

DANIEL E. BUNKER

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EDUCATION

Ph.D., 2004, University of Pittsburgh.

B.S., B.A., 1994, The Evergreen State College.

PROFESSIONAL POSITIONS

Assistant Professor: Departments of Biological Sciences and Mathematical Sciences,
New Jersey Institute of Technology. 2008-Present.

Post-Doctoral Research Scientist: Department of Ecology, Evolution and Environmental
Biology, Columbia University. 2004-2008.

Co-Director: TraitNet Research Coordination Network, Columbia University. 2006-
present.

Associate Director: BioMERGE Research Coordination Network, Columbia University.
2004-present.

Teaching Assistant: Department of Biological Sciences, University of Pittsburgh. 1998-
2003.

Graduate Research Assistant: Department of Biological Sciences, University of
Pittsburgh. 2000-2002.

Research Assistant: Tree Ring Lab, Lamont-Doherty Earth Observatory, Columbia
University. 1995-1997.

JOURNAL PUBLICATIONS

Carson, W. P., Hovick, S. M., Baumert, A. J., **Bunker, D. E.** and Pendergast, T. H. 2008.
Evaluating the post-release efficacy of invasive plant biocontrol by insects: A
comprehensive approach. *Arthropod-Plant Interactions*, 2, 77-86.

Bunker, D.E., and S. Naeem. 2006. Species diversity and ecosystem functioning. Letter
to the editor in *Science*. 312: 846-847

Stark, S.C., **D.E. Bunker**, and W.P. Carson. 2006. A null model of exotic plant
diversity tested with exotic and native species-area relationships. *Ecology Letters*. 9:
136-141.

Bunker, D.E., F. DeClerck, J.C. Bradford, R.K. Colwell, I. Perfecto, O. L. Phillips, M.
Sankaran and S. Naeem. 2005. Species Loss and Above-ground Carbon Storage in a
Tropical Forest. *Science*. 310:1029-1031.

Bunker, D.E., and W.P. Carson. 2005. Drought stress and tropical forest woody
seedlings: effect on community structure and composition. *Journal of Ecology*. 93:
794-806

- Stevens, M.H.H, **D.E. Bunker**, S. Schnitzer, and W.P. Carson. 2004. Establishment limitation reduces species recruitment and species richness as soil resources rise. *Journal of Ecology*. 92: 339-347.
- D'Arrigo, R.D., C.M. Malmstrom, G.C. Jacoby, S.O. Los and **D.E. Bunker**. 2001. Correlation between maximum latewood density of annual tree rings and NDVI based estimates of forest productivity. *International Journal of Remote Sensing*. 21: 2329–2336.
- Yamaguchi, D.K., B.F. Atwater, **D.E. Bunker**, B.E. Benson, and M.S. Reid. 1997. Tree-ring dating the 1700 Cascadia earthquake. *Nature* 389: 922-923.
- Jacoby, G.C., **D.E. Bunker**, B.E. Benson. 1997. Tree-ring evidence for an AD 1700 Cascadia earthquake in Washington and northern Oregon. *Geology* 25: 999-1002.

BOOKS

- Naeem, S., **D.E. Bunker**, A. Hector, M. Loreau and C. Perrings, editors. *In press*. 2009. Biodiversity, Ecosystem Functioning, and Human Wellbeing: An Ecological and Economic Perspective. Oxford University Press, Oxford.

BOOK CHAPTERS

- Naeem, S., **D.E. Bunker**, A. Hector, M. Loreau, and C. Perrings. *In press*. 2009. The ecological and social implications of changing biodiversity: An overview of a decade of biodiversity and ecosystem functioning research. *In* Naeem, *et al*, editors, Biodiversity, Ecosystem Functioning, and Human Wellbeing: An Ecological and Economic Perspective. Oxford University Press, Oxford.
- Solan, M., J. Godbold, D.F.B. Flynn, A. Symstad, and **D.E. Bunker**. Biodiversity-ecosystem function research and biodiversity futures: Early bird catches the worm or a day late and a dollar short? *In press*. 2009. *In* Naeem, *et al*, editors, Biodiversity, Ecosystem Functioning, and Human Wellbeing: An Ecological and Economic Perspective. Oxford University Press, Oxford.
- Engelhardt, K., A. Symstad, A. Prieur-Richard, M. Thomas, and **D.E. Bunker**. *In press*. 2009. Opening communities to colonization –The impacts of invaders on biodiversity and ecosystem functioning. *In* Naeem, *et al*, editors, Biodiversity, Ecosystem Functioning, and Human Wellbeing: An Ecological and Economic Perspective. Oxford University Press, Oxford.
- Naeem, S., and **D.E. Bunker**. *In press*. 2009. TraitNet: Furthering biodiversity research through the curation, discovery, and sharing of species trait data. *In* Naeem, *et al*, editors, Biodiversity, Ecosystem Functioning, and Human Wellbeing: An Ecological and Economic Perspective. Oxford University Press, Oxford.
- Naeem, S., **D.E. Bunker**, A. Hector, M. Loreau, and C. Perrings. *In press*. 2009. Can we predict the effects of global change on biodiversity loss and ecosystem functioning? *In* Naeem, *et al*, editors, Biodiversity, Ecosystem Functioning, and Human Wellbeing: An Ecological and Economic Perspective. Oxford University Press, Oxford.

