

James Skelton, Ph.D.

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Education and Professional Experience

- 2015 - present **Postdoc**, University of Florida. Mentor: Dr. Jiri Hulcr. Project: *Diversity in the ambrosia beetle-fungus symbiosis; Emerging threats to forest health.*
- 2015 (summer) **Postdoc**, Virginia Tech. Mentor: Dr. Jeffery Walters. Project: *Avian community responses to endangered species management in southeastern forests.*
- 2010 - 2015 **Ph.D.**, Virginia Tech. Advisor: Bryan L. Brown. Dissertation: *Towards an understanding of symbiont natural history through studies of crayfish and their annelid associates.*
- 2005 - 2009 **M.S., Biology**, Northern Michigan University. Advisor: Mac Strand. Thesis: *Evaluation of the trophic ecology of a freshwater Sponge and two sponge predators.*
- 2001 - 2005 **B.S., Zoology**, Northern Michigan University, *Cum Laude.*
- 2004 - 2005 **Invertebrate Museum Curator**, Northern Michigan University.

Publications (*undergraduate mentees)

- 2017 Skelton, J., M. A. Jusino, Y. Li, C. Bateman, P. H. Thai, D. L. Lindner, J. Hulcr. Detecting symbioses in complex communities: the specialist and generalist fungal symbionts of beetles within dead Asian pines. **Microbial Ecology**, *accepted pending revisions.*
- 2017 Smith, J. A., K. Brust, J. Skelton, and J. R. Walter. Does enrollment in the Safe Harbor Program affect breeding performance of endangered Red-cockaded woodpeckers? **Condor**, *accepted.*
- 2017 Li, Y., C. C. Bateman, J. Skelton, M. A. Jusino, Z. J. Nolen, D. R. Simmons, and J. Hulcr. Wood decay fungus *Flavodon ambrosius* (Basidiomycota: Polyporales) is widely farmed by two genera of ambrosia beetles. **Fungal Biology**, *in press.*
- 2017 Skelton, J., K. M. Geyer, J. T. Lennon, R. P. Creed, and B. L. Brown. Multi-scale ecological filters shape the crayfish microbiome. [**Cover article**] **Symbiosis** 72 (3), 159-170.
- 2017 Brown, B. L., E. R. Sokol, J. Skelton, and B. Tornwall. Making sense of metacommunities: Dispelling the mythology of a metacommunity typology. **Oecologia** 183 (3), 643-652.
- 2017 Skelton, J., R. P. Creed, L. Landler, K. M. Geyer, and B. L. Brown. Geographic patterns of crayfish symbiont diversity persist over half a century despite seasonal fluctuations. **Freshwater Crayfish** 22 (1), 9-18.
- 2017 Brown, B. L., M. Turnbull, J. Skelton, and R. P. Creed. Ectosymbiotic cleaning mutualists induce down regulation of crayfish immune response genes. **Freshwater Crayfish** 22 (1).
- 2016 Skelton, J., S. Doak*, M. Leonard*, R. P. Creed, and B. L. Brown. The rules for symbiont community assembly change along a mutualism-parasitism continuum. **Journal of Animal Ecology** 86, 843-853

