

Brooks Consulting

61 Aloha Street, Port Matilda, PA 16870

Resume

Robert P. Brooks, Ph.D.

CONTACT INFORMATION:

61 Aloha Street, Port Matilda, PA 16870
ph: 814-880-7607, e-mail: rpbrooks2@gmail.com

EDUCATION:

University of Massachusetts, Amherst	Wildlife Biology	Ph.D.
	Wildlife Biology	M.S.
Muhlenberg College, Allentown, PA	Biology	B.S.

CERTIFICATIONS

Society of Wetland Scientists
Certified Professional Wetland Scientist – 1995, recertified 2011
The Wildlife Society
Certified Wildlife Biologist - 1983

PROFESSIONAL ACTIVITIES – UNIVERSITY:

As Director and Founder of Riparia (www.riparia.psu.edu), and as Professor of Geography and Ecology in the Department of Geography at the Pennsylvania State University, Dr. Brooks has developed a widely recognized wetland and wildlife research and education program. Current research projects include:

- wetlands restoration and creation on altered and damaged landscapes
- monitoring protocols for reference wetlands and mitigation projects
- modeling cumulative impacts in wetland and riparian portions of landscapes
- developing hydrogeomorphic models for riverine, depression, and slope wetlands
- developing ecological indicator models for invertebrates, amphibians and birds
- habitat modeling for wetland-riparian and forest wildlife.

He has taught over a dozen different undergraduate and graduate courses in the ecology and management of wetlands, physical geography, humans and the environment, field geography, wildlife management and conservation, and restoration ecology. Since 1978, he has published over 175 technical papers, books, and book chapters, and presented over 140 technical presentations at conferences and meetings. Dr. Brooks has been the senior principal investigator on 100 of 140 grants funded between 1981-2012, totaling over \$22 million.

Dr. Brooks has studied numerous wetland and river systems in the U.S. including emergent marshes, peatlands, shrub and forested wetlands, large rivers, and headwater streams. He attends 3-4 national and regional wetlands meetings per year, and is familiar with current federal and state regulations regarding the policy, protection, and mitigation of wetlands and rivers. He has worked with:

- agencies (e.g., U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Bureau of Mines, U.S. Fish & Wildlife Service, National Park Service, PA Department of Environmental Protection, Ohio EPA),
- industries (e.g., coal mining, forestry, industrial development authorities, utilities)

Brooks Consulting

61 Aloha Street, Port Matilda, PA 16870

- educational institutions (e.g., public schools, conservation organizations, land trusts)

to address natural resource issues, deliver information, and solve environmental problems.

Dr. Brooks has been a consultant and collaborator on wetlands for the USEPA since 1987. He serves on the Board of the Chesapeake Research Consortium, and was a recent member of the Louisiana Coastal Area Science Board. He is a member of the IUCN Otter Specialist Group committed to otter conservation worldwide. He is a member of the Mid-Atlantic Wetlands Working Group, sponsored by USEPA Region 3 and the Mid-Atlantic states. Dr. Brooks served as Chair of Pennsylvania's DEP Wetlands Protection Advisory Committee for all 8 years of its existence. He is also a member of Pennsylvania's DCNR Ecosystem Management Committee, the Millbrook Marsh Nature Center Advisory Committee, and served on a municipal planning commission for 16 years.

PROFESSIONAL ACTIVITIES – CONSULTING:

As a consultant, Dr. Brooks has worked with agencies, corporations, utilities, citizen groups, and individuals concerning natural resources issues and management, with an emphasis on assessments of wetlands and streams, and habitat modeling for wetland-dependent wildlife, such as muskrat, otter, beaver, amphibians, and waterbirds. Projects have addressed issues and problems involving the conservation, restoration, and management of wetlands, streams, and riparian areas; wildlife habitat assessment and modeling; wetlands restoration and creation, and riparian corridors.

PROFESSIONAL EMPLOYMENT:

- 2004-present - Principal, Brooks Consulting
- 2003-present - Professor of Geography and Ecology, Department of Geography
Pennsylvania State University
- 2000-2003 - Partner, Water's Edge Technology, LLC
- 1998-2003 - Professor of Wildlife and Wetlands, School of Forest Resources
- 1993-present - Director, Riparia (formerly Penn State Cooperative Wetlands Center)
- 1988-1999 - President, Water's Edge Technology, Inc.
- 1986-1997 - Associate Professor of Wildlife Ecology, School Forest Resources
- 1985-1988 - Chairman, Wildlife & Fisheries Science, School Forest Resources
- 1983-1985 - Assistant Professor of Wildlife Ecology, School of Forest Resources
- 1980-1983 - Assistant Professor of Wildlife Technology, DuBois Campus
Wildlife Technology Program Leader (1982/83)
School of Forest Resources, Pennsylvania State University

SELECTED PROFESSIONAL ORGANIZATIONS:

- Society of Wetland Scientists - member, Certified Professional Wetland Scientist (1995, 2011), Associate Editor for Wetlands (2003-2005)
- Association of State Wetland Managers – member
- Association of American Geographers – member

Brooks Consulting

61 Aloha Street, Port Matilda, PA 16870

The Wildlife Society - Certified Wildlife Biologist (1983), Associate Editor for Journal of Wildlife Management (1989-91); member National, Section, and Pennsylvania Chapters; Advisor to Penn State Student Chapter (1991-2000), Board Member PA Chapter (1991-1994), President PA Chapter (1993)

SELECTED TRAINING COURSES TAUGHT:

Jurisdictional Delineation of Wetlands in the Mid-Atlantic States - 5-day course offered by National Wetland Science Training Coop. and Water's Edge Technology, Inc. on federal method (May 1990).

A Corporate Approach to Wetlands Permitting and Assessment - one-day training course for the professional staff of the Allegheny Power System (July 1990).

Balancing Wetlands and Industrial Development - statewide seminar series delivered to industrial development corporations and authorities; manual and video (1991-92).

Wetland Restoration and Creation for Mitigation – 2-day, 3-day and 5-day courses offered by the Institute for Wetland & Environmental Education & Research and Water's Edge Technology, Inc. (May 1994, 1995, 1996).

Wetlands Assessment – multiple 1-day workshops for PADEP (2000-2008).

SELECTED CONSULTING ACTIVITIES:

Allegheny Power Service Corp. - wetland assessments, mitigation design and construction, hydro-electric power plant impacts

Collins Pine Co./Kane Hardwood – develop forest wildlife management plan to meet Forest Stewardship Council certification standards

Electric Power Research Institute - design, construction, and monitoring of wetland treatment system

EPD, LLC – technical advising on development of a 9-county natural infrastructure analysis

Golder Associates Inc. - wetland delineation, ecological assessments for landfills

Joseph A. Piccone, Inc. – prepared a biological assessment for bog turtles for mall development

Mintz Levin / General Electric - assessment and interpretation of riverine ecosystem restoration project

PA Dep. of Transportation - monitoring and design of statewide wetland mitigation projects

Shell Oil Company - natural resource damage assessment for muskrat on Gasconade River, MO

Union County Planning Commission - wetland assessment for hazardous waste incinerator

U.S. Department of Justice – assessment and technical support of wetland violations

U.S. Environmental Protection Agency - research plan reviews, authored books and chapters, risk assessment workshop panelist

U.S. Fish and Wildlife Service - assessment of wetland and wildlife project plans, advice on development of muskrat model for central NJ, training of biologists

Waste Management of North America, Inc. - wetland delineation and stream surveys for landfills

Brooks Consulting

61 Aloha Street, Port Matilda, PA 16870

SELECTED PUBLICATIONS:

Katzner, T., B.W. Smith, T. A. Miller, D. Brandes, J. Cooper, M. Lanzone, D. Brauning, C. Farmer, S. Harding, D. Kramar, C. Koppie, C. Maisonneuve, M. Martell, E.K. Mojica, C. Todd, J.A. Tremblay, M. Wheeler, D.F. Brinker, T.E. Chubbs, R. Gubler, K. O'Malley, S. Mehus, B. Porter, **R.P. Brooks**, B.D. Watts & K.L. Bildstein. 2012. Status, biology and conservation priorities for North America's eastern Golden Eagle (*Aquila chrysaetos*) population. *The Auk*. 129(1): 168-176.

Osmond, D, **R Brooks**, S Yetter, R Carline, K Boomer, A Armstrong, R Stedman, D Meals, and G Jennings. 2012. Chapter 20 - Spring Creek Watershed, Pennsylvania: National Institute of Food and Agriculture–Conservation Effects Assessment Project Watershed Project. 2012. Pages 321-336 in D Osmond, D Meals, D Hoag, and M Arabi (eds.). *How to Build Better Agricultural Conservation Programs to Protect Water Quality: The National Institute of Food and Agriculture – Conservation Effects Assessment Project Experience*. Soil and Water Conservation Society, Ankeny, IA.

Piechnik, DA, SC Goslee, TL Veith, JA Bishop, and **RP Brooks**. 2012. Topographic placement of management practices in riparian zones to reduce water quality impacts from pastures. *Landscape Ecology* DOI: 10.1007/s10980-012-9783-7

Gebo, NA, and RP Brooks. 2012. Hydrogeomorphic (HGM) assessment of mitigation sites compared to natural reference wetlands in Pennsylvania. *Wetlands* 32:321-331.

Brooks, RP, MM Brinson, KJ Havens, CS Hershner, RD Rheinhardt, DH Wardrop, DF Whigham, AD Jacobs, and JM Rubbo. 2011. Proposed hydrogeomorphic classification for wetlands of the Mid-Atlantic Region, USA. *Wetlands* 31(2):207-219.

Wardrop, DH, AK Glasmeier, J Peterson-Smith, D Eckles, H Ingram, and **RP Brooks**. 2011. Wetland ecosystem services and coupled socio-economic benefits through conservation practices in the Appalachian Region. *Ecological Applications* 21(3):S93-S115.

Brooks, RP, and ER Brooks. 2011. Translating the *Rapanos* ruling into practice. *National Wetlands Newsletter* May-Jun:6-7.

Brooks, RP. 2011. Monitoring and assessing wetlands: How do we take advantage of becoming data rich?, *National Wetlands Newsletter* Nov-Dec:8-9.

Brooks, R., M. McKenney-Easterling, M. Brinson, R. Rheinhardt, K. Havens, D. O'Brian, J. Bishop, J. Rubbo, B. Armstrong, and J. Hite. 2009. A Stream-Wetland-Riparian (SWR) index for assessing condition of aquatic ecosystems in small watersheds along the Atlantic slope of the eastern U.S. *Environmental Monitoring and Assessment* 150:101-117.

Rheinhardt, R.D., M.M. Easterling, M.M. Brinson, J.M. Rubbo, **R.P. Brooks**, D.F. Whigham, D. O'Brien, J.T. Hite, and B.K. Armstrong. 2009. Canopy composition and

Brooks Consulting

61 Aloha Street, Port Matilda, PA 16870

forest structure provide restoration targets for low order riparian ecosystems. *Restoration Ecology* 17(1):51-59.

Spinola, R.M., T.L. Serfass, and **R.P. Brooks**. 2008. Survival and post-release movements of river otters translocated to western NY. *Northeastern Naturalist* 15(1):13-24.

Brooks, R.P., G.P. Patil, S. Fei, A.I. Gitelman, W.L. Myers, and E.D. Reavie. 2007. Next generation of ecological indicators of wetland condition. *EcoHealth* 4(2):176-178 (Editor: Special Section of *EcoHealth* featuring 6 papers on emerging wetland indicators).

Wardrop, D.H., M.E. Kentula, D.L. Stevens, Jr., J.M. Rubbo, K. Hychka, and **R.P. Brooks**. 2007. The condition of wetlands on a watershed basis: The Upper Juniata Watershed in Pennsylvania, U.S.A. *Wetlands* 27(3):432-445.

Serfass, T.L., **R.P. Brooks**, L.M. Rymon, and O.E. Rhodes, Jr. 2007. River otters in Pennsylvania, USA: Lessons for predator re-introduction. *Proc. European Otter Conference, Returning the otter in Europe – Where and how?* 30 June – 5 July 2003, Skye, Scotland, J. W. H. Conroy, G. M. Yoxon, A. C. Gutleeb, and J. Ruiz-Olmo (eds.). *Journal of the International Otter Survival Fund* 2:22pp.

Brooks, R. P., D. H. Wardrop, and C. A. Cole. 2006. Inventorying and monitoring wetland condition and restoration potential on a watershed basis with examples from the Spring Creek watershed, Pennsylvania, USA. *Environmental Management* 38:673-687.

