

**STATEMENT OF INTEREST**

*I work on linking animal function to social and ecological systems, that is, I try to understand how animals work in a complex world. Most of my work has focused on nutrition of wildlife and the performance of populations. Although most of my recent projects concern large herbivorous mammals (bison, caribou, moose, muskoxen, reindeer), I have also studied carnivores (bear, seal), waterfowl (ducks and geese) and a diverse group of non-game species (e.g. porcupines, bats, tortoises, iguanas and marsupials) in Australia, Canada and the United States. My projects address issues of natural and anthropogenic change for the management of wildlife populations (bison, caribou, moose). I strive to connect wildlife science to public policy in undergraduate courses on fish and wildlife policy, graduate courses on wildlife issues and graduate research on wild ungulates.*

**EDUCATION**

- 1991 Doctor of Philosophy (Department of Biochemistry, Microbiology, and Nutrition), University of New England, Armidale, NSW, Australia.
- 1984 Bachelor of Science (majors in Biochemistry and Zoology) with Honors (Zoology), University of New South Wales, Kensington, NSW, Australia.

**EMPLOYMENT**

- 2020 Professor, jointly appointed in the College of Agriculture and Life Sciences to the Department of Rangeland, Wildlife and Fisheries Management, and the Department of Ecology and Conservation Biology, Texas A&M University, College Station. Affiliate Faculty of Department of Public Service and Administration, Bush School of Government and Public Administration
- 2015 – 2019 Professor, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station. Tenured September 2, 2015. Boone and Crockett Chair in Wildlife Conservation and Policy, 15 October 2015 - 31 October 2020
- 2009 – 2015 Professor of Biology, Department of Biology and Wildlife and Institute of Arctic Biology, University of Alaska, Fairbanks.
- 2002 – 2008 Associate Professor of Biology (Wildlife Physiology and Nutrition), Department of Biology and Wildlife and Institute of Arctic Biology, University of Alaska, Fairbanks. Tenured 2002.
- 1997 – 2002 Assistant Professor of Biology (Nutritional Physiology), Institute of Arctic Biology & Department of Biology and Wildlife, University of Alaska, Fairbanks.
- 1994 – 1997 Visiting Assistant Professor, George Washington University, Department of Biological Sciences, Washington DC.
- 1993 Visiting Lecturer, Catholic University of America, Department of Biology, Washington DC.
- 1991 – 1993 Visiting Scientist / Comparative Nutritionist, Smithsonian Institution.
- 1990 Smithsonian Institution Postdoctoral Research Fellow.
- 1985 – 1989 Commonwealth Postgraduate Research Fellow, Department of Employment Education and Training, Australia.
- 1984 – 1989 Laboratory Instructor: University of New England; Armidale College of Technical and Further Education; University of Sydney.
- 1984 – 1985 Research Assistant, Department of Biochemistry, Microbiology, and Nutrition, University of New England, Australia.

**PROFESSIONAL RECOGNITION**

- 2020 – 2025 Certified Wildlife Biologist, The Wildlife Society
- 2018 – 2023 Certified Senior Ecologist, Ecological Society of America
- 2019 Graduate Teaching Award, Wildlife and Fisheries Sciences, Texas A&M University

- 2015 Undergraduate Teaching Award, Department of Biology & Wildlife, University of Alaska Fairbanks  
2015 Wildlife Conservation Award, Alaska Chapter of the Wildlife Society

**TEACHING**

**UNDERGRADUATE COURSES**

- 2017 – 2021 Fish and Wildlife Law and Administration. (WFSC303) Texas A&M University (30 students in face-to-face class with blended delivery using videos and discussion; online delivery of 15 students per section. Writing intensive class. 30-50 students per semester.  
2018 – 2019 Fundamentals of Wildlife and Fisheries Sciences (WFSC101) Texas A&M University (30 - 42 students in blended lecture, activity and online learning)  
2016 Ecology and management of wild ungulates. (WFSC 489) Texas A&M University (20 students).  
1997 – 2014 Wildlife Nutrition (WLF460/660; BIOL459/659) – University of Alaska, Fairbanks. 15–30 students/course each year.  
2011, 2012, 2013 Principles and Techniques of Wildlife Management (WLF322) – University of Alaska, Fairbanks. 10–12 students/course.  
2008 – 2009, 2011, 2012, 2014 Introduction to Wildlife Science (WLF101) – University of Alaska, Fairbanks. 35–60 undergraduates each year.  
2000 – 2003, 2006 – 2008 Animal Physiology (BIOL310) – University of Alaska, Fairbanks. 45–50 students/course each year.  
1998 Principles of Metabolism and Biochemistry (BIOL303) – University of Alaska, Fairbanks. 40 students for 1 semester (Sabbatical Replacement)  
1994 – 1997 Human Nutrition (BISC128) – George Washington University, Department of Biology. 30–40 students/course for 3 semesters plus 10 students/course for 2 summer semesters.  
1996 Cell Biochemistry (BISC103 & BISC104) – George Washington University, Department of Biology. 60 students in lecture, 15 students in lab for 1 semester (Sabbatical Replacement).  
1994 – 1996 Introductory Biology for Science Majors (BISC111) – George Washington University, Department of Biology. 180–200 students/course for 2 semesters plus 40 students for 2 semesters.  
1996 Histology (BISC118) – George Washington University, Department of Biology. 50 students for 1 semester (Sabbatical Replacement).  
1993 Biological Chemistry (BIO554) – Catholic University of America, Department of Biology. 20 students for 1 semester (Sabbatical Replacement).

