471–2480.
49. Nelson, M.P., M. Phillips, & J. A. Vucetich. 2007. Normativity & the meaning of endangered, a comment on Waples et al. 2007. *Cons Biology* 21, 1646–1648.
50. Vucetich, JA & MP Nelson. 2007. What are 60 warblers worth?: killing in the name of conservation. *Oikos* 116, 1267-1278.
51. Wilmers, CC, ES Post, RO Peterson, & JA Vucetich. 2006. Predator disease out-break modulates top-down, bottom-up and climatic effects on herbivore population dynamics. *Ecol Letters* 9, 383-389.
52. Vucetich, JA, MP Nelson, & MK Phillips. 2006. The normative dimension & legal meaning of ‘endangered’ & ‘recovery’ within the United States’ Endangered Species Act. *Cons. Biol.* 20, 1383-1390.
53. Brodeur-Campbell, SE, JA Vucetich, DL Richter, TA Waite, JN Rosemier, C.-J. Tsai. 2006. Insect herbivory on low-lignin transgenic aspen. *Environ. Entom.* 35(6): 1696-1701.
54. Theberge, JB; Theberge, MT; Vucetich, JA; Paquet, PC. 2006. Pitfalls of Applying Adaptive Management to a Wolf Population in Algonquin Provincial Park, Ontario. *Environ. Manag.* 37(4): 451-460.
55. Waite, TA, JA Vucetich, T. Saurer, M Kroninger, E Vaughn, K Field, & S Ibargüen. 2005. Minimizing extinction risk through genetic rescue. *Animal Biodiv & Cons* 28, 121–130.
56. Jost, C, G Devulder, JA Vucetich, R Peterson, & R Arditi. 2005. The wolves of Isle Royale display scale-invariant satiation & density dependent predation on moose. *J. Anim. Ecol.*, 74, 809-816.
57. Vucetich, JA; Smith, DW; Stahler, DR. 2005. Influence of harvest, climate, and wolf predation on Yellowstone elk, 1961-2004. *Oikos* 111(2): 259-270.
58. Potvin, MJ, TD Drummer, JA Vucetich, BE Beyer, RO Peterson, JH Hammill. 2005. Monitoring and habitat analysis for wolves in Upper Michigan. *J. Wildl. Manag.* 69(4): 1660-1669.
59. Vucetich, JA, RO Peterson, & TA Waite. 2004. Raven scavenging favours group foraging in wolves. *Animal Behaviour* 67, 1117-1126.
60. Vucetich, JA & RO Peterson. 2004. The influence of top-down, bottom-up, & abiotic factors on the moose (*Alces alces*) population of Isle Royale. *Proc Roy Soc Lond, B* 271, 183-189.
61. Lotts, KC, TA Waite, & JA Vucetich. 2004. Reliability of absolute & relative predictions of population persistence based on time series. *Cons. Biol.* 18, 1224-1232.
62. Vucetich, JA & RO Peterson. 2004. The influence of prey consumption & demographic stochasticity on population growth rate of Isle Royale wolves (*Canis lupus*). *Oikos* 107, 309-320.
63. Potvin, MJ, RO Peterson, & JA Vucetich. 2004. Wolf Homesite Attendance Patterns. *Can. J. Zool.* 82, 1512-1518.

64. Vucetich, JA, Waite, TA. 2003. Spatial patterns of demography and genetic processes across the species' range: Null hypotheses for landscape conservation genetics. *Cons. Genetics* 4(5): 639-645.
65. 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. *Pol. J. Ecol.* 51(4): 471-479.
66. Oelfke, J, RO Peterson, JA Vucetich, & LM Vucetich. 2003. Wolf handling at Isle Royale: Can we find another approach? *George Wright Soc.* 20(3):50-58.
67. Peterson, RO, JA Vucetich, RE Page, & A Chouinard. 2003. Temporal and spatial aspects of predator-prey dynamics. *Alces*, 39:215-232.
68. Vucetich, JA, RO Peterson, & CL Schaefer, CL. 2002. The effect of prey and predator densities on wolf predation. *Ecology* 83(11): 3003-3013.
69. Krzys, G; TA Waite, M Stapanian, JA Vucetich. 2002. Assessing avian richness in remnant wetlands: towards an improved methodology. *Wetlands* 22(1): 186-190.
70. Post, E; NC Stenseth, RO Peterson, JA Vucetich, AM Ellis. 2002. Phase dependence and population cycles in a large mammal predator-prey system. *Ecology* 83(11): 2997-3002.
71. Vucetich, LM; JA Vucetich, CP Joshi, TA Waite, RO Peterson. 2001. Genetic (RAPD) diversity in *Peromyscus maniculatus* in a naturally fragmentation landscape. *Mol. Ecol.* 10(1): 35-40.
72. Vucetich, JA & TA Waite. 2001. Migration and inbreeding: the importance of recipient population size for genetic management. *Conserv. Genetics* 2(2):167-171.
73. 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.
74. Vucetich, JA, TA Waite L Qvarnemark, S Ibarguen. 2000. Population variability and extinction risk. *Cons. Biol.* 14(6):1704-1714.
75. Vucetich, JA; Waite, TA. 2000. Is one migrant per generation sufficient for the genetic management of fluctuating populations? *Anim. Cons.* 3:261-266, Part 3.
76. Vucetich, JA; Reed, DD; Breymeyer, A; Degorski, M; Mroz, GD; Solon, J; Roo-Zielinska, E; Noble, R. 2000. Carbon pools and ecosystem properties along a latitudinal gradient in high latitude Scots pine (*Pinus sylvestris*) forests. *For. Ecol & Manag.* 136(1-3): 135-145.
77. Vucetich, JA, & TA Waite. 1999. Erosion of heterozygosity in fluctuating populations. *Cons. Biol.* 13(4): 860-868.
78. Vucetich, JA, & TA Waite. 1999. On the interpretation and application of mean times of extinction. *Biodiv & Cons.* 8 (7):100.
79. Vucetich JA, & S Creel. 1999. Ecological interactions, social organization, and extinction risk in African wild dogs. *Cons. Biol.* 13(5): 1172-1182.
80. Vucetich, JA, & TA Waite. 1998. The number of censuses required for demographic estimation of the effective population size. *Cons. Biol.* 12(5): 1023-1030.
81. Vucetich, JA, & TA Waite. 1998. On the interpretation and application of mean times to extinction. *Biodiv. & Cons.* 7(12): 1539-1547.
82. Peterson, RO; Thomas, NJ; Thurber, JM; Vucetich, JA; Waite, TA. 1998. Population limitation and the wolves of Isle Royale. *J Mamm.* 79(3): 828-841.
83. Vucetich, JA, Waite, TA; Nunney, L. 1997. Fluctuating population size and the ratio of effective to census population size (N_e/N). *Evolution* 51(6): 2017-2021.
84. Vucetich, JA, Peterson, RO; Waite, TA. 1997. Effects of social structure and prey dynamics on extinction risk in gray wolves. *Cons. Biol.* 11(4): 957-965.
85. Thurber, JM, RO Peterson, JD Woolington, JA Vucetich. 1992. Coyote coexistence with wolves on the Kenai Peninsula, Alaska. *Can. J. Zool.* 70(12): 2494-2498.

