

CURRICULUM VITAE

Jennifer L. Murrow

ADDRESS:

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Environmental Science and Policy Program
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PROFESSIONAL INTERESTS

- Spatial ecology as it relates to wildlife habitats and demographics
 - Complex integration of Geographical Information Systems (GIS) and wildlife management
 - Professional conflict resolution, mediation, and conservation planning
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WORK EXPERIENCE

Wildlife Ecology Senior Lecturer/Advisor. Environmental Science Policy Program, Department of Environmental Science and Technology, University of Maryland (UMD), College Park, MD. August 2011 – Current.

Teaching four 400-level wildlife courses at UMD: Principles of Wildlife Ecology and Management, Wildlife Field Techniques, Wildlife Habitat Management and Modeling, and Environmental Conflicts and Decision Making. I helped form and now advise UMD's first student chapter of The Wildlife Society (TWS). I am responsible for the advising of approximately 50 wildlife ecology undergraduate students. I am the primary advisor for 2 PhD students and 1 Master's student and am a member-at-large for 4 Master's students in the Marine Estuarine and Environmental Science program (MEES) and the Environmental Science and Technology department (ENST).

My research lab is focused on landscape ecology of wildlife with emphasis on habitat use analyses and spatially explicit modeling. I want to facilitate management needs in the face of current challenges. I am currently working on and directing several projects: a habitat and management end point model for black bears throughout Louisiana and Arkansas; bat habitat use in White Nose Syndrome positive areas from Washington D.C. to the rural Eastern shore of Maryland; assessing the connectivity of habitat used by suburban white-tailed deer population in Howard County, Maryland; and completing an eastern box turtle relocation project in Washington D.C.

I conducted an assessment of the climate change vulnerability of all terrestrial species and habitats in Washington, D.C. for their wildlife action plan. I served on the interagency management committee to identify species of concern and define strategies and coordinate management of those species within the District of Columbia. This required working with state, federal, and district agencies, and NGO's.

Contact: Joe Sullivan, jsull@umd.edu

Consulting Wildlife Ecologist. Research Triangle Institute International. 3040 East Cornwallis Rd., Research Triangle Park, NC 27709-2194. 2014 – 2015. Evaluated North Carolina habitat suitability model, estimated potential elk population size in suitable locations, develop elk population projections with various harvest rates, and evaluate scaled feasibility of a sustainable and hunted elk population via spatially explicit decision support models and population viability analyses.

Project Manager: Marion Deerhake (919) 316-3410

Postdoctoral Research Associate. Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville. May 2010 – March 2013. Finalized a model of endangered panther habitat in southern Florida. Completed upgrades and edits to a GIS tool that quantitatively assesses the effect that land use changes have on suitable panther habitat. That utility is a landscape-level decision-making tool that will help managers evaluate the status of the panther population for restoration area selection as development/land use change occurs. I extended my previously developed black bear habitat model throughout Louisiana and built a GIS-utility or decision support tool, similar to the panther tool, to quantitatively assess the impact of user-defined landscape changes on the quality of bear habitat. This tool will help managers evaluate the impacts of future landscape changes from development and climate impacts (via water) on the habitat of the threatened Louisiana black bear.

Contact: Joe Clark (865) 974-0739 ext. 4790

Advanced Natural Resources Services, Inc. President and Founder. January 2009 – December 2011. Environmental consulting firm: Developed and wrote the environmental assessment and elk management plan for Great Smoky Mountains National Park for 2010–2025. Conducted all National Environmental Policy Act compliance for the Environmental Assessment. Served as the NPS representative and lead negotiator at numerous interagency committees and public meetings, including federal, state, tribal, and private interest groups.

Postdoctoral Research Associate. Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville. August 2007 – April 2010. Investigated the changes of black bear habitat in coastal Louisiana resulting from hurricanes Katrina and Rita. Investigated the habitat and health of butternut trees throughout the Appalachian mountains. Investigated changes in tree occurrence with latitude and future climate impacts on the rare tree species.

