

Anne Maura Trainor

The Nature Conservancy

African Program

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DEGREES

University of North Carolina, Ph.D., Geography, 2006 to 2011

Integrated field ecology with remote sensing identify and conserve critical dispersal habitats for the federally endangered species and provide scientific insights that prioritize mitigation measures while mediating conflicting land-use needs between a U.S. military installation, privately held lands, and public spaces in a highly fragmented landscape.

Colorado State University, M.S., Wildlife Management and Conservation, 2001 to 2004

Incorporated animal movement behavior and geospatial analyses to refine habitat regulations and evaluated the effectiveness of mitigation efforts for federally protected species.

University of New Hampshire, B.Sc., Biology (Focus: Ecology and Evolution), 1992 to 1996

PROFESSIONAL POSITIONS

THE NATURE CONSERVANCY

Smart Growth Director, 2015 to Present

I conduct spatial and statistical analysis related to The Nature Conservancy's Development by Design approach – proactive scenario planning to avoid, minimize or offset the negative environmental impact of development throughout Africa.

UNIVERSITY OF CINCINNATI

Adjunct Assistant Professor, Department of Biological Sciences, 2014 to Present

THE NATURE CONSERVANCY AND YALE UNIVERSITY, New Haven, CT

Postdoctoral Fellow, NatureNet Fellowship, 2013 to 2015

I lead two projects balancing the need for energy production while minimizing impacts and risks on biodiversity, provision of ecosystem services, and climate change mitigation.

- Conducting an in-depth analysis predicting future land-use requirements under various energy development scenarios produced by the Energy Information Administration. This project also highlights how land-use intensity greatly varies among renewable, conventional, and unconventional energy productions.
- In collaboration with The Nature Conservancy's Renewable Energy Initiative Team in California's San Joaquin Valley, I am developing a spatially-explicit multi-objective decision framework to reconcile conflicting, land-use demands from expanding renewable energy infrastructure, while maintaining productive farmlands and biodiversity habitat and corridors for climate change migration.

YALE UNIVERSITY, New Haven, CT

Postdoctoral Associate, School of Forestry and Environmental Studies, 2011 to 2013

As a coordinator and a key participant in the Yale Framework, I helped develop an infrastructure that encouraged practitioners to consider multiple climate adaptation strategies (e.g., preserving biodiversity and geophysical patterns, while maintaining ecological connectivity) at the species, ecosystem, and landscape scales. The Yale Framework was also foster collaboration and coordination among conservation and management agencies to help practitioners reconcile protecting ecosystems services with other compatible land uses for infrastructure development (e.g., urban growth and renewable energy siting).

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Additional responsibilities and professional accomplishments in this position include:

- Conducted outreach to private landowners, public land managers, and other groups throughout the United States to assist conservation planners and policy makers struggling to implement climate adaptation strategies into spatially-explicit and climate-resilient landscape development plans and projects.
- Serve as a technical authority in analysis and interpretation of ecological scientific data related to climate change and ecosystem management.
- Communicated ecological research results in oral and written format via conferences and peer-reviewed publications.

COLORADO PARKS AND WILDLIFE, Fort Collins, CO

Research Technician, Lynx Reintroduction Project. 2005 to 2006

As the lead spatial ecologist and data manager, my primary responsibilities were to development and manage long-term demographic and geospatial data sets. I also crafted environmental analysis for reports and peer-reviewed publications.

Additional responsibilities and professional accomplishments in this position include:

- Geospatial analysis of telemetry and vegetation data with geographic information system software (ArcGIS).
- Developed, organized, maintained the long-term dataset in geographic information system (GIS) format to improve research protocols
- Project manager and supervisor.
- Communicated ecological research results in oral and written format via conferences, reports, and peer-reviewed publications.
- Provide direction and technical support with database management and geospatial analysis to fellow scientist.

MPALA RESEARCH CENTRE, Nanyuki, Kenya

Field Supervisor, Investigating biodiversity cascades in an east Africa Savanna. 2004 to 2005

Ecologist supervising a long-term research project investigating biodiversity cascades in savanna ecosystem.

Additional responsibilities and professional accomplishments in this position include:

- Supervised and prioritized activities for crews and volunteers.
- Developed a database (Access) to facilitate analysis for reports and peer-review publications.
- Maintain and manage project equipment (including 4WD vehicles).
- Performed wildlife inventory and monitoring. Experience includes:
 - Small mammal trapping using Sherman live traps and ear tagging to record species richness and abundance of small mammals in grasslands.
 - Reptile surveys to determine species presence or absence of snake species in savanna habitats.
 - Insect surveys in collaboration with disease ecologist to investigate how sandflies (*Phlebotomus* spp.), known vectors of leishmaniasis, are dependent upon rodent populations in termite mounds. Furthermore, I conducted tick abundance surveys to evaluate the effects of tick abundance is associated with rodent density.