- 2016 Luther, D., J. Skelton, C. Fernandez, and J. R. Walters. Conservation action implementation, funding, and population trends of birds listed on the Endangered Species Act. **Biological Conservation** 197, 229-234.
- 2016 Thomas, M. J., R. P. Creed, J. Skelton, and B. L. Brown. Ontogenetic shifts in a freshwater cleaning symbiosis: Consequences for hosts and their symbionts. **Ecology** 97(6), 1507-1517
- 2016 Johnson, A. J., P. E. Kendra, J. Skelton, and J. Hulcr. Species diversity, phenology, and temporal flight patterns of *Hypothenemus* pygmy borers (Coleoptera: Curculionidae: Scolytinae) in South Florida. **Environmental Entomology**. Online first: DOI: <http://dx.doi.org/10.1093/ee/nww039>
- 2016 Bateman, C., M. Sigut, J. Skelton, K. Smith, and J. Hulcr. Fungal symbionts of the black twig borer, *Xylosandrus compactus* (Coleoptera: Curculionidae, Scolytinae) are spatially segregated on the insect body. **Environmental Entomology**. 45(4), 883-890.
- 2015 Skelton, J., R. P. Creed, and B. L. Brown. A symbiont's dispersal strategy: Condition-dependent dispersal underlies predictable variation in direct transmission among hosts. **Proceedings of the Royal Society B**. 282(189).
- 2015 Tornwall, B., E. Sokol, J. Skelton, and B. L. Brown. Trends in stream biodiversity research since the River Continuum Concept. **Diversity** 7, 16-35.
- 2015 Landler, L., M. A. Jusino, J. Skelton, and J. R. Walters. Global trends in woodpecker cavity entrance orientation: Latitudinal and continental effects suggest regional climate influence. **Acta Ornithologica** 49(2), 257-266.
- 2014 Skelton, J., R. P. Creed, and B. L. Brown. Ontogenetic shift in host tolerance controls initiation of a cleaning symbiosis. **Oikos** 123(6), 677-686.
- 2013 Skelton, J., K. J. Farrell, R. P. Creed, B. W. Williams, B. Helms, J. Stoekel, and B. L. Brown. Servants, scoundrels, and hitchhikers: Current understanding of the complex interactions between crayfish and their ectosymbiotic worms (Branchiobdellida). **Freshwater Science** 32(4), 1345-1357.
- 2012 Brown, B. L., R. P. Creed, J. Skelton, M. A. Rollins, and K. J. Farrell. The fine line between mutualism and parasitism: Complex effects in a cleaning symbiosis demonstrated by multiple field experiments. **Oecologia** 170(1), 199-207.
- 2012 Skelton, J., and M. Strand. Trophic ecology of a freshwater sponge (*Spongilla lacustris*) revealed by stable isotope analysis. **Hydrobiologia** 709(1), 227-235.

Publication submitted or in advanced stages of preparation

- In prep* Skelton, J. and J. Hulcr. Chapter 18: Ambrosia Beetles. In Forest Entomology and Pathology. Springer.
- In review* Jusino, M. A., J. Skelton, D. L. Lindner, M. T. Banik, and J. R. Walters. Succession of fungal communities in excavated tree cavities: a woodpecker facilitated process. *In review- pdf available by request.*
- In prep* Skelton, J., L. Landler, M. A. Jusino, A. Van Lanen, and J. R. Walters. West is the best: global cues determine red-cockaded woodpecker cavity entrance alignment. *In prep - pdf available by request.*
- In prep* Creed, R. P., B. L. Brown, K. Farrell, J. Skelton, and A. Meeks. Ectosymbiotic mutualists alter the effect of a dominant species on community structure. *In prep - pdf available by request*

CIRRICULUM VITAE

In prep Landler, L., J. Skelton, M. S. Painter, P. W. Youmans, R. Muheim, R. P. Creed, B. L. Brown, and J. B. Phillips. Ectosymbionts alter spontaneous responses to the Earth's magnetic field in crustaceans. *In prep*.

Grants

2016	National Science Foundation: Ambrosia beetles and fungi – a comprehensive global survey of an increasingly important symbiosis. Senior personnel. Lead PI: Jiri Hulcr.	\$668,980
2014	National Science Foundation Doctoral Dissertation Improvement Grant. <i>The ax and wedge of competition shapes symbiont diversity.</i> J. Skelton and B. L. Brown.	\$20,668
2014	VBI & Fralin Life Science Institute Small Grants Program, Virginia Tech, <i>The effects of cleaning symbionts on the crayfish microbiome; an experimental test and metagenomics approach.</i> J. Skelton, K. M. Geyer, B. L. Brown, J. E. Barret, and J. T. Lennon.	\$14,156
2013	Organismal Biology and Ecology Interdisciplinary Summer Research Program, Virginia Tech, Summer 2013. <i>Multipartite mutualisms: Disentangling context and diversity.</i> J. Skelton and K. M Geyer.	\$3,995
2012	Organismal Biology and Ecology Interdisciplinary Summer Research Program, Virginia Tech. <i>Magnetoreception of two ecologically different crayfish species (Cambarus bartonii and Cambarus sciotensis).</i> J. Skelton and L. Landler.	\$1,756
2012	Organismal Biology and Ecology Interdisciplinary Summer Research Program, Virginia Tech, <i>Exploring interactions between branchiobdellidans and the crayfish microbiome.</i> J. Skelton and K. M Geyer.	\$2,827
2008	Charles C. Spooner Student Research Program, Northern Michigan University. <i>Using stable isotopes to investigate freshwater sponge and spongivorous insect trophic ecology.</i> J. Skelton.	\$500
2006 & 2007	Excellence in Education Program, Northern Michigan University. <i>The role of symbiotic algae in the diet of spongivorous insects.</i> J. Skelton.	\$2,700

Awards and Scholarships

Virginia Tech Doctoral Assistantship Fellowship, Virginia Tech Graduate School, 2014, Awarded \$12,000 for tuition for excellence in graduate research.

