



# Bleats and Blats

Official Newsletter of the Desert Bighorn  
Council

February 2004



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*Hello everyone,*

*At this time of year, we would typically be planning for the annual DBC meeting, and many of you would be preparing updates and presentations. Since we have switched to an alternate-year meeting schedule, consider this newsletter and our website (<http://www.desertbighornCouncil.org>) as a way to stay in contact with fellow DBC members between meetings. If you have a research or management update that you'd like to share, feel free to email me. Opinion pieces or accounts of your experiences in the field are also welcome. We have an opinion piece by Ray Lee in this newsletter. The next newsletter will be out in early summer, so please send me material by May 31.*

*Hope to hear from you!*

*Esther Rubin  
DBC Secretary*

*([erubin@sandiegozoo.org](mailto:erubin@sandiegozoo.org))*

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## *The DBC says good-bye to a longtime friend...*

Sadly, Buddy Welles, one of the founders of the DBC who has been featured as “First Ewe” on our website, has passed away. Pat Hansen and family have kindly supplied us with Buddy’s obituary, which is posted here:

The San Luis Obispo Tribune

Florence (Buddy) Welles, 96, of Oceano died peacefully Tuesday morning, Jan. 20, 2004, at her home.

Memorial services will be held at a later date.

Florence Welles was born to Clara B. and Harry Williams Aug. 21, 1907 in Oakland. In the mid-1920s she was the secretary for the San Jose State Players where she met her husband of 61 years, Ralph E. Welles, an actor and president of the club. In 1927 they moved to Hollywood where Ralph pursued his acting career. While in Hollywood, Buddy was a receptionist for the Actors Equity Association, a precursor of today's Screen Actors Guild, and worked with such legends as Clark Gable, Boris Karloff and Mary Pickford. In 1932, Buddy and her husband left Hollywood for Palo Alto where together they managed the Palo Alto Community Theatre for 18 years. While Ralph was theatre director, Buddy acted, danced, designed and directed choreography for the shows, and played piano accompaniment for their many musical productions. In 1950, they left Palo Alto to begin a new 17-year career with the National Park Service. She did archaeological field work and interpretive programs for park visitors at Death Valley, Joshua Tree and Crater Lake. While in Death Valley Ralph and Buddy began photographing and studying the elusive desert bighorn sheep. In 1961 the National Park Service published Ralph and Buddy's "The Bighorn of Death Valley," the first life history study of desert bighorns. In 1967, they moved to the Central Coast and became supporters of art and music in this area. Buddy began volunteering with the Arroyo Grande Community Hospital Auxillary and joined the Arroyo Grande Women's Club in 1973. She volunteered weekly for the hospital for 31 years and each holiday created tray favors to cheer hospital patients. She continued her musical career throughout her life, playing four-hand piano concerts with friends, including numerous musical performances with local pianist Trudy Beck. At 93, she began teaching piano lessons and began her solo piano career playing popular tunes each Sunday for transitional care unit patients at Arroyo Grande Community Hospital. She will be missed by many dear friends, both old and new.

Buddy is survived by her cousin Bob Patch and family of Santa Barbara; and cousin Joyce Borders and family of Sunnyvale.

In Buddy's memory, donations may be made to the Ralph E. and Florence B. Welles Music Scholarship, Cal Poly Foundation; Arroyo Grande Community Hospital Auxiliary Fund; San Luis Obispo County Symphony; or the Desert Bighorn Council, Hansen-Welles Memorial Fund (contact Ray Lee, technical staff chairman for the Desert Bighorn Council at 307-527-6261).

Pat Hansen’s daughter and son-in-law, Debi and Tom Clark, are putting together a book about Buddy and Ralph. This will be a celebration of their adventures and life together. If you knew Buddy and Ralph, Debi invites you to send her stories of how you met them or about memorable times or adventures you shared with them. She also invites you to share photos or articles written by Ralph and/or Buddy. Digital photos should be in jpg format and not larger than 500kb (and please send only one photo attachment per email). Alternatively, you may mail photos to the address below; just be sure to add a note and address if you would like photos returned to you.

