

Research Associate
Center for Water and the Environment
Natural Resources Research Institute
University of Minnesota
5013 Miller Trunk Highway
Duluth, MN 55811
Voice: (218)720-4372
Fax: (218)720-4328
E-mail: rmoen@nrri.umn.edu

Home: 4954 W. Pike Lake Road
Duluth, MN 55811
Cell: (218)341-6271

Websites: www.d.umn.edu/~rmoen
www.nrri.umn.edu/moose
www.nrri.umn.edu/lynx

Education:

Ph.D., 1995. University of Minnesota, Wildlife Conservation.
M.S., 1988. University of Minnesota, Wildlife. Plant Physiology Minor.
B.S., 1984. Cornell University, Division of Biological Sciences.

Professional Experience:

Research Associate, Center for Water and the Environment, Natural Resources Research Institute, University of Minnesota, 1998 to present.

Graduate Faculty, Integrated Biological Science, Univ. of Minnesota-Duluth. Fall 2004 to present.

Graduate Faculty, Conservation Biology, Univ. of Minnesota-Twin Cities. Fall 2005 to present.

Instructor/Assistant Professor (non-tenure track), Biology Dept., Univ. of Minnesota-Duluth.

Biology 4764, Mammalogy. 2003-2012.

Integrated Biological Sciences 8020, Colloquia. Fall 2010, Spring 2010.

Integrated Biological Sciences 8201, Ecological Processes. Spring 2007.

Biology 4802, Evolution. Fall 2008, Spring 2009, Fall 2011.

Biology 4891, Animal Behavior. Spring 2006

Biology 4892, Animal Behavior Laboratory. Spring Semester, 2000.

Visiting Assistant Professor, Dept. of Biology. University of North Dakota, Grand Forks. 2001-2002.
Introductory Biology 150, Ecology 332, Biometry 470.

Research Associate, Department of Fisheries and Wildlife, University of Minnesota, 1995 to 1998.

Visiting Scientist, Macaulay Land Use Research Institute, Aberdeen, Scotland, March 1998.

Research Assistant and/or Teaching Assistant, Department of Fisheries and Wildlife, University of Minnesota, June 1986 to March 1995.

Refereed Publications (36 total):

McGraw, A.M., R.A. Moen, and L. Overland. 2012. Effective Temperature of Cover Types Found in Moose Home Ranges in Northeast Minnesota. *Alces* 48: *In press*.

Moen, R.A., S.K. Windels, and B. Hansen. 2012. Suitability of Voyageurs National Park as Canada lynx habitat. *Natural Areas Journal*. *In press*.

Moen, R.A., M.E. Nelson, and A. Edwards. 2011. Radiotelemetry locations, home ranges, and aerial surveys in Minnesota. *Alces* 47:101-112.

McGraw, A.M., R.A. Moen, and M. Schrage. 2011. Characteristics of Post-Parturition Areas of Moose in Northeast Minnesota. *Alces* 47:113-124.

McCann, N. and R.A. Moen. 2011. Mapping potential core areas for lynx (*Lynx canadensis*) using snowshoe hare (*Lepus americanus*) pellet counts and satellite imagery. *Canadian Journal of Zoology* 89:509-516.