**GRADUATE COURSES**

- 2018 - 2021 Capstone in Master of Public Service and Administration (PSAA675; PSAA676) – 8 to 10 students advised with Dr. Cole Blease Graham in Bush School of Government, TAMU  
2017 Directed studies: thermal biology and stress in animals (WFSC 685) – TAMU. 3 PhD students.  
1997 – 2014 Recitation and Laboratory – Wildlife Nutrition (WLF660/ BIOL659) – University of Alaska, Fairbanks. 3–10 MS and PhD students/course once each year.  
1999 Techniques in Physiology and Nutrient Analysis (BIOL620) – Department of Biology and Wildlife, University of Alaska, Fairbanks. 5 students for 1 semester.

1991 – 1992 Comparative Animal Nutrition – Tufts University, School of Veterinary Medicine, Boston MA. 40–50 students/course for 2 semesters.

**GRADUATE STUDENTS**

Current Students as Principal Advisor

*Doctor of Philosophy*

Bridgett Downs. Ecology and Conservation Biology, Texas A&M. Topic: Costs of insect harassment to ungulates

Amelia Christian. Rangelands, Wildlife and Fisheries Management. Metabolic constraints on carnivory in grizzly bears.

*Master of Natural Resources Development (non-thesis).*

Shelby Echols (Rangelands, Wildlife and Fisheries Management. Topic (professional paper): Rewilding ungulates.

Kyle Watter (Rangelands, Wildlife and Fisheries Management. Topic (professional paper): Spatial evaluation of deer management

Theses Completed as Principal Advisor

*Doctor of Philosophy*

2011 Gustine, D. PhD Wildlife Biology, UAF. Topic: Body protein stores of barren ground caribou and muskoxen.

2011 Coltrane, J. PhD Wildlife Biology, UAF. Topic: Physiology of porcupines in winter.

2020 Thompson, D.P. Wildlife & Fisheries Sciences, Texas A&M. Topic: Thermal biology of moose.

2020 Jeffrey M. Martin. Wildlife & Fisheries Sciences, Texas A&M. Topic: Body size of bison.

*Master of Science*

2002 Rombach, E. P. MS Biology, UAF. Topic: Copper metabolism during pregnancy and neonatal development of muskoxen.

2003 Peltier, T. C. MS Wildlife Biology, UAF. Topic: Effects of season, sex and diet on muskoxen.

2004 Knott, K.K. MS Biology, UAF. Topic: Nutritional development of muskoxen and reindeer.

2005 Mason (Mather), D.M. MS. Wildlife Biology, UAF. Topic: Migration strategies of black brant.

2006 Crater, A.R. MS. Biology, UAF. Topic: Microbial ecology of the rumen in muskoxen.

2011 De Groot, K. MS Wildlife Biology, UAF. (Co-Chair with M. Lindberg). Topic: Relationships between physiological condition and reproduction of lesser scaup.

2012 Welch, J. MS Wildlife Biology, UAF. Topic: Movement of moose in a nutritional landscape.

2013 Thompson, D.P. MS Wildlife Biology, UAF. Topic: Food intake of caribou and reindeer.

2014 Van Someren, L. MS Wildlife Biology, UAF. Topic: Forage quality for arctic caribou.

2016 Shively, R.D. MS Wildlife Biology, UAF. Topic: Food and habitat for bats in the arctic.

2017 Oster, K.W. MS. Wildlife and Fisheries Sciences, TAMU. Topic: Forage minerals for arctic caribou.

2019 Hollingsworth, K. Wildlife & Fisheries Sciences, Texas A&M. Topic: Minerals for populations of rodents and deer in Texas

Theses Completed as a Member of the Advisory Committee:

*Doctor of Philosophy*

2003 S. Trumble. PhD. Assessing the health of harbor seals in Alaska.

2007 C. Ihl. PhD. Foraging ecology and sociality of muskoxen in northwestern Alaska.

- 2008 M.N. Grant-Hofmann. PhD. The effects of invasive rats and burrowing seabirds on seed and seedling communities on New Zealand islands.
- 2010 D. J. Rinella. PhD. Marine-derived nutrients in Kenai Peninsula salmon streams: tracking techniques and fisheries management applications
- 2010 T. Hegel. PhD. Spatio-temporal recruitment dynamics of mountain-dwelling caribou in the Yukon territory, Canada.
- 2014 J-M. Seymour. PhD. Pacific walrus use of higher trophic level prey and the relation to sea ice extent, body condition, and Trichenellosis.
- 2014 T. Mullett. Ph.D. Effects of snowmobile noise and activity on a boreal ecosystem in south-central Alaska.
- 2017 Inglis, S. Ph.D. Topic: Dietary effects on protein turnover in three pinniped species.
- 2020 Rachel Short. PhD. Topic: Ecological metrics of ungulates.