B. Writings for General Audiences

1. Vucetich JA RO Peterson, MP Nelson. 2013. Predator and prey, a delicate balance. *New York Times*, 8 May 2013.
2. Vucetich JA & MP Nelson. 2014. Conservation, or curation. *New York Times*, 20 Aug 2014.
3. Nelson, MP & JA Vucetich. 2014. The Future of conservation and the tragedy of triage. *Huffington Post*, 23 Sept 2014.
4. Vucetich JA & RO Peterson. 2014. The wolves of Isle Royale, 2013-14 Annual Report. Michigan Tech University. Houghton, MI. 16pp.
5. Vucetich, JA. 2014. How and why I am concerned about wolves in National Geographic Kids

- Books on conserving endangered species edited by Jazynka K, MacNutly D, Raven-Ellison D. forthcoming.
6. Vucetich, JA. 2013. Wolves and their place in the great hierarchy of life. In Thiel, D (ed) *Wild Wolves We Have Known*. International Wolf Center.
 7. Vucetich, JA. 2013. *Winter Study Notes from the Field, 2013*. Michigan Tech University. Houghton, MI. 35pp
 8. Vucetich JA & RO Peterson. 2013. *The wolves of Isle Royale, 2012-13 Annual Report*. Michigan Tech University. Houghton, MI. 16pp.
 9. Vucetich JA & RO Peterson. 2012. *The wolves of Isle Royale, 2011-12 Annual Report*. Michigan Tech University. Houghton, MI. 16pp.
 10. Vucetich, JA. 2012. *Winter Study Notes from the Field, 2012*. Michigan Tech University. Houghton, MI. 35pp.
 11. Vucetich JA & RO Peterson. 2011. *The wolves of Isle Royale, 2010-11 Annual Report*. Michigan Tech University. Houghton, MI. 16pp.
 12. Vucetich, JA. 2011. *Notes from the Field, 2011*. Michigan Tech University. Houghton, MI. 43pp.
 13. Vucetich JA and MP Nelson. 2010. The Moral Obligations of Scientists. *Minding Nature* (a journal of the Center for Humans and Nature). August 2010. 3(2):48-49.
 14. Vucetich JA and MP Nelson. 2010. The Moral Obligations of Scientists. *Chronicle of Higher Education*. <http://forums.chronicle.com/article/The-Moral-Obilgations-of/123725/>.
 15. Vucetich JA & RO Peterson. 2010. *The wolves of Isle Royale, 2009-10 Annual Report*. Michigan Tech University. Houghton, MI. 16pp.
 16. Vucetich, JA. 2010. *Notes from the Field, 2010*. Michigan Tech University. Houghton, MI. 40 pp.
 17. Nelson, MP & Vucetich, JA. 2009. True sustainability needs an ethical revolution. *The Ecologist*. Online Dec 31, 2009.
 18. Nelson MP & Vucetich JA. 2009. Abandon Hope. *The Ecologist*.
 19. Vucetich JA & RO Peterson. 2009. *The wolves of Isle Royale, 2008-09 Annual Report*. Michigan Tech University. Houghton, MI. 16pp.
 20. Vucetich, JA. 2009. *Notes from the Field, 2009*. Michigan Tech University. Houghton, MI. 36pp.
 21. Vucetich, JA. 2008. *Notes from the Field, 2008*. Michigan Tech University. Houghton, MI. 42pp.
 22. Vucetich JA & RO Peterson. 2008. *The wolves of Isle Royale, 2007-08 Annual Report*. Michigan Tech University. Houghton, MI. 16pp.
 23. Vucetich JA. 2008. What Have We Learned from Isle Royale Wolf-Moose Research? *International Wolf* 18(2) Summer 2008.
 24. Bump, JK & JA Vucetich. 2007. Pyramid of ideas: the art of generating novel research questions. *Frontiers in Ecology & the Environment* 10(5): 555-556.
 25. Vucetich JA & RO Peterson. 2007. *The wolves of Isle Royale, 2006-07 Annual Report*. Michigan Tech University. Houghton, MI. 16pp.
 26. Vucetich, JA. 2002. The limits and proper role of science in conserving wolves of Algonquin Park. Published in *Howlings*, official publication of the Central Rockies wolf project.

