

CURRICULUM VITAE

Alan Hastings

Distinguished Professor

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Education:

Ph. D. in Applied Mathematics with minors in Population Ecology and Population Genetics, Cornell University, 1977

M. S. in Applied Mathematics, Cornell University, 1975

B. S. in Mathematics, Cornell University, 1973

Employment:

2003- -- Distinguished Professor, Department of Environmental Science & Policy;

1992-1998--Chair, Department of Environmental Science & Policy;

1989- -- Professor, Department of Environmental Science & Policy;

1985-1989-- Professor, Department of Environmental Science & Policy and Department of Mathematics;

1983-1985-- Associate Professor, Department of Environmental Science & Policy and Department of Mathematics;

1982-1983--Associate Professor, Department of Mathematics;

1979-1982--Assistant Professor, Department of Mathematics;

University of California, Davis

1977-1979--Assistant Professor, Department of Pure and Applied Mathematics;

Washington State University

Honors and awards:

Member, National Academy of Sciences (Elected 2015)

Fellow, American Academy of Arts & Sciences (Elected 2005)

Robert H. MacArthur Award, Ecological Society of America (2006)

Faculty Research Lecturer, University of California, Davis (2006-7)
 Fellow, Society for Mathematical Biology (Elected 2017, Inaugural Class)
 Fellow, Society for Industrial and Applied Mathematics (Elected 2013)
 Fellow, Ecological Society of America (Elected 2012, Inaugural Class)
 Fellow, American Association for the Advancement of Science (Elected 2005)
 Honorary Editor, Journal of Mathematical Biology 2011-
 NSF Predoctoral Fellowship 1974-1977
 Ford Foundation Fellowship for Engineering Research Relevant to Society 1973-1974

Other experience:

2011 – 2015 Chair, Awards Committee, Ecological Society of America
 2009 -- 2011 Chair, MacArthur Award Committee, Ecological Society of America
 2009 (June) Visiting Professor, EPFL, Lausanne, Switzerland
 2008- 2011 Member and Chair, NIMBioS (National Institute for Mathematical and
 Biological Synthesis) Advisory Board
 2008- 2014 Member, NEON (National Ecological Observatory Network) Science
 Technology and Education Advisory Committee
 2005- 2009 Member, (acting chair 2006-2007), Mercer Award Committee, Ecological
 Society of America
 2004-2008 Member, Science Advisory Board, National Center for Ecological Analysis
 and Synthesis
 2003 – NSF panels
 2002-2004 Chair, Graduate Council, University of California, Davis
 2002-2004 Council Delegate, AAAS
 1998-1999, Vice President; 1999-2001, President, 2001-2002, Past President, Society for
 Mathematical Biology
 2001 NSF Long Term Ecological Research 20 year Review Committee
 2000- 2002 NSF Ecology Panel
 1997- 2002 Director, Research Training Grant in Nonlinear Dynamics in Biology,
 University of California, Davis
 August 1997; July 1999; April 2002, July 2003, May 2005 —Distinguished Visitor,
 NERC Centre for Population Biology, Silwood Park, Imperial College
 1994-1995, Vice Chair; 1995-1996, Chair; Theoretical Ecology Section, Ecological
 Society of America
 Jan. 1991-June 1993--Chair, California Coordinating Committee for Nonlinear Sciences

(a UC wide research group)

Jan. - Mar. 1992, Acting Chair, Division of Environmental Studies, UC Davis

Editorial work:

2016 – present Bulletin of Mathematical Biology, Co - Editor in Chief
 2006 – present Theoretical Ecology, founding Editor in Chief
 1995-2008 Journal of Mathematical Biology, Co - Editor in Chief
 2016 – present Proceedings of the National Academy of Sciences, Editorial Board
 2014 – present Ecological Complexity, Editorial Board
 2013 – present Movement Ecology, Editorial Board
 2013 – present PeerJ, Board of Editors
 2011 – 2017 Nature Communications Editorial Advisory Panel
 2010 – present Mathematical Population Studies, Associate Editor
 2006 – 2015 Journal of Theoretical Biology, Editorial Board
 2003- present Theoretical Ecology Series, Academic Press, founding Editor in Chief
 2003-present Chaos and Complexity Letters, Editorial Board
 1989-2014 Mathematical Biosciences, Editorial Board
 1998-2003 Conservation Ecology, Editorial Board
 1993-1995; 2008-2011 Journal of Mathematical Biology, Editor
 1990-2003 Theoretical Population Biology, Associate Editor
 1996-2001 Oecologia, Associate Editor
 1995-1997 Evolution, Associate Editor
 1989-1992 Ecology and Ecological Monographs, Board of Editors

Selected Invited presentations (1998-present):

MIT Physics of Life Sciences Group (Oct. 2017)
 CRITICS workshop Plenary speaker, Valladolid, Spain (Sept. 2017)
 Mathematical Population Dynamics and Ecology, Marseille, France (September 2016)
 Michigan State University Distinguished Ecologist (July 2016)
 Cornell University, Center for Applied Math (December 2015)
 Workshop on Uncertainty, MBI, Columbus, Ohio (October 2015)
 University of Auckland, New Zealand, Public Lecture (September 2015)
 University of Canterbury, Christchurch, New Zealand, Public Lecture (September 2015)

University of Otago, Dunedin, New Zealand, Public Lecture (September 2015)
University of Victoria, Wellington, New Zealand, Public Lecture (August 2015)
Mathematics of Planet Earth Workshop on Natural Resources, Howard University
(June 2015)
University of Washington, School of Fisheries and Aquatic Sciences (May 2015)
Spatio-Temporal Dynamics in Ecology, Lorentz Center, Lediden, Netherlands
(December 2014)
MDPE 2014 Plenary Speaker, Turin, Italy (August 2014)
SIAM Life Sciences Plenary Speaker, Charlotte, North Carolina (August 2014)
SMB-JSMB Annual Meeting, Osaka, Japan (July 2014)
Tokyo Metropolitan University Symposium Speaker (July 2014)
Symposium, American Geophysical Union (December 2013)
Workshop on regime shifts, ICMS, Edinburgh, UK (September 2013)
MPDE 2013 Plenary Speaker, Osnabruck, Germany (August 2013)
Summer school on invasive species, Edmonton, Alberta, Canada (June 2013)
Workshop on Mathematics of Invasive Species and Global Change, BIRS, Banff,
Alberta, Canada (May 2013)
Yale University (April 2013)
Population Ecology Society of Japan Plenary Speaker, Tokyo, Japan (October 2012)
Master Class on Early Warning Signs for Tipping Points, KNAW, Amsterdam,
Netherlands (October 2012)
MPDE Plenary Speaker, Santa Maria, RS, Brazil (September 2012)
National Marine Fisheries Service, Santa Cruz (July 2012)
BIOCOMP Plenary Speaker, Vietri Sul Mare, Italy (June 2012)
Santa Fe Institute (May 2012)
Workshop on Critical Transitions in Complex Systems, London, UK (March 2012)
University of Michigan (October 2011)
Rollie Lamberson Lectures, Humboldt State University (April 2011)
Colorado College (January 2011)
University of Florida (January 2011)
University of Wyoming (December 2010)
University of Alberta, Distinguished Visitor (October 2010)
Arizona State University (October 2010)
University of Calgary (March 2010)
Tulane University (November, 2009)

Plenary Speaker, Workshop on Control in Chemical and Life Sciences, Bernoulli Institute, EPFL, Lausanne, Switzerland (June, 2009)

Plenary Speaker, Mathematical Models of Collective Dynamics in Biology and Evolution, Leicester, England (May, 2009)

University of Chicago (April, 2009)

Duke University (April, 2009)

McGill University, Montreal, Canada (March, 2009)

University of Colorado, Boulder (September 2008)

University of Guelph (September 2008)

Cornell Probability Summer School (June 2008)

UniNet meeting on Networks, Paris, France (June 2008)

Dynamical Systems in Biology, New York University (April 2008)

Louis Thaler Lecture, Montpellier, France (November 2007)

Robert H. MacArthur opening scientific plenary lecture, Ecological Society of America Annual Meeting, San Jose, CA (August 2007)

Plenary Lecture; Society for Mathematical Biology Annual Meeting, San Jose, CA (July 2007)

Plenary Lecture, The 2nd International Symposium "Dynamical Systems Theory and Its Applications to Biology and Environmental Sciences" Shizuoka University of Hamamatsu, Japan (March 2007)

International Congress on Ecology Modeling, Ube, Japan, Keynote Lecture (August 2006)

Hokusei Lecture, 2nd International Workshop of Application of Chaos Theory and Nonlinear Dynamics on Agricultural and Ecological Systems Tokyo University of Agriculture and Technology College of Agriculture (March 2006)

Unity in Diversity (in honor of Margalef) Barcelona, Spain (Nov. 2005)

Estación Biológica de Doñana, CSIC, Sevilla, Spain (Nov. 2005)

Ecological Society of America, Annual Meeting, (August 2005)

Centre for Mathematical Biology, University of Bath (May 2005)

Ostrom Lectureship, Washington State University, (March 2005)

Keynote Speaker, The 1st International Workshop of Application of Chaos Theory and Nonlinear Dynamics on Agricultural and Ecological Systems Tokyo University of Agriculture and Technology College of Agriculture (Nov. 2004)

Dept. of Biology University of South Florida (October 2004)

Dept. Ecology and Evolutionary Biology Iowa State University (September 2004)

Ecological Society of America, Annual Meeting, (August 2004)
Society for Conservation Biology, Annual Meeting (July 2004)
International Food Web Conference, Giessen, Germany (November 2003)
Dept. Ecology, Evolution, and Marine Biology, UC Santa Barbara (October 2003)
SMB Annual Meeting, Dundee (August 2003)
Biocomplexity Series, Northwestern (May 2003)
Dept. of Ecology and Evolution, Cornell University (February 2003)
Symposium on Ecological Theory and Restoration, Ecology Society of America
Annual Meeting, Tucson, Arizona (August 2002)
Symposium on Structured Population and Community Modeling and Ecotoxicology,
Society for Mathematical Biology Annual Meeting Knoxville (July 2002)
Special Session on Mathematical Biology, American Mathematical Society Regional
Meeting, Portland, Oregon (June 2002)
Conference on Distribution, Diversity, and Evolutionary Dynamics, University of
Virginia, Charlottesville, VA (June 2002)
Oxford University, Centre for Mathematical Biology (April 2002)
Imperial College, Centre for Population Biology (April 2002)
Dept. of Zoology, University of British Columbia (March 2002)
Dept. of Biological Sciences, University of Alberta (March 2002)
Dept. of Ecology and Evolutionary Biology, UC Santa Cruz (January 2002)
Newton Institute, University of Cambridge (Dec. 2001)
SUNY Stonybrook Symposium Honoring James Rohlf (Nov. 2001)
Mathematical Biology Conference at Gulbenkian Institute, Lisbon, Portugal (Keynote
speaker) (Oct. 2001)
Workshop on Marine Reserves, Woods Hole Oceanographic Institute, (Aug. 2001)
IEEE Summer School on Biocomplexity and Biological Signal Processing (June
2001) (Three Lectures)
Frontiers in Oceanography Series, Scripps Institute of Oceanography (May 2001)
Texas A & M University (May 2001)
1st Brazilian Symposium on Mathematical and Computational Biology, Rio de
Janeiro, Keynote speaker (April 2001)
Claremont Math Colloquium (April 2001)
McGill University (Sept. 2000)
Princeton University (April 2000)
Workshop on Mathematical Biology, Oberwolfach, Germany (Oct. 1999)

