



Bleats and Blats

Official Newsletter of the
Desert Bighorn Council

December 2008



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Hello DBC members!

As we approach the busy holiday season and the end of the year, we'd like to remind you of some important dates that are just around the corner. Remember, our upcoming meeting is less than 4 months away! Please read on, to find information on registration, submitting a paper, and other important information. You'll also be able to find updated information on our website, at www.desertbighorncouncil.org. Along with this newsletter, we're sending you a registration form (as a separate file if you are receiving this newsletter electronically) and a meeting announcement flyer (see last page). We'd appreciate if you could please share both with friends and colleagues.

The next newsletter is scheduled for early March, so if you have updates or announcements to share, please email them to me by February 15, 2009. We hope to hear from you!

Happy New Year to you!

*Esther Rubin
DBC Secretary (esrubin@consbio.org)*

2009 DBC MEETING
REGISTRATION AND CALL FOR PAPERS!

The Desert Bighorn Council's 2009 biennial meeting will be held in Colorado this coming spring. Plan to join us to learn more about research, management, and conservation of desert bighorn sheep. And better yet, plan to share your work with us!

Dates: April 8-10, 2009

Location: Grand Junction, Colorado
Grand Vista Hotel
<http://www.grandvistahotel.com>
Phone: 970-241-8411

Registration: Please complete and return the attached registration form by March 20, 2009. (the form can also be downloaded from www.desertbighornCouncil.org)
Registration deadline is March 20, 2009.

Abstract submission: Abstracts for talks or posters are due by January 31, 2009. Abstracts submitted after this date will be considered on a space available basis. Abstracts should be limited to one page, include your affiliation and contact information, and be submitted in Word format. Please submit abstracts to Brad Banulis at brad.banulis@state.co.us

Accommodations: The Grand Vista Hotel
Make reservations before March 15, 2009 (\$81/ night, single occupancy).
<http://www.grandvistahotel.com>
Phone: 970-241-8411

For meeting information, please contact: Scott Wait
Colorado Division of Wildlife
scott.wait@state.co.us, Phone: 970-375-6745

Please share the attached meeting announcement flyer with friends and colleagues.

IMPORTANT HANSEN-WELLES SCHOLARSHIP
REMINDER

Looking for some money for your research or management project? The Hansen-Welles Scholarship may be able to help! Proposals may be submitted by active DBC members or those sponsored by a current member, and must be for the benefit of desert bighorn sheep or desert bighorn sheep habitat. Although any person is eligible to apply, graduate students will receive preference in our selection of applicants. Applications are due February 1, 2009. Additional details can be found on our website (www.desertbighornCouncil.org).

IN MEMORY OF TED MCKINNEY

Ted D. McKinney
July 16, 1937 – October 22, 2008



Ted McKinney, PhD born in Miami, Arizona passed at his home in Mesa, Arizona at the age of 71. Never one to retire, he worked tirelessly with the Arizona Game and Fish Department's Research Branch to the end of his days. Ted's drive to learn and discover was matched only by his desire to mentor. Young and veteran biologists alike benefited from time spent with such a man.

He enjoyed a wide array of experiences and held multiple professions during his lifetime; a cowboy in his youth, bank loan officer, gold miner in Costa Rica, assistant and associate professor in Oklahoma and Texas, outfitter and guide in Colorado, self employed environmental consultant, and wildlife research biologist in Arizona. His formal education started at the University of Arizona where he earned his B.S. in range management, followed by an M.S. in wildlife management from Colorado State University. At Virginia Polytechnic Institute, Ted obtained his PhD in wildlife ecology and then a post-doctoral fellowship at the National Institutes of Health, Albert Einstein Medical Center in Philadelphia, Pennsylvania.

