

Phred M. Benham

NSF Postdoctoral Fellow
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CURRENT POSITION

Oct. 2018 - present NSF Post-doctoral fellow, Museum of Vertebrate Zoology, University of California Berkeley. Sponsoring scientist: Dr. Rauri C. K. Bowie.

EDUCATION

2018 Ph.D. University of Montana, Organismal Biology, Ecology & Evolution
Advisor: Zachary A. Cheviron.

2012-2015 Ph.D. Student, University of Illinois, Urbana-Champaign, Dept. Animal Biology
Moved to University of Montana with the Cheviron lab

2012 M.s. University of New Mexico, Biology.
Advisor: Christopher C. Witt

2006 B.s. Louisiana State University, Biological Sciences

GRANTS & AWARDS

- 2018** NSF Postdoctoral Research Fellowship in Biology, Research Using Biological Collections. "Leveraging museum collections to track population responses to a century of California coastal development in a tidal marsh songbird." (\$138,000)
- 2017** University of Montana, OBE, Drollinger-Dial Travel Award (\$950)
AMNH Frank M. Chapman Memorial Fund (\$1,700)
American Society of Naturalists' Student Research Award (\$2,000)
Bertha Morton Fellowship (\$5,000)
- 2016** University of Montana, OBE, Drollinger-Dial Travel Award (\$950)
- 2015** Society for Integrative & Comparative Biology, Grant-in-aid-of-research (\$1,000)
UIUC, School for Integrative Biology, Clark Research Support Grant (\$1,000)
UIUC, Department Animal Biology, Odum-Kendeigh Research Grant (\$1,000)
Sigma-Xi Grant-in-aid-of-research (\$500)
Illinois Ornithological Society Grant (\$1,000)

- 2014** Society for the Study of Evolution, Rosemary Grant Research Award (\$2,460)
 American Ornithologists' Union Research Award (\$2,500)
 UIUC Dissertation Travel Grant (\$2,916)
 UIUC, School for Integrative Biology, Clark Research Support Grant (\$1,000)
 UIUC, Department Animal Biology, Odum-Kendeigh Research Grant (\$1,000)
 AMNH Frank M. Chapman Memorial Fund (\$2,000)
 Systematics Research Fund, Linnean Society and Systematics Association (\$1,587)
 UIUC, Center for Latin American & Caribbean Studies, Tinker Fellowship (\$2,000)
- 2013** American Genetics Association Travel Award, Speciation Continuum Symposium (\$150)
- 2012** North American Ornithological Conference-V, Student Travel Award (\$300)
 Illinois Distinguished Fellowship (\$25,000 annual stipend).
 NSF-IGERT Fellowship (\$30,000 annual stipend, \$5,000 in research funds).
- 2011** American Ornithologists' Union Student Travel Award, AOU Meetings (\$477)
 Frank M. Chapman Memorial Fund, American Museum of Natural History (\$3,000)
 Graduate Research Allocations Committee Grant, University of New Mexico (\$400)
- 2010** Frank M. Chapman Memorial Fund, American Museum of Natural History (\$2,250)
 Graduate Research Allocations Committee Grant, University of New Mexico (\$400)
- 2004-2006** Louisiana State University Museum of Natural Science, prepathon (\$6,000 over 3 years)
- 2003** Louisiana State University Non-resident's Tuition Exemption and Chancellor's work study scholarships.

TEACHING EXPERIENCE

- 2017** Teaching Assistant, Ornithology, Ecology, University of Montana
2016 Teaching Assistant, Ornithology, Mammalogy, University of Montana
2015 Teaching Assistant, Ecology, University of Montana
2014 Teaching Assistant, Ornithology, University of Illinois, Urbana-Champaign
2012 Teaching Assistant, Human Anatomy and Physiology II, University of New Mexico
2011 Teaching Assistant, Ornithology, University of New Mexico
2010 Teaching Assistant, Human Anatomy and Physiology I, University of New Mexico
2009 Teaching Assistant, Human Anatomy and Physiology I, University of New Mexico

MUSEUM EXPERIENCE

Curatorial experience:

- Senior curatorial assistant, Philip L. Wright Zoological Museum, University of Montana, May-August 2018
 Graduate curatorial assistant, Philip L. Wright Zoological Museum, University of Montana, January-May 2018
 Graduate curatorial assistant, Museum of Southwestern Biology, University of New Mexico, Spring 2010-2011

Field experience:

13 international museum expeditions between 2005-2014 to Peru (9 times), Brazil, Malaysia, Mexico, & South Africa.