University of Tennessee, (October 1999)

Centre for Population Biology, Silwood Park, Imperial College, Ascot, England (July 1999)

Centre for Mathematical Biology, Oxford University, Oxford, England (July 1999)

Society for Mathematical Biology/ESTMB Joint Meeting (July 1999)

NATO Summer School on Mathematical Problems Arising from Biology, Toronto (June 1999)

University of Turku, Turku, Finland (April 1999)

Workshop on Metapopulations, Tvarminne, Finland (April 1999)

Mathematics Department, Pomona College, Claremont, California (April 1999)

Western Society of Naturalists, San Diego (December 1998)

INTELCOL (International Ecology Congress) Florence, Italy (July 1998)

Workshop on Mathematical Population Biology, Gothenberg, Sweden (May 1998)

University of Arizona, Dept. of Ecology and Evolutionary Biology (April, 1998)

Teaching Interests

Population Ecology, Mathematical Methods in Population Biology, Theoretical Ecology

Graduate students trained:

Previous: Richard Gomulkiewicz, Kevin Higgins, Aaron Klebanoff, Chris Ray, Perry deValpine, Brad Crane, Katya Prince, Arthur Amezcua, James Umbanhowar, David Brown, Charlotte Lee, Chris Dugaw, Caz Taylor, Roy Wright, Matt Holland, Eli Goldwyn, Julie Blackwood, Alex Perkins, Carl Boettiger, Yun Tao, Noam Ross

Current: Robin Decker, Kaela Vogel, Easton White

Postdoctoral scholars trained:

Previous: Duncan Callaway, Kathleen Crowe, Kim Cuddington, Tad Dallas, Gordon Fox, Sergey Gavrilets, Gabriel Gellner, Wesley Godoy, Jessica Green, Richard Hall, A. Noble Hendrix, M. Forrest Hill, Matt Holland, Carole Hom, Gary Huxel, Aaron King, John Lambrinos, Adam Lampert, Urmila Malvadkar, Kevin McCann, Andrew Noble, Pablo Rosso, Maria Sanchez, Chris Wilmers, Lee Worden, Brett Melbourne, Derin Wysham, Julie Kellner, Danielle Lyles, Steve Teo, Paul Williams

Current: Bo Zhang

Grant Support

- Predator-Prey Systems and Evolution of Ecological Parameters, National Science Foundation (DEB-8002593) 6/1/80-11/30/83 \$46,406
- NSF-CBMS Regional Conference on Mathematical Ecology, National Science Foundation, MCS-8403557 3/85 \$19,711
- New Approaches to Multilocus Population Genetics, National Institutes of Health, 1 R01 GM32130 7/1/83 - 6/30/95 (from \$30,000 to \$80,000 per year)
- Development of Paradigms for the Dynamics of Structured Populations, Department of Energy, DE-FG 7/89 - 6/93, \$150,000
- Physical Forcing of Spatially Distributed, Meroplanktonic Organisms, National Science Foundation, (co-pi, with L.W.Botsford, J.Quinn, M. Patterson and T. Powell) OCE-90-16721, 10/90-10/93 \$200,000
- Acquisition of Computer Graphics Instrumentation for Computational Biology, National Science Foundation (with Joel Keizer and Angela Cheer, co-pi), 10/92-9/94 \$200,000
- Effects of Climatic Changes on Ecological Communities in Fragmented Habitat, NIGEC, 7/1/95-6/30/99 \$186,000
- Hybrid Zones: Changing the Assumptions Underlying the Theories, National Science Foundation, 10/15/96-9/30/00 \$114,000
- Research Training Grant in Nonlinear Dynamics in Biology, National Science Foundation (PI, with Joel Keizer, Angela Cheer, and Maureen Stanton), 1/1/97-12/31/02 \$1,861,000
- Larval Dispersal and Marine Metapopulation Dynamics, National Science Foundation (co-pi, with Louis Botsford), 10/15/97-10/14/00 \$300,000
- Spatial Dynamics of an Outbreaking Insect Population, National Science Foundation (co-pi, with Susan Harrison) 7/1/96-6/30/00 \$200,000
- Integrating biological control in the integrated pest management program for *Spartina alterniflora* in Willapa Bay, National Sea Grant (with Miranda Wecker and Donald Strong) 10/1/99 – 9/30/01 \$120,000
- Quantitative Environmental Biology Workshop, Fall 2000. National Science Foundation (PI, with Peter Arzberger and Shandelle Henson) 8/1/00-12/31/02 \$38,881

- CoOP NE Pacific: The Role of Wind Driven Transport in Shelf Productivity, National Science Foundation (with Louis Botsford for Davis part) 1/1/00-12/31/04 \$946,349
- GLOBEC: Physical Influences on California Current Salmon, National Science Foundation (co-pi, with Louis Botsford) 10/1/00-9/30/05 \$597,000
- Biocomplexity: Dynamics of an Invasive Non-Native Species and its Biological, Physical, and Human Impacts: *Spartina alterniflora* on the Pacific Coast. National Science Foundation (PI, with David F. Layton, Donald R. Strong, Edwin D. Grosholz, Susan L. Ustin) 10/15/00-10/14/05 \$3,799,621
- Subcontract for Biocomplexity: Coupled natural and human dynamics in coral reef ecosystems: The effect of marine reserve network design and implementation on fisheries, biodiversity, and humans. National Science Foundation (Main award to American Museum of Natural History) 1/1/02-12/31/06 \$199,998 (subcontract amount)
- QEIB. Using Phase Dynamics and a Model Experimental System to Understand the Effects of Extrinsic Variability on Predator and Prey Metapopulations. National Science Foundation (co-pi, with Marcel Holyoak) 7/1/02 - 6/30/05 \$274,708
- QEIB. Theory and Experimentation with a Powerful Trophic Cascade: Nematodes, Rootfeeders, and Bush Lupine. National Science Foundation (co-pi, with Don Strong) 9/1/03-8/31/08 \$495,000
- Collaborative:MSPA-CSE: Analysis and Detection of Transient Dynamics in Ecological Systems. National Science Foundation (PI, with Anthony Ives, Univ. of Wisconsin; Kevin Gross; NC State Univ.) 9/15/04-9/14/07 \$450,000 (Total award to all 3 campuses)
- Subcontract for EPA STAR Grant: Connectivity in Marine Seascapes: Predicting ecological and socioeconomic costs of climate change in coral reef ecosystems 3/1/2005-2/29/2008. EPA (Main Award to RFF) \$86,607.64 (subcontract amount)
- QEIB: Stochastic Spatial Spread: Models and Experiments. National Science Foundation (PI, with Brett Melbourne) 07/01/05 – 06/30/08 \$291,893
- U.S.-GLOBEC NEP Phase IIb-CGOA: Environmental influences on growth and survival of Southeast Alaska coho salmon in contrast with other Northeast Pacific regions (co-pi, with L W Botsford) 04/01/06-03/31/09 \$290,424
- Biological Dynamics at Intermediate Time Scales. National Science Foundation

9/1/08-8/30/11 (PI) \$460,192

Collaborative Research: Comparative Analysis of Salmon and Cod Population Responses. National Science Foundation 9/1/08-8/30/11 (co-PI, with Louis Botsford) \$267,466

Collaborative Research: Range Limits and Their Response to Environmental Change: Experiments and Stochastic Models. National Science Foundation 8/1/09-7/30/14 (PI, with Brett Melbourne, Univ. of Colorado) \$304,691

CNH: Removal and Restoration: Social, Economic and Ecological Dynamics of Invasive *Spartina* in San Francisco Bay. National Science Foundation 10/1/10 – 9/30/16 (PI, with Carmia Feldman, Ted Grosholz, Mark Lubell, Jim Sanchirico) \$1,350,000

Dynamics at Intermediate Time Scales and Management of Ecological Populations. Army Research Office 9/1/13-8/31/16 (PI) \$359,000

INSPIRE Track 1: From population ecology to physics and back: understanding spatiotemporal synchrony using Ising class phase transitions in noisy dissipative models. National Science Foundation 10/1/13-9/30/17 (PI, with Andrew Noble and Jonathon Machta) \$600,000

Collaborative Research: Species Interactions in Range Dynamics and Changing Environments: Stochastic Models and Experiment. National Science Foundation 7/1/15-6/30/20 (PI, with Brett Melbourne, Univ. of Colorado) \$502,000

NRT: Sustainable Oceans: From Policy to Science to Decisions. National Science Foundation 9/1/2017-8/31/2022 (co-PI, with James Sanchirico, Marissa Baskett, Nann Fangue, Louis Botsford) \$2,999,889

Metacommunity dynamics: integrating local dynamics, stochasticity and connectivity. National Science Foundation 6/15/2018-5/31/2021 (PI) \$290,670

RoL:FELS:RAISE: Integrating statistical physics and nonlinear dynamics to understand emergent synchrony and phase transitions in biological systems. National Science Foundation 9/1/2018-8/31/2022 (PI, with Karen Abbott and Jonathon Machta) \$999,992

Improving management under MLMA by accounting for effects of MLPA MPAs on fisheries. California Sea Grant 12/1/2018-11/30/2020 (co-PI, with Louis Botsford and Will White) \$293,103

Workshop to Advance Theory in Ecology (co-PI, with Katriona Shea, Penn State University) National Science Foundation 4/15//2019-3/31/2020 \$99,816