Supervisor: Scott Schlarbaum (865) 974-7993

Graduate Research Assistant. Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville. May 2001 – August 2007. Investigated dispersal and mortality rates and causes of mortality of reintroduced elk. Determined whether mortality or post-release movements vary by age, sex, or reproductive status. Reevaluated disease risk assessment. Assessed elk habitat use. Evaluated negative impacts of elk reintroduction (e.g., damage to native vegetation and T and E species, agricultural crops, fence damage, highway mortality). Assessed the feasibility, methodology, approach, and probability of success of releasing elk to establish a permanent, viable population in Great Smoky Mountains National Park.

Graduate Research Assistant. Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville. August 1998 – May 2001. Investigated the black bear populations within the southern Appalachians as a metapopulation. Developed a metapopulation model for black bears in the southern Appalachians. Identified key parameters that influence black bear populations. Project required extensive use of with a Unix operating system, ArcInfo, and ArcView. Used a variety of univariate and multivariate statistical analyses.

Graduate Black Bear Project Assistant. Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville. August 1998 – May 2001. Captured, immobilized, and released black bears. Captured bears using barrel traps, snares, and in winter dens. Fitted captured bears with ear tags, radio collars, and applied tattoos. Extracted a premolar for aging and collected blood, hair, and morphometric data. Radio-tracked collared bears by ground and aerial telemetry. Compiled and entered data into computer database.

Wildlife Technician. Louisiana State University. Summer 1998. Assisted a graduate student investigating black bear ecology in St. Mary parish, Louisiana. Captured, immobilized, and released black bears. Captured bears using barrel traps and snares. Fitted captured bears with ear tags, radio collars, and applied tattoos. Extracted a premolar and collected blood, hair, and morphometric data. Radio-tracked collared bears by ground telemetry. Assisted with wetlands delineation.

Wildlife Technician. Clemson University and USDA Forest Service. Summer 1997. Francis Marion National Forest. Conducted bait-station transects throughout the forest for black bears.

SCDNR Camp Wildwood Counselor. South Carolina Department of Natural Resources. Summers 1994 – 2001. Responsible for teaching 100 high school students about black bear ecology and natural resources.

Wildlife Volunteer. Clemson University. Summers 1996 – 1998. Assisted a graduate student investigating white-tailed deer mortality in Rhems, South Carolina. Captured and released white-tailed deer using rocket nets. While physically restraining deer, fitted deer with ear tags and radio-collars and visually estimated age. Monitored survival of radio collared deer via telemetry. Investigated all deer-vehicle collisions.

Wildlife Volunteer. South Carolina Department of Natural Resources. Summers 1997–1998. Assisted biologists trapping Canada geese. Corralled, banded, and released geese at alternative sights. Dealt with public relations regarding animal rights.

Veterinary Technician. Animal Hospital of North Charleston. 1990 – 1995. Responsible for vaccinating and general care of animals. Performed teeth cleaning and assisted in surgery. Conducted all wildlife rehabilitation including opossums, squirrels, and birds.

CAREER DEVELOPMENT ACTIVITIES

Attended

23rd The National Wildlife Society Meeting, 2016
Modeling abundance and survival using BUGS and R by Marc Kéry of the Swiss Ornithological Institute, and Andy Royle of Patuxent Wildlife Research Center, 2015.
SESYNC: Teaching Socio-Environmental Synthesis with Case Studies, 2015
19th The National Wildlife Society Meeting, 2012
7th-10th Eastern Elk Management Workshop, 2002–2008
15th The National Wildlife Society Meeting, 2008
10th The National Wildlife Society Meeting, 2003
7th The National Wildlife Society Meeting, 2000
6th The National Wildlife Society Meeting, 1999
15th Eastern Black Bear Workshop, 1998
The 11th International Conference on Bear Research and Management, 1998
The Annual Tennessee Chapter of The Wildlife Society Meeting, 1998
The Annual South Carolina Chapter of The Wildlife Society Meeting, 1997, 2005
The Wildlife Society Southeastern Student Conclave, 1997
The Southeastern Fish and Wildlife Agency Conference, 1997