Brooks, R. P., D. H. Wardrop, K. W. Thornton, D. Whigham, C. Hershner, M. M. Brinson, and J. S. Shortle (eds.). 2006. Ecological and socioeconomic indicators of condition for estuaries and watersheds of the Atlantic Slope. Final Report to U.S. Environmental Protection Agency STAR Program, Agreement R-82868401, Washington, DC. Prepared by the Atlantic Slope Consortium, University Park, PA. 96pp. + attachments (CD).

Miller, S. J., D. H. Wardrop, W. M. Mahaney, and **R. P. Brooks**. 2006. A plant-based index of biological integrity (IBI) for headwater wetlands in central Pennsylvania. *Ecological Indicators* 6:290-312.

Brooks, R. P., C. Snyder, and M. M. Brinson. 2006. Structure and functioning of tributary watershed ecosystems in the Eastern Rivers and Mountains Network: Conceptual models and vital signs monitoring. *Natural Resources Report NPS/NER/NRR-2006/009*. National Park Service, Philadelphia, PA. 88pp.

Brooks, R. P., D. H. Wardrop, C. A. Cole, and D. A. Campbell. 2005. Are we purveyors of wetland homogeneity?: A model of degradation and restoration to improve wetland mitigation. *Ecological Engineering* 24(4):331-340.

CURRICULUM VITAE - MALCOLM L. HUNTER, JR.

Department of Wildlife Ecology, 5755 Nutting Hall, University of Maine, Orono, ME 04469
Phone: (207) 581-2865 Fax: (207) 581-2858 Email: mhunter@maine.edu

Education

1966 - 1970 Lincoln Academy, Newcastle, Maine
1970 - 1974 B.S. in Wildlife Science, University of Maine, Orono
1974 - 1978 D. Phil. in Zoology, Edward Grey Institute of Field Ornithology, Department of Zoology, Oxford University. Thesis title: "Environmental effects on the singing behaviour of Great Tits." Stipend from Rhodes Scholarship, Research funds from National Geographic Society

Employment

1971 Research Technician, Maine Dept. of Inland Fisheries and Wildlife
1972-74 Self-employed as ecological consultant. Funding from: Center for Natural Areas, Central New Hampshire Planning Office, Maine Bureau of Public Lands, Maine State Planning Office, Massachusetts Audubon Society, Mid-coast Audubon Society, New England Regional Commission, Smithsonian Institution, Time/Life Books.
1976 Research Assistant, U.S. Forest Service and School of Forest Resources, University of Maine
1978 Zoology Instructor, Oxford University
1978 - pr. Department of Wildlife Ecology, University of Maine, Current titles: Libra Professor of Conservation Biology and Professor of Wildlife Ecology

Scholarships and Academic Honors

1973 Rhodes Scholarship
1974 Graduated from University of Maine with Highest Distinctions
1974 P. F. English Award for outstanding wildlife student in northeastern U.S. and eastern Canada
1974 D. B. Demeritt Award for outstanding student in School of Forest Resources
1975 Senior Scholar, St. Catherine's College, Oxford University
1990 Libra Professor of Conservation Biology
1995 Pew Conservation Fellow
1996 University of Maine 1996 Distinguished Professor
1996 University of Maine Commencement Speaker
2003 Webber Award for Outstanding Forest Resource Research
2005 President Harris Award for contributions to the University of Maine
2007 Distinguished Service Award of the Society for Conservation Biology

Membership in Professional Societies

American Ornithologists Union (Elective member)
Association for the Study of Animal Behaviour
Ecological Society of America (Editorial board)
Natural Areas Association
Society for Conservation Biology (President; Board of Governors; Editorial Board)
The Wildlife Society

Membership and roles in other organizations

Doris Duke Charitable Foundation, Chair of Environmental Committee
Joseph Jones Ecological Research Center, Ichauway, Georgia, Scientific Advisory Comm.
Maine Council on Sustainable Forest Management (Gubernatorial appointment)
Maine Forest Biodiversity Project
Maine Bureau of Public Lands (Silvicultural Advisory Committee)
Maine Dept. Inland Fisheries and Wildlife (Nongame Advisory Council)
Maine Governor's Task Force on Management of Public Land (Gubernatorial appointment)
Maine Natural Areas Program, Advisory Board
Maine Ecological Reserves Scientific Advisory Committee (Gubernatorial appointment)
Maine Ecosystems Working Group
Nature Conservancy, Maine Chapter (Trustee; Chair, Conservation Priorities and International Comms)
Nature Conservancy, International (Science Review Panel; Smith Fellowship Review)
Natural Resources Council of Maine (Board of Directors; Forestry Committee)
Northeastern Naturalist, Editorial Board
President's Commission on Environmental Quality: Biodiversity Task Force
White House Task Force on Spotted Owls (Consultant)
World Conservation Union (IUCN); Species Survival Commission (Mustelid/Viverrid/Procyonid Specialist Group)

International Experience

Research, education, and conservation work in Australia, Belize, Botswana, Brazil, Canada, Dominica, D.R. Congo, Finland, Germany, Great Britain, Greece, India, Iran, Kenya, Mexico, Morocco, Nepal, Norway, Panama, Peru, Poland, Seychelles, South Africa, Spain, Sweden, Switzerland, Zambia, Zimbabwe. Travel to 36 other countries.

Consultant and reviewer for the U.S. Agency for International Development, Smithsonian Institution, World Wildlife Fund, World Conservation Union, United Nations Environment Program, and a member of the IUCN Species Survival Commission.

Graduate advisor to students from Argentina, Canada, Chile, India, Nepal, United Kingdom, Romania, and Zaire.

International funding from: British Overseas Development Administration, Fauna and Flora Preservation Society, National Geographic Society, Rockefeller Foundation, Royal Geographic Society, Toronto Zoo, U.S. Agency for International Development, U.S. Fish and Wildlife Service, Van Tienhoven Foundation, Volkart Foundation, Wildlife Conservation Society, World Pheasant Association, World Wildlife Fund (International and U.S.)

Rudimentary knowledge of Farsi, French, German, and Spanish

Books and Monographs

Hunter, M.L. Jr. and F. Schmiegelow. 2011. Wildlife, forests, and forestry: Principles of managing forests for biological diversity. 2nd edition. Prentice-Hall, Upper Saddle River, NJ. 259 pp.

Gibbs, J., M.L. Hunter, Jr. and E. Sterling. 2008. Problem-solving in conservation biology and wildlife management: Exercises for class, field, and laboratory, 2nd edition. Blackwell Publishing, Oxford, United Kingdom. 328 pp.

Hunter, M.L. D. Lindenmayer, and A. J.K. Calhoun. 2007. Saving the earth as a career: Advice on becoming a conservation professional. Blackwell Publishing, Oxford, United Kingdom. 200pp.

Hunter, M.L. Jr. and J.P. Gibbs. 2007. Fundamentals of conservation biology, 3rd edition. Blackwell Publishing, Oxford, United Kingdom, 497pp.

Hunter, M.L. Jr. 2002. Fundamentals of conservation biology, 2nd edition. Blackwell Science, Malden, Massachusetts, 547pp.

Hunter, M.L. Jr. (editor). 1999. Maintaining biodiversity in forest ecosystems. Cambridge University Press, Cambridge, England. 698pp.

Hunter, M.L. Jr., A. Calhoun and M. McCollough.(editors). 1999. Maine amphibians and reptiles. University of Maine Press, Orono, Maine. 252pp.

Gibbs, J., M.L. Hunter, Jr. and E. Sterling. 1998. Problem-solving in conservation biology and wildlife management: Exercises for class, field, and laboratory. Blackwell Science, Malden, Massachusetts. 215pp.

Hunter, M.L. Jr. 1996. Fundamentals of conservation biology. Blackwell Science, Cambridge, Massachusetts, 482pp.

Witham, J., E. Moore, M. Hunter, A. Kimball, and A. White. 1993. Long-term study of an oak-pine forest ecosystem: Techniques manual for the Holt Research Forest. Maine Agricultural Experiment Station Technical Bulletin 153. 164 pp.

Hunter, M.L. Jr., J. Albright and J. Arbuckle 1992. The amphibians and reptiles of Maine. Maine Agricultural Experiment Station Bulletin 838. 188 pp.

Hunter, M.L. Jr. 1990. Wildlife, forests, and forestry: Principles of managing forests for biological diversity. Prentice-Hall, Englewood Cliffs, NJ. 370pp.

Gaston, A.J., M.L. Hunter, Jr, and P.J. Garson. 1981. The wildlife of Himachal Pradesh, Western Himalayas. School of Forest Resources Technical Note No. 82, Orono, ME. 159pp.

Hunter, M.L. Jr. 1976. Maine ecosystems. Center for Natural Areas. Washington, D.C. 224pp.

Seymour, R. M.L. Hunter, Jr., P. deMaynadier, and C. Foss Practicing ecological forestry: Maintaining biodiversity and wood production in the Northeast. In preparation for Island Press.

Refereed Journals

Politi, N., M.L. Hunter, Jr., and L Rivera. In press. Assessing the effects of selective logging on birds in Neotropical piedmont and cloud montane forest. *Biodiversity and Conservation*

Popescu, V.D., M.L. Hunter, and J. Zydlewski. In press. Use of olfactory cues by newly metamorphosed wood frogs (*Lithobates sylvaticus*) during emigration. *Copeia*

Campbell, S.P., J.W. Witham, and M.L. Hunter Jr. In press. Long-term changes in spatial distribution of birds responding to a group-selection timber harvest. *Wildlife Society Bulletin*

Popescu, V.D., D.A. Patrick, M.L. Hunter, and A.J.K. Calhoun. 2012. The role of forest harvesting and subsequent vegetative regrowth in determining patterns of amphibian habitat use *Forest Ecology and Management* 270:163-174

Wang, G., N.T. Hobbs, N. A. Slade, J. F. Merritt, L. L. Getz, M. L. Hunter, Jr., S. H. Vessey, J. W. Witham and A. Guillaumet. 2011. Comparative population dynamics of large and small mammals in the Northern Hemisphere: Deterministic and stochastic forces. *Ecography* 34:1-8.

Popescu, V.D. and M.L. Hunter. 2011. Clearcutting affects habitat connectivity for a forest amphibian by decreasing permeability to juvenile movements. *Ecological Applications* 21:1283-1295.

Lindenmayer, D.B. and M.L. Hunter, Jr. 2010. Some guiding concepts for conservation biology. *Conservation Biology* 24:1459-1468.

Politi, N., M.L. Hunter, Jr., and L. Rivera. 2010. Availability of cavities for avian cavity nesters in selectively logged subtropical montane forests of the Andes. *Forest Ecology and Management* 260:893-906.

