BOONE AND CROCKETT CLUB

University Programs | *2023*

Welcome

Dear Supporters,

Today's conservation challenges are multifaceted and often occur at the interface of ecology, economics, culture, and communication. The policy process seeks to integrate these diverse drivers to determine the most appropriate action. The process of formulating conservation policy is more likely to be successful if knowledgeable, skilled professionals are involved. That is where the Boone and Crockett Club's University Programs come in. Boone and Crockett Fellows study wildlife ecology with top scientists and get their degrees from the best wildlife programs in North America. They are trained in ecology, wildlife management, and conservation policy and learn how to use their research results, networks, and knowledge to impact policy. By developing a diverse community of high-impact wildlife conservation leaders, University Programs is preparing experts for tomorrow's policy decisions.

The mission of the Boone and Crockett Club University Programs is the development of a diverse community of high-impact wildlife conservation leaders.

We are pleased to provide this year's Annual Report on University Programs. We know you will be inspired by the outstanding young professionals being trained through University Programs, ready to enter the arena on behalf of wildlife and its conservation.

William Demmer and Steven Leath
University Programs, Co-Chairpersons

Dave Hewitt and Josh Millspaugh
University Programs, Deputy Co-Chairpersons

Clemson University
Michigan State University
Mississippi State University (inactive)
Oregon State University
Texas A&M University
Texas A&M University-Kingsville
University of Montana
University of Wisconsin-Stevens Point

2023 OVERVIEW

3 ENDOWED PROFESSORSHIPS
TOTAL FELLOWS: 38
UNDERGRAD: 2
MASTERS: 16
PHD: 14
POSTDOCTORAL: 6
SCHOLARLY PUBLICATIONS: 66
INVITED TALKS: 38
RESEARCH PRESENTATIONS: 117
COURSES TAUGHT: 22

Learn more about the Boone and Crockett Club and our University Programs at www.Boone-Crockett.org

COVER: The cover photo was generously donated by B&C Official Measurer L. Victor Clark. It was taken in the fall of 2021 in Denali National Park. Victor was hiking above the Savage River when he found this beautiful Dall's ram bulking up on leaves in preparation for the coming winter.

Boone and Crockett Fellow Spotlight

2023 Boone and Crockett Fellow Outstanding Achievement Award In Graduate Research

In 2019 the Club established the annual Boone and Crockett Fellow Outstanding Achievement Award to recognize a graduate student whose research advances the Club's mission and informs natural resource management and policy decisions in North America. The award highlights and strengthens the connection between students and the Boone and Crockett Club that supports them.

2023 AWARD WINNER - CALVIN ELLIS

Texas A&M University - Kingsville - M.S. Student
Graduating December 2023

Thesis title: The interaction between mule deer spatial ecology and chronic wasting disease epidemiology.

Calvin grew up in a small town outside of Athens, Georgia. His love for the outdoors helped him decide to earn a bachelor's in wildlife science from the Warnell School of Forestry and Natural Resources at the University of Georgia in 2020. At Texas A&M University-Kingsville his graduate research project focuses on mule deer spatial ecology in the Texas Panhandle, specifically understanding the movement of species susceptible to chronic wasting disease. His team GPS-collared 30 juvenile mule deer in Oldham County, located along the Canadian River, to study movement and dispersal patterns. Calvin will also use a previously collected five-year dataset of mule deer movement to examine site fidelity and fine-scale selection in crop fields in this region.

RESEARCH PRESENTATION

At the Boone and Crockett Club's 2023 Spring meeting, in conjunction with the Wildlife Management Institute's 88th North American Wildlife and Natural Resources Conference in St. Louis, Missouri, four B&C University Programs Fellows presented at the luncheon on Thursday, March 13, 2023.

Calvin was selected as one of the presenters because he is not only well-grounded in wildlife ecology and management but understands the role of hunters in conservation. The Club is proud of Calvin and all the Outstanding Fellow Award winners because they have the passion that one day will lead them to be the 21st century's premier scientists and leaders in conservation.

ABOVE: Calvin presented his research to Boone and Crockett members at the Club's Spring meeting in March, 2023. LEFT: A group photo of the presenting B&C Fellows along with their advisors. LEFT TO RIGHT: B&C Professional Member and Caesar Kleberg Wildlife Research Institute Director, David G. Hewitt; B&C Fellow Hayden Walkush; **B&C Fellow and 2023 Boone and Crockett Fellow Outstanding Achievement Award Winner Calvin Ellis**; B&C Fellow Hunter Parker; B&C Fellow Erin Kavanagh; B&C Ex-Officio Member and Boone and Crockett Club Professor of Wildlife Conservation and Policy at Texas A&M University, Perry S. Barboza.