COLORADO PARKS AND WILDLIFE, Fort Collins, CO

Field Supervisor, Preble's Meadow Jumping Mouse. 1999 to 2001

As supervisor, I successfully lead teams of researchers conducting mark-recapture trapping and radio tracking the nocturnal movements of the federally threatened Preble's meadow jumping mouse, *Zapus hudsonius preblei*. I was also lead spatial analyst and data manager for the project. This position allowed me to developed methods for systematically and transparently assessing how species movement behavior is associated with U.S. Fish and Wildlife Service's critical habitat definition.

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Additional responsibilities and professional accomplishments in this position include:

- Developed, designed and maintained long-term geospatial datasets (movement behavior via radio-telemetry and vegetation data) to evaluate federally protected species movement capacity and critical habitat requirements in Microsoft Excel and Access.
- Produced annual summary reports of field-collected data for internal use and for compliance with state and federal wildlife monitoring protocol.
- Hired, supervised, and prioritized activities for seasonal wildlife technicians.
- Trained field crew in mark-recapture (e.g., identifying, handling, and inserted Passive Integrated Transponder (PIT) tags) and radio-tracking techniques (anesthetizing, attaching radio-collar, GPS data collection, and radio telemetry protocol).
- Wrote peer-reviewed publication and communicated ecological research results in oral presentations.

CHARLES DARWIN RESEARCH STATION, Galapagos Islands, Ecuador

Field Supervisor, Department of Protection, Ornithology. 1998 to 1999

Supervised fieldwork evaluating the reproductive biology and breeding success of the endangered Mangrove Finch.

Responsibilities:

- Lead a team of researchers (logistics, planning, and organized equipment for field excursions field research trip).
- Investigated various techniques estimating population size (point counts and line transects).
- Performed data collection, management, and analysis.
- Communicated ecological research results in publication for the National Park Service of the Galapagos and Charles Darwin Research Station.

Research Assistant, Department of Protection, 1998 to 1998

Collaborated with 6 researchers with information management, technical support, and data collection in the field. Completed challenging assignments requiring teamwork while enhancing strong interpersonal skills working closely with small groups in adverse conditions.

Responsibilities:

- Established protocol and operated a species-monitoring program with GPS equipment for future use in GIS software.
- Performed GPS data management for the department and inter-organizational GIS project.
- Implemented a protocol for data collected with Garmin GPS units in the field.
- Independently learned new software and computer technology enhancing my ability to identify and solve data management problems.
- Surveyed reptile, mammal (rodent and ungulate), and bird populations.

UNIVERSITY OF NEW HAMPSHIRE, Durham, NH

Research Assistant, Dept. of Botany. 1995 to 1995.

- Investigated tree distribution in relationship to global warming trends.
- Performed data collection, entry, and management via Microsoft Excel.

Research Assistant, Dept. of Zoology, Lakes Lay Monitoring Program. 1994 to 1994.

- Digitized scales of fresh water fish to determine age and growth rate.

SKILLS

Software: ArcGIS, Microsoft Access, Circuitscape, Maxent, ERDAS Imagine and ENVI (processing satellite imagery), Fusion (Processing LiDAR data), MARK, Distance, Adobe Illustrator

Programming: R, SAS, Python, Visual Basic

Modeling concepts: Multi-objective optimization, Graph theory, Multivariate ordination, Cluster analysis, Discrete-choice modeling, Information-theoretic inference, Linear regression models with mix effects, Resource selection models, Species distribution models for current and future climates, Spatial analysis and autocorrelation, Home range estimation, Demographic parameters estimation

TEACHING EXPERIENCE

Co-Instructor, *Conservation Science*, 2014. [FES 744]

School of Forestry and Environmental Studies, Yale University, New Haven, CT

Responsibilities: Developed curriculum and lab exercises with a real world context, selected clearly written primary literature to enhance scientific literacy for a diverse array of students (e.g., backgrounds in ecology, forestry, sociology and policy), and guided students in designing, implementing, analyzing, and present results from a semester-long project.

Teaching Assistant, *Introduction to Geographic Information Systems*. 2011. [GEOG 491]

Geography Department, University of North Carolina, Chapel Hill, NC.

Responsibilities: Lead instructor for lab section, created innovative presentations to help students become proficient with complex computer software.

Teaching Assistant, *Introduction to Distance Sampling Workshop*. 2006.

Fish, Wildlife, and Conservation Biology Department, Colorado State University, Fort Collins, CO.

Responsibilities: Organized teaching and lab material while assisting students with implementing statistical software and data interpretation.

