

MATTHEW P. HARE

Cornell University
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EDUCATION

Harvard University, Cambridge, MA, 1996-2000
Postgraduate with Dr. Stephen Palumbi
University of Georgia, Athens, GA 1996
Ph.D. in Genetics, with Dr. John Avise
University of Alaska, Fairbanks, AK 1990
M.S. in Zoology, with Dr. Gerald Shields
College of the Atlantic, Bar Harbor, Maine
B.A. in Human Ecology, 1984.

PROFESSIONAL EMPLOYMENT

Associate Professor, Department of Natural Resources, Cornell University 7/07 – present
Assistant Professor, Department of Biology, University of Maryland College Park 8/00 – 6/07
Hrdy Biodiversity Fellow, Harvard University 9/99 – 7/00
Instructor, Harvard University undergraduate tutorial seminar 9/97 – 5/00
NIH Pre-doctoral Fellow, Genetics Department, University of Georgia 6/91 – 8/96
Teaching Assistantship, Genetics Department, University of Georgia 9/90 – 6/91
Research Assistantship, U.S. Fish & Wildlife Service, University of Alaska 6/89 – 6/90
Teaching Assistantship, University of Alaska 9/87 – 6/89
Museum technician, Division of Mammals, National Museum of Natural History, Smithsonian Institution 8/84 – 7/86

PUBLICATIONS

Submitted

1. Thompson, C.M., **M.P. Hare**, and S.M. Gallager. In revision. Automated image-analysis for the identification of bivalve larvae from a Cape Cod estuary. *Limnology & Oceanography*.
2. Thompson, P., B. Rosenthal, and **M.P. Hare**. In revision. Microsatellite genotypes reveal some long distance gene flow in *Perkinsus marinus*, a major pathogen of eastern oysters. *Marine Biology*.
3. Zhang, H. and **M.P. Hare**. In revision. Identifying and reducing AFLP genotyping error: An example of tradeoffs when comparing population structure in broadcast spawning versus brooding oysters. *Molecular Ecology*.

Refereed

1. Kruse, I., **M.P. Hare** & A.H. Hines. In press. Genetic relationships of the marine invasive crab parasite *Loxothylacus panopaei*: an analysis of DNA sequence variation, host specificity, and distributional range. *Biological Invasions*.
2. Chen, G. and **M.P. Hare**. 2011. Cryptic diversity and comparative phylogeography of the estuarine copepod *Acartia tonsa* on the US Atlantic coast. *Molecular Ecology* 20(11): 2425–2441.
3. **Hare, M.**, L. Nunney, M. Schwartz, D. Ruzzante, M. Burford, R. Waples, K. Ruegg, and F. Palstra. 2011. Understanding and estimating effective population size for practical applications in marine species management. *Conservation Biology* 25(3):438-449.
4. Thompson, P., B. Rosenthal, and **M.P. Hare**. 2011. An evolutionary legacy of sex and clonal reproduction in the protistan oyster parasite *Perkinsus marinus*. *Infection, Genetics and Evolution* 11(3): 598-609.
5. **Hare, M.P.**, J. Weinberg, O. Peterfalvy and M. Davidson. 2010. The “southern” surfclam (*Spisula solidissima similis*) found north of its reported range: A commercially harvested population in Long Island Sound, New York. *Journal of Shellfish Research* 29(4):799-807.
6. Zhang, H., J. Scarpa, and **M.P. Hare**. 2010. Differential fertilization success between two populations of eastern oyster, *Crassostrea virginica*. *Biological Bulletin* 219:142-150.
7. Carlsson, J., R.B. Carnegie, J.F. Cordes, **M.P. Hare**, T. Leggett, and K.S. Reece. 2008. Evaluating recruitment contribution of a selectively bred *Crassostrea*