7th International Woodpecker Conference, Vitoria-Gasteiz, Spain, 2014. Recognized for 3rd place Best Poster Award.

John G. Palmer Memorial Scholarship, Virginia Tech, 2014-2015, awarded \$1,220 for excellence in graduate research.

Schaeffer Scholar Award, Virginia Tech, 2013. Awarded \$1,050 to cover publication costs of graduate research in stream ecology.

Society for Freshwater Science Boesel-Sanderson Award, summer 2013, awarded \$600 to describe branchiobdellidan life histories.

First Place EEB Poster at Virginia Tech Biological Sciences Research Day, Virginia Tech, February 25, 2012, awarded \$300.

Teaching Experience

- 2011 – 2015 Teaching assistant at Virginia Tech. Includes lab courses in General Biology, Honors Biology, Invertebrate Zoology (2 semesters), and Stream Ecology. Guest lecturer in Invertebrate Zoology and Stream Ecology.
- 2010 – 2011 Teaching assistant at Clemson University. Field measurement techniques.
- 2008 – 2010 Adjunct faculty at Northern Michigan University. Introductory Genetics Lab (3 semesters) and Animal Physiology Lab (2 semesters).
- 2005 – 2008 Teaching assistant Northern Michigan University. General Biology Lab, Animal Physiology Lab, Entomology, Aquatic Insects, Invertebrate Zoology.

Specialized Skills and Interests

- Analytical** R programming, multivariate statistics and ordination, creative permutations-based null model hypothesis testing, generalized linear models and mixed effects models, multi-model selection, molecular species identification.
- Field** Extensive experience in aquatic and terrestrial macroinvertebrate sampling, stream morphometrics, quantitative sampling methods, in situ field experiments, avian identification.
- Laboratory** Invertebrate taxonomy with special expertise in several groups, molecular techniques for microbial community assessment including Ion Torrent and Illumina based next generation sequencing and metagenomics and library prep, fungal isolation and culture.

Service

- Reviewer:** NSF DEB ad hoc panel reviewer, Ecology, Oikos, Oecologia, Freshwater Science - Journal of the North American Benthological Society (7), PeerJ (2), Parasites and Vectors, Environmental Biology of Fishes, Aquatic Invasions, Biological Invasions, Ecological Research, Zoological Science, Plos one (2), Symbiosis, Environmental Microbiology, Canadian Journal of Zoology.
- Memberships:** Ecological Society of America, Entomological Society of America, Society for Freshwater Science, Mycological Society of America
- Outreach:** Public presentations given at SEEDs program (www.seedskids.org) at Price House Nature Center, Blacksburg Va.
- Service:** Member of the Virginia Tech Biology Student Recognition Committee, Volunteer for Biology Department Research Day

Presentations

Invited lectures

- 2017 Embracing complexity to accelerate discovery in the fungal symbioses of bark and ambrosia beetles. Bark and ambrosia beetle symposium at the Entomological Society of America Meeting, Denver CO.
- 2017 The hunt for nefarious symbioses in a complex world: Experimental, molecular, and statistical perspectives of bark beetles and fungi. Insect/fungus symbiosis symposium at Mycology Society of America Annual summer meeting, Athens GA.

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- 2016 Every host an island; integrating ideas across community ecology and parasitology to understand real-world complexity in multi-species symbioses. University of Florida Dept. of Biology Seminar Series.
- 2016 The fascinating fungal symbioses of two (wood) boring animals. J. Skelton and M. A. Jusino. Northern Michigan University Dept. of Biology Seminar Series
- 2016 Top-down controls and ambrosia beetle symbiont fidelity. J. Skelton and J. Hulcr. Symposium: Wood Borer-Fungus Alliances and Conflicts: The Frontier of Forest Entomology, 25th International Congress of Entomology, Orlando, FL.
- 2015 Homage to Hutchinson, or why are there so many kinds of animals... living on animals? J. Skelton. University of Florida School of Resources and Conservation.
- 2015 Science on the side: How collaborative side projects can enrich the graduate school experience. J. Skelton. Virginia Tech Biological Sciences Research Seminar Series
- 2010 Trophic ecology of freshwater sponges revealed by stable isotope analyses; Skelton, J. and M. Strand. Presented at Tri-Beta Biological Research Seminar Series, Northern Michigan University
- 2010 Symbiont abundance and variable outcomes in an aquatic cleaning symbiosis; Skelton, J., Brown, B. L., and R. P. Creed. Natural Resources Student Research Symposium, Clemson University.

