

Sarah E. Bush - Curriculum Vitae

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Education: Ph.D. in Biology, University of Utah, UT, 2004
Molecular Evolution, Woods Hole, MA, 2004
B.S. in Biology, University of Utah, UT, 1999

Research Interests:

Co-evolutionary ecology of hosts and parasites
Biodiversity, biogeography, and systematics of parasites



Removing ectoparasites from an American White Pelican on the flats of the Great Salt Lake, Utah.

Positions:

Current: Associate Professor, Department of Biology, University of Utah (since 2017)
Adjunct Curator-Vertebrate Zoology, Natural History Museum of Utah (since 2011)
President (elected), International Society of Phthirapterists (2018-2022)
Council Member-at-Large (elected), Am. Soc. Parasitologists (2016-2020)
Priorities & Planning Committee (appointed), Am. Soc. Parasitologists (2019-2022)
Adjunct Researcher, University of Kansas, Biodiversity Institute (2019-2021)

2014-2018: Executive Committee Councilor (elected), International Society of Phthirapterists

2010-2017: Assistant Professor, Department of Biology, University of Utah
(half-time 2010-2014; full-time 2014-2017)

2008 - 2010: Research Assistant Professor, University of Utah

2004 - 2010: Postdoctoral Researcher, Natural History Museum and Biodiversity Research Center,
University of Kansas

2004 - 2005: Co-director, Center for Alternate Strategies of Parasite Removal (CASPeR), University of Utah

2001 - 2004: NIH Genetics Training Grantee, University of Utah

1995 - 1999: Undergraduate researcher, Department of Biology, University of Utah

1993: Howard Hughes Summer Research Program, Inst. Human Genetics, University of Utah

Teaching:

Current: Co-instructor: "Bootcamp for Graduate Students" (fall semester 2018)
Co-instructor: "Evolution & Diversity of Life" (Biol 2010 fall semesters, since 2015)
Instructor: "Ecology & Evolution of Parasites & Pathogens" (Biol 5555, Lecture/Lab, 3credits, every other spring since 2012)
Instructor: "Ecological Speciation" (Biol 7406, fall semester 2018)

2012, 2016: Instructor: "SpeakerFest" (Biol 7406), University of Utah

2010-- Lecturer in: "Advanced Topics in Ecology & Evolution" (Biol 7964, fall semesters),
University of Utah

2010-- Lecturer in: "Bootcamp for Graduate Students" (Biol 7964, spring semesters)

2009: Instructor; Continuing Education Course: "In the footsteps of Darwin, Evolutionary Biology in the 21st Century", OSHR Institute of Learning

2006: Co-instructor; Graduate Seminar: "Geographic Mosaic of Coevolution", University of Utah

Teaching cont.:

- 2004 - 2005: Guest Lecturer & Field Support: Ornithology & Adv. Field Ornithology, University of Utah
2004: Guest Lecturer: Heredity and Genetics for high school teachers, Genetic Science Learning Center, Department of Human Genetics, University of Utah
- 1998 - 2003: Teaching Assistant, University of Utah
Advanced Field Ornithology 2000, 2001 and 2003
Ornithology 1999, 2000
Plant Systematics 1999
Organismal Diversity, Form and Function 1998 and 1999
- 1997 - 2001: Educator, Tracy Aviary, Salt Lake City, Utah
Public outreach programs, and summer workshops for children

Professional Memberships (*honorary status, †service):

- American Ornithologists' Union
*Elected Member (2009), *Fellow (2017)
- American Society of Parasitologists
†Council Member-at-Large (2016-2020)
- International Society of Phthirapterists
†President (2018-2022), †Executive Committee Councilor (2014-2018)
- Society for the Study of Evolution
Society for Systematic Biology

Grants & Honors:

- 2019: NSF Collaborative Research: Digitization TCN: Digitizing collections to trace parasite-host associations and predict the spread of vector-borne disease. (\$4.3 million, 3yrs, 25 institutions; amount to PI-Bush \$148,750).
- 2019: NSF Dimensions US-China: Collaborative Research: Functional Genomics and Experimental Endosymbiont Replacements in Lice. (\$2 million, 5yrs, one of four PIs; amount to University of Utah \$1,292,098).
- 2018: Golden Commemorative Badge of the University of Veterinary and Pharmaceutical Sciences, Brno, Czech Republic (in honor of significant contributions to Phthiraptera research)
- 2017: Fellow of the American Ornithological Society
- 2016: University of Utah Funding Incentive Seed Grant: Conditions of engagement - are hosts more likely to resist or tolerate parasites under different environmental conditions? (\$15,362, 1yr).
- 2016: NSF DDIG: Effect of Phoretic Dispersal on the Structure of Parasite Populations (\$19,503, with Ph.D. candidate Emily DiBlasi).
- 2015: Early Career Teaching Award, University of Utah
- 2014: NSF REU supplement for undergraduate research (\$6,600).
- 2013: NSF Dimensions of Biodiversity: Experimental adaptive radiation - genomics of diversification in bird lice (\$2 million; amount to University of Utah \$1,370,098, 5yrs; one of four PIs).
- 2013: NSF REU supplements for undergraduate research (\$19,050).
- 2013: Swedish Taxonomic Initiative: Chewing lice on birds in Nordic countries (\$290,000, 3yrs). Lead PI. Co-PIs: Daniel Gustafsson, (postdoctoral fellow in Bush lab) and Urban Olsson, Professor, University of Gothenburg, Sweden.
- 2012: NSF REU supplements for undergraduate research (\$7,500).
- 2011: NSF- REVSYS: Unlocking the black box of feather louse diversity, a comprehensive revision of the hyper-diverse genus *Brueelia* (\$407,000, 3 yrs). Lead PI. (Co-PI: K.P. Johnson, Illinois Natural History Survey.)
- 2011: NSF- OPUS: The ecological basis of coevolutionary history - lessons from lice (\$150,000, 2yrs; one of 3 PIs).
- 2009: Elected Member of the American Ornithologists' Union

