

# BRENT J. DANIELSON

## Associate Professor of Spatial Ecology

---

[jessie@iastate.edu](mailto:jessie@iastate.edu)  
office: 515-294-5248  
fax: 515-294-7874

The Department of Ecology, Evolution, and Organismal Biology  
353 Bessey Hall  
Iowa State University  
Ames Iowa 50011-3221

### **Biographical information**

#### *Educational background*

- 1976-80 – Bachelors in Zoology, Michigan State University
- 1981-86 – Doctorate in Systematics and Ecology, University of Kansas

#### *Academic experience, titles, and promotions*

- 1986-87 Gjesteforsker (Visiting Scholar); Division of Zoology, University of Oslo, Norway
- Fall '87 Visiting Scholar; Department of Ecology and Evolutionary Biology, University of Arizona
- 1988-89 Postdoctoral Research Associate; Department of Zoology & Institute of Ecology, University of Georgia
- 1989-91 Postdoctoral Research Associate; Department of Ecology and Evolutionary Biology, University of Arizona
- 1992-98 Assistant Professor; Department of Animal Ecology, Iowa State University
- 1998- Associate Professor; Department of Animal Ecology, Iowa State University

### **Field of research**

My research involves understanding the factors that affect the abundance and diversity of wild species as they are affected by features of the landscape. The work involves a range scales from the perception of individual animals to the impact of several entire populations upon each other.

My research organisms of choice are generally small mammals. However, I have also conducted field work on plants, snails, and large mammals. In addition to field work, I also develop mathematical or, more often, computer simulation models to test basic hypotheses concerning the ways in which different levels of ecological organization can affect higher levels of organization. Principally, this involves modeling behavioral traits to determine their importance in population or community processes that occur over large spatial and temporal scales.

Although I do not frequently focus on endangered species or game animals, I and my students and postdocs have worked on three federally endangered species (Alabama Beach Mouse, Iowa Pleistocene Snail, Mount Graham Red Squirrel), and whitetailed deer.

### **Professional societies and service**

#### *Memberships*

- American Society of Mammalogists
- Ecological Society of America
- Society of American Naturalists
- American Assoc. for the Advancement of Science
- International Association of Landscape Ecologists

*Offices held in professional societies*

American Society of Mammalogists Grants-in-Aid of Research Committee  
 American Society of Mammalogists Public Relations Committee - chair

*Editorial responsibilities*

I am currently (2003-2006) an associate Editor for the Ecological Society of America's journals *Ecology* and *Ecological Monographs*.

I have reviewed papers for at least 15 professional journals or academic publishers since arriving at ISU.

I have reviewed uncounted grant proposals for the National Science Foundation, the Environmental Protection Agency, National Institutes of Health, Department of Defense, Israel Basic Research Foundation, US Forest Service, Australian Research Council, US Department of Agriculture and other academic societies.

I have served also on review panels for the National Science Foundation and National Institutes of Health, The Department of Defense SERDPA, and The American Society of Mammalogists.

*Other professional contributions*

I am currently a member of the Endangered Species Recovery Team for the federally endangered Alabama Beach Mouse (*Peromyscus polionotus ammobates*)