The depth and breadth of Ted's contribution to wildlife science is remarkable. He is widely published in topics ranging from the ecology of the flannelmouth sucker and rainbow trout in the Colorado River, and dietary overlap in meso-carnivore populations to identifying trans-highway movement corridors for desert bighorn sheep and the ecology of mountain lions. Perhaps his greatest contribution to the conservation of bovids is the monograph he authored entitled "Evaluation of factors potentially influencing a desert bighorn sheep population". At the time of his passing, Ted was embarking on an ambitious study to determine the effect of mountain lion predation on stable, increasing, and decreasing desert bighorn sheep populations.

Our challenge is to gain the intuition of Ted's unique perspective, earned through a lifetime of awareness and perseverance, and to continue where he left us. Be at peace, Ted.

Submitted by Thorry Smith, DBC Member

SEEKING DBC AWARDS NOMINATIONS

Submitted by Rick Brigham, Technical Staff Member

Awards Chair, Dick Weaver, is seeking nominations for awards for the upcoming Grand Junction meeting. Please!, think about individuals who have contributed significantly to the betterment of desert bighorn sheep and who might deserve a Ram award, a plaque, or a Certificate of Appreciation. It would be great to present several awards at Grand Junction! Contact Dick at 505-539-2378, or by regular mail (P.O. Box 100, Glenwood, NM 88039). Or, if you function best using email, contact Rick Brigham at rickceil30@cableone.net. Please provide the name of the proposed recipient and a list of their accomplishments, so appropriate wording may be prepared. Please submit information to Dick or Rick no later than February 1, 2009 to give them adequate time to get the awards ready. Thanks!

DBC TRANSACTIONS UPDATE

Submitted by Ray Lee, Technical Staff Chair

Since 1996, Jim DeForge has allowed the Desert Bighorn Council to store its extra copies of the DBC Transactions at the Bighorn Institute. Even more importantly, a number of his staff have taken on the task of administering the distribution of the Transactions. Elaine Barrett, Charles Willmott, Stacey Ostermann, Elizabeth Morgan, and, since 2002, Aimee Byard, have all shouldered the task of distributing the Transactions, collecting the revenue for the Council, and keeping immaculate records of the process. The Council owes Jim, his associates, and the Bighorn Institute a BIG Thank You!

In October, I drove to Palm Desert, California, to the headquarters of the Bighorn Institute. Aimee Byard had done an excellent job of arranging the many boxes of Transactions. We fully loaded my Expedition with all of the Transactions that we could stuff in. The following day, I did an inventory of the Transactions in my mother's driveway in Las Vegas. The Bighorn Institute recycled the few remaining copies that we had left at their facility, and I reduced the holdings still further (primarily recycling some of the Transactions copies that were damaged from their handling/storage). The Transactions have been re-inventoried and are now stored in a climate controlled area - my office. I will be administering the distribution of the Transactions for a while.

It was actually very interesting to look through the many boxes of Transactions. The boxes were labeled by the various printers that have been used over the past 50 years. Most boxes had been sent to the various Editors - of which we have had 13 (I am sure that Brian Wakeling would be glad to turn this task over to the 14th), or to the Chairs of the various meetings. It was great to have 50 years of desert bighorn sheep research and management information in my hands.

While it is certainly a wonderful thing to have the Transactions online, there is nothing quite like having a hard copy in your hands - particularly when you want to share an article with someone. I encourage each of you to look through your personal library, and your organization's, to see which volumes are missing - we'll help fill those gaps while there are still some copies left. The 2005 issue of the DBC Transactions was recently mailed to all who paid for them (at the last meeting or as part of your membership). Copies are now available for purchase (via the order form on our website). All previous issues are now also available in digital format, at no cost, on our website.

