Continuing to Invest in MULE DEER RESEARCH

2005 Recipients of the William I. Spencer Conservation Grants

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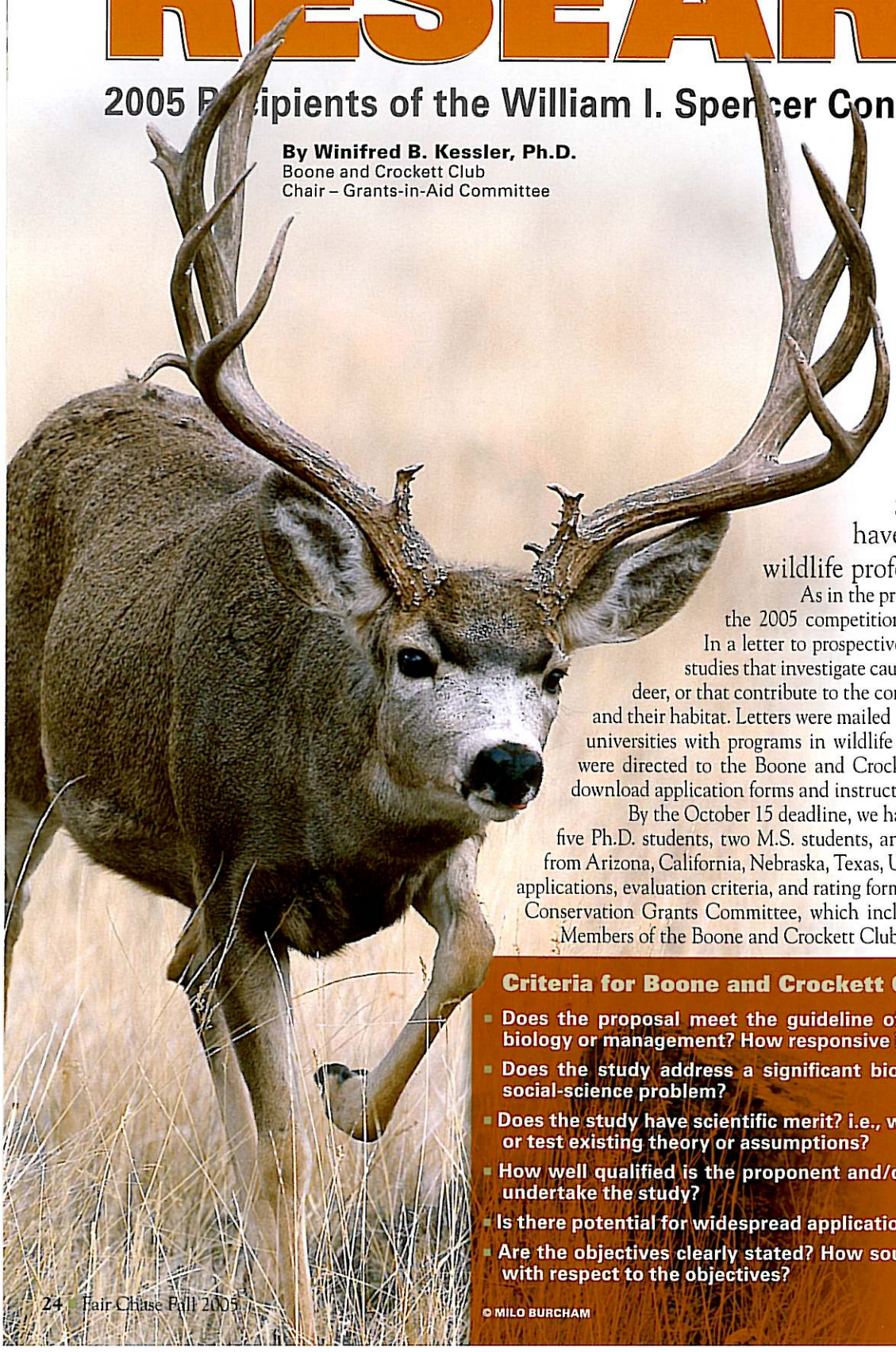


Supporting the development of new knowledge is an important element of the Boone and Crockett Club's mission. The William I. Spencer Conservation Grants Program contributes to this goal by assisting research projects and graduate students who have chosen careers in the wildlife profession.

