

Brian Tilston Smith

Associate Curator | Associate Professor
Department of Ornithology | Division of Vertebrate Zoology
American Museum of Natural History
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AREA OF SPECIALIZATION

Systematics, biogeography, population genetics, and phylogeography of birds

EDUCATION

Ph.D. in Biological Sciences, University of Nevada, Las Vegas, 2011
B.S. in Biology, University of Nevada, Las Vegas, 2005

PREVIOUS EXPERIENCE IN DOCTORAL EDUCATION

Postdoctoral Fellow, Museum of Natural Science, Louisiana State University,
2011–2013

FACULTY APPOINTMENTS

Adjunct Faculty Member, City University of New York Graduate School, 2014–*present*
Adjunct Faculty, Department of Ecology, Evolution & Environmental Biology (E3B),
Columbia University, 2014–*present*

ARTICLES IN REFEREED JOURNALS

Google Scholar: <https://scholar.google.com/citations?hl=en&user=uwjT9SQAAAAAJ>

43. Moreira LR, Hernandez-Baños BE, Smith BT. 2020. Spatial predictors of genomic and phenotypic variation differ in a lowland Middle American bird (*Icterus gularis*). *Molecular Ecology*, DOI: 10.1111/mec.15536.
42. Joseph L, Merwin J, Smith BT. 2020. Improved systematics of lorikeets reflects their evolutionary history and frames conservation priorities. *Emu–Austral Ornithology*, DOI.org/10.1080/01584197.2020.1779596.
41. Smith BT, Mauck III WM, Benz B, Andersen MJ. 2020. Uneven missing data skews phylogenomic relationships within the lories and lorikeets. *Genome Biology and Evolution*, DOI:10.1093/gbe/evaa113.
40. Thom G, Smith BT, Gehara M, Montesanti J, Lima-Ribeiro MS, Piacentini VQ, Miyaki CY, do Amaral FR. 2020. Climatic dynamics and topography control genetic variation in Atlantic Forest montane birds. *Molecular Phylogenetics and Evolution*, 106812.
39. Merwin JT, Seeholzer GF, Smith BT. 2020. Macroevolutionary bursts and constraints generate a rainbow in a clade of tropical birds. *BMC Evolutionary Biology*, 30, 32.

38. McCullough JM, Moyle RG, Smith BT, Andersen MJ. 2019. A Laurasian origin for a pantropical bird radiation is supported by genomic and fossil data (Aves: Coraciiformes). *Proceedings of the Royal Society B*, 286(1910), 20190122.
37. Kimball RT, Oliveros CH, Wang N, White ND, Barker FK, Field DJ, Ksepka DT, Chesser RT, Moyle RG, Braun MJ, Brumfield RT, Faircloth BC, Smith BT, Braun EL. A phylogenomic supertree of birds. *Diversity*, 2019, 11, 109.
36. Oliveros CH, Field DJ, Ksepka, DT, Barker FK, Aleixo A, Andersen MJ, Bravo GA, Brumfield RT, Chesser RT, Claramunt S, Cracraft J, Cuervo AM, Derryberry EP, Glenn TC, Harvey MG, Hosner PA, Joseph L, Kimball RT, Mack AL, Miskelly CM, Peterson AT, Robbins MB, Sheldon FH, Silveira LF, Smith BT, White ND, Moyle RG, Faircloth BC. 2019. Earth history and the passerine superradiation. *Proceedings of the National Academy of Sciences*, 116(16), 7916-7925.
35. Provost KL, Mauck WM, Smith BT. 2018. Genomic divergence in allopatric Northern Cardinals of the North American warm deserts is linked to behavioral differentiation. *Ecology and Evolution*, 8, 12456-12478.
34. Smith BT, Bryson Jr RW, Mauck III WM, Chaves J, Robbins MB, Aleixo A, Klicka J. 2018. Species delimitation and biogeography of the gnatcatchers and gnatwrens (Aves: Polioptilidae). *Molecular Phylogenetics and Evolution*, 126, 45–57.
33. Provost KL, Joseph L, Smith BT. 2018. Resolving a phylogenetic hypothesis for parrots: implications from systematics to conservation. *Emu–Austral Ornithology*, 118, 7–21.
32. Andersen MJ, McCullough JM, Mauck WM III, Smith BT, Moyle RG. 2018. A phylogeny of kingfishers reveals an Indomalayan origin and elevated rates of diversification on oceanic islands. *Journal of Biogeography*, 45, 269–281.
31. Andersen MJ, Fatdal L, Mauck WM II, Smith BT. 2017. An ornithological survey of Vanuatu on the islands of Éfaté, Malakula, Gaua, and Vanua Lava. *Check List*, 13, 755–782.
30. Chua V, Smith BT, Rahman MA, Lakim M, Moyle RG, Martin TE, Sheldon FH. 2017. Patterns and mechanisms of population diversification in Bornean montane birds. *Molecular Phylogenetics and Evolution*, 113, 139–149.
29. Harvey MG, Seeholzer GF, Smith BT, Rabosky D, Cuervo AM, Brumfield R. The rate of population genetic differentiation predicts speciation rate in New World birds. 2017. *Proceedings of the National Academy of Sciences*, 114, 6328–6333.
28. Smith BT, Seeholzer GF, Harvey MG, Cuervo AM, Brumfield R. 2017. A latitudinal phylogeographic diversity gradient in birds. *PLoS Biology*, 15(4), e2001073.