Publications

1. **Hastings, A.** (1972). Eliminating viability differences in computing recombination percentages. Journal of Heredity, 63, 129-131.
2. **Hastings, A., & Rohlf, F. J.** (1974). Gene flow: effect in stochastic models of differentiation. American Naturalist, 108, 701-705.
3. **Hastings, A.** (1977). Spatial heterogeneity and the stability of predator-prey systems. Theoretical Population Biology, 12, 37-48.
4. **Hastings, A.** (1977). Some models in population biology. Unpublished doctoral dissertation, Cornell University, Ithaca, New York.
5. **Hastings, A.** (1978). Global stability of two species systems. Journal of Mathematical Biology, 5, 399-403.
6. **Hastings, A.** (1978). Global stability of Lotka-Volterra systems with diffusion. Journal of Mathematical Biology, 6, 163-168.
7. **Hastings, A.** (1978). Spatial heterogeneity and the stability of predator-prey systems: predator mediated coexistence. Theoretical Population Biology, 14:380-395.
8. **Hastings, A.** (1978). An evolutionary optimization principle. Journal of Theoretical Biology, 75, 519-525.
9. **Hastings, A.** (1978). Evolutionarily stable strategies and the evolution of life histories. I. Density dependent models. Journal of Theoretical Biology, 75, 527-536.
10. **Hastings, A.** (1979). Spatial heterogeneity and the stability of predator-prey systems: population cycles. in V. Lakshmikantham (ed.), Applied Nonlinear Analysis. (pp. 607-618). New York: Academic Press.
11. **Hastings, A., & Caswell, H.** (1979). Role of environmental variability in the evolution of life history strategies. Proceedings of the National Academy of Sciences, USA, 76, 4700-4703.
12. **Hastings, A.** 1979. Review of "Time Lags in Biological Models" by Norman MacDonald. Quarterly Review of Biology 54:496
13. Caswell, H., & **Hastings, A.** (1980). Fecundity, developmental time, and population growth rate: an analytical solution. Theoretical Population Biology, 17, 71-79.
14. **Hastings, A.** (1980). Population dynamics in patchy environments. in T. A. Burton

- (ed.), Modelling and Differential Equations in Biology. (pp. 217-223). : Marcel Dekker.
15. Wollkind, D. J., **Hastings, A.**, & Logan, J. A. (1980). Models involving differential and integral equations appropriate for describing a temperature dependent predator-prey mite ecosystem on apples. in T. A. Burton (ed.), Modelling and Differential Equations in Biology. (pp. 255-277). : Marcel Dekker.
 16. **Hastings, A.** (1980). Disturbance,coexistence,history, and competition for space. Theoretical Population Biology, 18, 363-373.
 17. Wollkind, D. J., **Hastings, A.**, & Logan, J. A. (1980). Functional response, numerical response, and stability in arthropod predator-prey ecosystems involving age structure. Researches on Population Ecology, 22, 323-338.
 18. **Hastings, A.** (1981). Multiple limit cycles in predator- prey models. Journal of Mathematical Biology, 11, 51-63.
 19. **Hastings, A.** (1981). Simultaneous stability of $D=0$ and $D\neq 0$ for multiplicative viabilities at two loci:an analytical study. Journal of Theoretical Biology, 89, 69-81.
 20. **Hastings, A.**, Seradilla, J. M., & Ayala, F. J. (1981). Boundary layer model for the population dynamics of single species. Proceedings of the National Academy of Sciences, 78, 1972-1975.
 21. **Hastings, A.** (1981). Disequilibrium,selection and recombination: limits in two-locus two-allele models. Genetics, 98, 659-668.
 22. **Hastings, A.** (1981). Marginal underdominance at a stable equilibrium. Proceedings of the National Academy of Sciences, USA, 78, 6558-6559.
 - 23 **Hastings, A.** (1981). Stable cycling in discrete time genetic models. Proceedings of the National Academy of Sciences, USA, 78, 7224-7225.
 24. **Hastings, A.**, & Wollkind, D. (1982). Age structure in predator-prey systems I. A general model and a specific example. Theoretical Population Biology, 21, 44-56.
 25. Wollkind, D., **Hastings, A.**, & Logan, J. (1982). Age structure in predator-prey systems II. Functional response and stability and the paradox of enrichment. Theoretical Population Biology, 21, 57-68.
 26. **Hastings, A.** (1982). Unexpected behavior in two locus genetic models: an analysis of marginal underdominance. Genetics, 102, 129-138.
 27. **Hastings, A.** (1982). Dynamics of a single species in a spatially varying environment:

- The stabilizing role of high dispersal rates. Journal of Mathematical Biology, 16, 49-55.
28. **Hastings, A.** (1982). Small deviations from symmetry in models in population biology. in V. Lakshmikantham (ed.), Nonlinear Phenomena in Mathematical Sciences. (pp. 513-516). New York: Academic Press.
 29. **Hastings, A.** 1982. Review of “Nonlinear Phenomena in Physics and Biology”. Quarterly Review of Biology 57:512
 30. **Hastings, A.** (1983). Age dependent predation is not a simple process. I. Continuous time models. Theoretical Population Biology, 23, 347-362.
 31. **Hastings, A.** (1983). Can spatial variation alone lead to selection for dispersal? Theoretical Population Biology, 24, 244-251.
 32. Hastings, A. 1983. Review of “The Mathematical Theory of the Dynamics of Biological Populations II,”. Quarterly Review of Biology 58:114-115
 33. Levin, S. A., Cohen, D., & **Hastings, A.** (1984). Dispersal strategies in patchy environments. Theoretical Population Biology, 26, 165-191.
 34. **Hastings, A.** (1984). Simple models for age dependent predation. S. A. Levin, & T. G. Hallam (eds.), Mathematical Ecology, Proceedings, Trieste 1982. (pp. 114-119). New York: Springer-Verlag.
 35. **Hastings, A.** (1984). Evolution in a seasonal environment: simplicity lost ? Evolution, 38, 350-358.
 36. **Hastings, A.** (1984). Linkage disequilibrium, selection and recombination at three loci. Genetics, 106, 153-164.
 37. **Hastings, A.** (1984). Age dependent predation is not a simple process. II. Wolves, ungulates and a discrete time model for predation on juveniles with a stabilizing tail. Theoretical Population Biology, 26, 271-282.
 38. **Hastings, A.** (1984). Maintenance of high disequilibrium in the presence of partial selfing. Proceedings National Academy of Sciences, USA, 81, 4596-4598.
 39. **Hastings, A.** (1984). Delays in recruitment at different trophic levels effects on stability. Journal of Mathematical Biology, 21, 35-44.
 40. **Hastings, A.** (1985). Stable equilibria at two loci in populations with large selfing rates. Genetics, 109, 215-228.

41. **Hastings, A.** (1985). Four simultaneously stable polymorphic equilibria in two-locus two-allele models. Genetics, 109, 255-261.
42. **Hastings, A.** (1985). Multilocus population genetics with weak epistasis. I. Equilibrium properties of two- locus two-allele models. Genetics, 109, 799-812.
43. **Hastings, A.** (1985). Evolution in the seasonal theta models. Evolution, 39, 709.
44. **Hastings, A.** (1986). Interacting age structured populations. in T. G. Hallam, & S. A. Levin (eds.), Mathematical Ecology. (pp. 287-294). New York: Springer-Verlag.
45. **Hastings, A.** (1986). Multilocus population genetics with weak epistasis. II. Equilibrium properties of multilocus models: What is the unit of selection ? Genetics, 112, 157-171.
46. **Hastings, A.** (1986). The invasion question. Journal of Theoretical Biology, 121, 211-220.
47. **Hastings, A.** 1986. Review of “Continuous and Discrete Dynamics Near Manifolds of Equilibria” by Bernd Aulbach. SIAM Review 28:105
48. **Hastings, A.** (1986). Limits to the relationship among recombination, disequilibrium, and epistasis in two locus models. Genetics, 113, 177-185.
- 49 **Hastings, A.** (1987). Can competition be detected using species co-occurrence data? Ecology, 68, 117-124.
50. **Hastings, A.** (1987). Cycles in cannibalistic egg-larval interactions. Journal of Mathematical Biology, 24, 651-666.
51. **Hastings, A.**, & Costantino, R. (1987). Cannibalistic egg-larval interactions in *Tribolium*: an explanation for the oscillations in population numbers. The American Naturalist, 113, 36-52.
52. **Hastings, A.** (1987). Substitutions under stabilizing selection. Genetics, 116, 479-486.
53. Quinn, J. F., & **Hastings, A.** (1987). Extinction in subdivided habitats. Conservation Biology, 1, 198-208.
54. **Hastings, A.** (1987). Monotonic change of the mean phenotype in two locus models. Genetics, 117, 583-585.
55. **Hastings, A.** (1988). Disequilibrium in two-locus mutation-selection models. Genetics, 118, 543-547.

56. **Hastings, A.** (1988). Dependence of expected heterozygosity on locus number with stabilizing selection and drift. Journal of Theoretical Biology, 134, 103-112.
57. **Hastings, A.** (1988). Food web theory and stability. Ecology, 69, 1665-1668.
58. Quinn, J. F., & **Hastings, A.** (1988). Extinction in subdivided habitats: Reply to Gilpin. Conservation Biology, 2, 293-296.
59. **Hastings, A.** (ed.). (1988). Community Ecology. New York: Springer-Verlag.
60. **Hastings, A.** (1988). When should you include age structure? in A. Hastings (ed.), Community Ecology. (pp. 25-34). New York: Springer-Verlaag.
61. **Hastings, A.** (1989). Linkage disequilibrium and genetic variances under mutation-selection balance. Genetics, 121, 857-860.
62. **Hastings, A.**, & Hom, C. L. (1989). Pleiotropic stabilizing selection limits the number of polymorphic loci to at most the number of characters. Genetics, 122, 459-463.
63. **Hastings, A.**, & Wolin, C. L. (1989). Within patch dynamics in a metapopulation. Ecology, 70, 1261-1266.
64. **Hastings, A.** (ed.). (1989). Some Mathematical Questions in Biology: Models in Population Biology. Lectures on Mathematics in the Life Sciences, Volume 20. Providence, Rhode Island: American Mathematical Society.
65. **Hastings, A.** (1989). Deterministic multilocus population genetics: an overview. in A. Hastings (ed.), Some Mathematical Questions in Biology: Models in Population Biology. Lectures on Mathematics in the Life Sciences. Vol. 20. (pp. 27-54). Providence, Rhode Island: American Mathematical Society.
66. **Hastings, A.** (1990). The interaction between selection and linkage in plant populations. in A. H. D. Brown, M. T. Clegg, A. Kahler, & B. Weir ((eds.)), Population Genetics, Plant Breeding and Gene Conservation. (pp. 163-180). Sunderland, MA: Sinauer Associates, Inc.
67. **Hastings, A.** (1990). Maintenance of polygenic variation through mutation-selection balance: bifurcation analysis of a biallelic model. J. Math. Biol., 28, 329-340.
68. Gomulkiewicz, R. S., & **Hastings, A.** (1990). Ploidy and evolution by sexual selection: a comparison of haploid and diploid female choice models near fixation equilibria. Evolution, 44, 757-770.