- virginica* oyster aquaculture line used in restoration efforts. *Journal of Shellfish Research* 27(5):1117-1124.
8. Chen, G. and **M.P. Hare**. 2008. Cryptic ecological diversification of a planktonic copepod, *Acartia tonsa*. *Molecular Ecology* 17:1451-1468.
 9. Wangchuk, T., D.W. Inouye, and **M.P. Hare**. 2008. The emergence of an endangered species: Evolution and phylogeny of the *Trachypithecus geei* of Bhutan. *International Journal of Primatology* 29(3):565-582.
 10. Kruse, I. and **M.P. Hare**. 2007. Genetic diversity and expanding nonindigenous range of the rhizocephalan *Loxothylacus panopaei* parasitizing mud crabs in the western North Atlantic. *J. Parasitology* 93(3):575-582
 11. Murray, M. and **M.P. Hare**. 2006. Genomic evidence for divergent selection between Atlantic and Gulf of Mexico oysters, *Crassostrea virginica*. *Molecular Ecology* 15: 4229–4242.
 12. **Hare, M. P.**, S. K. Allen Jr., P. Bloomer, M. D. Camara, M. D. Carnegie, J. Murfree, M. W. Luckenbach, D. Merritt, C. Morrison, K. T. Paynter, K. S. Reece, and C. G. Rose. 2006. A genetic test for recruitment enhancement in Chesapeake Bay oysters, *Crassostrea virginica*, after population supplementation with a disease tolerant strain. *Conservation Genetics* 7: 717–734.
 13. Rose, C. G., K. T. Paynter, and **M. Hare**. 2006. Isolation by distance in the eastern oyster, *Crassostrea virginica*, in Chesapeake Bay. *J. Heredity* 97(2):158-170.
 14. Gaines, C.A., **M.P. Hare**, S.E. Beck and H.C. Rosenbaum. 2005. Nuclear markers confirm taxonomic status and relationships among highly endangered and closely related right whale species. *Proceedings of the Royal Society B* 272:533-542.
 15. **Hare, M.P.**, C. Guenther and W.F. Fagan. 2005. Nonrandom larval dispersal can steepen marine clines. *Evolution* 59:2509-2517.
 16. **Hare, M.P.** and J. Weinberg. 2005. Phylogeography of surf clams, *Spisula solidissima*, in the western North Atlantic based on mitochondrial and nuclear DNA sequences. *Marine Biology* 146:707-716.
 17. Robinson T.B., C.L. Griffiths, A. Tonin, P. Bloomer & **M.P. Hare**. 2005. Naturalized populations of *Crassostrea gigas* along the South African coast: distribution, abundance and population structure. *Journal of Shellfish Research* 24(2):443-450.
 18. **Hare, M.P.** and S.R. Palumbi. 2003. High intron sequence conservation across three mammalian orders suggests functional constraints. *Molecular Biology and Evolution* 20(6): 969-978.

19. Wangchuk, T., D.W. Inouye and **M.P. Hare**. 2003. A new subspecies of golden langur (*Trachypithecus geei*) from Bhutan. *Folia Primatol* 74:104-108.
20. **Hare, M.P.**, F. Cipriano, and S.R. Palumbi. 2002. Genetic evidence on the demography of speciation in allopatric dolphin species. *Evolution* 56:804-816.
21. **Hare, M.P.** 2001. Prospects for nuclear gene phylogeography. *Trends in Ecology and Evolution*, 16(12):700-706.
22. Palumbi, S.R., F. Cipriano, and **M.P. Hare**. 2001. Predicting nuclear gene coalescence from mitochondrial data: The three-times rule. *Evolution*, 55:859-868.
23. **Hare, M.P.**, S.R. Palumbi, and C.A. Butman. 2000. Single-step species identification of bivalve larvae using multiplex polymerase chain reaction. *Marine Biology*, 137:953-961.
24. **Hare, M.P.** and S.R. Palumbi. 1999. The accuracy of heterozygous base calling from diploid sequence and resolution of haplotypes using allele-specific sequencing. *Molecular Ecology*, 8:1750-1752.
25. **Hare, M.P.** and J.C. Avise. 1998. Population structure in the American oyster as inferred by nuclear gene genealogies. *Molecular Biology and Evolution* 15:119-128.
26. Orti, G., **M.P. Hare**, and J.C. Avise. 1997. Detection and isolation of nuclear haplotypes by PCR-SSCP. *Molecular Ecology*, 6:575-580.
27. **Hare, M.P.** and J.C. Avise. 1996. Molecular genetic analysis of a stepped multilocus cline in the American oyster (*Crassostrea virginica*). *Evolution*, 50:2305-2315
28. **Hare, M.P.**, S.A. Karl, and J.C. Avise. 1996. The heterozygote deficiency phenomenon in marine bivalves: Lessons from the refinement of anonymous DNA markers. *Molecular Biology and Evolution*, 13:334-345.
29. **Hare, M.P.** and G.F. Shields. 1992. Mitochondrial-DNA variation in the polytypic Alaskan Song Sparrow. *Auk*, 109(1):126-132.
30. Foster, N.R. and **M.P. Hare**. 1990. Cephalopod remains from a Cuvier's beaked whale (*Ziphius cavirostris*) stranded in Kodiak, Alaska. *Northwestern Naturalist*, 71:49-51.

