

Clark S Rushing

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EDUCATION

2008–14 Ph.D. Behavior, Ecology, Evolution, & Systematics
University of Maryland, College Park, MD USA
Causes and consequences of long-distance dispersal in a migratory bird
Co-advisors: Dr. Pete Marra & Dr. Michele Dudash

2001–05 B.A. Ecology & Evolutionary Biology
Princeton University, Princeton, NJ, USA
Effects of beach nourishment on loggerhead sea turtle nesting success
Advisor: Dr. Rosemary Grant
Departmental Honors

PROFESSIONAL EXPERIENCE

2016– Research associate
Migratory Bird Center
Smithsonian Conservation Biology Institute
Washington, DC

2015–16 George Didden post-doctoral fellow
Migratory Bird Center
Smithsonian Conservation Biology Institute
Washington, DC

2014–15 James Smithson post-doctoral fellow
Migratory Bird Center
Smithsonian Conservation Biology Institute
Washington, DC

2007–08 Hazardous Waste Specialist
Boulder County Resource Conservation Division
Boulder, CO

2007 Ecological Monitoring Intern
The Nature Conservancy
Boulder, CO

2005–07 Remedial Project Manager
US Environmental Protection Agency
Atlanta, GA

PUBLICATIONS

2017 Cohen, E.B., J.A. Hostetler, M.T. Hallworth, **C.S. Rushing**, T.S. Sillet, P.P. Marra. A quantitative definition for the strength of migratory connectivity. *Methods in Ecology and Evolution*. In press.

2017 **Rushing**, C.S., J.A. Hostetler, T.S. Sillet, P.P. Marra, J. Rotenberg, T.B. Ryder. Full annual cycle population model identifies seasonal and habitat-specific drivers of population growth in a migratory bird. *Ecology*. In press.

2017 **Rushing**, C.S., P.P. Marra, C.E. Studds. Determining breeding origins of migratory birds using stable isotopes and breeding abundance on continuous surfaces. *Ecology and Evolution*. 7(11): 3847–3855.

2016 Boves, T.J., D. A. Buehler, **C.S. Rushing**, G.D. Fairhurst. Evaluating the role of corticosterone in carry-over effects, and the dependency of age, in a declining migratory songbird. *Conservation Physiology*. 4(1): cow041. doi: 10.1093/conphys/cow041.

2016 Tesson, S.V., B. Okamura, R.Y. Dudaniec, W. Vyverman, J. Londahl, **C.S. Rushing**, A. Valentini, A.J. Green. Integrating micro and macro-organism dispersal: ways, techniques and challenges with particular focus on co-dispersal. *Ecoscience*. 22: 109–124.

2016 **Rushing**, C.S., T.B. Ryder, P.P. Marra. Quantifying drivers of population dynamics for a migratory bird throughout the annual-cycle. *Proceedings of the Royal Society, B*. 283(1823): 20152846.

2015 **Rushing**, C.S., T.B. Ryder, A.L. Scarpignato, J.F. Saracco, P.P. Marra. Using demographic attributes from long-term monitoring data to delineate natural population structure. *Journal of Applied Ecology*. 53(2): 491–500.

2015 **Rushing**, C.S., P.P. Marra, M.R. Dudash. Winter habitat quality but not long-distance dispersal influence apparent reproductive success in a migratory bird. *Ecology*. 97(5): 1218–1227.

2015 **Rushing**, C.S., M.R. Dudash, C.E. Studds, P.P. Marra. Annual variation in long-distance dispersal driven by breeding and non-breeding season climatic conditions in a migratory bird. *Ecography*. 38(10): 1006–1014.

2015 **Rushing**, C.S., M.R. Dudash, P.P. Marra. Habitat features and long-distance dispersal modify the use of social information by a long-distance migratory bird. *Journal of Animal Ecology*. 84(6): 1469–1479.

2014 **Rushing**, C.S., T.B. Ryder, J.F. Saracco, P.P. Marra. Assessing migratory connectivity of a long-distance migratory bird using multiple intrinsic markers. *Ecological Applications*. 24(3): 445–456.

