

# **BRUCE A. SCHULTE, Ph.D.**

*Associate Vice President for Strategy, Performance and Accountability*

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## **Education**

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

**Doctor 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).** Senior 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 Positions and Related Experiences**

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*Associate Vice President for Strategy, Performance and Accountability (AVP-SPA) at WKU 2019- PRESENT*

- Oversee WKU strategic planning, continued development, implementation, assessment, and accountability of initiatives and ongoing practices under the 2018-2028 WKU Strategic Plan *Climbing to Greater Heights*.
  - Direct committee of staff, faculty, students, and administrators.
  - Establish and evaluate University level metrics and prioritizations.
  - Collaborate with Director of Institutional Research.
  - Evaluate WKU, State, and National data on enrollment.
  - Develop diagnostic benchmarking and identify signature programs.
  - Create a road map for improving operations to achieve outcomes.
  - Coordinate activities with Committee on Diversity, Equity & Inclusion
  - Interact with Faculty and Staff Senates and the Student Government Association.
  - Work with Athletics, Communications & Marketing, Philanthropy & the Alumni Association, and other units on strategic initiatives, fundraising, and messaging.
  - Communicate with Board of Regents and media on SP and implementation.
  - Advance WKU initiatives in coordination with local, regional, and state entities
- President appointed liaison for WKU with the Kentucky Council for Postsecondary Education (CPE) Strategic Agenda 2022-2030. Developed WKU strategies to align with State directives and priorities.
- SACSCOC Advisory Committee Member assisting with reaffirmation process.
- Integrate with three major Divisions (Academic Affairs; Enrollment and Student Engagement; Strategy, Operations & Finance), Philanthropy & Alumni Engagement (PAE), and Athletics.

- Liaison for industrial partnerships, including Ford Blue Oval and Envision.
- As a member of President's Cabinet discuss, help sculptor, and vote on policies.
- Member of Budget Executive and Capital Allocation Committees that oversee operation of RCM budget model and procedures. Assist with processes for budgetary requests, discussions, and determinations.
- Collaborate with Huron Consulting, HelioCampus, Human Resources, the Budget Director, EVP, Provost, and President to promote sustainable practices and efficient use of campus resources.
  - Evaluate compensation and benefits schemes.
  - Assess staffing relative to benchmarks.
- Interim Director of the Ethics & Compliance Hotline Response Team. Lead process for complaint evaluation and resolution.

***Council of Academic Deans Plus Leadership Team 2019- PRESENT***

- Under the direction of the provost work to improve the educational environment.
- Provide advice in all matters related to strategic planning.
- Involved in policy creation and review, state initiatives, and SACSCOC reaffirmation.

***Leadership Committee Member for Strategic Enrollment Planning 2019- PRESENT***

- Establish priorities for development of the enrollment plan.
- Assess strategies for implications on recruitment, retention, progression, and graduation.
- Determine budgets and actionable items.

***Enrollment & Student Experience (ESE) Leadership Team Member 2019- PRESENT***

- Collaborate with Vice-President and unit leaders on all aspects of the student experience.
- Evaluate recruitment, retention, progression, and graduation strategies for undergraduate, transfer, and graduate students.

***University Distinguished Professor 2019- PRESENT***

- Serve on a several university committees to evaluate leadership, scholarship, service, and teaching.
- Represent WKU at community events in this role coupled with my role as AVP.

***WKU Research Foundation Executive Director 2020-2021***

- Represented WKU in business community for start of the Innovation Campus at WKU.
- Facilitated technology transfer for university personnel and students.
- Partnered with regional industry and Chamber of Commerce.
- Coordinate incubation of business startups and new ventures with established companies.
- Initiated development of the Innovation Campus at WKU.
- Promoted scholarly research and creative activity and to serve as WKUs agent in the receipt of intellectual property income, and in the protection, development, and commercialization of intellectual properties.
- Developed policies and procedures for new role of WKURF.
- Directed staffing, evaluations, and protocols at Center for Research & Development.

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

- Co-chaired the year-long strategic planning process (appointed by WKU President Timothy Caboni).
- Facilitated design of vision for WKU's next decade.
- Managed 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.

***Board Member for the Kentucky Museum at WKU 2014-2017***

- 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.

***External Searches with Consideration of Diversity, Equity, and Inclusion. 2013, 14, 19***

- Co-Chaired Search: Associate Provost for Research and Graduate Education.
- Director of Search Process for Chair of Mathematics at WKU.
- Member of Search Committee for Dean of CHHS at WKU.