Chapters

Hare, M.P. 1998 Using mitochondrial DNA gene trees and nuclear RFLPs to predict genealogical patterns at nuclear loci: Examples from the American oyster. Pp. 125-138 in (M.K. Uyenoyama and A. Haeseler, eds) Proceedings of the Trinational

Workshop on Molecular Evolution, Duke University Publications Group, Durham NC.

Extension Publications

Hare, M.P. and Mead, J.G. 1987. Handbook for determination of adverse human-marine mammal interactions from necropsies. Northwest and Alaska Fisheries Center processed report 87-06, *National Marine Fisheries Service*, NOAA, Seattle, Washington. 35 pp.

GRANTS AND CONTRACTS

Active:

1. New York Sea Grant
Genomic analysis of oyster dispersal and recruitment success
2012– 2014, \$248,213 pending federal budget
2. Atkinson Center for a Sustainable Future – Academic Venture Fund
Harnessing Genomics to Advance Biodiversity and Conservation Research (M. Hare PI, co-PIs: K. Zamudio, A. Travis, I. Hewson)
July 2011 – July 2012, \$71,884
3. Hatch USDA
Surfclams in Long Island Sound: A recent range expansion facilitated by climate change?
2011– 2013, \$41,000
4. Cornell Center for Comparative Population Genomics Research
Priming Grant : SNPs for the Masses: Developing a Method for SNP Discovery and Accurate Scoring in Heterozygous Genomes without a Full Reference Sequence.
Dec. 2009, \$5,000
5. NSF Biological Oceanography (PI: M. Hare)
Patterns of larval dispersal and post settlement selection shaping connectivity of oyster populations along an ecotone. Co-PI J. Scarpa
2/1/07 – 1/31/11, no cost ext. to 1/31/12, \$848,012
6. U.S. Fish & Wildlife Service, Coastal Program (PI: M. Hare)
Rebuilding oyster (*Crassostrea virginica*) reefs in the St. Lucie Estuary, Florida: Prioritizing reef restoration via identification of source populations
10/1/2009 – 9/30/2012, \$105,351

Awards pending and recent proposals not funded

1. National Science Foundation, IGERT Pre-proposal: Training Conservation Scientists of the Future: Genomics, Science Communication, and Biodiversity

Conservation. (K. Zamudio [Project Director], co-PIs: M. Hare, I. Lovette, C. Aquadro, A. Clark; submitted to Cornell April 1, 2011)
Jan 2012 - Dec 2013; \$3,427,553, not chosen for NSF submission

2. Cornell Center for Comparative and Population Genomics Priming Grant, Spring 2011, not funded
3. NSF Doctoral Dissertation Improvement Grant, L. Eierman co-PI, Spring 2011, not funded

Completed:

1. Hatch USDA
High Throughput Genetic Measurements of Larval Abundance in Support of Hard Clam Restoration in Great South Bay, NY.
2008 – 2010, \$50,000.
2. Cornell Center for Comparative and Population Genomics
Travel grant to attend American Genetics Association Conservation Genomics meeting.
2010, \$750
3. New York State Department of Environmental Conservation
Estimates of genetic diversity in Temescamie Hybrid strain and wild brook trout in New York.
2010, \$11,753
4. NOAA/SeaGrant, Oyster Disease Research Program
Genetic rehabilitation and conservation of Chesapeake oysters using disease-tolerant oyster strains: A study of their recruitment and introgression potential.
6/2003 – 5/2005, \$357,464, three co-PIs at two institutions, UMD portion for P.I. Hare \$242,618.
5. NOAA/Sea Grant, Oyster Disease Research Program
Cooperative Regional Oyster Selective Breeding (CROSBreed) Project:
Comprehensive strategy for genetic rehabilitation and conservation of oysters.
2001 – 2003, \$600,004, with four co-PIs at two institutions, UMD subcontract to co-P.I. Hare, \$245,384.
6. Maryland Sea Grant (PI: M. Hare)
A genetic analysis of oyster recruitment patterns in the Chesapeake Bay.
2002 – 2003, \$84,999, with co-P.I. K. Paynter.
7. University of Maryland General Research Board, Research support award
2001, \$2500.
8. U.S. Environmental Protection Agency

An estimate of ancestral genetic diversity in right whales and elephant seals to test for the propensity to inbreeding depression. 2 years, \$122,692, Hare co-P.I. with Steve Palumbi.

1999 – 2001, Second year entirely at U. Maryland.

