

# Felicia Keesing

David & Rosalie Rose Distinguished Chair in the Sciences, Mathematics, and Computing  
Bard College  
Annandale-on-Hudson, New York 12504  
keesing@bard.edu

## Education

- 1983-87 B.S., Symbolic Systems, Stanford University, Stanford, CA.  
1991-97 Ph.D., Integrative Biology, University of California, Berkeley, CA. Thesis: *Ecological interactions among small mammals, large mammals, and vegetation in a tropical savanna of central Kenya*. Advisor: W. Z. Lidicker, Jr.

## Recent professional experience

- 2012- David & Rosalie Rose Distinguished Chair of the Sciences, Mathematics, and Computing, Bard College, Annandale-on-Hudson, NY.  
2012- Adjunct Scientist, Cary Institute of Ecosystem Studies, Millbrook, NY.  
2012-2015 Chair, Program in Biology, Bard College, Annandale-on-Hudson, NY.  
2003-2012 Associate Professor, Department of Biology, Bard College, Annandale-on-Hudson, NY.  
1998-2011 Visiting Scientist, Cary Institute of Ecosystem Studies, Millbrook, NY.  
2000-2003 Assistant Professor, Department of Biology, Bard College, Annandale-on-Hudson, NY.

## Selected grants (bold indicates active grants)

- 1999-06 National Science Foundation. "CAREER: Investigating biodiversity cascades in an East African savanna".  
1999-03 National Institutes of Health. "Forecasting Lyme disease risk: the roles of host dispersal and diversity." With R.S. Ostfeld.  
2000-03 National Science Foundation. "Ecology in context: Research strategies and applications for undergraduates." With A.R. Berkowitz, S.E.G. Findlay, and R.S. Ostfeld.  
2003-07 National Institutes of Health. "Biodiversity, habitat fragmentation, and Lyme disease risk". With R.S. Ostfeld, K. Schmidt, R. Winchcombe, and H. John-Alder.  
2003-06 National Science Foundation. "Ecology in context: Research strategies and applications for undergraduates." With A.R. Berkowitz, S.E.G. Findlay, and R.S. Ostfeld.  
2006-11 National Science Foundation. "Ecology in context: Research strategies and applications for undergraduates." With A.R. Berkowitz, S.E.G. Findlay, and R.S. Ostfeld.  
2009-2011 National Science Foundation. "RAPID: Investigating a rapidly emerging epidemic of babesiosis in New York State". PI: Keesing, with R.S. Ostfeld and M. Tibbetts.  
2011-2013 Environmental Protection Agency. "Landscape epidemiology of tick-borne diseases". PI: Ostfeld, with Keesing, Canham.  
2011-13 University of Illinois. "Tick-borne disease in central Kenya". With B. F. Allan.  
2008-15 National Science Foundation. "The ecology of *Anaplasma phagocytophilum*: reservoirs, risk, and incidence". PI: Keesing, with R.S. Ostfeld, J. Brunner, M. Tibbetts, K. Schmidt, K. LoGiudice.

- 2011-16 National Science Foundation. “REU: Translational ecology: Research strategies and applications for undergraduates.” With A.R. Berkowitz, S.E.G. Findlay, and E. Rosi-Marshall.
- 2012-16 Howard Hughes Medical Institute. “Cultivating scientific literacy: a campus initiative.” Program Director, with M. Tibbetts, B. Jude, M. Halsey, and P. Pardi.
- 2013-16 National Science Foundation, “CNH: COLLABORATIVE RESEARCH: An ecological trap for parasites and its impacts on human disease risk, nutrition, and income” PIs: B.F. Allan, F. Keesing, G. Daily, S. Polasky, H. Tallis, R.S. Ostfeld.
- 2014-17 National Science Foundation. COLLABORATIVE RESEARCH: Ecological consequences of the effects of a zoonotic pathogen on its reservoir host. With R.S. Ostfeld and D. Brisson.