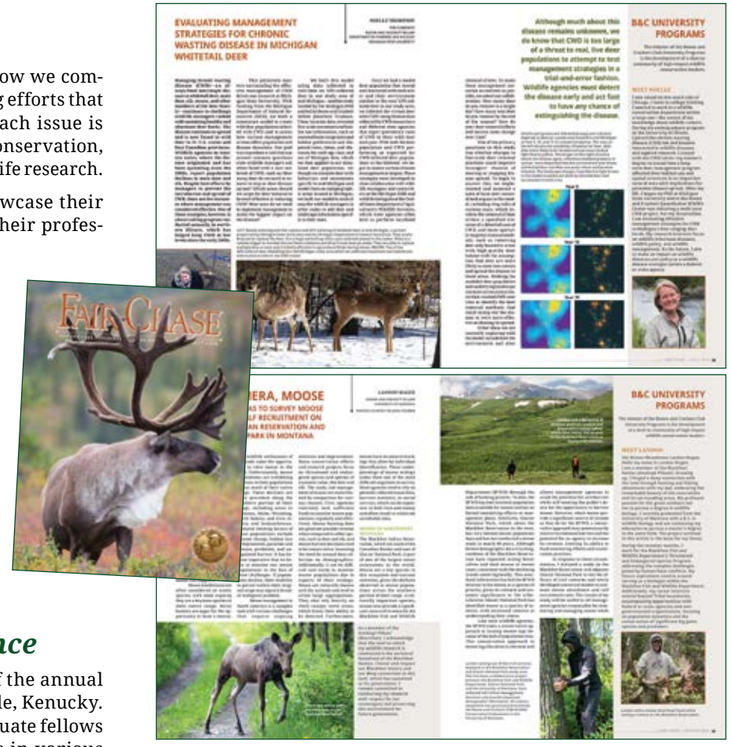
2023 University Programs Outreach

Fair Chase Magazine

Published quarterly, *Fair Chase* magazine is how we communicate with Club members about our ongoing efforts that benefit conservation and hunting heritage. Each issue is packed with timely and insightful articles on conservation, hunting advocacy, conservation policy, and wildlife research.

B&C Fellows are given the opportunity to showcase their research to a broader audience and develop their professional communication skills.

In the Fall 2023 issue Noelle Thompson, PhD Candidate at Michigan State University, shared her research on developing a temporally and spatially explicit agent-based model to project and assess a suite of management strategies for chronic wasting disease in free-ranging deer populations in central Michigan. Landon Magee, a B&C fellow working towards his M.S. in wildlife Biology at the University of Montana, was featured in the Winter 2023 issue. His article explains how he has been using trail cameras to survey moose abundance and calf recruitment on the Blackfeet Indian Reservation and Glacier National Park in Montana.



The Wildlife Society Conference

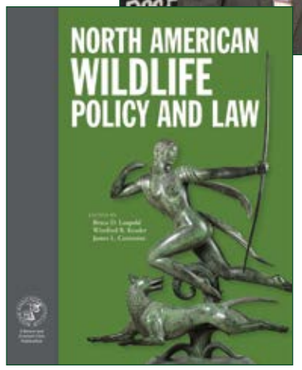
The Boone and Crockett Club was a sponsor of the annual conference of The Wildlife Society in Louisville, Kenucky. The Club was also well-represented by our graduate fellows who offered a couple dozen posters and talks in various symposia. Fellows benefited from professional development opportunities and took advantage of the strong network of regular and professional Club members. These sessions have historically included lessons on leadership, science communication, and diversity, equity, and inclusion in the field of wildlife conservation.

Edward Arnett (left), TWS Chief Executive Officer and B&C professional member stopped by the Club's booth at this year's conference to visit with B&C professional member and former B&C Fellow, Jon McRoberts.

North American Wildlife Policy and Law

A basic understanding of wildlife law and policy is essential knowledge for anyone who aspires to work in wildlife management and other natural resource fields. The Boone and Crockett Club is pleased to have published a book, *North American Wildlife Policy and Law*, for anyone interested in natural resource management, public policy, or environmental law.

The book begins by examining the need for, and history of, wildlife policy and law; wildlife and gun ownership; wildlife law enforcement; constitutional authorities and jurisdictions; how laws and policies are made; statutory law and agency rule-making; relationships of Indigenous peoples to natural resources; and subsistence resource use.



Edited by: Bruce D. Leopold, Winifred B. Kessler, and James L. Cummins. Available in hardcover or eBook. Individual chapter PDFs are also available on B&C's website.

ORDER ONLINE

Demmer Scholars Program

Mr. Mark Rey

During 2023, we were able to offer an experience that was not affected by COVID for the first time since 2019. With the completion of the 15th Demmer Scholars cohort this past summer, we have now put 365 students through the experience. Over 90 of our Demmer Scholars, having finished their academic studies, relocated to Washington, DC to start their careers in full time, professional positions in government or the private sector. Seventy-one are still in the nation's Capital, influencing the development of federal natural resources policy. The student reviews on this page suggest that the 2023 program will add a few more.

"I immensely enjoyed my time at International Programs as an intern, and am excited to continue working for them as a part-time employee into the school year. Everyone working in the office has been extremely kind, welcoming, and helpful, and could see myself working for the Forest Service and this office in the future. I would recommend anyone interested in a similar field take a look at USFS International Programs."

Janelle Grech
Michigan State University

"Working for the Office of Environmental Policy and Compliance in the Department of the Interior was a truly transformative experience. It was an experience that better defined what I want to do with my life, and the paths I want to take."

Ryan Fleetwood
University of Montana

"This summer felt like a fever dream. I went into my DC summer with the expectations I would enjoy it, bur for the most part would wish I was somewhere else. Thankfully, this summer changed my life. My world view was shifted, and I feel as if my time in the world finally found a purpose which I could build from. A huge reason for this was my internship with the legislative affairs team in the Forest Service. We collaborated with various agencies, staff on the Hill, and our regional offices daily, so I was exposed to a plethora of opportunities. The people I worked with and the students in the Demmer Scholars Program really made this summer memorable."