*Master of Science*

- 2002 W. T. O'Connell. MS. Role of wetlands and endogenous factors in incubation behavior of nesting eiders on the Yukon Kuskokwim Delta, Alaska.
- 2002 D.F. Spaeth. MS. Sexual segregation in moose: effects of incisor morphology, quality of willows and foraging behavior.
- 2002 S. Karpovich. MS. Hibernation in the ground squirrel.
- 2002 R. M. Swor. MS. The effect of a marginal copper diet on muskox calf growth and immune function.
- 2003 C. Nicolai. MS. Reproductive decisions by Black Brant: mechanisms to synchronize hatch and spatial variation in growth rates of goslings.
- 2004 M. Knoche. MS. King eider wing molt: inferences from stable isotope analyses.
- 2007 L. Parrett. MS. Summer ecology of the Teshekpuk caribou herd.
- 2007 K. Martin. MS. Breeding ecology and fasting tolerance of scaup and other ducks in the boreal forest of Alaska.
- 2013 K. Colson. MS. Genetic population structure of moose at multiple scales.
- 2014 S. Worker. MS. Causes and consequences of geophagy in snowshoe hares (*Lepus americanus*), an important generalist herbivore of the boreal forest.
- 2017 N. Alonso. MS. Texas A&M, Kingsville. Topic: Heat stress in young white-tailed deer
- 2019 A. Gugenheimer – MS. Topic: Body condition of wintering ducks in Texas

**POST DOCTORAL ASSOCIATES**

- 2004 A.J. Munn. Ph.D. Topic: Nutrition and thermal balance of young muskoxen and their mothers over winter.
- 2010 E.M. Ungerfeld. Ph.D. Co-sponsored by M.B. Leigh (UAF) and R.J. Forster (Lethbridge Research Center, AB Canada). Topic: Functional diversity of ruminal bacteria in muskoxen.
- 2014 R.E. Wilson. Ph.D. Co-sponsored by S.D. Farley (Alaska Department of Fish and Game) and S. Talbot (Alaska Science Center, USGS, Anchorage AK). Topic: Genetic comparisons of moose in relation to roads in Alaska.
- 2017 S.Garnick. PhD. Topic: Diet determination of rangeland herbivores.

**PROFESSIONAL ACTIVITIES**

**EXTRAMURAL SERVICE**

Peer Review:

Associate Editor for Journal of Mammalogy (June 2015 - July 2020).  
Ad hoc reviewer for Acta Theriologica; Arctic, Antarctic and Alpine Research; Canadian Journal of Zoology; Comparative Biochemistry and Physiology; Conservation Letters, Ecological

Modeling; Ecology Letters; Functional Ecology; Journal of Comparative Physiology B; Journal of Experimental Biology; Journal of Fish and Wildlife Management; Journal of Mammalogy, Journal of Wildlife Management; Physiological and Biochemical Zoology. PLoS One, Polar Biology, Wildlife Biology, Zoo Biology, National Science and Engineering Research Council (Canada), National Science Foundation, Research Council of Norway, Belmont Forum.

External PhD Examiner (since 2014): Texas State University, University of Alberta (Canada), University of Aarhus (Denmark)

Membership in Professional Societies

American Society of Mammalogists  
Ecological Society of America  
The Wildlife Society

**INTRAMURAL SERVICE**

Texas A&M University

- 2020 Committee on Academic Freedom, Responsibility and Tenure (CAFRT)
- 2020 Chair, review committee for endowed chair reappointments, College of Agriculture and Life Sciences
- 2020 Member of Graduate Curriculum Committee, Rangelands Wildlife and Fisheries Management
- 2020 Member of Undergraduate Curriculum Committee, Rangelands Wildlife and Fisheries Management
- 2020 Member of Wildlife Job Board Committee, Rangelands Wildlife and Fisheries Management
- 2020 Member of Diversity and Inclusion Committee, Rangelands Wildlife and Fisheries Management
- 2015 – 2020
  - The Boone & Crockett Wildlife Conservation and Policy Program at Texas A&M
  - Represent A&M program at four meetings each year for B&C University Programs
  - Consult with B&C Members in management committee
  - Engage and sustain donor relationships with A&M Development Officers
  - Assisted Mark Klemm (Asst. VP Development) to raise \$1,055,000 for B&C endowment in 2018
  - Assisted B&C member F.S. “Jayar” Daily to produce promotional video for B&C Endowment
  - Design & display of North American Wild Sheep “Grand Slam” collected by James H. “Red” Duke – work with Dawn Miles
- 2019 Member, ad hoc advisory committee for reorganization of the departments of Wildlife and Fisheries Sciences and Ecosystem Sciences and Management, College of Agriculture and Life Sciences
- 2016 – 2021
  - Member of Faculty Search Committees – Diversity Fellow, Animal Behaviorist, Wildlife Extension, Research Scientist (Uvalde)
  - Chair, Animal Conservation Seminar for department (Wildlife and Fisheries Sciences)
  - Co-chair undergraduate curriculum review committee (Wildlife and Fisheries Sciences)
- 2016 Chair, faculty review committee for Sid Kyle Endowed chairs (Ecosystem Sciences and Management)

University of Alaska Fairbanks

- 1999 – 2014 Member of Radiation Safety Committee
- 2008 – 2010 Committee for Integration of Research and Teaching
- 2001 – 2002; 2006, 2007, 2009 – 2013
  - Member of User Committee for New Biosciences Building (Murie)
- 1999 – 2001 Member of Food Service Advisory Board