27. Oswald JA, Overcast I, Mauck III WM, Andersen MJ, Smith BT. 2017. Isolation with asymmetric gene flow during the nonsynchronous divergence of dry forest birds. *Molecular Ecology*, 26, 1386–1400.
26. Burbrink F, Chan Y, Myers E, Ruane S, Smith BT, Hickerson M. 2016. Asynchronous demographic responses to Eastern Nearctic Pleistocene climate changes in vertebrate communities. *Ecology Letters*, 19, 1457–1467.
25. Harvey MG, Smith BT, Glenn T, Faircloth BC, Brumfield. 2016. Sequence capture versus restriction site associated DNA sequencing for shallow systematics. *Systematic Biology*, 65, 910–924.
24. Bacon CD, Silvestro D, Jaramillo C, Smith BT, Chakrabarty P, Antonelli A. 2015. Reply to Lessios and Marko et al.: Early and progressive migration across the Isthmus of Panama is robust to missing data and biases. *Proceedings of the National Academy of Sciences*, 112, E5767–E5768.
23. Seeholzer GF, Justiniano MA, Harvey MG, Smith BT. 2015. Ornithological inventory along an elevational gradient in the río Cotacajes Valley, dptos. La Paz and Cochabamba, Bolivia. *Cotinga*, 37, 87–100.
22. Bacon CD, Silvestro D, Jaramillo C, Smith BT, Chakrabarty P, Antonelli A. 2015. Biological evidence supports an early and complex emergence of the Isthmus of Panama. *Proceedings of the National Academy of Sciences*, 112, 6110–6115.
21. Smith BT, McCormack JE, Cuervo AM, Hickerson MJ, Aleixo A, Cadena CD, Pérez-Emán J, Burney CW, Xie X, Harvey MG, Faircloth BC, Glenn TC, Derryberry EP, Prejean J, Fields S, Brumfield RT. 2014. The drivers of tropical speciation. *Nature*, 515, 406–409.
20. Bryson Jr R, Smith BT, Nieto-Montes A, Garcia U, Riddle B. 2014. Conflicting gene histories confound phylogeographical inference in a widespread group of Nearctic treefrogs. *Zoological Journal of the Linnean Society*, 172, 103–116.
19. van Els P, Spellman GM, Smith BT, Klicka J. 2014. Extensive gene flow characterizes the phylogeography of a widespread North American migrant bird: Black-headed grosbeak (*Pheucticus melanocephalus*). *Molecular Phylogenetics and Evolution*, 78, 148–159.
18. Houston DD, Shiozawa DK, Smith BT, Riddle BR. 2014. Investigating the effects of Pleistocene events on genetic divergence within *Richardsonius balteatus*, a widely distributed western North American minnow. *BMC Evolutionary Biology*, 14, 111.
17. Harvey MG, Lane DF, Hite J, Terrill RS, Figueroa-Ramírez S, Smith BT, Klicka J, Campos W. 2014. Notes on bird species in bamboo in Northern Madre de Dios, Peru, including the first Peruvian record of Acre Tody-Tyrant (*Hemitriccus cohnhafti*). *Occ. Pap. LSU Mus. Nat. Sci.* 81.