Teaching Assistant, *Ecology of African Savannas* (Kenyan Field Portion). 2004.

Biology Department, Bard College, Annandale-on-Hudson, NY.

Responsibilities: Through hands-on learning, I taught undergraduate students how to examine scientific issues related to biological diversity in a novel ecosystem. I also mentored students implementing month-long field research projects.

Teaching Assistant, *Wildlife Data Collection and Analysis*. 2002. [FW 471]

Fish, Wildlife, and Conservation Biology Department, Colorado State University, Fort Collins, CO.

Responsibilities: I taught undergraduates field methods and statistical analysis. I also developed several lectors and lab exercises in my area of expertise (e.g., animal movement behavior).

RESEARCH GRANTS

S. Baruch-Mordo, **A. M. Trainor**, J. Kiesecker, J. Fargione, and J. Ryan

Impacts of hydraulic fracturing on water quantity and quality for nature and people: Are we prepared for the future? National Center for Ecological Analysis and Synthesis (NCEAS) and Science for Nature and People (SNAP). \$260,000

As a co-lead and a key participant in the working group, I am collaborating with hydrologists, environmental engineers, policy experts, government agencies and industry to proactively highlight potential impacts and risks of water use and waste water contamination from hydraulic fracturing on both nature and people.

PUBLICATIONS

Trainor A. M., McDonald, R.I., and Fargione, J., Energy Sprawl in the United States: The Land Use Effects of Renewable and Unconventional Energy Sources. *BioScience In Review*

McLean, K. A., **A. M. Trainor**, G. Asner, P. Jansen, M. Crofoot, M. Hopkins, C. Campbell, R. Martin, D. Knapp. Movement patterns of three arboreal primates in a Neotropical moist forest explained by LiDAR-estimated canopy structure. *Journal of Animal Ecology In Review*

Trainor A. M., C. M. Donihue, K. A. McLean, O. J. Schmitz. 2014 Projecting the likelihood of community disassembly under climate change: A geospatial food web module approach. *PlosOne In Review*

Wiederholt, R., **A. M. Trainor**, N. Michel, P. Shirey, R. Swaisgood, D. Tallamy, Cook Patton S. C. 2015. The face of conservation responding to a dynamic changing world. *Integrative Zoology*. DOI: 10.1111/1749-4877.12151

Schmitz, O. J., J. J. Lawler, P. Beier, C. Groves, G. Knight, D. Boyce, J. Bulluck, K. M. Johnston, M. L. Klein, K. Muller, J. Pierce, J. Strittholt, D. M. Theobald, S. Trombulak, **A. M. Trainor**, W. Singleton. 2015. Conserving Biodiversity in an Era of Climate Change: Some Practical Guidance about Adaptation Approaches in Support of Land-use Planning. *Natural Areas Journal*. 35:190-203

PUBLICATIONS (cont.)

- Trainor A. M.** and O. J. Schmitz. 2014. Infusing food web ecology into analyses of geographic distributions of Species. *Ecology Letters*. 17: 1507-1517
- Breckheimer, I., N. M. Haddad, W. F. Morris, **A. M. Trainor**, B. Hudgens, W. Fields, R. T. Jobe, A. Moody, and J. R. Walters. 2014. Defining and evaluating the umbrella species concept for conserving and restoring landscape connectivity. *Conservation Biology*. 28: 1584-1593
- Schmitz, O. J., and **A. M. Trainor**. Adaptation approaches for conserving ecosystems services and biodiversity in dynamic landscapes caused by climate change. V. Sample and R. P Bixler (eds). *Forest Conservation and Management in the Anthropocene: Conference Proceedings*. RMRS-P-71. Fort Collins, CO US Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pg 297-309
- Trainor A. M.**, O. J. Schmitz, J. Ivan, and T. M. Shenk. 2014. Enhancing species distribution modeling by characterizing predator-prey interactions. *Ecological Applications*. 24: 204-216
- Trainor A. M.**, J. R. Walters, W. F. Morris, J. Sexton, and A. Moody. 2013. Empirical estimation of dispersal resistance surfaces: A case study with Red-cockaded Woodpeckers. *Landscape Ecology*. 28:755-767
- Trainor A. M.**, J. R. Walters, D. L. Urban and A. Moody. 2013 Evaluating the effectiveness of a Safe Harbor Program for connecting wildlife populations. *Animal Conservation*. 16: 610-620
- Trainor A. M.**, T. M. Shenk, and K. R. Wilson 2012. Spatial, temporal, and biological factors associated with Preble's meadow jumping mouse (*Zapus hudsonius preblei*) home range. *Journal of Mammalogy*. 93:429-438
- Trainor A. M.**, T. M. Shenk, and K. R. Wilson. 2007. Microhabitat characteristics of Preble's meadow jumping mouse high-use areas. *Journal of Wildlife Management*. 71:469-477
- Trainor A. M.**, K. R. Wilson, and T. M. Shenk. 2007. Response of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) to resource supplementation. *American Midland Naturalist*. 158:338-353