- McGraw, A.M., R. Moen, et al. 2010. An advisory committee process to plan for moose in Minnesota. *Alces* 46:189-200.
- Moen, R., J.M. Rasmussen, C.L. Burdett, and K.M. Pelican. 2010. Hematology, serum chemistry, and body mass of free-ranging and captive Canada lynx in Minnesota. *Journal of Wildlife Diseases* 46:13-22.
- Moen, R.A., C.L. Burdett, and G.J. Niemi. 2008. Predicting suitable denning habitat for Canada lynx based on past reproduction. *Journal of Wildlife Management* 72:1507:1513.
- McCann, N.P., R.A. Moen, and G.J. Niemi. 2008. Using pellet counts to estimate snowshoe hare numbers in Minnesota. *Journal of Wildlife Management* 72:955:958.
- Burdett, C.L., R.A. Moen, G.J. Niemi, and L.D. Mech. 2007. Defining Canada lynx space use and movements with GPS telemetry. *Journal of Mammalogy* 88:457-467.
- Pastor J. and R.A. Moen. 2004. Palaeontology - Ecology of ice-age extinctions. *Nature*. 431:639-640.
- DelGiudice, G.D., R.A. Moen, F.J. Singer, and M.R. Riggs. 2001. Winter nutritional restriction and simulated body condition of Yellowstone elk and bison before and after the fires of 1988. *Wildlife Monographs*: 147:1-60.
- Moen, R.A., J. Pastor, and Y. Cohen. 2001. Effect of animal movement on GPS telemetry locations. *Alces* 37:207-271.
- Moen, R.A., DelGiudice, G.D., Garrott, R.A., and R.O. Peterson. 2000. Urinary metabolites for enhancing ecological interpretations: a workshop. *Alces* 36:269-272.
- Moen, R.A. J. Pastor, and Y. Cohen. 1999. Antler growth and extinction of Irish elk. *Evolutionary Ecology Research* 1:235-249.
- Pastor, J., Y. Cohen, and R.A. Moen. 1999. Generation of spatial patterns in boreal forest landscapes. *Ecosystems* 2:439-450.
- Pastor, J., K. Standke, K. Farnsworth, R. A. Moen and Y. Cohen. 1999. Further development of the Spalinger-Hobbs mechanistic foraging model for free-ranging moose. *Canadian Journal of Zoology* 1505-1512.
- Cohen, Y., R.A. Moen, and J. Pastor. 1999. Bite, Chew, and Swallow. *Ecological Modelling* 116:1-14.
- Moen, R.A. and J. Pastor. 1998. A model to predict nutritional requirements for antler growth in moose. *Alces* 34:59-74.
- Moen, A.N. and R.A. Moen. 1998. Metabolic ratios for estimating energy metabolism in moose. *Alces* 34:181-187.
- Pastor, J., B. Dewey, R.A. Moen, Y. Cohen, D.J. Mladenoff, and M. White. 1998. Spatial patterns in the Isle Royale moose-forest ecosystem. *Ecological Applications* 8:411-424.
- Moen, R.A. and J. Pastor. 1998. Simulating antler growth and energy, nitrogen, calcium, and phosphorus metabolism in caribou. *Rangifer Special Issue Number* 10:85-97.
- Moen, R.A., J. Pastor, and Y. Cohen. 1998. Corrigendum: Accuracy of GPS telemetry collar locations with differential correction. *Journal of Wildlife Management* 62:808-810.
- Moen, R.A., Y. Cohen, and J. Pastor. 1998. Linking moose population and plant growth models with a moose energetics model. *Ecosystems* 1:52-63.
- Moen, R.A., B.A. Crooker, and W.J. Weber. 1997. Modeling the effect of bST and dietary fat on body composition and energy efficiency in lactating dairy cows. *Journal of Animal Science Supplement* 75:56.
- Moen, R.A. and G.D. DelGiudice. 1997. Simulating nitrogen metabolism and urinary urea nitrogen : creatinine ratios in ruminants. *Journal of Wildlife Management* 61:881-894.
- Moen, R.A., J. Pastor, and Y. Cohen. 1997. A spatially-explicit model of moose foraging and energetics. *Ecology* 78:505-521.