69. **Hastings, A.**, & Hom, C. L. (1990). Multiple equilibria and maintenance of additive genetic variance in a model of pleiotropy. Evolution, 44, 1153-1163.
70. **Hastings, A.** (1990). Second-order approximations for selection coefficients at polygenic loci. J. Math. Biol., 28, 475-483.
71. **Hastings, A.** (1990). Spatial heterogeneity and ecological models. Ecology, 71, 426-428.
72. **Hastings, A.** (1991). Structured models of metapopulation dynamics. Biological Journal of the Linnean Society, 42, 57-71.
73. **Hastings, A.**, & Costantino, R. F. (1991). Oscillations in population numbers: Age dependent cannibalism. Journal of Animal Ecology, 60, 471-482. doi: 10.2307/5292
74. **Hastings, A.**, & Powell, T. (1991). Chaos in a three species food chain. Ecology, 72, 896-903.
75. Klebanoff, A., Minta, S., **Hastings, A.**, & Clark, T. (1991). Age-dependent predation model of black-footed ferrets and prairie dogs. SIAM Journal on Applied Mathematics, 51, 1053-1073.
76. **Hastings, A.** (1991). McKendrick-Von Foerster Models for Patch Dynamics. in Lecture Notes in Biomathematics,
77. **Hastings, A.** (1992). Second-order approximations for selection coefficients at polygenic loci. 2. Pleiotropy. Journal of Mathematical Biology, 30, 379-388
78. **Hastings, A.** (1992). Age dependent dispersal is not a simple process: density dependence, stability and chaos. Theoretical Population Biology, 41, 388-400.
79. Fox, G.A. & **Hastings, A.** (1992) Inferring selective history from multilocus frequency data -- Wright meets the Hamiltonian. Genetics. 132, 277-288.
80. **Hastings, A.** (1993) Complex interactions between dispersal and dynamics: Lessons from coupled logistic equations. Ecology. 74, 1362-1372.
81. Gavrillets, S. & **Hastings, A.** (1993). Maintenance of genetic variability under strong stabilizing selection: a two-locus model. Genetics, 134, 377-386.
82. **Hastings, A.**, Hom, C., Ellner, S., Turchin, P., & Godfray, H.C.J. (1993) Chaos in ecology: Is mother nature a strange attractor? Annual Reviews of Ecology and Systematics, 24, 1-33.
83. Klebanoff, A. & **Hastings, A.** (1994). Chaos in three species food chains. Journal

of Mathematical Biology 32:427-451

84. **Hastings, A.** (1994) Conservation and spatial structure: Theoretical approaches. pp. 494-503 in Lecture Notes in Biomathematics. v. 100.
85. Gavrillets, S. & **Hastings, A.** (1994) Maintenance of multilocus variability under strong stabilizing selection. Journal of Mathematical Biology, 32, 287-302.
86. Botsford, L.W., C.L. Moloney, **A. Hastings**, J.L. Largier, T.M. Powell, K.Higgins, and J.F. Quinn. (1994). The influence of spatially and temporally varying oceanographic conditions on meroplanktonic larvae. Deep-Sea Research Part II - Topical Studies in Oceanography , 41:107-145
87. Klebanoff, A. & **Hastings, A.** (1994) Chaos in one-predator, two-prey models: general results from bifurcation theory. Mathematical Biosciences, 122:221-233
88. **Hastings, A.** & Higgins, K. (1994) Persistence of transients in spatially structured ecological models, Science, 263, 1133-1136.
89. Gavrillets, S. & **Hastings, A.** (1994) A quantitative genetic model for developmental noise Evolution 48:1478-1486.
90. Gavrillets, S. & **Hastings, A.** (1994) Dynamics of genetic variability in two-locus models of stabilizing selection. Genetics, 138:519-532.
91. **Hastings, A.** & Harrison, S. (1994). Metapopulation dynamics and genetics. Ann. Rev. Ecol. Syst. 25:167-188.
92. Gavrillets, S. and **Hastings, A.** (1995) Dynamics of polygenic variability under stabilizing selection, recombination, and drift. Genetical Research, 65:63-74
93. **Hastings, A.** & Fox, G.A. (1995) Optimization as a technique for studying population genetics equations. pp. 18-26 in Lecture Notes in Computer Science vol. 899
94. Ewens, W.J. & **Hastings, A.** (1995) Aspects of optimality behavior in population genetics equations. pp. 7-18 in Lecture Notes in Computer Science vol. 899
95. **Hastings, A.** (1995) A metapopulation model with population jumps of varying sizes. Math. Biosci. 128:285-298
96. **Hastings, A.** (1995). Review of "Chaos in Dynamical Systems" by E Ott. Bulletin of Mathematical Biology 57:943-944

97. Gavrillets, S., & **Hastings, A.** (1995) Intermittency and transient chaos from simple frequency-dependent selection. Proceedings Royal Society: Biological Sciences 261:233-238
98. **Hastings, A.** (1996) What equilibrium behavior of Lotka-Volterra models does not tell us about food webs. pp. 211-217 in Polis, G.A. and Winemiller, K.O. (eds.) *Food Webs: Integration of Patterns & Dynamics* Chapman & Hall, New York
99. **Hastings, A.** (1996) Models of spatial spread: is the theory complete? Ecology 77:1675-1679
100. **Hastings, A.** (1996) Ecosystem Modelling: Can it be done at all? Review of "The dynamics nature of ecosystems: chaos and order entwined" by C. Pohl-Wostl. Ecology 77:1957
101. Gavrillets, S., & **Hastings, A.** (1996) Founder effect speciation: a theoretical reassessment. American Naturalist 147:466-491
102. Harrison, S. & **Hastings, A.** (1996) Genetic and evolutionary consequences of metapopulation structure. Trends in Ecology and Evolution 11:180-183
103. Ray, C. & **Hastings, A.** (1996) Density dependence: are we searching at the wrong spatial scale? J. Animal Ecology 65:556-566
104. **Hastings, A.** (1996) Models of spatial spread: A synthesis. Biological Conservation 78:143-148
105. Gyllenberg, M., Hanski, I & **Hastings, A.** (1997) Structured metapopulation models. pp. 93-122 in Hanski, I. and Gilpin, M., eds. *Metapopulation Biology*. Academic Press, San Diego.
106. **Hastings, A.** (1997) *Population Biology: Concepts and Models*. Springer-Verlag, New York
107. Higgins, K., **Hastings, A.**, & Botsford, L. (1997) Density dependence and age structure: a general nonlinear study American Naturalist 149:247-269
108. Levin, S.A., Grenfell, B., **Hastings, A.**, & Perelson, A.S. (1997) Mathematical and computational challenges in population biology and ecosystems science. Science 275:334-343.
109. Higgins, K., **Hastings, A.**, Sarvela, J.N., & Botsford, L. (1997) Stochastic dynamics and deterministic skeletons: Population behavior of Dungeness crab. Science 276:1431-1435

110. McCann, K., **Hastings, A.** (1997) Re-evaluating the omnivory-stability relationship in food webs. Proceedings Royal Society: Biological Sciences 264:1249-1254.
111. **Hastings, A.** (1997) Transients in spatial ecological models. pp. 185-194 in Bascompte, J. & Solé, R.V. ed. , Landes Bioscience
112. **Hastings, A.**, Harrison, S. & McCann, K. (1997) Unexpected spatial patterns in an insect outbreak match a predator diffusion model. Proceedings Royal Society: Biological Sciences 264:1837-1840.
113. Botsford, L.W., Moloney, C.L., Largier, J.L. & **Hastings, A.** (1998) Metapopulation dynamics of meroplanktonic invertebrates: the Dungeness crab (*Cancer magister*) as an example. *In* Proceedings of the North Pacific Symposium in Invertebrate Stock Assessment and Management. *Edited by* G.S. Jamieson and A. Campbell. *Can. Spec. Publ. Fish. Aquat. Sci.* 125:295-306.
114. Huxel, G., & **Hastings, A.** (1998) Population size dependence, competitive coexistence and habitat destruction. Journal of Animal Ecology 67:446-453.
115. McCann, K. **Hastings, A.**, & D. R. Strong. (1998) Trophic cascades and trophic trickles in pelagic food webs. Proceedings Royal Society: Biological Sciences 265:205-209.
116. Gavrillets, S. & **Hastings, A.** (1998) Coevolutionary chase in two-species systems with applications to mimicry. Journal of Theoretical Biology 191:415-427.
117. **Hastings, A.** (1998) Review of “Case Studies in Mathematical Modeling – Ecology, Physiology, and Cell Biology,”. Quarterly Review of Biology 73:257-258
118. McCann, K; **Hastings, A.**; & Huxel, G.R. (1998) Weak trophic interactions and the balance of nature. Nature 395:794-798
119. Wilson, W.; Harrison, S; **Hastings, A.**; & McCann, K. (1999) Exploring stable pattern formation in models of tussock moth populations J.Anim.Ecol. 68:94-107
120. **Hastings, A.** & Godfray, H.C.J. (1999) Learning, host fidelity and the stability of host-parasitoid communities. American Naturalist 153:295-301
121. **Hastings, A.** (1999) Outbreaks of insects: A dynamic approach. Pp. 206-215 in Hawkins, B. and Cornell, H. eds. *Theoretical Approaches to Biological Control*. Cambridge University Press
122. **Hastings, A.** (1999) Modeling, not theory. Review of “Ecological Dynamics” by W.S.C. Gurney and R.M. Nisbet. Trends in Ecology & Evolution 14:412-413

123. **Hastings, A.** and Botsford, L. (1999) Equivalence in yield from marine reserves and traditional fisheries management. Science 284:1537-1538.
124. Huxel, G. & **Hastings, A.** (1999) The influence of restoration on species persistence in fragmented habitats. Restoration Ecology 7:309-315
125. **Hastings, A.** & Gavrillets, S. (1999) .Global dispersal reduces local diversity Proceedings Royal Society: Biological Sciences 266:2067-2070
126. **Hastings, A.** (2000) Parasitoid spread: lessons for and from invasion biology. Pp. 70-82 in Hochberg, M.E. and Ives, A.R. (Eds.) Parasitoid Population Biology, Princeton University Press
127. McCann, K., **Hastings, A.**, Harrison, S & Wilson, W. (2000) Population outbreaks in a discrete world. Theoretical Population Biology 57:97-108
128. **Hastings, A.** (2000) Synchronicity: differential responses to vaccination illuminate dynamics. Trends in Ecology and Evolution 15:129-130
129. **Hastings, A.** (2000) The lion and the lamb find closure. Science 290:1712-1713. (simplified version reprinted as "Arrangements mathematiques entre ennemis", Le Figaro, Dec. 1, 2000)
130. **Hastings, A.** (2001) Population dynamics. pp. 769-776. In Levin, S.A. (Ed.) Encyclopedia of Biodiversity, vol. 4. Academic Press, New York
131. Petersen, J.E. & **Hastings, A.** (2001) Dimensional approaches to scaling experimental ecosystems: Designing mouse traps to catch elephants. American Naturalist 157:324-333.
132. Botsford, L., **Hastings, A.**, & Gaines, S.D. (2001) Dependence of sustainability on the configuration of marine reserves and larval dispersal distance. Ecology Letters 4:144-150.
133. **Hastings, A.** (2001) Transient dynamics and persistence of ecological systems. Ecology Letters 4:215-220.
134. **Hastings, A.** (2001) Population biologists back in the lab: Stability in Model Populations. Review of "Stability in Model Populations" by L.D. Mueller and A. Joshi. Trends in Ecology & Evolution 16:722
135. **Hastings, A.** (2001) Hardy-Weinberg theorem. In Encyclopedia of Life Sciences MacMillan Publishing
136. de Valpine, D.P. & **Hastings, A.** (2002) Fitting population models with process