Gabriella Ybarra
Mississippi State University

The students gathered on the roof of the Watergate complex on the 51st anniversary of the famous break in to discuss the lasting impacts on american society.

Michigan State University

Dr. Jerry Belant

HOW DOES YOUR PROGRAM SUPPORT THE BOONE AND CROCKETT MISSION?

Our program is specifically oriented toward the sustainable consumptive use of our wildlife resources.

HOW DOES YOUR PROGRAM PROMOTE HUNTING AS A TOOL FOR CONSERVATION?

Our program places a strong emphasis on the development and evaluation of sustainable harvest management strategies. Recent projects include the role of science in developing Missouri's first legal black bear hunting seasons, evaluating the success of brown bear harvests across the Kodiak Archipelago in meeting State of Alaska's management goals, and evaluating the effects of fall harvests of wolves in Wisconsin. Our program is also developing a course on hunting for conservation for first-time hunters, where students will discuss the role of hunting in conservation, learn about the several levels of government involved in wildlife and natural resource policy, and gain hands-on experience hunting. Participants will earn their hunter safety certification from the Michigan DNR.

HOW DOES YOUR PROGRAM TRAIN FELLOWS FOR POLICY WORK?

Our students work directly with state, tribal, and federal practitioners from project conception to completion to ensure objectives and results have relevance and direct application to management. Our forthcoming graduate specialization in Fisheries and Wildlife Policy will provide students with broad training in wildlife governance, policy, and practice, including direct participation.

TELL US ABOUT A RESEARCH PROJECT CONDUCTED BY A FELLOW THAT WOULD INTEREST OUR MEMBERSHIP:

Hunting and trapping gray wolves is a highly controversial issue across segments of the public. A common argument against wolf harvests is that it will cause pack dissolution and reduce reproductive success. We evaluated the effects of previous fall wolf hunts in Wisconsin and determined that harvests of up to 23% of the population did not influence wolf pack persistence, reproduction, or statewide abundance.

University of Montana

Dr. Joshua Millspaugh

HOW DOES YOUR PROGRAM SUPPORT THE BOONE AND CROCKETT MISSION?

Our program's research, teaching and service activities are closely aligned with the Club's strategic plan and mission. Examples include:

1. Advancing the understanding and acceptance of the North American Model of Wildlife Conservation. Fellow Vaughan Branch (graduate spring 2023) investigated the historical foundations of funding to support state wildlife management including the congressional intent of P-R and D-J. I taught a graduate course titled "Models of Wildlife Conservation" that addressed the N.A. Model and how it compares with other approaches to wildlife management throughout the world. During spring 2023, I also taught "State Conservation Policy" for graduate students at the University of Montana.
2. Advancing the concept of multiple use/sharing and private/public land management. Several on-going research projects promote multiple use/sharing such as: elk response to oil and gas development in North Dakota; new collaborative research with Chevron and Colorado Parks and Wildlife to address mule deer and pronghorn migration and habitat selection in relation to development activities; and on-going research at the Club's ranch which considers how sustainable ranch management techniques relates to wildlife distributions. I also taught a two semester course titled "Private Lands Management and Policy" for graduate students during the 2022 academic year.
3. Improving wildlife health. Our work with CWD in Missouri has addressed how management strategies affect CWD spread.
4. Increasing the Club's emphasis on habitat management for big game and other wildlife. Our Clearwater elk project evaluated the effects of wildfire on elk habitat and distribution; pronghorn research is addressing fine and broad scale habitat needs; elk research in North Dakota is offering guidance to balance public and private habitat management; white-tailed deer research in Missouri is providing guidance on private land habitat management.
5. Advance the role of hunting in society. Our "Wild Sustenance" class offers college students the chance to learn about how to hunt and its importance in society and our recent research which analyzed hunting regulation complexity in all 50 states provided insight into factors which might impact R3 efforts.

HOW DOES YOUR PROGRAM PROMOTE HUNTING AS A TOOL FOR CONSERVATION?

I developed and teach "Wild Sustenance" which is a college course intended for students who have never hunted, but are interested. This semester long course offers field components that teach students how to hunt, but significant time is devoted to hunter ethics, communicating about hunting, laws and policies related to hunting, the North American Model, human and social dimensions of hunting. I was also a Keynote Speaker at National Assembly of Sportsmen's Caucuses, 19th Annual Legislator's Summit, Bozeman, MT, December 2022 and discussed student hunting legislation as a model for working with legislators. This presentation has led to many requests for input from other states interested in pursuing similar legislation

HOW DOES YOUR PROGRAM TRAIN FELLOWS FOR POLICY WORK?

UM students conduct policy related research. For example, Vaughan Branch (graduate in spring 2023) evaluated state and federal wildlife management authority. We also facilitate training sessions for all University Program students such as the "Policy Bootcamp" provided by Dr. Greg Schildwachter and Charlie Booher at the 2022 conference of The Wildlife Society.

TELL US ABOUT A RESEARCH PROJECT CONDUCTED BY A FELLOW THAT WOULD INTEREST OUR MEMBERSHIP:

Fellows Daniel Bird (Ph.D. student) and Landon Magee (M.S. student) are working with the Blackfeet Tribe to address issues of critical management importance. Daniel's research is focused on elk migration on the Blackfeet Reservation and Glacier National Park with consideration of fencing and how it might influence elk movements. Landon's research will allow the Tribe to estimate moose abundance and better understand factors affecting calf survival. Results from Landon's research will allow for sustainable harvest strategies and ensure hunter opportunities are not lost.