College of Natural Sciences and Mathematics

- 2013 Faculty Senate, Committee for Criteria to Evaluate Faculty with Joint Appointments  
2010 – 2012 Faculty Senate, Representative for College and Chair of Unit Criteria Committee  
2007 – 2009 Faculty Senate, Representative for College and member of Graduate Academic & Advisory Committee  
2000 Chair for Committee to draft Mission and Vision Statements

Department of Biology and Wildlife and Institute of Arctic Biology

*Academic Service*

- 2007 – 2010,  
2013 – 2014 Chair, Wildlife Biology Program (~120 undergraduates, 20 masters, 10 doctoral).  
2001– 2003, 2005 – 2006  
Masters Comprehensive Examination Committee; Chair for 2002–2003  
2012 – 2014 Member of scholarship committee for Department of Biology and Wildlife  
2007 – 2012 Chair, Irving Scholander Lecture Committee  
2001– 2006 Member Irving Scholander Lecture Committee  
1999 – 2001 Co-convener of Life Sciences Seminars (4 semesters)  
*Administrative Service*  
2005 – 2010 Science Director, R.G. White Large Animal Research Station  
1998 – 2003 Chair, Large Animal Research Committee  
2008 – 2011, 2002 – 2004  
Member Director's Council, Institute of Arctic Biology  
2000 – 2002 Member of Life Sciences Space Committee  
2006 – 2007, 2002 – 2003  
Integrative and Environmental Physiology (NSF EPSCoR Alaska) - Leader of Research Focus Area

*Service for Recruitment and Evaluation*

- 2014 Chair, Unit Peer Review Committee for Promotion and Tenure  
2014 Chair Faculty Search Committee – Wildlife Biologist (Human Dimensions)  
2002 Chair Faculty Search Committee – Integrative Physiologist  
2002 Chair Faculty Search Committee – Molecular Biologist  
2003 Chair Faculty Search Committee – Wildlife Toxicologist  
2000 Member of Faculty Search Committee – Organic Chemist  
2000 Member of Faculty Search Committee – Conservation Biologist  
1999 Member of Faculty Search Committee – Integrative Physiologist  
1999 – 2011 Member of Staff Search Committees: IAB Fiscal Officer, Assistant to IAB Director, Departmental Office Manager, Departmental Student Coordinator, Tour Coordinator for LARS, IAB Fiscal Officer, Senior Research Technician, Administrative Assistant for Grants

**GRANTS AND CONTRACTS**

**EXTRAMURAL AWARDS: Total \$3,836,295**

- 2016 – 2020 Food intake and food quality of Kenai moose. Principal Investigator: P.S. Barboza. Sponsor: J. Crouse, Alaska Dept Fish and Game. 1 July 2015 to 30 June 2017 - \$90,000. Extension 2018 - \$20,000. Extension 2019 - \$20,000.  
2016 Blood indices of life-history constraints in wild caribou bulls. Principal Investigator: P.S. Barboza. Sponsor: Layne Adams, USGS Alaska Science Center through Gulf Coast Cooperative Ecosystem Studies Unit. \$45,000 1 August 2016 to 31 July 2018

**CURRICULUM VITAE**  
**PEREGRINE (Perry) STEPHEN BARBOZA**

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- 2014 Food Intake of Kenai moose. \$25,000. Principal Investigator: P.S. Barboza. Sponsor: J. Crouse, Alaska Dept Fish and Game.
- 2014 Indices of protein balance in moose from contrasting ranges in South – Central Alaska \$20,000. Principal Investigator: P.S. Barboza. Sponsor: J. Crouse, Alaska Dept. Fish and Game.
- 2013 Dietary indicators for migratory mule deer. \$20,000. Principal Investigator: P.S. Barboza. Analytical support for project by Cody Schroeder. Sponsor: Kelley Stewart, University of Nevada at Reno.
- 2012 – 2015 Summer forage quality for Teshekpuk and Western Arctic caribou. \$85,000. Principal Investigator: P.S. Barboza. Sponsor: D.D. Gustine, USGS.
- 2011 – 2014 Nutrient dynamics of forages for ungulates in the changing arctic. \$102,000 over 4 years Principal Investigator: P.S. Barboza. Sponsor: D.D. Gustine, USGS.
- 2012 – 2017 Protein availability for caribou in the summer ranges of the Central Arctic and Teshekpuk herds. Research Work Order for \$86,773 over 5 years. Principal Investigator/Advisor: P.S. Barboza. Sponsor: D.D. Gustine, USGS.
- 2010 – 2012 Assessing body protein dynamics in female moose (*Alces alces*) during winter. \$18,500 over 2 years. Principal Investigator: P.S. Barboza. Sponsor: J. Crouse, Alaska Dept. Fish and Game.
- 2010 Isotopic Evaluation of protein status in Northern Alaska Peninsula caribou. \$15, 505 from US Fish and Wildlife Service Principal Investigator: P.S. Barboza. Sponsor: D. Watts, USFWS.
- 2010 Diet and body protein status of Central Arctic muskoxen \$15, 000 from Alaska Department of Fish and Game. Principal Investigator: P.S. Barboza. Sponsor: Steve Arthur, ADFG.
- 2009 – 2013 Nutritional baselines for caribou. \$992,479 from National Council for Air and Stream Improvement, USA. Principal Investigator for UAF: P.S. Barboza. Visiting Investigators: K.L. Parker, J. Cook, R. Cook, D. Sleep.
- 2009 – 2013 Condition and movement of moose, wolves and black bears in relation to urban development. \$472,000 from Army Corps of Engineers, US Department of Defense. Principal Investigator for UAF: P.S. Barboza. Principal Investigator at Alaska Department of Fish and Game: Sean Farley.
- 2008 – 2009 Fiber degrading microbes and enzymes in the rumen of muskoxen. \$43,526 from University of Lethbridge with funds from Lethbridge Research Center. Host Investigators at UAF: P. S. Barboza with M.B. Leigh. Canadian Investigators: E. Ungerfeld, R. J. Forster, B. Selinger.
- 2007 Caribou body condition measures for the CARMA Network. \$113,000 from University of Northern British Columbia over three years. Principal Investigator: P.S. Barboza. Sponsor/Collaborator: K.L. Parker with funds from Canadian International Polar Year to D.E. Russell.
- 2008 Preparation for caribou and nutrition research initiative at Large Animal Research Station. \$19,737 from National Council for Air and Stream Improvement, USA. Principal Investigator: P.S. Barboza. Collaborator: K.L. Parker.
- 2008 Monitoring the body condition of caribou in late winter: developing and evaluating a 'hands off' approach. \$78, 861 from USGS – Parks Oriented Biological Support. Principal Investigator: P.S. Barboza. Sponsor: D.B. Griffith. Support for D. Gustine Ph.D. research.
- 2008 Hormone assessment in blood, hair and feces of captive caribou and reindeer. \$20,000 in work orders from North Slope Borough and University of Saskatchewan. Principal Investigator: P.S. Barboza. Sponsor/Collaborator: N. Owen-Ashley and M. Cattet.