- Hunter, M.L., Jr, E. Dinerstein, J. Hoekstra, and D. Lindenmayer. 2010. Conserving biodiversity in the face of climate change: A call to action. *Conservation Biology* 24:1169-1171.
- Campbell, S.P., J.W. Witham, and M.L. Hunter Jr. 2010. Stochasticity in avian habitat use: a test of deterministic explanations for habitat selection. *Ecological Monographs* 80:287-302.
- Blomquist, S.M., and M.L. Hunter Jr. 2010. A multi-scale assessment of amphibian habitat selection: wood frog response to timber harvesting. *Ecoscience* 17:251-264.
- Strojny, C. A. and M. L Hunter, Jr. 2010. Comparing relative abundance of amphibians in forest canopy gaps of natural origin vs. timber harvest origin. *Animal Biodiversity and Conservation* 33:1-13.
- Beaudry, F., P. G. deMaynadier, M. L. Hunter, Jr. 2010. Identifying hot moments in road mortality risk for freshwater turtles. *Journal of Wildlife Management* 74:152-159.
- Strojny, C. A. and M. L Hunter, Jr. 2010. Log diameter influences detection of eastern red-backed salamanders (*Plethodon cinereus*) in harvest gaps, but not in closed-canopy forest conditions. *Herpetological Conservation and Biology* 5:80-85.
- Beaudry, F., P. G. deMaynadier, M. L. Hunter, Jr. 2010. Nesting movements and nest site characteristics of spotted turtles (*Clemmys guttata*) and Blanding's turtles (*Emydoidea blandingii*): Implications for the use of artificial nest sites. *Herpetological Conservation and Biology* 5:1-8.
- Politi, N., M.L. Hunter, Jr., and L. Rivera. 2009. Nest selection by cavity-nesting birds in subtropical montane forests of the Andes: some implications for sustainable forest management. *Biotropica* 41:354-360.
- Lindenmayer, D.B., M.L. Hunter, Jr., P.J. Burton, and P. Gibbons. 2009. Effects of logging on fire regimes in moist forests. *Conservation Letters* 2:271-277.
- Blomquist, S.M. and M.L. Hunter, Jr. 2009. A multi-scale assessment of habitat selection and movement patterns by Northern Leopard Frogs (*Lithobates [Rana] pipiens*) in a managed forest. *Herpetological Conservation and Biology* 4:142-160.
- Beaudry, F., P. G. deMaynadier, M. L. Hunter, Jr. 2009. Seasonally-dynamic habitat use by Spotted (*Clemmys guttata*) and Blanding's Turtles (*Emydoidea blandingii*) in Maine. *Journal of Herpetology* 43:636-645.
- Semlitsch, R.D., S.M. Blomquist, A.J.K. Calhoun, J. W. Gibbons, J.P. Gibbs, G. Graeter, E.B. Harper, D. Hocking, M. Hunter, Jr., D.A. Patrick, T.A.G. Rittenhouse, B.B. Rothermel, and B.D. Todd. 2009. Effects of timber management on amphibian populations: understanding mechanisms from forest experiments. *Bioscience* 59:853-862.
- Hunter, M.L. Jr., M.J. Bean, D. B. Lindenmayer, and D. S. Wilcove. 2009. Thresholds and the mismatch between environmental laws and ecosystems. *Conservation Biology* 23:1053-1055.
- Wang, G., J. O. Wolff, S. H. Vessey, N. A. Slade, J. W. Witham, J. F. Merritt, M. L. Hunter, Jr., and S.P. Elias. 2009. Comparative population dynamics of *Peromyscus leucopus* in North America: influences of climate, food, and density dependence. *Population Ecology* 51:133-142.
- Sutherland, W.J. et al. 2009. An assessment of the 100 questions of greatest importance to the conservation of global biological diversity. *Conservation Biology* 23:557-567.
- Beaudry, F., P. G. deMaynadier, M.L. Hunter Jr. 2008. Identifying road mortality threat at multiple spatial scales for semi-aquatic turtles. *Biological Conservation* 141:2550-2563.
- Schwartz, M.W., M. L. Hunter, Jr., P. D. Boersma. 2008. Scientific societies in the 21st century: a membership crisis? *Conservation Biology* 22:1087-1089.
- Patrick, D.A., E.B. Harper, M.L. Hunter Jr, and A.J.K. Calhoun. 2008. Terrestrial habitat selection and strong density-dependent mortality in recently metamorphosed amphibians. *Ecology* 89:2563-2574.

- Patrick, D.A., A.J.K. Calhoun and M.L. Hunter Jr. 2008. The importance of understanding spatial population structure when evaluating the effects of silviculture on spotted salamanders (*Ambystoma maculatum*). *Biological Conservation* 141:807-814
- Blomquist, S.M., J.D. Zydlewski and M.L. Hunter Jr. 2008. Efficacy of PIT tags for tracking the terrestrial anurans *Rana pipiens* and *Rana sylvatica*. *Herpetological Review* 39:174-179.
- Lindenmayer, D. et al. 2008. A checklist for ecological management of landscapes for conservation. *Ecology Letters* 11:78-91.
- Cornelius, C., K. Cockle, N. Politi, I. Berkunsky, L. Sandoval, V. Ojeda, L. Rivera, M.L. Hunter, Jr., and K. Martin. 2008. Cavity-nesting birds in Neotropical forests: cavities as a potentially limiting resource. *Ornitologia Neotropical* 19:253-268.
- Hunter, M.L. 2007. Climate change and moving species: Furthering the debate on assisted colonization. *Conservation Biology* 21:1356-1358.
- Campbell, S.P., J.W. Witham, and M.L. Hunter Jr. 2007. A long-term study on the effects of a selection timber harvest on a forest bird community in Maine. *Conservation Biology* 21:1218-1229.
- Blomquist, S.B. and M. L. Hunter Jr. 2007. Externally attached radio-transmitters have limited effects on the antipredator behavior and vagility of *Rana pipiens* and *R. sylvatica*. *Journal of Herpetology* 41:430-438.
- Patrick, D. A. Calhoun, and M.L. Hunter, Jr. 2007. The orientation of juvenile wood frogs, *Rana sylvatica*, leaving experimental ponds. *Journal of Herpetology* 41:158-163.
- Anderson, M.W. et al. 2007. Attitude changes of undergraduate university students in general education courses. *Journal of General Education* 56: 149-168.
- Elias, S.P., J. W. Witham, and M. L. Hunter, Jr. 2006. Impact of a group-selection timber harvest on a 22-year population fluctuation pattern in *Clethrionomys gapperi*. *Journal of Mammalogy* 87:440-445.
- Perkins, D. W. and M. L. Hunter. 2006. Use of amphibians to define riparian zones along headwater streams in Maine. *Canadian Journal of Forest Research* 36:2124-2130.
- Patrick, D.A., M.L. L. Hunter Jr., and A. J. K. Calhoun. 2006. Effects of experimental forestry treatments on a Maine amphibian community. *Forest Ecology and Management* 234:323-332.
- Perkins, D. W. and M.L. Hunter, Jr. 2006. Effects of riparian timber management on amphibian communities in Maine. *Journal of Wildlife Management* 70:657-670.
- Schulte, Lisa A., R. J. Mitchell, M. L. Hunter, Jr., J. F. Franklin, R. K. McIntyre, and B. J. Palik. 2006. Evaluating the conceptual tools for forest biodiversity conservation and their implementation in the United States. *Forest Ecology and Management* 232:1-11.
- Hunter, M.L. Jr. 2005. A mesofilter complement to coarse and fine filters. *Conservation Biology* 19:1025-1029.
- Elias, S.P., J. W. Witham, and M. L. Hunter, Jr. 2004. Maine *Peromyscus leucopus* abundance and acorn mast: Population fluctuation patterns over 20 years. *Journal of Mammalogy* 85:743-747
- Lindenmayer, D.B., D.R. Foster, J.F. Franklin, M.L. Hunter, R.F. Noss, D. Perry, and F.A. Schmiegelow. 2004. Salvage harvesting policies after natural disturbances. *Science* 303:1303.
- Belovsky, G.E., D. B. Botkin, T. Crowl, K. Cummins, J. Franklin, M.L. Hunter, A. Joern, D. B. Lindenmayer, J. MacMahon, C. Margules, M. Scott. 2004. Ten suggestions to strengthen the science of ecology. *BioScience*. 54:345-351.

- Hunter, M.L. Jr., A. Calhoun, and D. S. Wilcove. 2004. Goliath Heron fishing with an artificial bait? *Waterbirds* 27:312-313.
- Guerry, A. and M.L. Hunter, Jr. 2002. Amphibian distributions in a landscape of forests and agriculture: An examination of landscape composition and configuration. *Conservation Biology* 16:745-754 .
- Hunter, M.L. Jr. and S. L. Webb. 2002. Enlisting taxonomists to survey poorly known taxa for biodiversity conservation: A lichen case study. *Conservation Biology* 16:660-665.
- DiMauro, D. and M.L. Hunter, Jr. 2002. Reproduction of amphibians in natural and anthropogenic temporary pools in managed forests. *Forest Science* 48:397-406.
- Mitchell, R.J., B.J. Palik, M.L. Hunter, Jr. 2002. Natural disturbance as a guide to silviculture. *Forest Ecology and Management* 155:315-317.
- Perkins, D. W. and M.L. Hunter, Jr. 2002. Effects of placing sticks in pitfall traps on amphibian and small mammal capture rates. *Herpetological Review* 33:282-284.
- Joyal, R., M. McCollough and M.L. Hunter, Jr. 2001. Wetland conservation at a landscape scale: A case study of spotted and Blanding's turtles in southern Maine. *Conservation Biology* 15:1755-1762.
- Noss, R. and M.L. Hunter. 2001. From assemblage to community. *Conservation Biology* 15:1201-1202.
- Plucinksi, K.E. and M.L. Hunter, Jr. 2001. Spatial and temporal patterns of seed predation on three tree species in an oak-pine forest. *Ecography* 24:309-317.
- Hunter, M.L. Jr. 2000. Refining normative concepts in conservation. *Conservation Biology* 14:573-574.
- deMaynadier, P.G. and M.L. Hunter, Jr. 2000. Forest roads and amphibian movements in Maine. *Natural Areas Journal* 20:56-65.
- Joyal, L.A., M. McCollough, and M.L. Hunter, Jr. 2000. Population structure and reproductive ecology of Blanding's turtle (*Emydoidea blandingii*) in Maine near the northeastern edge of its range. *Chelonian Conservation and Biology* 3:580-588.
- Monti, L., M.L. Hunter, Jr. and J. Witham. 2000. An evaluation of the artificial cover object (ACO) method for monitoring populations of the redback salamander (*Plethodon cinereus*). *Journal of Herpetology* 34:624-629.
- McCracken, K., M.L. Hunter, Jr. and J. Witham. 1999. Relationships between seed fall of three tree species and *Peromyscus leucopus* and *Clethrionomys gapperi* during ten years in an oak-pine forest. *Journal of Mammalogy* 80:1288-1296.
- White, A., J. Witham, M.L. Hunter, Jr. and A.J. Kimball. 1999. The relationship between plant species richness and biomass in a coastal Maine *Quercus-Pinus* forest. *Journal of Vegetation Science* 10:755-762.
- deMaynadier, P.G. and M.L. Hunter, Jr. 1999. Forest canopy closure and juvenile emigration by pool-breeding amphibians in Maine. *Journal of Wildlife Management* 63:441-450.
- Dibble, A., J.C. Brissette, and Hunter, M.L. Jr. 1999. Putting community data to work: Some understory plants indicate red spruce habitat. *Forest Ecology and Management* 114: 275-291.
- Vickery, P.D., M.L. Hunter, Jr., and J.V. Wells. 1999. Effects of fire and herbicide treatment on habitat selection of grassland birds in southern Maine. *Studies in Avian Biology* 19:149-159.
- deMaynadier, P.G. and M.L. Hunter, Jr. 1998. Effects of silvicultural edges on the distribution and abundance of amphibians in Maine. *Conservation Biology* 12:340-352.
- Hartley, M. and M.L. Hunter, Jr. 1998. A meta-analysis of forest cover, edge effects, and predation rates of artificial nests. *Conservation Biology* 12:465-469.

- Whitman, A.A., M.L. Hunter, Jr. and J. W. Witham 1998. Age distribution of ramets of a forest herb, Wild Sarsaparilla, *Aralia nudicaulis*, (Araliaceae). *Canadian Field-Naturalist* 112:37-44.
- Hunter, M.L. Jr. and A. White. 1997. Ecological thresholds and the definition of old-growth forests. *Natural Areas Journal* 17:292-296.
- Hunter, M.L. Jr. and J. Jaros-Su. 1997. Insects, entomologists, and the conservation of biodiversity. *Northeast Naturalist* 4:153-158.
- Hunter, M.L. Jr. 1996. Benchmarks for managing ecosystems: Are human activities natural? *Conservation Biology* 10:695-697.
- Hunter, M.L. Jr. 1996. "A desktop reference for conservationists." Book review of R. Paelkhe's "Conservation and environmentalism: An encyclopedia." *Conservation Biology* 10:1477-1478.
- Boone, R., and M.L. Hunter, Jr. 1996. Using diffusion models to simulate the effects of grizzly bear dispersal in the Rocky Mountains. *Landscape Ecology* 11:51-64.
- deMaynadier, P.G. and M.L. Hunter, Jr. 1995. The relationship between forest management and amphibian ecology: a review of the North American literature. *Environmental Reviews* 3:239-261.
- Mugangu, T., M.L. Hunter, Jr., and J. Gilbert. 1995. Food, water, and predation: a model of habitat selection by buffalo in Virunga National Park, Zaire. *Mammalia* 59:349-362.
- Kimball, A., J. Witham, J. Rudnicki, A. White, and M.L. Hunter, Jr. 1995. Harvest-created and natural canopy gaps in an oak-pine forest in Maine. *Bulletin of the Torrey Botanical Society* 122:115-123.
- Vickery, P. and M.L. Hunter, Jr. 1995. Testing the song perch limitation hypothesis: Do artificial perches affect bird use. *American Midland Naturalist* 133:164-169.
- Vickery, P., M.L. Hunter, Jr. and S. Melvin. 1994. Effects of habitat area on the distribution of grassland birds. *Conservation Biology* 8:1087-1097. Reprinted in P. Vickery and P. Dunwiddie. 1997. *Grasslands of Northeastern North America*, Massachusetts Audubon Society, Lincoln, MA.
- Hunter, M.L. Jr. and A. Hutchinson. 1994. The virtues and shortcomings of parochialism: Conserving species that are locally rare, but globally common. *Conservation Biology* 8:1163-1165.
- Markowsky, J., M.L. Hunter, Jr. and W. Glanz. 1994. Why do brown tremblers tremble? *Journal of Field Ornithology* 65:247-249.
- Rudnicki, T. and M.L. Hunter, Jr. 1993. Reversing the fragmentation perspective: Effects of clearcut size on bird species richness in Maine. *Ecological Applications* 3:357-366.
- Rudnicki, T. and M.L. Hunter, Jr. 1993. Avian nest predation in clearcuts, forests, and edges in a forested landscape. *Journal of Wildlife Management* 57:358-364.
- Gibbs, J., M.L. Hunter, Jr. and S. Melvin. 1993. Snag availability and communities of cavity nesting birds in tropical versus temperate forests. *Biotropica* 25: 236-241.
- Hunter, M.L. Jr. and P. Yonzon. 1993. Altitudinal distribution of birds, mammals, people, parks, and forests in Nepal. *Conservation Biology* 7:420-423.
- Hunter, M.L. Jr. 1993. Natural disturbance regimes as spatial models for managing boreal forests. *Biological Conservation* 65:115-120.
- Hunter, M.L. Jr. 1993. "Biodiversity goes public." Book review of E. O. Wilson's "The diversity of life." *Conservation Biology* 7:208-209.