- noise and observation error. Ecological Monographs 72:57-76
137. Okubo, A., **Hastings, A.**, & Powell, T. (2002) Population dynamics In temporal and spatial domains. pp. 298-373 In Okubo, A., and Levin, S.A. Diffusion and Ecological Problems: A Modern Perspective. Springer-Verlag
138. Callaway, D.S. & **Hastings, A.** (2002) Consumer movement through differentially subsidized habitats creates a spatial food web with unexpected results Ecology Letters 5: 329–332
139. Lockwood, D.R., **Hastings, A.**, & Botsford, L. W. (2002) The Effects of Dispersal Patterns on Marine Reserves: Does the Tail Wag the Dog? Theoretical Population Biology 61: 297–309
140. Hill, M.F., **Hastings, A.**, & Botsford, L.W. (2002) The effects of small dispersal rates on extinction times in metapopulation models. American Naturalist 160:389-402
141. Umbanhowar, J. & **Hastings, A.** (2002) The impact of resource limitation and the phenology of parasitoid attack on the duration of insect herbivore outbreaks. Theoretical Population Biology 62:259-269
142. Botsford, L.W., Lawrence, C.A., Hill, M.F., **Hastings, A.**, & McCann, K. (2002) Dynamic responses of California Current populations to environmental variability. pp. 215-226 in McGinn, N.A. (ed.) Fisheries in a Changing Climate, American Fisheries Society Symposium 32
143. **Hastings, A.** (2002) Theoretical ecology. pp. 326-329 in McGraw-Hill Encyclopedia of Science and Technology, 8th Edition, Volume 18
144. **Hastings, A.** (2002) Review of “Mathematical models in Population Biology and Epidemiology” by Fred Brauer and Carlos Castillo-Chavez. Quarterly Review of Biology 77:313
145. **Hastings, A.** (2003) Ecology you can count on. Review of “Population Ecology: First Principles” by John H.Vandermeer & Deborah E.Goldberg. Princeton University Press: 2003. Nature 424:881
146. Fox, G.A. & **Hastings, A.** (2003) Limiting relationships between selection and recombination. Bulletin of Mathematical Biology (2003) 65: 129–141
147. Botsford, L., Micheli, F. & **Hastings, A.** (2003) Principles for the design of marine reserves. Ecological Applications 13:S25-S31
148. Gerber, L.R., Bosford, L.W., **Hastings, A.**, Possingham, H.P., Gaines, S.D.,

- Palumbi, S.R., & Andelman, S.J. (2003) Population models for marine reserve design: A retrospective and prospective synthesis. Ecological Applications 13:S47-S64
149. **Hastings, A.** & Botsford, L. (2003) Comparing designs of marine reserves for fisheries and for biodiversity. Ecological Applications 13:S65-S70
150. **Hastings, A.** & Palmer, M.A. (2003) A bright future for biologists and mathematicians? Science 299:2003-2004
151. Brown, D. & **Hastings, A.** (2003) Resistance may be futile: dispersal scales and selection for disease resistance in competing plants. Journal of Theoretical Biology 222:373–388
152. Hill, M.F., Botsford, L. & **Hastings, A.** (2003) The effects of spawning age distribution on salmon persistence in fluctuating environments Journal of Animal Ecology 72:736-744
153. **Hastings, A.** (2003) Metapopulation persistence with age dependent disturbance or succession. Science 301:1525-1526
154. Botsford, L.W., Lawrence, C.A., Dever, E.P., **Hastings, A.** & Largier, J. (2003) Wind Strength and Biological Productivity in Upwelling Systems: An Idealized Study. Fisheries Oceanography 12:245-259
155. McCann, K.S., Botsford, L.W. & **Hastings, A.** (2003) Differential response of marine populations to climate forcing. Canadian Journal of Fisheries and Aquatic Science 60: 971–985
- 156 Sanchez, M. & **Hastings, A.** (2003) Uniform vertical transmission and selection in a host- symbiont system. Nonrandom symbiont distribution generates apparent differential selection. Journal of Theoretical Biology 225:517–530
157. King, A. & **Hastings, A.** (2003) Spatial mechanisms for coexistence of species sharing a common natural enemy. Theoretical Population Biology 64:431-438
158. **Hastings, A.** (2004) Transients: the key to long-term ecological understanding? Trends in Ecology and Evolution 19:39-45
159. Dugaw, C.J., **Hastings, A.**, Preisser, E.L. & Strong, D.R. (2004) Seasonally limited host supply generates microparasite population cycles. Bulletin of Mathematical Biology 66:583-594
160. **Hastings, A.** (2004) Response to comment on “Metapopulation Persistence with Age-Dependent Disturbance or Succession”. Science 384:604d

161. **Hastings, A.** (2004) Old wine in a new bottle. Review of “The Struggle for Existence” by G.F. Gause. Reprinted by Dover Publications, 2003. Trends in Ecology & Evolution 19:64-65
162. Moore, John C., Berlow, Eric L., Coleman, David C., de Ruiter, Peter C., Dong, Quan, **Hastings, Alan**, Johnson, Nancy Collins, McCann, Kevin S., Melville, Kim, Morin, Peter J., Nadelhoffer, Knute, Rosemond, Amy D., Post, David M. Sabo, John L., Scow, Kate M., Vanni, Michael J. & Wall, Diana H. (2004) Detritus, trophic dynamics, and biodiversity. Ecology Letters 7:584-600
163. Cuddington, K. & **Hastings, A.** (2004) Invasive engineers. Ecological Modelling 178:335-347
164. Botsford, L.W., Kaplan, D. & **Hastings, A.** (2004) Sustainability and yield in marine reserve policy. American Fisheries Society Symposium 42:75-86
165. Bonsall, M.B. & **Hastings, A.** (2004) Demographic and environmental stochasticity in predator-prey metapopulation dynamics. Journal of Animal Ecology 73:1043-1055
166. Guichard, F., Levin, S.A., **Hastings, A.** & Siegel, D. (2004) Toward a dynamic metacommunity approach to marine reserve theory. Bioscience 54:1003-1111
167. Taylor, C.M. & **Hastings, A.** (2004) Finding optimal control strategies for an invasive grass using a density-structured model. Journal of Applied Ecology 41:1049-1057
168. Taylor, C.M., Davis, H.G., Civille, J.C., Grevstad, F.S., & **Hastings, A.** (2004) Consequences of an Allee effect in an invasive plant: *Spartina alterniflora* in Willapa Bay, Washington. Ecology 85:3254-3266
169. **Hastings, A.**, Cuddington, K., Davies, K.F., Dugaw, C.J., Elmendorf, S., Freestone, A., Harrison, S., Holland, M., Lambrinos, J., Malvadkar, U., Melbourne, B.A., Moore, K., Taylor, C., & Thomson, D. (2005) The spatial spread of invasions: new developments in theory and evidence, Ecology Letters 8:91-101
170. **Hastings, A.** (2005) Epidemiology, in *Encyclopedia of Nonlinear Science*, ed. Alwyn Scott. New York and London: Routledge.
171. Olson, D.B., Cosner, C., Cantrell, S. & **Hastings, A.** (2005) Persistence of fish populations in time and space as a key to sustainable fisheries. Bulletin of Marine Science 76:213-232
172. Green, J.L., **Hastings, A.**, Arzberger, P., Ayala, F., Cottingham, K.L., Cuddington, K., Davis, F., Dunne, J.A., Fortin, M-J., Gerber, L., Neubert, M. (2005) Complexity

in ecology and conservation: mathematical, statistical, and computational challenges. BioScience 55:501-510.

173. **Hastings, A.**, Arzberger, P., Bolker, B., Collins, S., Ives, A.R., Johnson, N.A., Palmer, M.A. (2005) Quantitative Bioscience for the 21st Century. BioScience 55:511-517.
174. Taylor, C.M. & **Hastings, A.** (2005) Allee effects in biological invasions. Ecology Letters 8:895-908.
175. Kinlan, B.P. & **Hastings, A.** (2005) Rates of population spread and geographic range expansion: what exotic species tell us. Pp. 381-419 in Sax, D.F., Stachowicz, J.J. & Gaines, S.D. (eds.) *Species Invasions: Insights into Ecology, Evolution, and Biogeography*. Sinauer Assoc., Inc., Sunderland, MA
176. **Hastings, A.** (2005) Unstructured models in ecology: past, present, and future. Pp. 9-29 in Cuddington, K. and Besiner, B. (eds.) *Ecological Paradigms Lost*. Academic Press.
177. Harrison, S., **Hastings, A.** and D. R. Strong, (2005) Spatial and temporal dynamics of insect outbreaks in a complex multitrophic system: tussock moths, ghost moths, and their natural enemies on bush lupines. Annales Zoologici Fennici 42: 409–419.
178. Dugaw, C.J., Preisser, E.L., **Hastings, A.** & Strong, D.R. (2005) Widening the window of persistence in seasonal pathogen-host systems. Theor. Pop. Biol. 68:267–276.
179. Rosso, P. H., Ustin, S. L. & **Hastings, A.** (2005) Mapping marshland vegetation of San Francisco Bay, California, using hyperspectral data. International Journal of Remote Sensing 26: 5169 – 5191.
180. Sabo, J.L., Beisner, B.E., Berlow, E. L., Cuddington, K., **Hastings, A.**, Koen-Alonso, M., McCann, K., Melian, C., & Moore, J. (2005) Population dynamics and food web structure? Predicting measurable food web properties with minimal detail and resolution. Pp. 437-450 in De Ruiter, P., Wolters, V. & Moore, J. (eds.) *Dynamics Food Webs*. Academic Press
181. Lee, C.T. & **Hastings, A.** (2006) Non-equilibrium genetic structure is robust to the shape of the dispersal distribution. Evolutionary Ecology Research 8:279-293.
182. **Hastings, A.** & Botsford, L.W. (2006) Persistence of spatial populations depends on returning home. Proc. Natl. Acad. Sci. 103:6067-6072.