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- 2007 Physiological ecology of wintering porcupines – analytical support. \$2,627 from Alaska Department of Fish and Game. Principal Investigator: P.S. Barboza. Support for J. Coltrane Ph.D. research.
- 2007 Blood fractions as indicators of protein balance in Rangifer tarandus. \$16,000 from USGS Alaska Science Center. Collaborator: L. Adams.
- 2007 Evaluating winter condition of Teshekpuk caribou. \$7,200 in work orders from North Slope Borough. Principal Investigator: P.S. Barboza. Sponsor/Collaborator: B. Person.
- 2007 Comparative forestomach physiology in arctic ruminants - the basis for niche partitioning. \$33,062 from University of Zurich. Principal Investigator: P.S. Barboza. Sponsor: M. Clauss with funding from Swiss National Science Foundation.
- 2007 Evaluating nutritional condition of arctic ungulates. \$63,000. National Parks Service PMIS 119377. Principal Investigator: P.S. Barboza. Sponsor/Collaborator: J. Lawler.
- 2006 Relationship Between Physiological Condition and Reproduction of Lesser Scaup. \$37,380. Yukon Flats National Wildlife Refuge. Co-Investigators M. Lindberg and P.S. Barboza.
- 2006 Sampling microbes for effects of usnic acid on reindeer. \$5,000 University of Tromso, Norway Principal Investigator: P.S. Barboza. Collaborator M. A. Sundset
- 2006 Metabolism of lichen in reindeer and caribou. \$14,000. M.J. Murdock Charitable Trust. Principal Investigator: P.S. Barboza. Support for R. Parsley. Research experience for High School Teachers.
- 2006 Nutritional status of Chisana caribou. \$17,250 Research Work Order for US Geological Survey. Principal Investigator: P.S. Barboza. Collaborator: L. Adams.
- 2005 Nutritive value of moss for muskoxen in winter. \$2,494. National Parks Service, Western Arctic National Parklands. Principal Investigator: P.S. Barboza. Support for C.Ihl, PhD research.
- 2004 Energetic costs of migration and over-wintering for Pacific black brant - analysis of tissues from migrating black brant. \$12,500. Fish and Wildlife Service Agreement Number 701814G286. Principal Investigator: P.S. Barboza.
- 2002 Effects of dietary N and lichen on body protein conservation in reproducing Rangifer. \$664,980 from Office of Polar Programs, Arctic Sciences Section, Arctic Natural Sciences Program (Biological Sciences), National Science Foundation. Principal Investigator: P.S. Barboza. Co-investigator: K.L. Parker (University of Northern British Columbia).
- 2000 Feeds for qiviut production: trace mineral nutrition in muskox. Project Renewal. Alaska Science and Technology Foundation. \$76,221. Principal Investigator: P.S. Barboza. Co-Investigators: J.E. Blake and C.E. Lewis.
- 1999 Feeds for qiviut production: trace mineral nutrition in muskox. Alaska Science and Technology Foundation. \$176,434. Principal Investigator: P.S. Barboza. Co-Investigators: J.E. Blake and C.E. Lewis.
- 1996 Nutritional constraints on body composition and muscle protein of wintering black ducks and migratory waterfowl. Patuxent Wildlife Research Center, US Geological Survey. \$226,539. Co-Principal Investigators: P.S. Barboza and D.G. Jorde.
- 1993 Nutritional Research on the desert tortoise in Southern Nevada. The Nature Conservancy, Supplementary Award of \$50,000. Principal Investigator: O.T. Oftedal Co-principal Investigator: P.S. Barboza.
- 1991 Nutritional research on the desert tortoise (*Gopherus agassizii*) in southern Nevada. The Nature Conservancy. \$236,000. . Principal Investigator: O.T. Oftedal Co-principal Investigator: P.S. Barboza.



