



Bleats and Blats

Official Newsletter of the Desert Bighorn
Council

MARCH 2006



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Hello DBC members and friends,

I'm happy to share this newsletter with you, to give you a wide assortment of bighorn sheep updates. Remember, this newsletter can be a way for you to communicate with fellow DBC members, so feel free to submit information or requests for information to be shared with others. The newsletter comes out 4 times a year. Our next newsletter is scheduled for June 2006, so if you have material to submit, please send it to me by June 1, 2006.

And, as always, additional information about the Desert Bighorn Council can be found on our website (<http://www.desertbighornCouncil.org>).

All the best to you,

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

DBC TRANSACTIONS REMINDER

If you would like to publish a paper in the DBC Transactions, you have an important deadline approaching. Brian Wakeling, DBC Editor, will be accepting manuscripts for publication in the next Transactions until the end of April (the April 1 deadline has been extended). You can find author instructions on our website (<http://www.desertbighornCouncil.org/>) or you may email Brian directly at BWakeling@azgfd.gov. Please remember that all manuscripts dealing with bighorn sheep management, biology, or conservation may be considered for publication in the Transactions, and that publication is not limited to those papers presented at DBC meetings.

JOB POSTINGS

EMPLOYMENT OPPORTUNITY: For a field person to monitor radio-collared bighorn sheep in remote regions of the Santa Rosa Mountains in southern California. Must be experienced, independent hiker who is capable of long hikes and overnight stays in remote regions of the desert. Summer temperatures often exceed 100° F. Position is full-time for one year, with continuation possible. Salary is dependent upon experience. Position will start as soon as possible. If interested, please contact Stacey Ostermann-Kelm at Stacey_Ostermann@fws.gov.

UNEXPECTED FALL ARRIVALS

Submitted by Aimee Byard, Bighorn Institute

Bighorn Institute monitors over 50 collared Peninsular bighorn in the San Jacinto and Santa Rosa Mountains of southern California. During 2005, we documented two sets of lambs (spring and fall) born in the northern Santa Rosa Mountains (NSRM) and central Santa Rosa Mountains (CSRM). The spring lambs were born between January and May, and the fall lambs were born between October and December. Many of the fall lambs were born to ewes that were known to have also produced a spring lamb. This is the first time the Institute has documented Peninsular bighorn lamb births during the fall and it is also the first time we have documented ewes giving birth to more than one lamb in the same calendar year.

All but 4 of the lambs born in the spring in the NSRM “disappeared” by June 2005, and a few showed signs of illness prior to their death. In October 2005, Institute biologists began seeing newborn lambs in the NSRM and 15 fall lambs were documented, 9 of which are still alive as of March 2006.

In the CSRM, we also documented several lambs born in the fall of 2005. The most unique observation was two adult ewes with both 8 month old and 1 month old lambs. These were the only ewes observed that had given birth to more than one lamb in the same year and both lambs were still alive.

WILDLIFE PROFESSIONALS MEETING - AN UPDATE

Update provided by Eric Rominger

At the recent 2006 Foundation for North American Wild Sheep (FNAWS) convention in Reno, Nevada, Eric Rominger (New Mexico Department of Game and Fish) and Kevin Hurley (Wyoming Game and Fish

Department) organized and led a "Wildlife Professionals" meeting to address and discuss the following questions:

What are the management implications of an increasing presence of domestic goats in wild sheep habitat? What management strategies should be in place to prevent and/or minimize opportunities for contact?

More than 40 people attended this meeting and participated in a lively 2-hour discussion on bighorn sheep/domestic goat issues. Representatives from nearly all the states and provinces were present. A synopsis of this meeting will be produced to share with all of you. Please look for this synopsis in our next DBC newsletter and on our website.

BIGHORN SHEEP ARTWORK FOR SALE



Gale Monson is selling this sculpture, which was created by Bill Welsh (son of George Welsh) in 1978. The sculpture is approximately 6 inches tall, with a marble base, which is 8 ½" x 6 ¼" x 7/8". The sheep itself is about 3 ½" long and 2" tall. It is made of Kingman, Arizona, turquoise and stands on a lava rock base that is from northwest of Kingman. The asking price is \$1,500. If you are interested, please contact Gale Monson at abqmons@aol.com.

