

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): cowo41. doi: 10.1093/conphys/cowo41.
- 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, <i>honorable mention</i>
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. <i>Estimability of migration survival rates from integrated CJS models.</i> Euring Analytical Conference, Barcelona, Spain.
2017	Sillett, T.S., C.S. Rushing <i>Survival of passerines during spring and fall migration: the importance of carry-over effects.</i> Euring Analytical Conference, Barcelona, Spain.
2016	Rushing, C.S., S. Sillett, P.P. Marra, T.B. Ryder. <i>Using integrated population models to estimate seasonal survival and full-annual-cycle drivers of population dynamics.</i> 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. Converse, 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