GRANTS AND AWARDS

Grants

2016 Conservation Grant, Disney Conservation Fund, \$25,000

2012 Wetmore Memorial Research Award, American Ornithologists Union, \$2,490

2012 Research Grant, American Society of Naturalists, *honorable mention*

2012 Research Grant, Maryland Ornithological Society, \$1,200

2012 Research Grant, Washington Biologists Field Club, \$3,000

2011 Dorothy Blake Memorial Fund, Baltimore Birding Club, \$3,000

2011 Research Grant, Maryland Ornithological Society, \$1,200

2011 COSMOS Foundation Scholars Program, \$1,250

2008 Darwin Fellowship, University of Maryland, \$2,000

2008 Boulder County Small Grants Program, \$500

Fellowships

2015–16 George Didden Conservation Biology Post-doctoral fellowship, \$50,000

2014–15 James Smithson Post-doctoral fellowship, \$50,000

2012–13 Smithsonian Pre-doctoral fellowship, \$15,000

2013 Ann G. Wylie Dissertation fellowship, \$10,000

Awards

2013 Cooper Ornithological Society Student Presentation Award

2013 Jane Pritchard Outstanding Teaching Assistant Award

2013 AOU-COS Student Travel Award, \$333

2012 Biology Department Travel Award, \$500

ORAL PAPERS

2017 **Rushing, C.S.** *Estimability of migration survival rates from integrated CJS models*. Euring Analytical Conference, Barcelona, Spain.

2017 Sillett, T.S., C.S. **Rushing** *Survival of passerines during spring and fall migration: the importance of carry-over effects*. Euring Analytical Conference, Barcelona, Spain.

2016 **Rushing, C.S.**, S. Sillett, P.P. Marra, T.B. Ryder. *Using integrated population models to estimate seasonal survival and full-annual-cycle drivers of population dynamics*. North American Ornithological Conference, Washington, DC.

2016 **Rushing, C.S.**. *Developing full annual cycle population models to advance migratory bird conservation*. North American Ornithological Conference, Washington, DC.

2016 **Rushing, C.S.**, L. Powell. *Developing a full annual cycle model for a rapidly declining but data poor migratory bird, the Rusty Blackbird*. North American Ornithological Conference, Washington, DC.

2015 Ryder, T.B., C.S. **Rushing**, T. Wilbert, S. Sillett, P.P. Marra. *Thinking outside the black box: Novel approaches to measuring recruitment and source-sink dynamics in migratory species*. Ecological Society of America Annual Meeting, Baltimore, MD.

2015 **Rushing, C.S.**, T.B. Ryder, P.P. Marra. *Regional variation in the strength of breeding vs non-breeding factors limiting populations of a declining migratory bird*. Ecological Society of America Annual Meeting, Baltimore, MD.

2014 **Rushing, C.S.**, E.B. Cohen, J.A. Hostetler, P.P. Marra. *Quantifying the influence of long-distance dispersal on migratory connectivity strength*. American Ornithologists Union Annual Meeting, Estes Park, CO.

2014 **Rushing, C.S.**, T.B. Ryder, P.P. Marra. *Combining demographic data, migratory connectivity, and remote sensing data to quantify drivers of population dynamics in a migratory bird*. American Ornithologists Union Annual Meeting, Estes Park, CO.

2013 **Rushing, C.S.**, M.R. Dudash, P.P. Marra. *Climate drives long-distance dispersal in a migratory bird*. American Ornithologists Union/Cooper Ornithological Society Annual Meeting, Chicago, IL. (Cooper Ornithological Society Student Presentation Award).

2012 **Rushing, C.S.**, M.R. Dudash, P.P. Marra. *Quantifying the reproductive consequences of long-distance dispersal in a migratory bird, the American redstart*. North American Ornithological Conference, Vancouver, BC.

2011 **Rushing, C.S.**, M.R. Dudash, P.P. Marra. *Reproductive consequences of long-distance dispersal in a migratory bird, the American redstart*. BEES graduate program recruitment, University of Maryland, College Park, MD.

INVITED TALKS

2017 **C.S. Rushing**, S. Sillett, P.P. Marra, Ryder, T.B. *Developing full-annual-cycle models to inform conservation of declining migratory birds*. Department of Natural Resources, Cornell University, Ithaca, NY.

2016 **C.S. Rushing**, S. Sillett, P.P. Marra, Ryder, T.B. *Using integrated population models to estimate seasonal survival and full-annual-cycle drivers of population dynamics*. Patuxent Wildlife Research Center, Laurel, MD.