## Recent awards, fellowships, honors

- 2014 Master Teacher, Center for Faculty and Curricular Development, Bard College.
- 2012 David & Rosalie Rose Distinguished Chair in the Sciences, Mathematics, and Computing, Bard College.
- 2005 Featured ecologist, “Profiles of Ecologists” series at the annual Ecological Society of America meeting.
- 2000 United States Presidential Early Career Award for Scientists and Engineers (PECASE)

## Publications

\* indicates undergraduate student

1. Keesing, F. 1998. Ecology and behavior of the pouched mouse, *Saccostomus mearnsi*, in central Kenya. *Journal of Mammalogy* 79:919-931.
2. Keesing, F. 1998. Impacts of ungulates on the demography and diversity of small mammals in central Kenya. *Oecologia* 116:381-389.
3. Ostfeld, R. S., F. Keesing, C. G. Jones, C. D. Canham, and G. Lovett. 1998. Integrative ecology and the dynamics of species in oak forests. *Integrative Biology* 1:178-186.
4. Keesing, F. and R. S. Ostfeld. 1999. Linking dispersal and population dynamics of white-footed mice to community dynamics in patchy landscapes: a prospectus for research. *Siberian Journal of Ecology*.
5. Keesing, F. 2000. Cryptic consumers and the ecology of an African savanna. *BioScience* 50:205-215.
6. Ostfeld, R.S. and F. Keesing. 2000. Biodiversity and disease risk: the case of Lyme disease. *Conservation Biology* 14(3): 1-7.
7. Ostfeld, R.S. and F. Keesing. 2000. Pulsed resources and generalist consumers. *Trends in Ecology and Evolution* 15: 232-237.
8. Pusenius, J., R.S. Ostfeld, and F. Keesing. 2000. Patch selection and tree seedling predation by resident vs. immigrant meadow voles. *Ecology* 81(11):2951-2956.
9. Ostfeld, R.S. and F. Keesing. 2000. The function of biodiversity in the ecology of vector-borne zoonotic diseases. *Canadian Journal of Zoology* 78:2061-2078.
10. \*Metz, M. and F. Keesing. 2001. Dietary preferences of the pouched mouse, *Saccostomus mearnsi*, and their consequences for savanna vegetation. *Biotropica* 33(1):182-187.
11. Keesing, F. and T. Crawford\*. 2001. Impacts of density and large mammals on space use by pouched mice (*Saccostomus mearnsi*) in central Kenya. *Journal of Tropical Ecology* 17(3):465-472.
12. Ostfeld, R.S., E. Schaubert, C.D. Canham, F. Keesing, C.G. Jones, and J.O. Wolff. 2001. Effects of acorn production and mouse abundance on abundance and *Borrelia burgdorferi* infection prevalence of nymphal *Ixodes scapularis* ticks. *Vector-Borne and Zoonotic Diseases* 1(1):55-63.