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

- Responsible for a \$3M budget, infrastructure improvements, and personnel development.
- Interacted with Dean, Associate Deans, Heads of six departments and one school.
- Directed and responsible for annual evaluations for over 30 faculty and staff.
- In a collaborative process, created and enacted a departmental strategic plan in 2010.
- Directed formation of policies and procedures to enhance student and personnel success, including a mentor process for new faculty and search processes that better incorporate DEI considerations.
- Determined merit-based raises for departmental faculty and staff.
- Served as spokesperson and advocate for department.
- Improved website and social media presence.
- Coordinated departmental program review as part of Comprehensive Academic Program Evaluation (CAPE).
- Practiced and facilitated expansion of High Impact Practices (HIP) in curriculum.
- Collaborated with faculty to create new degree programs and modernizing existing ones, including a mostly online MS in Biology.
- Enhanced process learning components of the curriculum including research opportunities, internships, internationalization, and a capstone course.
- Hired numerous faculty including two into newly developed tenure track pedagogy lines.
- Aided in garnering support for student scholarships and employment.
- Advocated and established action-items for enhancing sustainability of all departmental activities, including incorporating these into our curriculum.
- Created student surveys to evaluate aspects of student success.
- Conducted exit surveys with seniors to improve our programs and processes and to strengthen relationships with new alumni.

***External Program Review, Biology Department, Univ. Nebraska Kearney 2016***

- Administered an on-site program review of the Biology Department (> 230 majors, 270 graduate students, 27 faculty and staff).
- Directed review panel and interviewed departmental constituents.
- Composed review and recommendations to Department Head and to Dean.

***Research Biologist (entire academic career)***

- Keynote speaker at professional meetings.
- Professional and public presentations on a range of biological and environmental topics.
- Organize professional meetings, symposia, and workshops.
- Published author of professional manuscripts and public articles.

**Global Experience**

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***Research Biologist***

- Africa
  - Long-term research on human-elephant interaction in East Africa and southern Africa working with small shareholder farmers.
  - Collaborations with NGOs, private companies, African Universities, National Parks, and private reserves on elephant behavior in Kenya, South Africa, Tanzania, Zambia, and Zimbabwe.
- Caribbean, Indian Ocean, and Pacific Ocean Regions
  - Marine research in Fiji, India, the Kingdom of Tonga, Mexico, the Republic of the Maldives, and Sri Lanka. Collaborated with scientists and local people from these regions in studying coral reef biology with applications of using natural products chemistry to improve human health or improve the human condition.
  - Study abroad instruction in Belize.
- North America
  - Affiliate faculty status, Department of Biological Sciences at UA-Anchorage.
    - Research program on whales and whale-watching; developing new projects in collaboration with Drs. Deborah Boege-Tobin and Douglas Causey.
    - Presenter and assisted with conservation behavior workshop at 2015 Animal Behavior Society Conference.
  - Affiliate faculty status, School of Forestry & Wildlife Sciences, Auburn Univ.
    - Serve on doctoral committee of R.L. Von Hagen.
    - Collaborate on human elephant interaction research in Africa.
  - Elephant behavior research at zoological institutions throughout US and Canada.
  - Florida manatee research in conjunction with colleagues at University of Florida.
  - Dolphin foraging and human conflict research in Georgia.
  - Beaver communication research in Georgia, New York, and South Carolina.
  - Bumblebee optimality research in Black Canyon, Crested Butte, Colorado

**Leadership in Scholarly Activities at WKU & GSU (Georgia Southern University)  
PI on “Elephants and Sustainable Agriculture” 2017-PRESENT**

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 shareholder farmers. Climate change poses another severe threat to agricultural production. Invoking a conservation behavior approach and climate smart agriculture, our team works to mitigate conflict between farmers and elephants. Our collaborator, the Earthwatch Institute, facilitates scientific research in conjunction with citizen science. Our project is based in southern Kenya in conjunction with the REDD+ Conservation Company Wildlife Works.

- Generate grant applications, publications, reports, and PR.
- 90 Citizen Scientists involved in project to date including a high school group.
- Oversee graduate students and field personnel in field research.
- Responsible for all fiscal matters.

**Science Advisor for the International Elephant Foundation 2011-PRESENT**

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

**Chair of Conservation Committee for Animal Behavior Society 2011-2014**

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, guided follow-ups, PR, and reports.

**Co-PI on NSF-BREAD at WKU 2010-2015**

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.

**Graduate Program Director 2008-2009**

Coordinated 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.

**Co-PI on NSF-STEP at Georgia Southern University (GSU) 2006-2009**

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.

**Inaugural Director of the College Office for Undergraduate Research 2005-2008**

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.