**Grants awarded (since arrival at ISU)**

- 2004-06 Iowa Department of Natural Resources – The Effect of Preserve and Conservation Site Clustering on the Local Densities and Species Richness of Amphibian and Reptilian Fauna. \$65,000 pending.
- 2002-03 National Science Foundation – Research Experience for Undergraduates Program – Landscape mediation of ecological communities: corridors and invertebrate seed predators. 1 yr \$6,270.
- 2000-01 National Science Foundation – Research Experience for Undergraduates Program – Landscape mediation of predator/prey interactions. 1 yr \$5000.
- 1999-02 National Science Foundation - Collaborative Proposal: Patches, corridors, and the dispersal of insects and plants: scaling up from local experiments to large complex landscapes; with N. Haddad, D. Levey, S. Sargent. 4 yr, \$350,000.
- 1998-99 Iowa Departments of Transportation and Natural Resources - Assessment, evaluation, and possible methods for reducing deer-vehicle accidents on Iowa highways. 1 yr, \$44,993.
- 1997-99 Iowa National Guard - Spatial analysis of grassland small mammals at Camp Dodge, Iowa. 1 yr, \$30,938.
- 1997 Iowa Department of Natural Resources, State Preserves Board - Small mammal diversity in southwestern Iowa. 1 yr, \$5,000.
- 1997-99 National Science Foundation / Environmental Protection Agency, Partners for Environmental Research Water and Watershed Program - Modeling the effects of alternative landscape design and management on water quality and biodiversity in Midwest agricultural watersheds; with M. Santlemann, K. Freemark, J. Nassauer. 3 yr, \$1,158,600 (ISU subcontract \$235,018).
- 1997-98 Iowa Department of Natural Resources - The distribution and abundances of the Iowa Pleistocene Land Snail on algific slopes in Northeast Iowa; with T. Ross. 1 yr, \$11,600.
- 1996-98 Iowa Department of Natural Resources, State Preserves Board - The spatial conservation genetics of Iowa Pleistocene Snails on algific talus slopes; with T. Ross. 1 yr, \$6,804.
- 1995-97 United States Forest Service, Southeastern Experiment Station - Dispersal behavior of *Peromyscus polionotus*. 2.5 yr, \$51,225.
- 1994-95 Iowa Department Natural Resources - The relationship between patterns of disturbance, the abundances of small mammals, and seedling survival in tallgrass prairies; with K. Moloney. 1 yr, \$650.

- 1994-95 Iowa Department Natural Resources, State Preserves Board - The impact of disturbance on establishment and maintenance of plant diversity on Anderson Prairie, Iowa; with K. Moloney. 1 yr, \$4,760.
- 1993 United States Forest Service, Southeastern Experiment Station - Landscape patterns and the distributions of small mammals in managed pine forests; with J.B. Dunning, and H.R. Pulliam. 1 yr, \$4,000.
- 1992 Department of Energy - Landscape patterns of habitat dispersion on the SRS and their effects on biodiversity; with J.B. Dunning and H.R. Pulliam. 2 yr, \$49,780.
- 1992 Iowa State University - Graduate research grant. 1 yr, \$5,000.
- 1992-93 Environmental Protection Agency, Global Change Program - Comparative risk assessment of climate change and other anthropogenic stressors: habitat and biological diversity on the Savannah River Site, South Carolina; with H.R. Pulliam, J.B. Dunning, J.E. Pinder, J.D. Congdon, B. Taylor, and P. Dixon. 3.5 yr, \$578,818 (ISU subcontract \$131,274).