16. Amei A, Smith BT. 2014. Robust estimates of divergence times and selection with a Poisson Random Field model: a case study of comparative phylogeographic data. *Genetics*, 196, 225–233.
15. Gawin DF, Rahman MA, Ramji MFS, Smith BT, Lim HC, Moyle RG, Sheldon FH. 2014. Patterns of avian diversification in Borneo: The case of the endemic Mountain Black-eye (*Chlorocharis emiliae*). *The Auk*, 13, 86–99.
14. Bryson RW, Chaves J, Smith BT, Miller M, Winker K, Pérez-Emán J, Klicka J. 2014. Diversification across the New World within the “blue” cardinalids (Aves: Cardinalidae). *Journal of Biogeography*, 41, 587–599.
13. Smith BT, Harvey MG, Faircloth BC, Glenn TC, Brumfield RT. 2014. Target capture and massively parallel sequencing of ultraconserved elements (UCEs) for comparative studies at shallow evolutionary time scales. *Systematic Biology*, 63, 83–95.
12. Pulgarín-R PC, Smith BT, Bryson RW, Spellman GM, Klicka J. 2013. Multilocus phylogeny and biogeography of the New World *Pheucticus* grosbeaks (Aves: Cardinalidae). *Molecular Phylogenetics and Evolution*, 69, 1222–1227.
11. Whittaker A, Alexio A, Whitney BM, Smith BT, Klicka J. 2013. A distinctive new species of gnatcatcher in the *Polioptila guianensis* complex (Aves: Polioptilidae) from western Amazonian Brazil. In: Handbook of the Birds of the World. Special volume: new species and global index [J. del Hoyo, A. Elliott e D. Christie, eds.]. Lynx Edicions, Barcelona, Spain, pp. 301–305.
10. Smith BT, Klicka J. 2013. Examining the role of effective population size on mitochondrial and multilocus divergence time discordance in a songbird. *PLoS ONE*, 8, e55161.
9. Smith BT, Bryson RW, Chua V, Africa L, Klicka J. 2013. Speciation history of the North American *Haemorhous* finches (Aves: Fringillidae) inferred from multilocus data. *Molecular Phylogenetics and Evolution*, 66, 1055–1059.
8. Bryson RW, Riddle BR, Graham MR, Smith BT, Prendini L. 2013. As old as the hills: montane scorpions in southwestern North America reveal ancient associations between biotic diversification and landscape history. *PLoS ONE*, 8, e52822.
7. Smith BT, Ribas CC, Whitney BW, Hernández-Baños BE, Klicka J. 2013. Identifying biases at different spatial and temporal scales of diversification: a case study using the Neotropical parrotlet genus *Forpus*. *Molecular Ecology*, 22, 483–494.
6. Smith BT, Bryson RW, Houston D, Klicka J. 2012. An asymmetry in niche conservatism contributes to the latitudinal species diversity gradient in New World vertebrates. *Ecology Letters*, 15, 1318–1325.