MAJESTIC RAM DIES OF NATURAL CAUSES

Colorado Bighorn Sheep Ram Among the Largest Ever Recorded
Colorado Division of Wildlife
12/13/2005

(Printed with permission from the Colorado Division of Wildlife)

A world-class bighorn sheep ram that lived along the Arkansas River was found dead in late November. Over the past few years, the ram was spotted in a small herd of sheep that lived on private property west of Pueblo Reservoir. Colorado Division of Wildlife (DOW) biologists estimate the ram was between 12 and 13 years old and was driven from the herd by younger males. At that point, he traveled north onto property owned by Fort Carson where it died of old age. A necropsy indicated heart and lung problems along with

arthritis and a chest infection. “This old guy is one for the record books,” said Allen Vitt, a terrestrial biologist from Pueblo. “Based on the initial measurements, the ram will score among the largest in the world.” The current Boone & Crocket world record ram is 208 and three-eighths. Scoring is done by taking a series of standardized measurements. Boone & Crocket requires that horns dry for at least 60 days before measuring, so a final score will not be calculated until February. One thing that might prevent this sheep from becoming a new world record is the fact that one of its horns was broken off at the tip. “Brooming” is the name for the chipping and fraying of the horns. It is usually caused by fighting. Regardless of the final score, the ram was one of the most majestic bighorn sheep recorded in Colorado. One of the reasons this ram’s horns grew to such massive proportions is because he lived a long time in relative seclusion. There is no public access to the portion of the Arkansas River where it lived. The rocky cliffs adjacent to the river provided ample protection from predators and there was good access to forage and water. Fort Carson military and wildlife officials discovered the ram on the southern end of their property in late August and kept a close eye on it to ensure its safety. The ram was showing signs of old age including decreased muscle mass, fatigue, and had become seemingly unafraid of humans. “We were very fortunate that personnel at Fort Carson found the ram,” said Shaun Deeney, an area wildlife manager from Colorado Springs. “Due to their vigilance, we will be able to preserve this majestic animal for future generations.” The DOW plans to have the ram mounted to use in an educational display. “Our records indicate that bighorn sheep were first documented along the Arkansas River between Pueblo and Cañon City in the early 1990’s, said Bob Davies, a senior biologist with the DOW. “We believe the sheep migrated into the rugged cliffs along the river after transplant operations along Hardscrabble Creek in 1988.” Bighorn sheep are the official state mammal in Colorado. They are an extremely popular animal both for hunting and for wildlife viewing. Many areas of the state have developed wildlife viewing areas specifically for bighorns including Georgetown west of Denver and along the Arkansas River west of Cañon City. At the time of the arrival of European settlers, bighorn sheep were very common throughout Colorado and the Rocky Mountain West. By the end of the 19th century, however, populations of bighorn sheep declined. Although the exact cause of the decline is not fully understood, wildlife biologists believe that parasites and diseases, such as lungworm and pneumonia, may have been key factors. Other reasons included market-hunting to feed a growing population in the gold mining camps. Over the past 50 years, the Colorado DOW has taken a proactive role in sheep management and today there are approximately 8,000 sheep roaming the mountainsides and canyon lands in the state. “Intensive management efforts began in the 1970’s and bighorn sheep populations have been on the rise ever since,” said Davies. In 1962, there were at least 52 known herds of bighorn sheep in Colorado ranging from the Continental Divide to Mesa Verde National Park. Today the number of herds in Colorado has more than doubled.

March 5, 2006 update: Eric Rominger (New Mexico) reported that the ram’s final score was 195 and 5/8.



RECENT LITERATURE **RELATED TO DESERT BIGHORN SHEEP**

Bangs, P. D., P. R. Krausman, K. E. Kunkel, and Z. D. Parsons. 2005. **Habitat use by desert bighorn sheep during lambing.** *European Journal of Wildlife Research* 51:178-184.

Abstract: Habitat used for predator escape may be a factor limiting restoration of desert bighorn sheep (*Ovis canadensis mexicana*) in small mountain ranges in New Mexico. Female bighorn sheep seek isolation in discrete areas for parturition. Although parturition sites are used only for < 3 days they play an important role in neonate survival. We compared habitat characteristics at pre-parturition (n = 21), parturition (n = 38), random (n = 38), and post-parturition sites (n = 21). At each site we calculated distance to steep terrain, elevation, ruggedness, slope, and visibility. Parturition and post-parturition sites were higher in elevation and more rugged than sites used during pre-parturition. Post-parturition sites were closer to terrain with 100% slope than the pre-parturition or parturition sites. Post-parturition sites had higher visibility and steeper slopes than the pre-parturition sites. Parturition sites were steeper, higher in elevation, more rugged, and had lower visibility than the random sites. Fidelity to parturition sites was observed on 1 of 38 occasions. Because lambing sites are used for short periods they are poorly understood and often ignored by land managers. Additional research is recommended in other desert bighorn sheep populations to understand better and predict habitat use during the lambing period.