PUBLICATIONS IN PREPARATION

- Smith, J. R.* and **Trainor, A. M.** Modeling the distribution of invasive plant species: Moving beyond the bioclimatic envelope. Target Journal: *Nature Climate Change*
- Trainor A. M.**, J. R. Walters, and A. Moody. Environmental and conspecific cues influencing prospecting behavior. Target Journal: *Animal Behaviour*

SELECTED PRESENTATIONS

- Trainor A. M.** 2015. Hydraulic Fracturing and Water: Are We Prepared for Future Impacts? The Nature Conservancy Board of Trustee's Meeting, Austin, TX. *Invited*
- Trainor A. M.** 2015. "Finding common ground: Integrating spatial ecology and conservation science into land-use planning". Department of Biological Sciences, University of Cincinnati, Cincinnati, OH. *Invited*
- Trainor A. M.** 2015. "Finding common ground: Integrating spatial ecology and conservation science into land-use planning". Department of Biological Sciences, Ohio University, Athens, OH. *Invited*
- Trainor A. M.** and O. J. Schmitz. 2014. "Infusing community ecology into species geospatial distributions: A Trophic module approach. Gordon Research Conference on Predator-Prey Interactions". Ventura, CA
- Trainor, A. M.** 2011. "A Framework for Integrating Climate Adaptation and Landscape Conservation Planning. Ecological Society of America. Emerging Issues Conference". Shepherdstown, WV
- Trainor A. M.**, J. R. Walters, and A. Moody. 2011. "Evaluation of Safe Harbor Program influence on current and future connectivity: Case study of the Red-cockaded Woodpecker" United States Regional Association of the International Association for Landscape Ecology (US-IALE). Newport, RI
- Trainor A. M.**, K. R. Wilson, and T. M. Shenk. 2007. "Spatial Response of Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) to Resource Supplementation" Association of American Geographers. San Francisco, CA
- Trainor A. M.** K. R. Wilson, and T. M. Shenk. 2006. "Changes in the spatial distribution of Preble's meadow jumping mouse after resource supplementation." Eastern Oregon Agricultural Research Center, Oregon State University, Union, OR. *Invited*
- Trainor A. M.**, K. R. Wilson, and T. M. Shenk. 2004. "Influence of resource addition on the distribution of Preble's meadow jumping mouse." The Wildlife Society. Burlington, VT.
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HONORS AND AWARDS

- Ecological Society of America Travel Award 2012. \$1000. Ecological Society of America
- Graduate Education Advancement Board Impact Award. 2010. \$500. University of North Carolina Graduate School
- USDA-NIFA Professional Enhancement Award. 2010. \$500. International Association for Landscape Ecology
- Interdisciplinary Research Fellowship. Spring 2009. University of North Carolina Graduate School
- GIS, Remote Sensing, and Telemetry Working Group 2008. Travel Grant. \$500. The Wildlife Society
- AAG Biogeography Best Poster Award 2008. \$100. Association of American Geographers
- AAG International Geographic Information Fund 2007. Student Travel Award. \$500. Association of American Geographers
- Cum Laude and Dean's List. University of New Hampshire

PROFESSIONAL AFFILIATIONS

- Society for Conservation Biology
- Ecological Society of America
- United States Regional Association of the International Association for Landscape Ecology (US-IALE)
- American Society of Mammalogists
- The Wildlife Society

PROFESSIONAL SERVICES AND ACTIVITIES

Reviewer: PNAS, PLOSOne, Journal of Biogeography, Biological Conservation, Landscape Ecology, Canadian Journal of Zoology, The Southwestern Naturalist, and Journal of Applied Ecology, Ecological Modelling

Guest editor: The Southeastern Naturalist
Symposia Convener

Schmitz, O.J., A.M. Trainor, and P. Beier. 2012. Towards Conservation Assessments for Climate Adaptation: Presentation and Evaluation of a Framework. North America Congress for Conservation Biology. Oakland, CA

Costanza, J., A. M. Trainor, and M. Simon. 2009. The Social Context of Landscape Conservation: Communication and Collaboration with Citizen Stakeholders. United States Regional Association of the International Association for Landscape Ecology. Snowbird, UT

Women in Science at Yale Mentor

Board Member: Triangle Chapter of the Society for Conservation Biology 2008-2009

Treasurer: Department of Geography Graduate Student Association 2007-2008

Department of Geography Senator for UNC Graduate and Professional Student Federation 2006 – 2007