5. Ribas CC, Maldonado MC, Smith BT, Cabanne GS, D’Horta FM, Naka LN. 2012. Towards an integrated historical biogeography of the Neotropical lowland avifauna: combining diversification analysis and landscape evolution. *Ornitología Neotropical*, 23, 189–208.
4. Smith BT, Amei A, Klicka J. 2012. Evaluating the role of contracting and expanding rainforest in initiating cycles of speciation across the Isthmus of Panama. *Proceedings of the Royal Society: Biological Sciences*, 279, 3520–3526.
3. Smith BT, Escalante P, Hernández-Baños BE, Navarro-Sigüenza AG, Rowher S, Klicka J. 2011. The role of historical and contemporary processes on the phylogeography of the Northern Cardinal, *Cardinalis cardinalis*. *BMC Evolutionary Biology*, 11, 136.
2. Klicka J, Spellman GM, Winker KS, Chua V, Smith BT. 2011. Phylogeography and population-genetic analysis of a widespread, sedentary North American bird: The Hairy Woodpecker (*Picoides villosus*). *The Auk*, 128, 346–362.
1. Smith BT, Klicka J. 2010. Late Pliocene Panamanian uplift has profound affect on the exchange, diversification, and distribution of New World birds. *Ecography*, 33, 333–342.

CURRENT GRANTS

Full Proposal: *All Birds: A Time-scaled Avian Tree from Integrated Phylogenomic and Fossil Data*. 2016. Brian Tilston Smith (PI: AMNH); F. Keith Barker (Co-PI: UM); Edward L. Braun (Co-PI: UF); Robb T. Brumfield (Co-PI: LSU); Brant C. Faircloth (Co-PI: LSU); Rebecca T. Kimball (Co-PI: UF); Daniel T. Ksepka (Co-PI: Bruce Mus.); R. Terry Chesser (Lead Senior Investigator: Smithsonian); Robert G. Moyle (Senior Personnel: KU). Funded for \$1,421,651 by National Science Foundation; DEB-1655736 (Smith plus two subawards) \$565,352; 2017–2021.

Smith BT, Thom G, Parker J. Exploring the chemical evolution in Amazonian birds. *Explore* 21. 2020.

SELECT INVITED TALKS AND PRESENTATIONS

Smith BT, Brumfield RT, Ferreira M, Mauck III WM, Merwin JT, Moyle R, Wright T, Joseph L. Phylogenomics of the Parrots of the World. American woodpeckers. Talk presented at: American Ornithological Society 137th Stated Meeting; 2019; Anchorage, Alaska.

Moreira LR, Smith BT. Genomics of parallel divergence and local adaptation in two North American woodpeckers. Talk presented at: American Ornithological Society 137th Stated Meeting; 2019; Anchorage, Alaska.

Moreira LR, Smith BT. Genomics of parallel divergence and local adaptation in two North American woodpeckers. Talk presented at: Evolution; 2019; Providence, Rhode Island.

Merwin JT, Seeholzer GF, Smith BT. Macroevolutionary bursts and constraints generate a rainbow in a clade of tropical birds. Talk presented at: Evolution; 2019; Providence, Rhode Island.

Provost KL, Shue S, Forcellati M, Smith BT. Environmental impacts structuring genomic and phenotypic variation in desert birds. Talk presented at: Society of Systematic Biology Standalone Meeting: Systematics in the Swamp; 2020; Gainesville, FL

Provost KL, Smith BT. Environment Wins! Using SDMs to Assess Drivers of Morphological Divergence in Desert Birds. Talk presented at: New York Regional Species Distribution Modeling Meeting; 2019; New York, NY.

Provost KL, Shue S, Forcellati M, Smith BT. Comparative genomics and modes of differentiation in North American warm desert birds. Talk presented at: American Ornithological Society 137th Stated Meeting; 2019; Anchorage, AK.

Provost KL, Shue S, Forcellati M, Smith BT. Society of Systematic Biology Ernst Mayr Symposium: Comparative genomics and modes of differentiation in North American warm desert birds. Talk presented at: Evolution Meeting; 2019; Providence, RI.