- Moen, R.A., J. Pastor, and Y. Cohen. 1997. Accuracy of GPS telemetry collar locations with differential correction. *Journal of Wildlife Management* 61:530-539.
- Pastor, J., Moen, R.A., and Cohen, Y. 1997. Spatial heterogeneities, carrying capacity, and feedbacks in animal-landscape interactions. *Journal of Mammalogy* 78:1040-1052.
- Rodgers, A.R., R.S. Rempel, R.A. Moen, J. Paczkowski, C.C. Schwartz, E.J. Lawson, and M.J. Gluck. 1997. GPS collars for telemetry studies: a workshop. *Alces* 33:203-210.
- Moen R.A., J. Pastor, Y. Cohen, and C.C. Schwartz. 1996. Effects of moose movement and habitat use on GPS collar performance. *Journal of Wildlife Management* 60:659-668.
- Moen, R.A., J. Pastor, and Y. Cohen. 1996. Interpreting behavior from activity counters in GPS collars on moose. *Alces* 32:101-108.
- Jordan, P.A., R.A. Moen, E.G. DeGayner, and W.C. Pitt. 1995. Trap-and-shoot and sharpshooting methods for control of urban deer: the case history of North Oaks, Minnesota. Pages 97-104 in J.B. McAninch, ed. *Urban Deer - a manageable resource?* Proceedings of the 1993 symposium of the North Central Section, The Wildlife Society. 175 pp.
- Yeakley, A., R.A. Moen, D.D. Breshears, and M.K. Nungasser. 1994. Response of North American ecosystem models to multi-annual periodicities in temperature and precipitation. *Landscape Ecology* 9:249-260.
- Moen, R.A., J. Pastor, and Y. Cohen. 1990. Effects of beaver and moose on the vegetation of Isle Royale National Park. *Alces* 26:51-63.
- Moen, R.A. and Y. Cohen. 1989. Growth and competition between *Potamogeton pectinatus* L. and *Myriophyllum exalbescens* Fern. in experimental ecosystems. *Aquatic Botany* 33:257-270.

Manuscripts in review or nearing submission:

- Moen, R.A., M.E. Nelson, and C.L. Burdett. Extra-territorial movements in a southern population of Canada lynx. *In revision*.
- Moen, R.A., L. Terwilliger, A.R. Dohmen, and S.C. Catton. *In review*. Use of transportation corridors by Canada lynx. *To be submitted to Conservation Biology*.
- Burdett, C.L., R.A. Moen, and G.J. Niemi. Evaluating fine-scale habitat selection of Canada lynx with a distance-based use metric. *In revision*.
- Abel, R.L. Bat activity and habitat use in Northeastern Minnesota. *To be submitted to Journal of Mammalogy*.

Manuscripts in progress:

- Moen, R.A. Effect of cover type and collar movement on GPS collars. *To be submitted to Journal of Wildlife Management*.
- Moen, R.A. et al. Effects of net-gunning and darting on behavior and blood chemistry of moose. *To be submitted to Journal of Wildlife Diseases*.
- Moen, R.A. et al. Post-parturition sites used by moose based on GPS radiotelemetry. *To be submitted to Journal of Wildlife Management*.

Technical Reports (these and others available from www.nrri.umn.edu/lynx):

- Moen, R., R.O. Peterson, S.K. Windels, L. Frelich, and M. Johnson. 2011. Minnesota Moose Status: Progress on Moose Advisory Committee Recommendations. NRRI/TR-2011-41.
- Moen, R. and S.A. Moore. 2011. Beaver in the Grand Portage National Monument. NRRI/TR-2010-02.
- Moen, R., K Potts, and J. Gilbert. 2011. Status of Mammalian Carnivores and Evaluation of Monitoring Techniques in the Lake Superior Basin. NRRI/TR-2010-02.
- Abel, R. and R. Moen. 2011. North Shore bat activity and habitat use. NRRI/TR-2010-02.
- Stever, R. and R. Moen. 2011. Evaluating habitat use by moose with aerial photographs. NRRI/TR-2010-02.