- Hunter, M.L. Jr. 1993. Of puffins and parochialism: Is it important to conserve species that are locally rare but globally common? *Maine Naturalist* 1: 39-42.
- Vickery, P., M.L. Hunter, Jr. and J. Wells. 1992. Is density an indicator of breeding success? *Auk* 109:706-710.
- Vickery, P., M.L. Hunter, Jr. and J. Wells. 1992. Use of a new reproductive index to test the relationship between habitat quality and breeding success. *Auk* 109:697-705.
- Mugangu, E. and M.L. Hunter, Jr. 1992. Aquatic foraging by hippopotamus in Zaire: response to a food shortage? *Mammalia* 56:345-349.
- Vickery, P., M.L. Hunter, Jr. and J. Wells. 1992. Predation of grassland birds in southern Maine: is it directed or incidental? *Oikos* 63:281-288.
- Yonzon, P. and M.L. Hunter, Jr. 1991. Conservation of the red panda *Ailurus fulgens*. *Biological Conservation* 57:1-11.
- Yonzon, P. and M.L. Hunter, Jr. 1991. Cheese, tourists, and red pandas in the Nepal Himalayas. *Conservation Biology* 5:196-202. (Reprinted in D. Ehrenfeld. 1995. *Readings from Conservation Biology*. Blackwell, Boston.)
- Hunter, M.L. Jr. 1991. Conservation strategies for the giant and red pandas. *Trends in Ecology and Evolution* 6:378-379.
- Jennings, D.T., H.S. Crawford and M.L. Hunter, Jr. 1991. Predation by amphibians and small mammals on the spruce budworm (Lepidoptera: Tortricidae). *Great Lakes Entomologist* 24:69-74.
- Hunter, M.L. Jr., R. Hitchcock and B. Wyckoff-Baird. 1990. Women and wildlife in southern Africa. *Conservation Biology* 4:448-451. (Reprinted in D. Ehrenfeld. 1995. *Readings from Conservation Biology*. Blackwell, Boston.)
- Hunter, M.L. Jr. 1990. "When I am hungry ..." Book review of Western and Pearl (1989), "Conservation for the twenty-first century." *Ecology* 71:2398.
- Hunter, M.L. Jr. 1989. What constitutes an old growth stand? *Journal of Forestry* 87:33-35.
- Small, M. and M.L. Hunter, Jr. 1989. Response of passerines to abrupt forest-river and forest-powerline edges in Maine. *Wilson Bulletin* 101:77-83.
- Stockwell, S.S. and M.L. Hunter, Jr. 1989. Distribution and abundance of herpetofauna in eight types of Maine peatlands vegetation. *Journal of Herpetology* 23:409-414.
- Hunter, M.L. Jr. 1989. Himalayan birds face uphill while singing. *Auk* 106:728-729.
- Hunter, M.L. Jr. 1989. Aardvarks and Arcadia: Two principles of wildlife research. *Wildlife Society Bulletin* 17:350-351.
- Hunter, M.L. Jr., G. Jacobson and T. Webb 1988. Paleocology and the coarse-filter approach to maintaining biological diversity. *Conservation Biology* 2:375-385. (Reprinted in D. Ehrenfeld. 1995. *Readings from Conservation Biology*. Blackwell, Boston.)
- Small, M. and M.L. Hunter, Jr. 1988. Forest fragmentation and avian nest predation in forested landscapes. *Oecologia* 76:62-64.
- Gibbs, J.P., S. Woodard, M.L. Hunter, Jr. and A.W. Hutchinson. 1988. Comparison of techniques for censusing great blue heron nests. *Journal of Field Ornithology* 59:130-134.
- Gibbs, J.P., S. Woodard, M.L. Hunter, Jr. and A.E. Hutchinson. 1987. Determinants of great blue heron colony distribution in coastal Maine. *Auk* 104:38-47.

- Hunter, M.L. Jr., J. J. Jones, J. W. Witham and T. M. Mingo. 1986. Biomass and species richness of aquatic macrophytes in four Maine, U.S.A. lakes of different acidity. *Aquatic Botany* 24:91-95.
- Hunter, M.L. Jr., A. Kacelnik, J. Robert and M. Vuillemoz. 1986. Directionality of avian vocalizations: a laboratory study. *Condor* 88:371-375.
- Hunter, M.L. Jr., J. Jones, K.E. Gibbs and J.R. Moring. 1986. Duckling responses to lake acidification: do black ducks and fish compete? *Oikos* 47:27-32.
- Hunter, M.L. Jr. and J. Witham. 1985. Effects of a carbaryl-induced depression of arthropod abundance on the foraging behavior of Parulinae warblers. *Canadian Journal of Zoology* 63:2612-2616.
- Hunter, M.L. Jr., J. Witham and H. B. Dow. 1984. Effects of a carbaryl-induced depression in invertebrate abundance on the growth and behavior of American black duck and mallard ducklings. *Canadian Journal of Zoology* 62:452-456.
- Kacelnik, A., A. Moreno, J. Roberts and M.L. Hunter, Jr. 1983. Physical considerations in the frequency limits of bird song. *Acoustic Letters* 6:100-105.
- Gaston, A.J., P.J. Garson and M.L. Hunter, Jr. 1983. The status and conservation of forest wildlife in Himachal Pradesh, Western Himalayas. *Biological Conservation* 27:291-314.
- Roberts, J., A. Kacelnik and M.L. Hunter, Jr. 1981. The ground effect and acoustic communication. *Animal Behaviour* 29:633-634.
- Gaston, A.J., P.J. Garson and M.L. Hunter, Jr. 1981. Present distribution and status of pheasants in Himachal Pradesh, West Himalayas. *Journal of the World Pheasant Association* 6:10-30.
- Hunter, M.L. Jr. 1980. Microhabitat selection for singing and other behaviour in great tits *Parus major*: Some visual and acoustical considerations. *Animal Behaviour* 28:468-475.
- Hunter, M.L. Jr. 1980. Vocalization during inhalation in a nightjar. *Condor* 82:101-103.
- Roberts, J., A. Kacelnik and M.L. Hunter, Jr. 1980. Some consequences of sound interference patterns for bird song. *Acoustic Letters* 3:141-146.
- Hunter, M.L. Jr. and J.R. Krebs. 1979. Geographical variation in the songs of the great tit (*Parus major*) in relation to ecological factors. *Journal of Animal Ecology* 48:759-785.
- Hunter, M.L. Jr. and P.J. Garson. 1979. The effects of temperature and time of year on the singing behaviour of Wrens (*Troglodytes troglodytes*) and Great Tits (*Parus major*). *Ibis* 121:481-487.
- Roberts, J., A. Kacelnik and M.L. Hunter, Jr. 1979. A model of sound interference in relation to acoustic communication. *Animal Behaviour* 27:1271-1273.
- Hunter, M.L. Jr. 1975. Least tern breeding range extension in Maine. *Auk* 92:143-145.
- Politi, N., M.L. Hunter, Jr., and J. Witham. In review. Effect of logging on tree cavity resources in an oak-pine forest of Maine. *Northern Journal of Applied Forestry*
- Blomquist, S.M., and M.L. Hunter Jr. In review. Environmental stochasticity induces species and life-stage-specific changes in fitness correlates of two anuran species. *Oikos*.
- Foss, C.R., B.R. Sturtevant, T.P. Skaling and M.L. Hunter, Jr. A comparison of three methods to assess reproductive success of forest birds. To be submitted to *Journal of Ornithology*.
- Foss, C.R., and M.L. Hunter, Jr. Evaluating biological integrity along an urban to forest gradient using bird community metrics. To be submitted to *Ecological Applications*

Foss, C.R., and M.L. Hunter, Jr. Avian density and nesting success: relationships in a managed Acadian sprucefir forest. To be submitted to Auk

Foss, C.R., and M.L. Hunter, Jr. Effects of partial cutting on breeding birds in an Acadian spruce-fir forest. To be submitted to Forest Ecology and Management

Hartley, M.A. and M. L. Hunter, Jr. Effects of 10% and 20% timber removals on bird community composition: an experimental approach. To be submitted to Journal of Wildlife Management.

Hartley, M.A. and M. L. Hunter, Jr. Effects of experimental habitat disturbances on breeding site fidelity of adult hermit thrushes (*Catharus guttatus*) and ovenbirds (*Seiurus aurocapillus*). To be submitted to Auk.

Hartley, M.A. Effects of red squirrel (*Tamiasciurus hudsonicus*) population fluctuations on bird populations. To be submitted to Oikos.

Kolozsvary, M. B., A. J. K. Calhoun, and M. L. Hunter, Jr. An evaluation of sampling techniques for larval amphibians in wetlands. In revision for Herpetological Reviews.

Kolozsvary, M. B., A. J. K. Calhoun, and M. L. Hunter, Jr. Constraints of flood duration of wetlands on reproduction in wood frogs and spotted salamanders. Submitted to Ecology

Kolozsvary, M. B., A. J. K. Calhoun, and M. L. Hunter, Jr. Hydrological characteristics and landscape setting of breeding pools for wood frogs and spotted salamanders. To be submitted to Wetlands.

Stockwell, S.S. and M.L. Hunter, Jr. Habitat selection and population density changes in peatland birds: A test of the Fretwell-Lucas hypothesis. In prep.

Book chapters

Popescu, V.D. and M.L. Hunter (in press) Assisted colonization of wildlife species at risk from climate change. In J. Brodie and E. Post (eds.) Conserving wildlife populations in a changing climate. University of Chicago Press.

Politi, N., L. Rivera, and M.L. Hunter, Jr. "Los bosques no son sólo árboles y los árboles no son sólo madera: la necesidad de un manejo forestal que incluya la biodiversidad." Ecología, historia natural y conservación de la Selva Pedemontana de las Yungas Australes. Brown A. D., Blending P. G., Lomáscolo T. y P. García Bes (eds.). Ediciones del Subtrópico, Tucumán.

Hunter, M.L., Jr. 2010. Of fir and fen: Exploring ecological patterns. Pages 4-6 in S.C. Gawler, and A.R. Cutko. Natural landscapes of Maine. Maine Natural Areas Program, Maine Dept of Conservation, Augusta Maine.

Hunter, M.L., C. Burns, P. deMaynadier, L. Incze, W. Krohn, P. Vaux, and B. Vickery. 2009. Biodiversity . Pages 30-36 in Jacobson, G.L., I.J. Fernandez, P.A. Mayewski, and C.V. Schmitt (editors). 2009. Maine's climate Future. University of Maine. Orono, ME.

Hunter, M.L. Jr. 2008. Valuing and conserving vernal pools as small-scale ecosystems. Pages 1-8 in A.J.K. Calhoun and P. deMaynadier, editors. Science and conservation of vernal pools in northeastern North America. CRC Press, Boca Raton, Florida. 363 pp.