OTHER PUBLICATIONS

Stevens, M., Z.T. Long, S.A. Schnitzer, **D.E. Bunker**, R. Collins, A. Bledsoe, W.P. Carson. 2003. Testing Ecological Theory - Lab Manual for Ecology Laboratory. University of Pittsburgh. Pittsburgh, PA.

MANUSCRIPTS IN PREPARATION

Bunker, D.E., S.C. Stark and W.P. Carson. *In prep.* Modeling competition for light between species with complex canopies: An empirical approach. To be submitted to *American Naturalist*.

Stark, S.C., **D.E. Bunker**, and W.P. Carson. *In prep.* Comparing effects of plant species dominance on marsh diversity: Does invasive purple loosestrife depress diversity more than other native and exotic species. To be submitted to *Conservation Biology*.

Nichols, E. , **D.E. Bunker**, S. Spector, *et al.* *In prep.* Species traits associate with dung beetle response to tropical forest modification: insights from a hierarchical Bayesian model. To be submitted to *Ecology Letters*.

Hovick, S., **D.E. Bunker**, W.P. Carson, and C.J. Peterson. *In prep.* Fortuitous invasions into experimental wetland mesocosms: The effects of nitrogen enrichment and canopy-species composition. To be submitted to *Ecology*.

Bunker, D.E., D.F.B. Flynn, and S. Naeem. *In prep.* Functional diversity defined by convex hull volume. To be submitted to *American Naturalist*.

PRESENTED PAPERS

Bunker, D.E., Dan F.B. Flynn, Shahid Naeem. Functional diversity, ecosystem services, and restoration. Presented at Ecological Society of America, August 2007, San Jose, CA.

Stephen M. Hovick, **D. E. Bunker**, Walter P. Carson, and Chris J. Peterson. Fortuitous invasions into experimental wetland mesocosms: The effects of nitrogen enrichment and canopy-species composition. Presented at Ecological Society of America, August 2007, San Jose, CA.

Bunker, D.E., F. DeClerck, J.C. Bradford, R.K. Colwell, I. Perfecto, O. L. Phillips, M. Sankaran and S. Naeem. Species Loss and Above-ground Carbon Storage in a Tropical Forest. Presented at Ecological Society of America, August 2006, Memphis.

Bunker, D.E., F. DeClerck, J.C. Bradford, R.K. Colwell, I. Perfecto, O. L. Phillips, M. Sankaran and S. Naeem. Species Loss and Above-ground Carbon Storage in a Tropical Forest. Presented at DIVERSITAS: Biodiversity and Carbon storage, September 2005, Danum Valley, Sabah, Malaysia.

Bunker, D.E., Scott Stark and Walter P. Carson. Competition for light between plant species with complex canopies: using invasibility criteria to predict competitive outcomes. Presented at Ecological Society of America, August 2005, Montreal.

Bunker, D.E., and Walter P. Carson. Experimental test of resource competition and keystone predation theories: Predicting the success of invasions and biological control. Presented at Ecological Society of America, August 2003, Savannah, Georgia.

- Scott Stark, **D. E. Bunker** and Walter P. Carson. Predicting plant invasion in North American ecoregions: A macroecological approach. Poster presented at Ecological Society of America, August 2003, Savannah, Georgia.
- Stark, S.C., **D.E. Bunker** and W.P. Carson. Consequences of purple loosestrife (*Lythrum salicaria*) invasion for marsh vegetation in Northwestern Pennsylvania. Presented at Ecological Society of America, August 2002, Tucson, Arizona.
- Stark, S.C., **D.E. Bunker** and W.P. Carson. Consequences of purple loosestrife (*Lythrum salicaria*) invasion for marsh vegetation in Northwestern Pennsylvania. Presented at Department of Biological Sciences Annual Retreat, September 2002, Pymatuning Lab of Ecology. Awarded second prize for best poster.
- Stevens, M.H.H., S.P. Schnitzer, **D.E. Bunker** and W.P. Carson. Loss of plant species in productive habitats is not due to seed limitation. Presented at Ecological Society of America, August 2002, Tucson, Arizona.
- Bunker, D.E.**, and Walter P. Carson. Effect of irrigation on tropical forest seedling growth and survivorship during an El Niño-related drought. Poster presented at Ecological Society of America, August 2001, Madison, Wisconsin.
- Bunker, D.E.**, and Walter P. Carson. Resource competition between the exotic invasive, purple loosestrife, and native broad-leaved cattail: Evidence from field observations. Poster presented at Ecological Society of America, August 2000, Snowbird, Utah.
- Bunker, D.E.**, and Walter P. Carson. Resource competition between the exotic invasive, purple loosestrife, and native broad-leaved cattail: Evidence from field observations. Poster presented at Biological Sciences annual retreat, September 2000, Pymatuning Laboratory of Ecology. Awarded second prize for best poster.
- Bunker, D.E.**, and Walter P. Carson. Manipulating dry season soil moisture availability in a tropical moist forest during El Niño: influence on tree seedling growth and survivorship; Poster presented at Ecological Society of America, August 1998, Baltimore, MD.