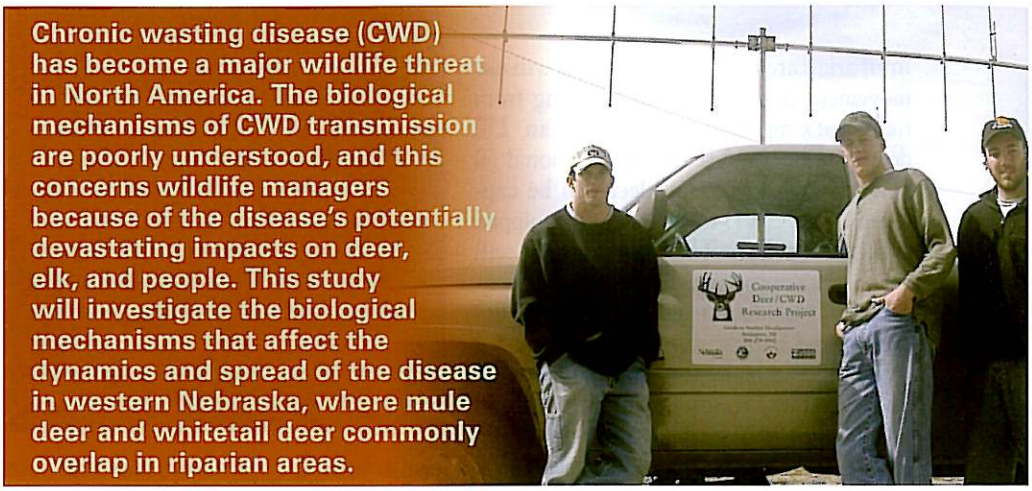
As in the previous year, the Club decided to focus the 2005 competition on the conservation of mule deer. In a letter to prospective applicants, we invited proposals for studies that investigate causes of the range-wide declines in mule deer, or that contribute to the conservation or restoration of mule deer and their habitat. Letters were mailed in July 2004 to all U.S. and Canadian universities with programs in wildlife biology or management. Applicants were directed to the Boone and Crockett Club website, where they could download application forms and instructions.

By the October 15 deadline, we had received eight proposals, including five Ph.D. students, two M.S. students, and one non-student. Applicants were from Arizona, California, Nebraska, Texas, Utah/Montana, and Washington. The applications, evaluation criteria, and rating forms were distributed to members of the Conservation Grants Committee, which included both Professional and Regular Members of the Boone and Crockett Club.

Criteria for Boone and Crockett Conservation Grants:

- Does the proposal meet the guideline of being relevant to big-game biology or management? How responsive is it to this year's theme?
- Does the study address a significant biological, ecological, policy, or social-science problem?
- Does the study have scientific merit? i.e., will it produce new knowledge or test existing theory or assumptions?
- How well qualified is the proponent and/or the academic supervisor to undertake the study?
- Is there potential for widespread application of findings?
- Are the objectives clearly stated? How sound is the proposed approach with respect to the objectives?

As in the past few years, the selection process was difficult because we had only $25,000 for distribution. This amount was enough to fulfill the funding requests of the top three applicants. Considering the high quality of projects and investigators, we can be confident of an excellent return on investment now and for many years to come.



Chronic wasting disease (CWD) has become a major wildlife threat in North America. The biological mechanisms of CWD transmission are poorly understood, and this concerns wildlife managers because of the disease's potentially devastating impacts on deer, elk, and people. This study will investigate the biological mechanisms that affect the dynamics and spread of the disease in western Nebraska, where mule deer and whitetail deer commonly overlap in riparian areas.

