

CURRICULUM VITAE

**SHAWN L. WORTHING**

*Department of Forest Resources*

*1257 Sample Ave.*

*Saint Paul, MN 55108*

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**EDUCATION**

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**Ph.D. Conservation Biology, University of Minnesota, St. Paul, Minnesota**

DISSERTATION: *Ecological Effects and Conservation Implications of Exotic Earthworm Invasion in Northern Hardwood Forests*

ADVISORS: Peter B. Reich and Lee. E. Frelich

EXPECTED COMPLETION: December 2005

**B.S. Environmental Science, Brown University, Providence, Rhode Island, 1995**

THESIS: *Fire in Amazonian Selectively Logged Rain Forest and the Potential for Fire Reduction*

**DISSERTATION**

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Temperate forests are experiencing significant changes from an unexpected agent, exotic earthworms. Our understanding of the extent, mechanisms, and long-term consequences of these changes is limited. My research describes the extent of earthworm invasion and its relationship to plant diversity across two regions of the Midwestern United States. I use experimental studies to explore three principal mechanisms that could affect native plant community response to earthworm invasion: forest floor conditions, browsing of native plants by deer, and plant supply. This research is the most extensive study of earthworm invasion in hardwood forests and has significant implications for invasive species and forest management and forest conservation.

**RESEARCH EXPERIENCE**

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**Graduate Research Fellow, U. of Minnesota, Center for Hardwood Ecology, St. Paul, MN, 2002-2005**

*Project:* European earthworms and deer in Midwestern hardwood forests

Supervisor: Lee E. Frelich, Director

**Research Assistant, University of Arizona, Latin American Area Center, Tucson, AZ, 1996**

*Project:* Assessment of water resources in two U.S.-Mexico Rivers

Supervisor: Diana M. Liverman, Director

**Research Fellow, Brown University, Department of Geological Sciences, 1995**

*Project:* Remote sensing of a large wildfire in fragmented forest of the eastern Amazon

Supervisor: John F. Mustard, Assistant Professor

**Research Assistant, Brown University, Ecology and Evolutionary Biology, 1992-1995**

*Project:* Reproductive ecology of the crab spider (*Misumena vatia*)

Supervisor: Douglass H. Morse, Professor

**Visiting Researcher, Amazon Institute of People and the Environment (IMAZON), Para, Brazil, 1994**

*Project:* Fire in Amazonian selectively logged rain forest and the potential for fire reduction

Supervisor: Christopher F. Uhl, Professor

**Research Assistant, Brown University, Ecology and Evolutionary Biology, 1992**

*Project:* Frugivory during autumn migration in nearctic-neotropical migrant landbirds

Supervisor: Jeffrey D. Parrish, PhD candidate

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PROFESSIONAL EXPERIENCE

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**Consultant**, Friends of the Boundary Waters Wilderness, Minneapolis, MN, 2002

- Designed and helped lead Superior National Forest Roadless Area Inventory program

**Field Coordinator**, Sky Island Alliance, Tucson, AZ, 1997-1999

- Designed ecological and roadless area survey program and trained over 125 volunteers to implement it
- Represented organization to diverse stakeholder groups
- Wrote and coordinated portion of regional conservation reserve design proposal

**Consultant**, The Wildlands Project, Tucson, Arizona, 1997-1998

- Research and co-authored State of the Desert Biome Report to guide conservation in the Sonoran Desert
- Presented report at The Nature Conservancy's Ecoregional Planning Experts Workshop

**Special Projects Coordinator**, Institute for the Study of Planet Earth, University of Arizona, Tucson, AZ, 1997

- Researched and wrote white paper to persuade university administration to invest in remote sensing and GIS for global change research and teaching

TEACHING EXPERIENCE

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**Instructor**, University of Minnesota, College of Natural Resources, Cloquet, MN, spring 2005

- Co-taught short course on Impact of European Earthworms on Minnesota's Forests to professional foresters