Debi says that currently “the booklet will be available to folks who contribute or express an interest in it. At the moment, we don't know about printing costs, etc, so will let folks know costs, etc as we get more into this project. It will be a "labor of love" for several of us.”

Tom and Debi Clark  
P.O. Box 750309  
Torrey, Utah 84775-0309  
435-425-3055 (home phone)  
[tdclark@color-country.net](mailto:tdclark@color-country.net)

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## **FNAWS Update**

### **2004 FNAWS Convention**

*By Ray Lee (DBC Tech Staff Chair)*

The Foundation for North American Wild Sheep recently held its 27<sup>th</sup> Annual Convention in Reno, Nevada, at the Reno Hilton. This year's Convention boasted outstanding attendance and raised nearly \$4,000,000 for wildlife conservation. Thousands enjoyed the Exhibit Hall with nearly 400 companies and organizations exhibiting their wares.

The 27<sup>th</sup> Annual Auctions, which grossed nearly \$3,000,000, offered high quality hunting trips from around the world, fine merchandise, original art, and 30 special government hunting permits. The final in a series of 4 custom rifles, the Grand Slam Series by John Bolliger, was purchased for \$150,000. Among the special permits offered were the Alberta Minister's Special Bighorn Sheep License, which sold for \$160,000; the Montana Rocky Mountain Bighorn Sheep Permit, which sold for \$160,000; the British Columbia Special Sheep Permit, which sold for \$135,000; and the Tiburon Island, Mexico, Desert Bighorn Sheep Permit which sold for \$117,500.

The Auctions not only raised money for wildlife conservation, they raised nearly \$80,000 for the USA Olympic Shooting Team. What started as a fundraiser for an ordinary Remington shotgun, worth \$750, snowballed into a very moving show of support for our hardworking Olympic Shooting Team Athletes. The lucky winner of the initial fundraiser generously donated the shotgun to the FNAWS live-auction to raise more money for the team. The first live auction bid ended at \$4,500, and was immediately re-donated to FNAWS. The next bid ended at \$5,000 and the shotgun was once again re-donated in hopes of raising more money for our Olympic hopefuls. The final sale of the Remington 1100 shotgun took place at the Saturday evening gala banquet. During the banquet the USA Shooting Team athletes were welcomed onto the auction stage to speak of their many sacrifices and needs for their team. So moved by the tales of their struggles, the FNAWS members wasted no time in raising the bid to dizzying heights. When the dust settled, it was Mrs. JoAnn Fiedelley of Cincinnati, Ohio, who secured the prize with a spectacular closing bid of \$65,000.

The Foundation Auctions also offered hunts for antelope, aoudad, blesbuck, caribou, chamois, deer, elk, gazelle, ibex, impala, kudu, moose, mouflon, mountain goat, oryx, red stag, tahr, warthog, water buffalo, wild boar, wolverine, crane, dove, duck, geese, pheasant, prairie chicken, quail, swan, wild turkey, and deep sea and fresh water fishing excursions.

The Foundation for North American Wild Sheep hopes to surpass this year's achievements at their 2005 Annual Convention, at the San Antonio Convention Center in San Antonio, Texas, March 2-5, 2005.

For nearly 30 years, FNAWS has been the leader in funding wild sheep conservation promoting protection of habitat, professional wildlife management based upon sound biological principles, and educating the public. For more information please visit their website at [www.fnaws.org](http://www.fnaws.org).

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## **RECENT LITERATURE** **RELATED TO BIGHORN SHEEP** *(citations and abstracts)*

Bassano B., A. von Hardenberg, F. Pelletier, and G. Gobbi. 2003. A method to weigh free-ranging ungulates without handling. *Wildlife Society Bulletin*. 31(4):1205-1209.