Texas A&M University

Dr. Perry Barboza

HOW DOES YOUR PROGRAM SUPPORT THE BOONE AND CROCKETT MISSION?

We work with five members of the Boone and Crockett Club and with our A&M donors. Club members receive updates twice a year on program activities. We also hold in person meetings with members each spring on campus to present student projects.

We research the responses of large mammals to environmental changes that affect the number and distribution of animals. Our studies of caribou concern changing land use in the Arctic coastal plain for energy and mineral development. Our studies of moose concern natural changes in disease risk and heat stress associated with forest succession and warming. Our studies in policy concern attitudes to contribute, money time and land for conservation actions.

HOW DOES YOUR PROGRAM PROMOTE HUNTING AS A TOOL FOR CONSERVATION?

Caribou and moose populations are hunted for recreation and subsistence in Alaska. Our work is supported by the Alaska Department of Fish and Game because the information is valuable for managing harvest. I teach an introductory course in wildlife conservation and policy for undergraduates. We discuss hunter harvest and the use of hunting to manage both ungulates and carnivores. Students that prefer non-consumptive uses are introduced to hunting as a tool for managing the attributes of both the game animal and its habitat when populations approach carrying capacity. Students that prefer consumptive use are introduced to methods for managing use by economic incentive and permitting when populations are near the minimum viable limit. All students are exposed to the conundrums of removing overabundant species that are invasive to restore populations of native species and habitat function.

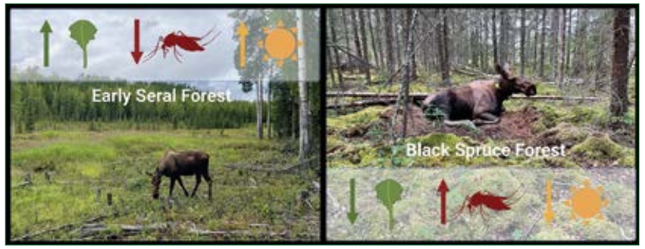
HOW DOES YOUR PROGRAM TRAIN FELLOWS FOR POLICY WORK?

I teach an introductory course in wildlife conservation and policy for undergraduates. The course partially fulfills the requirement for policy in the certification for Associate Wildlife Biologist in The Wildlife Society. We discuss public trust doctrine, property rights, invasive species, endangered species, wildlife ownership, water allocation and air quality. The course is writing intensive. We prepare students to communicate with policy makers by developing a concise argument with evidence. Students prepare two briefs: one on state legislation and another on federal legislation.

I also teach a capstone course for master's students at the Bush School of Government. Students enter the capstone with undergraduate degrees in physical science (chemistry, physics), applied science (environment, ecology), social science (economics, geography, political science, government, sociology, marketing & communication, business management) and humanities (English, philosophy). In the last five years, we have graduated 60 students from projects supported by personnel from Texas Parks and Wildlife Department and the Natural Resources Conservation Service. We have studied conservation funding, management of invasive species, and the willingness of private landowners to recover prairies for pollinators. Capstone students have graduated to positions with the Western Governors Association, Bureau of Land Management, Texas Sunset Commission, Texas Department of Transportation, and a wide variety of positions in local government and the environmental sector.

TELL US ABOUT A RESEARCH PROJECT CONDUCTED BY A FELLOW THAT WOULD INTEREST OUR MEMBERSHIP:

Bridgett Benedict defended her doctoral thesis in March 2023. She studied the effects of temperature and biting flies on moose on the Kenai Peninsula, Alaska. Flies open wounds on the legs of moose, which become infected with parasitic worms that can invade other tissues and eventually cause the death of the moose. Flies are most abundant in shady areas where moose cool down to ruminate after feeding. Moose mostly forage in open areas where their body temperature rises with metabolic activity and with radiant heat from the sun. Moose trade injury and potential infection from flies for the benefit of cooling in black spruce whereas moose feeding in open habitats trade heat load for nutrition. Compounding trade-offs decrease the value of habitat for moose, which explains wide regional variation in moose productivity and the ability of the population to support hunter harvest.



Conservation Capstone 2023: Back row Left to Right – Aiman Mansoor, Hailey Feik, Sydney Fox, Hunter Parker, Garion Finkel, Jaylin Morales, Erin Kavanagh. Front row Left to Right – William Willingham, Yvette Mensah, Troy Medeiros, Sangeen Khan, Javier Miguel Segura

Texas A&M University - Kingsville

HOW DOES YOUR PROGRAM SUPPORT THE BOONE AND CROCKETT MISSION?

Boone and Crockett fellows at TAMUK gain experience in conducting applied research and working on private lands. We strive to have the Fellows understand how their research can impact policy decisions. With the Club's help, our fellows are provided training on how to use their knowledge, research findings, and professional contacts to influence conservation policy.

HOW DOES YOUR PROGRAM PROMOTE HUNTING AS A TOOL FOR CONSERVATION?

Our fellows receive training in modern wildlife management and the role of hunting in funding conservation, providing data for wildlife managers, and serving as a tool to shape wildlife populations. Our fellows are provided an opportunity to hunt. We provide a carefully mentored hunting experience that covers all the requisite skills, from finding game, stalking to obtain a clear, humane shot, and then processing and cooking the animals harvested. Calvin Ellis, our current B&C Fellow, is especially interested in R3 activities and has volunteered as a mentor at events to recruit youth and young professionals into hunting.