Organizations

National and Section member of The Wildlife Society
International Association for Bear Research and Management (IBA)
Society for Conservation Biology
American Society of Mammalogists

CERTIFICATION

- Chainsaw safety: U. S. Forest Service, 1997 Witherbee Ranger Station, Cordesville, SC
- Special-Use flight training: Department of Interior, 2001 Gatlinburg, TN
- Safe-Capture Chemical Immobilization of Animals, 1997 and 2001 Gatlinburg, TN; 2011 Laurel, MD

- Certified Professional Wildlife Biologist, The Wildlife Society

AWARDS/OFFICES HELD

- President-elect, MD-DE Chapter of The Wildlife Society, 2016
- Member at Large, Early Career Professional Working Group, The Wildlife Society, 2016
- UMD-ENST Excellence in Teaching Award, 2014
- UMD-AGNR Best Educator/Advisor Nomination, 2013
- Presidential Management Fellow, 2006
- Graduate Representative, Student Chapter of The Wildlife Society, University of Tennessee, 1999–2000
- Calhoun College Honors Society, Clemson University, 1995–1998
- Algernon Sydney Sullivan Award, Clemson University, 1998
- Cum Laude, Clemson University, 1998
- Secretary/Treasurer, Student Chapter of The Wildlife Society, Clemson University 1997–1998
- Outstanding Undergraduate Award, Clemson University 1997
- Sergeant At Arms, Sigma Alpha, Clemson University, 1997
- Alpha Zeta Honor Society, Clemson University, 1996–1998
- Gamma Sigma Delta Agricultural Honors Society, Clemson University, 1996–1998
- Golden Key Honors Society, Clemson University, 1995–1998
- President's honor list, Clemson University 1996–1998

EDUCATION

Ph.D., Natural Resources, August 2007, University of Tennessee, Knoxville, TN,
USA GPA: 4.0/4.0

Dissertation Title: An experimental release of North American elk into Great Smoky Mountains National Park.

M.S., Wildlife Science, May 2001, University of Tennessee, Knoxville, TN, USA

Minors: Statistics, Environmental Policy

GPA: 4.0/4.0

Thesis Title: A Metapopulation analysis of black bears in the Southern Appalachians.

B.S., Aquaculture, Fisheries, and Wildlife Biology, August 1998, Clemson University, Clemson, SC, USA

GPA: 3.64/4.0

HONORS Thesis: Accurately aging white-tailed deer jaws

PUBLICATIONS

In Review or In Preparation

- Rohrbaugh, L., A. Spivy, and **J. L. Murrow**. 2017. Box turtle relocation management and success in an urban environment. *Journal of Wildlife Management*. (*In Preparation*)
- Murrow, J. L.** and J. D. Clark. 2017. A state-wide habitat model and planning tool for Louisiana Black Bears. *Environmental planning*. (*In Preparation*)
- Murrow, J. L.** and J. D. Clark. 2017. Habitat use and vegetation impacts of experimentally released elk in Great Smoky Mountains National Park. (*In Preparation*)
- Clark, J. D., J. Yarkovich, and **J. L. Murrow**. 2017. Elk in Great Smoky Mountains National Park, a section in Chapter 5 of the Book “Elk Restoration in Eastern North America”. (*In Review*)
- Muller, L.; **J. L. Murrow**, J. Lupardus, J. D. Clark, J. Yarkovich, W. Stiver, K. E. Delozier, B. Slabach, J. Cox, and B. Miller. 2017. Genetic Structure in Elk Persists after Reintroduction in Tennessee and North Carolina. (*In Review in Journal of Wildlife Management*)