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

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 Work Positions**

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Affiliate Professor, University of Alaska Anchorage Department of Biology (2021-Present).

Affiliate Professor, Auburn University School of Forestry and Wildlife Sciences (2020-Present).

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

Executive Director of the Research Foundation (2020-2021), 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, (2008-2009), 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.

Programs Director (1986 - 1989), Roundup Ranch Resort, Downsville, NY.

Research Biologist (1984 - 1986), University of Southern California, Los Angeles, CA.

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.

Assistant Club House Manager (1982), Newark Valley Golf Course, Newark Valley, NY.

Research Intern (Summers 1980, 1981), Gunnison National Forest, CO.

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## Honors and Awards

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2022 *Animal Behavior Society Richard Buchholz Conservation Behavior Award*

2019 *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 undergraduate and graduate courses online and in the classroom to further continued growth of the biology program.
- Providing exemplary service to WKU, region, and profession.

2019 *Office of Sponsored Programs Prolific Proposer Award, WKU*

2007 *Award for Excellence in Service, Georgia Southern University*

2004 *Award for Excellence in Scholarship, Georgia Southern University*

## Scholarship

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### Grant Awards

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*External Funding (Ca. \$2.5M)*

2023 Earthwatch Institute: <i>Elephants and Sustainable Agriculture in Kenya (ESAK)</i>	\$89,480.
2021 Elephant Managers Association: Exploring socioeconomic drivers of HEC through community workshops (L. Von Hagen, C. Lepczyk and B.A. Schulte)	\$ 1,640.
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.
2019 Earthwatch, <i>Elephants and Sustainable Agriculture</i> (Lead PI)	\$52,085.
2018 Earthwatch, <i>Elephants and Sustainable Agriculture</i> (Lead PI)	\$43,949.
2017 Earthwatch, <i>Elephants and Sustainable Agriculture</i> (Lead PI)	\$24,776.
2016 Lounsbery Foundation through Earthwatch: <i>Elephants and Sustainable Agriculture in Kenya</i> (Lead PI with Drs. Mwangi Githiru and Urbanus Mutwiwa)	\$60,140.
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> .	\$469,418.
Collaborative Grant (Goodwin & Rasmussen) IBN-0217062, 2002-2008.	{ \$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.
2006 Faculty Development for Teaching Award with Dr. Alan Harvey	\$ 2,200.
2006 Faculty Development & Welfare Travel Award	\$ 1,545.
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

78. Von Hagen RL, Corde SC, Norris P, Kasaine S, Githiru M, Amakobe BA, Mutwiwa UN, Schulte BA. 2023. Chemical communication & elephant conservation: Chili pepper fences & other chemo-approaches. In: *Chemical Signals in Vertebrates*, Vol. 15. (Schaal B et al., eds.), at press.
77. Corde SC, Von Hagen RL, Kasaine S, Mutwiwa UN, Amakobe B, Githiru M, Schulte BA. 2023. Lunar phase as a dynamic landscape of fear factor affecting elephant crop raiding potential. *Ethology, Ecology & Evolution*, at press.
76. Von Hagen RL, Schulte BA, Dunning D, Steury TD, Githiru M, Zohdy S, Lepczyk CA. 2023. Farmer attitudes on climate change, farming practices, and livelihood threats, and the impact to conservation in the Kasigau Wildlife Corridor, Kenya. *Human Ecology*, <https://doi.org/10.1007/s10745-023-00426-9>.
75. Von Hagen L, LaDue CA, Schulte BA. 2023. Elephant scar prevalence in the Kasigau Wildlife Corridor, Kenya: Echoes of human-elephant conflict. *Animals*, 13, 605, <https://doi.org/10.3390/ani13040605>.
74. von Dürckheim KEM, Hoffman LC, Poblete-Echeverria C, Bishop JM, Goodwin TE, Schulte BA, Leslie A. 2022. A pachyderm perfume: odour encodes identity and group membership in African elephants. *Scientific reports*, 12:16768, <https://doi.org/10.1038/s41598-022-20920-2>.
73. Schulte BA, LaDue CA. 2021. The chemical ecology of elephants: 21st century additions to our understanding and future outlooks. *Animals*, open access, <https://doi.org/10.3390/ani11102860>.