**INTRAMURAL AWARDS: Total \$326,339**

- 2017 - 2020 Fauna Monitoring for Savanna Long Term Research Experiment Initiative. Sid Kyle Foundation, Department of Ecosystem Sciences and Management, Texas A&M. \$170,000. Principal Investigator: Perry S. Barboza.
- 2014 Instructional equipment for wildlife biology: telemetry, field camera & incubator. University of Alaska, Fairbanks, Technology Advisory Board. \$9,880. Principal Investigator: Perry S. Barboza & Denise Kind
- 2007 Extending the laboratory with data loggers. University of Alaska, Fairbanks, Technology Board. \$14, 268. Principal Investigator: Perry S. Barboza.
- 2007 Monitoring winter body condition of barren ground caribou from the Bering Sea to the Hudson Bay. Cooperative Institute for Arctic Research (CIFAR) and National Oceanic and Atmospheric Administration (NOAA). \$26, 697. Principal Investigator: P.S. Barboza. Support for D. Gustine.
- 2006 Physiology for populations. NSF EPSCoR Travel Awards \$2000. Principal Investigator: Perry S. Barboza.
- 2004 Molecular approaches to microbial diversity. NSF EPSCoR Travel Award \$1,314. Principal Investigator: Perry S. Barboza.
- 2003 A new mammalian stress model: male reindeer in rut. Alaska BRIN (NIH) – Faculty Mentoring and Development Grant. \$29,420. Principal Investigator: Perry S. Barboza.
- 2002 Digestive physiology of caribou: testing a nutritional mechanism for sexual segregation and niche partitioning. University of Alaska, President’s Special Projects Fund and Alaska NSF EPSCoR. \$10,000. Principal Investigator: Perry S. Barboza. Co-Investigators: R. Terry Bowyer and Jonathan A. Jenks.
- 2002 Wintering strategies of an arctic nesting goose: energetic costs of migration and overwintering for Pacific black brant. \$15,000 from Angus Gavin Memorial Bird Research Grant. Principal Investigator: Perry S. Barboza on behalf of Danielle Mather (MS student). Co-investigator: David Ward, USGS.
- 2001 Active learning of physiology: upgrading non-invasive approaches. University of Alaska, Fairbanks, Technology Board. \$24,985. Principal Investigator: P.S. Barboza.
- 1999 Physiological monitors for humans and other large animals. University of Alaska, Fairbanks, Technology Board. \$16,175. Principal Investigator: P.S. Barboza.
- 1998 Nutritional resources of Alaskan wildlife: applied research for students. University Of Alaska, Natural Resources Fund. \$16,662. Principal Investigator: P.S. Barboza.
- 1998 Ultra-low temperature storage for biological preservation. MAPCO Foundation, University of Alaska Fairbanks. \$7,000. Principal Investigators: P.S. Barboza and J.F. Braddock.

**PUBLICATIONS:**

**POPULAR ARTICLES & BOOK REVIEWS**

- Barboza P.S. The wombat digs in. *Natural History* 1995. 104: 26–29.
- Van Someren, L., K. Oster, D. Gustine, P.S. Barboza. 2018. The nutrient migrants: how climate and habitat shape where caribou go. *Fair Chase* magazine Fall 2018: 26-30
- Barboza, P.S. 2019. Wildlife Politics by Bruce Rocheleau. *Journal of Wildlife Management* 83(2): 502.
- Hollingsworth, K.A, R.D. Shively, S. Glasscock, J. Light, D. Tolleson, and P.S. Barboza. Tracing the nutrients on the landscape for wildlife health. *Fair Chase* Winter 2019: 68-69.
- Martin, J.M. and P.S. Barboza. Bison as sentinels: monitoring the response to warming, drought and productivity on the Great Plains. *Bison Review*. Western Bison Association. Fall 2019:22-25. DOI: [10.13140/RG.2.2.33957.04320](https://doi.org/10.13140/RG.2.2.33957.04320).

- Martin, J.M. and P.S. Barboza. Some like it hot, bison don't: rising temperatures and falling growth. *Bison World*. National Bison Association. Summer 2020:12-15
- Martin, J.M. and P.S. Barboza. Some like it hot, bison (*Bison bison*) don't. *Bulletin of the Ecological Society of America* 101(4): e01758 <https://doi.org/10.1002/bes2.1758>
- Alvi, T., C. Haffey, M. Huddleston, E. Parks. B. Prieto, A. Reed, H. Sadiq, C. Smith, M. Vathauer, M. Zaheed. Advisors, C. B. Graham and P.S. Barboza. Sustainable funding options for Texas wildlife conservation. The Takeaway. Mosbacher Institute 28 May 2020. [https://bush.tamu.edu/wp-content/uploads/2020/07/V11-7\\_TX\\_Conservation\\_Fund\\_Takeaway.pdf](https://bush.tamu.edu/wp-content/uploads/2020/07/V11-7_TX_Conservation_Fund_Takeaway.pdf)

#### **BOOKS/ MONOGRAPHS**

Barboza, P.S., K.L. Parker and I.D. Hume. 2009. *Integrative Wildlife Nutrition*. Springer Verlag; 342 pages with 119 illustrations; hardcover ISBN: 978-3-540-87884-1; soft-cover ISBN: 978-3-642-03695-8; eISBN: 978-3-540-87885-8. Outstanding Book Award for 2010 from The Wildlife Society.