13. Thompson, J., O.J. Reichman, P.J. Morin, G.A. Polis, M.E. Power, R.W. Sterner, C.A. Couch, L. Gough, R. Holt, D. Hooper, F. Keesing, C. Lovell, B.T. Milne, M.C. Molles, D.W. Roberts, and S.Y. Strauss. 2001. Frontiers of ecology. *BioScience* 51(1):15-24.
14. \*Shaw, M.T., F. Keesing (corresponding author), and R.S. Ostfeld. 2002. Herbivory on *Acacia* seedlings in an African savanna. *Oikos* 98(3): 385-392.
15. Ostfeld, R.S., F. Keesing, E.M. Schaubert, and K.A. Schmidt. 2002. The ecological context of infectious disease: diversity, habitat fragmentation, and Lyme disease risk in North America. In: A. Aguirre, R.S. Ostfeld, C.A. House, G. Tabor, and M. Pearl, eds. *Conservation medicine: ecological health in practice*. Oxford University Press; New York.
16. \*Allan, B.F., F. Keesing (corresponding author), and R.S. Ostfeld. 2003. The effect of habitat fragmentation on Lyme disease risk. *Conservation Biology* 17:267-272.
17. Ewing, H., K. Hogan, F. Keesing, H. Bugmann, A. Berkowitz, L. Gross, J. Oris, and J. Wright. 2003. The role of modeling in undergraduate education. Pages 413-427 in: C.D. Canham and J. Cole, eds., *Models in Ecosystem Science*. Princeton University Press.
18. LoGiudice, K., R.S. Ostfeld, K. Schmidt, and F. Keesing. 2003. The ecology of infectious disease: Effects of host diversity and community composition on Lyme disease risk. *Proceedings of the National Academy of Sciences* 100: 567-571.
19. \*Shaw, M., F. Keesing, R. McGrail, and R.S. Ostfeld. 2003. Factors influencing the distribution of larval blacklegged ticks on rodent hosts. *American Journal of Tropical Medicine and Hygiene* 68(4): 447-452.
20. Goheen, J., F. Keesing (corresponding author), B. Allan, D. Ogada, and R.S. Ostfeld. 2004. Net effects of large-mammal exclusion on *Acacia* seedling survival in an East African savanna. *Ecology* 85:1555-1561.
21. Ostfeld, R.S., P. Roy\*, W. Haumaier, L. Canter, F. Keesing, and E. Rowton. 2004. Sandfly (*Lutzomyia vexator*) populations in upstate New York: abundance, microhabitat, and phenology. *Journal of Medical Entomology* 41(4): 774-778.
22. Ostfeld, R.S. and F. Keesing. 2004. Oh the locusts sang, then they died. *Science* 306:1488-1489. [Perspective]
23. Ostfeld, R.S., G.E. Glass, and F. Keesing. 2005. Spatial epidemiology: an emerging (or re-emerging discipline). *Trends in Ecology and Evolution* 20:328-336.
24. \*O'Reilly, L., D. Ogada, T.M. Palmer, and F. Keesing (corresponding author). 2006. Effects of fire on bird diversity and abundance in an African savanna. *African Journal of Ecology* 44:165-170.
25. Ostfeld, R.S., A. Price\*, V. Hornbostel, M. Benjamin, and F. Keesing. 2006. Controlling ticks and tick-borne zoonoses with biological and chemical agents. *BioScience* 56:383-394.
26. Keesing, F., R.D. Holt, and R.S. Ostfeld. 2006. Effects of species diversity on disease risk. *Ecology Letters* 9: 485-498.
27. McCauley, D.M., F. Keesing, T.P. Young, B.F. Allan, and R. Pringle. 2006. Indirect effects of large herbivores on snakes in an African savanna. *Ecology* 87:2657-2663.
28. Dobson, A., I Cattadori, R. Holt, R.S. Ostfeld, F. Keesing, K. Krichbaum, J. Rohr, S.E. Perkins, and P.J. Hudson. 2006. Sacred cows and sympathetic squirrels: the importance of biological diversity to human health. *PLoS Medicine* 3(6) e231.
29. Ostfeld, R.S., C.D. Canham, K. Oggenfuss, R.J. Winchcombe, and F. Keesing. 2006. Climate, deer, rodents, and acorns as determinants of variation in Lyme-disease risk. *PLoS Biology* 4(6) e145.
30. Ostfeld, R.S., F. Keesing, and K. LoGiudice. 2006. Community ecology meets epidemiology: the case of Lyme disease. Pages 28-40 in S. Collinge and C. Ray, eds. *Disease ecology: community structure and pathogen dynamics*. Oxford University Press.
31. \*Horobik, V., F. Keesing, and R.S. Ostfeld. 2007. Abundance and *Borrelia burgdorferi*-infection prevalence of nymphal *Ixodes scapularis* ticks along forest-field edges. *EcoHealth*.