- 2008: NSF-Biotic Surveys & Inventories Grant: *A Comprehensive Biotic Survey of Philippine Land Vertebrates and their Parasites* (\$900,000, 5yrs; one of 4 PIs).
- 2005: Utah Centers of Excellence Grant (renewal) Co-director: *Center for Alternate Strategies of Parasite Removal* (\$150,000, 1 yr.)
- 2005: G. Richard Riser Award for outstanding graduate research, University of Utah
- 2005: NIH Travel award, Symposium on the Evolution of Infectious Diseases, Maryland
- 2004: Utah Centers of Excellence Grant Co-director: *Center for Alternate Strategies of Parasite Removal* (\$135,000, 1 yr).
- 2003: Biology Department Travel Award, University of Utah
- 2003: Marcia Brady Tucker Travel Award, American Ornithologists' Union
- 2002: ASUU Travel Award, Association of Students, University of Utah
- 2002: Research Award, American Ornithologists' Union
- 2002: Frank M. Chapman Research Grant, American Museum of Natural History
- 2002: Grant-in-Aid of Research, Sigma Xi
- 2002: Biology Departmental Travel Award, University of Utah
- 2001: Marcia Brady Tucker Travel Award, American Ornithologists' Union
- 2001: Biology Department Travel Award, University of Utah
- 2000: Biology Department Travel Award, University of Utah
- 1999: Student Presentation Award, Bio. Undergrad. Research Program, University of Utah
- 1998: Bioscience Undergraduate Research Grant, University of Utah
- 1997: Bioscience Undergraduate Research Grant, University of Utah
- 1994: Honors at Entrance Scholarship, University of Utah

Eponyms:

- Sarahcultrix* n. gen. ex *Peltops* spp. (Mountain Peltops and Lowland Peltops).
Gustafsson, D. G. 2019. New genus and two new species of chewing lice (Phthiraptera: Ischnocera) parasitizing New Guinean *Peltops* (Passeriformes: Artamidae). *Journal of Parasitology* 105: 840-845.
- Proterothrix sarahbushae* n. sp. ex. *Paradoxornis verreauxi* (Golden Parrotbill).
Mironov, S., and H. Proctor. 2009. Feather Mites of the Genus *Proterothrix* Gaud (Astigmata: Proctophyllodidae) from Parrotbills (Passeriformes: Paradoxornithidae) in China. *Journal of Parasitology* 95: 1093–1107.
- Neopsittaconirmus bushae* n. sp. ex. *Northiella haematogaster* (Bluebonnet Parrot)
Price, Roger D., and K. P. Johnson. 2007. Three new species of chewing lice (Phthiraptera: Ischnocera: Philopteridae) from Australian parrots (Psittaciformes: Psittacidae). *Proceedings of the Entomological Society of Washington* 109: 513-521.
- Columbicola* [bush] *altamimiae* n. sp. ex. *Metriopelia aymara* (Golden-spotted Ground-dove)
Clayton, D. H., and R. D. Price. 1999. Taxonomy of New World *Columbicola* (Phthiraptera: Philopteridae) from the Columbiformes (Aves), with descriptions of five new species." *Annals of the Entomological Society of America* 92: 675-685.

Publications:

Books and Monographs

- Clayton, D. H., **S. E. Bush**, and K. P. Johnson. 2016. Coevolution of life on hosts: Integrating ecology and history. University of Chicago Press. 320pp ([Univ. Chicago Press website](#))
- Gustafsson, D. R., and **S. E. Bush**. 2017. Morphological revision of the hyperdiverse *Brueelia*-complex (Insecta: Phthiraptera: Ischnocera: Philopteridae) with new taxa, checklists and generic key. *Zootaxa* 4313: 1-443. [PDF](#)
- ♦ Describes 21 new genera, 4 new subgenera, 37 new species, and 186 new host records.
- Gustafsson, D. R., E. DiBlasi, U. Olsson, T. Najer, O. Sychra and **S. E. Bush**. 2018 Checklist and key to the lice (Insecta: Phthiraptera) of Sweden. *Entomologisk Tidskrift* 139: 205-394. [PDF](#)