#### **BOOK-CHAPTERS**

1. Hume I.D. and P.S. Barboza. 1993. Designing artificial diets for captive marsupials. Pages 281-288 in *Zoo and Wild Animal Medicine*, 3rd edition, M.E. Fowler Ed.
2. St. Pyrek J., S.K. Aggaraval, P. Barboza, J.P. Goodman, and P. Yang. 1996. Metabolites of nuatigenin ((22S,25S)22,25-epoxy-3 $\beta$ ,26-dihydroxy-furost-5-ene) accumulate in the bile of rabbits fed oats. Pages 443-458 in Waller and Yamasaki (eds) *Saponins used in traditional and modern medicine*, Plenum Press, New York.
3. Hume I.D. and P.S. Barboza. 1998. The gastrointestinal tract and digestive physiology of wombats. Pages 67-74 in *Wombats*. Surrey Beatty & Sons, Australia.
4. Barboza, P.S. and D. Tihanyi. 2018. State wildlife policy in a national environment. Chapter 30, pages 359-390 in B.D. Leopold, J.L. Cummins and W.B. Kessler (editors) *North American Wildlife Policy and Law*. Boone and Crockett Club, Missoula MT.

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### **MANUSCRIPTS IN PROGRESS**

- Benedict, B.M., D.P. Thompson, J.A. Crouse, P.T. Shults, G.L. Hamer and P.S. Barboza. Physiological resistance of moose calves to insects: cortisol and environmental stressors. *Canadian Journal of Zoology*. In Review.
- Benedict, B.M., and P.S. Barboza. Death and debility by a thousand bites: effects of biting insects on North American ungulates. *Mammal Review*. In Review
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- Barboza, P.S. Resilience in wildlife: how do animals work in a complex world? *Physiological and Biochemical Zoology*. In Revision.
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- Barboza, P.S. A wild system: bridging science and policy for wildlife conservation. Textbook proposal. In Preparation.
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- Barboza, P.S., R.D. Shively and D.P. Thompson. 2019. Tolerance of foraging constraints in female barren-ground caribou (*Rangifer tarandus granti*). American Society of Mammalogists, Washington D.C. 30 June 2019
- Hollingsworth, K.A, R.D. Shively, S. Glasscock, J. Light, D. Tolleson, and P.S. Barboza. Little and large herbivores as indicators of trophic availability of essential trace nutrients. American Society of Mammalogists, Washington D.C. 30 June 2019
- Martin, J. and P.S. Barboza. Drought and temperature influences spatial and temporal variation in growth of North American *Bison* American Society of Mammalogists, Washington D.C. 2 July 2019
- 2018 Thompson, D.P., P.S. Barboza, J.A. Crouse, T.J. McDonough, O.H. Badajos, and A.M. Herberg. Body Temperature Patterns Vary with Pregnancy and Condition in Moose (*Alces alces*). International Deer Biology Congress. Estes Park CO. 9 July, 2018.
- Barboza, P.S. Educating for resilience: a new role for policy in natural resources. The Wildlife Society 8 October 2018
- Barboza, P.S., L. Van Someren, K.W. Oster, D.D. Gustine, H.E. Johnson. Windows of nitrogen and minerals for migratory caribou in Alaska. The Wildlife Society 11 October 2018
- 2017 Tolerance of foraging constraints in female barren-ground caribou (*Rangifer tarandus granti*). P.S. Barboza, R.D. Shively and D.P. Thompson. Annual Meeting of American Society of Mammalogists. Moscow, Idaho.
- Mineral phenology of forages available for migratory caribou in Alaska. Keith Oster, P.S. Barboza and D.D. Gustine. Annual Meeting of American Society of Mammalogists. Moscow, Idaho.
- Fossil *Bison* and past climates: a long-term trend of body size into the future. J.M.Martin, J.I. Mead and P.S. Barboza. Annual Meeting of American Society of Mammalogists. Moscow, Idaho.
- 2014 Simulated ranges indicate the importance of seasonal habitat for female caribou. P.S. Barboza, D.P. Thompson, R. Hart. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK.
- Evaluating protein balance in wintering moose. J. Crouse and P. Barboza. 48<sup>th</sup> North American Moose Conference and Workshop, Girdwood AK.
- Natural and anthropogenic effects on the spatial genetic structure of moose. R. Wilson, S.D. Farley, T.J. McDonough, S. Talbot, P.S. Barboza. 48<sup>th</sup> North American Moose Conference and Workshop, Girdwood AK.
- 2013 Feeding behavior of caribou calves does not compensate for low forage quality. P.S. Barboza and R. Ruffner. Annual meeting of The Wildlife Society, Alaska Chapter, Fairbanks AK.
- Activity and diet of Little Brown Bats in interior Alaska. R. Shively, P.S. Barboza, C. Stricker, and T. Jung. Annual meeting of The Wildlife Society, Alaska Chapter, Fairbanks AK.