Conditions Affecting Limiting Factors for Mule Deer in Southwestern Montana

Todd Atwood, recipient of a 2004 grant, was also selected for 2005 funding to support his work on *Conditions Affecting Limiting Factors for Mule Deer in Southwestern Montana*. Atwood is a Ph.D. student working under the direction of Dr. Eric Gese in the Department of Forestry, Wildlife, and Range Sciences at Utah State University. Dr. Kyran Kunkel, in the Department of Ecology at Montana State University, is a collaborator on the project. Atwood received his B.S. and M.S. in Wildlife Ecology from Purdue University. As an undergraduate, Atwood studied sex- and age-specific patterns of mineral-lick use and preference in whitetail deer. His master's research focused on the spatial and behavioral ecology of coyotes relative to anthropogenic activity. Current research interests include understanding the complex relationships between physiological stress, anti-predator behavior, and intra- and inter-specific competition.

Atwood is using his B&C funding to investigate the behavioral and physiological responses of mule deer and coyotes to the re-colonization of wolves. Wolf populations are increasing and expanding into areas of Montana, Wyoming, and Idaho where they have long been absent. This study seeks to identify the factors that limit mule deer population growth in the northern Madison ranges of southwestern Montana. It will examine how wolves affect mule deer mortality rates in multi-prey, multi-predator landscapes, and factors that influence these relationships. Specific objectives are to determine: 1) causes, extent, and timing of mortality in adult female and fawn mule deer and coyotes; 2) factors (including habitat) affecting the relative vulnerability of adult female and fawn mule deer to wolves, cougars, bears, and coyotes; 3) the effect of predators on mule deer population trends; and 4) the degree to which predation is additive or compensatory. The study uses both radio-collared and hunter-killed deer and other methods to gather a variety of information, including deer nutritional condition, pregnancy rates, recruitment and survival of mule deer, predator responses, and estimations of wolf, coyote, and mule deer populations. Study results should be applicable to other mule deer populations, and especially those in multi-prey and multi-predator systems. With this information, managers will be better able to predict mule deer population trends and develop appropriate management strategies.

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Transmission of Chronic Wasting Disease in Riparian Areas

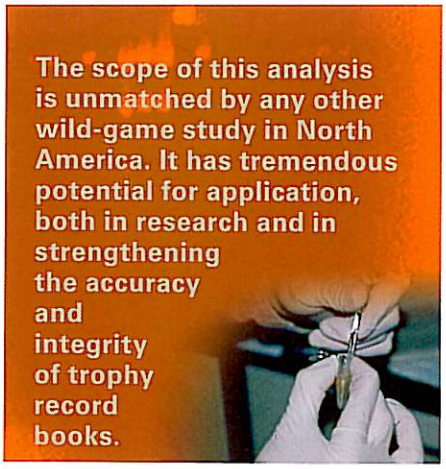
Charles Frost received a grant to support his work on *Transmission of Chronic Wasting Disease in Riparian Areas*. Frost is working on his M.S. degree at the University of Nebraska–Lincoln under the direction of Scott Hygnstrom, Professor and Extension Wildlife Damage Specialist, and Kurt VerCauteren, CWD Project Leader. The project is a partnership of the university, USDA National Wildlife Research Center, USGS Biological Resources Division, the Nebraska Game and Parks Commission, Berryman Institute, Cabela's, and others. While employed with USDA Wildlife Services, Frost provided research assistance on projects involving black bear, Mexican grat wolf, mountain lion, deer, skunk, cattle, and other species. He also has experience as a preschool teacher. Frost received his B.S. degree in agricultural economics from the University of Nebraska-Lincoln, with minors in fisheries and wildlife biology and history.

