

BRUCE A. SCHULTE, Ph.D.

Associate Vice President for Strategy, Performance and Accountability

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Education

Candidate for Bachelor of Arts in Theatre (Present). Western Kentucky University, Bowling Green, KY.

Doctorate of Philosophy in Biology (1989 - 1993). Thesis title, "Chemical communication and ecology of North American beaver (*Castor canadensis*)," State University of New York, College of Environmental Science and Forestry, Syracuse, NY.

Master of Science in Biology (1982 - 1985). Thesis topic on allelopathy and chemical predation defense of tropical marine sponges, University of Southern California, Los Angeles, CA.

Bachelor of Science in Biology (1978 - 1982). Seniors honors thesis on foraging strategies of dragonfly nymphs, *Anax junius*, College of William and Mary, Williamsburg, VA.

New York State Regents Diploma (1978). Newark Valley High School, Newark Valley, NY.

Leadership Experience

2019-PRESENT WKU Associate Vice President for Strategy, Performance and Accountability

As Associate Vice President for Strategy, Performance and Accountability, I report directly to the Executive Vice President for Strategy, Operations and Finance. The AVP plays a formative role in strategic planning, continued development, implementation, assessment, and accountability of initiatives and ongoing practices under the 2018-2028 WKU Strategic Plan *Climbing to Greater Heights*. I oversee a university-wide committee on implementation.

- Successfully embedding strategic planning and implementation at unit levels aligned with the university strategic plan
- Ensuring that budget planning and allocations of resources are aiding effectively and efficiently in the advancement of university initiatives and mission
- Facilitated WKU joining the Academic Benchmark Consortium (ABC Insights)
- Developing partnerships with regional businesses and alumni to further the applied aspects of our education model

2019-PRESENT University Distinguished Professor at WKU

The purpose of this appointment is to recognize faculty members who have served WKU with distinction and achieved an outstanding record in teaching, research, and service with a demonstrated commitment to the mission and vision of WKU..

- Maintaining externally funded scholarly activity as a role model to facilitate the development of socially responsible citizen leaders of a global society
- Instructing graduate level courses online and in the classroom to facilitate continued growth of the biology program

2019-PRESENT Co-Chair Search Committee for Associate Provost for Research and Graduate Education

The co-chairs oversee a search committee representative of the university and liaison with a professional search firm. The search is currently ongoing.

- Formed the search committee with university-wide representation
- Composed the position advertisement in conjunction with the Provost, search firm, and full committee with consideration of diversity, equity, and inclusion

2019-PRESENT Steering Committee Member for Strategic Enrollment Planning

The steering committee reviews inputs from the six working committees in the design of a university enrollment plan. The process is ongoing and in 2020 the committee will make final recommendations to the President.

- Evaluated white papers from the six action committees
- Established priorities for development of the final enrollment plan

2019-PRESENT Member of Operating Allocation Committee for New Budget Model

WKU is adopting a Responsibility Center Management model of budgeting after use of a traditional, incremental budget model.

- Reviewed unit budget proposals for FY21 in light of the WKU Strategic Plan
- Made recommendations on the information needed for requests and the overall process

2019-PRESENT University Member of Corporate Council

As AVP I work with the President, Provost, Philanthropy and Development, and regional business leaders to expand and strengthen the university – community connection to serve our students and our community.

- Developing an Innovation Campus
- Continued meetings / action plans with the Chamber of Commerce and local business CEOs on how a WKU education can stimulate the regional economy

2018-PRESENT Chair of the Implementation Committee for the 2018-2028 WKU Strategic Plan, *Climbing to Greater Heights*

Prior to my position as AVP, I served in this capacity while Department Head of Biology.

- Recruited staff, faculty, students, and administrators and formed Executive Council
- Established conduits for information flow to coordinate of SP implementation
- Created University level metrics and prioritizations

2011-PRESENT Science Advisor for the International Elephant Foundation

Review grant proposals for research projects on *in situ* and *ex situ* elephant populations. Provide advice to primary investigators and help to direct postdoctoral researchers on elephant studies. Assist with helping to define future research directions for IEF.

- Co-mentored Tanzanian postdoctoral researcher Andimile Martin
- Assisted with defining the direction for the Dr. Phil Kahl IEF postdoctoral grants

2017-PRESENT **Lead PI on Earthwatch Project “Elephants and Sustainable Agriculture”**

African elephants are ecosystem engineers and popular with tourists, yet they are a major source of crop depredation in sub-Saharan Africa, jeopardizing the livelihoods of small shareholder farmers. Climate change poses another severe threat to agricultural production in these landscapes. Invoking a conservation behavior approach and climate smart agriculture, our team is working to help mitigate the conflict between farmers and elephants. Our collaborator, the Earthwatch Institute, is an international environmental charity that facilitates scientific research in conjunction with citizen science. Our project is based in southern Kenya in conjunction with the REDD+ Conservation Company Wildlife Works (WW).

- Graduate student R. Von Hagen completed her MSc and S. Corde has begun
- Generate budget, reports, grant applications, publications, and PR
- 90 Citizen Scientists involved in project to date including a high school group

2009-2019 **Department Head of Biology at WKU**

Biology is a department of 30 full-time and adjunct faculty with office and laboratory staff, post-doctoral scientists, graduate and undergraduate teaching assistants, associated Biotechnology, Biodiversity, and Bioinformatics Centers, thesis and non-thesis (largely online) graduate students, and 600 undergraduate majors. Through faculty and staff meetings, daily interactions, student organizations, teaching, research, and outreach activities, I motivated and facilitated the growth and success of this thriving department.

- Created and enacted a departmental strategic plan in 2010
- Enhanced process learning components of the curriculum including research opportunities, internships, internationalization, and a capstone course
- Oversaw a \$3M budget, infrastructure improvements, and personnel development
- Worked towards greater equity, inclusiveness, and diversity in hires, recruitment, retention, and outreach for faculty, staff, and students
- Hired two excellent faculty into newly developed tenure track pedagogy lines
- Aided in garnering funds and other support for scholarships and improvements
- Served as spokesperson and advocate for department

2017-2018 **Co-Advisor to the President, 2018-2028 WKU Strategic Plan, *Climbing to Greater Heights***

In collaboration with co-advisor Dr. Paula Potter, Department Chair of Management, I chaired the year-long strategic planning process following the appointment of University President, Dr. Timothy Caboni. WKU is a public, comprehensive institution governed by a Board of Regents with over 2100 full-time and 1000 part-time employees, as well as 17500 undergraduate and 2500 graduate students. We involved the entire academic community.

- Facilitated design of vision for WKU’s next decade
- Oversaw activities of six action committees and a steering committee
- Successfully completed the planning process in the one-year time designated by the President and aligned with budgetary restructuring

- 2016 **External Program Review, Biology Department, Univ. Nebraska Kearney**
 UNK is a public, residential university comprised of four colleges with 500 full and part-time faculty and 5200 undergraduate and 1600 graduate students. Following selection by the UNK Provost, I administered an on-site program review of the Biology Department, which serves > 230 majors and 270 graduate students (many online) with 27 faculty and staff.
- Directed review panel and interviewed departmental constituents
 - Composed review and recommendations to Department Head and to Dean
- 2014-2017 **Board Member for the Kentucky Museum at WKU**
 The Kentucky Museum houses permanent and rotating exhibits on the arts, history, and culture with emphasis on the greater Kentucky region.
- Facilitated future direction for the museum with greater emphasis on active programming to serve students, faculty, staff, and K-12 educators
 - Assisted with re-organization of fiscal base and fundraising
- 2014 **Member of Search Committee for Dean of CHHS at WKU**
 The College of Health and Human Services (CHHS), ca. 5300 students in 2014, consisted of seven academic units. Through a national search we were charged with identifying a Dean who could enhance scholarly activity and further community service.
- Helped develop advertisement, interview, and select qualified candidates
 - Evaluated finalists and presented recommendations to Provost
- 2013 **Director of Search Process for Chair of Mathematics at WKU**
 The Department of Mathematics offers graduate and undergraduate degrees and serves the university through its general education courses. I was appointed by Dean Cheryl Stevens, Ogden College of Science and Engineering, to run an internal search for a Department Chair.
- Organized search process and review with faculty of candidates
 - Presented final recommendations to Dean
- 2011-2014 **Chair of Conservation Committee for Animal Behavior Society**
 After serving as a member of this committee, I was elected by my peers as chair. The mission is to forward the role of behavior as a tool in conservation.
- Initiated the first workshop on conservation behavior held at the annual ABS meeting.
 - Secured funding sources for workshops; oversaw follow-ups, PR, and reports
- 2010-2015 **Co-PI on NSF-BREAD at WKU**
 Along with lead PI Dr. M. Stokes (Biology) and Co-PI M. Cambron (Engineering), we developed a project to increase food production in Africa via a reduction in crop depredation and other human wildlife conflict that reduced personal security and productivity in sub-Saharan Africa. [Joint funding venture between NSF and the Gates Foundation].
- Co-authored proposal for funding, analyses, reports, and presentations
 - Mentored graduate students to completion of MSc

2008-2009 Graduate Program Director at Georgia Southern University (GSU)

Oversaw graduate program in the Department of Biology with some 30 faculty and staff and over 40 MSc candidates.

- Graduate program continued to prosper in recruitment, retention, and graduation
- Added to initiatives for facilitating graduate student success at teachers

2006-2009 Co-PI on NSF-STEP at Georgia Southern University

Our project “Advisement and Scholarship Promoting Inquiry-based Research Experiences in STEM (ASPIRES)” had the goal to increase the number of students graduating in Science, Technology, Engineering and Mathematics (STEM).