183. Rosso, P. H., Ustin, S. L. & **Hastings, A.** (2006) Use of lidar to study changes associated with *Spartina* invasion in San Francisco Bay marshes. Remote Sensing of Environment. 100:295-306.
184. Botsford, L.W. & **Hastings, A.** (2006) Conservation dynamics of marine metapopulations with dispersing larvae. Pp. 411-430 in Kritzer, J. and Sale, P. (eds.). *Marine Metapopulations*. Academic Press
185. Hall, R.J., **Hastings, A.** & Ayres, D. (2006) Explaining the explosion: Modelling hybrid invasions. Proc Roy. Soc. B 273: 1385–1389
186. **Hastings, A.** & Botsford, L.W. (2006) A simple persistence condition for structured populations. Ecology Letters 9:846-852
187. Byers, J. E., Cuddington, K., Jones, C. G., Talley, T. S., **Hastings, A.**, Lambrinos, J.G., Crooks, J.A. & Wilson, W.G. (2006) Using ecosystem engineers to restore ecological systems. Trends in Ecology and Evolution 21:493-500.
188. Sanchirico, J.N., Malvadkar, U., **Hastings, A.** & Wilen, J.E. (2006) When are no-take zones an economically optimal fishery management strategy? Ecol Appl. 16:1643-1659.
189. **Hastings, A.**, Hall, R.J., & Taylor, C.M. (2006) A simple approach to optimal control of invasive species. Theoretical Population Biology 70:431-435.
190. Botsford, L.W., Lawrence, C., Dever, E., **Hastings, A.**, & Largier, J. (2006) Dynamic effects of variable winds on biological productivity in coastal upwelling systems with advective losses. Deep Sea Research Part II 53: 3116-3140
191. Melbourne, B.A., Cornell, H.V., Davies, K.F., Dugaw, C.W., Elmendorf, S., Freestone, A.L., Hall, R., Harrison, S., **Hastings, A.**, Holland, M., Holyoak, M., Lambrinos, J., Moore, K., Yokomizo H. (2007). Invasion in a heterogeneous world: resistance, coexistence or hostile takeover? Ecology Letters 10:77-94
192. **Hastings, A.**, Byers, J. E., Crooks, J.A, Cuddington, K., Jones, Lambrinos, J.G., C. G., Talley, T. S., & Wilson, W.G. (2007) Ecosystem engineering in space and time. Ecology Letters 10:153-164
193. Wilmers, C.C., Post, E. & **Hastings, A.** (2007) A perfect storm: the combined effects on population fluctuations of auto-correlated environmental noise, age structure, and density dependence. American Naturalist 169:673-683
194. Cuddington, K., Byers, J. Wilson, W. and **Hastings, A.** (Eds.) (2007) *Ecosystem Engineers: Concepts, Theory and Applications*. Elsevier, London

195. Cuddington, K. and **Hastings, A.** (2007) Balancing the engineer-environment equation: the current legacy. Pp. 253-274 in Cuddington, K., Byers, J. Wilson, W. and Hastings, A. (Eds.) *Ecosystem Engineers: Concepts, Theory and Applications*. Elsevier, London
196. **Hastings, A.** (2007) Management and ecosystem engineers: current knowledge and future challenges. Pp. 387-393 in Cuddington, K., Byers, J. Wilson, W. and Hastings, A. (Eds.) *Ecosystem Engineers: Concepts, Theory and Applications*. Elsevier, London
197. Sax, D.F., Stachowicz, J.J., Brown, J.H., Bruno, J.F., Dawson, M.N., Gaines, S. D., Grosberg, R.K., **Hastings, A.**, Holt, R.D., Mayfield, M.M., O'Connor, M.I., Rice, W.R. (2007) Ecological and evolutionary insights from species invasions. *Trends in Ecology and Evolution* 22:465-471.
198. Wilmers, C.C., Post, E. & **Hastings, A.** (2007) The anatomy of predator-prey dynamics in a changing climate.. *Journal of Animal Ecology* 76:1037-1044.
199. Wright, R. W. and **Hastings, A.** (2007) Spontaneous patchiness in a host-parasitoid integrodifference model. *Bulletin of Mathematical Biology* 69: 2693-2709
200. Mumby, P.J., **Hastings, A.**, & Edwards, H.J. (2007) Thresholds and the resilience of Caribbean coral reefs. *Nature* 450:98-101.
201. Gaines, S.D., Gaylord, B., Gerber, L.R., **Hastings, A.**, and Kinlan, B. (2007) Connecting places: the ecological consequences of dispersal in the sea. *Oceanography* 20(3):90-99
202. Hall, RJ and **Hastings, A.** (2007) Minimizing invader impacts: striking the right balance between removal and restoration. *Journal of Theoretical Biology* 249:437-444
203. **Hastings, A.** (2008) Transients and the dynamics of ecological systems. Pp. 39-53 in Valladares, F., A. Camacho, A. Elosegui, M. Estrada, C. Gracia, J. C. Senar, and J. M. Gili, editors.. *Unity in diversity. Reflections on ecology after the legacy of Ramon Margalef*. Fundación BBVA, Madrid.
204. **Hastings, A.** (2008) Editorial – an ecological theory journal at last. *Theoretical Ecology* 1:1-4.
205. Goldwyn, E.E. and **Hastings, A.** (2008) When can dispersal synchronize populations? *Theoretical Population Biology* 73:395-402
206. Wysham, D.B. and **Hastings, A.** (2008) The coupled two-patch Ricker population model: transients explained. *Bulletin of Mathematical Biology* 70: 1013-1031

207. Mumby, P.J. and **Hastings, A.** (2008) The impact of ecosystem connectivity on coral reef resilience. J Appl. Ecol 45:854-862
208. Malvadkar, U. and **Hastings, A.** (2008) Persistence of mobile species in marine protected areas. Fisheries Research 91:69-78
209. Melbourne, B.A. and **Hastings, A.** (2008) Extinction risk depends strongly on factors contributing to stochasticity. Nature 454:100-103.
210. Mumby, P.J., Broad K., Brumbaugh, D.R., Dahlgren, C.P., Harborne, A.R., **Hastings, A.**, Holmes, K.E., Kappel, C.V., Micheli, F., and Sanchirico, J.N. (2008) Coral reef habitats as surrogates of species, ecological functions and ecosystem services. Conservation Biology 22:941-951.
211. Holland, M.D. and **Hastings, A.** (2008) Strong effect of dispersal network structure on ecological dynamics. Nature 456:792-795.
212. Hochberg, M.E., Chase, J.M., Gotelli, N.J., **Hastings, A.** and Naeem, S. (2009) The tragedy of the reviewer commons. Ecology Letters 12:2-4.
213. Goldwyn, E.E. and **Hastings, A.** (2009) Small heterogeneity has large effects on synchronization of ecological oscillators. Bulletin of Mathematical Biology 71:130-144.
214. Cuddington, K., Wilson, W.G., and **Hastings, A.** (2009) Ecosystem engineers: feedback and population dynamics. American Naturalist 173:488-498.
215. **Hastings, A.** (2009) Editorial: Theoretical Ecology: A successful first year for a new journal. Theoretical Ecology 2:1-2.
216. Sokolow, S.H., Foley, P., Foley, J.E., **Hastings, A.** and Richardson, L.L. (2009) Disease dynamics in marine metapopulations: modelling infectious diseases on coral reefs. Journal of Applied Ecology 46:621-631.
217. Kellner, J.B. and **Hastings, A.** (2009) A reserve paradox: introduced heterogeneity may increase regional invisibility. Conservation Letters 2:115-122.
218. Lyles, D., Rosenstock, T.S., **Hastings, A.** and Brown, P.H. (2009) The Role of Large Environmental Noise in Masting: General Model and Example from Pistachio Trees Journal of Theoretical Biology 259:701-713
219. **Hastings, A.** (2009) Biological chaos and complex dynamics. Pp. 172-176 in Levin, S.A. (ed.) *The Princeton Guide to Ecology*, Princeton University Press

220. Melbourne, B., and **Hastings, A.** (2009) Highly variable spread rates in replicated invasions: fundamental limits to predictability. Science 325:1536-1539
221. Teo, S.L.H., Botsford, L.W. and **Hastings, A.** (2009) Spatio-temporal covariability in coho salmon (*Oncorhynchus kisutch*) survival, from California to Southeast Alaska Deep Sea Research Part II 56:2570-2578
222. Blackwood, J., **Hastings, A.**, and Costello, C. (2010) Cost-effective management of invasive species using linear-quadratic control. Ecological Economics 69:519-527
223. White, J.W., Botsford, L.W., **Hastings, A.**, and Largier, J.L. (2010) Population persistence in marine reserve networks: incorporating spatial heterogeneities in larval dispersal. Marine Ecology Progress Series 398:49-67
224. **Hastings, A.** (2010) Editorial Theoretical Ecology 3:1.
225. Yokomizo, H., Botsford, L.W., Holland, M.D., Lawrence, C.A., and **Hastings, A.** (2010) Optimal wind patterns for biological production in shelf ecosystems driven by coastal upwelling. Theoretical Ecology 3:53-63.
226. **Hastings, A.**, and Wysham, D.B. (2010) Regime shifts in ecological systems can occur with no warning. Ecology Letters 13:464-472.
227. Epanchin-Niell, R. and **Hastings, A.** (2010) Controlling established invaders: integrating economics and spread dynamics to determine optimal management. Ecology Letters 13:528-541.
228. Kellner, J.B., Litvin, S.Y., **Hastings, A.**, Micheli, F., and Mumby, P.J. (2010) Disentangling trophic interactions inside a Caribbean marine reserve. Ecological Applications 20:1979-1992.
229. **Hastings, A.** (2010) Time scales, dynamics, and ecological understanding. Ecology 91:3471-3480.
230. Worden, L., Botsford, L.W., **Hastings, A.**, and Holland, M.D. (2010) Frequency responses of age-structured populations: Pacific salmon as an example. Theoretical Population Biology 78:239-249.
231. Kellner, J.B., Sanchirico, J.N., **Hastings, A.**, and Mumby, P.J. (2011) Optimizing for multiple species and multiple values: tradeoffs inherent in ecosystem-based fisheries management. Conservation Letters 4:21-30.
232. Blackwood, J.C., and **Hastings, A.** (2011) The effect of time delays on Caribbean coral-algal interactions. Journal of Theoretical Biology 273:37-43.