Papers and Book Chapters

73. Goodman, G. B., M. C. Klingensmith, **S. E. Bush**, and D. H. Clayton. 2020. The role of scratching in the control of ectoparasites on birds. *The Auk*, in press.
72. Goodman, G. B., S. A. Conner, **S. E. Bush**, and D. H. Clayton. 2020. Is allopreening a stimulus-driven defense against ectoparasites? *Journal of Parasitology*, in press.
71. Gustafsson, D. R., and **S. E. Bush**. 2019. The genus *Brueelia* (Phthiraptera: Ischnocera: Philopteridae) of North American jays and allies (Aves: Passeriformes: Corvidae), with descriptions of five new species. *Journal of Parasitology* 105:893-903.
70. Gustafsson, D. R., and **S. E. Bush**. 2019. *Brueelia* (Phthiraptera: Ischnocera: Philopteridae) of North American nine-primaried oscines (Aves: Passeriformes: Passerida) with descriptions of nine new species. *Journal of Parasitology* 105:858-873.
69. Gustafsson, D. R., O. D. Malysheva, O. O. Tolstenkov, and **S. E. Bush**. 2019. Five new species of *Guimaraesiella* (Phthiraptera: Ischnocera) from broadbills (Aves: Passeriformes: Calyptomenidae, Eurylaimidae). *Journal of Parasitology* 105:846-857.
68. Gustafsson, D. R., **S. E. Bush**, and R. L. Palma. 2019. The genera and species of the *Brueelia*-complex (Phthiraptera: Philopteridae) described by Mey (2017). *Zootaxa* 4615:252-284. [PDF](#)
67. Villa, S. M., J. C. Altuna, J. S. Ruff, A. B. Beach, L. I. Mulvey, E. J. Poole, H. E. Campbell, K. P. Johnson, M. D. Shapiro, **S. E. Bush**, and D. H. Clayton. 2019. Rapid experimental evolution of reproductive isolation from a single natural population. *Proceedings of the National Academy of Sciences* 201901247. [PDF](#)
- ◆ **Recommended by Faculty of 1000Prime**
66. **Bush, S.E.**, S. M. Villa, J. C. Altuna, K. P. Johnson, M. D. Shapiro, and D. H. Clayton. 2019. Host defense triggers rapid adaptive radiation in experimentally evolving parasites. *Evolution Letters* 3:120-128. doi:10.1002/evl3.104 [PDF](#)
- ◆ **Featured in The Atlantic, An Unusual Evolutionary Experiment** – by Ed Yong, Mar. 13, 2019
- ◆ **Recommended by Faculty of 1000Prime**
65. Gustafsson, D. R., L. Lei, X. Chu, F. Zou and **S. E. Bush**. 2019. New genus and two new species of chewing lice from Southeast Asian trogons (Aves:Trogoniformes), with a revised key to the *Philopterus*-complex. *Acta Parasitologica* 64:86-102. [PDF](#)
64. Gustafsson, D. R., D. H. Clayton, and **S. E. Bush**. 2019. Twelve new species of *Guimaraesiella* (Phthiraptera: Ischnocera: Philopteridae) from “babblers” (Passeriformes: Leiotherichidae, Pellorneidae, Timaliidae), with a description of a new subgenus and a key to its species. *Zootaxa* 4543: 451-497. [PDF](#)
63. McNew, S. M., S. A. Knutie, G. B. Goodman, A. Theodosopoulos, A. Saulsberry, J. Yépez R., **S. E. Bush**, and D. H. Clayton. 2019. Annual environmental variation influences host tolerance to parasites. *Proceedings of the Royal Society, B*. 286:20190049. doi:10.1098/rspb.2019.0049 [PDF](#)
62. Gustafsson, D. R., X. Chu, F. Zou, and **S. E. Bush**. 2018. Seven new species of *Resartor* Gustafsson et Bush, 2017 (Phthiraptera: Ischnocera: Philopteridae) from Asian “babblers” (Passeriformes: Leiotherichidae, Paradoxornithidae). *Folia Parasitologica* 65:020 doi:10.14411/fp.2018.020 [PDF](#)
61. Gustafsson, D. R., X. Chu, **S. E. Bush**, and F. Zou. 2018. Ten new species of *Brueelia* Kéler, 1936 (Phthiraptera: Ischnocera: Philopteridae) from nuthatches (Aves: Passeriformes: Sittidae), tits and chickadees (Paridae), and goldcrests (Regulidae). *Acta Parasitologica* 63:527-557. doi:10.1515/ap-2018-0063. [PDF](#)
60. DiBlasi, E., K. P. Johnson, S. A. Stringham, A. N. Hansen, A. B. Beach, D. H. Clayton, and **S. E. Bush**. 2018. Phoretic dispersal influences parasite population genetic structure. *Molecular Ecology* 27: 2647-2779. doi:10.1111/mec.14719 [PDF](#) and [Supp.Info \(PDF\)](#)
59. **Bush, S. E.** and D. H. Clayton. 2018. Anti-parasite behaviour of birds. *Philosophical Transactions of the Royal Society, B*. 373: 20170196. doi:10.1098/rstb.2017.0196 [PDF](#)
58. **Bush, S. E.**, D. R. Gustafsson, and D. H. Clayton. 2018. New records of ectoparasites from passerine birds in the High Tatras of Slovakia. *Oecologia Montana* 27:43-45. [PDF](#)
57. Gustafsson, D. R., D. H. Clayton, and **S. E. Bush**. 2018. Twelve new species of *Priceiella* (Phthiraptera: Ischnocera: Philopteridae) from Old World babblers, with keys to species of two subgenera and checklists of species for the genus. *Zootaxa* 4382:401-449. [PDF](#)
56. Villa, S. M., M. D. Evans, Y. K. Subhani, J. C. Altuna, **S. E. Bush**, and D. H. Clayton. 2018. Body size and fecundity are correlated in feather lice (Phthiraptera: Ischnocera): Implications for Harrison's Rule. *Ecological Entomology* 43:394-396. <https://doi.org/10.1111/een.12511>. [PDF](#)