### *Abstract*

The number of studies that have documented individual body-mass changes in free-ranging ungulates is limited, due to difficulties and risks associated with repeated captures of wild animals. We tested a remotely controlled platform scale on Alpine ibex (*Capra ibex*) and bighorn sheep (*Ovis canadensis*). Animals were baited onto the

platform scale with salt, and weights were recorded by observers with binoculars and spotting scopes. We found this method was both accurate and effective and suggest that it has application for other studies on ecology and management of wild ungulates.

Bender L. C., H. Li, B. C. Thompson, P. C. Morrow, and R. Valdez. 2003. Infectious disease survey of gemsbok in New Mexico. *Journal of Wildlife Diseases*. 39(4):772-778.

*Abstract*

Exotic wildlife can introduce new diseases or act as reservoirs of endemic diseases. On White Sands Missile Range, New Mexico (USA), significant declines in populations of native ungulates generally correspond to increases in range and population density of the exotic gemsbok (*Oryx gazella gazella*), introduced beginning in 1969. We surveyed gemsbok in 2001 for exposure to a variety of diseases potentially important for native ungulates. High seroprevalence was found for malignant catarrhal fever virus (49 [98%] of 50 sera; 43 [96%] of 45 plasma samples), bluetongue virus (48 [96%] of 50), bovine respiratory syncytial virus (33 [66%] of 50), and parainfluenza-3 virus (10 [20%] of 50). Low numbers of *Nematodirus* spp. eggs in a few individuals were the only parasites detected in gemsbok. Exposure to the above diseases in gemsbok is of interest to managers because of potential implications for recovery of desert bighorn sheep (*Ovis canadensis mexicana*) and desert mule deer (*Odocoileus hemionus crooki*) in the White Sands area because each has been implicated in mortality in these species either in the White Sands area or elsewhere in the western/southwestern United States.

Coltman D. W., P. O'Donoghue, J. T. Jorgenson, J. T. Hogg, C. Strobeck, and M. Festa-Bianchet. 2003. Undesirable evolutionary consequences of trophy hunting. *Nature*. 426(6967):655-658.

*Abstract*

Phenotype-based selective harvests, including trophy hunting, can have important implications for sustainable wildlife management if they target heritable traits. Here we show that in an evolutionary response to sport hunting of bighorn trophy rams (*Ovis canadensis*) body weight and horn size have declined significantly over time. We used quantitative genetic analyses, based on a partly genetically reconstructed pedigree from a 30-year study of a wild population in which trophy hunting targeted rams with rapidly growing horns, to explore the evolutionary response to hunter selection on ram weight and horn size. Both traits were highly heritable, and trophy-harvested rams were of significantly higher genetic 'breeding value' for weight and horn size than rams that were not harvested. Rams of high breeding value were also shot at an early age, and thus did not achieve high reproductive success. Declines in mean breeding values for weight and horn size therefore occurred in response to unrestricted trophy hunting, resulting in the production of smaller-horned, lighter rams, and fewer trophies.

McKinney T., S. R. Boe, and J. C. deVos. 2003. GIS-based evaluation of escape terrain and desert bighorn sheep populations in Arizona. *Wildlife Society Bulletin*. 31(4):1229-1236.

*Abstract*

Habitat assessment models currently widely used by wildlife managers lack a quantitative descriptor of escape terrain used by desert bighorn sheep (*Ovis canadensis*). We examined habitat patch characteristics associated with 14 augmented, reintroduced, remnant, and extirpated desert bighorn sheep populations in Arizona using Geographic Information System (GIS) technology to determine relationships between escape terrain area and configuration and estimated population size, density, and production. Total bighorn, female, and lamb population sizes were positively correlated with measures of escape terrain area and configuration, including number and size of patches and percent of landscape, indicating that abundance was greater in more heterogeneous landscapes. Populations using smaller patches were more vulnerable to extirpation than those using larger patches. Populations with greater than or equal to 10 animals per km<sup>2</sup> of escape terrain and patches

with less than or equal to 10 km<sup>2</sup> of escape terrain were more variable, suggesting the likelihood of wider population fluctuations compared to populations tending to occupy larger patches at lower densities. Consistent with theory, density and relative productivity were independent of habitat patch and population size, except that variability of lamb density was negatively correlated with escape terrain patch size. Variability of total, female, and lamb population density increased directly with density. We hypothesized that area and configuration of escape terrain are primary correlates of desert bighorn sheep population size in Arizona, and management efforts to restore or augment desert bighorn sheep populations on isolated habitat patches might best focus on locations with at least 15-km<sup>2</sup> escape terrain. Habitat evaluation using GIS technology should provide a useful preliminary, quantitative step in making decisions regarding habitat quality and management intervention for desert bighorn sheep populations and for translocations into historically occupied vacant areas.