- Monitoring summer forages for Arctic caribou: correlating isotopes with diet and latitude. L.L. Van Someren, P.S. Barboza, D.D. Gustine, L.S. Parrett, and C. Stricker. Annual meeting of The Wildlife Society, Alaska Chapter, Fairbanks AK.
- Browse intakes of caribou during summer. D.P. Thompson and P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Fairbanks AK.
- Relationships between movement, diet, and habitat quality of urban moose. J.H. Welch, P.S. Barboza, S.D. Farley and D.E. Spalinger. Annual meeting of The Wildlife Society, Alaska Chapter, Fairbanks AK.
- 2012 Applying stable isotopes to wildlife nutrition:  $^2\text{H}$  and body composition,  $^{15}\text{N}$  and protein balance. P.S. Barboza. *Advances in Stable Isotope Techniques and Applications*. Fairbanks Alaska. Invited speaker.
- Body condition of female caribou at first reproduction. E.M. Garrett, K.W. Oster, and P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK
- Onset of breeding behavior in young male caribou. K.W. Oster, E.M. Garrett and P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK
- An in vitro method for monitoring digestibility of forages for caribou. L.L. Van Someren, P.S. Barboza and D.D. Gustine. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK.
- Plant secondary metabolites as indicators of lichen consumption. R.D. Shively, D. Zhipeng, T. Green, J. Lawler and P. S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK.
- Nutritional ecology of moose in an urban landscape. J.H. Welch, P.S. Barboza, S.D. Farley and D.E. Spalinger. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK.
- Response of caribou and reindeer to variable food supply in late winter. D.P. Thompson, D.P. and P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK.
- 2011 Isotopic indicators of protein dynamics in wintering reindeer, caribou, and muskoxen. P.S. Barboza, D.D. Gustine, J.A. Addison and R.D. Shively. Arctic Ungulate Conference, Yellowknife Canada.
- Effects of food shortage in spring on compensatory intake and body mass of caribou (*Rangifer tarandus granti*) and reindeer (*R.t. tarandus*). D.P. Thompson and P.S. Barboza. Arctic Ungulate Conference, Yellowknife Canada.
- Nutrition and post-weaning growth of caribou from interior Alaska. P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Juneau AK.
- Are migratory caribou more active than sedentary caribou? J. Ball, L.L. Van Someren, and P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Juneau AK
- What does a wet caribou weigh? L.L. Van Someren, J. Ball, and P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Juneau AK.
- 2010 Risk and resilience in wildlife nutrition. P.S. Barboza. Plenary Lecture to Comparative Nutrition Society, Tucson AZ. Invited speaker.
- Physiology of recruitment in muskox populations. P.S. Barboza. Annual meeting of The Wildlife Society, Alaska Chapter, Anchorage AK and Annual Meeting of The Wildlife Society, Snow Bird UT.
- 2009 Trophic matches and mismatches: monitoring responses to variable environments. P.S. Barboza, K.L. Parker, I.D. Hume. Symposium on Trophic Matches and Mismatches at the Annual Meeting of The Wildlife Society, Monterrey CA. Invited speaker.
- Wildlife nutrition: integrating animal responses to variable environments. P.S. Barboza Annual meeting of The Wildlife Society, Alaska Chapter, Fairbanks AK.
- A tale of two males in the arctic: contrasting strategies for rut in reindeer and muskoxen. P.S. Barboza. Annual Meeting of the American Society of Mammalogists, Fairbanks AK.

Seasonal digestive function in arctic ruminants: flexible fermentation and a variable food supply.  
P.S. Barboza. Conference on Gastrointestinal Function, Chicago, IL. Invited speaker.

**SELECTED SEMINARS & PRESENTATIONS SINCE 2009**

- 16 April 2020 Invited Seminar (Webinar): Can we manage wild ungulates on a climatic scale?  
University of Wisconsin Stevens Point.
- 2 May 2019 Invited Lecture: Caribou currencies: valuing land for a migratory ungulate.  
Ecology, Evolution and Conservation Biology Program, University of Nevada  
Reno.
- 7 November 2018 Invited presentation: Bison as a model for informing and transforming wildlife  
systems in North America. Rethinking the North American Model of Wildlife  
Conservation PERC Conference Center, Bozeman, MT
- 13 November 2017 Seminar: A nutritional perspective of resilience in wildlife. Ecology and  
Evolutionary Biology program, Texas A&M University
- 2 October 2015 Seminar: What do wildlife cost? Department of Biology. Baylor University, Waco  
Texas.
- 5 March 2015 Invited Lecture. Cesar Kleberg Wildlife Research Institute, Deer Associate  
Meeting, San Antonio, Texas. Overheating in the Arctic.
- 10 November 2014 Seminar: What do wildlife cost? Wildlife and Fisheries Sciences, Texas A&M  
University.
- 12 September 2014 Seminar: Institute of Arctic Biology, University of Alaska Fairbanks. What does a  
caribou cost?
- 25 March 2013 Invited Lecture. Texas State University, San Marcos, TX. Tracking protein with  
<sup>15</sup>N in arctic ungulates.
- 5 October 2009 Seminar. Texas State University, San Marcos, TX. Seasonal digestive function in  
arctic ruminants: flexible fermentation and a variable food supply.