Thom G, Smith BT, Raposo do Amaral F, Miyaki CY. Population dynamics of montane bird species is associated with a narrow latitudinal gradient in the Atlantic Forest; Talk presented at: Society of Systematic Biology Standalone Meeting: Systematics in the Swamp; 2020; Gainesville, FL.

Braun EL, Kimball RT, Oliveros CH, Wang N, Barker FK, Field DJ, Ksepka DT, Chesser R T, Moyle RG, Brumfield RT, Faircloth, BC, Smith BT. Unlocking the phylogenomic (super)tree of birds (and other organisms). G10K Annual Meeting. New York, New York, USA. 2018.

Moreira LR, Smith BT. Genomics of parallel local adaptation in two North American woodpeckers. Joint Congress on Evolutionary Biology. Montpellier, France. 2018.

McCullough JM, Moyle RG, Smith BT, Andersen MJ. Biogeography and trait evolution of the pantropical avian order Coraciiformes. American Ornithological Society 136th Stated Meeting. Tucson, Arizona, USA. 2018.

Merwin, JT, Seeholzer GF, Smith BT. Color evolution in the lorries and lorikeets. American Ornithological Society 136th Stated Meeting. Tucson, Arizona, USA. 2018.

Smith BT, Mauck WM III, Benz B, Andersen MJ. Uneven missing data skews phylogenomic relationships within the lorries and lorikeets. American Ornithological Society 136th Stated Meeting. Tucson, Arizona, USA. 2018.

Brumfield RT, Faircloth BC, Smith BT, Kimball RT, Braun EL, Barker FK et al. OpenWings: Collaborative construction of a fossil-calibrated species-level bird phylogeny. Poster presented at: American Ornithological Society 136th Stated Meeting. Tucson, Arizona, USA. 2018.

Provost KL, Smith BT. Population genomics of Southwestern Desert Birds. American Ornithological Society 136th Stated Meeting. Tucson, Arizona, USA. 2018.

Harvey MG. et al. Ecological and biogeographical drivers of diversification in New World suboscine birds (Aves; Tyranni). American Ornithological Society 136th Stated Meeting. Tucson, Arizona, USA. 2018.

Oliveros CH. et al. Phylogeny of all passerine families reveal a diversification history tied to Cenozoic global climate. American Ornithological Society 136th Stated Meeting. Tucson, Arizona, USA. 2018.

Provost KL, Mauck WM III, Smith BT. Genomic differentiation in Northern Cardinals of the North American warm deserts is maintained by behavioral isolation. Metropolitan Society of Natural Historians Sixth Annual Symposium. New York, New York, USA. 2018.

Provost KL, Mauck WM III; Smith, BT. Genomic divergence across a barrier is mediated by song dialects. Evolution Meeting. Portland, Oregon, USA. 2017.

Moreira LR, Hernández Baños BE, Smith BT. Genome-wide markers reveal the determinants of genetic divergence in a lowland Mesoamerican bird (*Icterus gularis*). Evolution Meeting. Portland, Oregon, USA. 2017.

Smith BT. When are species delimitation methods necessary for studying macroevolutionary patterns? Society of Systematic Biology Symposium - A debate of conceptual issues surrounding genetic-based species delimitation in the genomic era. Invited Speaker at: Evolution Meeting. Portland, Oregon, USA. 2017.

Smith BT. A biological view on avian phylogeography. E3B Departmental Seminar, Columbia University. New York, New York, USA. 2017.

Smith BT. A biological view on avian phylogeography. Center for Biodiversity and Global Change, Yale University, New Haven, Connecticut, USA. 2017.

Provost, K, Mauck III WM, Smith BT. Testing the permeability of a barrier using integrative phylogeography. Society of Systematic Biologists Standalone Meeting, Baton Rouge, Louisiana, USA. 2017.