Published or In Press

- Deerhake, M., **J. L. Murrow**, K. Heller, D. Cobb, and B. Howard. 2016. Assessing the Feasibility of a Sustainable, Hunttable Elk Population in North Carolina. *Journal of the Southeast Association of Fish and Wildlife Agencies* 3:303–312 .
- Pack, S., M. Ferreira, R. Krithivasanc, **J. L. Murrow**, E. Bernarde, and M. Masciac. 2016. Protected Area Downgrading, Downsizing, and Degazettement (PADDD) in Brazil and its impacts on deforestation in the Amazon. *Biological Conservation* 197:32–39.
- Murrow, J. L.** 2015. Climate Change Vulnerability Assessments Chapter *in* District of Columbia Wildlife Action Plan 2015 update. Pages 100-116. District Department of the Environment, Washington, DC.
- Clark, J. L., J. Laufenberg, M. Davidson, and **J. L. Murrow**. 2015. Connectivity among subpopulations of Louisiana black bears as estimated by a step-selection function. *Journal of Wildlife Management* 79: 1347–1360.
- Murrow, J. L.**, C. A. Thatcher, F. T. van Manen, and J. D. Clark. 2013. A data-based conservation planning tool for Florida panthers. *Environmental Modelling and Assessment* 18:159–170.

- Murrow, J. L.**, J. D. Clark, S. Flanagan, and C. Thatcher. 2013. A tool for estimating effects of land-use changes on Louisiana black bear habitat. Final Report. U.S. Fish and Wildlife Service, Ecological Services Field Office, Lafayette, Louisiana, USA.
- Murrow, J. L.** and J. D. Clark. 2012. Effects of Hurricane Katrina and Rita on Louisiana Black Bear Habitat. *Ursus* 23: 192–205.
- Yarkovich, J., J. D. Clark, and **J. L. Murrow**. 2011. Bear relocation to reduce calf predation at Great Smoky Mountains National Park. *Journal of Wildlife Management* 75: 1145–1154.
- Kindall, J. K., L. I. Muller, J. D. Clark, Lupardus, J. L., and **J. L. Murrow**. 2011. Population viability analysis to identify management priorities for reintroduced elk in the Cumberland Mountains, Tennessee. *Journal of Wildlife Management* 75: 1745–1752.
- Thatcher, C. A., **J. L. Murrow**, F. T. van Manen, and J. D. Clark. 2010. Florida Panther Habitat Estimator for ArcMap™ (version 2.0). U.S. Geological Survey, Leetown Science Center, Southern Appalachian Research Branch, Knoxville, Tennessee, USA.
- Murrow, J. L.**, J. D. Clark, E. K. Delozier. 2009. Demographics of an experimentally Released Population of Elk in Great Smoky Mountains National Park. *Journal of Wildlife Management* 73(8): 1261–1268.
- Murrow, J. L.** and J. D. Clark. 2009. Effects of Hurricane Katrina and Rita on black bear habitat in southern Louisiana. Final Report. U.S. Fish and Wildlife Service, Ecological Services Field Office, Lafayette, Louisiana.
- Murrow, J. L.** 2007. An experimental release of elk into Great Smoky Mountains National Park. Dissertation. University of Tennessee, Knoxville, USA.
- Ramsay, Edward C.; Greer, Leah; Delozier, Kim; **Murrow, Jennifer**; Zagaya, Nancy; Patton, Sharon; New, John. 2001. Veterinary participation in an experimental release of elk (*Cervus elaphus*) into the Great Smoky Mountain National Park. *In* Proceedings American Association of Zoo Veterinarians American Association of Wildlife Veterinarians Association of Reptilian and Amphibian Veterinarians National Association of Zoo and Wildlife Veterinarians Joint Conference. Eds. Baer, Charlotte Kirk; Willette, Michelle M.
- Murrow, J. L.** 2001. A Metapopulation analysis of black bears in the Southern Appalachians. Thesis. University of Tennessee, Knoxville, Tennessee, USA.
- Murrow, J. L.** 1997. Black bear survey of Francis Marion National Forest. Produced by USDA Forest Service, Witherbee Ranger Station.

TEACHING

ENST 460: Principles of Wildlife Management. Class size: ~45. Spring semesters at University of Maryland. 2012-present.

ENST 461: Urban Wildlife Ecology and Management. Class size: ~45. Spring semesters at University of Maryland. 2012-2016.

ENST 462: Field Techniques in Wildlife Ecology and Management. Class size: ~15. Fall semesters at University of Maryland. 2012-present.