HOW DOES YOUR PROGRAM TRAIN FELLOWS FOR POLICY WORK?

Our fellows attend policy training workshops, such as that held in Spokane after the 2022 meeting of The Wildlife Society. Our program also brought Dr. Greg Schildwachter and Charlie Booher to Kingsville for a 3-day policy workshop that was attended by students and faculty from TAMUK and Sul Ross State University. Finally, our fellows conducted applied research that is linked to the needs of private, state, and federal managers. Results of this research are not only published in dissertations and peer-reviewed publications, but also in lay-audience outlets where the information will be accessible to policy makers and their constituents.

TELL US ABOUT A RESEARCH PROJECT CONDUCTED BY A FELLOW THAT WOULD INTEREST OUR MEMBERSHIP:

TAMUK is initiating a project to determine trends in mountain lion populations in Texas. The project will also determine common prey of mountain lions in the region. This project has important policy implications because the management status of mountain lions in Texas was recently challenged through a petition submitted to Texas Parks and Wildlife Department. There is too little known about mountain lion populations in Texas for the agency to make an informed decision on how to respond to the petition. TAMUK's new B&C Fellow will study mountain lions in the western portion of South Texas, thereby providing information to help the agency and landowners manage this iconic species.

University of Wisconsin - Stevens Point

HOW DOES YOUR PROGRAM SUPPORT THE BOONE AND CROCKETT MISSION?

Our program and the associated Doug Stephens Boone and Crockett endowment support 1-2 undergraduate research fellows/year. Fellowships are competitive and not associated with specific faculty. Instead, faculty (from any discipline within the college) may select a student and co-apply to compete for the fellowship annually. To apply, the undergraduate applicant must be paired with a faculty member who has additional extramural funding focused on a game species. Traditionally, this has been funding supporting a wildlife graduate student. The undergraduate fellow then develops their own research question, study design, and objectives. The project is designed to also be of value to the graduate student's project.

HOW DOES YOUR PROGRAM PROMOTE HUNTING AS A TOOL FOR CONSERVATION?

Faculty in our program often partner with conservation organizations (e.g., Ducks Unlimited) to offer learn-to-hunt opportunities. Additionally, we have offered firearm safety trainings through our student chapter of The Wildlife Society. Finally, two of the instructors in our college are also instructors for Conservation Leaders for Tomorrow (CLfT).

HOW DOES YOUR PROGRAM TRAIN FELLOWS FOR POLICY WORK?

In addition to special webinars and trainings that the Club offers for fellows, we provide policy coverage in several of our required courses: People, Resources, and the Environment (100-level), Human Dimensions of Wildlife (400-level), and Wildlife Ecology and Conservation Biology (400-level). Students have the option to take Natural Resources Communication and Public Relations (300-level).

TELL US ABOUT A RESEARCH PROJECT CONDUCTED BY A FELLOW THAT WOULD INTEREST OUR MEMBERSHIP:

Ava Cross-Weisbeck is studying the sound ecology of ruffed grouse (*Bonasa umbellus*). Ruffed grouse are an important ecological, cultural, and economic game species throughout North America, especially in Wisconsin and the upper Midwest. Ruffed grouse often are associated with young forests and relatively dense understory. As such, they are remarkably compatible with rotational forest and timber management practices. Male ruffed grouse have a stunning breeding display in which they "drum" to attract mates and fend off competing males. This drumming display is typically done on a fallen log. The drum is characteristically low in frequency. The low frequency sounds travel further in densely covered habitats. Ava's preliminary results suggest that ruffed grouse are choosing drumming locations that allow their display to be heard over greater distances than from random locations within the woods. If ruffed grouse select breeding habitats based on acoustic properties, then using site-specific acoustics information could lead to more effective survey designs for monitoring efforts as well as more effective management techniques.

Clemson University

HOW DOES YOUR PROGRAM SUPPORT THE BOONE AND CROCKETT MISSION?

Clemson's B&C program prides itself on meeting the needs of state and federal agencies and teaching the core tenets of the North American model. We do cutting-edge ecological research on game species, particularly as it relates to big game on the extensive private lands that occur across the southeastern US. We fundamentally believe that science is not done when publishing in a peer-reviewed journal, but requires dedicated efforts to make that science translatable and disseminated to managers and the public. We also explore next frontiers, such as the integration of tribal lands in discussions regarding the landscape-scale management of big game.

HOW DOES YOUR PROGRAM PROMOTE HUNTING AS A TOOL FOR CONSERVATION?

This past year we worked with a prestigious group of scientists from around the world on a peer-reviewed publication that for the first time comprehensively outlined the reasons why humans must kill animals. This issue is particularly relevant nationally and internationally, where there is great pressure to restrict hunting and more broadly lethal control of wildlife by animal rights groups.

HOW DOES YOUR PROGRAM TRAIN FELLOWS FOR POLICY WORK?

I teach the only course of its kind in the country on how to engage with Indigenous Communities on natural resource conservation. This course helps build capacity for graduates to ethically and effectively work with Indigenous Communities to achieve conservation outcomes.

TELL US ABOUT A RESEARCH PROJECT CONDUCTED BY A FELLOW THAT WOULD INTEREST OUR MEMBERSHIP:

We are co-producing science with the Eastern Band of the Cherokee Indians (EBCI) on how National Park Service infrastructure and management strategies impact elk and deer on sovereign EBCI lands. The fellow, Brianna Pruitt, is an enrolled member of the EBCI, fulfilling a goal of our program to mentor the next generation of influential conservation leaders within underrepresented communities.

