

PROMOTION RECOMMENDATION
The University of Michigan-Dearborn
College of Arts, Sciences, and Letters

Melissa S. Bowlin, assistant professor of biology, Department of Natural Sciences, College of Arts, Sciences, and Letters, is recommended for promotion to associate professor of biology, with tenure, Department of Natural Sciences, College of Arts, Sciences, and Letters.

Academic Degrees:

Ph.D. 2007	Princeton University, Ecology and Evolutionary Biology
M.A. 2004	University of Illinois, Ecology and Evolutionary Biology
B.S. 2002	Cornell University, Biological Sciences

Professional Record:

2010 – present	Assistant Professor, Department of Natural Sciences, University of Michigan-Dearborn
2008 – 2010	Marie Curie Incoming International Fellow, Lund University, Lund, Sweden
2007 – 2008	Post-doctoral Fellow in Avian Biology, University of Montana, Missoula, Montana

Summary of Evaluation:

Teaching: Professor Bowlin's teaching is excellent. Her teaching ability has been recognized in multiple ways: from faculty and student evaluations to nominations for a campus teaching award (2014). Faculty peer evaluations note her excellent pedagogical techniques and her student evaluations note her extensive knowledge, helpfulness, enthusiasm, and high expectations. She gives intensive feedback to students on their critical thinking and writing through the use of examinations with both essay and short answer questions and multiple writing exercises from lab reports to term papers. Her former students have won campus awards for scientific writing.

Professor Bowlin has improved the curriculum in the Department of Natural Sciences in several ways. She developed a new course: BIOL 490D/590D, ESCI 490A Conservation Biology. She developed 12 new labs for an existing course, BIOL 303 Comparative Animal Physiology (including several based on spider locomotion and physiology which was recently published with campus colleagues in an educational journal). She applied for and was awarded internal funding for an educational grant to improve lab materials.

Professor Bowlin has taught upper and lower division courses in Biology: Introductory Organismal and Environmental Biology and Laboratory (BIOL 130/130L), Comparative Animal Physiology (BIOL 303), Comparative Vertebrate Anatomy (BIOL 312), Conservation Biology (BIOL 490D/590B), Ornithology (BIOL 353), and Ecology Lab (BIOL 304). Her comprehensive reflective teaching statement and self-evaluation clearly indicate she continually strives to refine her teaching practices and effectiveness, whilst engaging students in active learning. She emphasizes critical thinking and effective communication, and works very hard to

improve students' writing and math skills plus their scientific knowledge. She employs diverse techniques, identifies daily lecture goals, gives daily quizzes, provides practice problems, study guides, reviews, and additional materials with Canvas.

Professor Bowlin maintains “rigorous standards” and sets high expectations according to her students. Student evaluations reflect their appreciation. Professor Bowlin most often taught Comparative Anatomy and Physiology (BIOL 303) (five times) a lecture with one or two lab sections. Student evaluations (overall) ranged from 4.1-4.5, superb. In laboratory, all but one lab class had scores ranging from 4.1-4.8. Professor Bowlin also frequently taught Introduction to Organismal and Environmental Biology (BIOL 130). Her evaluation scores were mostly excellent/above average and showed continual improvement over time. In the BIOL 130 lecture, her evaluations improved to 4.1 (in 2015) and ranged from 3.7 - 4.8 in the several lab sections. Students said she was “helpful, knowledgeable, enthusiastic, and attentive.”

Research: Professor Bowlin's research is excellent. Her research aims to explain why migratory behavior has evolved repeatedly through time, even though migration is costly and risky. Her work is integrative and involves both laboratory and field work using cutting edge geolocators and radiotransmitters. Her specific research foci are, 1) understanding flight altitude choices of migratory birds, 2) assessing the effects of chronic stress on birds, and 3) linking variation in migratory bird performance to variation in fitness.