### **Publications and presentations**

#### *Refereed publications*

- Orrock, John L. and B. J. Danielson. Pending minor revision. Patch shape, connectivity, and foraging by the oldfield mouse, *Peromyscus polionotus*. *Journal of Mammalogy*.
- Loeb, S.C., Wike, L.D., John J. Mayer, J.J. and Danielson, B.J. In press. Nongame mammals. *Ecology and Management of Natural Resources on the Savannah River Site:50 Years of Environmental Stewardship*". Hancock Press.
- Orrock, John L. and B. J. Danielson. In press. A note on the status of the endangered red-backed vole, *Clethrionomys gapperi*, in Iowa. *Journal of the Iowa Academy of Science*.
- Orrock, John L. and B. J. Danielson. 2004. Balancing a variety of risks: the effects of fire ants and predation risk on foraging by oldfield mice, *Peromyscus polionotus*. *Oecologia* 140: 662-667.
- Orrock, John L., B. J. Danielson, and J. Brinkerhoff. 2004. Rodent foraging is affected by indirect, but not direct, cues of predation risk. *Behavioral Ecology* 15: 433-437.
- Orrock, John L., B. J. Danielson, M. J. Burns, and D. J. Levey. 2003. Spatial ecology of predator-prey interactions: corridors and patch shape influence seed predation. *Ecology* 84:2589-2599.
- Nickel, A.M., Danielson, B.J. and Moloney, K.A. 2003. Wooded habitat edges as refugia from microtine herbivory in tallgrass prairies. *Oikos* 100: 525-533.
- Haddad, N., Bowne, D.R., Cunningham, A., Danielson, B.J., Levey, D., Sargent, S. and Spira. T. 2003. Corridor Use by Diverse Taxa. *Ecology* 84: 609-615.
- Tewksbury, J.J., Levey, D.J., Haddad, N.M., Sargent, S., Orrock, J.L., Weldon, A., Danielson, B.J., Brinkerhoff, J., Damschen, E.I., and Townsend, P. 2002. Corridors affect plants, animals, and their interactions. *Proceedings of the National Academy of Science* 99:12923-12926.
- Santlemann, M., Freemark, K. White, D., Nassaurer, J., Clark, M., Danielson, B., Eilers, J., Cruse, R., Glatowitsch, S., Polasky, S., Wu, J. 2001. Applying ecological principles to land-use decision-making in agricultural watersheds. *Applying Ecological Principles to Land Management*. Dale, V. and Haeuber R. , (eds.). Springer-Verlag, NY.
- Danielson, B.J. and Hubbard, M.W. 2000. The influence of corridors on the movement behavior or individual *Peromyscus polionotus* in experimental landscapes. *Landscape Ecology* 15: 323-331.
- Macedo, M. and Danielson B., and Cook, D. 2000. An exploratory methodology to uncover populational characteristics in a geographically referenced data set. Scuola Superiore G. Reiss Romoli 2000.
- Dunning, J.B., Danielson, B.J., Watts, B.D., Liu, J., and Kremets, D.G. 2000. Studying wildlife at local and landscape scales: Bachman's Sparrows a the Savannah River Site, South Carolina. *Studies in Avian Biology* 21: 75-80.
- Klaas, B.A., Moloney, K.A., and Danielson, B.J. 2000. The tempo and mode of gopher mound production in a tallgrass prairie remnant. *Ecography* 23: 246-256.

- Hubbard, M.W, Danielson, B.J. and Schmitz, R.A. 2000. Factors influencing the location of deer-vehicle accidents in Iowa. *Journal of Wildlife Management* 64: 707-713.
- Danielson, B.J. and Anderson, G.S. 1999. Habitat selection in geographically complex landscapes. Pages 89-103 in *Landscape Ecology of Small Mammals*. Barrett, G.W. and Peles, J.D. (eds.). Springer Press.
- Klaas, B.A. Danielson, B.J., and Moloney, K.A. 1998. Influence of pocket gophers on meadow voles in a tallgrass prairie. *Journal of Mammalogy* 79: 942-952.
- Anderson, G.S. and Danielson, B.J. 1997. The effects of landscape composition and physiognomy on metapopulation size: the role of corridors. *Landscape Ecology* 12: 261-271.
- Donovan, T.M., Clark, D.A., Howe, R.W., and Danielson, B.J. 1996. Metapopulations and the conservation of neotropical birds in the Midwest. Pages 41-52, in *Management of Midwestern Landscapes for the Conservation of Neotropical Migratory Birds*. Thomson, F.R. (ed.), North Central Forest Experiment Station US Forest Service.
- Dunning, J.B., Stewart, D.J., Danielson, B.J., Noon, B.R., Root, T., Laberson, R.H., and Stevens, T. 1995. Spatially-explicit population models: current forms and future uses. *Ecological Applications* 5: 3-11.
- Danielson, B.J. and Klaas, E.E. 1995. Conservation, restoration, and management of Great Plains landscapes. Pages 185-198 in *Conservation of Great Plains Ecosystems: Current Science, Future Options*. Johnson, S.R. and Bouzaher, A. (eds.). Kluwer Academic Publishers.
- Hayslett, L.A. and Danielson, B.J. 1994. Small mammal diversity and abundances in three central Iowa grassland habitat types. *The Prairie Naturalist* 26: 37-44.
- Danielson, B.J. and Stenseth, N.C. 1992. The ecological and evolutionary implications of recruitment for competitively structured communities. *Oikos* 65: 34-44.
- Dunning, J.B., Danielson, B.J., and Pulliam, H.R. 1992. Ecological processes that affect populations in landscapes. *Oikos* 65: 169-175.
- Danielson, B.J. 1992. Habitat selection, interspecific interactions, and landscape composition. *Evolutionary Ecology* 6: 399-411.
- Pulliam, H.R. and Danielson, B.J. 1991. Sources, sinks, and habitat selection: A landscape perspective on population dynamics. *American Naturalist* 137: S50-S66.
- Danielson, B.J. 1991. Communities in a landscape: the influence of habitat heterogeneity on the interactions between species. *American Naturalist* 137: 1105- 1120.
- Kotler, B.P., Gaines, M.S., and Danielson, B.J. 1988. The effects of vegetative cover on the community structure of prairie rodents. *Acta Theriologica* 27: 13-25.
- Danielson, B.J. and Gaines, M.S. 1987. Spatial patterns in two syntopic microtines: *Microtus ochrogaster* and *Synaptomys cooperi*. *Journal of Mammalogy* 68: 313-322.
- Danielson, B.J. and Gaines, M.S. 1987. The influence of conspecific and heterospecific residents on colonization. *Ecology* 68: 1778-1784.
- Danielson, B.J. and Swihart, R.K. 1987. Home range dynamics and activity patterns of *Microtus ochrogaster* and *Synaptomys cooperi* in syntopy. *Journal of Mammalogy* 68: 160-165.
- Danielson, B.J., Johnson, M.L., and Gaines, M.S. 1986. An analysis of a method for comparing residents and colonists in a natural population of *Microtus ochrogaster*. *Journal of Mammalogy* 67: 733-735.