C. Reports & Other publications

1. Vucetich, J. A., J. T. Bruskotter, R. O. Peterson, A. Treves, T. Van Deelen, and A. M. Cornman. 2013. Evaluating the scientific soundness of plans for harvesting wolves to manage depredations in Michigan. Little River Band of Ottawa Indians Natural Resources Report No. 2013- 3.
2. Lute ML, Gore ML, Nelson MP, Vucetich JA. 2012. Toward improving the effectiveness of wolf management approaches in Michigan: insights from a 2010 statewide survey.
3. Alexander, G. *et al* (20 authors, listed alphabetically). 2007. Recommended guiding principles for wolf management in Michigan. Commissioned by and submitted to the Michigan DNR.
4. Huntzinger, BA, JA Vucetich, TD Drummer, and RO Peterson. 2005. Wolf recovery in Michigan, 2002-05 Summary Report. Michigan Technological University, Houghton, MI.
5. Vucetich, JA. 2002. The limits and proper role of science in conserving wolves of Algonquin

- Park. Published in *Howlings*, the official publication of the Central Rockies wolf project.
6. Paquet, P, JA Vucetich, MK Phillips, LM Vucetich. 2001. Mexican wolf recovery: three-year program review and assessment. Prepared by the Conservation Breeding Specialist Group for the United States Fish and Wildlife Service.
 7. Conservation Breeding Specialist Group. 2000a. Population and habitat viability assessment for the wolves of Algonquin Provincial Park. Apple Valley, MN. I was a member of the committee that prepared this report.
 8. Conservation Breeding Specialist Group. 2000b. Population and habitat viability assessment for the wolves of the Southern Rockies. Apple Valley, MN. I was a member of the committee that prepared this report.
 9. Vucetich, JA and P Paquet. 2000. The demographic viability of Algonquin wolves. Commissioned by the Algonquin Wolf Advisory Committee.
 10. Oelfke, J, RO Peterson, JA Vucetich, and LM Vucetich. 2000. Wolf research in the Isle Royale wilderness: Do the ends justify the means? In Cole, D. and S. McCool (eds.). *Proceedings: Wilderness Science in a time of change*. Proc. RMRS-P-000, UT: U.S. Dept of Agriculture, Forest Service, Rocky Mountain Research Station.
 11. Beyer, D, T Drummer, J Hamilton, J Johnson, B Kenner, W Moritz, R Peterson, B Roell and JA Vucetich. 1999. The gray wolf in Michigan: 1998-1999 annual report for cooperative research and monitoring by the Michigan Department of Natural Resources, National Park Service and Michigan Technological University.

D. Book Chapters

1. Nelson MP and Vucetich JA. 2014. Wolves and Ravens, Science and Ethics: Traditional Ecological Knowledge Meets Long-Term Ecological Research. In *Keepers of the Green World* edited by M Nelson and D. Ware (Cambridge Univ Press), *forthcoming*.
2. Vucetich, John, and Michael P. Nelson. 2014. "Wolf Hunting and the Ethics of Predator Control." *Oxford Handbooks Online*. 12 Jul. 2014. <http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199927142.001.0001/oxfordhb-9780199927142-e-007>.
3. Michael P. Nelson, John A. Vucetich, and Kathleen Dean Moore. 2014. So You Say You Love Fish. Pages 129-134 in *Future of Fisheries: Perspectives for Emerging Professionals*, edited by William Taylor, Nancy Leonard, and Abigail Lynch (American Fisheries Society).
4. Vucetich JA, Nelson MP, Batavia C. 2014. The Anthropocene: disturbing name, limited insight. In *After Preservation* edited by B. Minteer and S. Pyne (University of Chicago Press). *forthcoming*.
5. Goralnik, L; JA Vucetich; and MP Nelson. 2013. "Ethics." In *Achieving Sustainability: Visions, Principles, and Practices*, ed. Debra Rowe. Detroit: Macmillan Reference, USA. (Sept 2013)
6. Vucetich, JA & MP Nelson. 2013. The Infirm Ethical Foundations of Conservation. In M. Bekoff (ed.), *Ignoring Nature No More*, Univ. Chicago Press.
7. Nelson MP, Vucetich JA. 2013. The value of wilderness. in *The International Encyclopedia of Ethics*, edited by Hugh LaFollette, Wiley-Blackwell, print pages 5476-5484, DOI: 10.1002/9781444367072.wbiee645 (Feb 2013).
8. Nelson, MP and JA Vucetich. 2012. Environmental Ethics for Wildlife Management. In D Decker, SJ Rily, WF Siemer (eds.), *Human Dimensions of Wildlife Management*, Johns Hopkins Press.
9. Vucetich, JA. 2010. Wolves, Ravens and a New Purpose for Science. In: Moore, K & Nelson MP (eds.), *Moral Ground: Our Obligation to the Future*, Trinity University Press, San Antonio, TX, Pp 337-342.
10. Vucetich JA, RO Peterson, & MP Nelson. 2010. Will the future of Isle Royale wolves & moose always differ from our sense of their past? in *The World of Wolves, new perspectives on ecology, behaviour & policy*. (Eds. M Musiani, L Boitani & P Paquet) Univ Calgary Press, Pp 123-154.
11. Beyer, DE, RO Peterson, JA Vucetich, & JH Hammill. 2009. Wolf Population Changes in Michigan. In: Wydeven, A.P., VanDeelen, T. R., and Heske, E.J. (eds.) *Recovery of Gray wolves in the Great Lakes Region of the United States: An Endangered Species Success Story*. Springer Press, New York, NY.
12. Vucetich JA and RO Peterson. 2009. Dynamics of wolf and moose on Isle Royale In: Wydeven, A.P., VanDeelen, T. R., and Heske, E.J. (eds.) *Recovery of Gray wolves in the Great Lakes*