- Moen, R., L. Terwilliger, A.R. Dohmen, and S.C. Catton 2010. Habitat and road use by lynx on long-distance movements. NRRI/TR-2010-02.
- Moen, R. 2009. Canada lynx in the Great Lakes region. 2009 Annual Report. NRRI/TR-2009-40.
- Peterson, R., R. Moen, R. Baker, D. Becker, L. Cornicelli, A. J. Edwards, L. Frelich, G. Huschle, M. Johnson, A. Jones, M. S. Lenarz, J. Lightfoot, T. Martinson, G. Mehmel, S. Perich, D. Ryan, M. W. Schrage, and D. Thompson. 2009. Report to the Minnesota Department of Natural Resources (DNR) by the Moose Advisory Committee.
- Moen, R. and S.K. Windels. 2009. Lynx habitat suitability in and near Voyageurs National Park. NRRI/TR-2009/19.
- Moen, R. 2009. Den sites of radiocollared Canada Lynx in Minnesota 2004-2007. NRRI/TR-2009/07.
- Moen, R. 2009. Canada lynx in the Great Lakes region. 2008 Annual Report. NRRI Technical Report No. NRRI/TR-2009/06.
- Moen, R. and R.J. Baker. 2008. Canada lynx on the border. NRRI Technical Report No. NRRI/TR-2008/16.
- Moen, R., G.J. Niemi, and C. Burdett. 2008. Canada lynx in the Great Lakes. Final Report NRRI Technical Report No. NRRI/TR-2008/14
- Hanson, K. and R. Moen. 2008. Diet of Canada lynx in Minnesota. NRRI Technical Report No. NRRI/TR-2008/13.
- Moen, R. and E.L. Lindquist. 2006. Testing a remote camera protocol to detect animals in the Superior National Forest. NRRI Technical Report No. NRRI/TR-2006-28.
- Burdett, C.L., E.L. Lindquist, and R. Moen. 2006. National Interagency Canada Lynx Detection Survey in Minnesota, Wisconsin, and Michigan. NRRI Technical Report No. NRRI/TR-2006-37.
- Moen, R. G.J. Niemi, J. Palakovich, and C. Burdett. 2006. Snowtrack surveys for Canada lynx presence in Minnesota west of Highway 53. NRRI Technical Report No. NRRI/TR-2006-17.
- Moen, R. G.J. Niemi, C. Burdett, and L. D. Mech. 2006. Canada lynx in the Great Lakes region. 2005 Annual report. NRRI Technical Report No. NRRI/TR-2006-16.
- Moen, R.A., A. Peterson, and J. Mayasich. 2006. Terrestrial snail status assessment. NRRI Technical Report No. NRRI/TR-2005/34.
- Moen, R. G. J. Niemi, C. Burdett, and L. D. Mech. 2004. Canada lynx in the Great Lakes region. 2003 Annual report. NRRI Technical Report No. NRRI/TR-2004-01.
- Moen, R. G. J. Niemi, C. Burdett, and L. D. Mech. 2004. Canada lynx in the Great Lakes region. 2004 Annual report. NRRI Technical Report No. NRRI/TR-2004-33.

Books and Computer Programs:

- Moen, A.N., C.W. Severinghaus, and R.A. Moen. 1986. Deer CAMP Computer-Assisted Management Program (diskette, operating manual, and tutorial). CornerBrook Press. Lansing, New York.
- Moen, A.N. and R.A. Moen. 1985. Computer Programs for Natural Resource Analysis and Management. Volume 1. CornerBrook Press. Lansing, New York.
- Moen, A.N. and R.A. Moen. 1985. Deer Management at the Bernheim Foundation Properties, Clermont, Kentucky. CornerBrook Press. Lansing, New York.

Proposals and Contracts (recent):

2013. Moose Habitat Restoration Phase II. NE MN Moose Habitat Collaborative. \$2,000,000 to MDHA. ~\$120,000 to UMD.
2012. Moose Habitat Restoration Phase I. NE MN Moose Habitat Collaborative. \$960,000 to MDHA. ~\$50,000 to UMD.
2012. NPS Climate Change Initiative. S. Windels, R.A. Moen and Lee Frelich. Effects of Climate Change in Upper Midwest National Parks. ~\$350,000.