- Created an intrusive advising program and center for advising
- Developed experiential learning through instruction, research, and outreach

2005-2008 Inaugural Director of the College Office for Undergraduate Research (COUR) at Georgia Southern University

Supervised committee of seven faculty members representing each academic department in the College of Science and Technology for funding, research involvement, and a symposium.

- Created Charter, Mission and Objectives
- Assessed program, initiated new directives, prepared reports, and provided PR

2002-2008 PI on NSF-RUI Project “Development and Identity of Sexually Dimorphic Reproductive Signals and Responses by African Elephants”

In collaboration with biochemist L.E.L. Rasmussen and natural products chemist Thomas E. Goodwin, we received a RUI NSF proposal to conduct research on elephants in North America and Africa. The project had a large budget and supported graduate (MSc) and undergraduate student research in South Africa and Tanzania.

- Forged meaningful national and international relationships, spawning research that continues to the present
- Multiple MSc students continued their education in doctoral programs while others found fulfilling employment in the biological sciences
- Provided outreach to schools, zoos, and management agencies

Academic Appointments and Positions

Associate Vice-President for Strategy, Performance, and Accountability (2019-Present), WKU.

University Distinguished Professor (2019-Present), WKU.

Chair Strategic Plan Implementation Committee WKU (2018-Present), WKU.

Co-Chair of WKU 2018-2028 Strategic Plan, *Climbing to Greater Heights* (2018-2019), WKU.

Department Head of Biology and Professor (2009-2019), WKU.

Professor of Biology (2008-2009), Georgia Southern University (GSU).

Director, Biology Graduate Program, (2008-Present), GSU.

Director, College of Science & Technology (COST) - College Office of Undergraduate Research (COUR) (2005-2008), GSU.

Associate Professor of Biology (2003-2008), GSU.

Assistant Professor of Biology (1999-2003, Tenured 2002), GSU.
 Associate & Tenured Professor of Biology (1998-99) Providence College, Providence, RI.
 Assistant Professor of Biology (1994-1998, Tenured), Providence College.
 Postdoctoral Research Scientist (1993-1994), Dr. L.E.L. Rasmussen, Portland, OR.
 Instructor for Field Mammalogy (Summer 1993), State University of New York, College of Environmental Science and Forestry (SUNY-CESF), Syracuse, NY.
 Teaching Assistant in Biochemistry (Fall 1992), SUNY-CESF, Syracuse, NY.
 Instructor, BOCES Adirondack Field Studies (8/92), Cranberry Lake Biological Station, NY.
 Research Biologist (1989 - 1992), SUNY-CESF, Syracuse, NY.
 Research Biologist (1984 - 1986), University of Southern California, Los Angeles, CA.
 Programs Director (1986 - 1989), Roundup Ranch Resort, Downsville, NY.
 Marine Fish Culturist (1984), County Museum of Natural History, Los Angeles, CA.
 Teaching Assistant for Physiology and Introductory Biology (1982 - 1984), University of Southern California, Los Angeles, CA.
 Research Intern (Summers 1980, 1981), Gunnison National Forest, CO.

Scholarship

Grant & Awards

External Funding

2020 International Elephant Foundation: <i>Elephant deterrent effectiveness in light of ecological and agricultural variation</i> (Lead PI with Drs. Mwangi Githiru and Urbanus Mutwiwa; Doctoral candidate at Auburn U. Ms. R. Lynn Von Hagen received separate funding for \$8,000.); re-applied and received	\$ 7,000.
2019 International Elephant Foundation: <i>Elephant deterrents, behavioral responses, and ecological correlates of crop-raiding</i> (Lead PI with Drs. Mwangi Githiru, Urbanus Mutwiwa, and R. Lynn Von Hagen); re-applied and received	\$10,000.
2018 International Elephant Foundation: <i>HEC Abatement: Deterrents, ecological correlates, and climate smart agriculture practices</i> (see above)	\$12,000.
2017 IEF: <i>HEC Abatement</i> (see above)	\$12,000.
2016 Lounsbery Foundation through Earthwatch: <i>Elephants and Sustainable Agriculture in Kenya</i> (Lead PI with Drs. Mwangi Githiru and Urbanus Mutwiwa)	\$41,640.
2015 Earthwatch, <i>Towards improved climate-smart agriculture, wildlife conflict mitigation, and resilient livelihoods in the Kasigau Corridor landscape, SE Kenya</i> (Lead PI)	\$ 26,920.
2014 Kentucky Science & Engineering Foundation, Kentucky Commercialization Fund, <i>Automated Estrous Detection in Cattle</i> , F. DeGraves (Lead PI)	\$ 70,774.
2011 Kentucky Academy of Sciences: <i>Leadership and Personality Attributes in African Elephants</i>	\$ 4,800.
2010 NSF-BREAD Grant (M. Stokes lead PI): <i>Development of Automated Systems to Increase Crop Yield by Reducing Group Foraging Intensity by Crop Pests</i>	\$452,924.
2007 University of Florida, Manatee Endocrinology and Behavior	\$ 7,500.
2007 International Elephant Foundation	\$ 9,983.
2006 NSF-STEP Grant: <i>Advisement and Scholarship Promoting Inquiry-based Research Experiences in STEM (ASPIRES)</i> , Co-PI's: Mary K. Boyd (Lead PI), Amy R. Heaston, Bret S. Danilowicz, Bruce A. Schulte, David R. Stone	\$1,000,000.
2005 The National Science Foundation, RET Award	\$ 9,000.
2005 National Fish & Wildlife Centennial Scholarship (with Ryan Berger)	\$ 5,000.

2003 The State of Florida Marine Mammal Grant, sub-award.	\$ 10,997.
2002 The National Science Foundation, <i>Development and Identity of Sexually Dimorphic Reproductive Signals and Responses by African Elephants</i> . Collaborative Grant (Goodwin & Rasmussen) IBN-0217062, 2002-2008.	\$469,418. { \$842,251. }
2001 The Eppley Foundation for study on manatee behavior.	\$ 13,500.
2000 Jane Smith Turner Foundation grant for study on manatee behavior.	\$ 10,000.
2000 Feld Entertainment, Inc. grant for study of elephant behavior.	\$ 4,000.
1994 Biospherics Research Corporation, Postdoctoral Fellowship.	\$ 24,000.
1991 Theodore Roosevelt Memorial Fund, American Museum of Natural History.	\$ 1,000.
1984-85 Biomedical Research Support & USC Marine & Coastal Studies Grant.	\$ 3,500.

Internal Funding (not including two FUSE recipients as these awards go to students)

2015 Research & Creative Activities Program (RCAP), WKU	\$13,562.
2011 Research & Creative Activities Program (RCAP), WKU	\$ 8,000.
2007 Award for Excellence in Service, Georgia Southern University	\$ 4,000.
2006 Faculty Development for Teaching Award with Dr. Alan Harvey	\$ 2,200.
2006 Faculty Development & Welfare Travel Award	\$ 1,545.
2004 Award for Excellence in Scholarship, Georgia Southern University	\$ 4,000.
2003 Faculty Development & Welfare Professional Travel Award.	\$ 662.
2003 Faculty Research Stipend Award, Georgia Southern University.	\$ 7,500.
2002 Research Committee Grant Award, Georgia Southern University.	\$ 2,500.
2000-02 Awarded annual funds from Graduate Office for Professional Development.	\$ 300.
1999-2001 Five Research / Travel Awards, Georgia Southern University.	\$ 9,690.

Publications

Peer-reviewed

67. Bechert US, Brown JL, Dierenfeld ES, Ling PD, Molter CM & Schulte BA. 2019. Zoo elephant research: contributions to conservation of captive and free-ranging species. *International Zoo Yearbook* 53. DOI: 10.1111/izy.12211
66. LaDue CA, Goodwin TE, Schulte BA. 2018. Concentration-dependent chemosensory responses towards pheromones are influenced by receiver attributes in Asian elephants. *Ethology*, 124, 387-399.
65. Hacker CE, Miller LJ, Schulte BA. 2018. Examination of enrichment using space and food for African elephants at the San Diego Zoo Safari Park. *Animal Welfare*, 27, 55-65.
64. Githiru M, Mutwiwa U, Kasaine S, Schulte B. 2017. A spanner in the works: Human-elephant conflict complicates the energy-food-water nexus in drylands of Africa. *Frontiers in Environmental Science*, 5:69, doi: 10.3389/fenvs.2017.00069.
63. Edge A, Henley M, Daday J, Schulte BA. 2017. Examining human perception of elephants and large trees for insights into conservation of an African savanna ecosystem. *Human Dimensions of Wildlife*, 22 (3), 231–245. <http://dx.doi.org/10.1080/10871209.2017.1298168>.
62. Youldon DA, Abell J, Briffitt JS, Chama L, Channings MD, Kilundo AS, Larson CK, Sakal D, Schulte BA. 2017. Patch - occupancy survey of elephant (*Loxodonta africana*) surrounding Livingstone, Zambia. *Koedoe*, 59(1), a1372. <https://doi.org/10.4102/koedoe.v59i1.1372>.
61. Hazelkorn RA, Schulte BA, Cox TM. 2016. Persistent effects of begging on common bottlenose dolphin *Tursiops truncatus* behavior in an estuarine population. *Aquatic Mammals*, 42, 531-541.
60. Derham KS, Henley MD, Schulte BA. 2016. Wire netting reduces African elephant (*Loxodonta africana*) impact to selected trees in South Africa. *Koedoe*, 58(1), (7pp), <https://doi.org/10.4102/koedoe.v58i1.1351>.