32. Ostfeld, R.S. and F. Keesing. 2007. Pulsed resources and community responses: An exploration of factors influencing outcomes. 2007. Pages 30-42 in J.A. Bissonette and I. Storch, eds. *Temporal dimensions of landscape ecology: wildlife responses to variable resources*. Springer, NY, USA.
33. Goheen, J.R., T.P. Young, F. Keesing, and T.M. Palmer. 2007. Consequences of herbivory by native ungulates for the reproduction of a savanna tree. *Journal of Ecology* 95:129-138.
34. Ogada, D.L., M.E. Gadd, R.S. Ostfeld, and F. Keesing. 2008. Impacts of large herbivorous mammals on bird diversity and abundance in an African savanna. *Oecologia* 156: 387-397.
35. McCauley, D.J., F. Keesing, T.P. Young, and K. Dittmar. 2008. Effects of the removal of large herbivores on fleas of small mammals. *Journal of Vector Ecology* 2008 33 (2), 263-268.
36. Keesing, F., R.S. Ostfeld, V.T. Eviner. 2008. Introduction. Pages 1-5 in *Infectious Disease Ecology: Effects of Ecosystems on Disease and of Disease on Ecosystems*, edited by R.S. Ostfeld, F. Keesing and V.T. Eviner. Princeton University Press.
37. Ostfeld, R.S. and F. Keesing. 2008. One acorn at a time: understanding the spread of infectious diseases. *Odyssey Magazine*. February issue, pages 19-21. [Odyssey is "the science magazine for young adventurers, ages 10-16.]
38. Keesing, F. 2008. Introduction to Part I. Pages 9-11 in *Infectious Disease Ecology: Effects of Ecosystems on Disease and of Disease on Ecosystems*, edited by R.S. Ostfeld, F. Keesing and V.T. Eviner. Princeton University Press.
39. Ostfeld, R.S., F. Keesing, and V.T. Eviner. 2008. The ecology of infectious diseases: progress, challenges, and frontiers. Pages 469-482 in *Infectious Disease Ecology: Effects of Ecosystems on Disease and of Disease on Ecosystems*, edited by R.S. Ostfeld, F. Keesing and V.T. Eviner. Princeton University Press.
40. Ostfeld, R.S., F. Keesing, and V. T. Eviner. 2008. *Infectious Disease Ecology: Effects of Ecosystems on Disease and of Disease on Ecosystems*. Princeton University Press.
41. Ostfeld, R.S., M. Thomas, and F. Keesing. 2009. Biodiversity and ecosystem function: perspectives on disease. Pages 209-216 in S. Naeem, D. Bunker, A. Hector, M. Loreau, and C. Perrings, eds. *Biodiversity and Human Impacts*, Oxford University Press.
42. Keesing, F. and R. Ostfeld. 2009. Human ecology through the lens of social ecology. *EcoHealth*. Book review. DOI: 10.1007/s10393-009-0213-5
43. Keesing, F., J. Brunner, M. Killilea, K. LoGiudice, K. Schmidt, H. Vuong, and R.S. Ostfeld. 2009. Hosts as ecological traps for the vector of Lyme disease. *Proceedings of the Royal Society B* 276:3911-3919.
44. Dowling, Z.\* , T. Hartwig, E. Kiviat, F. Keesing. 2010. Experimental management of nesting habitat for the Blanding's turtle (*Emydoidea blandingii*). *Ecological Restoration* 28:154-159.
45. Ogada, D. and F. Keesing. 2010. Decline of raptors over a three-year period in Laikipia, Central Kenya. *Journal of Raptor Research* 44 (2), 129-135.
46. Keesing, F., L. Belden, P. Daszak, A. Dobson, D. Harvell, R.D. Holt, P. Hudson, A. Jolles, K. Jones, C. Mitchell, S. Myers, T. Bogich, and R. Ostfeld. 2010. Impacts of biodiversity on the emergence and transmission of infectious diseases. *Nature* 468:647-652.
47. Keesing, F., P. Oberoi\*, R. Vaicekonyte\*, K. Gowen\*, L. Henry\*, S. Mount\*, L. Serene\*, P. Johns, and R.S. Ostfeld. 2011. Effects of garlic mustard (*Alliaria petiolata*) on entomopathogenic fungi. *EcoScience* 18: 164-168.
48. Brunner, Jesse L., Cheney, Laura, Keesing, Felicia, Killilea, Mary, Logiudice, Kathleen, Previtali, Andrea, Ostfeld, Richard S. 2011. Molting success of *Ixodes scapularis* varies among individual blood meal hosts and species . *Journal of Medical Entomology* 48: 860-866.
49. Pringle, R., Todd M. Palmer, Jacob R. Goheen, Douglas J. McCauley, and Felicia Keesing. 2011. Ecological Importance of Large Herbivores in the Ewaso Ecosystem. In N. Georgiadis, editor, *Conserving Wildlife in African Landscapes: Kenya's Ewaso Ecosystem*.