**Guest Lecturer**, University of Minnesota, Horticulture, Forest Resources, St. Paul, MN, 2002-2004

- Taught classes on consequences of invasive species for forest restoration and principles of reserve design

**Teaching Assistant**, University of Minnesota, College of Biological Sciences, Minneapolis, MN, fall 2000

- Taught 4 lab sections (~80 students) of Introductory Biology: evolution, ecology, and genetics

**Teaching Assistant**, Brown University, Center for Environmental Studies, Providence, RI, fall 1994

- Facilitated discussion section of 20 students and graded student exams and papers

PUBLICATIONS

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*Refereed Journal Publications:*

Worthing, S.L. and D.H. Morse. 2000. Frequencies of male guarding and female aggression in the crab spider *Misumena vatia*. *American Midland Naturalist* 143:201-211

Worthing, S.L. and C.F. Uhl. 1997. Fire in Amazonian selectively logged rain forest and the potential for fire reduction. *Ecological Applications* 7:713-725

Frelich, L.E., C.M. Hale, S. Scheu, S.L. Worthing, L. Heneghan, P.J. Bohlen, and P.B. Reich. In press. Earthworm invasion into previously earthworm-free temperate and boreal forests. *Biological Invasions*

Tiunov, A.V., C.M. Hale, S.L. Worthing, and T.S. Perel. In press. Invasion patterns of Lumbricidae into the previously earthworm-free areas of northeastern Europe and the western Great Lakes region of North America. *Biological Invasions*.

Worthing, S.L., L.E. Frelich, and P.B. Reich. In prep. Landscape patterns of non-native earthworm invasion in northern hardwood forests.

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Worthing, S.L., L.E. Frelich, and P.B. Reich. In prep. Invasive earthworms and understory plant composition in northern hardwood forests.

Worthing, S.L., L.E. Frelich, and P.B. Reich. In prep. Effects of earthworm invasion on leaf litter disappearance and decomposition rates.

Worthing, S.L., L.E. Frelich, and P.B. Reich. In prep. Factors limiting understory recovery: deer, propagule supply, or invasive earthworms?

*Un-refereed Journal Publications:*

Worthing S.L. and G.P. Nabhan. 1999. State of the Sonoran Desert biome: executive summary. *Wild Earth* 9(2):71-73

Worthing, S.L., J. Talberth, and B. Bird. 1999. State of the ecosystem reports: a tool for wildlands advocacy. *Wild Earth* 9(2):64-67

**PRESENTATIONS, INVITED**

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Worthing, S.L. Invasive Earthworms and Hardwood Regeneration. Minnesota Chapter of the Society of American Foresters and MN Association of Conservation Districts Annual Meeting, Mankato, MN, February, 2005

Worthing, S.L. Management Implications of Invasive Earthworms for Minnesota State Parks. Minnesota Parks and Recreation Association Meeting, Anoka, MN, October, 2005

**PRESENTATIONS**

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Worthing, S.L., L.E. Frelich, P.B. Reich. Earthworm invasion is extensive and reduces plant diversity in hardwood forests of the western Great Lakes region (U.S.A.). Society for Conservation Biology Annual Meeting, Brasilia, Brazil, July, 2005

Worthing, S.L. Of worms and slugs: a message from the plants. University of Minnesota Invasion Biology Research Consortium, Chanhassen, MN, January, 2005

Worthing, S.L. Limits to herb layer recovery in a suburban forest fragment. Natural Areas Conference, Chicago, Illinois, October, 2004

Worthing, S.L. Landscape patterns of earthworm invasion and understory plant composition in lakeside northern temperate hardwood forests. (Poster) XIV<sup>th</sup> International Colloquium on Soil Zoology and Ecology, Rouen, France, September, 2004

Worthing, S.L. The effect of deer exclusion on plant communities in a suburban forest fragment. Society for Conservation Biology Annual Meeting, New York, NY, July, 2004

Worthing, S.L. Patterns of earthworm invasion and understory plant composition in lakeside northern hardwood forests. Ecological Society of America Annual Meeting, Savannah, Georgia, August, 2003