Oregon State University

HOW DOES YOUR PROGRAM SUPPORT THE BOONE AND CROCKETT MISSION?

Our program supports the B&C mission by focusing on policies impacting active forest management, which directly supports the conservation and management of wildlife habitat. In addition, through teaching, we discuss policies impacting wise resource use across many natural resources, including wildlife and game species. Faculty research focuses on aspects of maintaining active management and working forests across the West, including impacts of state-level policies and regulations on private lands and federal policies such as the ESA.

HOW DOES YOUR PROGRAM PROMOTE HUNTING AS A TOOL FOR CONSERVATION?

Our program promotes the conservation of natural resources through several management strategies, including hunting. All of our students learn about these programs through our policy curriculum.

HOW DOES YOUR PROGRAM TRAIN FELLOWS FOR POLICY WORK?

Our program does not support a standard fellows track like other B&C University Programs. However, beginning next year, we will be working with and partially supporting a student in fish and wildlife investigating the presence of a forest-dwelling species (red tree vole) that is a candidate species under the ESA.

In addition, my graduate students become proficient in myriad aspects of policy. First, many of them are teaching assistants for my forest policy undergraduate class, where they learn policy formulation and processes in addition to key state and federal policies impacting wise resource use. Many of them also do research in policy analysis methods or do applied research with policy implications.

TELL US ABOUT A RESEARCH PROJECT CONDUCTED BY A FELLOW THAT WOULD INTEREST OUR MEMBERSHIP:

I believe the upcoming red tree vole project will be of great interest. OSU has been at the forefront of documenting the extent of red tree vole use in managed forests, a critical piece of science needed by the USFWS to determine the listing status of this species. This upcoming work will help further that project in conjunction with federal, state, and pri-

2023 Boone and Crockett Fellows

Bridgett Benedict
PH.D. STUDENT - TEXAS A&M
Wildlife and Fisheries Sciences. Physiological and behavioral costs and consequences of fly exposure for moose

Daniel Bird
PH.D. STUDENT - U OF MONTANA
Elk migration on the Blackfoot Indian Reservation

Hailey Boone
PH.D. STUDENT - MICHIGAN STATE
Mammalian community response to introduced gray wolves

Vaughan Branch
M.S. STUDENT - U OF MONTANA
State and federal management authority

Amelia Christian
PH.D. STUDENT - TEXAS A&M
Rangelands, Wildlife and Fisheries Management. Physiological constraints on mass gain of grizzly bears in summer

Madison Crane
M.S. STUDENT - U OF MONTANA
Pronghorn habitat management in Montana

Ava Cross-Weisbeck
B.S. STUDENT -
U OF WISCONSIN-STEVENS POINT
An Investigation of Ruffed Grouse Drumming Log Site Selection

Shelby Echols
M.S. STUDENT - TEXAS A&M
Rangelands, Wildlife and Fisheries Management. Rewilding ungulates

Calvin Ellis
M.S. STUDENT - TEXAS A&M - KINGSVILLE
Interaction among mule deer spatial ecology and CWD management

Joseph Goergen
M.S. STUDENT - MICHIGAN STATE
Role of hunting in community-based natural resource management, Namibia

Jessie Golding
POSTDOCTORAL FELLOW - U OF MONTANA
Multi-species monitoring approaches

Christopher Hansen
POSTDOCTORAL FELLOW - U OF MONTANA
Elk dynamics in relation to carnivore management in Montana

Jordan Heiman
M.S. STUDENT - U OF MONTANA
Power of variable effort wildlife surveys

Holli Holmes
M.S. STUDENT - U OF MONTANA
Harlequin duck populations in Glacier National Park

Andrea Huriega
M.S. STUDENT - TEXAS A&M
Ecology and Conservation Biology. Seasonal protein dynamics of grizzly bears

Erin Kavanagh
MPSAA STUDENT - TEXAS A&M
Improving Future Wildlife Conservation Programs by Understanding Emerging Stakeholder Values

Cody Lane
M.S. STUDENT - U OF MONTANA
Wildlife response following wildfire in mixed conifer-aspen forests in Wyoming

Dan Li
PH.D. STUDENT - MICHIGAN STATE
Human-wolf conflicts in the western Great Lakes region

Landon Magee
M.S. STUDENT - U OF MONTANA
Moose abundance and calf survival on the Blackfeet Indian Reservation

Molly McDevitt
PH.D. STUDENT - U OF MONTANA
Pronghorn survival and movements in Montana and South Dakota

Dan Morina
PH.D. STUDENT - U OF MONTANA
Elk response to oil development in North Dakota

Matt Nelson
PH.D. STUDENT - MICHIGAN STATE
Wolf population estimation in Michigan

Waldemar Ortiz-Calo
M.S. STUDENT - U OF MONTANA
White-tailed deer movements and habitat selection

Jamshid Parchizadeh
PH.D. STUDENT - MICHIGAN STATE
Kodiak brown bear harvest management

Hunter Parker
MPSAA STUDENT STUDENT - TEXAS A&M
Improving Future Wildlife Conservation Programs by understanding emerging stakeholder values

Brianna Pruitt
M.S. STUDENT - CLEMSON
Elk connectivity and Cherokee Lands

Marco Salvo
M.S. STUDENT - U OF MONTANA
Avian radar applications at US Air Force Bases in South Dakota and Nebraska