59. Peterson EK, Schulte BA. 2016. Impacts of pollutants on beavers and otters with implications for ecosystem ramifications. *Journal of Contemporary Water Research and Education*, 157, 33-45.
58. Schulte BA. 2016. Learning and applications of chemical signals in vertebrates for human-wildlife conflict mitigation. In: *Chemical Signals in Vertebrates 13* (BA Schulte, TE Goodwin & MH Ferkin, eds), pp. 499-510, Springer, New York.
57. Rasmussen LEL, Greenwood DR, Goodwin TE, Schulte BA. 2016. Asian elephant reflections: chirality counts. In: *Chemical Signals in Vertebrates 13* (BA Schulte, T& MH Ferkin, eds), pp. 229-246, Springer, New York.
56. Goodwin TE, Harelimana H, MacDonald LJ, Mark DB, Juru AU, Yin Q, Engman JA, Kopper RA, Lichti CF, Mackintosh SG, Shoemaker JD, Sutherland MV, Tackett AJ, Schulte BA. 2016. The role of bacteria in chemical signals of elephant musth: proximate causes and biochemical pathways. In: *Chemical Signals in Vertebrates 13* (BA Schulte, TE Goodwin & MH Ferkin, eds), pp. 63-86, Springer, New York.
55. Goodyear SE, Schulte BA. 2015. Habituation to auditory stimuli by captive African elephants (*Loxodonta africana*). *Animal Behavior and Cognition* 2, 292-312.
54. Wisniewska M, Freeman EW, Schulte BA. 2015. Behavioural patterns among female African savannah elephants: the role of age, lactational status, and sex of the nursing calf. *Behaviour* 152, 1719-1744.
53. Hoffmeier-Karimi RR, Schulte BA. 2015. Assessing perceived and documented crop damage in a Tanzanian village impacted by human-elephant conflict (HEC). *Pachyderm* 56, 51-60.
52. York CA, Schulte BA. 2014. The relationship of dominance, reproductive state and stress in female horses (*Equus caballus*). *Behavioural Processes* 107, 15-21.
51. Freeman EW, Meyer JM, Addendorf J, Bird J, Schulte BA, Santymire RM. 2014. Impacts of environmental pressures on the reproductive physiology of subpopulations of black rhinoceros (*Diceros bicornis bicornis*) in Addo Elephant National Park, South Africa. *Conservation Physiology* 2, doi:10.1093/conphys/cot034.
50. Freeman EW, Meyer JM, Addendorf J, Schulte BA, Santymire RM. 2014. Scraping behavior of black rhinoceros is related to age and fecal gonadal metabolite concentrations. *Journal of Mammalogy* 95, 340-348.
49. Freeman EW, Meyer JM, JM, Putman SB, Schulte BA, Brown JL. 2013. Ovarian cycle activity varies with respect to age and social status in free-ranging elephants in Addo Elephant National Park, South Africa. *Conservation Physiology* 1, 1-15.
48. Schulte BA, Bagley KR, Castelda S, Loizi H, Nasserri N, Vyas DK, Goodwin TE. 2013. From exploration to selective information gathering: the development of chemosensory investigation in male African elephants (*Loxodonta africana*). In: *Chemical Signals in Vertebrates 12* (M. East & M. Dehnhard, eds), pp. 135-145, Springer, New York.
47. Goodwin TE, Broederdorf LJ, Burkert BA, Hirwa HH, Mark DB, Waldrip ZJ, Kopper RA, Sutherland MV, Freeman EW, Hollister-Smith JA, Schulte BA. 2012. Chemical signals of elephant musth: I. Temporal aspects of microorganism-mediated modifications. *Journal of Chemical Ecology* 38, 81-87.
46. Freeman EW, Meyer JM, Putman S, Schulte BA, Brown JL. 2011. Using a simplified field progestagen method to assess ovarian activity in female African elephants. *Biological Conservation* 144, 2105–2111.
45. Castelda S, Napora E, Nasserri N, Vyas D, Schulte BA. 2011. Diurnal co-occurrence of African elephants and other mammals at a Tanzanian waterhole. *African Journal of Ecology* 49, 250-252.
44. Nasserri NA, McBrayer LA, Schulte BA. 2011. The impact of tree modification by African elephant (*Loxodonta africana*) on herpetofaunal species richness in northern Tanzania. *African Journal of Ecology* 49, 133-140. Note - Covered by BBC: <http://www.bbc.co.uk/news/science-environment-11607299>
43. Freeman EW, Schulte BA, Brown JL. 2010. Using behavioral observations and keeper questionnaires to assess social relationships among captive female African elephants. *Zoo Biology* 29, 140-153.
42. Freeman EW, Schulte BA, Brown JL. 2010. Investigating the impact of rank and ovarian activity on the social behavior of captive female African elephants. *Zoo Biology* 29, 154-167.

41. Freeman EW, Abbondanza FN, Meyer JM, Schulte BA, Brown JL. 2010. A simplified method for monitoring progestagens in African elephants under field conditions. *Methods in Ecology and Evolution* 1, 86-91.
40. Riddle HS, Schulte BA, Desai AA, van der Meer L. 2010. Elephants – a conservation overview. *Journal of Threatened Taxa* 2, 653-661.
39. Merte CE, Goodwin TE, Schulte BA. 2010. Male and female developmental differences in chemosensory investigations by African elephants (*Loxodonta africana*) approaching waterholes. *Behavioral Ecology & Sociobiology* 64, 401-408. 38.
38. Merte CE, Gough KF, Schulte BA. 2009. Investigation of a fresh African elephant carcass by conspecifics. *Pachyderm* 45, 124-126.
37. Goodwin TE, Schulte BA. 2009. Prospecting for mammalian chemical signals via solventless extraction techniques: an elephantine task. *ChemoSense* 11(2), 9-15.
36. Brzyski JR, Schulte BA. 2009. Beaver (*Castor canadensis*) impacts on herbaceous and woody vegetation in southeastern Georgia. *American Midland Naturalist* 162, 81-93.
35. Loizi H, Goodwin TE, Rasmussen LEL, Whitehouse AM, Schulte BA. 2009. Sexual dimorphism in the performance of chemosensory investigatory behaviours by African elephants (*Loxodonta africana*). *Behaviour* 146, 373-392.
34. Slade-Cain BE, Rasmussen LEL, Schulte BA. 2008. Estrous state influences on investigative, aggressive, and tail flicking behavior in captive female Asian elephants. *Zoo Biology* 27, 167-180.
33. Meyer JM, Goodwin TE, Schulte BA. 2008. Intrasexual chemical communication and social responses of captive female African elephants, *Loxodonta africana*. *Animal Behaviour* 76, 163-174.
32. Schulte BA, Bagley KR., Groover M, Loizi H, Merte C, Meyer JM, Napora E, Stanley L, Vyas DK, Wollett K, Goodwin TE, Rasmussen LEL. 2008. Comparisons of state and likelihood of performing chemosensory event behaviors in two populations of African elephants (*Loxodonta africana*). In: *Chemical Signals in Vertebrates 11* (J.L. Hurst, R.J. Beynon, S.C. Roberts & T.D. Wyatt, eds.), pp. 81-90. Springer, New York.
31. Schulte BA, Freeman E, Goodwin TE, Hollister-Smith J, Rasmussen LEL. 2007. Honest signaling through chemicals by elephants with applications for conservation and care. *Applied Animal Behaviour Science* 102, 344-363.
30. Goodwin TE, Brown PA, Eggert MS, Evola MG, House SJ, Morshedi RG, Weddell ME, Chen CJ, Jackson SR, Aubut Y, Eggert J, Schulte BA, Rasmussen LEL. 2007. Use of automated solid phase dynamic extraction (SPDE)/GC-MS and novel macros in the search for African elephant pheromones. In: *Chemical Signals in Vertebrates 11* (Eds J.L. Hurst, R.J. Beynon, S.C. Roberts & T.D. Wyatt), pp. 25-35. Springer, New York.
29. Horikoshi-Beckett C, Schulte BA. 2006. Activity patterns and spatial use of facility by a group of captive female manatees (*Trichechus manatus latirostris*). *Zoo Biology* 25, 285-301.
28. Bagley KR, Goodwin TE, Rasmussen LEL, Schulte BA. 2006. Male African elephants (*Loxodonta africana*) can distinguish oestrous status via urinary signals. *Animal Behaviour* 71, 1439-1445.
27. Goodwin TK, Eggert M, House SJ, Weddell ME, Schulte BA, Rasmussen LEL. 2006. Insect pheromones and precursors in female African elephant urine. *Journal of Chemical Ecology* 32, 1849-1853.
26. Vyas DK, Goodwin TE, Rasmussen LEL, Schulte BA. 2005. Elephant death, possibly by constipation. *Pachyderm* 39, 93-96.
25. Harper JY, Schulte BA. 2005. Social interactions in captive female Florida manatees. *Zoo Biology* 24, 135-144.
24. Schulte BA, Bagley K, Correll M, Gray A, Heineman SM, Loizi H, Malament M, Scott NL, Slade BE, Stanley L, Goodwin TE, Rasmussen LEL. 2005. Assessing chemical communication in elephants. Pp. 140-151. In: *Chemical Signals in Vertebrates 10* (R.T. Mason, M.P. LeMaster and D. Müller-Schwarze, eds.). Springer Press, NY.