FELLOWSHIPS, PRIZES AND AWARDS

1. University of Maryland GRB Summer Research Award 2001
2. Hrdy Biodiversity Fellowship, Harvard University 1999 – 2000
3. NIH Training Grant Fellowship, University of Georgia 1993 – 1996

INVITED SEMINARS

- 2011 Zoology Department, University of Hawaii at Manoa
- 2009 Ecology & Evolutionary Biology Dept., Cornell University
- 2008 Isle of Shoals, Cornell University
- 2007 University of Southern California
National Conservation Training Center, Shepardstown, West Virginia
- 2006 Cornell University, Department of Natural Resources
- 2004 Horn Point Environmental Research Center, University of Maryland
UC Santa Barbara
University of Southern California
Library of Congress, Washington D.C
- 2003 Center of Marine Biotechnology, Baltimore, MD
National Shellfisheries Association, New Orleans, biotech symposium
- 2002 University of Maryland, Baltimore County
Lewes Marine Station, University of Delaware, Lewes, DE
Northeast Aquaculture Conference, Warwick, RI, biotech symposium
- 2001 Laboratory of Molecular Systematics, Smithsonian Institution
National Zoo, Smithsonian Institution
Georgetown University, Georgetown, DC
- 1999 San Diego State University, San Diego, CA
- 1998 Biology Department, University of California, Santa Barbara, CA
Woods Hole Oceanographic Institute, Woods Hole, MA

- 1997 Lewes Marine Station, University of Delaware, Lewes, DE
Trinational Workshop on Genealogical Inference, Munich, Germany
- 1995 Humanities Center, University of Georgia, Athens, GA
Biology Department, University of California, Santa Cruz, CA

INVITED SYMPOSIUM PRESENTATIONS

- 05/09 Effective Population Size: Practical Applications in Marine Population Conservation & Management. International Marine Conservation Congress, George Mason U., Virginia
- 06/08 8th Larval Biology Symposium, Lisbon, Spain
- 01/08 Symposium: Multidisciplinary approaches to larval dispersion and connectivity; Ocean Sciences 2008, Orlando, Florida
- 12/07 Oyster Management Plan Workshop, MD Dept. Natural Resources
- 4/05 University of Amsterdam, Netherlands, Structure @ Sea symposium
- 9/04 Jacques Monod Conference on host-parasite evol-ecology, Roscoff, France

SYNERGISTIC ACTIVITIES

1. Participant in working group to develop intrinsic organismal/population criteria for vulnerability to climate change. Two meetings, May 2009 at Cornell and October 2009 at BioSynC Center, Chicago Field Museum.
2. Organized 'Topical Lunch' discussion on "Genetic Diversity Research at Cornell" under auspices of Cornell Center for a Sustainable Future, March 2009
3. Co-organizer of symposium at the International Marine Conservation Congress, May 2009: Effective Population Size: Practical Applications in Marine Population Conservation & Management.
4. Co-organizer of symposium at Ocean Sciences 2008: Multidisciplinary approaches to larval dispersion and connectivity.
5. Organized an NSF-funded symposium, "Empirical and Theoretical Advances in Studies of Effective Population Size", May 10-11, 2002. Eight speakers and 50+ participants.

TEACHING, MENTORING, AND ADVISING

A. Courses taught during the past five years:

University of Maryland

BIOL 608E Molecular Ecology
BSCI 222, Principles of Genetics
BIOL 608N Conservation Genetics

Cornell University

NTRES 2830	DNA, Genes and Genetic Diversity
NTRES 4940/6940	Conservation Genetics
NTRES 4100	Advanced Conservation Biology (co-taught)
NTRES 7283	Mol. Genet. Approaches to Study of Ecology & Evolution
BioEE 2780	Evolution and Diversity (6 lectures, pop. gen.)
Visiting lecture(s)	Invertebrate Diversity Seminar (2) Intro to Conservation Biology (1)

B. Undergraduate advising

<u>Name</u>	<u>Major / Completion Date</u>
Alexander Kumar	Natural Resources / 2011
Kristina Cammen	5/2007, UMD Honors thesis
Sarah Beck	5/2002, UMD Honors thesis
Victoria DiCamillo	Natural Resources
Marilyn Wang	Natural Resources
Jacqueline Wu	Natural Resources
Kelly Wang	Natural Resources
Mary Fisher	Natural Resources