Hunter, M.L. Jr. 2007. Core principles for using natural disturbance regimes to inform landscape management. Pages 408-422 In Hobbs, R. and D. Lindenmayer (editors). Managing and designing landscapes for conservation. Blackwell Science, Oxford, United Kingdom.

Hunter, M.L. 2003. Foreword. Pages xi-xiii in C. Groves. Drafting a conservation blueprint. Island Press, Washington, D.C. 456pp.

Calhoun, A. and M.L. Hunter, Jr. 2003. Managing ecosystems for amphibian conservation. Pages 22&241 in R. Semlitsch, ed., Amphibian conservation. Smithsonian Institution Press, Washington DC.

- Hixon, M.A., P. D. Boersma, M. L. Hunter, Jr., F. Micheli, E. A. Norse, H.P. Possingham, P. V. R. Snelgrove. 2001. Oceans at risk: Research priorities in marine conservation biology. Pages 125-154 in M. E. Soulé and G. H. Orians. eds. Conservation biology: Research priorities for the next decade. Island Press, Washington, D.C.
- Engstrom, R.T., S. Gilbert, M.L. Hunter, Jr., D. Merriwether, G. J. Nowacki, and P. Spencer. 1999. Practical applications of disturbance ecology to natural resources management. Pages 313-330 in: Johnson, N.C., A.J. Malk, W.T. Sexton, and R. Szaro (eds.), Ecological Stewardship: A Common Reference for Ecosystem Management. Volume 2. Elsevier Science Ltd., Oxford.
- Hunter, M.L. Jr. 1999. Biological diversity. Pages 3-21 in Hunter, M.L. (ed.). Maintaining biodiversity in forest ecosystems. Cambridge University Press, Cambridge, England. 698pp.
- Seymour, R. and M.L. Hunter, Jr. 1999. Principles of ecological forestry. Pages 22-61 in Hunter, M.L. (ed.). Maintaining biodiversity in forest ecosystems. Cambridge University Press, Cambridge, England. 698pp.
- deMaynadier, P.G., and M.L. Hunter, Jr. 1997. The role of keystone ecosystems in landscapes. Pages 68-76 in A. Haney and M. Boyce. Ecosystem management. Yale University Press, New Haven, Connecticut. 361pp.
- Hunter, M.L. Jr. 1997. The biological landscape. Pages 57-67 in: K. Kohm and J. Franklin. Creating a forestry for the 21st century. Island Press, Washington D.C. 475 pp.
- Hunter, M.L. Jr. and A. Calhoun. 1996. A triad approach to land-use allocation. Pages 477-491 in R. Szaro and D. Johnston. (Editors). Biodiversity in managed landscapes. Oxford University Press, New York. 778 pp.
- Kitsos, A., M.L. Hunter, Jr., J.H. Sabnis, and A. Mehta. 1995. A guide to the identification of some Indian mammal hairs. Pages 123-130 in S. H. Berwick and V.B. Saharia (eds.) The development of international principles and practices of wildlife research and management: Asian and American approaches. Oxford University Press, Delhi.
- Witham, J.W. and M.L. Hunter, Jr. 1992. Population trends of neotropical landbird migrants in northern coastal New England. Pages 85-95 in J. Hagan and D. Johnston (eds.). Ecology and Conservation of Neotropical Migrant Landbirds. Smithsonian Institution Press, Washington D.C. 608 pp.
- Hunter, M.L. Jr. 1992. Paleocology, landscape ecology, and the conservation of neotropical migrant passerines in boreal forests. Pages 511-523 in J. Hagan and D. Johnston (eds.). Ecology and Conservation of Neotropical Migrant Landbirds. Smithsonian Institution Press, Washington, D.C. 608 pp.
- Hunter, M.L. Jr. 1991. Coping with ignorance: the coarse-filter strategy for maintaining biological diversity. Pages 266-281 in K. Kohm (ed.) Balancing on the brink of extinction. Island Press, Washington, D.C. 316pp.
- Yonzon, P.B. and M.L. Hunter, M.L. Jr. 1989. Ecological study of the red panda in the Nepal-Himalayas. Pages 1-7 in A.R. Glatston (ed.). Red panda biology. SPB Academic Publ., The Hague, Netherlands. 178pp.
- Yonzon, P.B. and M.L. Hunter. The red panda. In: Johnsingh, A.J.T. and R. Sukumar. Mammals of South Asia. Oxford University Press.
- Symposia proceedings
- Hunter, M.L. Jr. 1993. Some ideas about New Forestry in New England. Pages 6-15 in: Briggs, R.D. and W.B. Krohn. Nurturing the northeastern forest. Maine Agricultural and Forestry Experiment Station Misc. Report 382.
- Hunter, M.L. Jr. 1993. An overview of biodiversity in forest ecosystems. Pages 7-13 in D. Kuhnke, ed., Birds in the Boreal Forest. Forestry Canada, Edmonton, Alberta.
- Hunter, M.L. Jr. 1993. Managing biodiversity in forests at large spatial and temporal scales. Pages 102-112 in D. Kuhnke, ed., Birds in the Boreal Forest. Forestry Canada, Edmonton, Alberta.
- Hunter, M.L. Jr. 1991. Seeing the world from a bird's eye view: bird conservation at a landscape scale. Acta Congressus Internationalis Ornithologici 20:2283-2285.

Hunter, M.L. Jr. and R.S. Seymour. 1989. A combined voluntary-mandatory approach to fostering diverse, paroductive forests in Maine. Pp. 88-92 in R. Briggs, W. Krohn, J. Trial, W. Ostrofsky, and D. Field (eds.). Forest and wildlife management in New England. Maine Agric. Expt. Stn. Misc. Rep. 336. 262pp.

Hunter, M.L. Jr. 1987. Managing forests for spatial heterogeneity to maintain biological diversity. Trans. North American Wildlife Natural Resources Conference 52:60-69.

DesGranges, J.L. and M.L. Hunter, Jr. 1987. Duckling response to lake acidification. Trans. North American Wildlife Natural Resource Conference 52:636-644.

Goodell, S.B., M.L. Hunter, Jr. and A. Kimball. 1986. Application of wood science to the creation and maintenance of snags for wildlife. Pp. 135 to 139 in J. A. Bissonette (ed.). "Is Good Forestry Good Wildlife Management?" Maine Agric. Expt. Stn. Misc. Publ. No. 689. 377pp.

Hunter, M.L. Jr. 1986. The diversity of New England forest ecosystems. Pp. 35 to 47 in J. A. Bissonette (ed.) "Is Good Forestry Good Wildlife Management?" Maine Agric. Expt. Stn. Misc. Publ. No. 689. 377pp.

Hunter, M.L. Jr. and P.W. Brown. 1985. Potential effects of insecticides on the survival of dabbling duck broods. Journal of the Minnesota Academy of Science 50(3):41-45.

Hunter, M.L. Jr. and T.W. Haines. 1981. Waterfowl and their habitat: threatened by acid rain? Proc. IV International Waterfowl Symposium, New Orleans, pp. 177-188.

Hunter, M.L. Jr. and J.R. Krebs. 1981. Structure and function of Great Tit songs. Acta XVII Congressus Internationalis Ornithologici, Berlin. pp. 689-693.

Miscellaneous Publications

Hunter, M.L., C. Burns, P. DeMaynadier, L. Incze, W. Krohn, P. Vaux, and B. Vickery. 2009. Biodiversity. Pages 30-33 in Jacobson, G.L., I.J. Fernandez, P.A. Mayewski, and C.V. Schmitt (editors). Maine's climate future: An initial assessment. University of Maine, Orono, Maine. 70 pp.

White, Alan S., and Malcolm L. Hunter, Jr. 2007. Defining old growth. News Quarterly, New England Society of American Foresters 68 (4):8-9, 11.

Aber, J., N. Christensen, I Fernandez, J Franklin, L Hidingler, M. Hunter, J. MacMahon, D. Mladenoff, J. Pastor, D. Perry, R. Slangen, H Miegrot. 2000. Applying ecological principles to management of the U.S. National Forests. Issues in Ecology No. 6, Ecological Society of America, Washington, D.C. 20pp.

Witham, J., M. Hunter, H. Tedford, A. Kimball, A. White, and S. Gerken 1999. A long-term study of an oak-pine forest ecosystem: A brief overview of the Holt Research Forest. Maine Agricultural and Forest Experiment Station Miscellaneous Publication 745. 23 pp.

Seymour, R. and M.L. Hunter, Jr. 1992. Principles and applications of New Forestry in spruce-fir forests of eastern North America. Maine Agricultural Experiment Station Miscellaneous Publication 716

Hartshorn, G., B. Kattel, M.L. Hunter, Jr., J. Mehta, B. Thapa and R. Shrestha. 1989. Feasibility assessment for creating the Nepal Conservation Training and Research Institute (NECTARI). World Wildlife Fund, Washington, D.C. 49pp.

Hunter, M.L. Jr. 1989. Environmental assessment. Annex IV in Wildlife in Local Development Project Paper. Africa Bureau, U.S. Agency for International Development, Washington, D.C.

Hunter, M.L. Jr., J.J. Jones, K.E. Gibbs, J.R. Morin and M. Brett. 1985. Interactions among waterfowl, fishes, invertebrates, and macrophytes in four Maine lakes of different acidity. U.S. Fish Wildl. Serv. FWS/OBS. 80(40.20) 80pp.

- Hunter, M.L. Jr., J.W. Witham and J.J. Jones. 1985. Techniques for using the growth and behavior of imprinted ducklings to evaluate habitat quality. Maine Agric. Expt. Sta. Techn. Bull. 117. 18pp.
- Hunter, M.L. Jr. 1984. A preliminary guide to finding and identifying the amphibians and reptiles of Maine. The Nature Conservancy, Brunswick, Maine. 44pp. (2nd ed. 1985)
- Hunter, M.L. Jr. and J.W. Witham. 1982. Further studies on the indirect effects of carbaryl on birds. Pp. 35-66 in Environmental Monitoring Reports from the 1981 Maine Cooperative Spruce Budworm Suppression Project. Dept. of Conservation, Augusta, ME. 203pp.
- R.W. Hansen, E. Osgood and M.L. Hunter, Jr. 1982. Effects of spraying with Sevin-4-oil on fruit-set and its potential consequences for wildlife in a spruce-fir forest. Pp. 91-122 in Environmental Monitoring Reports from the 1981 Maine Cooperative Spruce Budworm Suppression Project. Dept. of Conservation, Augusta, ME. 203pp.
- Roberts, J., A. Kacelnik and M.L. Hunter, Jr. 1981. Some ecological and anatomical constraints on animal acoustic communication. Institute of Environmental Science and Technology, London. Tech. Mem. 77. London. 47pp.
- Hunter, M.L. Jr. 1981. The indirect effects of carbaryl on the behavior of birds. Pp. 169-191 in Environmental Monitoring Reports from the 1980 Maine Cooperative Spruce Budworm Suppression Project. Dept. of Conservation, Augusta, ME. 191pp.
- Hunter, M.L. Jr. 1980. Methods for describing the effects of catastrophic food supply depression on the behavior of birds. Pp. 40-50 in Environmental Monitoring Reports from the 1979 Maine Cooperative Spruce Budworm Suppression Project. Dept. of Conservation, Augusta, ME. 300pp.
- Roberts, J., A. Kacelnik and M.L. Hunter, Jr. 1979. Sound interference patterns in animal acoustic communication. Institute of Environmental Science and Technology, London. Tech. Mem. 66. 28pp.
- Hunter, M.L. Jr., S.C. Hacker, D.T. Jennings and F. B. Knight. 1979. Spruce budworms thesaurus. Maine Life Sci. Agric. Exp. Stn. Misc. Rep. 2220. 41pp.
- Hunter, M.L. Jr. and K.L. Sage. 1975. Natural resources, pp. 28-86 in Reed, W. R., ed. Merrymeeting Bay: A Guide to the Conservation of a Unique Resource. Maine Bureau of Public Lands, Augusta, Maine. 369pp.
- Hunter, M.L. Jr. 1975-78 I published five book reviews in Ibis.
- Hunter, M.L. Jr. and K.J. Sage. 1975. Natural resources inventory. Pp. 25-39, and Natural resources analysis. Pp. 70-99 in: Lyman, F. (ed.). The Machias River Watershed Study. Maine Bureau of Public Lands, Augusta, Maine. 196pp.
- Hunter, M.L. Jr. 1973. Ecosystems of the Maine Coast: Freshwater and Marine Ecosystems. Reed and D'Andrea, South Gardiner, Maine. 95pp.
- Hunter, M.L. Jr. and A. LaBastille. 1973. Rare, endangered, threatened, and peripheral wildlife and fish of the Maine coast. in: Reed, W. C. (ed.). Conservation Priorities Plan of the Coast of Maine. Reed & D'Andrea, South Gardiner, Maine. 240pp.
- Hunter, M.L. Jr. and W.C. Reed. 1973. Selection criteria and conservation priorities. Pp. 139-170 in Reed, W. C. (ed.). Conservation Priorities Plan of the Coast of Maine. Reed & D'Andrea, South Gardiner, Maine. 240pp.
- Hunter, M.L. Jr. 1972. Soil analysis. In: Reed, W. C. (ed.). River Corridors and Open Space Handbook for the Central New Hampshire Planning Region, Reed & D'Andrea, South Gardiner, Maine. 396pp.
- Hunter, M.L. Jr. and A.A. King. 1972. Water resources. In: Reed, W. C. (ed.). River Corridors and Open Space Handbook for the Central New Hampshire Planning Region, Reed & D'Andrea, South Gardiner, Maine. 396pp.