INVITED TALKS

- Quantifying species functional diversity with convex hull volume. Mathematical Biology Seminar Series, Department of Mathematical Sciences, New Jersey Institute of Technology, October 24, 2008.
- Global change, community composition, and ecosystem functioning. Department of Biological Sciences, Rutgers-Newark, January 25, 2008.
- Global change, community composition, and ecosystem functioning. Department of Mathematical Sciences, New Jersey Institute of Technology, April 3, 2008.
- Global change, community composition, and ecosystem functioning. Biology Department Seminar Series, Queens College of CUNY, September 10, 2008.
- Global change, community composition, and ecosystem functioning. Department of Biological Sciences, Lehman College of CUNY, February 11, 2008.
- Predicting ecosystem consequences of global change. Department of Botany, Connecticut College, March 1, 2007.

Predicting ecosystem consequences of global change. Department of Biology, Colgate University, January 17, 2007.

Can competition theory predict invasions and biocontrol?. Center for Environmental Research and Conservation, Columbia University, October 14, 2004.

Resource competition between cattail and loosestrife. Pymatuning Laboratory of Ecology Brown Bag Seminar Series, Pymatuning Laboratory of Ecology, July 2003.

Resource competition between cattail and loosestrife. Ecology and Evolution Seminar Series, University of Pittsburgh, February 2003.

Modeling light competition between terrestrial plants: fact and fiction. Ecology and Evolution Seminar Series, University of Pittsburgh, March 2002.

Application of resource competition theory to invasive species: a test case with *Lythrum salicaria*. Ecology and Evolution Seminar Series, University of Pittsburgh, October 1999.

Application of resource competition theory to invasive species: a test case with *Lythrum salicaria*. Pymatuning Laboratory of Ecology, Brown Bag Seminar Series, June 1999.

GRANTS AND AWARDS (Totaling ~\$675,000):

RCN: TraitNet - Coordinating trait-based ecological and evolutionary research (\$430,963), NSF. Shahid Naeem, PI, Daniel E. Bunker, Co-PI, 2007-2012.

The application of resource competition theory and keystone herbivory to plant invasions: towards a predictive theory (\$12,000), NSF Doctoral Dissertation Improvement Grant. Walter P. Carson, PI; Daniel E. Bunker, Co-PI. 2003.

The application of resource competition theory and keystone herbivory to plant invasions (\$15,500 plus tuition waiver), Andrew Mellon Pre-doctoral Fellowship, University of Pittsburgh, 2003.

Application of Resource Competition Theory to Invasive Species and Biological Control: An Experimental Test Using *Lythrum Salicaria* (\$2248), McKinley Research Fund, 2003

Resource Competition: Tests of competing hypotheses (\$2300), McKinley Research Fund, 2001.

Evaluation of *Galerucella* and *Hylobius* impacts on Purple Loosestrife (*Lythrum salicaria*) at varying levels of site productivity: Combining observational and experimental approaches (\$12,000), Biological Control Implementation Grant Program, USDA NBCI, 2000. Walter P Carson, Daniel E. Bunker and Wilbur Mountain.

The application of resource competition theory and keystone herbivory to plant invasions: towards a predictive theory (\$200,000), USDA NRI, 2000. Walter P. Carson, PI; Daniel E. Bunker, co-author.

Application of Resource Competition Theory to Invasive Species and Biological Control: An Experimental Test Using *Lythrum Salicaria* (\$2700), McKinley Research Fund, 2000. (Declined)

Evaluation of *Galerucella* and *Hylobius* impacts on Purple Loosestrife (*Lythrum salicaria*) at varying levels of site productivity: Combining observational and

experimental approaches, Biological Control Implementation Grant Program (\$11,000), USDA NCI, 1999. Walter P Carson, Daniel E. Bunker and Wilbur Mountain.