Bender, L. C. and M. E. Weisenberger. 2005. **Precipitation, density, and population dynamics of desert bighorn sheep on San Andres National Wildlife Refuge, New Mexico.** *Wildlife Society Bulletin* 33:956-964.

Abstract: Understanding the determinants of population size and performance for desert bighorn sheep (*Ovis canadensis mexicana*) is critical to develop effective recovery and management strategies. In arid environments, plant communities and consequently herbivore populations are strongly dependent upon precipitation, which is highly variable seasonally and annually. We conducted a retrospective exploratory analysis of desert bighorn sheep population dynamics on San Andres National Wildlife Refuge (SANWR), New Mexico, 1941 - 1976, by modeling sheep population size as a function of previous population sizes and precipitation. Population size and trend of desert bighorn were best and well described ($R^2 = 0.89$) by a model that included only total annual precipitation as a covariate. Models incorporating density-dependence, delayed density-dependence, and combinations of density and precipitation were less informative than the model containing precipitation alone ($\Delta AICc = 8.5 - 22.5$). Lamb:female ratios were positively related to precipitation (current year: $F_{1,34} = 7.09$, $P = 0.012$; previous year: $F_{1,33} = 3.37$, $P = 0.075$) but were unrelated to population size (current year: $F_{1,34} = 0.04$, $P = 0.843$; previous year: $F_{1,33} = 0.14$, $P = 0.715$). Instantaneous population rate of increase (r) was related to population size ($F_{1,33} = 5.55$; $P = 0.025$). Precipitation limited populations of desert bighorn sheep on SANWR primarily in a density-independent manner by affecting production or survival of lambs, likely through influences on forage quantity and quality. Habitat evaluations and recovery plans for desert bighorn sheep need to consider fundamental influences on desert bighorn populations such as precipitation and food, rather than solely focus on proximate issues such as security cover, predation, and disease. Moreover, the concept of carrying capacity for desert bighorn sheep may need re-evaluation in respect to highly variable (CV = 35.6%) localized precipitation patterns. On SANWR carrying capacity for desert bighorn sheep was zero when total annual precipitation was <28.2 cm.

Blanchard, P. 2005. **On lactation and rumination in bighorn ewes (*Ovis canadensis*).** *Journal of Zoology* (London) 265:107-112.

Abstract: Because lactation has high energetic costs, females should vary their foraging behaviour according to reproductive status. In ungulates, however, some studies found no differences in feeding behaviour between non-reproductive (yeld) and lactating females. Despite the importance of rumination in determining digestive efficiency, no study has attempted to identify tactics involving this parameter in free-ranging ungulates. Whether or not females varied their ruminating behaviour as a function of the presence/absence of offspring was tested by observing marked bighorn ewes *Ovis canadensis* of known reproductive status, age, and body weight. Lactating ewes ruminated 1.21 times faster than yeld ewes and showed less inter-individual variability in rumination speed, suggesting an energetic constraint. After considering the potential physiological advantages of this behaviour, I suggest that differences in ruminating parameters may allow the synchronization of activities in groups made up of individuals with different energy requirements. Lactating females may increase rumination effort in response to increased energetic demands and risk of predation.

Boyce, W. M, and M. E. Weisenberger. 2005. **The rise and fall of psoroptic scabies in bighorn sheep in the San Andres Mountains, New Mexico.** Journal of Wildlife Diseases 41:525-531.

Abstract: Between 1978 and 1997, a combination of psoroptic scabies (*Psoroptes* spp.), mountain lion (*Puma concolor*) predation, and periodic drought reduced a population of native desert bighorn sheep (*Ovis canadensis*) in the San Andres Mountains (SAM), New Mexico, from > 200 individuals to a single ewe. In 1999, this ewe was captured, ensured to be *Psoroptes*-free, and released back into the SAM. Eleven radiocollared rams were translocated from the Red Rock Wildlife Area (RRWA) in New Mexico into the SAM range and monitored through 2002 to determine whether *Psoroptes* spp. mites were still in the environment. None of these sentinel rams acquired scabies during this period, and no additional native sheep were found to be present in the range. In 2002, 51 desert bighorn sheep were translocated into the SAM from the Kofa National Wildlife Refuge in Arizona (n=20) and the RRWA in New Mexico (n=31). Twenty-one bighorn sheep have died in the SAM since that time, but *Psoroptes* spp. mites have not been detected on any of these animals, nor have they been found on mule deer (*Odocoileus hemionus*) sampled since 2000. We conclude that psoroptic scabies is no longer present in the San Andres bighorn sheep population and that psoroptic scabies poses a minimal to nonexistent threat to the persistence of this population at this time.