Oswald JA, Overcast I, Mauck III WM, Andersen MJ, Smith BT*. Asymmetric gene flow during the protracted diversification of dry-forest-bird assemblages. North American Ornithological Conference, Washington, DC, USA. 2016. *presenter

Provost, K, Mauck III WM, Smith BT. Genetic and behavioral divergence among Northern Cardinal populations: Testing the permeability of a biogeographic barrier. North American Ornithological Conference, Washington, DC, USA. 2016.

Mauck III, WM, Brenz B, Andersen MJ, Smith BT. Phylogenomics of Lories and Lorikeets (Order: Psittaciformes). North American Ornithological Conference, Washington, DC, USA. 2016.

Oswald JA, Overcast I, Mauck III WM, Andersen MJ, Smith BT*. Asymmetric gene flow during the protracted diversification of dry-forest-bird assemblages. Evolution Conference, Austin, Texas, USA. 2016. *presenter

Andersen MJ, McCullough JM, Mauck III, WM, Smith BT, Moyle RG. Phylogeny and biogeography of kingfishers. North American Ornithological Conference, Washington, DC, USA. 2016.

Provost, K, Mauck III WM, Smith BT. Genetic and behavioral divergence in a songbird across a barrier. Women in Science at Columbia Graduate Research Symposium, New York, New York, USA. 2016.

Smith BT, Seeholzer GF, Harvey MG, Klicka J, Cuervo AM, Brumfield R. Large-scale phylogeography. Society of Systematic Biology Meeting. Ann Arbor, Michigan, USA. 2015.

Smith, BT. The origins and diversification of New World birds. Department of Biology Seminar Series. City College of New York, New York, USA. 2014.

Smith, BT. Insights into latitudinal species diversity gradients gained from phylogenetic data. American Society of Naturalists, Palomar, California, USA. 2014.

GRADUATE STUDENT AND POSTDOC ADVISING

Frank M. Chapman Postdoctoral Fellows

Michael Andersen 2014–2015

Glenn Seeholzer 2017–2018

Gregory Thom 2019–*present*

Visiting Postdoctoral Fellow

Gregory Thom 2018–2019

Columbia University Ph.D. Students

Brian Weeks 2014–2017

Lais Araujo Coelho 2014–2019

Lucas Rocha Moreira 2014–*present* (Primary Advisor)

Patrick McKenzie 2018–*present*

Vijay Ramesh 2018–*present*

CUNY Ph.D. Students

Isaac Overcast 2017–2019

Arianna Kuhn 2017–*present*
Andrea Paz 2017–*present*
Elkin Alexander Tenorio Moreno 2019–*present* (Primary Advisor)

RGGS Ph.D. Students

Spencer Galen 2014–2018
Rachel Welt 2015–2018
Kaiya L. Provost 2016–*present* (Primary Advisor)
Lukas Musher 2016–*present*
Margaret Lazzeroni 2018–*present*
Tobit Liyandja 2018–*present*

Brazilian PhD Sandwich Fellows

Amanda Vaz Rocha 2017–2018
Bruno Almeida 2017–2018
Tiago Sousa-Neves 2017

Columbia University M.A. Students

Natalie Hofmeister 2014–2015
Kaiya L. Provost 2014–2016 (Primary Advisor)
Vijay Ramesh 2014–2016
Lukas Musher 2014–2016
Jacqueline Barry 2017–2019

Postbaccalaureate Helen Fellow in Computational Biology

Jordan Koch 2015–2016 (Research Advisor)

Columbia University Undergraduate Students

Jon Merwin 2016–2017 (Research Advisor)
Sarah Bai 2016 (Research Advisor)

NSF BIO REU

Ariella Kornreich 2018

AMNH Brown Scholars and High School Student Internships

Sophia Azaraev 2015–2016
Charlotte Nahley 2015–2016
Sarah Shetty 2015–2016
Jessica Wu 2015–2016
Stephanie Shue 2017–2018
Meghan Forcellati 2018–2019
Elliot Lee 2019; 2020