Popular Publications

Hunter, M.L., Jr., 2003. A forest reserve system for Maine. Pages 104-106 in P. Austin, D Bennett, and R. Kimber, eds. On wilderness: Voices from Maine. Tilbury House, Gardiner, Maine.

Hunter, M.L. Jr. 1999. Should a land trust cut its forest? Land Trust News 4(1):3-4.

Hunter, M.L. Jr. 1994. What is biodiversity? The Maine Scholar 7:56-74.

Hunter, M.L. Jr. 1989. Nicaragua, Haiti, and the world beyond Orono. Maine Forester, p. 9.

Hunter, M.L. Jr. 1985. Forests, forestry, and wildlife. Habitat. 2(8):30-34.

Hunter, M.L. Jr. 1985. The jumping frog of Kennebec County. Habitat 2(7):42-44.

Hunter, M.L. Jr. 1985. Are there any rattlesnakes in Maine? Habitat 2(6):40-41.

Hunter, M.L. Jr. 1984. Discovering Maine's little known animals. The Nature Conservancy-Maine Chapter News (5):6.

Hunter, M.L. Jr. 1978. Letter from an Oxford birdwatcher. AmericanOxonian 65:31-36.

Funding (grants over \$10,000)

- 2009-pr "Maine's Sustainability Science Initiative", National Science Foundation, \$20,000,000 (with many PIs).
- 1983-pr. *A long-term forest ecosystem study. Holt Woodlands Research Foundation. Ca. \$100,000/year (with A. J. Kimball, A. S. White, and J. W. Witham).
- 2003-pr A Land use practices and the persistence of amphibian populations. National Science Foundation Collaborative project with U Missouri, U Georgia, and SUNY-ESF; U.Maine=s portion of budget: \$415,000.
- 2000 Role of canopy gaps and down woody material in maintaining biodiversity in the Acadian Forest of Maine. USDA Competitive Grants. \$260,000. (With R. Wagner and S. Woods).
- 2003 A Calibration of Conservation Theory and Principles Applied at Various Geographic Scales National Commission on Science for Sustainable Forestry \$99,725 (with Robert Mitchell, Jerry Franklin, Lisa Schulte, Kevin McIntyre, and Brian Palik).
- 2003 "Effects of Roads on Movements and Mortality of Blandings and Spotted Turtles in Southern Maine" Maine Department of Transportation, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Maine Dept Inland Fisheries and Wildlife, The Nature Conservancy \$189,000. (with Phillip deMaynadier),
- 2001 An inquiry-based learning modules for conservation biology education National Science Foundation \$998,000 plus (with Eleanor Sterling and James Gibbs)
- 2002 Use of Natural Disturbances to Guide Restoration Silviculture. National Commission on Science for Sustainable Forestry \$199,438 (with Robert Mitchell, Jerry Franklin, and Brian Palik)
- 1998 Amphibian Populations of Acadia National Park: Patterns and Processes in Relation to Anthropogenic and Natural Changes in Wetland Ecosystems. U.S. Geological Survey. \$210,000. (With A. Calhoun and W. Glanz)
- 1995-98. *Conserving forest biodiversity. Pew Charitable Trusts. \$150,000. (with R. Seymour).
- 1993-96. The ecology of vernal pools. USDA Forest Service, US Fish and Wildlife Service; U.S. E.P.A., \$39,000 (with M. McCollough)

- 1991 *Ecology and conservation of Blanding's and spotted turtles in Maine. Davis Conservation Foundation, Maine Dept. Inland Fisheries and Wildlife, \$16,000. (with M. McCollough)
- 1991 New England biodiversity project. Part 2. Environmental Protection Agency. \$100,000 (with R. O'Connor, R. Owen, and S. Sader).
- 1990 An ecological reserves system for Maine. Maine Research Fund. \$17,915. (with J. McMahon and G. Jacobson).
- 1988 Habitat selection by the African buffalo in Virunga National Park, Zaire. Rockefeller Foundation - \$25,400. (with E. Mugangu and J. R. Gilbert)
- 1985 Nepal-Himalayas red panda project. World Wildlife Fund, Metropolitan Toronto Zoo \$77,000 (with P. Yonzon).
- 1982 *The peatland wildlife of Maine. Maine Dept. Inland Fisheries and Wildlife Service - \$68,782.
- 1982 *Effects of acid precipitation on the aquatic habitat and ecology of waterfowl and fish. U.S. Fish and Wildlife Service - \$132,434. (with K. E. Gibbs and J. G. Stanley).
- 1982 *A long term environmental monitoring program for the spruce budworm suppression project. Maine Forest Service - \$45,998. (with K. E. Gibbs).
- 1971-81 *Monitoring the indirect effects of spruce budworm suppression, the effects of catastrophic food supply depression on the behavior of birds. Maine Forest Service. \$103,000

*Senior or sole principal investigator.

Public Speaking

Hundreds of presentations in 15 countries, 27 states, and 8 Canadian provinces, mostly on forest biodiversity issues. Some notable talks 2007-2011:

Managing highly dynamic forests for biodiversity. Keynote address to IUFRO (International Union of Forestry Research Organizations) conference in Braganca Portugal.

Designing refuges that are resilient to climate change. National Conservation Leadership Forum, National Conservation Training Center, West Virginia.

Designing refuges to maintain biodiversity in the face of climate change. National Fish, Wildlife and Plants Climate Adaptation Strategy Team, Washington, D.C.

Managing forests for biodiversity. The Carlton Owen Distinguished Lecture, College of Forest Resources, Mississippi State University.

Managing forests for wildlife and people: an historical perspective. International Congress for Conservation Biology, Beijing China

"Biodiversity: buzzword or fundamental concept?" Distinguished Lecturer for Science Day. University of Maine at Presque Isle.

Amphibians and forestry: a 19-year retrospective from Maine. University of Connecticut

Maintaining forest biodiversity in a period of uncertain climate change. Warnell School of Forestry and Natural Resources, University of Georgia

Teaching

- 1979-pr University of Maine Graduate School. Advisor for 21 Ph.D. and 16 Masters students in Wildlife Ecology. Served on 50 graduate committees in 8 departments.
- 1979-pr University of Maine, Dept. Wildlife Ecology: Advanced Conservation Biology; Conservation Biology; Conservation planning, Forest Wildlife Management; International Conservation; Landscape Ecology and Conservation; Tropical Ecology field course; Introduction to Wildlife Conservation; Wildlife Management Planning; Behavioral Ecology; Photogrammetry (labs); Senior Seminar.
- 1978-79 University of Maine Honors Program: Sophomore seminar; Freshman seminar. Supervised four honor's theses.
- 1986 Wildlife populations and habitat management workshop for Nepali biologists.
- 1978 Oxford University: Introduction to Ecology.
- 1972-73 Abenaki Experimental College: Maine Ecosystems; Maine Fauna.

Dennis J. Lowry

Mr. Lowry is a Senior Wetland Ecologist who brings to the firm a national reputation in wetland ecology developed from his graduate work on relationships between hydrology and ecology in forested wetland systems as well as over 25 years of experience in wetland restoration and creation. Mr. Lowry has managed over 100 major projects, and has participated in hundreds of smaller projects. Recently his efforts have been devoted to large, complex development, highway and ecological restoration projects. On such projects he deals with all aspects of the development process including site feasibility assessment, project design and strategic planning, project team coordination, environmental permitting, construction supervision, and post-construction monitoring. Much of this work has involved the management of large multi-disciplinary teams, often comprised of several firms to develop cost-effective solutions to our clients' environmental issues. A large part of Mr. Lowry's efforts is focused on strategic input, where he is able to apply his considerable knowledge of regulatory programs and policies to set a successful strategy for the project. Mr. Lowry is also a significant technical contributor to projects, providing his expertise in the area of wetland ecology and hydrogeology, impact assessment, mitigation and creation. Mr. Lowry is recognized nationally for his contributions to wetland science, has provided expert testimony, and has several publications on the subject of wetland mitigation including a chapter published in the EPA's 'Wetland Creation and Restoration: The Status of the Science' (EPA 600/3-89-038a). In 1996 he received the Massachusetts Wetlands Restoration Award from the Executive Office of Environmental Affairs "in recognition of his outstanding contributions to the science of wetland restoration."

Years Experience: 35

Technical Specialties

- Wetland Science
- Wetland Mitigation and Ecological Restoration
- Environmental Impact Assessment
- Water Quality Assessment
- Wildlife Biology
- Environmental Permitting

Professional History

- AECOM
- ENSR
- Fugro East, Inc.
- IEP, Inc.
- Massachusetts Department of Environmental Management

Education

- MS (Plant and Soil Science) University of Rhode Island, Kingston
- BS (Biology) Tufts University

Representative Project Experience

Wetland Mitigation, Route 146/Massachusetts Turnpike Interchange. Designed over 7 acres of compensatory wetlands as mitigation for impacts due to the construction of this new interchange. Contributed to final permitting under state and federal requirements, and provided construction oversight.

Herring River Restoration Plan, Wellfleet, MA. The Herring River (Wellfleet, MA) with its associated salt and freshwater marshes, tributary streams, and vast floodplain is the largest riverine and estuarine system within the Cape Cod National Seashore (CCNS). The myriad of adverse environmental effects this system has suffered as a result of the construction of the tidal flow-restricting Chequessett Neck Road dike in 1908 is well documented and has been a major concern for resource managers for decades. Efforts to plan and implement the long-term restoration of more than 1,000 acres of habitat along the Herring River have been in development, and Mr. Lowry has managed AECOM's part in this restoration effort, the largest and most ambitious wetland restoration project undertaken in Massachusetts, alongside the Town of Wellfleet, the National Park Service, several State and Federal regulatory review agencies, and other restoration partners and sponsors. Mr. Lowry has directed AECOM's preparation of the Herring River Conceptual Restoration Plan, which explains the purpose and need for the restoration project, describes the affected environment and all potential impacts, presents restoration alternatives, and proposes the planned operation, adaptive management, and monitoring protocols. With the Herring River situated in the Wellfleet Harbor Area of Critical Environmental Concern (ACEC), consideration of the ACEC requirements was warranted in the development of the Conceptual Restoration Plan.

Housatonic River Restoration Assessment—General Electric. Mr. Lowry has directed AECOM's role in the development and assessment of ecological restoration measures to mitigate the impacts from a range of riverine, riverbank, and floodplain wetland remedial alternatives that are being evaluated to attenuate PCB exposure levels in

the Housatonic River system. Procedures were developed to inventory and assess the functions of riverine and floodplain wetland habitats, prepare conceptual restoration plans and procedures, and assess the reliability that remedial restoration measures would restore ecological functions. A significant effort was applied to the assessment of the potential impacts on roughly 30 state-listed species under the Massachusetts Endangered Species Act, including determinations of whether remedial work would result in a regulatory "take" of a significant portion of the local species population. With the remedial work proposed with the Upper Housatonic ACEC, consideration of the ACEC requirements was also incorporated into the assessment of remedial alternatives and restoration plans.

