

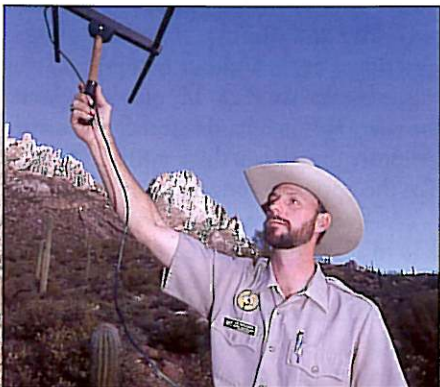
Investing in Mule Deer Research

2004 Recipients of the William I. Spencer Conservation Grants

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Louis Harveson – Sul Ross State University



James Heffelfinger – Arizona Game & Fish

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.

For 2004, the Club decided to focus its conservation grants program on 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 2003 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 11 proposals from 7 Ph.D. students, 3 Masters students, and 1 non-student. Applicants were from Alaska, Arizona (2), Iowa, Idaho (2), Montana, Oregon, Texas (2), and Washington. The applications, evaluation criteria, and rating forms were distributed to members of the Grants-in-Aid Committee for evaluation. The criteria were as follows:

- 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 2003 competition, the selection process was difficult because we had only \$25,000 for distribution. This amount was evenly split among the three top 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.

TODD ATWOOD

Todd Atwood received a grant to assist his study of on *Conditions Affecting Limiting Factors for Mule Deer in Southwestern Montana*. Todd is a Ph.D. student at Utah State University working under the direction of Dr. Eric Gese and in collaboration with Dr. Kyran Kunkel. Todd received his B.S. and M.S. in Wildlife Ecology from Purdue University. As an undergraduate, Todd 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.

Todd will apply his grant to his investigations of the behavioral and physiological responses of mule deer and coyotes to re-colonizing wolves in southwestern Montana. The effects of poor condition on prey vulnerability to predation may be direct (e.g. impaired evasion capabilities, physical debilitation) or indirect (i.e., state-dependent risk taking) and ultimately facilitate predation by either coursing or ambush predators. Direct effects due to poor absolute condition should be readily perceived when prey-food availability is limited and prey fall below the severe malnutrition threshold. In contrast, in systems where food is not limiting, condition-sensitive predation probably acts indirectly upon animals otherwise considered to be nourished adequately. Thus, a primary goal of this research is to relate relative body condition to forage/vigilance rates, thereby addressing the critical enigma of the linkage between relative condition and risk-sensitive behaviors. This is particularly important to document in systems where prey are not food limited because the majority of prey populations probably are held below levels of food limitation.

LOUIS HARVESON

Louis Harveson received a grant to assist his work on *Evaluating Landscape Changes of Mule Deer Habitats in Trans-Pecos, Texas*. Louis is an associate professor in the

Department of Natural Resource Management at Sul Ross State University in Alpine, Texas, where he has held a faculty appointment since 1998. His education includes a B.S. in Wildlife Management from Texas Tech University; M.S. in Range and Wildlife Management from Texas A&M University, Kingsville; and, Ph.D. in Wildlife Science from Texas A&M University. Louis has been recruiting a student to conduct the study as part of a Ph.D. program. The project is a joint effort between the Department of Natural Resource Management at Sul Ross State University, the Department of Wildlife and Fisheries Sciences at Texas A&M University, and the Texas Parks and Wildlife Department.

The project is a landscape-level study to evaluate the declines in desert mule deer in the Trans-Pecos region of Texas. The objectives are to: 1) evaluate habitat changes such as brush encroachment, habitat fragmentation, and shifting land-use patterns in relation to population trends of desert mule deer; 2) explore relationships between precipitation indices and trends in mule deer populations; and, 3) assess trends of harvest characteristics (quantity and quality) in desert mule deer. The investigators have more than 25 years of spotlight survey data, from nine counties, to work with. Remotely sensed imagery will provide information about changing land-use patterns and habitat distribution through time. Records from the National Climatic Data Center will allow exploration of relationships between precipitation patterns and deer demographics. The study results will aid natural resource managers by identifying possible factors associated with the range-wide decline of desert mule deer in west Texas.

JAMES HEFFELFINGER

James Heffelfinger received a grant to assist his work on *Defining Practical Units of Conservation and Record Keeping Through Analysis of Genetic Differentiation in Mule and Black-tailed Deer*. Since 1992, Jim 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, Texas, where he managed wildlife operations on the Rio Paisano Ranch. Jim's 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.



Todd Atwood – Utah State University

Throughout their geographic range, mule and black-tailed deer exhibit a wide 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 will evaluate genetic differentiation throughout the range of mule and black-tailed 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 black-tailed 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 black-tailed 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 will draw from a collection of over 2,200 tissue samples taken from deer harvested during normal hunting seasons.

Looking ahead to 2005, we will again solicit proposals on the theme of mule deer conservation. Proponents can download application forms from the Boone and Crockett Club website. All proposals received by October 15, 2004 will be eligible for the 2005 competition. ■