Mooring M.S., T. A. Fitzpatrick, I. C. Fraser, J. E. Benjamin, D. D. Reisig, and T. T. Nishihira. 2003. Insect-defense behavior by desert bighorn sheep. *Southwestern Naturalist*. 48(4):635-643.

#### *Abstract*

Biting insects impose costs on hosts, including decreased feeding or resting time as the result of disturbance, blood loss, and disease transmission. Insect-repelling behaviors, such as ear-flicking, head-shaking, stamping, and grouping, have evolved in many ungulate species to minimize these costs. We studied female desert bighorn sheep (*Ovis canadensis mexicana*) at Red Rock Wildlife Area, New Mexico, during the summers of 1999 and 2000. We tested the predictions that: 1) bighorn sheep will increase insect-defense behavior when biting insects are more abundant, and 2) close aggregation of sheep will decrease the per capita insect harassment by means of a dilution effect. Numbers of midges and other biting insects increased in association with rising temperature and decreased with increasing wind speed. Ewes performed between 0 and 78 ear-flicks/min, and >5,000 ear-flicks over the course of a 12-h day. As predicted, the rate of ear-flicking was positively correlated with counts of biting insects, indicating that ear-flicking was a direct response to the irritation of attacking insects. We also found a negative correlation between the number of sheep clustered together within 1 body length and ear-flicking rate, suggesting that insect harassment is diluted when bighorn sheep bunch together. Bighorn sheep generally bedded on upper slopes and rocky outcrops exposed to gusts of wind. These results indicate that ear-flicking, grouping, and microhabitat choice might be important strategies for reducing the costs of biting insects in desert bighorn sheep.

Oehler M.W., R. T. Bowyer, and V. C. Bleich. 2003. Home ranges of female mountain sheep, *Ovis canadensis nelsoni*: effects of precipitation in a desert ecosystem. *Mammalia*. 67(3):385-401.

#### *Abstract*

We compared sizes of home ranges and other ecological variables for female mountain sheep (*Ovis canadensis nelsoni*) inhabiting climatologically distinct areas in the Mojave Desert, California, USA. We also examined the relationship between size of home range and body size and age of mountain sheep. The pattern of precipitation was uni-modal in the more xeric Panamint Range, and bimodal at Old Dad Peak. Density of female sheep was about four times greater at Old Dad Peak than in the Panamint Range; Old Dad Peak also had more shrubs and perennial grasses than the Panamint Range. Home ranges and core areas were nearly twice as large in the Panamint Range than at Old Dad Peak, and females at Old Dad Peak were consistently nearer water. We detected no relationships between size of body or age and size of home-ranges for female mountain sheep. Females at Old Dad Peak foraged predominantly on perennial grasses and forbs, whereas those in the more xeric Panamint Range consumed mostly shrubs, perennial forbs, and succulents. In general, quality of forage was higher at Old Dad Peak than in the Panamint Range. Fecal nitrogen did not differ between areas in spring, but was higher in the Panamint Range during summer and autumn. We conclude that mountain sheep from the Panamint Range had larger home ranges because of lower availability and quality of forage, ostensibly a consequence of that precipitation regime. Use of cacti by mountain sheep in the Panamint Range likely enhanced the ability of females to increase the area in which they foraged in that depauperate and xeric

environment. We hypothesize that pattern and amount of precipitation, and subsequent productivity of plants, affect the distribution of mountain sheep, and ultimately probabilities of persistence for populations of these mountain ungulates.

