



Bleats and Blats

Official Newsletter of the
Desert Bighorn Council



March 2012

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Hello DBC members and friends,

I hope you enjoy reading the enclosed updates on bighorn sheep management in Texas and Baja California. Also included are abstracts from recent publications related to bighorn sheep, which I'm sure you'll find interesting.

During the past months, the desert bighorn sheep world lost several wonderful friends and accomplished scientists: Warren Ballard, Clarence "Clancy" Gansberg, Stephen Holl, and Gale Monson. This newsletter is dedicated to them and all that they have done for wildlife, especially desert bighorn sheep. As we move ahead with our efforts to manage and conserve bighorn sheep we will always remember their contributions to the wildlife world, as well as their good friendships.

Esther Rubin (DBC Secretary)

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The next newsletter is scheduled for early-summer, so if you have updates or announcements to share, please send them to me by June 1. Also, if you'd like to share your bighorn sheep stories, reports, and/or photos on our website, they would be most welcome. We hope to hear from you!

UPDATE ON WILD SHEEP MANAGEMENT IN BAJA CALIFORNIA

Submitted by Ray Lee, DBC Tech Staff Chair

There have been two recent surveys (one by helicopter in December 2010 and one by foot in January 2011) of wild sheep in Baja California. These surveys were conducted with support of the Autonomous University of Baja California (UABC) in Ensenada. A report on the aerial survey results has been accepted for publication in the California Game and Fish Journal.

In recent months, the Baja California Environmental Protection Agency has helped conduct workshops focused on wild sheep conservation in Baja California. The first of these workshops was held in Ensenada on February 16, 2011. This “First Experts Workshop on the Conservation and Sustainable Management of Bighorn Sheep in Baja California” was attended by federal and state agencies, the University, as well as a number of biologists and other interested parties. The second Experts workshop was held November 3-4, 2011, in Ensenada. On November 10-11, 2011, the Center for University Studies of the UABC in Mexicali held a “Forum on the University and Bighorn Sheep”. I made presentations at all three of these events discussing the status of bighorn sheep in Baja California, the economics of wild sheep management, and the potential market for wild sheep.

In anticipation of Baja California being re-opened for wild sheep hunting (it has been closed since a Presidential decree in 1990), the Mexican Hunting Federation, in cooperation with the Boone and Crockett Club, is hosting a scorer’s workshop in Tijuana on March 10, 2012.

TEXAS PARKS AND WILDLIFE DEPARTMENT DESERT BIGHORN RESTORATION UPDATE

Submitted by Froylán Hernández, Texas Parks and Wildlife Department



Today, desert bighorn sheep are coming back to mountain ranges in Texas. Thanks to decades of work by Texas Parks and Wildlife Department (TPWD), various state agencies including Arizona, Utah, and Nevada, as well as wildlife conservation groups such as Texas Bighorn Society, Wild Sheep Foundation, and Dallas Safari Club. Of equal importance have been the many private landowners and individuals committed to the restoration and management of desert bighorn sheep.

TPWD biologists reported over 1,100 sheep in Texas in September 2010, up from 822 in 2006 and 352 in 2002. This upward trend prompted planning and coordination for captures and transplants.

In December 2011, TPWD conducted the largest in-state capture and transplant in Texas bighorn restoration history. A total of 95 bighorn sheep (19 M, 76 F) were captured from the Beach, Baylor, and Sierra Diablo Mountains located north of Van Horn, TX. All bighorn sheep were transplanted to the Bofecillos Mountains of Big Bend Ranch State Park, over 160 miles to the southwest.

Of these 95, 43 were radio-collared to monitor the bighorn sheep for up to 2 years. Monitoring will not only allow us to gauge the success of the transplant, but more importantly provide data that will aide in furthering the understanding of bighorn sheep and its management in Texas.

The December 2011 transplant to the Bofecillos Mountains was the second reintroduction effort to that area. The first reintroduction occurred in December 2010 when 46 desert bighorns (12 M, 34 F) were translocated to the Bofecillos from Elephant Mountain Wildlife Management Area. Of the 46, 35 were fitted with radio-transmitters to facilitate monitoring. Up until this point, the Bofecillos Mountains and surrounding ranges had been unoccupied by desert bighorn sheep for over 50 yrs.

Over 140 desert bighorn sheep have been relocated to the Bofecillos Mountains within the last year with almost 80 of those fitted with radio-collars.



Photo by Mike Pittman (TPWD)

RECENT LITERATURE RELATED TO BIGHORN SHEEP

Cahn, M. L., M. M. Conner, O. J. Schmitz, T. R. Stephenson, J. D. Wehausen, and H. E. Johnson. 2011. Disease, population viability, and recovery of endangered Sierra Nevada bighorn sheep. *Journal of Wildlife Management* 75:1753-1766.