50. Keesing, F. and R.S. Ostfeld. 2012. Disease ecology. In Ingram, J.C., DeClerck, F., Rumbaitis del Rio, C. (Eds.). *Integrating Ecology and Poverty*. 1st Edition., approx. 450 p. 50 illus., Hardcover, ISBN: 978-1-4419-0632-8. Springer.
51. Keesing, F. 2012. What biology education should look like at colleges and universities. Special Report from the Michigan State University *Center for Research in Science and Mathematics Education*.
52. Ogada, D., F. Keesing, and M. Virani. 2012. Dropping dead: causes and consequences of vulture population declines worldwide. *The Year in Ecology and Conservation Biology*.
53. Previtali, A., R. Hanselmann, A. Jolles, F. Keesing, L. Martin, and R. Ostfeld. 2012. Relationship between pace of life and immune responses in wild rodents.
54. Keesing, F., Michelle H. Hersh, Michael Tibbetts, Diana J. McHenry, Shannon Duerr, Jesse Brunner, Mary Killilea, Kathleen LoGiudice, Kenneth A. Schmidt, and Richard S. Ostfeld. "Reservoir Competence of Vertebrate Hosts for *Anaplasma phagocytophilum*." *Emerging Infectious Diseases* 18, no. 12 (2012): 2013.
55. Hersh, Michelle H., et al. Reservoir competence of wildlife host species for *Babesia microti*. *Emerging infectious diseases* 18.12 (2012): 1951.
56. \*Vaicekonyte, R. and F. Keesing. 2012. Effects of garlic mustard (*Alliaria petiolata*) removal on re-colonization by entomopathogenic fungi. *Invasive Plant Species Biology and Management*.
57. Keesing, F., and R. S. Ostfeld. "An ecosystem service of biodiversity: the protection of human health against infectious disease." *New Directions in Conservation Medicine* (2012): 56-66.
58. Brunner JL, Duerr S, Keesing F, Killilea M, Vuong H, et al. 2013. An experimental test of competition among mice, chipmunks, and squirrels in deciduous forest fragments. *PLoS ONE* 8(6): e66798. doi:10.1371/journal.pone.0066798.
59. Ostfeld, Richard S., and Felicia Keesing. Effects of host diversity on infectious disease. *Annual Review of Ecology, Evolution, and Systematics* 43, no. 1 (2012): 157-182
60. Keesing, F. In press. Landscape epidemiology. In *Encyclopedia of Biodiversity*, edited by S. Levin.
61. Ostfeld, R.S. and F. Keesing. 2013. Biodiversity and human health. Pages 357-372 in *Encyclopedia of Biodiversity*, edited by S. Levin. Elsevier, New York.
62. Jeschke, J.M., F. Keesing, and R.S. Ostfeld. 2013. The ecology of novel organisms: invasive species, GMOs, and emerging pathogens. *Ambio* 42:541-548.
63. Keesing, F., B.F. Allan, T.P. Young, and R.S. Ostfeld. 2013. Effects of wildlife and cattle on tick abundance in central Kenya. *Ecological Applications* 23:1410-1418.
64. Ostfeld, R.S. and F. Keesing. 2013. Straw men don't get Lyme disease: response to Wood and Lafferty. *Trends in Ecology and Evolution* 28:502-503.
65. Keesing, Felicia, and T. P. Young. 2014. Cascading consequences of the loss of large mammals in an African savanna. *BioScience* 64: 487-495.
66. Hersh, M.H., R. S. Ostfeld, D. J. McHenry, M. Tibbetts, J. L. Brunner, M. E. Killilea, K. LoGiudice, K. A. Schmidt, F. Keesing. 2014. Co-Infection of blacklegged ticks with *Babesia microti* and *Borrelia burgdorferi* is higher than expected and acquired from small mammal hosts. *PLoS ONE*.
67. Ostfeld RS, Levi T, Jolles AE, Martin LB, Hosseini PR, et al. (2014) Life history and demographic drivers of reservoir competence for three tick-borne zoonotic pathogens. *PLoS ONE* 9(9): e107387. doi:10.1371/journal.pone.0107387.
68. Keesing, Felicia, Diana J. McHenry, Michelle Hersh, Michael Tibbetts, Jesse L. Brunner, Mary Killilea, Kathleen LoGiudice, Kenneth A. Schmidt, and Richard S. Ostfeld. 2014. Prevalence of human-active and variant 1 strains of the tick-borne pathogen *Anaplasma phagocytophilum* in hosts and forests of Eastern North America." *The American journal of tropical medicine and hygiene* 91: 302-309.
69. Levi, T., F. Keesing, K. Oggenfuss, R. S. Ostfeld. 2015. Accelerated phenology of blacklegged ticks under climate warming", *Philosophical Transactions of the Royal Society B*.

70. Ezenwa VO, Prieur-Richard A-H, Roche B, Bailly X, Becquart P, García-Peña GE, et al. 2015. Interdisciplinarity and Infectious Diseases: An Ebola Case Study. *PLoS Pathogens* 11(8): e1004992. doi:10.1371/journal.ppat.1004992.
71. Johnson, P. T., Ostfeld, R. S., & Keesing, F. (2015). Frontiers in research on biodiversity and disease. *Ecology Letters* 18:1119–1133.
72. Keesing, F., & Ostfeld, R. S. 2015. Is biodiversity good for your health? *Science* 349:235-236.
73. Levi, T., Massey, A.L., Holt, R.D., Keesing, F., Ostfeld, R.S. and Peres, C.A., 2016. Does biodiversity protect humans against infectious disease? Comment. *Ecology*, 97(2), pp.536-542.
74. Levi, T., Keesing, F., Holt, R.D., Barfield, M. and Ostfeld, R.S., 2016. Quantifying dilution and amplification in a community of hosts for tick-borne pathogens. *Ecological Applications*.
75. Keesing, F., 2016. The Messy Work of Saving Lions. *BioScience*, p.biw012. [book review]