72. LaDue CA, Schulte BA, Kiso WK, Freeman EW. 2021. Musth and sexual selection in elephants: a review of signaling properties and potential fitness consequences. *Behaviour*, open access, DOI:10.1163/1568539X-bja10120.
71. LaDue CA, Schulte BA. 2021. Pheromonal enrichment in the zoo: An empirical approach with Asian elephants (*Elephas maximus*). *Applied Animal Behaviour Science*, 235, (article 105228). <https://doi.org/10.1016/j.applanim.2021.105228>.
70. Chock RY, Clucas B, Peterson EK, Blackwell BF, Blumstein DT, Church K, Fernández-Juricic E, Francescoli G, Greggor A, Kemp P, Pinho G, Sanzenbacher PM, Schulte, BA, Toni, P. 2021. Evaluating potential effects of solar power facilities on wildlife from an animal behavior perspective. *Conservation Science and Practice*, 3, e19. <https://doi.org/10.1111/csp2.319>.
69. Von Hagen RL, Kasaine S, Githiru M, Amakobe B, Multiway UN, Schulte BA. 2021. Metal strip fences for preventing African elephant (*Loxodonta africana*) crop foraging in the Kasigau Wildlife Corridor, Kenya. *African Journal of Ecology*, 59, 293-298.
68. Von Hagen RL, Norris P, Schulte BA. 2020. Quantifying capsaicinoids from chili pepper and motor oil mixtures used in elephant deterrent fences. *Chromatographia*, 83, 1153-1157. <https://doi.org/10.1007/s10337-020-03934-8>.
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, 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, Nasser 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 progesterone method to assess ovarian activity in female African elephants. *Biological Conservation*, 144, 2105–2111.
45. Castelda S, Napora E, Nasser 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. Nasser 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 progesterone 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.
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## **Online Biographical / Research Information**

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[Schulte Lab at WKU](#)

[Coexisting with Giants: Elephant Conservation with Dr. Bruce A. Schulte](#) (August 2022)

TedEd: The incredible, bendable, twistable, expandable elephant trunk (LaDue & Schulte):

[https://www.youtube.com/watch?v=mL2\\_zXCgbXI](https://www.youtube.com/watch?v=mL2_zXCgbXI)

Earthwatch Science Matters: <https://earthwatch.org/science-matters-webinar-series/elephants-sustainable-agriculture>

IEF Video 2021: <https://www.youtube.com/watch?v=OpToRIgowul&t=2s>

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[WKU Strategic Plan on WBKO 2018](#)

[WKU News Research Grant HEC 2017](#)

[Bowling Green Daily News 2010](#)

You also can look for me at Research Gate and Linked In.

## **Presentations (155 at Professional Meetings 1995 - 2023) (92 from 2010-23 shown)**

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*International Congress for Conservation Biology (ICCB), Kigali, Rwanda (July 2023)*

Von Hagen RL, Schulte BA, Gray S, Githiru M, Zohdy S, Dunning K, Lepczyk C. Drivers and consequences of human-elephant interactions in an agricultural landscape of rural Kenya.

*Animal Behavior Society, Portland, OR (July 2023)*

Boege-Tobin D, Shostak J, Tierra SA, Becher T, Schulte BA, Webber M. Harbor porpoise mating in Alaska & preliminary photo ID matching: Conservation implications for Kachemak Bay.

Boege-Tobin D, Webber M, Schulte B, Shostak J, Tierra S, Becher T, Hoag C, Stallard A. Harbor porpoise mating & resightings in SC Alaska: Results from photo-id, novel video techniques & drones.

Randolph K, Dredla A, Lia A, Martell M. Schulte BA, Jones R, Peterson EK. "Quite badgering the prairie dogs": Determining a natural deterrent for North American badgers.

Schulte B. Agriculture and animal behavior: An elephantine dilemma. Symposium on Conservation behavior as a tool to reduce the effects of anthropogenic stressors.

*Human-Wildlife Conflict & Coexistence Conference. Oxford, England (March 2023)*

Von Hagen, R. L., Kasaine, S., Githiru, M., Amakobe, B., Schulte, B. A. The path to co-existence: Lessons from human-elephant conflict research and community engagement in the Kasigau Wildlife Corridor, Kenya.

*Ecological Society of America, Canada (August 2022)*

Prakash V, Von Hagen RL, Gitzen R, Irwin E, Schulte BA, Lepczyk CA. Structured decision making to mitigate negative human wildlife interactions – A case study of elephants and tigers.