Pelletier, F., J. Bauman, and M. Festa-Bianchet. 2003. Fecal testosterone in bighorn sheep (*Ovis canadensis*): behavioural and endocrine correlates. *Canadian Journal of Zoology - Revue Canadienne de Zoologie*. 81(10):1678-1684.

*Abstract*

Noninvasive endocrine techniques allow repeated sampling of the same individual to study causes and consequences of variation in individual behaviour and physiology. In this study, radioimmunoassay was used to measure fecal testosterone and to assess the repeatability of the testosterone assay for bighorn rams (*Ovis canadensis*). Fecal samples were collected from marked males during the pre-rut and the rut over 2 years. Results were highly repeatable for samples of the same ram within a day ( $r = 0.93$ ). Fecal testosterone peaked during the pre-rut (when social relationships are established) and then declined from the pre-rut to the rut. For both years of study, fecal testosterone was correlated with social rank (2001:  $r = 0.73$ ,  $P < 0.0001$ ; 2002:  $r = 0.54$ ,  $P = 0.007$ ) and age (2001:  $r = 0.65$ ,  $P = 0.002$ ; 2002:  $r = 0.53$ ,  $P = 0.008$ ) of individual rams. When age was accounted for, however, the relationship between social rank and testosterone was no longer significant. Aggressiveness (measured as hourly interaction rate) was weakly correlated with fecal testosterone ( $r = 0.44$ ,  $P = 0.039$ ). There was no association between aggressiveness and social rank ( $r = 0.13$ ,  $P = 0.591$ ). To our knowledge, this is the first report of an association between testosterone levels and individual social rank in wild ungulates.

Rudolph K.M., D. L. Hunter, W. J. Foreyt, E. F. Cassirer, R. B. Rimler, and A. C. S. Ward. 2003. Sharing of *Pasteurella* spp. between free-ranging bighorn sheep and feral goats. *Journal of Wildlife Diseases*. 39(4):897-903.

*Abstract*

*Pasteurella* spp. were isolated from feral goats and free-ranging bighorn sheep (*Ovis canadensis canadensis*) in the Hells Canyon National Recreation Area bordering Idaho, Oregon, and Washington (USA). Biovariant *Pasteurella haemolytica* organisms were isolated from one goat and one of two bighorn sheep found in close association. Both isolates produced leukotoxin and had identical electrophoretic patterns of DNA fragments following cutting with restriction endonuclease HaeIII. Similarly *Pasteurella multocida multocida* isolates cultured from the goat and one of the bighorn sheep had D type capsules, serotype 4 somatic antigens, produced dermonecrotin and had identical HaeIII electrophoretic profiles. A biovariant U-beta P *haemolytica* strain isolated from two other feral goats, not known to have been closely associated with bighorn sheep, did not produce leukotoxin but had biochemical utilization and HaeIII electrophoretic profiles identical to those of isolates from bighorn sheep. It was concluded that identical *Pasteurella* strains were shared by the goats and bighorn sheep. Although the direction of transmission could not be established, evidence suggests transmission of strains from goats to bighorn sheep. Goats may serve as a reservoir of *Pasteurella* strains that may be virulent in bighorn sheep; therefore, goats in bighorn sheep habitat should be managed to prevent contact with bighorn sheep. Bighorn sheep which have nose-to-nose contact with goats should be removed from the habitat.

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## **Job Announcement**

The following job announcement was provided by Dr. Foreyt of WSU; please feel free to distribute to those who may be interested.