#### *In review*

- Nickel, A.M., Moloney, K.A., and Danielson, B.J. The role of plant diversity in diluting herbivore pressure on prairie seedlings. *Plant Ecology*. In revision.
- Orrock, John L., G. C. Curler, B. J. Danielson, and D. R. Coyle. The effect of corridors and patch shape on the distribution and abundance of ants. *Ecological Applications*.

#### *Non-refereed publications*

Anderson, T.R. and Danielson, B.J. Rare Societies of Northeast Iowa's Air-Conditioned Slopes. *Managing Iowa Habitats*. ISU Extension. 8 pp.

*Invited seminars, symposia, or keynote presentations (since arrival at ISU)*

I have been a convener of three special symposia for the quadrennial International Theriological Congress (Italy 1989, Mexico 1997, South Africa 2001).

Danielson, B.J. 2002. The role of corridors and the connectance of habitat in fragmented landscapes: case studies of small mammals and butterflies. The Symposium on Habitat Fragmentation, Ecological Corridor and Habitat Networks. Taipei, Taiwan.

Danielson, B.J. 2001. Linking Behavior to Population Dynamics and the Distributions of Abundances Why population biology needs more animal behaviorists. Miami University, Oxford, Ohio.

Danielson, B.J. 2001. The role of interspecific recognition and landscape feature perception in small mammal dynamics. Special symposium on Spatial Ecology in the Evolution and Ecology of Small Mammals. Sun City, South Africa.

Danielson, B.J. 2000. Wildlife movement in fragmented habitats: the influence of landscape complexity. Carleton University, Ottawa, Canada.

Danielson, B.J. 2000. Symposium on the issue of Invasive Species of Iowa. Iowa Academy of Sciences. Ames, IA.

Macedo, M. and Danielson B., and Cook, D. 2000. An exploratory methodology to uncover populational characteristics in a geographically referenced data set. Scuola Superiore G. Reiss Romoli 2000.

Danielson, B.J. 2000. The role of small mammals in tallgrass prairie ecosystems. Iowa Lakeside Laboratory.

Danielson, B.J. 1998. The effects of landscape features on small mammal populations in an intensively managed forest ecosystem. Columbia University, New York, NY.

Danielson, B.J. 1998. Effects of landscape features on the distributions and abundances of three species of small mammals. Lakehead University, Thunder Bay, Ontario, Canada.

Danielson, B.J. 1997. The role of behavior in landscape-scale dynamics of vertebrate populations -- the Achilles' heel of landscape ecology: or where did all the behavioral ecologists go? University of Miami, Miami, Florida.

Danielson, B.J. 1997. The role of behavior in the dynamics of regional interspecific interactions. University of Massachusetts, Amherst, Massachusetts.