2016 **Rushing, C.S.**. *Full-annual-cycle population models: Theory and application to migratory bird conservation*. Department of Forestry and Environmental Resources, North Carolina State University, Raleigh, NC.

2015 Rushing, C.S., P.P. Marra. *Developing a full-annual-cycle population model to support Wood Thrush conservation planning*. North American Waterfowl Management Plan Science Support Team/Tri-initiative Science Team Joint Meeting, Ft. Collins, CO.

2015 Rushing, C.S.. *Full-annual-cycle population models: Theory and application to migratory bird conservation*. Midwest Landbird Migration Monitoring Network Workshop, Forest Beach Migratory Preserve, WI.

2013 Rushing, C.S., M.R. Dudash, P.P. Marra. *Dispersal in migratory species: Moving beyond conventional paradigms*. Symposium on Causes and Consequences of Dispersal, Lund University, Lund, Sweden.

PUBLIC LECTURES

2014 Rushing, C.S., M.R. Dudash, P.P. Marra. *Causes and consequences of long-distance dispersal in a migratory bird, the American redstart*. Howard County Audubon Society, Columbia, MD.

2013 Rushing, C.S., M.R. Dudash, P.P. Marra. *Causes and consequences of long-distance dispersal in a migratory bird, the American redstart*. Prince Georges Audubon Society, College Park, MD.

POSTERS

2011 Rushing, C.S.. *Carry-over effects, long-distance dispersal and reproductive success in a Neotropical migratory bird*. Biosciences Research Day, University of Maryland, College Park, MD.

2009 Rushing, C.S.. *Using stable isotopes to quantify patterns of dispersal in a Neotropical migratory bird, the American redstart (Setophaga ruticilla)*. Biosciences Research Day, University of Maryland, College Park, MD.

TEACHING

2008–13 Teaching Assistant
Human Anatomy & Physiology
Department of Biology
University of Maryland, College Park

2014–16 Instructor
Stable isotope analysis in migratory bird research
Developing effective conservation strategies for migratory birds: challenges and opportunities
Ecology and Conservation of Migratory Birds
Smithsonian-Mason School of Conservation
Front Royal, VA

2014 Guest Lecturer
Population regulation and limitation in migratory birds
Biogeography (300-level)

University of Maryland, Baltimore County
Baltimore, MD

PROFESSIONAL SERVICE

Service

2015– Member, Demographic Monitoring subcommittee
U.S. North American Bird Conservation Initiative

2014– Member
International Wood Thrush Conservation Alliance

2015–16 Organizer, SCBI lecture series
Smithsonian Conservation Biology Institute

2014–15 Chair, Transitional membership subcommittee
Young Professionals Committee, American Ornithologists Union

2012–13 Graduate student representative, University Sustainability Council
University of Maryland, College Park

2011–13 Admissions committee, Biological Sciences Graduate Program
University of Maryland, College Park

2011–13 Graduate student representative, BEES Graduate Program
University of Maryland, College Park

2009–10 Advising scientist
National Zoo High School Science Fair

2006–07 Conservation director
Atlanta Audubon Society

Symposium Organizer

2016 *Keeping common birds common: Advances in migratory bird conservation*
Co-organized with K. Rosenberg, V. Ruiz-Gutierrez, C. Beardmore, & D. Demarest
North American Ornithological Conference, Washington, DC

2016 *Study of avian life histories using integrated population models*
Co-organized with M. Weegman, B. Ross, S. Consverse, D. Koons, & T. Arnold
North American Ornithological Conference, Washington, DC

Reviews Provided

Proceedings of the Royal Society B

Ecology

Ecological Applications

PlosOne

Journal of Field Ornithology

The Condor

PeerJ

Avian Conservation & Ecology

Oecologia

Journal of Applied Ecology

Ecological Modelling

Scientific Reports

Professional Memberships

Ecological Society of America

Society for Conservation Biology

American Ornithological Society

SKILLS

- *Programming*: R, RStudio, WinBugs, JAGS, git/Github, ArcGIS, MARK, Presence
- *Field*: Avian banding, nest searching, target netting, point count/distance sampling
- *Modeling*: Generalized linear models, Hierarchical models, Survival analysis, Occupancy models, Integrated population models, Bayesian models/model selection
- *Laboratory*: Stable isotope mass spectrometry