*International Elephant Foundation, Virtual Meeting (August 2022)*

- Corde S, Von Hagen RL, Kasaine S, Githiru M, Amakobe B, Mutwiwa U, Schulte BA. Evaluating elephant presence around agricultural land in relation to lunar phase and crop season progression  
Schulte BA, Corde S, Vaccaro D, Von Hagen RL, Kasaine S, Githiru M, Amakobe B, Wambugu G, Mutwiwa U. Elephants and Sustainable Agriculture in Kenya (ESAK): Deterrent fences, habitat quality, food security, and education.
- Von Hagen RL, Gray S, Schulte BA, Lepczyk CA. Participatory modeling across Kenyan villages facilitates greater understanding of human-elephant interactions.  
*Animal Behavior Society, Costa Rica (July 2022)*
- Boege-Tobin D, Webber M, Schulte B, Ryan D, Hoag C. Harbor porpoise sex life: First observations of harbor porpoise mating behaviors in Alaska & preliminary results from photo ID matching.
- Corde S, Von Hagen L, Kasaine S, Githiru M, Amakobe B, Mutwiwa U, Schulte BA. Using crop season and moon phase to predict elephant crop raiding in southern Kenya.
- Schulte BA, Corde S, Von Hagen L, Kasaine S, Githiru M, Amakobe B, Mutwiwa U. Evaluating the effectiveness of multimodal fence types to reduce elephant crop raiding in southern Kenya
- Von Hagen RL, Gray S, Schulte BA, Lepczyk CA. Participatory mental models reveal complex drivers and consequences of human-elephant interactions.  
*North American Congress for Conservation Biology, Nevada (July 2022)*
- Von Hagen RL, Schulte BA, Dunning K, Githiru M, Zohdy S, Lepczyk C. Socioeconomic factors shaped relationships of rural farmers to deterrent measures for mitigating crop raiding by African elephants.  
*International Congress for Conservation Biology (ICCB), Virtual Meeting (December 2021): Invited Symposium Speaker, Decision Analysis for Conserving Biodiversity: A Global Perspective*
- Prakash V, Von Hagen RL, Gitzen R, Irwin E, Schulte BA, Lepczyk CA. Elephants and tigers and models, oh my! Structured decision making to mitigate negative human wildlife interactions.
- Schulte BA, Irwin E. Incorporating a conservation behavior approach into the adaptive management framework.  
*International Elephant Foundation, Virtual Meeting (November 2021): co-organizer HEC & Education*
- Schulte BA, LaDue CA. Human–elephant conflict (HEC) from a research perspective.
- Corde S, Von Hagen RL, Kasaine S, Githiru M, Amakobe B, Mutwiwa U, Schulte BA. The use of deterrent fences and environmental correlates to alleviate human elephant conflict in southern Kenya.
- Von Hagen RL, Schulte BA, Githiru M, Mutwiwa U, Kasaine S, Corde SC, Amakobe B, Lepczyk C. Evaluating socioeconomic drivers of human-elephant conflicts in Kenyan communities.  
*Chemical Signals in Vertebrates 15, Virtual Meeting (October 2021)*
- Schulte BA, Von Hagen RL, Githiru M, Mutwiwa U, Kasaine S, Amakobe B, Corde SC. Chemical communication and elephant conservation: Chili pepper fences and other chemo-approaches.  
*Animal Behavior Society, Virtual Meeting (August 2021)*
- Schulte BA, Corde SC, Von Hagen L, Githiru M, Kasaine S, Mutwiwa U, Amakobe B. Facilitating cohabitation of humans and elephants through a conservation behavior approach.  
*American Society of Mammalogists, Virtual Meeting (June 2021)*
- Von Hagen RL, Schulte BA, Githiru M, Mutwiwa U, Kasaine S, Corde SC, Amakobe B, Lepczyk C. Evaluating socioeconomic drivers of human-elephant conflicts in Kenyan communities.
- Corde SC, Von Hagen L, Schulte BA, Kasaine S, Githiru M, Amakobe B, Mutwiwa U. Alleviating human elephant conflict through the use of deterrent fences and environmental monitoring in southern Kenya.  
*Colorado Chapter of The Wildlife Society, Virtual Meeting (Summer 2020)*
- Chock et al. (14 authors total including Schulte BA). Using behavioral ecology perspectives to understand the impacts of solar power facilities on wildlife.  
*Elephant Managers Association, Virtual Meeting (October 2020)*
- Githiru M, Von Hagen RL, Mutwiwa U, Kasaine S, Amakobe B, Schulte BA (presenter). How carbon sequestration (or forest preservation or carbon credits) benefits the people and elephants of the Kasigau Wildlife Corridor of Kenya.