I-95/Route 128 Transportation Improvement Project, MassDOT. Mr. Lowry has managed AECOM's work for MassDOT in this project to improve this vital roadway between Route 24 in Randolph and Route 9 in Wellesley, Massachusetts, including the I-95/93 interchange. Work has included extensive wetland, stormwater, and rare species investigations and permitting, including numerous Notices of Intent under the Massachusetts Wetlands Protection Act and two Notices of Project Change to MEPA. AECOM is currently providing environmental permitting and engineering services in connection with the proposed reconstruction of a 5.4 kilometer section of the Route 128 (I-95) Add-A-Lane project, extending from Great Plain Avenue in Needham and ending at the Route 128 interchange crossing over Route 9 in Wellesley. Services include wetland delineation and confirmation of jurisdictional boundaries with state and local authorities, and final permitting of the project design, to include FEIR Notice of Project Change submittals, and Massachusetts Wetlands Protection Act Variance permitting. With significant stretches of the highway work situated within state-listed species habitats as well as the Fowl Meadow/Ponkapoag Bog ACEC, these regulatory requirements of these resource areas were addressed through the project design and permitting processes.

US Army Corps of Engineers Charles River Enhanced Shoreline Stabilization Project, MA. This project focused on evaluating the potential for ecological risks associated with sediment exposure in the Charles River, an urbanized, highly visible aquatic resource in the Greater Boston area. Mr. Lowry contributed to the bioengineering design of the riverbank to achieve protective stabilization of the riverfront area to ensure sediment exposure would not be an issue while also contributing to aesthetic and biological conditions.

Stream Relocation/Enhancement, Meriden Square Mall, Connecticut. Designed and permitted the relocation and enhancement of 1,000 linear feet of Cathole Brook and nearly one acre of adjacent wetland habitat for the redesign/expansion of the mall. Cold-water fish habitat measures were specifically targeted.

CIGNA, Master Plan of Redevelopment, Bloomfield, Connecticut. Conducted wetland and habitat studies and assisted in project design and permitting efforts for this multi-use project on the campus of CIGNA's operations headquarters. The plan included a championship golf course, 1.8 million square feet of office space, four residential communities, retail uses, and improvements to nearby roadways. Mr. Lowry provided the lead environmental services, including local wetlands permitting, rare species investigations, CTDEP Stream Channel Encroachment and Water Diversion permitting, and Federal Clean Water Act (Sections 404 and 401).

Riverfront Recapture and Commerce Center Corporation, Wetland delineation, inventory/assessment and mitigation, East Harford, Connecticut. Mr. Lowry provided wetland, wildlife habitat, and design/permitting services for this riverfront park and adjacent office park and magnet school development. As part of this work, Mr. Lowry designed/permitted 2 acres of Connecticut River forested floodplain wetland. Mr. Lowry conducted long-term monitoring of the floodplain wetland forest to document its successful establishment.

Wetland Inventory, Permit Preparation, Wetland Mitigation Design and Monitoring for Business Park Developments, Southern New England. Managed demarcating and inventory of wetland areas according to local, state and federal wetland regulations at numerous sites in southern New England, including related environmental issues such as rare species and water quality. Permit applications were submitted to local, state and federal

regulatory agencies and permits were obtained from the local Conservation/Wetland Commissions/State Agencies for site development and wetland replacement to mitigate for wetland impacts. Performed construction oversight for wetland replacement excavation and planting. Conducted wetland monitoring to determine success of wetland vegetation. Examples include Westford Technology Park and Bedford Woods in Massachusetts (for The Gutierrez Company), ING, ADVO and CIGNA in Connecticut, and Crosby Office Park (for Equity Office) in Bedford, MA.

Retail Development Site Selection, Impact Assessment, Mitigation Design, and Permitting, Connecticut, Massachusetts and New Hampshire. Managed environmental site assessments and permitting on numerous proposed retail sites throughout Connecticut, Massachusetts and New Hampshire. Projects have included regional malls and strip centers, Wal-Mart, Target Stores, Home Depot, Lowes Home Center, Homegoods, Stop and Shop and other major retailers. Provided initial conceptual planning and design, constraints analysis, wetland delineation, rare species, and hydrogeologic investigations during the planning phases of the projects. Coordinated the preparation, presentation and processing of wetland permit applications through the public hearing processes. Provided analyses of stormwater management, buffer zones, habitat enhancement and aquifer protection aspects of the proposed developments. Presided over erosion control monitoring and NPDES monitoring for compliance with environmental permits issued by state, local and federal regulatory authorities.

Superfund Project Wetland Remediation, New Bedford, Holbrook and Woburn, Massachusetts and Woodstock, Connecticut. Project manager on Superfund projects evaluating remediation options for wetland and upland habitats in New Bedford, Holbrook, Pittsfield and Woburn, MA and Woodstock, CT.

Emerald Square Mall, New England Development, Construction of Wetlands for Stormwater Treatment, North Attleborough, Massachusetts. Directed and supervised the construction of wetlands for stormwater treatment, including excavation, dewatering, soil deposition, planting, and monitoring. Over ten years of detailed, monthly water quality investigations demonstrated the effectiveness of the design at treating runoff quality from nearly 100 acres of impervious area. The project received awards for excellence in design from both the U.S. Environmental Protection Agency (EPA) and the Rhode Island Department of Environmental Management (DEM), and served as a model for stormwater management systems and guidelines developed during the 1990's.

Environmental Permitting Oversight, New England Transmission Line Projects: Provided input and oversight of environmental permitting of transmission line projects in southern New England, including the New England East-West Solutions (NEEWS) project (Greater Springfield Reliability Project and Interstate Reliability Project).

ABB/Winstanley Master Plan of Redevelopment, Great Pond, Windsor, Connecticut. Conducted wetland and habitat studies and assisted in project design and permitting efforts for this multi-use project on ABB's Combustion Engineering site. The site was undergoing remediation and closure from over 50 years of research, development, engineering, production, and servicing of nuclear and fossil fuel systems, and a Master Plan of redevelopment was warranted. AECOM worked with project team members in the development of the Master Plan, and has been working on a phased approach for the site redevelopment which will include residential, commercial, and civic development space on roughly 300 acres, along with over 300 acres of preserved land. Mr. Lowry provided the lead environmental services, including local wetlands permitting, rare species investigations, CTDEEP permitting, and Federal Clean Water Act permitting (Sections 404 and 401).

SELECTED PUBLICATIONS

- Golet, F.C., A. Calhoun, W. DeRagon, and D. Lowry. 1993. *The Ecology of Red Maple Swamps in the Glaciated Northeast U.S.: A Community Profile*. USDI. USFWS Biological Report. 12.
- Lowry, D.J., 1989. *Restoration and creation of palustrine wetlands associated with riverine systems of the glaciated northeast*, in: Vol. II, Wetland Creation and Restoration: The Status of the Science; edited by Kusler, Jon A. and Mary E. Kentula, USEPA/600/3-89/038.
- Lowry, D.J. 1990. *Wetland Restoration - Case Studies and Observations*. REI, Inc. 2nd Annual Conference on Wetland Law and Policy.
- Lowry, D. J., and N. Flynn., 1989.. *The basics of applying natural resource conditions to site feasibility analysis for development, with an emphasis on wetland considerations*. pp. 301-341 in: *Fundamentals of Environmental Law*. Mass. Continuing Legal Education, Inc. Boston.
- Daukas, P., D. Lowry, and W.W. Walker. 1989. *Design of wet detention basins and constructed wetlands for treatment of stormwater runoff from a regional shopping mall in Massachusetts*. pp. 686-694, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer (ed.) Lewis Publishers, Inc. Proceedings of the International Conference on Constructed Wetlands for Wastewater Treatment, June 1988.
- Lowry, D.J., 1988. *Wetland creation/restoration as mitigation for wetland losses*. p. 27 (abstract). in: *Proceedings of Freshwater Wetlands Conference, November 1988, Society of Soil Scientists of Southern New England*.
- Golet, F.C. and D.J. Lowry.. 1987. *Water regimes and tree growth in Rhode Island Atlantic White Cedar Swamps*. pp. 91-110 in: A.D. Laderman (ed.). *Atlantic White Cedar Wetlands*. Westview Press. Boulder, CO
- Lowry, D.J., 1987. *Design and implementation of a 5-acre inland wetland restoration project in northern Massachusetts*. Paper presented at National Wildlife Federation Conference, Washington, D.C., October 1987.
- Lowry, D., E. Sorenson, and D. Titus. 1986. *Wetland replacement in Massachusetts: regulatory approach and case studies*. pp. 35-36 in: M.W. Lefor and W.C. Kennard (eds.). *Proceedings of the Fourth Wetlands Conference: Wetlands Creation and Restoration*. University of Connecticut Institute of Water Resources
- Lowry, D. 1984.. *Water regimes and vegetation of Rhode Island forested wetlands*. MS thesis.. Univ. of Rhode Island. 174 pp.
- Yonika, D.A. and Lowry. 1979. *Feasibility study of wetland disposal of wastewater treatment plant effluent*. Research Rpt. 78-84, Massachusetts Division of Water Pollution Control and IEP, Inc. 134 pp.
- Lowry, D. J., 1975. *A wildlife and visual-cultural evaluation of wetland areas in Waltham, MA*. Mass. Audubon Society, Lincoln, MA. pp. 28.

ARAM J. K. CALHOUN

Department of Wildlife Ecology
University of Maine, Orono ME 04469-5722
Tel: 207-581-3010; Fax: 207/-581-2999
Email: calhoun@maine.edu

Professional Preparation

Ph.D. Microbial Ecology, University of Maine, 1996
M.S. Wetland Ecology, University of Rhode Island, 1989
M.A. Education, Rhode Island College, 1985
A.B. American Civilization, Brown University, 1981

Appointments

2011-present Professor of Wetland Ecology (UMaine)
2011-present Director, Ecology and Environmental Sciences Program (UMaine)
2004-2011 Associate Professor Wetland Ecology (UMaine)
1998-2004 Assistant Professor Wetland Ecology (UMaine)
1996-1997 Assistant Research Professor (UMaine)

Peer-reviewed Journal Articles (graduate students *):

- Jansujwicz, J., AJK Calhoun, R. Lillieholm. 2012. Using citizen science education and outreach to engage municipal officials and private landowners in vernal pool conservation. *Environmental Management*.
- Jansujwicz, J., AJK Calhoun, R. Lillieholm. 2012. Using mixed methods to develop a frame-based private landowner typology. *Society and Natural Resources*.
- *Popescu, D., M.L. Hunter, D. Patrick, AJK Calhoun. 2012. Predicting the response of amphibian communities to disturbance across multiple temporal and spatial scales. *Forest Ecology and Management* 270: 163-174.
- *Shearin, A.F., A.J.K. Calhoun, and C.S. Loftin. 2012. Evaluation of listener-based anuran surveys with automated audio recording devices. *Wetlands* 32:737-751.
- *Greenspan, S., AJK Calhoun, JE Longcore, and MG Levy. 2012. Transmissions of *Batrachochytrium Dendrobatidis* to wood frogs (*Lithobates sylvaticus*) via a Bullfrog (*L. catesbeianus*) vector. *Journal of Wildlife Diseases* 48:575–582.
- *Greenspan, S., JE Longcore, and AJK Calhoun. In press. Host invasion by *Batrachochytrium dendrobatidis*: fungal and epidermal ultrastructure in model anurans. *Diseases of Aquatic Organisms*.
- *Freeman, R.C., Bell, K.P., Calhoun, A.J.K., and C.S. Loftin. 2012. Incorporating economic models into vernal pool conservation planning: using local land use regulations to enhance state regulations. *Wetlands*32:509-520.