ENST 463: Wildlife Habitat and Demographic Modeling. Class size: ~15. Fall semester at University of Maryland. 2013.

ENST 466: Wildlife Habitat Ecology and Management. Class size: ~20. Spring semesters at University of Maryland. 2014-present.

ENST 467: Wildlife Habitat Modeling. Class size: ~12. Spring semesters at University of Maryland. 2014-present.

ENST 487: Conflict resolution and Structured Decision Making in Natural Resources. Class size: ~20. Fall semesters at University of Maryland. 2016-present.

ENSP 399: Research topics in ENSP: Fall 2014: Home range, Utilization distributions, and movements of box turtles in DC. Fall 2015-current: Urban White-tailed deer movements in relation to tick populations in a Lyme positive area.

PRESENTATIONS

Murrow, J. L. 2016. Integrating species needs into forest management plans. WEBINAR for Continued Forestry Education credit from the Society of American Foresters. GCPO LCC.

Murrow, J. L. 2016. Balancing the Needs of Bears and Foresters: A Methodology to Identify Specific Forest Management Goals that Regionally Benefit an Umbrella Species. The National Wildlife Society Conference, Raleigh, N.C., USA.

Murrow, J. L. 2015. Spatial landscape analyses on black bears in Louisiana from immediate weather events to long-term shifting landscapes. Chesapeake Bay Laboratory, Solomons Island, MD. (*invited*)

Muller, L. I., J. L. Murrow, J. D. Clark, K. Delozier, J. L. Lupardus, and J. L. Kindall. 2013.

Relationship between genetic structure and release methodology to female elk movements after translocation. The Wildlife Society 20th Annual Meeting, Milwaukee, Wisconsin. (*invited*)

A black bear habitat model and conservation planning tool for the state of Louisiana. Oral presentation at the 19th The National Wildlife Society Meeting, 2012.

Habitat use and availability and vegetative impacts of elk in Great Smoky Mountains National Park. Oral presentation at the 15th The National Wildlife Society Meeting, 2008.

Numerous cooperative professional presentations to NC State officials, TN State officials, NPS staff, and USFS staff, 2001–2010.

Approximately 200 talks to various groups from elementary schools to government organizations, 2001–2007: An experimental release of North American elk into Great Smoky Mountains National Park.

A Metapopulation Analysis of the Black Bear Population within the Southern Appalachian Assessment. 2000. Presented in poster format at The 7th National Wildlife Society Meeting.

A Metapopulation Analysis of the Black Bear Population within the Southern Appalachian Assessment. 1999. Presented to the faculty and students at the University of Tennessee, Department of Forestry, Wildlife, and Fisheries.

Black bears of the Great Smoky Mountains National Park. 1998–2001. Wesley Woods, and The Great Smoky Mountain Institute at Tremont.

GRANT PROPOSALS

Li, Andrew and J. L. Murrow. 2016. GPS Tracking of White Tailed Deer Movement and Tick Population Surveillance. USDA-ARS. Year 1: Funded \$155,044. Projected 5 year total funding: \$742,590

Prosser, Diann and J. L. Murrow. 2016. Elucidating recruitment stressors for Maryland state endangered common terns using a minimally invasive surveillance system. Funded \$27,899.

Murrow, J. L., J. D. Clark, and C. Thatcher. 2014. Black Bear Habitat Assessment with Associated Landscape Endpoints. GCPO LCC. Funded \$51,066

Murrow, J. L. and J. D. Clark. Louisiana Black Bear Project. 2009. A Habitat

Assessment Tool for the Louisiana Black Bear. USFWS. Funded \$155,000

F. T. vanmanen, J. L. Murrow, and J. D. Clark. 2009. Extensions and revision: Estimating effects of land-use changes on Florida panther habitat. USFWS. Funded \$25,000.

Murrow, J. L. and T. Fendley. 1998. Population ecology of black bears on the coast of South Carolina. Proposal submitted to South Carolina Department of Transportation. Proposal was funded by Flour Daniel Engineering Firm. Funded \$127,000.