- Von Hagen RL, Norris P, Githiru M, Mutwiwa U, Amakobe B, Kasaine S, Schulte BA. Opportunities for collaborative approaches on crop raiding prevention can advance elephant conservation. *Animal Behavior Society, Virtual Meeting (July 2020)*
- Chock et al. (14 authors total including Schulte BA). Utilizing animal behavior to assess potential impacts of solar power facilities on wildlife. *American Academy of Veterinary Nutrition (AAVN) Clinical Nutrition & Research Symposium, Providence, Rhode Island (June 2020)*
- Palkovic AG, Cook EL, Norman-Wilson GE, Walters TN, Pratt-Philips SE, Schulte BA, Gill JC. Comparison of GreenGuard® and Best Friend® muzzles on horse comfort, fit and behavior at pasture. *International Elephant Foundation, South Africa (October 2019)*
- Von Hagen RL, Kasaine S, Githiru M, 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 RL, Kasaine S, Githiru M, 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 africana*) 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, Florida (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 EW, Schulte BA. Demographic differences in responses of African elephants (*Loxodonta africana*) to lion calls.  
 Schulte BA, Felton SK, Merte CE, Collyer M. Examining personality via behavioral plasticity in female African elephants (*Loxodonta africana*).
- Wisniewska M, Freeman EW, 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 BA. Learning and applications of chemical signals in vertebrates for conservation and management.  
*WKU Student Research Conference, Bowling Green, Kentucky (March 2014)*
- Derham K, Henley MD, Schulte BA. African elephant (*Loxodonta africana*) impact to marula (*Sclerocarya birrea*), knobthorn (*Acacia nigrescens*), and false marula (*Lannea schweinfurtti*) in the Associated Private Nature Reserves, South Africa.
- Edge AC, Henley MD, Daday J, Schulte BA. 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 BA. Elephant behavior and grouping at the Nashville Zoo. (poster)  
*Midwest Ecology & Evolution Conference, Dayton, Ohio (March 2014)*
- Derham K, Henley MD, Schulte BA. African elephant (*Loxodonta africana*) impact to marula (*Sclerocarya birrea*), knobthorn (*Acacia Nigrescens*), and false marula (*Lannea schweinfurtti*) in the Associated Private Nature Reserves, South Africa.  
*Society for Integrative and Comparative Biology, Austin, Texas (January 2014)*
- Felton SK, Merte CE, Schulte BA. Exploration of the behaviors defining personality in African elephants.  
*Kentucky Academy of Sciences, Morehouse University, Kentucky (November 2013)*
- Derham K, Henley MD, Schulte BA. African elephant (*Loxodonta africana*) impact to marula (*Sclerocarya birrea*), knobthorn (*Acacia Nigrescens*), and false marula (*Lannea schweinfurtti*) in the Associated Private Nature Reserves, South Africa.  
*The Wildlife Society, Milwaukee, Wisconsin (October 2013)*

- Felton SK, Merte CE, Schulte BA. 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 BA, Blogg RW. 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 metabolite concentrations *American Chemical Society, New Orleans, Louisiana (April 2013)*
- Davenport SA, Yin Q, Mark DB, Harelimana IH, Schulte BA, Goodwin TE. Urinary chemical signals of musth in immature male African elephants.
- Umuhire-Juru A, Yin Q, Broederdorf LJ, Kopper RA, Sutherland MV, Schulte BA, Engman J, Goodwin TE. Bacterial metabolism produces exogenous urinary chemical signals of elephant musth.
- Yin Q, Harelimana IH, Goodwin TE, Shoemaker JD, Schulte BA. 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, Kentucky (March 2013)*
- Schulte BA, 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 BA. Testing the effect of a wildlife deterring scarecrow device on the feeding behavior of African ungulates. *Basic Research to Enable Agricultural Development, Arlington, Virginia (July 2012)*
- Schulte BA, 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 BA. The effect of human interactions on the behavior of *Tursiops truncatus*.
- Wisniewska M, Freeman EW, Schulte BA. Age & reproductive condition impacts on female African elephant activity. *American Chemical Society, San Diego, California (March 2012)*
- Hirwa IH, Broederdorf LJ, Mark DB, Waldrip ZJ, Burkert BA, Kopper RA, Goodwin TE, Sutherland MV, Schulte BA. Characterization of male elephant urine metabolites via automated solid phase dynamic extraction (SPDE)/GC-MS and <sup>1</sup>H NMR spectroscopy. *International Elephant & Rhino Conservation & Research Symposium, Rotterdam, Netherlands (October 2011)*.
- Freeman EW, Meyer JM, Putman S, Schulte BA, Brown JL. 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 TE, Schulte BA. Urinary chemical signals of elephant musth: Temporal aspects of microorganism-mediated modifications.
- Schulte BA, Bagley K, Blogg R, Loizi H, Vyas DK, Goodwin TE. From exploration to selective information gathering: the development of chemosensory investigation in male African elephants (*Loxodonta africana*). *Animal Behavior Society & International Ethological Conference, Bloomington, Indiana (July 2011)*
- Sinderbrand CA, Schulte BA. 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 BA. 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 NA, McBrayer L, Schulte BA. The impact of tree modification by African elephant (*Loxodonta africana*) on herpetofaunal species richness in northern Tanzania.