- Region of the United States: An Endangered Species Success Story. Springer Press, New York, NY.
13. Nelson, MP & JA Vucetich. 2009. Preservation. Pages 180-184 in Encyclopedia of Environmental Ethics and Philosophy, Edited by: J. Baird Callicott and Robert Frodeman (Farmington Hills, MI: Macmillan).
 14. Vucetich, JA & MP Nelson. 2008. Distinguishing experiential & physical conceptions of wilderness. Pages 611-631 in Nelson MP & JB Callicott (eds.) The Wilderness Debate Rages on: Continuing the Great New Wilderness Debate. University of Georgia Press
 15. Vucetich, JA & RO Peterson. 2004. Long-term population & predation dynamics of wolves on Isle Royale. Pages 281-292 in Biology & Conservation of Wild Canids (edited by D. Macdonald & C. Sillero-Zubiri), Oxford University Press.

VI. Presentations

A. Invited Departmental Seminars (32 seminars in past 11 years)

University of Georgia, Dept of Genetics, Athens, GA, 5 Nov 2014.
 Oregon State University, Dept of Forest Ecosystems & Society, Corvallis, OR, 29 Oct 2014.
 Grand Valley State University, Allendale, MI, 10 April 2014.
 Oregon State University, Corvallis, OR, 21 Nov 2013.
 University of Wisconsin, Madison, WI, 1 Nov 2013.
 Northland College, Ashland, WI Oct 2013.
 Vucetich, JA. Wolves & Moose of Isle Royale: Lessons from Fifty years of research. Dept. of Forest Ecosystems & Society. Oregon State Univ., Corvallis, OR. 1 April 2013
 Ohio State University, Dept of Evolution, Ecology & Organismal Biology, March 2013.
 Ohio State University, Dept of Natural Resources, March 2013.
 Michigan State University, Dept of Sociology, March 2013.
 Michigan State University, Dept of Fisheries & Wildlife, March 2013.
 Universite de Sherbrooke, CA, Dept de biologie, March 2013.
 Vucetich, JA. Working to Resolve the Conflict between Animal Welfare and Conservation Ethics. Invited talk, The Wildlife Society annual meeting. Portland, OR. 16 Oct 2012.
 Boise State University, Dept of Biological Sciences, Sept. 2012.
 University of Idaho, Moscow, Fish & Wildlife Resources, Sept 2012.
 University of IL, Urbana, Program in Ecology, Evolution & Conservation Biology, March 2012.
 Michigan Technological University, Dept of Biological Sciences, Sept 2011.
 University of Puerto Rico, San Juan, April 2011.
 Humboldt State University, Dept of Biology, Sept 2009.
 Michigan State University, Graduate Student Seminar Series, April 2009.
 SUNY-Syracuse, April 2008 (cancelled at last moment due to unforeseen, unavoidable conflict).
 Central Michigan University, Biology Dept, April 2008.
 Michigan State University, Fisheries & Wildlife, April 2008.
 University of Montana, Forestry Dept, April 2008.
 Western State College, April 2008.
 University of Oslo, Norway, 2006.
 Philosophy Department, University of Idaho, April 2006.
 University of California - Santa Cruz, Department of Applied Math, March 2006.
 Northern Illinois University, Biology Department, 2005.
 Lund University, Sweden, Department of Theoretical Ecology, 2004.
 Uppsala University, Sweden, Department of Conservation Biology, 2004.
 University of Wisconsin - Stevens Point, Department of Philosophy, 2004 of Philosophy, 2004.

B. Other Invited Talks

Detroit Zoo, Detroit, MI, 23 Oct 2014.
 Wayne State University, Detroit, MI, 24 Oct 2014.
 Grand Valley State University, Grand Rapids, MI, 25 Oct 2014.
 Mich Tech Univ, Houghton, MI. MTU Wildlife Society. 19 March 2014.
 California Wolf Center, Julian, CA, two talks on 26 Oct 2013.
 University of WI, Madison, WI. Conservation Ethics: an overview. Nov 2013.
 Oregon State University, Dept. of Forest Ecosystems & Society, Corvallis, OR, April 2013.
 Vucetich, JA. Wolves & Moose of Isle Royale: Lessons from Fifty years of research. Stewardship Network webcast. 12 Sept 2012.

Timber Wolf Alliance meeting. Manitowish Waters, WI. Aug 2012.
 Sinclair Community College, Dayton, OH, Keynote address at faculty retreat. March 2012.
 University of Montana, Missoula, evening presentation. Oct 2011.
 Center for Humans and Nature, Chicago, IL, Oct 29, 2010.
International Wolf Center group at MTU. August 2009.
 Yellowstone Center for Resources, Yellowstone National Park. June 2009.
 Applying conservation biology to endangered species recovery goals: The wolf as a case study,
 Ladder Ranch, New Mexico, April 2008.
 MTU SFRES symposium – Ecosystems and Climate Change, spring 2008.
 Senda Darwin Biological Station, Chiloe, Chile. March, 2007.
 Yellowstone Center for Resources, Yellowstone National Park. March 2006.
 Yellowstone Center for Resources, Yellowstone National Park. March, 2004.