BIGHORN SHEEP MANAGEMENT POLICY UPDATE

The U.S. Department of Agriculture has recently proposed a new agreement between its U.S. Forest Service and its Animal Plant Health Inspection Service to determine the health status (not defined) of bighorn sheep to be transplanted onto Federal lands and/or to be brought across State lines. The proposed and highly controversial agreement and a response from the Western Association of Fish and Wildlife Agencies (WAFWA) can be found at <http://www.mwvcrc.org/bighorn.html>

RECENT LITERATURE RELATED TO BIGHORN SHEEP

Cain, J. W., B. D. Jansen, R. R. Wilson, and P. R. Krausman. 2008. Potential thermo regulatory advantages of shade use by desert bighorn sheep. *Journal of Arid Environments* 72(8):1518-1525.

Abstract: Ungulates in arid climates use a variety of mechanisms to cope with environmental conditions that can result in heat stress and dehydration. Use of shade during midday is common among desert ungulates of the southwestern United States. Desert bighorn sheep (*Ovis canadensis mexicana*) use both vegetation and caves as sources of thermal cover. We assessed potential thermoregulatory advantages of the use of vegetation and caves by desert bighorn sheep on the Cabeza Prieta National Wildlife Refuge, Arizona. Midday ambient temperatures in caves were an average of 6.9 degrees C (SE = 0.344) lower than control sites; ambient temperature under tree canopies was an average of 3.3 degrees C (SE = 0.950) below control sites. Caves provided higher quality shade than tree canopies; midday temperature in caves was an average of 3.4 degrees C (SE = 1.06) lower than under tree canopies. Potential thermal benefits of both caves and tree canopies increased with increasing daily high temperature. Behavioral adaptations function in combination with physiological and morphological mechanisms and are of critical importance for the maintenance of temperature and water balance. Short-term physiological and ecological performance is influenced by habitat selection and use of microhabitat; abiotic factors (e.g., ambient temperature) can ultimately influence animal fitness and the demography of animal populations.

Feder, C., J. G. A. Martin, M. Festa-Bianchet, C. Berube, and J. Jorgensen. 2008. Never too late? Consequences of late birthdate for mass and survival of bighorn lambs. *Oecologia* 156 (4):773-781.

Abstract: In strongly seasonal environments, the timing of birth can have important fitness consequences. We investigated which factors affect parturition date and how birthdate interacts with sex, maternal characteristics and environmental variables to affect the growth and survival of bighorn sheep (*Ovis canadensis*) lambs in a marked population in Alberta. Over 14 years, the estimated birthdate of 216 lambs ranged from 21 May to 18 July. Parturition date was heritable and genetically correlated with maternal mass the previous fall. Weaning a lamb delayed parturition the following year by about 7 days. Birthdate did not affect summer growth rate, but late-born lambs were lighter in mid September (the approximate time of weaning) than early-born ones. Birthdate did not affect survival to weaning, but late birth decreased survival to 1 year for male lambs. Forage quality, measured by fecal crude protein, did not affect survival to 1 year. Once we accounted for lamb mass in mid September, birthdate no longer affected the probability of survival, suggesting that late birth decreased survival by shortening a lamb's growing season. Because there was no compensatory summer growth, late-born lambs were smaller than early-born ones at the onset of winter. Our data highlight the importance of birthdate on life history traits and suggest that resource scarcity had more severe consequences for juvenile males than for females.

Luikart, G., S. Zundel, D. Rioux, C. Miguel, K. A. Keating, J. T. Hogg, B. Steele, K. Foresman, and P. Taberlet. Low genotyping error rates and noninvasive sampling in bighorn sheep. *Journal of Wildlife*

Management 72(1):299-304.

Abstract: Noninvasive DNA sampling allows studies of natural populations without disturbing the target animals. Unfortunately, high genotyping error rates often make noninvasive studies difficult. We report low error rates (0.0-7.5%/locus) when genotyping 18 microsatellite loci in only 4 multiplex polymerase chain reaction amplifications using fecal DNA from bighorn sheep (*Ovis canadensis*). The average locus-specific error rates varied significantly between the 2 populations (0.13% vs. 1.6%; $P < 0.001$), as did multi-locus genotype error rates (2.3% vs. 14.1%; $P < 0.007$). This illustrates the importance of quantifying error rates in each study population (and for each season and sample preservation method) before initiating a noninvasive study. Our error rates are among the lowest reported for fecal samples collected noninvasively in the field. This and other recent studies suggest that noninvasive fecal samples can be used in species with pellet-form feces for nearly any study (e.g., of population structure, gene flow, dispersal, parentage, and even genome-wide studies to detect local adaptation) that previously required high-quality blood or tissue samples.