*American Chemical Society 241<sup>st</sup> meeting, Anaheim, California (March 2011)*

Harerimana IH, Mark DB, Broederdorf LJ, Burkert BA, Waldrip ZJ, Kopper RA, Goodwin TE, Sutherland MV, Freeman EW, Hollister-Smith JA, Schulte BA. Temporal aspects of bacteria-mediated production of urinary chemical signals of elephant musth.

Mark DB, Harerimana IH, Goodwin TE, Schulte BA. Appearance of urinary chemical signals of musth in immature African elephants.

*WKU Student Research Conference, Bowling Green, Kentucky (March 2011)*

Hook M, Schulte BA. Effect of simulated predation risk on African elephant behavior.

Sinderbrand CA, Schulte BA. Examining the dominance-stress hypothesis in the domestic horse (*Equus caballus*).

*Kentucky Academy of Sciences, Bowling Green, Kentucky (November 2010)*

Schulte BA, Hazekorn R, Hecht M. Aggression, hair whorls and handedness in horses (*Equus caballus*).

Sinderbrand CA, Schulte BA. Rate of aggressive behaviors in lactating and non-lactating domestic horses (*Equus caballus*).

*Animal Behavior Society, Williamsburg, Virginia (July 2010)*

Freeman EW, Meyer JM, Shelby L, Schulte BA, Brown JL. Role of elephant matriarchs in Addo Elephant National Park, South Africa.

*Society for Conservation Biology, Edmonton, Alberta, Canada (July 2010)*

Schulte BA, Esposito RMM, Karimi RR. Elephant Behavior, Human Perception and Human-Elephant Conflict.

*Center for Integrative Study of Animal Behavior Meeting, Indiana University (March 2010)*

Schulte BA, Hazekorn 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, San Francisco, California (March 2010)*

Waldrip ZJ, Broederdorf LJ, Burkert BA, Hirwa IH, Kopper RA, Goodwin TE, Sutherland MV, Freeman EW, Hollister-Smith JA, Schulte BA. Chemical signals of elephant musth: Biosynthesis and microbially-mediated modifications.

*International Elephant Conservation & Research Symposium, South Africa (January 2010)*

Schulte BA, Esposito RMM, Karimi RR. Furthering our understanding of elephant behaviour and human perception to facilitate conservation and reduce human-elephant conflict.

## Teaching

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### Courses Taught

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#### *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

Ecology, Behavior & Conservation of Manatees & Dolphins: A Unique Field Course in the Drowned Cayes, Belize 2009, 2010 {STUDY ABROAD}

Animal Behavior and Research, South Africa, June 2016 {STUDY ABROAD}

#### *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

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#### 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  
 2020: Beverly Gartland (WKU Department of Agriculture)  
 Non-thesis: Marcia Fuller, Andrea Marino, & Erin Brennan (chair); Rachel Johnson, Sarah Mortzfeldt, Ann Yaroach (committee member)

**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  
 2020: Dr. Lisa Barrett, University of Wyoming  
 2022: 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>	<u>Biology 4730 Internship</u>
Rebecca Hazelkorn (08-09)	Lauren Stanley (F 03)
Mallori Hecht (08-09)	Christa Rayl (F 03)
Amber Johnson (Su&F 08)	Kathryn Bagley (S 02)
Brittany Todd (S 07)	Ashley Kirkley (Su 00)
Josh White (S 07)	<u>McNair Advisor</u>
Matthew Groover (F 05)	Amy Gray (2003)
Kimberly Wollett (F 05)	<u>Honors Students</u>
Matthew McBride (F 04)	Brittany Todd (S 07)
Lauren Stanley (F 03)	Joseph Waddell (F 06)
Joe Scott (02, w/ Dr. Pung)	Andrew Quesada (F 04)
Darlinda Douglass (S 02)	Claire Erlacher (S 01)
Claire Erlacher (F 01)	
Maggie Mitchell (F 01)	
Chris O'Neil (Su 01)	
Erik Lunsford (S 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 Nasser, 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 schweinfurthii*) 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, 2022. Alleviating Human Elephant Conflict through Deterrent Fences and Environmental Monitoring in Southern Kenya.
- 27) Dakota Vaccaro, 2023. Mammalian and Avian Community Response to African Elephant (*Loxodonta africana*) Habitat Modification in Southeastern Kenya.
- 28) Matthew Bowers, 2022- Present. Climate Smart Agriculture and other Means of Enhancing Food Security in Southern Kenya.
- 29) Julia Brzezicki, 2023-Present. Development of an Elephant-Information Network as Part of a Tool-Kit for Alleviating Human Elephant Conflict in Rural Kenya.
- 30) Serena Seiler, 2023-Present. Evaluating Human Wildlife Interactions in Kachemak Bay, Alaska.