23. Goodwin TE, Rasmussen LEL, Schulte BA, Brown PA, Davis BL, Dill WM, Dowdy NC, Hicks AR, Morshedi RG, Mwanza D, Loizi H. 2005. Chemical analysis of preovulatory female African elephant urine: A search for putative pheromones. Pp. 128-139. In: *Chemical Signals in Vertebrates 10* (R.T. Mason, M.P. LeMaster and D. Müller-Schwarze, eds.). Springer Press, NY.
22. Rosell F, Schulte BA. 2004. Eurasian beaver (*Castor fiber*) scent gland structure and function. *Journal of Mammalogy* 85, 1138-1144.
21. Slade BE, Schulte BA, Rasmussen LEL. 2003. Oestrous state dynamics in chemical communication by captive female Asian elephants. *Animal Behaviour* 65, 813-819.
20. Schulte BA. 2003. Scientific writing and the scientific method: parallel structure in form and content. *American Biology Teacher* 65, 582-585.
19. Schulte BA. 2000. Social structure and helping behavior in captive elephants. *Zoo Biology* 19, 447-459.
18. Schulte BA, Feldman E, Lambert R, Oliver R, Hess DL. 2000. Temporary ovarian inactivity in elephants: relationship to status and time outside. *Physiology & Behavior* 71, 123-131.
17. Sun L, Müller-Schwarze D, Schulte BA. 2000. Dispersal pattern and effective population size of the beaver, *Castor canadensis*. *Canadian Journal of Zoology* 78, 1-6.
16. Schulte BA, Rasmussen LEL. 1999. Signal-receiver interplay in the communication of male condition by Asian elephants. *Animal Behaviour* 57, 1265-1274.
15. Schulte BA, Müller-Schwarze D. 1999. Understanding North American beaver behavior as an aid to management. In: *Beaver Protection, Management, and Utilization in Europe and North America* (PE Busher and RM Dzieciowski, eds.), pp. 109-127. Plenum Press, NY.
14. Müller-Schwarze D, Schulte BA. 1999. Behavioral and ecological characteristics of a "climax" population of beaver (*Castor canadensis*). In: *Beaver Protection, Management, and Utilization in Europe and North America* (PE Busher & RM Dzieciowski, eds.), pp. 161-177. Plenum Press, NY.
13. Schulte BA, Rasmussen LEL. 1999. Musth, sexual selection, testosterone and metabolites. In: *Advances in Chemical Communication in Vertebrates* (RE Johnston, D Müller-Schwarze, and P Sorensen, eds.), pp. 383-397. Plenum Press, NY.
12. Rasmussen LEL, Schulte BA. 1999. Ecological and biochemical constraints on pheromonal signaling systems in Asian elephants and their evolutionary implications. In: *Advances in Chemical Communication in Vertebrates* (RE Johnston, D Müller-Schwarze, and P Sorensen, eds.), pp. 49-62. Plenum Press, NY.
11. Rasmussen LEL, Schulte BA. 1998. Chemical signals in the reproduction of Asian and African elephants. *Animal Reproduction Science* 53, 19-34.
10. Schulte BA. 1998. Scent marking and responses to male castor fluid by beavers. *Journal of Mammalogy* 79, 191-203.
9. Schulte BA, Müller-Schwarze D, Tang R, Webster FX. 1995. Bioactivity of beaver castoreum constituents using principal components analysis. *Journal of Chemical Ecology* 21, 941-957.
8. Schulte BA, Müller-Schwarze D, Sun L. 1995. Using anal gland secretion to determine sex in beaver. *Journal of Wildlife Management* 59, 614-618.
7. Schulte BA, Müller-Schwarze D, Tang R, Webster FX. 1994. Responses by beaver (*Castor canadensis*) to major phenolic and neutral compounds in castoreum. *Journal of Chemical Ecology* 20, 3063-3081.
6. Müller-Schwarze D, Schulte BA, Sun L, Müller-Schwarze A, Müller-Schwarze C. 1994. Beaver (*Castor canadensis*) and red maple (*Acer rubrum*). *Journal of Chemical Ecology* 20, 2021-2034.
5. Schulte BA, Bakus GJ. 1992. Predation deterrence in marine sponges: Laboratory versus field studies. *Bulletin of Marine Science* 50, 205-211.
4. Schulte BA, de Nys R, Bakus GJ, Crews P, Eid C, Naylor S, Manes LV. 1991. A modified allomone collecting apparatus. *Journal of Chemical Ecology* 17, 1327-1332.
3. Bakus GJ, Schulte B, Jhu S, Wright M, Green G, Gomez P. 1990. Antibiosis and antifouling in marine sponges: laboratory vs. field studies. Pp. 102-108 in: *New Perspectives in Sponge Biology*. Proc. 3rd Int. Sponge Conf. (K Ruetzler, ed.). WHOI, Woods Hole, MA.

2. Bakus GJ, Targett N, Schulte B. 1986. Chemical ecology of marine organisms: an overview. *Journal of Chemical Ecology* 12, 951-987.
1. Zimmerman M, Cibula DA, Schulte B. 1984. Oviposition behavior of *Hylemya (Delia)* sp. (Diptera: Anthomyiidae): Sub-optimal host plant choice? *Environmental Entomology* 13, 696-700.

Special interest group articles, editor-reviewed & book chapters editor reviewed

- Von Hagen L, Kasaine S, Githiru M, Amakobe B, Mutwiwa U & Schulte BA. 2019 Search for solutions to human-elephant conflict. *Journal of the Elephant Managers Association* 30(2), 85-90.
- Schulte BA. 2018. Mammal societies – an eco-anthro-behavioral perspective. *Ecology*. <https://doi.org/10.1002/ecy.2411>.
- Fernández-Juricic E, Schulte BA. 2016. Conservation Behaviour: continued application, development and expansion. Special Issue: Conservation Behaviour in Animal Behaviour, 120, 195-196.
- Schulte BA, Goodwin TE, Ferkin MH, eds. 2015. *Chemical Signals in Vertebrates 13*, Springer, New York.
- Devous, Angie. 2013. Researching the researcher: Bruce Schulte, PhD. *Journal of the Elephant Managers Association*, 24(3), 28-29.
- Schulte, B.A. 2012. A decade of The Conservation Behaviorist and a 15 year perspective on the ABS Conservation Committee. *The Conservation Behaviorist*, 10, 3-4.
- Wisniewska, M., Pridgen, L., Eldridge, J., Yates, J., Hook, M., Kem, D. & Schulte, B.A. 2012. Review of A Primer of Conservation Behavior. *Biological Conservation*, 148, 219-221.
- Swaigood, R. & Schulte, B.A. 2010. Applying Knowledge of Mammalian Social Organization, Mating Systems and Communication to Management. Pp. 329-343, in *Wild Mammals in Captivity: Principles and Techniques for Zoo Management*, 2nd ed., ed. Devra Kleiman, Katerina Thompson, and Charlotte Kirk Baer. Chicago: University of Chicago Press.
- Schulte, B.A. 2010. Elephants. Pp. 212-213, in Mills, D.S., J.N. Marchant-Forde, P.D. McGreevy, D.B. Morton, C.J. Nicol, C.J.C. Phillips, P. Sandøe and R.R. Swaisgood (eds) “The Encyclopedia of Applied Animal Behaviour and Welfare”, CABI, Wallingford, UK.
- Paz-y-Mino, Guillermo, C. 2009. Conversation with Bruce Schulte. 2009. *The Conservation Behaviorist* 7(1), 5-8.
- Karimi, B. 2009. Transformations: a young researcher’s transition from animal behavior to conservation behavior. *The Conservation Behaviorist* 7(1), 9-10. (*Graduate Student*)
- Broederdorf, L., Meyer, J., Freeman, E., Goodwin, T. & Schulte, B.A. 2009. The elephants of Addo: an undergraduate research experience. *Journal of the Elephant Managers Association*, 29 (2), 27-31.
- Meyer, J., Freeman, E., Goodwin, T. & Schulte, B.A. 2009. Monitoring African elephant chemical communication and hormone activity in Addo Elephant National Park, South Africa. *Journal of the Elephant Managers Association*, 29 (2), 32-36.
- Castelda, S.M., Goodwin, T.E. & Schulte, B.A. 2008. Investigating chemical signals in African elephants for convergence with insects and similarities with Asian elephants. Pp. 81-91, in: Proceedings of the 2007 International Elephant Conservation & Research Symposium, Orlando, FL.
- Freeman, E.W., Abbondanza, F.N., Meyer, J.M., Schulte, B.A. & Brown, J.L. 2007. Use of a fecal kit to monitor hormone activity in free-ranging elephants. pp. 165-167. Proceedings of the 2007 International Elephant Conservation & Research Symposium, Orlando, FL.
- Goodwin, T.E. & Schulte, B.A. 2008. A tribute to L.E.L. “Bets” Rasmussen (1938-2006). In: *Chemical Signals in Vertebrates 11*, Hurst, J.L., Beynon, R.J., Roberts, S.C. & Wyatt, T.D., eds., pp. 1-9. Springer, New York.
- Schulte, B.A. 2006. Elephant Behavior. Chp 4. In: *The Biology, Medicine and Surgery of Elephants*, Fowler, M.E. & Mikota, S.K., eds. Ames, Iowa, Blackwell Publishing. Pp. 35-43.
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- Schulte, B.A., Rasmussen, L.E.L. & Goodwin, T.E. 2005. The secrets in secretions: a search for African elephant pheromones. *Pachyderm Periodical* 15, 1-2.
- Loizi, H., Correll, M., Gray, A., Goodwin, T.E., Rasmussen, L.E.L. & Schulte, B.A. 2004. A study of chemotactile behaviors by male and female African elephants in Addo Elephant National Park, South Africa. Pp. 55-57, in (ed) Jayewardene, Jayantha. *Endangered elephants past, present and future. Proceedings of the Symposium on Human Elephant Relationships and Conflicts*, Sri Lanka, September 2003. Biodiversity & Elephant Conservation Trust, Colombo. Pages 228.
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- Schulte, B.A. & Rosell, F. 2003. Beavers. In *Mammals V*. Vol. 16 of Grzimek's Animal Life Encyclopedia, edited by Devra G. Kleiman, Valerius Geist, Michael Hutchins, and Melissa C. McDade, 16, 177-184. Farmington Hills, Mich.: Gale Group.
- Schulte, B. 1998. The benefits of behavioral research to elephants and people. *Journal of the Elephant Managers Association* 9(3): 216-221.
- Schulte, B. & Rasmussen, B. 1996. Conservation and management of elephants: a symposium. *Journal of the Elephant Managers Association* 7(1): 12-14.
- Rasmussen, B. & Schulte, B. 1996. A medley of chemical signals. *Journal of the Elephant Managers Association* 7(1): 61-64.
- Schulte, B.A. 1993. *Chemical Communication and Ecology of the North American Beaver (Castor canadensis)*. Ph.D. Thesis.
- Bakus, G.J., Wright, M., Schulte, B., Mofidi, F., Yazdandoust, M., Naqvi, W., Jagtap, T., Goes, J. & Naik, C. 1994. *Coral Reef Ecosystems*. Oxford & IBH Publ. New Delhi. 232 pp.