GRADUATE COMMITTEES

Current:

Paul Marban (MS: 2018 expected): Identifying recruitment stressors for common tern (*Sterna hirundo*) through use of a minimally invasive surveillance system. MEES-Primary

Annette Spivy (PhD: 2018 expected): Climate and land use policy impacts on black bear habitat throughout the GCPO LCC. GEOG-Primary

Shannon Pederson Browne (PhD: 2018 expected): Evaluating relationships between bats and landscape characteristics in a White Nose Positive Region: Does Urbanization Play an Important Role? MEES-Primary

Completed:

Kendall Simon (PhD: 2016): Bald Eagle (*Haliaeetus leucocephalus*) Population Monitoring as an Indicator of Great Lakes Ecosystem Health. ENST

Patrice Nielson (PhD: 2016) Presence and Habitat Requirements of Secretive Marshbirds in the Washington, DC metro area. ENST

Claire Nemes (MS: 2016 expected) Cerulean Warbler (*Setophaga cerulea*) Microhabitat Use in Southern Indiana. BALL STATE UNIVERSITY

Syrena Johnson (MS: 2016 expected) Climate impacts on snow leopards (*Panthera uncia*) throughout the Middle East and Asia. CONS

Jessica O'Conner (MS: 2016) The foraging habits and resultant functional response of American black ducks (*Anas rubripes*). MEES

Annette Spivy (MS: 2015) Black Bear Habitat Assessment with Associated Landscape Endpoints. CONS

Robb Krehbiel (MS: 2015) Bears on the Move: Challenges and Opportunities Associated with Grizzly Bear Connectivity in the Northern Rockies. CONS

Shalynn M. Pack (MS: 2014) Protected Area Downgrading, Downsizing, and Degazettement (PADDD) in Brazil and its impacts on deforestation in the Amazon. CONS

Kendall Simon (MS: 2013): Bald Eagle (*Haliaeetus Leucocephalus*) Productivity and Reproductive Fitness in Michigan, 1961-2010 and Settlement Patterns And Density-Dependent Effects In A Recovering Bald Eagle (*Haliaeetus Leucocephalus*) Population in Michigan, 1961-2010. ENST

Cara Applestein (MS: 2012): Bird Community Response to Single-Tree Selection Timber Harvests in Northern Hardwood and Mixed-wood Forests. CONS

Alice Chmil (MS: 2012): Can Collaborative Forest Landscape Restoration Projects be Used for Wildlife Conservation. CONS

REVIEWER/PROFESSIONAL COMMITTEES

Northeastern Naturalist

Subject matter expert: mammal technical committee: DC Wildlife Action Plan Technical Committee: 2013-2015

Southeastern Naturalist

Ursus

ACADEMIC SERVICE

Spatial Lab Restructuring Committee—ENST, UMD, College Park, MD 2016-present

Diversity Committee—ENST, UMD, College Park, MD 2014-2015

Graduation Marshal—ENSP, UMD, College Park, MD 2013-present

Hiring Search Committees (3)—ENSP and ENST, UMD, College Park, MD 2014-present

PERSONAL

SKILLS Computing

Windows, Unix, ArcMap, ArcView, ArcInfo, Microsoft Office (Excel, Word, PowerPoint), Program Mark, Fragstats, Riskman, Biomapper, GME, Statistical applications software (SAS), Program R, Avenue & Python programming, website/blog generation

Trapping and Animal Handling

Expert experience trapping, anaesthetizing black bears and elk

Experience trapping white-tailed deer, Canada geese, mink, grouse, and many other small mammals

Experienced at immobilizing large mammals with a jab stick, blow gun, CO₂ pistol, and dart rifle

Experienced at hiking (8-10 miles/day) with pack (40lbs.)

Remote Sensing

Expert experience fitting radio collars to black bears, white-tailed deer, elk

Proficient with radio telemetry, including ground triangulation and aerial telemetry (fixed-wing). Experienced at identifying most eastern tree species and many forbs and grasses.

Equipment

4-wheel drive vehicles, manual transmission, tractors, front-end loader (bobcat), all-terrain-vehicles (ATV), chainsaw