Ostermann-Kelm, S., E. R. Atwill, E. S. Rubin, M. C. Jorgensen, and W. M. Boyce. 2008. Interactions between feral horses and desert bighorn sheep at water. Journal of Mammalogy 89(2):459–466.

Abstract: We studied sympatric populations of native bighorn sheep (*Ovis canadensis*) and feral horses (*Equus caballus*) to quantify their spatial and temporal overlap and to determine whether horses interfered with use of water by bighorn sheep. We observed no evidence of direct competition, but our field experiment, which involved placing desert-acclimated domestic horses near watering sites used by bighorn sheep, demonstrated that bighorn sheep avoided sites with horses nearby. The presence of domestic horses near a watering site preferred by bighorn sheep resulted in a 76% reduction in the number of groups of bighorn sheep coming to water at that location and a concomitant increase in the number of bighorn sheep watering at other sites. An experimental approach to studying competition between large mammals has been problematic and to our knowledge this study constitutes the 1st manipulative field experiment to test for competitive interactions between feral horses and native ungulates.

Rogerson, J. D., W. S. Fairbanks, and L. Cornicelli. 2008. Ecology of gastropod and bighorn sheep hosts of lungworm on isolated, semiarid mountain ranges in Utah, USA. Journal of Wildlife Diseases 44(1):28-44.

Abstract: Isolated, nonmigratory populations of bighorn sheep (*Ovis canadensis*) may experience high exposure to lungworms (*Protostrongylus* spp.) through a build-up of fecal material. However, semiarid climates may hinder lungworm transmission by limiting terrestrial gastropods, the intermediate hosts. We assessed potential for lungworm transmission, documented occurrence of transmission, and identified habitat types where transmission was likely to occur on ranges of two recently introduced populations of bighorn sheep in northern Utah. Gastropods were collected weekly on Antelope Island and the Newfoundland Mountains, May–August 2001–02, from each of the four major habitat types (riparian, rock, desert shrub, and grass). Distribution of 113 bighorn sheep groups was observed, and 421 fecal pellet groups were collected to estimate lungworm levels. A total of 1,595 gastropods representing five genera were collected from both ranges. *Vallonia* made up 85% of all gastropods collected. Of 980 gastropods collected on Antelope Island in 2002, only *Vallonia* were found infected with protostrongylid-type larvae (10 of 980=1%). Lungworm prevalence in bighorn fecal samples was 97% on Antelope Island and 90% on the Newfoundland Mountains. Lungworm prevalence in lambs indicated lungworm transmission was occurring on Antelope Island. Lungworm transmission was likely occurring in riparian habitat due to abundant gastropods, presence of infected gastropods, and reliance by bighorn sheep on few water sources. Differences in spatial distribution between ram and nursery groups may partly explain higher fecal larvae counts in nursery than in ram groups. We suggest lungworm levels in bighorn sheep on semiarid ranges may increase in dry years as bighorn sheep concentrate use on fewer perennial water sources.



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For meeting information, please contact: Scott Wait
Colorado Division of Wildlife
scott.wait@state.co.us, Phone: 970-375-6745

The Desert Bighorn Council was established in 1959 to promote the advancement of knowledge concerning desert bighorn and their long-term welfare. Membership is comprised of wildlife biologists, scientists, administrators, managers, and others concerned with the welfare of desert bighorn. The Council is interested in all ecological and management issues affecting bighorn sheep and their habitat.

For more information, please visit our website at <http://www.desertbighornCouncil.org>