VII. Service to Profession

A. Editorial and Review Activities

- Periodic reviewer for Journals including, but not limited to: *Conservation Biology*, *J Animal Ecology*, *Human Ecology - An Interdisciplinary Journal*, *Life: The Excitement of Biology*. Particular instances in 2014 are: *Bioscience* (Jan 2014), *Bioscience* (June 2014) *PLoS One* (Aug 2014), *Journal of Environment & History* (Aug 2014).
- Ad hoc assigning editor, *Conservation Biology*, July 2006.
- Ad hoc reviewer for five proposals submitted to the National Science Foundation since 2008.
- Subject Editor for *Oikos*, handling 91 papers (August 2006 - Sept 2010).
- Panelist for National Science Foundation, Ecology Panel, April 2007.
- Panelist for National Science Foundation, Ecology Panel, April 2014.

B. Conservation Ethics Group (CEG). – I co-created and co-direct the Conservation Ethics Group (www.conservationethics.org) with Michael Nelson (Oregon State Univ.) from March 2009 to the present. The vision of CEG is a community of natural resource professionals with an interest and ability to widely disseminate and search for knowledge as it relates to the ethical dimensions of natural resource management. To date, one of the group's main activities toward this vision is workshops for academics and professionals:

- Training workshop, Oregon State University, 26-28 Oct, 2014
(*Sponsored by Oregon State University*).
- Training workshop, Oregon State University, 29-31 Mar, 2012
(*Sponsored by Oregon State University*).
- Training workshop, Michigan Technological University, 16-18 Mar, 2012
(*Sponsored by Civil & Environmental Engineering Dept*).
- Training workshop, University of Montana, Missoula 27-30 Oct, 2011
(*Sponsored by Program in Wildlife Biology, Center for Ethics*).
- Training workshop, University of Puerto Rico, 29-31 Mar, 2011
(*Sponsored by University of Puerto Rico*).
- Training workshop, Center for Humans & Nature, Chicago, 27 Oct, 2010
(*Sponsored by Center for Humans & Nature, attended by their Board of Directors*).
- Training workshop, Michigan State University, 27-29 Aug, 2010
(*Attended by 19 graduate students and a full professor from University of Puerto Rico*).
- Problem-solving workshop, Wolf hunting in Upper Great Lakes, Baraboo, WI, 3-5 Nov, 2009; (*Sponsored by Leopold Foundation and Center for Humans & Nature; Attended by two dozen leaders in academia, state government, and NGOs*).

- Problem-solving workshop, *The Ethics of Predator Control*, Houghton, MI, 23-25 Oct, 2009.

C. Other Selected Services to the Profession

- Invited participant to NSF-funded working group (Mountain Socio-Ecological Observatory Network, MtnSEON) to develop new research related to carnivore management and conservation.
- Director of an intern program for the Isle Royale wolf-moose program. Each year we select four undergraduate students to work on Isle Royale during the summer field season for 4-5 weeks. Students are selected each year from an international pool of applicants. The program began in 2008. Most students report the experience to be transformative.
- Scientific Advisor to H.J. Andrews Long-term Ecological Research Station.
- Developed, in collaboration with M. Nelson (Oregon State Univ.), *Oikos'* policy for professional and conservation ethics.
- Science advisory member, French Wolf Research Review Panel, at the request of the French National Government, December 2008.
- Participant in NSF workshop, *Integrating Ecological Science and Environmental Ethics*, March 2007.
- Served as Opponent for the PhD Defenses of:
 - Erlend Nilson (advisors: N. C. Stenseth, A. Mysterud), University of Oslo, 2006.
 - Anders Jarnemo (advisor: O. Liberg), University of Uppsala, 2004.
- Instructor for the USDA Forest Service Program of Advanced Studies in Silviculture, May 1998, 2000, 2002.
- Peer reviewer for Denali wolf research program, National Park Service, 1998.

VIII. Service to University

- Organizing visit by Kyle Whyte an expert in traditional ecological knowledge from Michigan State University, Spring 2015.
- An in-progress collaboration with Christopher Plummer to create interactive art exhibit involving data-driven music, using data from the Isle Royale wolf-moose project. The efforts has attracted the attention of John Luther Adams, Pulitzer prize winner and leader in the field of data-driven music. I include this as a service to the University for its effort to synthesize the sciences and humanities at Michigan Technological University.
- Ad hoc committee on page charges, Spring 2014
- Search committee for science writer position, Michigan Technological University, Fall 2014.
- Committee to assess teaching goals associated with critical and creative thinking, MTU, Spring 2014.
- Reviewed applications for MTU Strategic Faculty Hiring Initiative in Water and Transportation, November 2011.
- Member, Institutional Animal Care and Use Committee, MTU, 2007.
- Inspired and consulted in the development of *Superior Ideas*, an MTU crowd funding apparatus.
- Representative, SFRES School Council, August 2013–May 2014.
- *Ad hoc* member, P&T Committee, SFRES, Sept 2013–May 2014.
- *Ad hoc* member, Curriculum Committee, SFRES, Sept 2013–May 2014.
- Chair, Curriculum Committee, SFRES, September 2008–September 2009.
- Member, Curriculum Committee, SFRES, September 2006–September 2008.
- Member, Wildlife Faculty Search Committee, SFRES, September 2008–April 2009.
- Chair, Ecogenomics Faculty Search Committee, SFRES, November 2007–November 2008.
- Led numerous building tours to prospective undergraduate students, 2007–present.

- Faculty host for the MTU Leading Scholar program, Dec 2011 and Dec 2012.
- Traveled with students to The Wildlife Society meeting, September 2007 and Sept 2013.
- Active participant as a faculty member in the MTU Sailing Club, 2010-2011.
- Evening presentation to the MTU Wildlife Society, March 2014.