Online Biographical / Research Information

[WKU Strategic Plan on WBKO 2018](#)

[WKU Herald Profile 2017](#)

[WKU News Research Grant HEC 2017](#)

[Earthwatch Expedition Leader](#)

[IEF HEC Abatement, Kenya](#)

[Research Gate](#)

[Steelman Science Lecture Series](#)

[WKU Herald Research on Elephants 2017](#)

[Schulte Lab at WKU](#)

[IEF Science Advisor](#)

[Bowling Green Daily News 2010](#)

[Linked in](#)

Presentations (131 at Professional Meetings 1995 - 2019) (63 from 2010-19 shown)

International Elephant Foundation, South Africa (October 2019)

Von Hagen RL, S Kasaine, M Githiru, Amakobe BA, Schulte BA. New methods utilized to deter African elephants (*Loxodonta africana*) from crop raiding in the Kasigau Wildlife Corridor, Kenya

Animal Behavior Society, Chicago Illinois (July 2019)

Schulte BA, Von Hagen R.L, S Kasaine, M Githiru, Amakobe B. A comparison of mitigation methods to prevent African elephant (*Loxodonta africana*) crop raiding

American Society of Mammalogists, Washington, D.C. (June 2019)

McCaslin LE, Schulte BA. Whale watching tours, conservation attitudes, and cetacean behavior in Kenai Fjords Alaska.

- Animal Behavior Conference, Indiana University (April 2019)*
Rooney B, Schulte BA. Assessing the relationship between tourism and African elephant (*Loxodonta africana*) habitat use in Zambezi National Park, Zimbabwe.
- WKU Student Research Conference, Bowling Green Kentucky (March 2019)*
McCaslin LE, Schulte BA. Documenting Marine Mammal Behavior and Evaluating the Benefits and Consequences of Viewing Marine Mammals in Southcentral Alaska.
- Rooney B, Schulte BA. Assessing the relationship between tourism and African elephant (*Loxodonta africana*) habitat use in Zambezi National Park, Zimbabwe.
- Kentucky Academy of Science, Bowling Green, Kentucky (November 2018)*
Von Hagen R.L, Kasaine S, Githiru M, Schulte BA. New methods utilized to deter elephant (*Loxodonta africa*) from crop raiding in the Kasigau Wildlife Corridor, Kenya.
- Animal Behavior Society, Milwaukee, Wisconsin (August 2018)*
Schulte BA. Conducting conservation behavior: Human-elephant conflict.
LaDue C , Goodwin TE, Schulte BA (presented). Concentration and receiver attributes influence responses to chemical signals in Asian elephants.
- WKU Student Research Conference, Bowling Green Kentucky (March 2018)*
Von Hagen RL, Kasaine S, Mutwiwa U, Githiru M. Amakobe B, Schulte BA. New methods utilized to deter elephant from crop raiding in the Kasigau wildlife corridor, Kenya
- Elephant Managers Association, Nashville Tennessee (October 2017)*
LaDue C, Schulte BA. Olfactory enrichment for captive elephants: managing animals with pheromones.
- Savanna Science Network Meeting (Skukuza South Africa March 2017)*
Edge AC, Henley MD, Daday J, Schulte BA. Examining human perception of elephants and large trees for insights into conservation of an African Savanna Ecosystem.
- WKU Student Research Conference, Bowling Green Kentucky (March 2017)*
Von Hagen RL, Kasaine S, Mutwiwa U, Githiru M. Amakobe B, Schulte BA. An exploration of chili pepper (*Capsicum* spp.) fences as a crop raiding deterrent method to alleviate human elephant conflict (HEC) in the Kasigau Wildlife Corridor, Kenya.
- International Elephant Foundation, Singapore (November 2016)*
Schulte BA, LaDue C, Von Hagen L, Kasaine S, Mutwiwa U, Githiru M. Human-elephant conflict reduction via deterrents, understanding ecological correlates, and climate smart agriculture practices.
Martin A, Schulte BA, Freeman EW. Understanding the behavior of African elephants as they move in landscapes with different protection status and habitat types in the Mahale – Katavi –Lwafi ecosystem of Tanzania.
- WKU Student Research Conference, Bowling Green Kentucky (March 2016)*
LaDue CA, Schulte BA. Chemosignaling in Asian elephants (*Elephas maximus*): Concentration effects with applications for management and conservation.
- Elephant Wellness Workshop, Jacksonville Zoo and Gardens (March 2016, Keynote Speaker)*
Schulte BA. How much wild belongs in a zoo? Examining behavioral wellness in a captive setting.
- Elephant Managers Association, Nashville Tennessee (October 2015, Keynote Speaker)*
Schulte BA. The benefits of understanding elephant behavior.
- Animal Behavior Society, Anchorage Alaska (June 2015)*
Schulte BA, Goodyear S. Battling habituation, warding off extinction, & harnessing social learning to mitigate human elephant conflict.
- WKU Student Research Conference, Bowling Green Kentucky (March 2015)*
Goodyear S, Schulte BA. Habituation to auditory stimuli by captive African elephants (*Loxodonta africana*).
- Hacker C, Schulte BA. Examination of enrichment using space and food for African elephants (*Loxodonta africana*) at the San Diego Zoo Safari Park.
- Ryckley M, Schulte BA. Evaluating the social behavior and activity patterns of clouded leopards (*Neofelis nebulosa*) at the Nashville Zoo.

Kentucky Innovation and Entrepreneurship 2014 Conference, Louisville Kentucky (September 2014)

Duvall, A., Moss, K., Ford, A., Salihovic, A., Budlove, D., Stewart, P., Rizzo, R., Wilson, S., Todd, P., Schulte, B., DeGraves, F. Automated estrus detection in cattle.

Animal Behavior Society, Princeton New Jersey (August 2014)

Hook, M., Freeman, E.W. & Schulte, B.A. Demographic differences in responses of African elephants (*Loxodonta africana*) to lion calls.

Schulte, B.A., Felton, S.K., Merte, C.E. & Collyer, M. Examining personality via behavioral plasticity in female African elephants (*Loxodonta africana*).

Wisniewska, M., Freeman, E.W. & Schulte, B.A. Risk-sensitive behaviors as influenced by age and reproduction in female African elephants.

Chemical Signals in Vertebrates, Urbana-Champaign Illinois (August 2014)

Schulte, B.A. Learning and applications of chemical signals in vertebrates for conservation and management.

WKU Student Research Conference, Bowling Green Kentucky (March 2014)

Derham, K., Henley, M.D. & Schulte, B.A. African elephant (*Loxodonta africana*) impact to marula (*Sclerocarya birrea*), knobthorn (*Acacia nigrescens*), and false marula (*Lannea schweinfurti*) in the Associated Private Nature Reserves, South Africa.

Edge, A.C., Henley, M.D., Daday, J. & Schulte, B.A. Examining human perception of African elephants (*Loxodonta africana*) and large trees for insights into conservation of an African savanna ecosystem.

Hall, L., Sartin, A. & Schulte, B.A. Elephant behavior and grouping at the Nashville Zoo. (poster)

Midwest Ecology & Evolution Conference (March 2014)

Derham, K., Henley, M.D. & Schulte, B.A. African elephant (*Loxodonta africana*) impact to marula (*Sclerocarya birrea*), knobthorn (*Acacia nigrescens*), and false marula (*Lannea schweinfurti*) in the Associated Private Nature Reserves, South Africa.

Society for Integrative and Comparative Biology, Austin Texas (January 2014)

Felton, S.K., Merte, C.E. & Schulte, B.A. Exploration of the behaviors defining personality in African elephants.

Kentucky Academy of Sciences, Morehouse University, Kentucky (November 2013)

Derham, K., Henley, M.D. & Schulte, B.A. African elephant (*Loxodonta africana*) impact to marula (*Sclerocarya birrea*), knobthorn (*Acacia nigrescens*), and false marula (*Lannea schweinfurti*) in the Associated Private Nature Reserves, South Africa.

The Wildlife Society (October 2013)

Felton, S.K., Merte, C.E. & Schulte, B.A. Exploration of the behaviors defining personality in African elephants.

Animal Behavior Society, Boulder Colorado (July 2013)

Co-organizer (with Dr. E. McPhee) of Workshop on Conservation Behavior and co-organizer (with Dr. E. Fernandez-Juricic) on Trends in Conservation Behavior.

Schulte, B.A. & Blogg, R.W. Conservation behavior implications for understanding behavioral patterns of African elephants.

26th International Congress for Conservation Biology, Baltimore, Maryland (July 2013)

Freeman, E., Meyer, J., Addendorf, J., Schulte, B. & Santymire, R. Scraping behavior of black rhinos (*Diceros bicornis bicornis*) is related to age and fecal progesterone concentrations

American Chemical Society, New Orleans, Louisiana (April 2013)

Davenport, S.A., Yin, Q., Mark, D.B., Harelimana, I.H., Schulte, B.A. & Goodwin, T.E. Urinary chemical signals of musth in immature male African elephants.

Umuhire-Juru, A., Yin, Q., Broederdorf, L.J., Kopper, R.A., Sutherland, M.V., Schulte, B.A., Engman, J. & Goodwin, T.E. Bacterial metabolism produces exogenous urinary chemical signals of elephant musth.