Amber Smith
B.S. STUDENT -
U OF WISCONSIN-STEVENS POINT
Mercury Exposure in Migrating and Breeding Wood Ducks in Wisconsin

Adia Sovie
POSTDOCTORAL FELLOW - MICHIGAN STATE
Gray wolf introduction to Isle Royale National Park

Hannah Specht
POSTDOCTORAL FELLOW - U OF MONTANA
Survey approaches to assess status of indicator species

Andi Stewart
PH.D. STUDENT - U OF MONTANA
Elk dynamics in relation to carnivore management in Montana

Sean Sultaire
POSTDOCTORAL FELLOW - U OF MONTANA
Mule deer dynamics in Nevada

Merijn van den Bosch
PH.D. STUDENT - MICHIGAN STATE
Spatial ecology of wolves in the eastern United States

Kyle Watter
M.S. STUDENT - TEXAS A&M
Rangelands, Wildlife and Fisheries Management. Spatial evaluation of pronghorn management

Nathaniel Wehr
PH.D. STUDENT - MICHIGAN STATE
Large mammal predator-prey dynamics in northeastern Minnesota

Chloe Wright
POSTDOCTORAL FELLOW - U OF MONTANA
Elk and deer survival and habitat relationships

Ale Zubiria Perez
PH.D. STUDENT - MICHIGAN STATE
Western Great Lakes gray wolf survival and cause-specific mortality

A complete listing of current and former fellows as well as the video can be found online.

2023 University Programs Accomplishments

SELECTED EXAMPLES OF RESEARCH OUTPUT

Allen, B. L., C. Bobier, S. Dawnson, P. Fleming, J. Hampton, **D. S. Jachowski**, G. I. H. Kerlye, K. Marneweick, L. Minnie, M. Muthersbaugh, J. O'Riain, D. Parker, G. Proulx, M. Somers, and K. Titus. 2023. Why humans kill animals and why we cannot avoid it. Science of the Total Environment 896:165283.

Benedict, B. M., **P. S. Barboza**, J. A. Crouse, K. R. Groch, M. R. Kulpa, D. P. Thompson, G. G. Verocai, and D. J. Wiener. 2023. Sores of boreal moose reveal a previously unknown genetic lineage of parasitic nematode within the genus Onchocerca. PLOS One 18(1): e0278886 https://doi.org/10.1371/journal.pone.0278886.

Benedict, B. M., D. P. Thompson, J. A. Crouse, P. T. Shults, G. L. Hamer, and **P. S. Barboza**. Salivary cortisol response to flies by moose calves. Alces 59:1-13

Branch, J. V., J. Karlen, J. Organ, C. Bishop, M. Mitchell, R. Regan, and **J. J. Millspaugh**. 2022. Echoes of 1937: Recovering America's Wildlife Act would bring wildlife conservation funding full circle. Conservation Letters 2022;15:e12890.

Foley, A. M., R. W. DeYoung, and **D. G. Hewitt**. 2023. Error in demographic ratios from aerial surveys of white-tailed deer in semi-arid rangelands. Journal of Wildlife Management 87:e22413. https://doi.org/10.1002/jwmg.22413.

Goldstein, B., **M. S. Crandall**, and E. C. Kelly. 2023. "The cost of doing business": Private rights, public resources, and the resulting diversity of state-level forestry policies in the U.S. Land Use Policy 132, 106792. https://doi.org/10.1016/j.landusepol.2023.106792

Heffelfinger, L. J., **D. G. Hewitt,** R. W. DeYoung, T. E. Fulbright, L. A. Harveson, W. C Conway, and S. S. Gray. 2023. Shifting agriculture and a depleting aquifer: Implications of row-crop farming on mule deer population performance. Animal Production Science.

Rankins, S. T., R. W. DeYoung , D. B. Wester, A. M. Foley, J. A. Ortega-S, T. E. Fulbright, **D. G. Hewitt**, L. R. Schofield, and T. A. Campbell. 2023. Ecogeographic variation in physical traits of white-tailed deer. Rangeland Ecology and Management 87:185-197.

Reilley, C., **M. S. Crandall**, J. D. Kline, J. B. Kim, and J. deDiego. 2023. The Influence of Socioeconomic Factors on Human Wildfire Ignitions in the Pacific Northwest, USA. Fire 6(8): 300-. https://doi.org/10.3390/fire6080300

Saldo, E. R., A. J. Jensen, M. S. Muthersbaugh, J. W. Butfiloski, J. Cantrell, J. C. Kilgo, C. Ruth, G. K. Yarrow, and **D. S. Jachowski.** 2023. Spatiotemporal overlap with invasive wild pigs (*Sus scrofa*) varies by species and season. Ecosphere 14:e4500.

Schooler, S. L., N. J. Svoboda, C. N. Kroll, S. P. Finnegan, and **J. L. Belant**. 2023. Multi-objective optimization for timber harvest management incorporating wildlife habitat goals. Landscape Ecology 11:e01766.

Siemer, W. F., T. B. Lauber, R. C. Stedman, J. E. Hurst, A. K. Fuller, C. C. Sun, N. A. Hollingshead, **J. L. Belant**, and K. F. Kellner III. 2023. Perception and trust influence acceptance for black bears more than bear density or conflicts. Frontiers in Conservation Science 4:1041393.