IX. Service to Conservation

- Member of the Mexican wolf recovery team (USFWS) since 2001.
- Served as a scientific peer-reviewer at the request of the USFWS for *The Wyoming Wolf Management Plan* and the USFWS *Proposed Rule To Delist The Wolf In Wyoming*, September 2011 - April 2012.
- Member, Canid Specialist Group of the Species Survival Commission of IUCN, February 2014 – present.
- Working group member for *Southern Rockies Wolf Reintroduction Feasibility Assessment*, sponsored by the IUCN's Conservation Breeding Specialist Group, 2000.
- Member, Michigan Wolf Steward's Roundtable, Michigan Department of Natural Resources, 2006-07.
- Working group member for *Algonquin Wolf Management and Conservation*, a working group sponsored by the IUCN's Conservation Breeding Specialist Group, 2000-01. My activities here contributed significantly to the establishment of a buffer zone surrounding Algonquin Provincial Park to effectively protect that park's wolf population. It is the first buffer zone ever established to protect a large carnivore.
- Board member and scientific advisor for Common Coast Research and Conservation, a 501(c) non-profit organization whose mission focuses on research and conservation of Loons in the Great Lakes region. (January 2008 - Present).
- Founder and President of the Michigan Technological University, Chapter of the Society for Conservation Biology, 1997-1998.

X. Other Public Service, Outreach, & Education

- *The Wolves and Moose of Isle Royale* (www.isleroyalewolf.org) is aimed at a general audience and continues to be visited by >10k people annually. More than 3600 people have signed-up to receive occasional research updates via email. I designed and maintain this site.
- *Citizen science*. – I organize (with L. Vucetich and R. Peterson) week-long research expeditions, where members of the general public work with the Isle Royale wolf-moose project. Participants learn about the project and help us collect vital data. In the past five years (2005-2009) 184 people (including teachers and students) have participated in the expeditions.
- *Presentations to general public*. – In the past decade (2005-2014), I have delivered more than 80 presentations to more than 5000 members of the general public, mostly National Park visitors and high school students.
- *Art Exhibit*. – In 2008, I led (with collaborators) the development of an art exhibit, *Thinking like an Island*. It features a collection of 38 still images depicting the Isle Royale wolf-moose project from an artistic perspective. The images were taken by project associates. The images are accompanied by narrative text that transforms the images into a vision for our relationship with nature. The title, *Thinking Like an Island*, references the famous episode in Aldo Leopold's life, where he began to "think like a mountain." In collaboration with environmental ethicist, Michael P. Nelson (Michigan State Univ.), we have been translating Leopold's sentiments in "Thinking Like a Mountain" into a formal theory of environmental ethics. The value of doing so is to add credibility and rigor to what otherwise might be passed off as no more than a nice essay. *Thinking Like an Island* is our sharing these thoughts with a broad audience.

The exhibit has been on display almost continuously since October 2008 at four different venues (Omphale Gallery [Calumet, MI], Michigan State University, The International Wolf Center, and a portion of this exhibit was also shown at *The Gallery Project* [Ann Arbor, MI, Oct 2008]). More than 25,000 people have seen the exhibit. It remains on display,

indefinitely, at the International Wolf Center (Ely, MN), which is visited by approximately 50,000 people, annually. Soon, we will also begin looking for a publisher to present *Thinking Like an Island* as a book.

- *Art Contest.* – In fall 2007, I (along with L. Vucetich) used www.isleroyalewolf.org to administer a nation-wide art contest for high school students. The contest theme was to depict, in art, some scientific lesson from our research.
- *Science Museum Exhibit.* – In 2007, I led (with collaborators) development of a 1000 ft² exhibit featuring the project's scientific discoveries. The exhibit has been viewed by more than 5000 people during 12 months of display at three different venues (Carnegie Museum, Houghton, MI; Library of Univ. MN, Duluth; Hartley Nature Center, Duluth, MN). We are looking for additional venues.
- *Documentary Film.* – *Fortunate Wilderness* is a feature-length film by George Desort (www.fortunatewilderness.com) that describes the Isle Royale wolf-moose project. It premiered in July 2008, has been shown at 20 venues throughout the Midwest and Canada (more than 2500 in attendance) and broadcast on 30 different public TV stations, with an estimated, total audience of 10,000. *Fortunate Wilderness* was released on DVD in June 2009, and has since sold more than 1000 copies.
- *Documentary Film.* – *Alces alces: uncut* is a short film by George Desort. In the film, I describe the natural history of moose. The film has been shown at film festivals, art galleries, and nature centers in Houghton (MI), Ann Arbor (MI), Washburn (WI), and Duluth (MN).
- I was a core contributor to the design of the *2008 Wolf Awareness Poster*, which featured the Isle Royale wolf-moose project. I wrote the text which filled the back of the poster and described the project. Thirty-five thousand copies of that poster were distributed nationally.
- *Publication series for general audiences.* – Each year I write, publish, and distribute *Notes from the Field* and *The Wolves of Isle Royale, Annual Report*. The annual reports are collaborations with Rolf Peterson and present each year's scientific findings for a general audience. *Notes*, presented in journal format, details the work and observations of each annual winter field season. *Notes* shares with the general public how observations are transformed into discoveries, and describes how at least one scientist relates his research on nature with his broader relationship to nature. The *Notes* are first presented as a daily blog (www.isleroyalewolf.org) and later in the year in hardcopy.
- Assist authors, instructors, and organizations in their use and interpretation of data and insight from the Isle Royale wolf-moose project. Selected, recent examples include:
 - The Benessee Group reprinted with permission an essay (Vucetich et al. 2013. New York Times, 13 May 2013) to be used in course materials by Japanese students who are learning English as a second language.
 - ModSim (<http://modelsim.tech.northwestern.edu/info/>) an NSF-funded effort to provide instructional materials for high school students and teachers.
 - Wilson, E. O. 2013. "Predator-prey relationships" in *E.O. Wilson's Life on Earth* <https://itunes.apple.com/us/book/e.-o.-wilsons-life-on-earth/id529004239?mt=13>.
 - Cover photo for undergraduate textbook, *Ecology: Concepts and Applications*. By Manuel Molles, 2014. This book accounts for about 60% of undergraduate ecology textbook sales.
 - Arditi, R. 2012. *How Species Interact: altering the standard view of trophic ecology*. Oxford University Press.
 - Shuster, M., J. Vigna, & M. Tontono. 2013. *Biology for a Changing World*, 2nd edition; W.H. Freeman and Company/Worth Publishers/Macmillan Higher Education.