Since 2010, Professor Bowlin has published six peer reviewed UM-Dearborn affiliated research articles, including several that she is first author on. One of these, Bowlin et al. 2015, has three UM-Dearborn undergraduates listed as co-authors. She has three additional manuscripts currently either in revision or under review, two of which have her identified as first author. One of these manuscripts also has one UM-Dearborn undergraduate listed as a co-author.

Professor Bowlin has supervised research projects for one graduate student and 21 undergraduates while at UM-Dearborn. The majority of these student research projects resulted in poster presentations given at the Natural Sciences Poster Session, CASL Undergraduate Research Showcase, and Meeting of the Minds conference. Notably, some of the undergraduate research students presented posters at national meetings, including the National American Ornithologists' Union Meetings (2011, 2012) and the National Society for Integrative and Comparative Biology (SICB, 2013). Her stellar efforts have resulted in increased overall preparation of students for professional careers and advance their opportunities for networking and identifying supervisors and future collaborators in science.

Professor Bowlin actively sought internal and external funding to support her research. She applied for and was awarded funding for five internal awards in the amount of \$24, 970, including the Faculty Research Initiation and Seed Grant and the Rackham Replacement Grant. She was awarded external funding from the National Geographic Society to support her research on the flight altitudes of small migratory birds in the amount of \$20,000. Professor Bowlin has submitted several grant proposals to external agencies such as the National Science Foundation (NSF). She has submitted an NSF CAREER grant, an NSF collaborative research grant, as well as contributing as a co-PI to an NSF NRT graduate traineeship grant proposal which is currently under internal review in a campus-wide competition.

To summarize, Professor Bowlin is a very active researcher. She has published six peer reviewed papers and attracted both internal and external funding. Her research emphasizes undergraduate involvement intertwined with student learning. Her research quality is outstanding.

Recent and Significant Publications:

- Bowlin, M.S., Enstrom D.A., Murphy B.J., Plaza E., Jurich P., and J. Cochran. 2015. Unexplained altitude changes in a migrating thrush: Long flight altitude data from radio telemetry. *The Auk: Ornithological Advances*. (accepted June 2, 2015). (undergraduate co-authors are underlined).
- Bowlin, M.S., McLeer, D.F., and A.M. Danielson-Francois. 2014. Spiders in motion: Demonstrating adaptation, structure-function relationships, and trade-offs in invertebrates. *Advances in Physiology Education* 38:71-79.
- Muijres, F.T., Johansson, L.C., Bowlin, M.S., Winter, Y., and A. Hedenström. 2012. Comparing aerodynamic efficiency in birds and bats suggests better flight performance in birds. *PLoS ONE* 7:e37335.
- Muijres, F.T., Bowlin, M.S., Johansson, L.C., and A. Hedenström. 2012. Vortex wake, downwash distribution, aerodynamic performance and wingbeat kinematics in slow-flying pied flycatchers. *Journal of the Royal Society Interface* 67:292-303.
- Bridge, E.S., Thorup, K., Bowlin, M.S., Chilson, P.B., Diehl, R.H., Fléron, R.W., Hartl, P., Kays, R., Kelly, J. F., Robinson, W. D., and M. Wikelski. 2011. Technology on the move: Recent and forthcoming innovations for tracking migratory birds. *Bioscience* 61:689-698.
- Bowlin*, M.S., Henningsson*, P. Muijres*, F.T., Vleugels, R.H.E., Liechi, F. and Hedenstrom, A. 2010. The effects of geolocator drag and weight on the flight ranges of small migrants. *Methods in Ecology and Evolution* 1:398-402. *Joint first authors.

Service: Professor Bowlin's service is excellent. She has exhibited exceptional service on a variety of committees for both the department and the campus-at-large as well as providing significant service to her profession. Within the department, Professor Bowlin served on the Poster Session Committee (2010-2014), the Environmental Science Graduate Program Committee (2010-present), the Colloquium Committee (2011), the Gateway Courses Committee (2011-2012), as a program representative on the Departmental Executive Committee (2013-2014), and as a member on two Faculty Search Committees. Beginning in 2011, she also served as an advisor for the Pre-Veterinary Club, and since 2013, gave research presentations for our annual Science Exploration Day.