233. **Hastings, A.**, Petrovskii, S., and Morozov, A. (2011) Spatial ecology across scales. Biology Letters 7:163-165
234. Williams, P.D. and **Hastings, A.** (2011) Paradoxical persistence through mixed-system dynamics: towards a unified perspective of reversal behaviours in evolutionary ecology. Proc. Roy. Soc. B 278:1281-1290
235. Botsford, L.W., Holland, M.D. Samhuri, J.F., White, J.W., and **Hastings, A.** (2011) Importance of age structure in models of the response of upper trophic levels to fishing and climate change. ICES Journal of Marine Science 68:1270-1283
236. **Hastings, A.** (2011) Single species population dynamics and its theoretical underpinnings. In Scheiner, S.M. and Willig, M.R. (eds.) *The Theory of Ecology*, University of Chicago Press
237. Rosenstock, T.S., **Hastings, A.**, Koenig, W.D., Lyles, D.J., and Brown, P.H. (2011) Testing Moran's theorem in an agroecosystem. Oikos 120: 1434–1440
238. White, J.W, Botsford. L.W., Baskett, M.L., Barnett, L.A.K., Barr, R.J., and **Hastings, A.** (2011) Linking models and monitoring data in assessing performance of no-take marine reserves. Frontiers in Ecology and the Environment 9:390-399
239. Blackwood, J.C., **Hastings, A.**, and Mumby, P. (2011) A model-based approach to determine the long term effects of multiple interacting stressors on coral reefs. Ecological Applications 21: 2722-2733.
240. Goldwyn, E.E. and **Hastings, A.** (2011) The roles of the Moran effect and dispersal in synchronizing oscillating populations. J. Theor. Biol. 289:237-246
241. Noble, A.E., **Hastings, A.** and Fagan, W.F. (2011) Multivariate Moran Process with Lotka-Volterra Phenomenology. Phys. Rev. Letters 107:228101
242. Blackwood, J.C., **Hastings, A.**, and Mumby, P. (2012) The effect of fishing on hysteresis in Caribbean coral reefs. Theoretical Ecology 5:105-114
243. Blackwood, J.C., Berec, L., Yamanaka, T., Epanchin-Niell, R.S., **Hastings, A.** and Liebhold, A.M. (2012) Bioeconomic synergy between tactics for insect eradication in the presence of Allee effects. Proc. Roy. Soc. B. 279:2807-2815
244. **Hastings, A.** (2012) In Focus: Unraveling stability-complexity relationships. J. Anim. Ecol. 81:513-515
245. Barnosky A.D., Hadly, E.A., Bascompte, J., Berlow, E.L., Brown, J.H., Fortelius, M., Getz, W.M., Harte, J., **Hastings, A.**, Marquet, P.A., Martinez, N.D., Mooers, A., Roopnarine, P., Vermeij, G., Williams, J.W., Gillespie, R., Kitzes, J., Marshall, C.,

- Matzke, N., Mindell, D.P., Revilla, E. and Smith, A.B. (2012) Approaching a state shift in earth's biosphere. Nature 486:52-58.
246. **Hastings, A.** and Gross, L. (eds.) (2012) *Encyclopedia of Theoretical Ecology*, University of California Press, Berkeley, CA
247. **Hastings, A.** (2012) Cannibalism. pp. 120-123 in Hastings, A. and Gross, L. (eds.) (2012) *Encyclopedia of Theoretical Ecology*, University of California Press, Berkeley, CA
248. **Hastings, A.** (2012) Spatial ecology. pp 659-665. in Hastings, A. and Gross, L. (eds.) (2012) *Encyclopedia of Theoretical Ecology*, University of California Press, Berkeley, CA
249. **Hastings, A.** (2012) Spatial spread. pp.670-674. in Hastings, A. and Gross, L. (eds.) (2012) *Encyclopedia of Theoretical Ecology*, University of California Press, Berkeley, CA
250. Weng, E., Luo, Y., Wang, W., Wang, H., Hayes, D.J., McGuire, A.D., **Hastings, A.**, and Schimel, D.S. (2012) Ecosystem carbon storage capacity as affected by disturbance regimes: A general theoretical model. J. Geophys. Res. 117: G03014, doi:10.1029/2012JG002040.
251. Boettiger, C. and **Hastings, A.** (2012) Quantifying limits to detection of early warning for critical transitions. J. Roy. Soc. Interface 9: 2527-2539
252. Boettiger, C. and **Hastings, A.** (2012) Early warning signals and the Prosecutor's Fallacy. Proc. Roy. Soc. B 279:4734-4739
253. **Hastings, A.** (2012) Temporally varying resources amplify the importance of resource input in ecological populations. Biology Letters 8:1067-1069
254. Boettiger, C. and **Hastings, A.** (2013) Tipping points: From patterns to predictions. Nature 493:157-158.
255. **Hastings, A.** (2013) Multiple stable states and regime shifts in ecological systems. Mathematics Today February 2013 37-39.
256. **Hastings, A.** (2013) Population dynamics. pp. 175-181. In Levin, S.A. (Ed.) *Encyclopedia of Biodiversity*, vol. 6. Academic Press, Waltham, MA
257. Cuddington, K., Fortin, M.-J., Gerber, L., **Hastings, A.**, Leibhold, A., O'Connor, M., and Ray, C. (2013) Process-based models are required to manage ecological systems in a changing world. Ecosphere 4 (no. 2) Article 20.

258. Mumby, P.J., Steneck, R.S. and **Hastings, A.** (2013) Evidence for and against the existence of alternate attractors on coral reefs. Oikos 122:481-491.
259. White, J.W., Botsford, L.W., **Hastings, A.**, Baskett, M.L., Kaplan, D.M., and Barnett, L.A.K.(2013) Transient responses of fished populations to marine reserve establishment. Conservation Letters 6:180-191.
260. Williams, P.D., and **Hastings, A.** (2013) Stochastic dispersal and population persistence in marine organisms. American Naturalist 182:271-282
261. Perkins, T.A., Phillips, B.L., Baskett, M.L. and **Hastings, A.** (2013) Evolution of dispersal and life history interact to drive accelerating spread of an invasive species Ecology Letters 16:1079-1087
262. Boettiger, C. and **Hastings, A.** (2013) No early warning signals for stochastic transitions: insights from large deviation theory. Proceedings Royal Society B 280: 1372.
263. Dakos, V. and **Hastings, A.** (2013) Editorial: special issue on regime shifts and tipping points in ecology. Theoretical Ecology 253-254.
264. Boettiger, C., Ross, N. and **Hastings, A.** (2013) Early warning signals: The charted and uncharted territories. Theoretical Ecology 255.264.
265. Lampert, A. and **Hastings, A.** (2013) Synchronization-induced persistence versus selection for habitats in spatially coupled ecosystems. J. Roy. Soc. Interface 10: 20130559.
266. Bearup, D., Petrovskii, S., Blackshaw, R. and **Hastings, A.** (2013) Synchronized dynamics of *Tipula paludosa* metapopulation in a South-Western Scotland agroecosystem: linking pattern to process. American Naturalist 182:393-409.
267. **Hastings, A.** (2014) Persistence and management of spatially distributed populations. Population Ecology 56:21-26.
268. Lampert, A. and **Hastings, A.** (2014) Optimal control of population recovery - the role of economic restoration threshold. Ecology Letters 17:28-35.
269. White, J.W., Botsford, L.W., **Hastings, A.** and Holland, M.D (2014) Stochastic models reveal conditions for cyclic dominance in sockeye salmon populations. Ecological Monographs 84:69-90.
270. **Hastings, A.** (2014) Temporal scales of resource variability: Effects on population dynamics of structured populations. Ecological Complexity 18:6-9.

271. Li, X., Wang, H. Zhang, Z., **Hastings, A.** (2014) Mathematical analysis of coral reef models. Journal of Mathematical Analysis and Applications 416:352-373.
272. Lampert, A., **Hastings, A.**, Grosholz, E., Jardine, S., Sanchirico, J.N. (2014) Optimal approaches for balancing invasive species eradication and endangered species management. Science 344:1028-1031.
273. Botsford, L.W., Holland, M.D., Field, J.C. and **Hastings, A.** (2014) Cohort resonance: a significant component of fluctuations in recruitment, egg production and catch of fished populations. ICES Journal of Marine Science 71:2158-2170
274. Lampert, A. and **Hastings, A.** (2014) Sharp changes in resource availability may induce spatial nearly-periodic population abundances. Ecological Complexity 19:80-83
275. Wang, H.-Y., Botsford, L.W., White, J.W., Fogarty, M.J., Juanes, F., **Hastings, A.**, Holland, M.D., and Brander, K. (2014) The influence of temperature on life histories sets the sensitivity of Atlantic cod, *Gadus morhua*, to fishing. Marine Ecology Progress Series 514:217-229
276. Lyles, D., Rosenstock, T.S., and **Hastings, A.** (2015) Plant Reproduction and Environmental Noise: How Do Plants Do It? Journal of Theoretical Biology 371:137–144
277. Gilarranz, L.J., **Hastings, A.** and Bascompte, J. (2015) Inferring topology from dynamics in spatial networks. Theoretical Ecology 8:15-21
278. Noble, A.E., Machta, J., and **Hastings, A.** (2015) Emergent long-range synchronization of oscillating ecological populations without external forcing described by Ising universality. Nature Communications 6, 6664
DOI:10.1038/ncomms7664
279. Abbott, K.C., Karst, J., Biederman, L.A., Borrett, S.R., **Hastings, A.**, Walsh, V. and Bever, J.D. (2015) Spatial heterogeneity in soil microbes alters outcomes of plant competition. PLoS ONE 10(5): e0125788. doi:10.1371/journal.pone.0125788
280. Li, Y., Liu, Y., Zhao, L., **Hastings, A.**, Guo, H. (2015) Exploring change of internal nutrients cycling in a shallow lake: A dynamic nutrient driven phytoplankton model Ecological Modeling 313:137-148. doi: 10.1016/j.ecolmodel.2015.06.025
281. Samia Y, Lutscher F, **Hastings A.** (2015) Connectivity, passability and heterogeneity interact to determine fish population persistence in river networks. J. R. Soc. Interface 12: 20150435. doi: 10.1098/rsif.2015.0435

282. **Hastings, A.**, van den Driessche, P. (2016) Inequalities on the spectral abscissa for matrices arising in a stage-structured population model. Linear Algebra and its Applications 494:90-106. doi:10.1016/j.laa.2016.01.001
283. **Hastings, A.**, McCann, K.S., de Ruiter, P.C., (2016) Introduction to the special issue: theory of food webs. *Theoretical Ecology* 9:1-2. Doi: 10.1007/s12080-016-0292-1
284. Laubenbacher, R., **Hastings, A.** (2016) Editorial. Bulletin of Mathematical Biology 78:1-3. doi: 10.1007/s11538-015-0134-0
285. Wilson, R. S., Hardisty, D. J., Epanchin-Niell, R.S., Runge, M.C., Cottingham, K. L., Urban, D.L., Maguire, L.A., **Hastings, A.**, Mumby, P.J., Peters, D.P.C (2016) A typology of timescale mismatches and behavioral interventions to diagnose and solve conservation problems. Conservation Biology 30:42-49. DOI: 10.1111/cobi.12632
286. Collie, J., Botsford, L, **Hastings, A.**, Kaplan, I., Largier, J., Livingston, P., Plaganyi, E., Rose, K., Wells, B., Werner, F. (2016) Ecosystem models for fisheries management: finding the sweet spot. Fish and Fisheries 17:165-175 DOI: 10.1111/faf.12093
287. Wang, Y-P., Jiang, J., Chen-Carpentier, B., Augusto, F.B., **Hastings, A.**, Hoffman, F., Rasmussen, M., Smith, M.J., Todd-Brown, K., Want, Y., Xu, X., Luo, Y. (2016) Responses of two nonlinear microbial models to warming or increased carbon input Biogeosciences 13:887-902 doi:10.5194/bg-13-887-2016
288. Lampert, A., **Hastings, A.** (2016) Stability and distribution of predator-prey systems: local and regional mechanisms and patterns. Ecology Letters 19:279-288 doi: 10.1111/ele.12565
289. Liebhold, A., Berec, L., Epanchin-Niell, R., Tobin, P.C., Kean, J., **Hastings, A.**, Suckling, D., McCullough, D. G., Herms, D.A., Yamanaka, T., Brockerhoff, E.G. (2016) Eradication of Invasive Insect Populations: From Concepts to Applications. Annual Review of Entomology 61:335-352 doi: 10.1146/annurev-ento-010715-023809
290. Tao, Y., Börger, L. and **Hastings, A.** (2016) Dynamic range size analysis of territorial animals: an optimality approach. American Naturalist 188:460-474. doi: 10.1086/688257
291. Boettiger, C., Bode, M., Sanchirico, J.N., LaRiviere, J., **Hastings, A.** and Armsworth, P.R. (2016) Optimal management of a stochastically varying population when policy adjustment is costly. Ecological Applications 26:808-817. DOI: 10.1890/15-0236