FACULTY POSITION  
Endowed Chair for Wild Sheep Disease Research  
Washington State University

The Department of Veterinary Microbiology and Pathology in the College of Veterinary Medicine is seeking applications for a recently endowed chair in wild sheep disease research. This will be a full-time, tenured appointment at the Associate Professor or Professor level starting July 1, 2004. The scientist hired to fill the Rocky Crate-Foundation for North American Wild Sheep Endowed Chair will be expected to devote 100% of their time to research on wild sheep diseases and graduate education. The research focus will be on respiratory diseases caused by *Mannheimia spp.* and *Pasteurella spp.* It is expected that a productive, extramurally funded program in the area of the research focus will be developed, and that effective collaborations will be established with current and future research programs at Washington State University. The Department has a long tradition of high quality, collaborative infectious disease research and current research programs include microbial genomics, proteomics for vaccine development, microarray, immunology and pathogenesis of infectious diseases of animals and food-borne diseases. The expectations in graduate education are to train PhD graduate students and to be a full participant in the graduate program in the Department of Veterinary Microbiology and Pathology. A PhD degree and at least five years of research experience after any post doctoral research training are required. Preference will be given to candidates with research experience with *Mannheimia spp.*, *Pasteurella spp.* or related bacteria. Further preference will be given to candidates with demonstrated abilities in conducting hypothesis-based research and publishing the results, obtaining extramural funding, and interest and experience in graduate education. Review of applications will begin March 1, 2004, and will continue until the position is filled. An application letter outlining research interests, curriculum vitae, and names and addresses of three references should be sent to Dr. Travis McGuire, Department of Veterinary Microbiology and Pathology, P.O. Box 647040, Washington State University, Pullman, WA 99164-7040. Washington State University is an equal opportunity/affirmative action educator and employer. Protected group members are encouraged to apply.

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## **Opinion Piece**

*You are invited to share your opinions and thoughts regarding bighorn sheep issues,  
and we will post them here.*

### **Science and Nature**

*By Ray Lee*

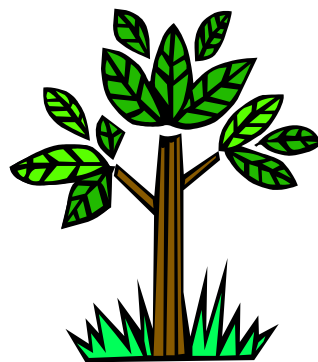
The December 11, 2003, issue of *Nature*, a British biological journal, contained a short article (in the letters section) titled *Undesirable evolutionary consequences of trophy hunting*. The authors of this article claimed to have used DNA studies to show that “trophy hunting” of an isolated sheep population on Ram Mountain, Alberta, had led to a genetically induced decrease in horn and body size of bighorn rams. Apparently none of the junior authors, some of whom are bighorn biologists of long standing, were sufficiently influential to put the paper into a proper management perspective.

To make matters worse, the *Nature* publicity department published two non-technical accounts of the article emphasizing that sheep hunters and managers were responsible for the negative genetic consequences in bighorn populations because the harvest typically consists of the largest males available. These editorials, titled *Ram cull dents gene pool* and *Sheep horns downsized by hunter's taste for trophies*, clearly cast sheep hunting as detrimental to bighorn sustainability and survival. Putting a wild sheep in a rifle scope's cross hairs on the cover did little to add to the story.

In the course of these editorials, the *Nature* reporter interviewed the Executive Director of the Northern Wild Sheep and Goat Council, whose "quotes" added fuel to the anti-hunting stance taken by *Nature*.

It is my position that hunters are conservationists, that they provide virtually all funding for wild sheep management programs, and that there are serious questions regarding the validity of the paper. The paper can be found in *Nature*, Volume 426, pages 655-658. The non-technical articles can be found online at [www.nature.com/nature](http://www.nature.com/nature).

Valerius Geist has written a rebuttal based upon information gained through the many years of intensive game management under the European system. Mike Frisina has written a rebuttal based upon the significant increase through time in the number of wild sheep trophies entered into the Boone and Crockett record books. Eric Rominger has written a rebuttal based upon the decades long reports from the same area and authors relating horn and body size to forage availability and density dependence. Wayne Heimer and Ray Lee have written a rebuttal based upon the genetic effects of alternative rutting strategies and the level of harvest rates. Considering the magazine's agenda, it is doubtful that any of these rebuttals will be published in *Nature*, but they will be made available to those of you who have need to address the related articles which have since appeared in such places as the New York Times and the Los Angeles Times.



***Have a great spring....and look for your next newsletter in early summer.***