2012. Moose Habitat Restoration Techniques in Northeastern Minnesota. LCCMR. \$200,000.
2010. Environmental Protection Agency Great Lakes Restoration Initiative. Restoring moose foraging habitat in Lake Superior Uplands. R. Moen. \$198,000.
2010. Legislative Citizen Committee on Minnesota Resources. Identifying Critical Habitats for Moose in Northeastern Minnesota. R. Moen, M. Lenarz, M. Schrage, A. Edwards, and M. Johnson. \$510,000.
2010. Tribal Wildlife Grants Program. Mooz (Moose) Habitat Use in a Changing Climate. S. Moore, A. Edwards, and R. Moen. \$199,999.
2009. Lake Superior Coastal Zone Program. Bats and wind along the North Shore of Lake Superior. \$20,000.
2008. Grand Portage National Monument. Beaver Populations in Grand Portage National Monument and the Grand Portage Indian Reservation. R. Moen and S. Moore. \$18,985.
2009. USGS-NPS Research Program. S. Windels, R.A. Moen and M.E. Nelson. Investigate Effects of Climate Change and Other Factors on Population Viability of Moose in Voyageurs National Park, MN. \$307,551.
- 2003-2009. Superior National Forest, US Forest Service. Partnership agreements for Canada lynx project on Superior National Forest. \$237,000.
2006. Tribal Landowners Incentive Program, USFWS. R.A. Moen, G. Host, G.J. Niemi, and B. Whiting (Grand Portage Indian Reservation). Identification of suitable habitat for Canada lynx -- Bizhiw -- in the Grand Portage area and northeastern Minnesota within 1854 Ceded Territories. \$141,000.
- 2003-2009. National Council on Air and Stream Improvement. R.A. Moen and G.J. Niemi. Canada lynx and snowshoe hare habitat use interactions. \$70,000.
2008. MN Department of Natural Resources. Marten studies in northeastern Minnesota. R.A. Moen. \$20,000.
2006. UMD Northland Advanced Transportation Systems Research Laboratories FY 2006 Summer Project Initiatives. R.A. Moen and G.J. Niemi. Animal-Vehicle Collisions and Road-Crossings— Detecting Responses. \$10,000.
2005. U.S. Fish and Wildlife Service. R.A. Moen and J. Mayasich. Terrestrial snail status assessment. \$20,000.
2005. Minnesota Dept. of Natural Resources. R.A. Moen and G.J. Niemi. Canada lynx ecology in Minnesota (CLEM). \$180,000. 2005-2007.
2005. UMD Chancellor's Faculty Small Grants Program. R.A. Moen and L.A. Shannon. Minnesota Mammals Website Project. \$1,410. 2005-2006.
2005. National Park Service, DOI. R.A. Moen and G.J. Niemi. Improve Limited Knowledge of Ecology and Population Status of Threatened Canada Lynx in Voyageurs National Park. \$100,000.
2003. US Geological Service. Canada lynx project on Superior National Forest in Northeastern Minnesota. ~\$250,000. 2003-2005.

Professional Service:

- Graduate Student Orientation, Integrated Biosciences Graduate Program. 2008 – present. Committee chair and responsible for planning new graduate student orientation.
- Curriculum Committee, Integrated Biosciences Graduate Program, University of Minnesota. 2009–present. Committee Chair 2010 – Present.
- GIS Laboratory Management Committee, Center for Water and Environment, Natural Resources Research Institute, University of Minnesota, Duluth. 1996-present.

Organizing Committee and Program Committee Chair, 35th North American Moose Conference and Workshop, Grand Portage, MN, May 1999.

Lynx on the Border Workshop, Chair, Organizing Committee, Grand Portage, MN, October 24-27, 2007.