55. Sweet, A. D., **S. E. Bush**, D. R. Gustafsson, J. M. Allen, E. DiBlasi, H. R. Skeen, J. D. Weckstein, and K. P. Johnson. 2018. Host and parasite morphology influence congruence between host and parasite phylogenies. *International Journal of Parasitology* 48: 641-648. <https://doi.org/10.1111/een.12511> [PDF](#)
 ◆ **Editor's Choice**
 ◆ **Recommended by Faculty of 1000Prime**
54. Boyd, B. M., J. A. Allen, N. Nguyen, A. D. Sweet, T. Warnow, M. D. Shapiro, S. M. Villa, **S. E. Bush**, D. H. Clayton, and K. P. Johnson. 2017. Phylogenomics using target restricted assembly resolves intrageneric relationships of parasitic lice (Phthiraptera: *Columbicola*). *Systematic Biology* 66:896-911. [PDF](#)
53. Harnos, A., Z. Lang, D. Petrás, **S. E. Bush**, and L. Rózsa. 2017. Size matters for lice on birds: coevolutionary allometry of host and parasite body size. *Evolution* 71: 421-431. [PDF](#)
52. Villa, S. M., H. E. Campbell, **S. E. Bush**, and D. H. Clayton. 2016. Does anti-parasite behavior improve with experience: An experimental test of the priming hypothesis. *Behavioral Ecology* 27: 1167-1171. [PDF](#)
51. Bartlow, A. W., S. M. Villa, M. W. Thompson, and **S.E. Bush**. 2016. Walk or Ride? Phoretic behavior of amblyceran and ischnoceran lice. *International Journal of Parasitology* 46: 221-227. [PDF](#)
 ◆ **Journal cover article**
50. **Bush, S. E.**, J. D. Weckstein, D. R. Gustafsson, J. Allen, E. DiBlasi, S. M. Shreve, R. Boldt, H. R. Skeen, and K. P. Johnson. 2016. Unlocking the black box of feather louse diversity: a molecular phylogeny of the hyper-diverse genus *Brueelia*. *Molecular Phylogenetics and Evolution* 94: 737-751. [PDF](#)
49. **Bush, S. E.**, J. D. Weckstein, D. R. Gustafsson, J. Allen, E. DiBlasi, S. M. Shreve, R. Boldt, H. R. Skeen, and K. P. Johnson. 2015. Data supporting a molecular phylogeny of the hyper-diverse genus *Brueelia*. *Data in Brief* 5: 1078-1091. [PDF](#)
48. Gustafsson, D. R. and **S. E. Bush**. 2015. Four new species of *Brueelia* Kéler, 1936 (Phthiraptera: Ischnocera: Philopteridae) from African songbirds (Passeriformes: Sturnidae and Laniidae). *Zootaxa* 4013: 503-518. [PDF](#)
47. Gustafsson, D. R., M. Tsurumi and **S. E. Bush**. 2015. The chewing lice (Insecta: Phthiraptera: Ischnocera, Amblycera) of Japanese pigeons and doves (Columbiformes), with descriptions of three new species. *Journal of Parasitology* 101: 304-313. [PDF](#)
46. Makarikov, A. A., V. V. Tkach, S. M. Villa, and **S. E. Bush**. 2015. Description of two new species of *Hymenolepis* Weinland, 1858 (Cestoda, Hymenolepididae) from rodents on Luzon Island, Philippines. *Systematic Parasitology* 90:27-37. [PDF](#)
45. Gustafsson, D. R., and **S. E. Bush**. 2014. Two new species of *Paraphilopterus* Mey, 2004 (Insecta: Phthiraptera: Ischnocera: Philopteridae) from New Guinean bowerbirds (Passeriformes: Ptilonorhynchidae) and satinbirds (Passeriformes: Cnemophilidae) *Zootaxa* 3873:155-164. [PDF](#)
44. McAllister, C. T., Seville, R. S., Duszynski, D. W., and **S. E. Bush**. 2014. A new species of coccidia (Apicomplexa: Eimeriidae) from Cordillera striped shrew-rat, *Chrotomys whiteheadi* (Rodentia: Muridae), from the Philippines. *Acta Parasitologica* 59: 686-689. [PDF](#)
43. Hastriter, M. W. and **S. E. Bush**. 2014. Description of *Medwayella independencia* (Siphonaptera: Stivaliidae), a new species of flea from Mindanao, Island, the Philippines and their phoretic mites, and miscellaneous flea records from the Malay Archipelago. *Zookeys* 408:107-123. [PDF](#)
42. Gustafsson, D. R., and **S. E. Bush**. 2014. Three new species of chewing lice of the genus *Emersoniella* Tendeiro, 1965 (Insecta: Phthiraptera: Ischnocera: Philopteridae) from Papua New Guinean kingfishers and kookaburras (Aves: Coraciiformes: Alcedinidae). *Zootaxa* 3796:528-544. [PDF](#)
41. McAllister, C. T., R. S. Seville, D. W. Duszynski, **S. E. Bush**, R. N. Fisher, C. C. Austin. 2013. Two new species of *Eimeria* Schneider, 1875 (Apicomplexa: Eimeriidae) from emerald tree skinks, *Lamprolepis smaragdina* (Lesson) (Sauria: Scincidae) from Papua New Guinea and the Philippines. *Systematic Parasitology* 86:165-171. [PDF](#)
40. **Bush, S. E.**, M. Reed, and S. Maher. 2013. Impact of forest size on parasite biodiversity: implications for conservation of hosts and parasites. *Biodiversity and Conservation* 22: 1391-1404. [doi:10.1007/s10531-013-0480-x](https://doi.org/10.1007/s10531-013-0480-x). [PDF](#)
 ◆ **Recommended by Faculty of 1000Prime**