Yin, Q., Harelimana, I.H., Goodwin, T.E., Shoemaker, J.D. & Schulte, B.A. Identification and quantitation of fatty acids in male elephant urine that may be metabolized to produce chemical signals of musth.

Living with Animals, Eastern Kentucky University, Richmond, KY (March 2013)

Schulte, B.A. & Stokes, M. Conservation behavior: approaches to reduce human-wildlife conflict and human-elephant conflict.

International Wildlife Management Congress, Durban, South Africa (July 2012)

Duvall, M., Stokes, M., Cambron, M. & Schulte, B.A. Testing the effect of a wildlife deterring scarecrow device on the feeding behavior of African ungulates.

Basic Research to Enable Agricultural Development, Arlington, VA (July 2012)

Schulte, B.A., Stokes, M., Cambron, M., Duvall, M., Kasaine, S. & Kimwele, C. BREAD: Development of automated systems to increase crop yield by reducing group foraging intensity by crop pests. (Oral presentation)

Stokes, M., Schulte, B., Cambron, M., Duvall, M., Hook, M., Kasaine, S. & Kimwele, C. BREAD: Development of automated systems to increase crop yield by reducing group foraging intensity by crop pests. (Poster presentation)

Animal Behavior Society, Albuquerque, New Mexico (June 2012)

Hazelkorn, R., Cox, T. & Schulte, B.A. The effect of human interactions on the behavior of *Tursiops truncatus*.

Wisniewska, M., Freeman, E.W. & Schulte, B.A. Age & reproductive condition impacts on female African elephant activity.

American Chemical Society, San Diego, California (March 2012)

Hirwa, I.H., Broederdorf, L.J., Mark, D.B., Waldrip, Z.J., Burkert, B.A., Kopper, R.A., Goodwin, T.E., Sutherland, M.V. & Schulte, B.A. Characterization of male elephant urine metabolites via automated solid phase dynamic extraction (SPDE)/GC-MS and ¹H NMR spectroscopy.

International Elephant & Rhino Conservation & Research Symposium, Rotterdam, Netherlands (October 2011).

Freeman, E.W., Meyer, J.M., Putman, S., Schulte, B.A. & Brown, J.L. Elephant-sized hot flashes? The relationship between social status and ovarian cycle activity provides evidence for menopause in female African elephants.

Chemical Signals in Vertebrates, Berlin, Germany (August 2011)

Goodwin, T.E. & Schulte, B.A. Urinary chemical signals of elephant musth: Temporal aspects of microorganism-mediated modifications.

Schulte, B.A., Bagley, K., Blogg, R., Loizi, H. Vyas, D.K. & Goodwin, T.E. From exploration to selective information gathering: the development of chemosensory investigation in male African elephants (*Loxodonta africana*).

Animal Behavior Society & International Ethological Conference, Bloomington, IN (July 2011)

Sinderbrand, C.A. & Schulte, B.A. Examining dominance and stress relationship in a non-cooperative breeder (*Equus caballus*).

Association for Tropical Biology and Conservation & Africa Section of the Society for Conservation Biology, Arusha, Tanzania (June 2011).

†Hoffmeier-Karimi, R. & Schulte, B.A. An assessment of perceived crop damage in a Tanzanian village impacted by human-elephant conflict. †Received the Alwyn-Gentry award for best student presentation.

Nasseri, N.A., McBrayer, L. & Schulte, B.A. The impact of tree modification by African elephant (*Loxodonta africana*) on herpetofaunal species richness in northern Tanzania.

American Chemical Society 241st meeting, Anaheim, CA (March 2011)

Harerimana, I.H., Mark, D.B., Broederdorf, L.J., Burkert, B.A., Waldrip, Z.J., Kopper, R.A., Goodwin, T.E., Sutherland, M.V., Freeman, E.W., Hollister-Smith, J.A. & Schulte, B.A. Temporal aspects of bacteria-mediated production of urinary chemical signals of elephant musth.

Mark, D.B., Harerimana, I.H., Goodwin, T.E. & Schulte, B.A. Appearance of urinary chemical signals of musth in immature African elephants.

WKU Student Research Conference, Bowling Green, KY (March 2011)

Hook, M. & Schulte, B.A. Effect of simulated predation risk on African elephant behavior.

- Sinderbrand, C.A. & Schulte, B.A. Examining the dominance-stress hypothesis in the domestic horse (*Equus caballus*).
Kentucky Academy of Sciences, Bowling Green, KY (November 2010)
- Schulte, B.A., Hazelkorn, R. & Hecht, M. Aggression, hair whorls and handedness in horses (*Equus caballus*).
Sinderbrand, C.A. & Schulte, B.A. Rate of aggressive behaviors in lactating and non-lactating domestic horses (*Equus caballus*).
Animal Behavior Society, Williamsburg, VA (July 2010)
- Freeman, E.W., Meyer, J.M., Shelby, L., Schulte, B.A. & Brown, J.L. Role of elephant matriarchs in Addo Elephant National Park, South Africa.
Society for Conservation Biology, Edmonton, Alberta, Canada (July 2010)
- Schulte, B.A., Esposito, R.M.M., & Karimi, R.R. Elephant Behavior, Human Perception and Human-Elephant Conflict.
Center for Integrative Study of Animal Behavior Meeting, Indiana University (March 2010)
- Schulte, B.A., Hazelkorn, R. & Hecht, M. The relationship of facial whorl (trichoglyph) direction to handedness and aggression in horses (*Equus caballus*).
National Meeting of the American Chemical Society in San Francisco (March 2010)
- Waldrip, Zach J., Broederdorf, L.J., Burkert, B.A., Hirwa, I.H., Kopper, R.A., Goodwin, T.E., Sutherland, M.V., Freeman, E.W., Hollister-Smith, J.A. & Schulte, B.A. Chemical signals of elephant musth: Biosynthesis and microbially-mediated modifications.
International Elephant Conservation & Research Symposium, South Africa (January 2010)
- Schulte, B.A., Esposito, R.M.M. & Karimi, R.R. Furthering our understanding of elephant behaviour and human perception to facilitate conservation and reduce human-elephant conflict.

Teaching

Courses Taught

Western Kentucky University

- | | |
|---|---|
| Animal Behavior Biol 334, Biol 530 | Advanced Topics Biol 675 |
| Behavioral Ecology Biol 532 & Lab Biol 533 | Chemical Ecology Biol 534 |
| Challenges of a Changing Biosphere Biol 380 | Conservation Behavior Biol 503 |
| Ecology Biol 315 | Environmental Science Concepts Biol 543 |
| Environmental Science Biol 280 | General Biology Biol 113 |
- Study Abroad (WKU)*
- Ecology, Behavior & Conservation of Manatees & Dolphins: A Unique Field Course in the Drowned Cayes, Belize 2009, 2010
- Animal Behavior and Research, South Africa, June 2016

Georgia Southern University

- | | |
|--|-------------------------------------|
| Animal Behavior BIOL 3635/5099/G | Behavioral Ecology BIOL 5645/G/7090 |
| Evolution & Ecology Lab BIOL 3113 | Induced Defenses BIOL 7610 |
| Animal Consciousness BIOL 7610 | Directed Study BIOL 4890 / 7890 |
| Environmental Biology BIOL 1230 | Pheromones & Anim Beh BIOL 7610 |
| Graduate Res / Thesis BIOL 7895 / 7999 | Chemical Ecology BIOL 5099/G |

Providence College

- | | |
|--|-------------------------------------|
| Animal Behavior 350: 1997-99 | Ecology 401: 1994-98 |
| Biology Seminar 430: 1996 | Environmental Biology 121: 1999 |
| Contemporary Biology 101-102: 1994-95, 1998 | Introductory Biol Lab 103L: 1994-95 |
| Biology 112: A Human Approach: 1995-96 | Internship & Research |
| Comparative Vertebrate Anatomy 201: 1995, 1996 (spring and fall), 1997 | |

Supervision of Research

Member of Steering Committee for the following 26 MSc thesis candidates

2001: Tiffany Neu, Adam Safer and Stephanie Schopmeyer
2002: Joel Fleming and Jan Mackinnon
2003: Alyssa Kunz
2004: Ann Marie LeBlanc
2005: Nyron Bovell and Rob Ruzicka
2006: Chris Freeman
2007: Linsey Cozzie, Tina Davis and Cameron Storey
2008: Leslie Bates, Timothy Gowan and Charles R. Chad Hubbard
2009: Heather Cason
2011: Simon Kasaine
2011: Molly Duval, Andrea Falcetto, Rebeccah Hazelkorn (Savannah State University)
2012: Merrie Richardson
2013: Shilo Felton
2014: Laura van Sicklin
2015: Laken Cooper
2017: Brent Hodinka
2018: Beverly Gartland (WKU Department of Agriculture)
Non-thesis: Marcia Fuller & Andrea Marino (chair); Rachel Johnson, Sarah Mortzfeldt, Ann Yaroch

Member of Steering Committee for PhD graduate students // Post-doctoral Advisor

2005: Elizabeth Freeman, George Mason University
2011: Meghan Bills, University of Florida
2012-14: Dr. Danielle Brown, Minority Post-doctoral Fellowship at WKU
2015-18: Dr. Andimile Martin, co-supervisor for Post-doctoral Phil Kahl Fellow in Tanzania
Present: Lisa Barrett, University of Wyoming; R. Lynn Von Hagen, Auburn University

Mentor of Research for WKU Undergraduate Students

Ashley Sartin (13-14) Adam Edge (12-14)*†‡
Lydia Hall (13-14)†
Meghan Ryckley (14-17)†‡ Katherine Chrisman (14-15, Vanderbilt)
†Honors College ‡FUSE recipient *Biodiversity Student of Year (2014)