Field work, application for scientific permits, and collecting of specimens with ancillary data from multiple localities within the United States, including: CA, NM, IL, AK, and WY.

Prepared over 2000 museum specimens with associated tissue and other ancillary data, deposited at several museums in the USA, Peru, Brazil, Malaysia, & Mexico.

SERVICE

2014-2017 American Ornithologists' Union, Student Affairs Committee

Reviewer: *The Auk*, *Cotinga*, *Journal of Biogeography*, *Revista de Biología Tropical*, *Molecular Phylogenetics & Evolution*

PUBLICATIONS

Peer-reviewed publications:

Beckman, L., **Benham, P.M.**, Cheviron, Z.A. & Witt, C.C. 2018. Detecting introgression despite persistent phylogenetic uncertainty: the case of the South American siskins. *Molecular Ecology*.
DOI: 10.1111/mec.14795

Stager, M., Pollock, H.S., **Benham, P.M.**, Sly, N.D., Brawn, J.D. & Cheviron, Z.A. 2016
Disentangling environmental drivers of metabolic flexibility in birds: the importance of temperature extremes versus temperature variability. *Ecography*, 39: 787-795

Benham, P.M & Witt, C.C. 2016 The dual role of Andean topography in primary divergence: functional and neutral variation among populations of the hummingbird, *Metallura tyrianthina*. *BMC Evolutionary Biology*, 16:22. DOI: 10.1186/s12862-016-0595-2

Galen, S.C., Natarajan, C., Moriyama, H., Weber, R.E., Fago, A., **Benham, P.M.**, Chavez, A.N., Cheviron, Z.A., Storz, J.F. & Witt, C.C. 2015 Contribution of a mutational hot spot to hemoglobin adaptation in high-altitude Andean house wrens. *Proceedings of the National Academy of Sciences*, 112: 13958-13963.

Benham, P.M., A.M. Cuervo, J.A. McGuire & C.C. Witt. 2015. Biogeography of the Andean metaltail hummingbirds: contrasting evolutionary histories of treeline-specialist and habitat-generalist clades. *Journal of Biogeography*, 42: 763-777.

Lim, H.C., Chua, V.L., **Benham, P.M.**, Oliveros, C.H., Rahman, M.A., Moyle, R.G. & Sheldon, F.H. 2014. Divergence history of the Rufous-tailed Tailorbird (*Orthotomus sericeus*) in eastern Sundaland: Implications for the biogeography of Palawan and the taxonomy of island species in general. *The Auk*, 131: 629-642.

Sanchez, C., J. Saucier, **P.M. Benham**, D.F. Lane, R.E. Gibbons, T. Valqui, S. Figueroa, C.J. Schmitt, C. Sánchez, C.M. Milenski, A.G. Bravo, D.G. Olaechea. 2012. New and noteworthy records from northwestern Peru, Dpto. Tumbes. *El boletín de la Unión de Ornitólogos del Perú*, 7: 18-36.

Gibbons, R.E., **P.M. Benham** & J. M. Maley. 2011. Notes on birds of the high Andes of Peru. *Ornitología Colombiana*, 11: 76-86.

Benham, P.M., E.J. Beckman, S.G. DuBay, M. Flores, A.B. Johnson, M.J. Lelevier, C.J. Schmitt, N.A. Wright & C.C. Witt. 2011. Satellite imagery reveals new critical habitat for endangered bird species in the high Andes of Peru. *Endangered Species Research*, 13: 145-157.

Hallworth, M.T., **P.M. Benham**, J.D. Lambert & L.R. Reitsma. 2008. Canada Warbler (*Wilsonia canadensis*) breeding ecology in young forest stands compared to a Red Maple (*Acer rubrum*) swamp. *Forest Ecology and Management*, 255, 1353-1358.

Reitsma, L.R., M.T. Hallworth & **P.M. Benham**. 2008. Does age influence territory size, habitat selection, and reproductive success of male Canada Warblers in Central New Hampshire? *Wilson Journal of Ornithology*, 120, 446-454.

Manuscripts in revision:

Walsh, J., **Benham, P.M.**, Deane-Coe, P.E., Arcese, P., Butcher, B.G., Chan, Y.L., Cheviron, Z.A., Elphick, C.S., Kovach, A.I., Olsen, B.J., Shriver, W.G., Winder, V.L., & Lovette, I.J. Genomics of rapid ecological divergence and parallel adaptation in songbirds.

Sweazea, K.L., Tsosie, K., Beckman, E.J., **Benham, P.M.** & C.C. Witt. Seasonal and elevational variation in glucose and glycogen in two songbird species.