Danielson, B.J., Moloney, K.A., Klaas, B., and Wolfe-Bellin, K. 1997. Co-convenor of Symposium: The ecological and evolutionary aspects of mammal-plant interactions. Presentation: Of gophers, voles, and seedling plants - the role of small mammals in tallgrass prairies. 7th International Theriological Congress, Acapulco, Mexico.

Danielson, B.J. and Anderson, G.A. 1997. Symposium: Geographical ecology. Presentation: At the eye-level of a mouse -- rules for moving through geographically complex environments. 7th International Theriological Congress, Acapulco, Mexico.

Klaas, B., Moloney, K.A., Danielson, B.J., and Reichman, O.J. 1997. Symposium: Geographical ecology. Presentation: Detailed spatio-temporal analysis of animal-generated disturbance patterns. 7th International Theriological Congress, Acapulco, Mexico.

Danielson, B.J. 1997. The effects of landscape features on small mammal populations in an intensively managed forest Ecosystem. University of Iowa, Iowa City, Iowa.

Danielson, B.J. 1997. The roles of small mammals in structuring tallgrass prairie plant communities. University of Iowa, Iowa City, Iowa.

Danielson, B.J. 1997. The effects of landscape features on small mammal populations in an intensively managed forest ecosystem. Bowling Green University, Bowling Green, Ohio.

Danielson, B.J. 1997. The roles of small mammals in structuring tallgrass prairie plant communities. Bowling Green University, Bowling Green, Ohio.

- Danielson, B.J. 1996. Small mammal response to temporally and spatially dynamic fragmented landscapes. Northern Illinois University.
- Danielson, B.J. 1996. Workshop: Modeling diversity in ecological landscapes. Presentation: Linking Individuals to Landscapes: What do we need to know to understand communities? International Association for Landscape Ecology Meeting of the U.S. Chapter, Houston, Texas.
- Danielson, B.J. 1995. The role of landscape composition in influencing populations and communities. University of Nebraska, Lincoln, Nebraska.
- Danielson, B.J. 1995. The role of behavior and perception in moderating landscape effects on communities. University of Nebraska, Lincoln, Nebraska.
- Danielson, B.J. 1995. The role of behavior and perception in moderating landscape effects on communities. University of California, Davis, California.
- Danielson, B.J. 1995. The nonadditivity of landscape components in influencing populations and communities: how can we scale up? University of California, Davis, California.
- Danielson, B.J. 1995. The relative importance of regional vs. local habitat variables in explaining the distributions of small mammals. Midwest Population Biology Meeting, Ames, Iowa.
- Donovan, T.M., Clark, D.A., Howe, R.W., and Danielson, B.J. 1995. Symposium: Managing Midwest Landscapes for the Conservation of Neotropical Migratory Birds. Presentation: Metapopulations and the conservation of neotropical birds in the Midwest. Midwest Wildlife Society, Detroit, Michigan.
- Danielson, B.J. 1994. Landscape effects on populations, communities, and diversity. Minnesota-Iowa Chapters of The Wildlife Society, Albert Lea, Minnesota.
- Danielson, B.J. 1994. The role of animal behavior in mediating landscape effects on communities. University of Minnesota, Duluth, Minnesota.
- Danielson, B.J. 1994. The role of landscape composition in influencing populations and communities. Northern Resource Research Institute, Duluth, Minnesota.
- Danielson, B.J. 1993. Models of populations and communities in complex landscapes: what are they good for? University of Illinois, Champaign, Illinois.
- Danielson, B.J. and Klaas, E.E. 1993. Conservation, restoration, and management of Great Plains landscapes. The Great Plains Initiative, Kansas City, Missouri.
- Danielson, B.J. 1993. Searching, sampling, and the exploitation of landscapes. The Quebec Society for the study of animal behavior. Rimouski, Quebec, Canada.
- Danielson, B.J. 1993. Landscape-level ecology and animal perception. Bryn Mawr College, Bryn Mawr, Pennsylvania.
- Danielson, B.J. 1993. The role of habitat selection in spatially-complex landscapes on interspecific interactions. University of Pennsylvania, Philadelphia, Pennsylvania.
- Danielson, B.J. 1992. The Institute of Ecology Workshop: The use of spatially-explicit models in management and conservation. Presentation: Modeling dispersal in spatially-explicit models. The University of Georgia, Athens, Georgia.