- Loftin, C.S., A.J.K. Calhoun, S.J. Nelson, A. Elksus, and K. Simon. *In press*. Does mercury bioaccumulate in wood frog larvae developing in seasonal woodland pools? *Northeastern Naturalist*.
- *McGreavy, B., T. Webler, and A.J.K. Calhoun. 2012. Local decision maker attitudes to vernal pool conservation in Maine. *Journal of Environmental Management* 95: 1-8.
- * Morley, T.R., A.S. Reeve, and A.J.K. Calhoun. 2011. The role of headwater wetlands in altering stream flow chemistry in a Maine, USA, catchment. *Journal of American Water Resources Association* 47:337-349.
- *Gahl, M.K. and A.J.K. Calhoun. 2010. The role of multiple stressors in ranavirus-caused amphibian mortalities in Acadia National Park wetlands. *Canadian Journal of Zoology* 88:108-121.
- Hart, D. and A.J.K. Calhoun. 2010. Rethinking the role of ecological research in the sustainable management of freshwater ecosystems. *Freshwater Biology* 55:258–269.
- *Morley, T.R. and A.J.K. Calhoun. 2009. Vegetation characteristics of forested hillside seeps in eastern Maine, USA. *The Journal of the Torrey Botanical Society* 136:520-531.
- Semlitsch, R.D.; B.D. Todd; S.M. Blomquist; A.J.K. Calhoun, J.W. Gibbons, J.P. Gibbs, G.J. Graeter; E.B. Harper; D.J. Hocking, M.L. Hunter, Jr., D.A. *Patrick, T.A.G. Rittenhouse, and B.B. Rothermel. 2009. Effects of Timber Harvest on Amphibian Populations: Understanding Mechanisms from Forest Experiments. *BioScience* 59:853–862.
- *Gahl, M.K., A.J.K. Calhoun, and R. Graves. 2009. Facultative use of seasonal pools by American bullfrogs (*Rana catesbeiana*). *Wetlands* 29:697-703.
- *Gahl, M.K. and A.J.K. Calhoun. 2008. Landscape setting and risk of *Ranavirus* mortality events. *Biological Conservation* 141:2679-2689.
- *Bailey, J.E. and A.J.K. Calhoun. 2008. Comparison of three physical management techniques for controlling variable-leaf milfoil in Maine Lakes. *Journal of Aquatic Plant Management* 46:163-167.
- *Patrick, D.A., E. Harper, M.L. Hunter, A.J.K. Calhoun. 2008. Terrestrial habitat selection and strong density-dependent mortality in recently metamorphosed amphibians. *Ecology* 89:2563-2574.
- *Patrick, D.A., A.J.K. Calhoun, and M.L. Hunter. 2008. The importance of understanding spatial population structure when evaluating the effects of silviculture on spotted salamanders (*Ambystoma maculatum*). *Biological Conservation* 141:807-814.
- Lindenmayer, D. et al. 2008. A checklist for ecological management of landscapes for conservation. *Ecology Letters* 10:1-14.
- *Baldwin, R.F., P.G. deMaynadier, and A.J.K. Calhoun. 2007. *Rana sylvatica* Predation. *Herpetological Review* 38:194-195.
- *Cunningham, J., A.J.K. Calhoun, and W.E. Glanz. 2007. Pond-breeding amphibian species richness and breeding habitat selection in a beaver-modified landscape. *Journal Wildlife Management* 71:2517-2526.

- *Patrick, D., A.J.K. Calhoun, M. L. Hunter, Jr. 2007. The orientation of juvenile wood frogs, *Rana sylvatica*, leaving experimental ponds. *Journal of Herpetology* 41:158-163.
- *Oscarson, D. and A.J.K. Calhoun. 2007. Developing vernal pool conservation plans at the local level using citizen scientists. *Wetlands* 27:80-95.
- *Vasconcelos, D. and J. K. Calhoun. 2006. Monitoring created seasonal pools for functional success: a six-year case study of amphibian responses, Sears Island, Maine, USA. *Wetlands* 26:992-1003.
- *Cunningham, J., A.J.K. Calhoun, W. E. Glanz. 2006. Patterns of beaver colonization and wetland change in Acadia National Park: Implications for pond-breeding amphibian species distribution. *Northeastern Naturalist* 13:583-596.
- *Baldwin, R., A.J.K. Calhoun, and P. G. deMaynadier. 2006. Conservation planning for amphibian species with complex habitat requirements: a case study using movements and habitat selection of the wood frog (*Rana sylvatica*). *Journal of Herpetology* 40:443-454.
- *Patrick, D., M.L. Hunter, and A.J.K. Calhoun. 2006. Effects of experimental forestry treatments on a Maine Amphibian Community. *Forest Ecology and Management* 234:323-332.
- *Baldwin, R.F., A.J.K. Calhoun, and P.G. deMaynadier. 2006. The significance of hydroperiod and stand maturity for pool-breeding amphibians in forested landscapes. *Canadian Journal of Zoology*. 84:1604–1615.
- Calhoun, A.J.K., N. Miller, and M.W. Klemens. 2005. Conservation strategies for pool-breeding amphibians in human-dominated landscapes. *Wetlands Ecology and Management* 13:291-304.
- Hunter, M.L. Jr., A. Calhoun, and D.S. Wilcove. 2004. Goliath Heron fishing with an artificial bait? *Waterbirds* 27:312-313.
- *Vasconcelos, D. and A.J.K. Calhoun. 2004. Movement patterns of adult and juvenile wood frogs (*Rana sylvatica*) and spotted salamanders (*Ambystoma maculatum*) in three restored vernal pools. *Journal of Herpetology* 38:551-561.
- Calhoun, A.J.K., T. Walls, M. McCollough, and S. Stockwell. 2003. Developing conservation strategies for vernal pools: a Maine case study. *Wetlands* 23:70-81.
- Calhoun, A.J.K., A. Reeve, and M. McGarry. 2003. Wetland connections: linking University research initiatives to high school science education. *J. of Geoscience Education* 51:387-397.
- *Lichko, L. and A.J.K. Calhoun. 2003. An Assessment of vernal pool creation attempts in New England: A Review of project documentation from 1991-2000. *Environmental Management* 32:141-151.
- Almquist, H.A. and A.J.K. Calhoun. 2003. A coastal outlier patterned fen: Lily Fen, Swans Island Maine. *Northeastern Naturalist* 10:119-130.
- *Baldwin, R. and A.J.K. Calhoun. 2002. Differential predation on ambystomatid egg masses by *Rana sylvatica*. *Herpetological Reviews* 33:44-45.
- Calhoun, A.J.K. and G.M. King. 1998. Characterization of root-associated methanotrophs from three aquatic macrophytes: *Pontederia cordata*,

Sparganium eurycarpum, and *Sagittaria latifolia*. Applied and Environmental Microbiology 64:1099-1105.

Calhoun, A. and G. M. King. 1997. Regulation of root-associated methanotrophy by oxygen availability in the rhizosphere of two aquatic macrophytes. Applied and Environmental Microbiology 63:3051–3058.

Books

Calhoun, A.J.K. and P.G. deMaynadier (eds.). 2008. Science and conservation of vernal pools in northeastern North America. CRC Press, Boca Rotan, FL

Hunter, M.L., D.B. Lindenmayer, and A.J.K. Calhoun. 2007. Saving the Earth as a career: Advice on becoming a conservation professional. Blackwell Publishing, VA.

Hunter, M.L. Jr., A.J.K. Calhoun, M. McCollough (eds.). 1999. Maine amphibians and reptiles. University of Maine Press, Orono, ME.

Book Chapters (peer-reviewed)

Calhoun, A.J.K. and M.K. *Gahl. 2012. Northern seasonal woodland pools. *In* Batzer, D. and A. Baldwin. Wetland habitats of North America: ecology and conservation concerns. University of California Press, Berkeley, CA

*Jansujwicz, J. and A.J.K. Calhoun. 2010. Protecting natural resources on private lands: the role of collaboration in land-use planning Pages 205-233 *in* Trombulak, S. and R. F. Baldwin (eds.). Protecting natural resources on private lands: the role of collaboration in land-use planning. Springer-Verlag, New York, N.Y.

Calhoun, A.J.K. and P. Reilly. 2008. Conserving vernal pool habitat through community based conservation. *In* Calhoun, A.J.K. and P.G. deMaynadier (eds). Science and conservation of vernal pools in northeastern North America. CRC Press.

Windmiller, B. and A.J.K. Calhoun. 2008. Conserving vernal pool wildlife in urbanizing landscapes. *In* Calhoun, A.J.K. and P.G. deMaynadier (eds). Science and conservation of vernal pools in northeastern North America. CRC Press.

Calhoun, A.J.K. 2007. Principles for conserving wetlands in the context of landscape management. Pages 429-444. *In* Hobbs, R. and D.B. Lindemayer (eds.). Managing and designing landscapes for conservation: moving from perspectives to principles.

Calhoun, A.J.K. and M.L. Hunter. 2003. Managing ecosystems for amphibian populations. Pages 228-241 *in* R.D. Semlitsch (ed). Amphibian Conservation. Smithsonian Institution Press, Washington, D.C.

Calhoun, A.J.K. 1999. Forested wetlands. Pages 300-334 *in* M.L. Hunter, editor. Managing forested ecosystems for biodiversity. Cambridge University Press, Cambridge, UK.

Technical Reports:

- *Morgan, D.E. and A.J.K. Calhoun. 2012. Maine municipal guide to mapping and conserving vernal pools. Maine's Sustainability Solutions Initiative, Orono, ME.
- Calhoun, A.J.K. and P. deMaynadier. 2004. Forestry habitat management guidelines for vernal pool wildlife in Maine. Wildlife Conservation Society Technical Paper #6, Rye, New York.
- Calhoun, A.J.K. 2003. Maine Citizen's guide to locating and documenting vernal pools (3rd edition). Maine Audubon Society, Falmouth, Maine.
- Calhoun, A.J.K. and M.W. Klemens. 2002. Best development practices for pool-breeding amphibians in commercial and residential developments. Wildlife Conservation Society Technical Paper #5, Rye, New York.
- Calhoun, A.J.K. 2000. Assessment of vernal pool resources. Maine Department of Inland Fisheries and Wildlife, Technical Report for Significant Wildlife Habitat designation.
- D.W. Sparling, A.J.K. Calhoun, D. Hoskins, M. Micacchion, and K.Richter. 2001. Using amphibians in Bioassessments. New England Bioassessment Working Group, US EPA report.

Popular literature

- Calhoun, A.J.K., and D.E.Morgan*. 2009. Conservation of Vernal Pools: Lessons from State and Local Action. Case study, discussion questions, and teaching notes. American Museum of Natural History, Network of Conservation Educators and Practitioners. Available at <http://ncep.amnh.org>.
- Calhoun, A.J.K. 2008. Listening to the woods sing in spring: the Maine Amphibian Monitoring Program, North Woods Magazine.

Special recognition/awards

- 2010 Outstanding Associate Editor Award, *Wetlands*
- 2008 College Outstanding Public Service Award
- 2005 Visiting Professor, Joseph Jones Ecological Research Center, GA
- 2004 College Outstanding Teacher Award
- 2004 Visiting Scholar Australian National University
- 1995 Switzer Fellow and leadership awards

Synergistic activities

I worked over a decade as a wetland scientist with Maine Audubon Society (1999-2011), a role in addition to my University job supported by a Switzer Leadership Fellowship. I continued to fund this position post-Switzer as a link between my research and outreach and policy work. I continue in this role through my work with 13 Maine towns in vernal pool conservation planning, by producing technical publications, creating and maintaining a vernal pool website (www.umaine.edu/vernalpools), and organizing and conducting vernal pool workshops directed toward citizens, and conservation, development, and forestry interests. I continue to be active in state and

federal wetland policy development. I served on a wetland task force including a Vernal Pools Working Group (resulted in passing 2 wetland bills that strengthened wetland regulations for vernal pools and other small wetlands), a Wetland Mitigation Working Group, and a member of both a scientific advisory board and steering committee for the Penobscot River Restoration Project. I am currently working with the US Army Corps of Engineers and multiple Maine state agencies to develop innovative vernal pool conservation policies with two Maine towns that will serve as model towns for pool conservation efforts in New England.

I serve as an informal advisor to a number states and provinces trying to launch vernal pool conservation programs (Virginia, Massachusetts, Wisconsin, New Brunswick) and as a formal advisor on wetland projects dealing with mercury contamination in vernal pool and salt marsh systems.

Collaborators & Co-editors (*last 4 years*): Baldwin, R. Clemson University; Batzer, D., University of Georgia; deMaynadier, P., Maine Department of Inland Fisheries and Wildlife; Forester, D., Murray State University; Freeman, R. Eastern Maine Community College; Gahl, M. Bates College; Glanz, W., University of Maine; Hart, D. UMaine; Hunter, M, University of Maine; Hunter, M.L., University of Maine; Leahy, J. UMaine; Levy, MG NC State University, Loftin, C., USGS.; Longcore, JE, UMaine

Thesis Advisor (*last 5 years*). Heather Smith (UMaine), Jen Raber (UMaine), Kris Hoffman, UMaine; Luke Groff, UMaine; Vanessa Levesque, UMaine; Jessica Jansujwicz, UMaine; Kevin Ryan, UMaine; David Ellis, UMaine, Dawn Morgan, UMaine; Gordon Moore, UMaine; Pilar Palacios, TNC; Amanda Shearin, Maine Department of Transportation; David Patrick, Paul Smith College; Terry Morley, Manhattan College; Damon Oscarson, Westchester Land Trust; Megan Gahl, Bates College; Jacolyn Bailey, UMaine; Robert Baldwin, Clemson University

Total post-doctoral and graduate students: 1 post doc, 11 Ph.D., 12 M.S.