Mentor of Research for GSU Undergraduate Students

<u>Biology 4890 Research</u>	Erik Lunsford (S 01)	<u>Biology 4730 Internship</u>
Rebeccah Hazelkorn (08-09)		Lauren Stanley (F 03)
Mallori Hecht (08-09)		Christa Rayl (F 03)
Amber Johnson (Su&F 08)		Kathryn Bagley (Sp 02)
Brittany Todd (S 07)		Ashley Kirkley (Su 00)
Josh White (S 07)		
Matthew Groover (F 05)		<u>McNair Advisor</u>
Kimberly Wollett (F 05)		Amy Gray (2003)
Matthew McBride (F 04)		
Lauren Stanley (F 03)		<u>Honors Students</u>
Joe Scott (02, w/ Dr. Pung)		Brittany Todd (S 07)
Darlinda Douglass (Sp 02)		Joseph Waddell (F 06)
Claire Erlacher (F 01)		Andrew Quesada (F 04)
Maggie Mitchell (F 01)		Claire Erlacher (Sp 01)
Chris O'Neil (Su 01)		

MSc Graduate Students Research Advisor [GSU 1-15; WKU 16-26]

- 1) Jennifer Young, 2001. An Investigation of Captive Florida Manatee (*Trichechus manatus latirostris*) behavior and social interactions.
- 2) Helen Loizi, 2004. Development of Chemosensory Behaviors in African Elephants (*Loxodonta africana*) and Male Responses to Female Urinary Compounds.
- 3) Chifuyu Horikoshi, 2004. Effect of Hormonal and Temporal Factors on Captive Female Manatee (*Trichechus manatus latirostris*) Behavior.
- 4) Kathryn R. Bagley, 2004. Chemosensory Behavior and Development of African Male Elephants (*Loxodonta Africana*).
- 5) Jessica R. Brzyski, 2005. Beaver (*Castor canadensis*) Impacts on Herbaceous and Woody Vegetation in Southeastern Georgia.
- 6) Christen E. Merte, 2006. Age Effects on Social and Investigative Behaviors in a Closed Population of African Elephants.
- 7) Dhaval K. Vyas, 2006. Sexually Dimorphic Developmental Patterns of Chemosensory Behaviors in African Elephants (*Loxodonta africana*).
- 8) Jordana M. Meyer, 2006. Sexually Dimorphic Social Development and Female Intrasexual Chemical Signaling of African Elephants (*Loxodonta africana*).
- 9) Ryan Berger, 2007. Seasonal Habitat Use of the Florida manatee (*Trichechus manatus latirostris*) in the Crystal River National Wildlife Refuge with Regards to Natural and Anthropogenic Factors.
- 10) Erek Napora, 2007. Chemical Signaling and Resource Use by African Elephants (*Loxodonta africana*).
- 11) Rhea M. M. Esposito, 2008. Effect of Matriarchs on Group Interactions, Kinship Fitness, and Differences in Chemosensory Behavior of African Elephants (*Loxodonta africana*).
- 12) Stacie Castelda, 2008. Waterhole Dynamics and Chemical Signals of African Elephants (*Loxodonta africana*).
- 13) Nabil Naseeri, 2009. The Relationship of Herpetofaunal Community Composition to an Elephant (*Loxodonta africana*) Modified Savanna Woodland of Northern Tanzania, and Bioassays with African Elephants.
- 14) Rebekah Karimi, 2009. An Assessment of Perceived Crop Damage in a Tanzanian Village Impacted by Human-Elephant Conflict and an Investigation of Deterrent Properties of African Elephant (*Loxodonta africana*) Exudates Using Bioassays.
- 15) Russell Blogg, 2012. Patterns of Chemosensory Behavior in a Closed Population of Wild African Elephants (*Loxodonta africana*).
- 16) Carly Sinderbrand, 2011. The Relationship of Dominance, Reproductive State and Stress in a Non-Cooperative Breeder, The Domestic Horse (*Equus caballus*). [Dillard Hoyt Award WKU]
- 17) Malgorzata Wisniewska, 2011. Factors Influencing Travel Order as Proxy for Leadership and Trade-offs in Activity Budgets in Lactating and Nonlactating African Savanna Elephants.
- 18) Margaret Rose Hook, 2012. Effect of Lion Calls on African Elephants (*Loxodonta africana*) in Addo Elephant National Park, South Africa.
- 19) Kelly Derham, 2014. Effectiveness of Wire Netting in Reducing Damage by African Elephants (*Loxodonta africana*) to Marula (*Sclerocarya birrea*), Knobthorn (*Acacia nigrescens*), and False Marula (*Lannea schweinfurtti*) in the Associated Private Nature Reserves, South Africa.
- 20) Sarah Goodyear, 2015. Habituation to Auditory Stimuli by Captive African Elephants (*Loxodonta africana*).
- 21) Charlotte Hacker, 2015. Examination of Enrichment Using Space and Food for African Elephants (*Loxodonta africana*) at the San Diego Zoo Safari Park.
- 22) Chase LaDue, 2016. Chemical Signaling in Asian Elephants (*Elephas maximus*): Concentration Effects with Applications for Management and Conservation. [Dillard Hoyt & Minton Award Recipient WKU]

- 23) Rebecca Lynn von Hagen, 2018. A Comparison of Mitigation Techniques Utilized to Alleviate Human Elephant Conflict (HEC) in the Kasigau Corridor, Kenya.
- 24) Lauren McCaslin, 2019. Documenting the Behavior of Marine Mammals and Evaluating the Benefits and Consequences of Viewing Marine Mammals in Southcentral Alaska.
- 25) Brigit Rooney, 2019. Tourism and African Elephant (*Loxodonta africana*) Behavior in Zambezi National Park, Zimbabwe
- 26) Sophia Corde, 2019-Present. HEC abatement in southern Kenya.

*Note: Ms. L. Caroline Jones and Emily McIntire (not listed) remain potential candidates for the MS in Biology degree, but circumstances have delayed the writing of their theses.

Service (CV limited to service while at WKU and GSU)

Western Kentucky University

Chair of Strategic Plan Implementation Committee at WKU
Co-Advisor to the President for WKU 2018-2028 Strategic Plan
Department Head at WKU (2009-present)
Kentucky Museum: Board Member (2014-2017)
External Program Review for Biology Department at the University of Nebraska Kearney (2016)
Member of search committee for Dean of the College of Health & Human Services (2014)
Directed search for Chair of Department of Mathematics (2013)

Georgia Southern University

President of Georgia Southern University Chapter of Sigma Xi 2001-2002. Organized Earth Forum (April 23, 2002) with numerous collaborators on campus "*Economics and the Environment: The Tangible Benefits of Greening.*"
Secretary of Georgia Southern Environmental Network (GSEN) 2001-2009
Vice-President of GSU Chapter of Sigma Xi 2000-2001: Created web site for local chapter. Organized Forum (March 1, 2001) on "*Science and the Media: Relaying Research to Reporters and the Public*" for which our local chapter won a National Award.

College of Science & Technology

Graduate Program Director, Department of Biology, 2008-2009.
Director, College Office of Undergraduate Research (COUR), 2005-2008.
Award for Excellence in Research Committee 2007-2008
External Representative on Renewable Energy Endowed Chair Search, 2007-08
College of Science & Technology representative to Faculty Senate Elections Committee (2001-04):
Dr. Jean-Paul Carton, Chair 2001-02, Jim Lobue chair 2002-04
Institutional Care and Use Committee, 2002-3

Department of Biology

Advisory Committee, Representative (elected) of non-tenured faculty, 2000-2001
BioScience Club Committee 1999-2000
Building (new), 2007-2008
Graduate Committee 2000-2001
Natural Areas Committee 2002-03, non-member attendee 1999-2000
Peer Review Committee 2003-6, chair 2004-5: New Peer Review format was adopted spring 2005.
Personnel Committee 2003-5, 2006-8
Seminar Series Committee 1999-2004, 2007-present
Undergraduate Activities & Research Committee 2000-2004 (chair, 2002-03)
Undergraduate Curriculum & Policy Committee 2001-2008

Undergraduate Curriculum Revision Committee 2004-07, chair 2005-6: formulated new undergraduate curriculum for submission to Department in 2006

Support of GSU Programs

Biology Representative for Georgia Southern University March 2007 Open House

Part of GSU panel on Office of Research and Sponsored Services Program "Approaching the National Science Foundation" 2/26/04 & Undergraduate Research Roundtable 10/05.

Liaison to South Africa, University of Port Elizabeth, to establish university level scholarly exchange between UPE and Georgia Southern University.

Met with Strategic Planning Council (9/02) to discuss EARTH Initiative.

Organized CLEC events on 1) April 10, 2006 by Dr. Thomas Goodwin of Hendrix College – two talks on "Green Chemistry and Gray Elephants" co-sponsored by the Chemistry Department and 2)

April 9, 2002: "Making friends and solving problems: how primates navigate social, genetic and environmental landscapes," a seminar by Dr. Susan Alberts of Duke University.