- Johnson-Sheehan, R. 2013. Technical Communication Strategies for Today, 1st edition, Pearson Education, Inc.
- White, B. Arthropod study guide for medical technology students. Microbiology Dept., St. Joseph Mercy Oakland. (provided images of *Dermacentor albipictus*).
- *Earth in Crisis*, The Teaching Company; Chris Stoner, Coordinator of Intellectual Property – we facilitated his request to use images for non-credit, college-level educational courses – 2009.
- Richard Wrangham, Ruth Moore Professor of Biological Anthropology at Harvard University and senior researcher with the Kibale Chimpanzee Project.
- Kent Innovation High School, Grand Rapids, MI; Marc Schulz, biology teacher – we facilitated his request to use our web pages and videos to help students learn about population dynamics – 2012.
- Terri Bocklund, General Music and Art teacher, Marriotts Ridge High School, Maryland – we facilitated her request to use images as part of a slide show for her classes – 2012.
- The Chicago Academy of Sciences and its Peggy Notebaert Nature Museum; Kristi Backe, Curriculum Coordinator – we facilitated her request to use our data for a middle school lesson plan about population fluctuations – 2011.
- Joshus Caditz, high school teacher from Carpinteria, CA – we facilitated his request to use our predator-prey dynamics graph as part of a lesson plan – 2011.

XI. Press coverage

In the past 5 years, I have been interviewed numerous times about the Isle Royale wolf-moose project. These interviews have resulted in articles appearing in more than 75 national and international print or radio media outlets (e.g., Science, Nature, New York Times, Wash Post, Assoc Press, Audubon, BBC, ABC News, US News & World Report, Aljazeera) and more than 25 regional print or radio media outlets.

Additionally, I have received national and international press coverage for my involvement with these more specific research findings: Vucetich et al., 2012 (*George Wright Forum*), Peterson et al. 2010 (*Ecology Letters*), Vucetich & Nelson 2010 (*Bioscience*), MacNulty et al. 2009 (*Ecology Letters*), Bump et al. 2009 (*Ecology*), Räikkönen et al. 2009 (*Biological Conservation*), Vucetich & Nelson 2009a (*The Ecologist*), Bump et al. 2007 (*Proc R Soc*), Vucetich et al. 2006 (*Cons Biol*), Vucetich et al. 2005 (*Oikos*), and Vucetich et al. 2004 (*Anim Behav*).

ScienceDaily.com, an important clearing house for science disseminated to the general public, has published 11 articles in the past 5 years about work that I've lead or to which I've contributed.

I was also interviewed for a July 2009 article on *ScienceLives*, an occasional series produced cooperatively by the National Science Foundation and LiveScience.

(<http://www.livescience.com/environment/090716-sl-john-vucetich.html>)

XII. Accolades & Distinctions

- According to the ISI Web of Science, I am the third most productive and cited scholar on the planet with respect to the ecology of wolves for the period 1997-present (the period of time covering my professional career).
- Recognized with the Phi Kappa Phi Excellence Award in Interdisciplinary Scholarship from Michigan State University for my contributions to the Conservation Ethics Group, April 12, 2011.
- The wolf-moose project was inducted into the Michigan Environmental Hall of Fame in April 2014.
- U.S. Congressional Record – On 21 July 2008, Senator Carl Levin entered into the congressional record a statement of gratitude for my contributions to the Isle Royale wolf-moose project.
- I was fictionalized as the main character in *Winter Study* (Putnam, 2008), a novel by Nevada Barr on the winter field season that I lead. Barr spent a week in the field at winter study to research her book. In April 2008, *Winter Study* made the New York Best-Sellers list at #10 for hard-cover fiction.
- Landscape genetics is the synthesis of landscape ecology and population genetics. It has been a rapidly growing field since 2005. In 2003, I senior-authored a paper that made general predictions about how genetic diversity should vary across a species' geographic range. According to the ISI Science Citation Index (accessed 4 April 2014), this paper has been cited >100 times and ranks in the top 3rd percentile for citations among the 1701 papers the associated with the keyword "landscape genetics."
- During the 1990s, there was confusion about a basic principle of extinction risk. Specifically, theory predicted that extinction risk should increase with population variability, yet several empirical assessments provided contradictory findings. I senior-authored a paper presenting original experimental results (on captive populations of bean beetles), simulation results, and new analyses of previously-published time series of population data for 114 bird populations. The experiments, simulations, and analyses all showed how the apparent conflict between theory and observation had been based on what had become an overlooked deficiency in how empirical data had, to that point, been analyzed (Vucetich et al. 2000. Cons. Bio. 14:1704-1714 [cited 36 times]).
- A critical tenet of conservation is that top predators are important for the top-down influence they have on ecosystems. During the ten years following wolf reintroduction in Yellowstone, elk abundance declined by ~60%. Most presumed that wolves caused the decline. I senior-authored a paper presenting evidence suggesting that elk decline was attributable to drought and hunting by humans, not wolves (Vucetich et al. 2005. Oikos 11:259-270 [cited 57 times]). Evidence of this paper's broader impact is it being posted on the home page of the Office of the Governor of Wyoming for about 12 months during 2005 and 2006. Vucetich et al. (2005) was relevant because it conflicted with a basic premise underlying Wyoming's management of wolves.