Within the university, Professor Bowlin gave a presentation at Campus Open House (2013), served as the Natural Sciences Representative to Faculty Senate (2014-present), served on the Campus Research Grants Committee (2011-2014, and served as chair in 2014), and is also currently serving as a member of the CASL Professional Climate Committee (2015-present). Professor Bowlin is a very active member in a number of professional societies, including the Society for Integrative and Comparative Biology, the Association of Field Ornithologists, the American Ornithologists' Union (elective member), the American Physiological Society (elective member), the Wilson Ornithological Society, CANMove and MIGRATE. She served as a peer-reviewer for ten manuscripts from professional journals, including *Behavioral Ecology*,

Ecology, Journal of Avian Biology, Journal of Field Biology, Journal of Zoology, and others. Professor Bowlin has been a reviewer for three grant proposals, including two for the National Science Foundation. She has served as the secretary of the Division of Animal Behavior (2011-2014) in the Society for Integrative and Comparative Biology. She also served as an editor-in-chief (2011-2014) and subsequently an associate editor (2014-present) of *Animal Migration*, an open-access journal on the migratory biology of animals. Most recently, she was appointed as an associate editor for the journal *The Auk: Ornithological Advances* (2013-present). This degree of professional service and service is impressive and exceeds expectations for a junior faculty member.

External Reviewers:

Reviewer A: “Despite being early in her career, Dr. Bowlin has nearly 700 citations on her record, with two papers having over 100 citations each. The journals she has used are generally strong ones, including PNAS. ... Dr. Bowlin has an impressive resume and appears to be a productive member of your academic community.”

Reviewer B: “Dr. Bowlin has an excellent scientific reputation and her contributions to her discipline have been substantial. ...it is apparent from her CV that she devotes a great deal of time and effort to classroom teaching and the development of the curriculum.”

Reviewer C: “To repeat for emphasis, from a purely objective evaluation, it is my opinion that Dr. Bowlin is an outstanding scholar in her fields of expertise with seemingly limitless promise.”

Reviewer D: “Dr. Bowlin’s package is impressive for someone at a school with substantial teaching responsibilities. She has continued to publish in the area of bird migration and flight energetics and is providing guidance on the use of technologies to unravel many questions in this field. She is also contributing substantially to the community of scientists.”

Reviewer E: “I think the quality of the work that Dr. Bowlin produces is quite good. It has and will continue to have an impact on the field.”

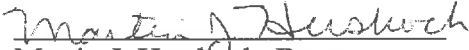
Reviewer F: “The quality, quantity and focus of her research are very good, taking into consideration a significant teaching load and the emphasis on undergraduate education. Dr. Bowlin publishes regularly in well-respected journals in her field of study with a recent average of one paper per year.”


Reviewer G: “Dr. Bowlin was elected to the honorary membership of the American Ornithologists’ Union in 2012 as an Elective Member. This honor is bestowed upon scientists for significant contributions to the field of ornithology and services to the society. ... Each year, many of the nominees are not elected so this is a significant honor and indicates that Dr. Bowlin’s [sic] work is highly regarded by her colleagues.”

Summary of Recommendation:

Professor Bowlin is both an excellent teacher and scholar. The Department of Natural Sciences rated her performance as excellent in teaching, research, and service. Her research is thoughtful, collaborative, and seeks to understand animal migration, the physiological and

ecological challenges, and implications for the future. Her colleagues value her many contributions in the classroom, the discipline, the department, and the campus community. She made substantial service contributions, quite valuable to her department, college, our university and her profession. We are pleased to recommend, with strong support of the College of Arts, Sciences, and Letters Executive Committee, Melissa S. Bowlin for promotion to associate professor of biology, with tenure, the Department of Natural Sciences, College of Arts, Sciences, and Letters.


Martin J. Herschcock, Dean
College of Arts, Sciences, and Letters


Daniel Little, Chancellor
University of Michigan-Dearborn

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