*Other presentations (since arrival at ISU)*

- Orrock, John L., D. J. Levey, B. J. Danielson, and R. J. Brinkerhoff. Seed dispersal, seed predation, and the distribution of plants in early-successional habitats. Annual Meeting of the Ecological Society of America, 2002.
- Orrock, John L. and B. J. Danielson. Connectivity affects top-down vs. bottom-up limitation of model ecological communities. International Association of Landscape Ecologists meeting, 2002.
- Danielson, B.J. and Haddad, N.M. 2002. The effect of isolation, dispersal corridors, and habitat quality on the metapopulations of two open\_habitat butterflies,. USA International Association of Landscape Ecologists, Lincoln, Nebraska.
- Nickel, A.M., Danielson, B.J., and Moloney ,K.A. 2002. The role of plant diversity in diluting mammalian herbivore pressure on prairie seedlings. . American Society of Mammalogists, Lake Charles, Louisiana.

- Orrock, John L., B. J. Danielson, and J. Brinkerhoff. Recognizing the enemy: do mice discriminate among cues of native and non-native predators? Annual Meeting of the American Society of Mammalogists, 2001.
- Clark, M.E. and Danielson, B.J. 1999. Single versus multi-species models for predicting the effects of landscape change on biodiversity and population dynamics. The Fifth World Congress of the International Association for Landscape Ecology, Steamboat. CO.
- Fung, J.L. and Danielson, B.J. 1999. Rodent oases: micropatches as a linking factor in fragmented habitats. The Fifth World Congress of the International Association for Landscape Ecology, Steamboat. CO.
- Hubbard, M.W and Danielson, B.J. 1999. Landscape influences on deer-vehicle collisions. The Fifth World Congress of the International Association for Landscape Ecology, Steamboat. CO.
- Macedo, M. and Danielson, B.J., and Cook, D. 1999. Modeling a 3-species community of small mammals in a temporally dynamic and spatially complex landscape. The Fifth World Congress of the International Association for Landscape Ecology, Steamboat. CO.
- Anderson, T. and Danielson, B.J. 1999. The effect of behavioral responses to dispersal corridors on the time to extinction of metapopulations. The Fifth World Congress of the International Association for Landscape Ecology, Steamboat. CO.
- Santelmann, M., Clark, M., Cruse, R., Danielson, B., Eilers, J., Freemark, K., Glatowitsch, S., Nassauer, J., Polasky, S., White, D., Wu, J. 1999. Modeling impacts of past and alternative future scenarios for agricultural watersheds in the Midwest USA. The Fifth World Congress of the International Association for Landscape Ecology, Steamboat. CO.
- Danielson, B.J. and Anderson, G.S. 1998. Assessing landscape under utilization and spatial complexity of interspecific competition in fragmented metapopulations of rodents. U.S. Chapter International Association of Landscape Ecology, East Lansing, Michigan.
- Nassauer, J., Freemark, K., Santelmann, M., Cruse, R., White, D., Danielson, B.J., Eilers, J., Bernert, J., Galatowitsch, S., and Polasky, S. 1998. Modeling effects of alternative landscape design and management on water quality and biodiversity in Midwest agricultural watersheds. U.S. Chapter of the International Association of Landscape Ecologists, East Lansing, Michigan.
- Danielson, B.J., Macedo, M., Cook, D., and Anderson, G.S. 1998. Assessing Interspecific Competition in Spatially Complex Landscapes. American Society Mammalogists, Blacksburg, VA.
- Klaas, B.A., Danielson, B.J., and Moloney, K. 1996. The effects of gopher mounds on the distribution of meadow voles in a tallgrass prairie. American Society of Mammalogists.
- Klaas, B.A., Moloney, K., and Danielson, B.J. 1996. The effects of gopher mounds on the distribution of meadow voles in a tallgrass prairie. Ecological Society of America.
- Anderson, G.S. and Danielson, B.J. 1995. The influences of spatial and nonspatial elements on the ability of small mammals to exploit habitats in Southern pine forests. American Society of Mammalogists.
- Danielson, B.J. 1992. Sources, sinks, and everything else. The Prairie States Ecology Conclave.