Chronic wasting disease (CWD) has become a major wildlife threat in North America. This fatal, naturally occurring and transmissible form of spongiform encephalopathy affects deer as well as elk. The biological mechanisms of CWD transmission are poorly understood, and this concerns wildlife managers because of the disease's potentially devastating impacts on deer, elk, and people. This study will investigate the biological mechanisms that affect the dynamics and spread of the disease in western Nebraska, where mule deer and whitetail deer commonly overlap in riparian areas. Objectives of the study are to: 1) create spatial models that describe the potential for and rates of disease transmission in the Missouri River Valley; 2) identify deer movement patterns and mortality rates in the North Platte River Valley; 3) estimate the densities of mule deer and whitetail deer; 4) evaluate the prevalence of physical contact within and among mule deer and whitetail deer; 5) evaluate predictions of the spatial models in western Nebraska; and, 6) develop a simulation model to describe transmission of CWD in mule deer and whitetail deer

in riparian areas. The investigators will use movement and range data resulting from radio-tracking studies of more than 250 deer in the past 15 years. An additional 60 mule deer and whitetail deer will be captured near a CWD-focus area and equipped with radio collars. This large data set will support examination of deer movement patterns, population dynamics, social behavior, and habitat selection as a basis for modeling the biological mechanisms that underlie CWD transmission. The findings will provide managers with important information for predicting and managing the spread of CWD and other diseases.

Defining Practical Units of Conservation and Record Keeping Through Analysis of Genetic Differentiation in Mule and Black-tailed Deer

James Heffelfinger, a grant recipient in 2004, used those funds to launch his work on *Defining Practical Units of Conservation and Record Keeping Through Analysis of Genetic Differentiation in Mule and Black-tailed Deer.* Heffelfinger effectively leveraged those funds to develop support from a variety of sources, and was awarded a 2005 B&C conservation grant to bring the project to conclusion. Since 1992, Heffelfinger has been a regional game specialist with the Arizona Game and Fish Department. He held earlier jobs with the Bureau of Land Management in New Mexico, Mississippi State University, and the Horlock Land and Cattle Company in Texas, where he managed wildlife operations on the Rio Paisano Ranch. His education includes a B.S. in wildlife and biology from the University of Wisconsin, and M.S. in wildlife and range management from Texas A&M University–Kingsville. He holds an adjunct faculty position at the University of Arizona.



Throughout their geographic range, mule and blacktail deer exhibit a range of variation in body size, coat color, antler shape, behavior, and many other characteristics. Such differences caused early naturalists to differentiate many species and subspecies based on slight differences of a few specimens, resulting in a confused and unsubstantiated pattern of geographic differentiation. Recent advances in DNA techniques allow the kinds of analyses that are needed to determine deer distribution patterns in a biologically meaningful way. Using DNA analysis techniques, this study is evaluating genetic differentiation throughout the range of mule and blacktail deer. The objectives are: 1) Provide a solid, defensible basis for trophy record-keeping categories based on a high-resolution genetic analysis. 2) Revise subspecific taxonomy for mule and blacktail deer in North America and restructure into units of conservation based on evolutionary history, current genetic differences, and restriction to gene flow. 3) Assess populations for evidence of negative genetic effects of isolation and range fragmentation (e.g., inbreeding, genetic drift). 4) Protect lawful hunting of mule deer throughout their range by acquiring the knowledge needed to guard against unjust legal actions based on nebulous subspecies designations. 5) Use findings about genetic variation to determine the probability that a mule or blacktail deer of interest was harvested from a particular location. 6) Provide a model of how intraspecific differences should be evaluated for animals with a large geographic range. The study draws from a collection of more than 2,200 tissue samples taken from deer harvested during normal hunting seasons.

The scope of this analysis is unmatched by any other wild-game study in North America. It has tremendous potential for application, both in research and in strengthening the accuracy and integrity of trophy record books. Be sure to read a more in-depth article by Heffelfinger in this issue of magazine, which appears on page 28.

Accepting Applications for 2006

Looking ahead to 2006, we have decided to focus the competition on a new area of investigation. The theme for 2006 will be impacts of hunting restrictions resulting from voter referenda. We will invite proposals for studies that investigate the forces behind wildlife-related voter initiatives and how the outcomes affect wildlife, conservation efforts, and society. Proposals that address social, biological, political, or economic impacts are encouraged.

The call for proposals was issued in mid-July to all U.S. and Canadian schools that have graduate programs in wildlife biology or management. All proposals received by October 15, 2005, will be eligible for the 2006 competition. ■