Epps, C. W., P. J. Palsboll, J. D. Wehausen, G. K. Roderick, R. R. Ramey II, and D. R. McCullough. 2005. **Highways block gene flow and cause a rapid decline in genetic diversity of desert bighorn sheep.** Ecology Letters 8:1029-1038.

Abstract: The rapid expansion of road networks has reduced connectivity among populations of flora and fauna. The resulting isolation is assumed to increase population extinction rates, in part because of the loss of genetic diversity. However, there are few cases where loss of genetic diversity has been linked directly to roads or other barriers. We analysed the effects of such barriers on connectivity and genetic diversity of 27 populations of *Ovis canadensis nelsoni* (desert bighorn sheep). We used partial Mantel tests, multiple linear regression and coalescent simulations to infer changes in gene flow and diversity of nuclear and mitochondrial DNA markers. Our findings link a rapid reduction in genetic diversity (up to 15%) to as few as 40 years of anthropogenic isolation. Interstate highways, canals and developed areas, where present, have apparently eliminated gene flow. These results suggest that anthropogenic barriers constitute a severe threat to the persistence of naturally fragmented populations.

Pelletier, F., K. A. Page, T. Ostiguy, and M. Festa-Bianchet. 2005. **Fecal counts of lungworm larvae and reproductive effort in bighorn sheep, *Ovis canadensis*.** Oikos 110:473-480.

Abstract: Because parasite resistance and reproduction require metabolic resources, life-history models predict a tradeoff between current reproduction and parasite load. These tradeoffs have been widely studied in birds, but few studies have been conducted on mammals. We monitored lungworm (*Protostrongylus* spp.) larvae counts in bighorn sheep (*Ovis canadensis*) over four years to examine how individual differences in fecal output of lungworm larvae (LPG) by yearlings and adults were affected by season, sex, body mass, age

and reproductive effort. We also compared lamb mass at six months and LPG. Overall, we found that LPG varies seasonally, peaking in females prior to lambing and in males during the rut. Age had no effect on LPG for either sex. During autumn, we found no effect of age or mass on LPG for sheep one year and older. Lamb body size or sex did not affect LPG. Females that weaned a lamb had higher counts than females that did not produce a lamb or females whose lamb died during summer. For rams, social rank and testosterone levels were not related to LPG but LPG increased with time spent searching for estrous ewes during the rut. Our results suggest a tradeoff between parasite resistance and reproductive effort in bighorn sheep of both sexes.

FNAWS 2006 PERMIT SALES

Update provided by Ray Lee

At the recent 2006 Foundation for North American Wild Sheep (FNAWS) convention in Reno, Nevada, the following hunting permits were sold at the following listed bids:

STATES:	Alaska (Dall)	\$13,500
	Alberta (RM)	\$85,000
	Arizona (Desert)	\$165,000
	California (Desert)	\$80,000
	Colorado (RM)	\$60,000
	Idaho (RM)	\$55,000
	Montana (RM)	\$115,000
	Nevada (Desert)	\$110,000
	New Mexico (either)	\$185,000
	Utah (RM)	\$67,000
	Utah (Desert)	\$57,500
	Washington (RM)	\$50,000
	Wyoming (RM)	\$55,000
RESERVATIONS	Kluane (Dall)	\$160,000
	Taos (RM)	\$120,000
	Navajo (Desert)	\$45,000 and \$40,000
MEXICO	Carmen Island	\$75,000 and \$65,000
	Tiburon Island	\$65,000 and \$60,000
	Biosphere	\$67,500 and \$66,000

The above is a subset of tags sold. For a complete list you may contact Ray Lee at rlee@fnaws.org. Deer tags also went very well with Utah's selling for \$156,000 and Arizona's for \$142,000.

MEETINGS OF INTEREST

Northern Wild Sheep and Goat Council: The biennial symposium of the Northern Wild Sheep and Goat Council will be held April 2-6, 2006, at Delta Lodge in Kananaskis, Alberta. Registration information can be found on the NWSGC website at www.nwsgc.org.

Desert Bighorn Council: Our next biennial meeting will be held in Las Vegas, Nevada, in April 2007. Ross Haley is the Chair, and can be contacted at Ross_Haley@NPS.gov. Remember to save the date! Detailed information will be posted on our website (<http://www.desertbighornCouncil.org>) at a later date.