Oral presentations

- 2016 Broken Covenant: Experimental symbiont switching in an ambrosia beetle symbiosis. J. Skelton. Annual Meeting of the Mycological Society of America, Berkeley, CA.
- 2015 Why are there so many kinds of animals... living on animals? J. Skelton; Dissertation defense seminar given at Virginia Tech, Blacksburg VA.
- 2014 Size matters and location is everything: Competition and prudent dispersal explain transmission in a freshwater cleaning symbiosis; Skelton, J., S. Doak, R. P. Creed, and B. L. Brown; presented at the Joint Aquatic Sciences Meeting, Portland, OR.
- 2014 Is your compass aligned? Ectosymbionts alter crayfish response to Earth's magnetic fields. Landler, L., Skelton, J., Painter, M. S., Youmans, P. W., Muheim, R., Brown, B. L., and J. B. Phillips; presented at the Joint Aquatic Sciences Meeting, Portland, OR.
- 2013 Slipping past the doorman: Host control shapes succession-like patterns in ectosymbiont assemblages; Skelton, J., Creed, R. P., and Brown, B. L.; Talk presented at the 2013 Annual Meeting of the Ecological Society of America, Minneapolis, MN.
- 2012 Partner Control and Ontogenetic Shifts in a Cleaning Symbiosis Involving Crayfish; Skelton, J., Brown, B. L., and R. P. Creed; Presented at the 2012 Summer Meeting of the Society for Freshwater Science, Louisville KY.
- 2012 Ectosymbionts of Crayfish Influence Benthic Community Structure and Ecosystem Properties; Brown, B. L., Creed, R. P., and Skelton, J. Presented at the 2012 Summer Meeting of the Society for Freshwater Science, Louisville KY.
- 2011 Variable Outcomes in the Cleaning Symbiosis between Crayfish and Branchiobdellid Annelids; Skelton, J., Brown, B. L., and R. P. Creed; Presented at the 2011 Summer Meeting of the North American Benthological Society, Providence RI.

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- 2010** Symbiont Abundance and Variable Outcomes in an Aquatic Cleaning Symbiosis; Skelton, J., Brown, B. L., and R. P. Creed; Presented at 2011 Southeast Ecology and Evolution Conference, Auburn University.
- 2009** Trophic ecology of Freshwater Sponges Revealed by Stable Isotope Analyses; Skelton, J. and M. Strand; Presented at NMU Biology Seminar Series, Northern Michigan University.
- 2005** Insects Associated with the Freshwater Sponges in Marquette Co., MI; J. Skelton; Presented at The 10th Annual Celebration of Student Research and Creative Works, Northern Michigan University.

Poster Presentations

- 2017 Methods matter: a better way to characterize the diets of insectivorous birds using fecal DNA. M. A. Jusino, J. Skelton, M. T. Banik, J. M. Palmer, L. Blanc, S. Goodman, J. R. Walters, and D. L. Lindner. Presented at the American Ornithologist Union, East Lansing, MI.
- 2014 Circular reasoning: cavity alignment preferences in red-cockaded woodpeckers. Landler, L., M.A. Jusino, J. Skelton, and J.R. Walters. Presented at the 7th International Woodpecker Conference, Vitoria-Gastiez, Spain. **Awarded 3rd Place Best Poster Award.**
- 2013 Ontogeny of a cleaning symbiosis: Age-specific controls examined from both sides; Skelton, J., Creed, R. P., and Brown, B. L.; Poster presented at the 2013 Society for Freshwater Science Annual Meeting; Jacksonville, FL
- 2012 Partner Control and Ontogenetic Shifts in a Cleaning Symbiosis Involving Crayfish; Skelton, J., Brown, B. L., and R. P. Creed; Presented at 2012 Virginia Tech Department of Biological Sciences Research Day, Blacksburg, VA. **Awarder 1st place Ecology and Evolutionary Biology Poster Award.**
- 2010 Evaluation of the Trophic Ecology of a Freshwater Sponge and Two Sponge-predators via Stable Isotope Analysis; Skelton, J. and M. Strand; Presented at 2010 Summer Joint Meeting of the North American Benthological Society and American Society of Limnology and Oceanography, Santa Fe, NM.