292. Cuddington, K, **Hastings, A** (2016) Autocorrelated environmental variation and the establishment of invasive species. Oikos 125:1027-1034. doi: 10.1111/oik.02859
293. Rasmussen, M., **Hastings, A.**, Smith, M.J., Agosto, F.B., Chen-Charpentier, B.M., Hoffman, F.M., Jiang, J., Todd-Brown, K.E.O., Wang, Y., Wang, Y-P. and Luo, Y. (2016) Transit times and mean ages for nonautonomous and autonomous compartmental systems. J. Math. Biol. 73:1379-1398. doi: 10.1007/s00285-016-0990-8
294. **Hastings, A.** (2016) Time scales and the management of ecological systems. PNAS 113: 14568–14573, doi: 10.1073/pnas.1604974113
295. Gellner, G. McCann, K.S. and **Hastings, A.** (2016) The duality of stability: towards a stochastic theory of species interactions. Theoretical Ecology (2016) 9: 477. doi:10.1007/s12080-016-0303-2
296. Luo, Y., Shi, Z., Lu, X., Xia, J., Liang, J., Jiang, J., Wang, Y., Smith, M. J., Jiang, L., Ahlström, A., Chen, B., Hararuk, O., **Hastings, A.**, Hoffman, F., Medlyn, B., Niu, S., Rasmussen, M., Todd-Brown, K. and Wang, Y. P. (2017) Transient dynamics of terrestrial carbon storage: mathematical foundation and its applications Biogeosciences 14(1): 145-161. doi:10.5194/bg-14-145-2017
297. Noble, A.E., Karimeddiny, **Hastings, A.**, Machta, J. (2017) Critical fluctuations of noisy period-doubling maps. European Physical Journal B 90:7 DOI: 10.1140/epjb/e2016-70641-1
298. Chadès. I., Nicol, S., Rout, T.M., Péron, M., Dujardin, Y., Pichancourt, J-B., **Hastings, A.**, Cindy E. Hauser, C.E. (2017) Optimization methods to solve adaptive management problems. Theoretical Ecology 10:1-20. doi:10.1007/s12080-016-0313-0
299. Sims, C., Finoff, D., **Hastings, A.** and Hochard, J. (2017) Listing and delisting thresholds under the endangered species act. American Journal of Agricultural Economics 99:549-570. doi: 10.1093/ajae/aaw094
300. **Hastings, A.**, Gaines, S.D. and Costello, C. (2017) Marine reserves solve an important bycatch problem in fisheries. Proc. Nat. Acad. Sci. 114:8927-8934 doi: 10.1073/pnas.1705169114
- 300a. **Hastings, A.**, Gaines, S.D. and Costello, C. (2017) Reply to Hilborn: Role of marine reserves depends on assumptions. Proc. Nat. Acad. Sci. 114 no. 50 E10611, doi: 10.1073/pnas.1717933114

301. Dallas, T., Decker, R. R. and **Hastings, A.** (2017), Species are not most abundant in the centre of their geographic range or climatic niche. *Ecol Lett.* doi:10.1111/ele.12860
302. Lubell, M., Jasny, L. and **Hastings, A.** (2017) Network governance for invasive species management. *Conservation Letters* 10:699-707. doi: 10.1111/conl.12311
303. Jianga, J., Huangb, Z., Seager, T.P., Lin, W., Grebogi, C., **Hastings, A.** and Ying-Cheng Lai, Y-C. (2018) *Proc. Nat. Acad. Sci.* vol. 115:E639-E647 doi: 10.1073/pnas.1714958115
304. Noble, A.E., Rosenstock, T.C., Brown,, P.H., Machta, J. and **Hastings, A.** (2018) Spatial patterns of tree yield explained by endogenous forces: the Ising model and ecology. *Proc. Nat. Acad. Sci.* 115:1825-1830
305. Johnson, C. and **Hastings, A.** (2018) Resilience in a Two-Population System: Interactions between Allee effects and connectivity. *Theoretical Ecology* 11:281-289 doi:10.1007/s12080-018-0365-4
306. **Hastings, A.**, Abbott, K.C., Cuddington, K., Francis, T., Gellner, G., Lai, Y-C., Morozov, A., Petrovskii, S., Scranton, K., and Zeemman, M.L.(2018) Transient phenomena in ecology. *Science* 361:eaat6412 <https://doi.org/10.1126/science.aat6412>
307. Blackwood, J., Machta, J., Meyer, A.D., Noble, A.E., **Hastings, A.** and Liebhold, A.M. (2018) Competition and "stragglers" as mediators of developmental synchrony in periodical cicadas. *American Naturalist* 192:479-489 <https://doi.org/10.1086/699255>
308. O'Loughlin, L. S., Lindenmayer, D. B., Smith, M. D., Willig, M. R., Knapp, A. K., Cuddington, K., **Hastings, A.**, Foster, C. N., Sato, C. F., Westgate, M. J. and Barton, P. S. (2018) Surrogates underpin ecological understanding and practice. *BioScience* 68:640-642 DOI: 10.1093/biosci/biy080
309. Lampert, A., **Hastings, A.**, and Sanchirico, J. (2018) Slow treatment promotes control of harmful species by multiple agents. *Conservation Letters* 11:e12568. <https://doi.org/10.1111/conl.12568>
310. Dallas, T. and **Hastings, A.** (2018) Habitat suitability estimated by niche models is largely unrelated to species abundance. *Global Ecology and Biogeography* 27:1448-1456 <https://doi.org/10.1111/geb.12820>
311. Dallas, T., Decker, R. R. and **Hastings, A.** (2018) Multiple data sources and freely available code is critical when investigating species distributions and diversity: a response to Knouft (2018), *Ecology Letters*, 21:1423-1424)

312. Lampert, A., and **Hastings, A.** (2019) How to combine two methods to restore populations cost-effectively. *Ecosphere* (Issue 1: e02552)
<https://doi.org/10.1002/ecs2.2552>
313. Dallas, T., Melbourne, B. and **Hastings, A.** (2019) When can competition and dispersal lead to checkerboard distributions? *Journal of Animal Ecology* 88:269-276
<https://doi.org/10.1111/1365-2656.12913>
314. Machta, J., Blackwood, J., Noble, A.E., Liebhold, A.M. and **Hastings, A.** (2019) A hybrid model for the population dynamics of periodical cicadas. *Bulletin of Mathematical Biology* 81:122-1142 <https://doi.org/10.1007/s11538-018-00554-0>
- xx. Snell, R.S., Beckman, N.G., Fricke, E., Loiselle, B.A., Carvalho, C.S., Jones, L.R., Lichti, N.I., Lustenhouwer, N., Schreiber, S., Strickland, C., Sullivan, L.L., Cavazos, B.R., Giladi, I., **Hastings, A.**, Holbrook, K., Jongejans, E., Kogan, O., Montaña-Centellas, F., Rudolph, J., Rogers, H.S., Zwolak, R., and Schupp, E. (2019) Consequences of intraspecific variation in seed dispersal for plant demography, communities, evolution, and global change. *AoB Plants* (in press)
<https://doi.org/10.1093/aobpla/plz016>
- xx. Beckman, N. G., Aslan, C. E., Rogers, H. R., Kogan, O., Bronstein, J. L., Bullock, J. M., Hartig, F., HilleRisLambers, J., Zhou, Y., Zurell, D., Brodie, J. F., Bruna, E. M., Cantrell, R. S., Decker, R., Effiom, E. O., Fricke, E. C., Gurski, K., **Hastings, A.**, Johnson, J., Loiselle, B. A., Miriti, M. N., Neubert, M. G., Pejchar, L., Poulsen, J. R., Pufal, G., Razafindratsima, O. H., Sandor, M., Shea, K., Schreiber, S. J., Schupp, E. W., Snell, R. S., Strickland, C., and Zambrano, J. (2019) Advancing an interdisciplinary framework to study seed dispersal ecology. *AoB Plants*. (in press)
- xx. Johnson, J., Cantrell, S., Cosner, C., Hartig, F., Rogers, H., Schupp, E., Shea, K., Teller, B., Yu, X., Zurell, D., Hastings, A., Loiselle, B., and Pufal, G. (2019) Phenotypic plasticity, rapid evolution and epigenetic effects in seed dispersal affect the response of plant ecosystems to global change. *AoB Plants*. (in press)
<https://doi.org/10.1093/aobpla/plz020>
- xx. Aslan, C., Schupp, G., Beckman, N.G., Fricke, E., Rogers, H.S., Bronstein, J., Zurell, D., Hartig, F., Shea, K., Pejchar, L., Neubert, M., Poulsen, J., HilleRisLambers, J., Miriti, M., Loiselle, B., Bruna, E., Effiom, E., Zambrano, J., Pufal, G., Johnson, J., Bullock, J.M., Brodie, J., Cantrell, R.S., **Hastings, A.**, Decker, R., Schreiber, S., Gurski, K., Kogan, O., Razafindratsima, O., Sandor, M., Snell, R., Strickland, C. and Zhou, Y. (2019) Employing plant functional groups to advance seed dispersal ecology and conservation. *AoB PLANTS*, **11**. (in press)
<https://doi.org/10.1093/aobpla/plz006>
- xx. Kaplan, K., Yamane, L., Botsford, L., Baskett, M., **Hastings, A.**, Worden, S., and White, J. W. (2019) Setting expected timelines of fished population recovery for the

adaptive management of a marine protected area network. *Ecological Applications* (in press)

- xx. Bennett, A.E., Preedy, K., Golubski, A., Umbanhowar, J., Borrett, S.R., Byrne, L., Apostol, K., Bever, J.D., Biederman, L., Classen, A.T., Cuddington, K., de Graaff, M-A., Garrett, K.A., Gross, L., Hastings, A., Hoeksema, J.D., Hryniv, V., Karst, J., Kummel, M., Lee, C.T., Liang, C., Liao, W., Mack, K., Miller, L., Ownley, B., Rojas, C., Simms, E.L., Walsh, V.K., Warren, M., Zhu, J. (2019) Beyond the Black Box: Promoting mathematical collaborations for elucidating interactions in soil ecology. *Ecosphere* (in press)