39. Morse, S. F., **S. E. Bush**, B. D. Patterson, C. W. Dick, M. Gruwell, K. Dittmar. 2013. Evolution, multiple acquisition, and localization of endosymbionts in bat flies (Diptera: Hippoboscoidea, Streblidae, Nycteribiidae). *Applied and Environmental Microbiology* 79:2952-2961. [PDF](#)
38. Makarikov, A. A., V. V. Tkach, and **S. E. Bush**. 2013. Two new species of *Hymenolepis* (Cestoda: Hymenolepididae) from murid rodents (Rodentia: Muridae) in the Philippines. *Journal of Parasitology* 99:847-855. [PDF](#)
37. Kuzmin, Y., J. M. Kinsella, V. V. Tkach, and **S. E. Bush**. 2013. New species of *Kalicephalus* (Nematoda: Diaphanocephalidae) from a snake *Oxyrhabdium leporinum* on Luzon Island, Philippines. *Comparative Parasitology* 80:240-246. [PDF](#)
36. Tkach, V. V., O. I. Lisistyna, J. L. Crossley, T. T. Binh, and **S. E. Bush**. 2013. Morphological and molecular differentiation of two new species of *Pseudoacanthocephalus* Petrochenko, 1958 (Acanthocephala: Echinorhynchidae) from amphibians and reptiles in Philippines, with identification keys for the genus. *Systematic Parasitology* 85:11-26. [PDF](#)
35. Hastriter, M. W., and **S. E. Bush**. 2013. Description of *Lentistivalius philippinensis*, a new species of the flea (Siphonaptera: Pygiosyllomorpha: Stivalidae), and new records of the Ascodipterinae (Streblidae) on small mammals and bats from the Philippines. *Zookeys* 260:17-30. [PDF](#)
34. **Bush, S. E.**, S. M. Villa, T. J. Boves, D. Brewer, and J. R. Belthoff. 2012. Influence of bill and foot morphology on the ectoparasites of Barn Owls. *Journal of Parasitology* 98:256-261. [PDF](#)
33. Lisistyna, O. I., V. V. Tkach, and **S. E. Bush**. 2012. New records of Acanthocephalans from birds in the Philippines with a description of a new *Porrorchis* species and identification keys for the genus. *Journal of Parasitology* 98:1176-1184. [PDF](#)
- ♦ **Journal cover article**
32. **Bush, S. E.** and R. G. Robbins. 2012. New host and locality records for *Ixodes simplex* Neumann and *Ixodes vespertilionis* Koch (Acari: Ixodidae) from bats (Chiroptera: Hipposideridae, Rhinolophidae, and Vespertilionidae) in southern China. *International Journal of Acarology* 38:1-5. [PDF](#)
- ♦ **Journal cover article**
31. Kuzmin, Y., V. V. Tkach, and **S. E. Bush**. 2012. A new species of *Rhabdias* (Nematoda: Rhabdiasidae) from Agamid Lizards in Luzon Island, Philippines. *Journal of Parasitology* 98: 608-611. [PDF](#)
30. **Bush, S. E.**, A. N. Rock, S. L. Jones, J. R. Malenke, D. H. Clayton. 2011. Efficacy of the LouseBuster, a new medical device for treating head lice. *Journal of Medical Entomology* 48: 67-72. [PDF](#)
29. Johnson, K. P., J. D. Weckstein, **S. E. Bush**, and D. H. Clayton. 2011. The evolution of host specificity in dove body lice. *Parasitology* 138:1730-1736. [PDF](#)
28. **Bush, S. E.**, D. Kim, M. Reed, and D. H. Clayton. 2010. Evolution of cryptic coloration in ectoparasites. *American Naturalist* 176:529-535. [PDF](#)
27. Clayton, D. H., Koop, J. A., Harbison, C. W., Moyer, B. R., and **S. E. Bush**. 2010. How birds combat ectoparasites. *Open Ornithology Journal* 3:41-71. [PDF](#)
26. Hastriter, M.W. and **S.E. Bush**. 2010. Notes and new records of fleas (Insecta: Siphonaptera) from small mammals and birds collected in southern China. *Proceedings of the Entomological Society of Washington* 112:214-228. [PDF](#)
25. Tkach, V. V. and **S. E. Bush**. 2010. *Serpentoanisocladium sinensis* n. gen., n. sp. (Digenea: Cryptogonimidae) from the Eastern Water Snake *Sinonatrix percarinata* (Serpentes: Colubridae) in Guizhou Province, China. *Systematic Parasitology* 76:205-210. [PDF](#)
24. **Bush, S. E.** 2009. Does behavioral flexibility facilitate host switching by parasites? *Functional Ecology* 23: 578-586. [PDF](#)
23. **Bush, S. E.**, C. W. Harbison, D. Slager, A. T. Peterson, R. D. Price, and D. H. Clayton. 2009. Geographic variation in the community structure of lice on Western Scrub-jays. *Journal of Parasitology* 95:10-13. [PDF](#)
22. **Bush, S. E.**, R. D. Price, and D. H. Clayton. 2009. Descriptions of eight new species of feather lice in the genus *Columbicola* (Phthiraptera: Philopteridae), with a comprehensive world checklist. *Journal of Parasitology* 95:286-294. [PDF](#)
21. M. W. Hastriter, **S.E. Bush**, K. Dittmar, S. S. Hla Bu, and M. F. Whiting. 2009. *Nycteridopsylla quadrispina* Lu and Wu, a junior synonym of *Nycteridopsylla iae* Beaucournu and Kock (Siphonaptera: Ischnopsyllidae) as determined by DNA analysis. *Proceedings of the Entomological Society of Washington* 111: 598-602. [PDF](#)