Snobl, L. A., K. M. Proffitt, and **J. J. Millspaugh**. 2022. Wildfire extends the shelf life of elk nutritional resources regardless of fire severity. Ecosphere 13:e4178.

Sultaire, S. M., Y. Kawai-Harada, A. Kimmel, E. M. Greeson, P. J. Jackson, C. H. Contag, C. W. Lackey, J. P. Beckmann, **J. J. Millspaugh**, and R. A. Montgomery. 2023. Black bear density and habitat use variation at the Sierra Nevada-Great Basin Desert transition. Journal of Wildlife Management 87:e22358.

Summers, J., C. Yahnke, J. P. White, H. Kaarakka, **J. Riddle**, T. Van Deelen, and S. Hygnstrom. Influence of Underground Mining with Explosives on Bats. Conservation Science and Practice 5(1), e12849

van den Bosch, M., K. F. Kellner, D. E. Beyer, Jr., J. D. Erb, D. M. MacFarland, D. C. Norton, J. L. Price Tack, B. J. Roell, and **J. L. Belant**. 2023. Gray wolf range in the western Great Lakes region under forecasted land use and climate change. Ecosphere 14:e4630.

Yu, S. W., K. E. Kunkel, D. L. Hagan and **D. S. Jachowski**. 2023. Evaluating riparian plant communities after restoration of plains bison in the Northern Great Plains of Montana. Rangeland Ecology and Management 90:186-194.

NOTE: Bolded names are B&C University Program Leaders. For a complete list of publications contact Karlie Slayer - Karlie@boone-crockett.org

UM student conducts fieldwork at the TRM Ranch

Examples of 2023 External Funding Sources

TOTAL EXTERNAL FUNDING:

OVER $21,000,000

ALASKA DEPARTMENT OF FISH AND GAME
Texas A&M University - Assessment of health and land use of the Teshekpuk Lake Caribou Herd

BLACKFEET INDIAN RESERVATION AND NATIONAL PARK SERVICE
University of Montana - Elk Migration and Moose Demographics on the Blackfeet Indian Reservation

GREAT LAKES FISH AND WILDLIFE RESTORATION ACT
Michigan State University - Quantifying abundance, distributional limits, and conflicts with gray wolves in the Great Lakes region

KIAWAH CONSERVANCY AND SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES
Clemson University - Island bobcat persistence in the face of rapid human development

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Michigan State University - Assessing potential for non-traditional harvests of white-tailed deer in Michigan

MISSOURI DEPARTMENT OF CONSERVATION
Michigan State University - Assessment of abundance and density of Missouri black bears to improve Missouri's black bear population model

University of Montana - Survival, recruitment and movement ecology of white-tailed deer in Missouri

MONTANA FISH, WILDLIFE AND PARKS AND THE ROCKY MOUNTAIN ELK FOUNDATION
University of Montana - Elk dynamics in relation to carnivore management

NATIONAL PARK SERVICE
Michigan State University - Mammalian community responses to wolf introduction

NATIONAL PARK SERVICE FOUNDATION
Texas A&M University - Kingsville - Impact of climate change on desert mammal and herptile communities in 5 National Park Service units

NATIONAL SCIENCE FOUNDATION
University of Wisconsin - Stevens Point - National Ecological Observatory Network (NEON) Avian Surveys

NATURAL RESOURCES CONSERVATION SERVICE
Texas A&M University - Organizational responses to addressing invasive species in the Great Plains

NORTH DAKOTA INDUSTRIAL COMMISSION AND THE NORTH DAKOTA GAME AND FISH DEPARTMENT
University of Montana - Elk response to oil and gas development in North Dakota)

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION
Texas A&M University - Kingsville Oklahoma mule deer population evaluation

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES
Clemson University - Doe and fawn movement and survival in the piedmont of South Carolina

US DEPARTMENT OF AGRICULTURE
Oregon State University - Keeping forests working: Understanding the context of, barriers to, and impacts of active forest management in the fire-adapted West.

US DEPARTMENT OF DEFENSE
University of Montana - Avian radar applications in South Dakota and Nebraska to reduce Bird Airstrike Hazard [BASH]

US FISH AND WILDLIFE SERVICE
Texas A&M University - Kingsville - Assessing and mitigating potential ecological impacts to large mammals from border barrier system construction and installation in South Texas, USA

US FOREST SERVICE JOINT VENTURE
Oregon State University - Understanding Linkages between Forest Management Infrastructure, Rural Communities, and Wildfire Risk Reduction in the Northwest Forest Plan Area

US GEOLOGICAL SURVEY, ALASKA SCIENCE CENTER
Texas A&M University - Forage quality for the Porcupine Caribou Herd

WYOMING DEPARTMENT OF TRANSPORTATION AND WYOMING GAME AND FISH
University of Montana - Wildlife use of highways crossing structures in Wyoming

NOTE: For a complete list of funding sources contact Karlie Slayer - Karlie @boone-crockett.org

For five months in 2022, a trail camera posted on a fence next to a riparian area caught the intimate travels of both predator and prey. Grizzlies, lions, elk, bobcats, mule deer—everything took a turn walking along, scooting under, hopping over, and plowing through this fence near Dupuyer Creek that runs along Montana's Rocky Mountain Front. These photos were part of Dr. Chris Hansen's dissertation research. Chris is a B&C Fellow at the University of Montana.

WATCH THE FENCELINE VIDEO