Worthing, S.L. Patterns of earthworm invasion and understory plant composition in lakeside northern hardwood forests. Society of Conservation Biology Annual Meeting, Duluth, MN, July, 2003

Worthing, S.L. The impact of a large wildfire on fragmented forest in the eastern Amazon. (Poster) Ecological Society of America Annual Meeting, Providence, Rhode Island, August, 1996

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Worthing, S.L. The ecological impacts of fire in logged rain forest of the eastern Amazon and the potential for fire reduction. International Association of Wildland Fire Conference, Coeur d'Alene, Idaho, November, 1995

#### HONORS

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Doctoral Dissertation Fellowship, University of Minnesota, Minneapolis, MN, 2005-2006  
Second Place, Student Award Competition, Society for Conservation Biology Annual Meeting, Brasilia, Brazil, 2005  
Outstanding PhD Student Award, University of Minnesota, Conservation Biology Graduate Program, 2004-2005  
Charles J. Brand Fellowship, University of Minnesota, Minneapolis, MN, 2004-2005  
Wood-Rill Fellowship, University of Minnesota, Center for Hardwood Ecology, St. Paul, MN, 2002-2004  
Undergraduate Research Fellowship, National Institute for Global Environmental Change, Wash., D.C. 1995  
Environmental Scholarship Award, Providence Gas Company, Providence, RI, 1994

#### GRANTS

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**Carolyn M. Crosby Research Fellowship**, University of Minnesota, Minneapolis, MN, May-Nov. 2004  
*Project Title:* Are Exotic Earthworms Threatening Native Plants of Northern Forests?

**Graduate Student Research Assistance Grant**, Applied Ecological Services, Inc. June-Nov. 2004  
*Project Title:* Factors Limiting Herbaceous Layer Recovery in an Oak-Maple-Basswood Forest:  
Deer, Exotic Earthworms, or Propagule Supply?

**Research Experience for Undergraduate Grant**, National Science Foundation, Jun-Sept. 2003  
*Project Title:* Relationships Between Litter-Dwelling Invertebrate Species Composition and Forest Floor  
Microhabitats at Invasive Earthworm Study Sites

**Dayton-Wilkie Natural History Funds**, University of Minnesota, June-Nov. 2003  
*Project Title:* The Effect of Reducing Deer Herbivory and Earthworm Density on Understory Plants in an Oak-  
Maple-Basswood Forest

#### PUBLIC and INSTITUTIONAL SERVICE

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Team Leader, Biodiversity Area Review Team, MN Chapter, Society for Conservation Biology, 2005  
Committee Member, Conservation Committee, MN Chapter, Society for Conservation Biology, 2004-present  
Field Instructor, O.H. Anderson Elementary School Nature Trail Day, 2004-2005  
Committee Member, Wilderness Review Committee, Friends of the Boundary Waters, 2003  
Graduate Student Representative, Univ. of Minnesota, Conservation Biology Steering Committee, 2002-2003  
Field Instructor, Environmental Studies High School Bioblitz, 2001-2003  
Committee Member, Interagency Exotic Earthworm Team, MN Department of Natural Resources, 2001-2002  
Committee Member, Science Technical Advisory Committee, Sonoran Desert Conservation Plan, 2000  
Science Volunteer, The Nature Conservancy, Arizona Chapter, 1996

#### PROFESSIONAL MEMBERSHIPS

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Society for Conservation Biology, 1992-present  
Ecological Society of America, 2001-present  
Natural Areas Association, 2002-present  
Minnesota Native Plant Society, 2002-present  
Minnesota Chapter of the Society for Conservation Biology, 2004-present

**SHAWN L. WORTHING**

**OTHER SKILLS**

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ArcView GIS; Statistical packages (SAS, JMP, PC-ORD); MS Word, Excel, Access, Powerpoint.

**REFERENCES**

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Peter B. Reich  
Professor and F.B. Hubachek, Sr. Chair in Forestry  
University of Minnesota  
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