20. **Bush, S. E.**, D. W. Duszynski, and B. B. Nickol. 2009. *Acanthocephala* from amphibians in China with description of a new species of *Pseudoacanthocephalus*. *Journal of Parasitology* 95:1440-1445. [PDF](#)
19. **Bush, S. E.** and J.R. Malenke. 2008. Host defense mediates interspecific competition in parasites. *Journal of Animal Ecology* 77: 558-564. [PDF](#)
18. Harbison, C. W., **S. E. Bush**, J. R. Malenke, D. H. Clayton. 2008. Comparative transmission dynamics of competing parasite species. *Ecology* 89: 3186-3194. [PDF](#)
17. Peterson, A. T., **S. E. Bush**, E. Spackman, D. E. Swayne, and H. Ip. 2008. Influenza A Virus Infections in Land Birds, People's Republic of China. *Emerging Infectious Diseases* 14: 1644-1646. [PDF](#)
16. Clayton, D. H., R. J. Adams and **S. E. Bush**. 2008. Phthiraptera, the Chewing Lice. Pp. 515-526 in C. T. Atkinson, N. J. Thomas, and D. B. Hunter (eds). *Parasitic Diseases of Wild Birds*. Wiley-Blackwell, Ames, Iowa.
15. Peterson, A. T., T. Brooks, A. Gamauf, J. C. T. Gonzalez, N. A. D. Mallari, G. Dutson, **S. E. Bush**, D. H. Clayton and R. Fernandez. 2008. The avifauna of Mt. Kitanglad, Bukidnon Province, Mindanao, Philippines. *Fieldiana: Zoology* 114: 1-43. [PDF](#)
14. **Bush, S. E.** and D. H. Clayton. 2006. The role of body size in host specificity: reciprocal transfer experiments with dove lice. *Evolution* 60: 2158-2167. [PDF](#)
13. Goates, B. M., J. S. Atkin, K. G. Wilding, K. G. Birch, M. R. Cottam, **S. E. Bush**, and D. H. Clayton. 2006. An effective non-chemical treatment for head lice: a lot of hot air. *Pediatrics* 118: 1962-1970. [PDF](#)
12. **Bush, S. E.**, and R. D. Price. 2006. Reconsideration of the *longiceps* species group of the feather louse genus *Columbicola* (Phthiraptera: Philopteridae) with descriptions of two new species. *Journal of Parasitology* 92:949-952. [PDF](#)
11. **Bush, S. E.**, D. Kim, J. Lever, B. R. Moyer and D. H. Clayton. 2006. Is melanin a defense against feather-feeding lice? *Auk* 123:153-161. [PDF](#)
10. **Bush, S. E.**, E. Sohn and D. H. Clayton. 2006. Ecomorphology of parasite attachment: experiments with feather lice. *Journal of Parasitology* 92:25-31. [PDF](#)
9. Hastriter, M. W. and **S. E. Bush**. 2006. Description of *Maabella stomalata*, n. gen., n. sp. (Diptera: Streblidae: Ascodipterinae) from Guangxi Province, China and Vietnam with notes on the preservation of Ascodipterinae. *Zootaxa* 1176:27-40. [PDF](#)
8. Robbins, R.G. and **S.E. Bush**. 2006. First report of *Amblyomma papuanum* Hirst (Acari: Ixodida: Ixodidae) from the dwarf cassowary, *Casuarus bennetti* Gould (Aves: Struthioniformes: Casuariidae), with additional records of parasitism of *Casuarus spp.* by this tick. *Proceedings of the Entomological Society of Washington* 108:1002-1004. [PDF](#)
7. Price, R. D., D. C. Arnold, and **S. E. Bush**. 2006. Five new species of *Myrsidea* (Phthiraptera: Menoponidae) from Asian Babblers (Passeriformes: Timaliidae). *Journal of the Kansas Entomological Society* 79:369-377. [PDF](#)
6. Clayton, D. H., B. R. Moyer, **S. E. Bush**, D. Gardiner, B. Rhodes, T. Jones and F. Goller. 2005. Adaptive significance of avian beak morphology for ectoparasite control. *Proceedings of the Royal Society of London: B*. 272: 811-817. [PDF](#)
5. Johnson, K.P., **S.E. Bush**, D.H. Clayton. 2005. Correlated evolution of host and parasite body size: tests of Harrison's rule using birds and lice. *Evolution* 59: 1744-1753. [PDF](#)
4. Price, J. J., K. P. Johnson, **S. E. Bush**, and D. H. Clayton. 2005. Phylogenetic relationships of the Papuan Swiftlet *Aerodramus papuensis* and implications for the evolution of avian echolocation. *Ibis* 147: 790-796. [PDF](#)
3. Clayton, D. H., **S. E. Bush** and K. P. Johnson. 2004. The ecology of congruence: Past meets present. *Systematic Biology* 53:165-173. [PDF](#)
2. Clayton, D. H., **S. E. Bush**, B. M. Goates and K. P. Johnson. 2003. Host defense reinforces host-parasite cospeciation. *Proceedings of the National Academy of Sciences* 100:15694-99. [PDF](#)
1. Clayton, D. H., **S. E. Al-Tamimi [Bush]**, and K. P. Johnson. 2003. The ecological basis of coevolutionary history. Pp. 310-341 in R. D. M. Page (ed.) *Tangled Trees: phylogeny, cospeciation, and coevolution*. University of Chicago Press, Chicago, Illinois. [PDF](#)

Non-traditional publications

Lim, B. K., J. L. Eger, A. T. Peterson, M. B. Robbins, D. H. Clayton, **S. E. Bush** and R. M. Brown. 2008. Biodiversity in China: Lost in the masses? *Harvard Asia Quarterly* 11:12-23.

Bush, S. E. Field Guide to Collecting Parasites - written to help vertebrate biologists collect parasites they encounter in their own research. [PDF](#)

◆ Featured on the Armed Forces Pest Management Board 2009-2010.

Examples of popular press & textbook coverage of published research:

Topic - evolution of cryptic coloration in ectoparasites (featuring: Bush et al. 2010. *American Naturalist*; Bush et al. 2019. *Evolution Letters*):

The Atlantic. Mar. 13, 2019. This is a Truly Louse Experiment About Evolution. Ed Yong

Ornithology 4th Ed. 2019 F.B. Gill & R. O. Prum. Blackwell's Publishing.

New York Times - Sept. 6, 2010. On Birds of Many Colors, Lice Dress the Part. S.N. Bhanoo.

Nature. 2010. 466:1024. Research Highlights - Evolutionary Biology: Lice in hiding.

Science NOW - Aug. 25, 2010. Science Shot: Colored lice are for the birds.

Evolutionary Analysis, 5th ed. 2013. J. Herron & S. Freeman. Pearson/Prentice Hall.

Evolution: Making Sense of Life (online edition). 2013. C. Zimmer & D. Emlen. Roberts & Co. Pub.

Topic - evolutionary ecology of hosts and parasites (featuring: Bush & Clayton 2006. *Evolution*; Clayton, Bush, Goates and Johnson 2003. *PNAS*).

Evolution. 2011. C. Bergstrom & L. Dugatkin. WW Norton & Co. Inc.

Evolution, 2nd ed. 2009, D. Futuyma, Sinauer.

Evolutionary Analysis, 4th ed. S. Freeman & J. Heron. 2007. Pearson/Prentice Hall.

New York Times - May 10, 2005. Tales a Bird's Beak Tells. H. Fountain.

Japan Times - Dec. 11, 2003. Lice of a feather grow together. R. Hooper.

Invited Talks and Seminars:

2019: Utah State University, Department of Biology. Logan, Utah. Research Seminar.

2017: Royal Society, Kavali Royal Society Centre, Chicheley, England. Symposium Speaker.

2017: Pennsylvania State University, Department of Entomology. Research Seminar

2017: University of Alberta, Edmonton, Canada, Department of Biological Sciences. Research Seminar.

2016: University of Illinois, Champaign-Urbana, Illinois Natural History Survey. Research Seminar.

2015: College of Science Day - November 2015, University of Utah.

2015: Hungarian Natural History Museum, Budapest, Hungary. Research Seminar.

2015: Utah State University, Ecology Center. Public Seminar.

2015: Utah State University, Ecology Center. Research Seminar.

2015: Washington State University, Department of Entomology, March 2015. Research Seminar.

2015: University of North Dakota, Department of Biology, January 2015. Research Seminar.