In spite of evidence presented in Vucetich et al. (2005), some colleagues argue that wolves caused the decline of Yellowstone elk. Inasmuch as this position has merit, Vucetich et al. (2005) is important for showing the difficulty of judging whether *past* dynamics that were observed in great detail represent strong top-down processes. This circumstance does not bode well for our ability to *predict* when predators will have a strong top-down effect.

- Served as a member of the working group on Ungulate Ecology, sponsored by the National Center for Ecological Analysis and Synthesis, 2002-2003.

XIII. Funding

<i>Project:</i> Ecological consequences of lignin-reduced transgenic aspen	<i>Amount:</i> \$283,923
<i>Period:</i> Sept 2001 – Aug 2004	<i>Source:</i> USDA
<i>Co-PIs:</i> C-J Tsai, D Richer, TA Waite, & JA Vucetich	
<i>My contribution:</i> conceived project; wrote proposal; shared equally with C-J Tsai in execution.	
 <i>Project:</i> Genetic characteristics of an inbred wolf population	 <i>Amount:</i> \$77,500
<i>Period:</i> Sept 2001 – Sept 2004	<i>Source:</i> NPS
<i>Co-PIs:</i> RO Peterson, LD Mech, & JA Vucetich	
<i>My contribution:</i> conceived project; wrote proposal; shared with Peterson & L Vucetich in execution.	
 <i>Project:</i> Loon monitoring on Isle Royale	 <i>Amount:</i> \$75,500
<i>Period:</i> Sept 2002 – May 2004	<i>Source:</i> NPS
<i>PI:</i> JA Vucetich	
 <i>Project:</i> Gray wolf monitoring in upper Michigan	 <i>Amount:</i> \$283,500
<i>Period:</i> 2002-2005	<i>Source:</i> Michigan-DNR
<i>Co-PIs:</i> RO Peterson, T Drummer, & JA Vucetich	
<i>My contribution:</i> shared equally all aspects of project with Peterson and Drummer.	
 <i>Project:</i> Monitoring wolf & moose populations, Isle Royale Nat'l Park	 <i>Amount:</i> \$26,600
<i>Period:</i> 2004	<i>Source:</i> NPS
<i>Co-PI:</i> RO Peterson & JA Vucetich	
<i>My contribution:</i> shared, with Peterson, the execution of this project.	
 <i>Project:</i> Monitoring wolf & moose populations, Isle Royale Nat'l Park	 <i>Amount:</i> \$173,000
<i>Period:</i> 2005-2009	<i>Source:</i> NPS
<i>Co-PIs:</i> JA Vucetich & RO Peterson	
<i>My contribution:</i> shared, with Peterson, the execution of this project.	
 <i>Project:</i> Trophic interactions of wolves and moose on Isle Royale	 <i>Amount:</i> \$450,000
<i>Period:</i> 2005-2009	<i>Source:</i> NSF
<i>Co-PI:</i> JA Vucetich & RO Peterson	
<i>My contribution:</i> conceived proposal idea; wrote proposal; shared, with Peterson, the execution of this project.	
 <i>Project:</i> Monitoring Beavers on Isle Royale	 <i>Amount:</i> \$9,800
<i>Period:</i> 2008	<i>Source:</i> Isle Royale
<i>PI:</i> J. Vucetich	Natural History Assoc
 <i>Project:</i> Wolf-moose research on Isle Royale	 <i>Amount:</i> \$450,000
<i>Period:</i> 2009-2013	<i>Source:</i> NSF
<i>Co-PI:</i> JA Vucetich & RO Peterson	
<i>My contribution:</i> conceived proposal idea; wrote proposal; share, with Peterson, the execution of this project.	
 <i>Project:</i> Wolf research in Yellowstone National Park	 <i>Amount:</i> \$450,000
<i>Period:</i> 2007-2011	<i>Source:</i> NSF
<i>Co-PI:</i> JA Vucetich, D. Smith, & RO Peterson	
<i>My contribution:</i> conceived proposal idea; wrote proposal; share, with Peterson & Smith, the execution of this project.	

<i>Project:</i> Genetic monitoring of Isle Royale wolves <i>Period:</i> 2010 <i>Co-PIs:</i> JA Vucetich, RO Peterson <i>My contribution:</i> conceived proposal idea; wrote proposal; share, with Peterson, the execution of this project.	<i>Amount:</i> \$50,000 <i>Source:</i> NPS
<i>Project:</i> Monitoring wolf & moose populations, Isle Royale Nat'l Park <i>Period:</i> 2011-2015 <i>Co-PIs:</i> JA Vucetich & RO Peterson <i>My contribution:</i> share, with Peterson, the execution of this project.	<i>Amount:</i> \$183,000 <i>Source:</i> NPS
<i>Project:</i> Wolf research in Yellowstone National Park <i>Period:</i> 2012-2017 <i>Co-PI:</i> JA Vucetich, D. Smith, & D. MacNulty <i>My contribution:</i> contributed equally to the conceptualized of the research, to the analysis of data, and preparation of manuscripts.	<i>Amount:</i> \$450,000 <i>Source:</i> NSF
<i>Project:</i> <i>Instability, contingency, and global change in a terrestrial food chain</i> <i>Period:</i> 2015-2020 <i>Co-PI:</i> JA Vucetich, RO Peterson <i>My contribution:</i> contributed equally to the conceptualized of the research, to the analysis of data, and preparation of manuscripts.	<i>Amount:</i> \$450,000 <i>Source:</i> NSF