C. Graduate student committees (primary advisor for top five; *graduated):

Catherine Sun	2010-present	M.Sc. DNR, Cornell
Margarita Lopez Uribe	2009-present	Ph.D. ENT, Cornell
Laura Eierman	2007-present	Ph.D. DNR, Cornell
Sarah Kingman	2005-present	Ph.D. BEES
Maria Murray	2003-present	Ph.D. BIOL
Christine Mingione	2009-2011*	Ph.D. MIT/WHOI
Peter Thompson	2003-2010*	Ph.D. BEES
Gang Chen	2002-2009*	Ph.D. BEES
Colin Rose	2001-2008*	Ph.D. BIOL
Andreanna Welch	2006-2007	Ph.D. BEES
Leonaldo de Carvalho Oliveira	2006-2007	Ph.D. BIOL
Gwen Schlichta	2005-2007	Ph.D. ENT
James Pettengill	2005-2007	Ph.D. BEES

Jon Beadwell	2003-2007*	Ph.D. BEES
Rob Ahern	2004-2007*	Ph.D. ENT
Paula Rodgers	2004-2007	Ph.D. BEES
Sky Lesnick	2004-2007	Ph.D. BEES
Coren Milbury	2004-2007*	Ph.D. U.Del.
Safra Altman	2003-2007	Ph.D. BEES
Joan West	2002-2007*	Ph.D. BEES
Kweli Powell	2002-2007	Ph.D. BEES
Holly Mortensen	2002-2007*	Ph.D. BEES
Brandie Smith	2000-2007	Ph.D. BEES
Jason South	2001-2006*	Ph.D. BEES
Kisi Bohn	2001-2005*	Ph.D. BEES
Ali Coffin	2001-2005*	Ph.D. NACS
Tashi Wangchuk	2001-2005*	Ph.D. BIOL
Cindy Hoover	2001-2003*	M.Sc. U.Del.
Elaine Pincus	2001-2002*	Ph.D. BEES
Eduardo Ezirik	2001-2002*	Ph.D. NACS

D. Outreach and Extension Activities

1. Member, Oyster Steering Committee to develop workshop objectives toward revision of the Chesapeake Bay oyster management plan.
2. Organized workshop on genetic considerations for oyster restoration and management, 07/03/07 in Colonial Beach, VA. Prepared summary of recommendations from workshop and distributed to stake holders.
3. Judge for Oxon Hill High School Science and Technology Fair, February 3, 2007
4. Discussion leader for Junior Science and Humanities annual Maryland symposium, March 10, 2006.
5. Testified at U.S. House Resources Committee hearing on petition to list *Crassostrea virginica* as a threatened/endangered species, July 19, 2005.
6. Presentation to NMFS/NOAA committee reviewing proposed listing of *C. virginica* under the ESA, Aug. 9, 2005.
7. Invited participant to Sea Grant research planning and coordination meeting, July 21-22, 2004
8. Invited participant at Sea Grant conference on "Oyster Research Restoration in US Coastal Waters", Aug. 19-20, 2003
9. Invited participant at EPA-sponsored workshop on "Identifying and Prioritizing Research Required to Evaluate Ecological Risks, Benefits and Alternatives Related to the Potential Introduction of *Crassostrea ariakensis* to Chesapeake Bay", Dec. 2-3, 2003

SERVICE

A. Professional Service

1. Associate editor, International Journal of Organic Evolution, January 2010 to present
2. Panelist, NSF Biological Oceanography (5 days in 2006)
3. Ad hoc Reviewer for NSF, NOAA NURP, Sea Grant and the Smithsonian Institution (approximately 3 – 5 proposals per year).
4. I also average 5 – 8 reviews per year for the following journals: Molecular Biology and Evolution, Systematic Biology, Molecular Phylogenetics and Evolution, Molecular Ecology, Marine Biology, Trends in Ecology and Evolution, Heredity, Journal of Heredity, Conservation Genetics, Journal of Evolutionary Biology, Evolutionary Applications, Oceanography & Limnography, Journal of Marine Biology & Ecology

B. Service to Cornell University

Department Committees

1. Co-chair, Adjunct Professor Nomination Criteria advisory committee 10/11 – 01/12
2. Chair, Fernow Hall Renovation Arts Committee 10/10 - present
3. Teaching and Curriculum Committee 5/08 – present
4. DNR Seminar committee 06/10 – 05/11
5. USGS Coop Unit Assistant Leader Search committee 06/10 – 09/10
6. USGS Coop Unit Assistant Leader committee to draft job ad 02/10
7. Subcommittee to Draft Conservation Biology program area definition 10/08 – 02/09:

College Service

New York Marine Science Consortium Board of Governors, 2008 to present

Marine Biology Curriculum Committee, October 2011 to present