2014: University of Southern Mississippi Gulf Coast Research Laboratory, Department of Coastal Sciences. Research Seminar.

2014: Utah Coalition of Reason & Humanists of Utah's "Darwin Day: A celebration of science". Keynote Address.

2014: Symposium in Honor of Dr. Roger D. Price. 5th International Conference on Phthiraptera, Park City, Utah.

2013: Avian Parasites: models for understanding processes and patterns of diversification. American Ornithologists' Union. Symposium co-organizer and speaker.

2012: University of the Philippines- Dilliman. Manila, Philippines. Research Seminar.

2011: Oklahoma State University, Department of Zoology. Research Seminar.

2011: Annual meeting for Ecology and Evolution of Infectious Diseases. Santa Barbara, California. Symposium Speaker.

2009: Arthropod Host-Symbiont Symposium, Entomological Society of Canada, Winnipeg. Symposium Speaker.

2009: Center for Infectious Disease Dynamics (CIDDD), Pennsylvania State University, State College, Pennsylvania. Research Seminar.

2009: Workshop: Collecting parasites for biotic inventory projects. Univ. Kansas, Lawrence, Kansas.

- 2008: University of Nebraska-Lincoln, Departments of Entomology and Veterinary & Biomedical Sciences. Research Seminar.
- 2008: Evolutionary Ecology of Host-Ectoparasite Interactions, American Society of Parasitologists, Arlington Texas. Symposium co-organizer and participant.
- 2007: Utah State University, Department of Biology. Research Seminar.
- 2006: Phylogenetic Perspectives on Ectoparasitism. Entomological Society of America, Indianapolis, Indiana. Symposium Speaker.
- 2006: College of Geography and Biology, Guizhou Normal University, Guiyang, China. Research Seminar.
- 2006: Tracy Aviary Lecture Series. Salt Lake City, Utah. Public Research Seminar.
- 2004: Genetics Science Learning Center, University of Utah. Public Research Seminar.
- 2003: Wasatch Avian Education Society, Salt Lake City, Utah. Public Research Seminar.

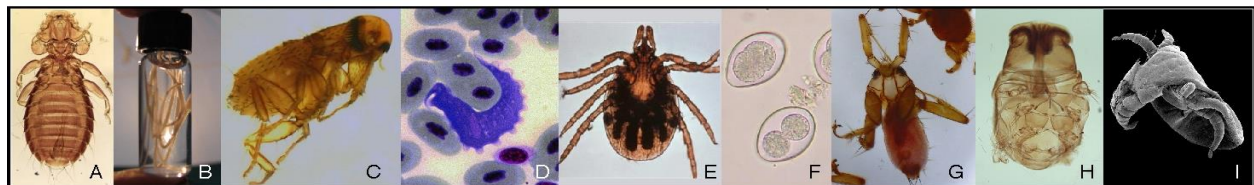
Contributed Talks and Posters at Scientific Meetings (partial list):

- 2019: American Society of Parasitologists, Rochester, Minnesota.
- 2018: 6th International Conference on Phthiraptera, Brno, Czech Republic.
- 2017: Royal Society. Kavali Royal Society Centre, England, UK
- 2016: North American Ornithological Conference. Washington, D.C.
- 2016: Society for the study of Evolution. Austin, TX
- 2016: Dimensions of Biodiversity PI-meeting, Washington, D.C.
- 2014: 5th International Conference on Phthiraptera, Park City, Utah.
- 2013: Society for the Study of Evolution, Snowbird, Utah.
- 2012: American Society of Parasitologists, Richmond, Virginia.
- 2010: American Society of Parasitologists, Colorado Springs, Colorado.
- 2009: Rock Mountain Conference of Parasitology, Moran, WY.
- 2007: Rocky Mountain Conference of Parasitology, Denver, CO.
- 2007: American Ornithologists' Union. Laramie, WY.
- 2007: Utah Ornithological Society. Provo, UT.
- 2006: 3rd International Conference of Phthiraptera, Buenos Aires, Argentina.
- 2003. American Ornithologists' Union. Urbana-Champaign, IL.
- 2003. Society for the study of Evolution. Chico, CA.
- 2002: 2nd International Conference on Phthiraptera. Brisbane, Australia.
- 2002: Society for the Study of Evolution, Urbana-Champaign, IL.
- 2001: American Ornithologists' Union. Seattle, WA.
- 1999: Biology Undergraduate Research Symposium, UT (student presentation award).

Field Work:

United States: Arizona, Florida, Hawaii, Oregon, Nevada, Texas, Utah

International: Australia, Bahamas, China, Galapagos, Grenada, Hungary, Papua New Guinea, Philippines, Slovakia



Parasite groups under study from projects in Australia, China, Papua New Guinea, Philippines, Sweden, and the United States: A) lice. B) helminths. C) fleas. D) hematozoans. E) ticks. F) coccidians. G-H) flies. I) mites.

Service:

Departmental Service

- 2017 - Curriculum reform taskforce
- 2016 - 2017: Development and award committee (Chair)
- 2015 - 2016: Biology undergraduate research advisory committee
- 2015 - 2018: Bartender for departmental functions (Ace Bartending Academy, ID#107350)
- 2014 - 2015: Seminar committee
- 2010 - 2014: Communications committee

University Service

- 2017 - 2020: (Elected) Academic Senator, University of Utah
- 2015 - 2017: (Elected) College of Science Council Member, University of Utah
- 2011-- (Appointed) Rio Mesa Center Advisory Committee Member, University of Utah