**Service** (CV limited to WKU and GSU)

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**Western Kentucky University**

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As University Distinguished Professor serve on multiple WKU committees such as UDP, University Awards, and Honorary Degrees.

Chair of Strategic Plan Implementation Committee at WKU, 2018-2019 (then part of AVP position)

Co-Advisor to the President for WKU 2018-2028 Strategic Plan

Department Head at WKU (2009-2019)

Kentucky Museum: Board Member (2014-2017)

External Program Review for Biology Department at the University of Nebraska Kearney (2016)

Co-advisor to WKU Greentoppers student organization (2015-2016)

Member of search committee for Dean of the College of Health & Human Services (2014)

Directed search for Chair of Department of Mathematics (2013)

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**Georgia Southern University**

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President of GSU Chapter of Sigma Xi 2001-2002. Organized Earth Forum (April 23, 2002) with 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):

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, 2007-2009

Undergraduate Activities & Research Committee 2000-2004 (chair, 2002-03)

Undergraduate Curriculum & Policy Committee 2001-2008

Undergraduate Curriculum Revision Committee 2004-07, chair 2005-6: new curriculum 2006

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**EXTERNAL SERVICE**

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**Associate Editor, Behaviour, 2007-present (119 submissions handled)**

**Section Editor (HAI, Animal Behavior & Emotion), Animals, 2021**

**Organizations**

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

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

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

**Professional Services (2010-present)**

External Examiner, Nelson Mandela Metropolitan University, South Africa; Bharathiar University, India; Oxford University, UK; Stellenbosch University, South Africa  
 Guest Editor, *Animal Behaviour*, Special Issue on Conservation Behavior  
 Guest Editor, *Animals*, HEC and Conservation Behavior  
 Advisory Council, Asian Elephant Support, <http://asianelephantsupport.org/directors-listing.asp>  
 Alabama Center of Excellence (ALCoE) grants  
 NSF Grant Review Panel 2012; review NSF (pre)proposals annually  
 Advisory Council, International Elephant Foundation, 2010-present and grant reviewer.  
 Scientific Advisor for "Zambezi Elephant Trust" (William Taylor)  
 Reviewed student abstracts for Society for Conservation Biology meeting (2010)  
 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*, *Global 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*, *Sustainability*, *Tropical Conservation Science*, and *Zoo Biology*.

**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 (2010-present)**

Cloudbridge Nature Reserve, Costa Rica, 7/25/22, Conservation Behavior, Food Security, and Elephant Conservation.  
 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, How Much Wild Belongs in a Zoo.  
 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 International University, 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.

### 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)

### *Theatre Major at WKU 2009- PRESENT*

- Actor, Director, or Stage Manager for WKU and Community Theatre productions.
- Demonstrated excellence in productions, interactions with press, and dialog with public.

Show	Role(s)	Company (Director(s); Year)
<i>The Heist</i>	Armond La Croix III	Phoenix Rising (H. Hadley; 2022)
<i>The Drowsy Chaperone</i> (Suspended because of COVID)	Superintendent	WKU (W. Pope & Julie Lyn Barber; 2020)
<i>La Canterina &amp; 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 &amp; Spike</i>	Vanya	PTK (W. Leonard; 2016)
<i>Finding the Sun</i>	Director	WKU (Bruce Schulte; 2016)
<i>Plaza Suite</i>	Sam	FSP (J. Beard; 2015)
<i>Sense and Sensibility</i>	Col. Brandon	PTK (W. Leonard; 2014)
<i>Arsenic &amp; Old Lace</i>	Jonathan	PTK (Nick Hudson; 2013)
<i>Becky's New Car</i>	Joe	PTK (William Leonard; 2012)
<i>It Was a Dark and Stormy Night</i>	Dawson	PTK (H. 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 (T. Phillips; 2009)
<i>Bye, Bye Birdie</i>	Mr. Johnson & ASM	TP (T. Phillips; 2009)
<i>Driving Miss Daisy</i>	Stage Manager	Averitt Stars (G. 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