Co-chair (with S. Windels), 45th North American Moose Conference and Workshop, International Falls, MN, June 2010.

Co-chair (with Chair Rolf Peterson), Moose Advisory Committee to Minnesota DNR. 2008-2009.

Editorial Board for *Oecologia*, 2001-2003.

Associate Editor, *Alces*: 1997-2004.

Manuscript Reviews:

Alces, *American Naturalist*, *Physiological and Biochemical Zoology*, *Canadian Journal of Zoology*, *Conservation Ecology*, *Ecology*, *Ecological Monographs*, *Ecological Modelling*, *Ecosystems*, *Great Basin Naturalist*, *Journal of Applied Ecology*, *Journal of Wildlife Management*, *Landscape Ecology*, *Oecologia*, *Photogrammetric Engineering and Remote Sensing*, *Rangifer*, *Wildlife Society Bulletin*.

Proposal Reviews:

National Science Foundation, USDA National Research Initiative Competitive Grants Program, and other Agencies/Organizations.

Graduate Students:

Nicholas McCann. M.S. 2006. Using pellet counts to predict snowshoe hare density, snowshoe hare habitat use, and Canada lynx habitat use in Minnesota. University of Minnesota Duluth. (Co-advised with J. Niemi, currently Ph.D. student at Purdue University).

Julie Palakovich. M.S. 2007. Using GPS collars to monitor the activity and habitat use of Canada lynx in Minnesota. University of Minnesota Duluth. (Co-advised with J. Niemi, currently Public Policy Associate with the American Institute of Biological Sciences).

Christopher Burdett. Ph.D. 2007. Hierarchical structure of Canada lynx space use and habitat selection in northeastern Minnesota. Ph.D. Dissertation, University of Minnesota, Twin Cities. (J. Niemi and L.D. Mech, my role was effectively advisor, currently post-doc at Colorado State University).

Brice Hansen. M.S. 2009. Factors affecting passive infrared cameras and their use in determining carnivore habitat selectivity based on presence and visitation rates. Integrated BioSciences program, University of Minnesota, Twin Cities. (Defended August 2009).

Tom Ness. M.S. 2010. Using activity counters to estimate behavior of free-ranging moose. University of Minnesota, Twin Cities.

Amanda McGraw. M.S. 2010. Characteristics of Post-Parturition Areas of Moose and Effective Temperature of Cover Types in Moose Home Ranges in Northeast Minnesota. Integrated BioSciences program, University of Minnesota, Twin Cities.

Becky Gordon. M.S. 2011. Bat habitat use and insect availability in northeast Minnesota. Integrated BioSciences program, University of Minnesota, Twin Cities.

Lauren Terwilleger. Ph.D. *in progress*. Lynx movements and snowshoe hare density estimations. Conservation Biology program, University of Minnesota, Twin Cities.

William Chen, Ph.D. *in progress*. Moose, specific topic to be decided. Integrated BioSciences program, University of Minnesota, Twin Cities.

Michael Joyce. M.S. *in progress*. American marten, specific topic to be decided. Integrated BioSciences program, University of Minnesota, Twin Cities.

Rachel Ward. M.S. *in progress*. Moose, specific topic to be decided. Integrated BioSciences program, University of Minnesota, Twin Cities.

Stephanía Galupo-Gaete. M.S. *in progress*. Codcod (South American cat), specific topic to be decided. Conservation Biology program, University of Minnesota, Twin Cities.

Tim Cyr. M.S. *in progress*. Moose, specific topic to be decided. Integrated BioSciences program, University of Minnesota, Twin Cities.

Yvette Ibrahim. M.S. *in progress*. Wolf scat analysis for diet composition. Integrated BioSciences program, University of Minnesota, Twin Cities.

Juliann Terry. M.S. *in progress*. Moose, specific topic to be decided. Integrated BioSciences program, University of Minnesota, Twin Cities.