Service to Scientific Societies and Institutions

- 2018 - 2022: (Elected) President, International Society of Phthirapterists
- 2016 - 2020: (Elected) Council Member-at-Large, American Society of Parasitologists
- 2018: (Appointed) Member, American Ornithological Society Nominations Committee
- 2014 - 2018: (Elected) Executive Committee Councilor, International Society of Phthirapterists
- 2015: NSF panelist
- 2013 - 2014: (Elected) Chair of Nomination Committee, American Society of Parasitologists
- 2012 - 2014: Co-organizer, 5th International Conference on Phthiraptera, held in Park City in 2014, UT.
- 2010 - 2013: Student Awards Committee Member, American Society of Parasitologists
- 2007 - 2010: Question writer for the Biology GRE
- 2006-- Grant reviewer for: NSF, Marsden (New Zealand grant agency), Graduate Women In Science, University of Utah Undergraduate Research Program, and the Global Change and Sustainability Center.
- 2004-- Manuscript reviewer for: *Auk*, *Acta Parasitologica*, *Behavioral Ecology*, *Canadian Entomol.*, *European Journal of Taxonomy*, *Evolution*, *Evolutionary Ecology*, *Functional Ecology*, *International Journal of Acarology*, *International Journal of Parasitology*, *Journal of Animal Ecology*, *Journal of Avian Biology*, *Journal of Experimental Biology*, *Journal of the Kansas Entomological Society*, *Journal of Parasitology*, *Journal of Medical Entomology*, *Oecologia*, *Oikos*, *Molecular Ecology*, *Molecular Phylogenetics and Evolution*, *Parasitology*, *Parasitology Research*, *Proceedings of the Royal Society, B.*, *Zootaxa*, and others.
- 1999-- Museum specimen collection and preparation: Hundreds of parasite samples deposited in collections worldwide, including: lice, fleas, flies, ticks, mites, acanthocephalans, cestodes, nematodes, trematodes, haematozoans, viruses, and other misc. parasites and pathogens. Birds: >300 skins, skeletons and anatomicals deposited in the Field Museum (IL), Kansas Museum of Natural History, Utah Museum of Natural History, Guangxi Provincial Museum (China), the Philippine National Museum, and the National Museum of Papua New Guinea.
- 1999-- Scientific and program illustrations: Clark Ornithology Symposium, *Life among feathers*, Ohio Wesleyan University; poster illustrations for the Tracy Aviary Distinguished Lecturer Series, Salt Lake City, Utah; 100 interpretive signs for birds on public display at Tracy Aviary, Salt Lake City, Utah; Price et al. 2003 *J. Avian Bio.* 35:135-143; Johnson et al. 2002 *Molecular Ecology* (cover); 5th International Conference of Phthiraptera, 2014.

Public Outreach

- 2015: Educational lab tours for youth groups (Summer camps at the Natural History Museum of Utah).
- 2013-- Teaching Toolbox designed, demonstrated and constructed for the Natural History Museum of Utah. The toolbox is a series of educational modules with specimens, lesson plans and interactive activities based on inquiry based learning protocols. This toolbox is freely available to any educator (K-12) in the state of Utah.

- 2014: Workshop for Salt Lake City School Board, Extended Learning Program Educators (K-12): Evolutionary lessons for Utah students.
- 2013: Workshop for Utah Educators (K-12): Using the Parasite Teaching Toolbox, Natural History Museum of Utah
- 2012 - 2013: Presentations with interactive activities at SLC elementary schools covering topics of parasitism, evolution, ecology, and field biology. Beacon Heights (2nd grad class), Bonneville Elementary (three 1st grade classes, two 3rd grade classes), Dilworth Elementary Community (three 6th grade classes), Community Cooperative Nursery School (one pre-K class).
- 2012: Davis County, UT - youth summer literacy program, scientific presentation and activities.
- 2010: Contributed information and photos to "Dirty and Dangerous Jobs: Parasite Collector" by J. Cohn (Marshall Cavendish Publishing, 2010).

Trainees:

Postdoctoral associates

- 2016 – 2018: Scott M. Villa, Ph.D., Experimental adaptive radiation: genomics of diversification in bird lice
- 2012 – 2017: Daniel R. Gustafsson, Ph.D., Biodiversity of ectoparasitic lice on songbirds

Graduate students

- 2017-- **Emiko Waite** (advisor), Bird-parasite interactions. MS student
- 2014- 2019 **Graham Goodman** (co-advisor), Host-parasite behavioral ecology.
- 2012- 2018 **Sabrina McNew** (co-advisor), Evolutionary ecology of avian blood parasites. (Went on to a postdoc at Cornell Laboratory of Ornithology, New York)
- 2012- 2018 **Andrew Bartlow** (advisor), Parasite diversity in changing environments. (Went on to a postdoc at Los Alamos National Laboratory, New Mexico)
- 2011- 2018 **Emily DiBlasi** (advisor), Influence of dispersal on host and parasite population genetic structure. (Went on to a postdoc at University of Utah School of Medicine, Department of Psychiatry, Utah)
- 2010 - 2016: **Scott M. Villa** (co-advisor) Dissertation: Evolutionary ecology of parasite diversification: experiments with pigeons and their ectoparasites. Ph.D. Defense: 8/2016. (Continued as a postdoc in the Clayton/Bush lab until 2018, then went on to a FIRST fellowship at Emory University, Georgia)

Graduate students in the Masters of Science for Secondary School Teachers (MSSST) program

- 2018: Cameron Dixon (committee chair)
- 2018: Sarah Conner (committee chair)
- 2016: Matthew Reynolds (committee chair)
- 2016: Scott Ripple (committee chair)
- 2014: Amanda Johnson (committee chair)

Undergraduate Research Associates

André Watson (2018-), Jessica Stanley (2018-), Arthur Carvalho (2018-2019), Laura Jacobsen (2017-2018), Mckenna Evans (2017-2019), Margaux Klingensmith (2016-2019), W. Chase Brown (2016), Andrew Beach (2016-2018), Matthew Talmage (2016 - 2017), John Jackson (2015-2016), Lane Mulvey (2015-2016), Hector Santiago-Zumeata (2014-2015), Angela Hansen (2014-2016), Erik Poole (2013-2015), Juan Altuna (2013-2018), Heidi Montgomery (2012-2015), Michael Thompson (2012-2014), Alejandra M. Aguilar (2010-2013), Kacey Gao (2012-2013), Sarah Windes (2012-2013), Ian White (2011-2012), Dallas Brewer (2010-2011), and Michelle Reed (2005-2008).