Effects of the introduced biological control agents *Galerucella* and *Hylobius* on the resource competitive ability of Purple Loosestrife (*Lythrum salicaria*), (\$500), Pennsylvania Academy of Sciences, 1999.

Application of resource competition theory and community assembly rules to invasive species: an experimental test using *Lythrum salicaria* (\$2,300), McKinley Research Fund, 1999.

Application of resource competition theory and community assembly rules to invasive species: an experimental test using *Lythrum salicaria*, Grant in Aid of Research (\$700), Sigma Xi, 1999.

University of Pittsburgh Graduate Recruiting Fellowship: 1997-1998.

WORKSHOPS AND WORKING GROUPS

Scarabaeinae Research Network, 5rd Annual Meeting, September 26-28, 2008, Black Rock Forest, New York, USA

iPlant Kick-Off Meeting, April 7-9, 2008, Cold Spring Harbor Lab, New York, USA.

*TraitNet I: Designing an ecoinformatics backbone for curating, sharing and discovering species trait data, 7-9 December 2007, New York City.

Characteristics of Vulnerability Across Taxa Workshop, 22-24 October 2007, Silwood Park, UK.

Ecophylogenetics Working Group, Linking phylogenetic history, plant traits, and environmental gradients to understand community organization at local and continental scales, 11-14 October 2007, Harvard Forest, MA, USA.

Research Coordination Network Meeting. National Science Foundation, Washington, D.C., USA. 10-11 September 2007

Fast Track Initiative on refining plant functional classifications for earth system modeling, International Geosphere and Biosphere Programme and DIVERSITAS, Alicante, Spain, 7-9 February 2007.

The economics of ecosystem services, BESTNet-DIVERSITAS, Paris, May 21-23, 2007.

*BioMERGE 4th Adaptive Synthesis Workshop, Ascona, Switzerland, 1-4 December 2006.

Center for Tropical Forest Science (CTFS) Species Trait Working Group. Smithsonian Tropical Research Institute, Panama City, Republic of Panama. 25-26 June 2006.

Research Coordination Network Meeting. National Science Foundation, Washington, D.C., USA. 12-13 September 2005.

Diversitas: Biodiversity and Carbon Storage, Danum Valley, Borneo, Malaysia, 7-10 September 2005.

Diversitas: Next Generation of Biodiversity Research, Kota Kinabalu, Borneo, Malaysia, 4-6 September 2005.

*BioMERGE 3rd Adaptive Synthesis Workshop, Kota Kinabalu, Borneo, Malaysia, 1-4 September 2005.

SEEK Early Career Faculty and Postdoctoral Training in Ecoinformatics, University of New Mexico, Albuquerque, NM, USA. 3-7 January 2005.

*Organizer

TEACHING

Courses taught – NJIT:

BIOL322, Evolution, to be taught Fall 2009.

BIOL6xx, The Scientific Method for Research in the Life Sciences, to be taught Fall 2009.

Courses taught – Columbia University:

Ushering in a New Era of Functional Ecology: Dynamics in a Changing Environment, an NCEAS Distributed Graduate Seminar co-taught with Shahid Naeem, Spring 2008

Courses taught – Teaching assistant, University of Pittsburgh:

Ecology Laboratory (3x), Genetics (2x), Introductory Biology Laboratory (4x), Mammalogy, Aquatic Botany

Guest lectures:

“Species diversity, functional diversity, and sustainable development”, Science for Sustainable Development”, S. Naeem, Columbia University, Fall 2007

“Use and valuation of ecosystem services”, Forest Ecology and People: Theory and Practice, R. Sears, Columbia University, Fall 2006

“Ordinary least-squares and logistic regression”, Understanding Nature Through Observation and Experiment, S. Naeem, Columbia University, Fall 2005

“Invasive species”, Ecology, W. Carson, University of Pittsburgh, Fall 2001-2003

Courses developed:

BIOL322, Evolution, to be taught Fall 2009.

BIOL6xx, The Scientific Method for Research in the Life Sciences, to be taught Fall 2009.

Ecology Laboratory Manual, University of Pittsburgh, “Testing the diversity invisibility hypothesis”

Mentoring

Scott C. Stark, Undergraduate research, USX Fellowship, 2003

Joni Brinker, Undergraduate research, Brackenridge Fellowship, 2003

Scott C. Stark, Undergraduate research, Brackenridge Fellowship, 2000

Lara Martinez, Undergraduate research, 2000

PEER REVIEW SERVICE

Journals:

Biological Invasions, Ecology Letters, Global Change Biology, Journal of Ecology,
Oecologia

Grants:

National Science Foundation

PROFESSIONAL MEMBERSHIPS

American Association for the Advancement of Science

Society for Conservation Biology

Ecological Society of America