Authored two "radio advertisements" for environmentally friendly behavior at Georgia Southern, aired over the college radio station (Dr. L. Wolfe edited script)

Speaker for SAGE (Student Alliance for a Green Earth) Earth Day event 2001

Judge for 1999 - 2000 Sigma Xi student award competition; organized 2002 competition

EXTERNAL SERVICE

Associate Editor, Behaviour, 2007-present (96 submissions handled)

5/07-5/08: 10 submissions handled;	5/13-5/14: 08 submissions handled
5/08-5/09: 08 submissions handled	5/14-5/15: 07 submissions handled
5/09-5/10: 09 submissions handled;	5/15-5/16: 08 submissions handled
5/10-5/11: 15 submissions handled	5/16-5/17: 04 submissions handled
5/11-5/12: 10 submissions handled;	5/17-5/18: 04 submissions handled
5/12-5/13: 10 submissions handled;	5/18-5/19: 04 submissions handled

Organizations

Chair of Conservation Committee for Animal Behavior Society (2011-2014): Workshop and Symposium co-organizer at ABS meeting in Boulder CO 2013; workshop 2013 Princeton

Manatee Working Group, March 2000, Epcot Center, Orlando, FL

River cleanup with Canoochee Riverkeepers, 2002, Chandra Brown, Executive Director

Professional Services

Guest Editor, Animal Behaviour, Special Issue on Conservation Behavior

Advisory Council, Asian Elephant Support, <http://asianelephantsupport.org/directors-listing.asp>

NSF Grant Review Panel 2012; review NSF (pre)proposals annually

Advisory Council, International Elephant Foundation, 2010-present and grant reviewer.

Member of Research Review Board for Lowry Park Zoo, Tampa, FL.

Scientific Review Panel, Riddle's Elephant and Wildlife Sanctuary

Scientific Advisor for "Zambezi Elephant Trust" (William Taylor)

Reviewed National Science Foundation Grant for International Program, 2003

Reviewed student abstracts for Society for Conservation Biology meeting (2010)

Reviewed Student Grants for Animal Behavior Society, 2001 (Dr. James Ha, chair), 2002 (Dr. Shelley Adamo, chair), 2006 (Dr. Lynette Hart, Chair).

Reviewed Grants for the Smithsonian's Scholarly Studies Program, SeaGrant, and US Civilian Research & Development Foundation Cooperative Grants Program

Review Committee for Animal Behavior Society Developing Nations Research Grants 2/99 (Michelle Pellissier Scott, Associate Professor, Department of Zoology, UNH, Chair) and 3/00 (James Ha, University of Washington, Chair)

Reviewed article on Giant Pandas: Biology & Conservation (eds D Lindburg & K Baragona, WWF-US).

Reviewer: *African Journal of Ecology, American Midland Naturalist, Animal Behaviour, Animal Reproduction Science, Animals, Applied Animal Behavior Science, Behaviour, Biological Conservation, Biology Letters, Canadian Journal of Zoology, Chemical Senses, Conservation Physiology, Conservation Letters, Crop Protection, Current Zoology, Environments, Frontiers Ecology & Evolution, Human Dimensions of Wildlife, Journal of Animal Ecology, Journal of Applied Animal Welfare Science, Journal of Chemical Ecology, Journal of Field Ornithology, Journal of Mammalogy, Journal of Wildlife Management, Journal of Zoology, Naturwissenschaften, Northeastern American Naturalist, Oecologia, PloS One, Proceedings of the Royal Society of London, Southeastern Naturalist, Sustainability, Tropical Conservation Science, and Zoo Biology.*

Reviewed chapters in textbooks: *Environmental Science, A Study of Interrelationships*, 7th & 11th ed. by Enger & Smith, WCB/McGraw-Hill Publishers; Brennan/Withgott's *Environment: The Science Behind the Stories*, 1e; *Environmental Science: People and the Natural World* by Friedland, Jones & Weisburg, and Cunningham's *Principles of Environmental Science*, 3rd and 4th eds.

Judge of student presentations 2003 Conference, Biology of Marine Mammals, Greensboro, NC

Community Activities in Statesboro, GA

Chair of Governing Board for Charter Conservatory for Liberal Arts & Technology (CCAT), Statesboro, GA, 2004-5; Board member 2003-6

Judge for Georgia Science and Engineering Fair, January 10, 2004

Seminars -- Invited Speaker

Auburn University, 4/14/20, Conservation Behavior & Human-Elephant Conflict.

University of Wyoming, 3/9/20, Elephant Communication, Conservation, and Sustainable Agriculture.

Tufts University, 3/12&13/18, Elephant Chemical Communication; Human Elephant Conflict and Elephant Conservation

Lenoir-Rhyne University, 2/15&16/18, [Steelman Science Lecture Series](#): Elephant Chemical Signaling; Elephant Behavior and Conservation

University of Louisville, 11/8/17, Elephants and Elephant Conservation.

Sigma Xi, Bowling Green KY, 5/29/17, Elephant and Society.

Penn State University, 3/10/17, Chemical Communication and Social Behavior of Elephants.

Keynote Speaker, 3/11/16, Elephant Wellness Workshop (Jacksonville Zoo and Gardens, FL,

Keynote Speaker, 10/12/15, Elephant Managers Association, Nashville, TN, The Benefits of Understanding Elephant Behavior.

University of Vermont, 9/15/14, Behavioral Variation and the Conservation of Elephants.

Zoo Miami, 4/1/14, Elephant Communication, Conservation and Enrichment.

Florida Internat'l Univ., 3/31/14, Conservation, Chemical Signals and Behavior: Microbes to Elephants.

Miami Univ. (Ohio), 2/27/14, Behavioral Conservation: Pachyderms, Proboscises & Problems.

Lincoln Park Zoo, Chicago, 11/26/13, Elephant Conservation - A Behavioral Approach.

Univ. of Wisconsin – Oshkosh, 11/25/13, Conservation Behavior – The Trunk and the Tale.

University of Illinois Urbana-Champaign, 10/2/13 Microbes, Invertebrates and Elephants – Connecting Chemical Signals and Conservation Behavior.

Purdue University, 11/16/11, Understanding Elephant Behavior to Facilitate Conservation.

Univ. Cincinnati, Graduate Student Speaker Selection, 4/11/09, A Behavior Conservation Approach for Studying Elephant Chemical Communication and Social Behavior.

Georgia Southern University, RIG Speaker, Dr. Steve Vives, 12/2/08, Behavior and Conservation of Three Megaherbivores: Beavers, Elephants & Manatees.

Hendrix College 4/13/07 Elephant Chemical Communication and Behavioral Development.
 GSU Optimist Club 9/20/06 Conservation and Behavior of Beavers, Elephants & Manatees.
 Conservation Research Center, Smithsonian Institution, Front Royal, VA, July 2005. Behavioral Ecology and Conservation of Three Megaherbivores: Beavers, Elephants and Manatees.
 Univ. Central Florida, Orlando, 11/04. Elephant Chemosensory Communication and Ecology.
 Georgia Southern University Scholarship Award Presentation, November 2004. Soaking Up Smells: Behavioral Studies from Sponges to Elephants.
 Sigma Xi, GSU Chapter, February 16, 2004, Elephant Communication and Conservation.
 Roger Williams Park Zoo and Museum of Natural History, Providence, RI, 7/15/03, Chemical Ecology of Elephants and Conservation Implications.
 Univ. Port Elizabeth, South Africa, 2/19/03, Elephant Communication: Chemosignals and Conservation.
 College of Charleston, SC, 10/21/02, Chemical Communication & Elephant Reproductive Behavior.
 College of William & Mary, VA, 10/6/00, Signal-Receiver Interplay: an Elephantine Illustration.
 Jacksonville University, FL, 10/7/99, The Influence of Estrus on Social Behavior in Captive Elephants.

Professional Organizations

American Association of Colleges & Universities / American Society of Mammalogists / Animal Behavior Society / Association for the Advancement of Sustainability in Higher Education / Elephant Managers Association / International Society for Behavioral Ecology / International Society of Chemical Ecology / Kentucky Academy of Science / Society for Conservation Biology

Theatrical Productions (2008-2020)

Show	Role(s)	Company (Director(s); Year)
<i>The Drowsy Chaperone</i>	Superintendent	WKU (Wayne Pope & Julie Lyn Barber; 2020)
<i>La Canterina & Trial by Jury</i>	Assistant Director	WKU (Wayne Pope & Carol Jordan; 2019)
<i>Visiting Mr. Green</i>	Mr. Green	FSP (Brandon Smith; 2019)
<i>Freud's Last Session</i>	C.S. Lewis	PTK (Kathy Leonard; 2018)
<i>Other Desert Cities</i>	Lyman Wyeth	PTK (Kathi E.B. Ellis; 2017)
<i>Much Ado About Nothing</i>	Assistant Director	WKU (David Young; 2016)
<i>Vanya, Sonya, Masha & Spike</i>	Vanya	PTK (William Leonard; 2016)
<i>Finding the Sun</i>	Director	WKU (Bruce Schulte; 2016)
<i>Plaza Suite</i>	Sam	FSP (Jeffrey Beard; 2015)
<i>Arsenic & Old Lace</i>	Jonathan	PTK (Nick Hudson; 2014)
<i>Sense and Sensibility</i>	Col. Brandon	PTK (William Leonard; 2014)
<i>Becky's New Car</i>	Joe	PTK (William Leonard; 2012)
<i>It Was a Dark and Stormy Night</i>	Dawson	PTK (Hannah Hadley; 2011)
<i>Driving Miss Daisy</i>	Boolie	PTK (Hannah Hadley; 2011)
<i>Death of a Salesman</i>	Charley	PTK (Jeffrey Beard; 2010)
<i>Seven Brides for Seven Brothers</i>	Logger & Suitor	FSP (Heather Bitterling; 2010)
<i>Seven Brides for Seven Brothers</i>	Caleb	TP (Tony Phillips; 2009)
<i>Bye, Bye Birdie</i>	Mr. Johnson & ASM	TP (Tony Phillips; 2009)
<i>Driving Miss Daisy</i>	Stage Manager	Averitt Stars (Gary Dartt; 2009)
<i>Look Homeward, Angel</i>	Will Pentland	GSU (Gary Dartt; 2008)
<i>Oklahoma!</i>	Fred	TP (Tony Phillips; 2008)

FSP = Fountain Square Players; GSU = Georgia Southern University; PTK = Public Theatre of Kentucky; TP = Tony Phillips Theatre Company; WKU = Western Kentucky University