Benham, P.M. & Cheviron, Z.A. Divergent mitochondrial lineages arose within a large, panmictic population of the Savannah Sparrow (*Passerculus sandwichensis*).

Manuscripts in preparation:

Benham, P.M. & Cheviron, Z.A. The influence of demographic history and ecological variation on functional divergence in tidal marsh Savannah sparrows (*Passerculus sandwichensis*).

Technical reports:

Benham, P.M. The influence of history, gene flow, and effective population size on local adaptation to saltmarshes in the Savannah Sparrow (*Passerculus sandwichensis*). 2015 Annual Report to the California Department of Fish & Wildlife, Sacramento, CA. 24 pp.

Benham, P. M., E. Bautista O., E. J. Beckman, J. A. Clark, L. M. Flores, S. C. Galen, A. B. Johnson, M. Combe, J. Huaroto, K. S. Verde G., and C. C. Witt. 2013. Survey of the Birds of Cloud Forest and Páramo Habitats above Agua Azul, Northwest Peru. Technical Report to Dirección General Forestal y de Fauna Silvestre (DGFFS), Lima, Peru. 13 pp.

SCIENTIFIC PRESENTATIONS

Contributed talks:

Benham, P.M. & Z.A. Cheviron. 2017. Ancestral plasticity and colonization of salt marsh habitats by the Savannah Sparrow. Evolution, Portland, OR.

- Benham, P.M. & Z.A. Cheviron. 2016. Genetic divergence predicts the degree of divergence in renal traits of salt marsh Savannah Sparrows (*Passerculus sandwichensis*). Society of Integrative & Comparative Biology, Portland, OR.
- Benham, P.M. & Z.A. Cheviron. 2016. Genetic divergence predicts the degree of divergence in renal traits of salt marsh Savannah Sparrows (*Passerculus sandwichensis*). Evolution, Austin, TX.
- Benham, P.M. & Z.A. Cheviron. 2016. Genetic divergence predicts the degree of divergence in renal traits of salt marsh Savannah Sparrows (*Passerculus sandwichensis*). North American Ornithological Council, Washington, DC.
- Benham, P.M. & Z.A. Cheviron. 2014. Historical and ecological correlates of population structure in the Savannah Sparrow (*Passerculus sandwichensis*). American Ornithologists' Union, Estes Park, CO.
- Benham, P.M., A.M. Cuervo, R.T. Brumfield & C.C. Witt. 2012. Topographic complexity in the Andes shapes diversification patterns in the hummingbird genus *Metallura*. North American Ornithological Conference, University of British Columbia, Vancouver, BC.
- Benham, P.M. & C.C. Witt. 2011. Climate explains the discordance between morphological and genetic variation in the hummingbird *Metallura tyrianthina*. American Ornithologists' Union Meeting, Jacksonville, FL.

Posters:

- Benham, P.M. & C.C. Witt. 2013. Andean topography promotes genetic and ecological divergence in the hummingbird *Metallura tyrianthina*. American Genetics Association: Symposium on the Speciation Continuum, Cornell University, Ithaca, NY.
- Benham, P.M., M.T. Hallworth & L.R. Reitsma. 2009. Habitat and mixed-species flock use by boreal migrants in eastern Ecuador with emphasis on Canada Warbler (*Wilsonia canadensis*). American Ornithologists' Union Meeting, Philadelphia, PA.

Invited talks:

- Benham, P.M. 2016. Birds, Museums, and Evolution. Talk presented for the University of Montana Chapter of the Wildlife Society.
- Benham, P.M. 2015. Adaptive genomics of Neotropical birds. Talk presented for the Smithsonian Tropical Research Institute IGERT-NEO tropical biology field course, Panama.

PUBLIC OUTREACH

- 2018** Presentation on birding and ornithology in Peru, Mascoma Chapter Audubon Society, Hanover, NH
- 2015** Leading spring bird walks for the Urbana Park District.
- 2013** Presented unit on Birds for the Girls Do Science Summer Camp, Orpheum Children's Science Museum, Champaign, IL.
- 2012** Presentation on ornithological fieldwork to classes at Kenwood Elementary School, Champaign, IL. Tour of the Museum of Southwestern Biology for members of the Central New Mexico Audubon Society.

- 2011** Migration Presentation, Santa Fe Audubon Society: April 2011
- 2010** Sponsored an ornithology merit badge for two Boy Scouts from Albuquerque with aid of Museum of Southwestern Biology collections
- Migration Presentation, Rio Grande Nature Center Herbfest
- Migration Presentation, Central New Mexico Audubon Society