Abstract: Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*) experienced a severe population decline after European settlement from which they have never recovered; this subspecies was listed as endangered under the United States Endangered Species Act (ESA) in 1999. Recovery of a listed species is accomplished via federally mandated recovery plans with specific population goals. Our main objective was to evaluate the potential impact of disease on the probability of meeting specific population size and persistence goals, as outlined in the Sierra Nevada bighorn sheep recovery plan. We also sought to heuristically evaluate the efficacy of management strategies aimed at reducing disease risk to or impact on modeled bighorn populations. To do this, we constructed a stochastic population projection model incorporating disease dynamics for 3 populations (Langley, Mono, Wheeler) based on data collected from 1980 to 2007. We modeled the dynamics of female bighorns in 4 age classes (lamb, yearling, adult, senescent) under 2 disease scenarios: 5% lower survival across the latter 3 age classes and persistent 65% lower lamb survival (i.e., mild) or 65% reduced survival across all age classes followed by persistent 65% lower lamb survival (i.e., severe). We simulated management strategies designed to mitigate disease risk: reducing the probability of a disease outbreak (to represent a strategy like domestic sheep grazing management) and reducing mortality rate (to represent a strategy that improved survival in the face of introduced disease). Results from our projection model indicated that management strategies need to be population specific. The population with the highest growth rate (λ -hat; Langley; λ -hat = 1.13) was more robust to the effects of disease. By contrast, the population with the lowest growth rate (Mono; λ -hat = 1.00) would require management intervention beyond disease management alone, and the population with a moderate growth rate (Wheeler; λ -hat = 1.07) would require management sufficient to prevent severe disease outbreaks. Because severe outbreaks increased adult mortality, disease can directly reduce the probability of meeting

recovery plan goals. Although mild disease outbreaks had minimal direct effects on the populations, they reduced recruitment and the number of individuals available for translocation to other populations, which can indirectly reduce the probability of meeting overall, range-wide minimum population size goals. Based on simulation results, we recommend reducing the probability of outbreak by continuing efforts to manage high-risk (i.e., spatially close) allotments through restricted grazing regimes and stray management to ensure recovery for Wheeler and Mono. Managing bighorn and domestic sheep for geographic separation until Sierra Nevada bighorn sheep achieve recovery objectives would enhance the likelihood of population recovery.

Johnson, H. E., L. S. Mills, J. D. Wehausen, T. R. Stephenson, and G. Luikart. 2011. Translating effects of inbreeding depression on component vital rates to overall population growth in endangered bighorn sheep. *Conservation Biology* 25:1240-1249.

Abstract: Evidence of inbreeding depression is commonly detected from the fitness traits of animals, yet its effects on population growth rates of endangered species are rarely assessed. We examined whether inbreeding depression was affecting Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*), a subspecies listed as endangered under the U.S. Endangered Species Act. Our objectives were to characterize genetic variation in this subspecies; test whether inbreeding depression affects bighorn sheep vital rates (adult survival and female fecundity); evaluate whether inbreeding depression may limit subspecies recovery; and examine the potential for genetic management to increase population growth rates. Genetic variation in 4 populations of Sierra Nevada bighorn sheep was among the lowest reported for any wild bighorn sheep population, and our results suggest that inbreeding depression has reduced adult female fecundity. Despite this population sizes and growth rates predicted from matrix-based projection models demonstrated that inbreeding depression would not substantially inhibit the recovery of Sierra Nevada bighorn sheep populations in the next approximately 8 bighorn sheep generations (48 years). Furthermore, simulations of genetic rescue within the subspecies did not suggest that such activities would appreciably increase population sizes or growth rates during the period we modeled (10 bighorn sheep generations, 60 years). Only simulations that augmented the Mono Basin population with genetic variation from other subspecies, which is not currently a management option, predicted significant increases in population size. Although we recommend that recovery activities should minimize future losses of genetic variation, genetic effects within these endangered populations either negative (inbreeding depression) or positive (within subspecies genetic rescue) appear unlikely to dramatically compromise or stimulate short-term conservation efforts. The distinction between detecting the effects of inbreeding depression on a component vital rate (e.g., fecundity) and the effects of inbreeding depression on population growth underscores the importance of quantifying inbreeding costs relative to population dynamics to effectively manage endangered populations.

Subramaniam, R., S. Shanthalingam, J. Bavananthasivam, A. Kugadas, K. A. Potter, W. J. Foreyt, D. C. Hodgins, P. E. Shewen, G. M. Barrington, D. P. Knowles, and S. Strikumar. 2011. A multivalent *Mannheimia-Bibersteinia* vaccine protects bighorn sheep against *Mannheimia haemolytica* challenge. *Clinical and Vaccine Immunology* 18:1689-1694.

Abstract: Bighorn sheep (BHS) are more susceptible than domestic sheep (DS) to *Mannheimia haemolytica* pneumonia. Although both species carry *M. haemolytica* as a commensal bacterium in the nasopharynx, DS carry mostly leukotoxin (Lkt)-positive strains while BHS carry Lkt-negative strains. Consequently, antibodies to surface antigens and Lkt are present at much higher titers in DS than in BHS. The objective of this study was to determine whether repeated immunization of BHS with multivalent *Mannheimia-Bibersteinia* vaccine will protect them upon *M. haemolytica* challenge. Four BHS were vaccinated with a culture supernatant vaccine prepared from *M. haemolytica* serotypes A1 and A2 and *Bibersteinia trehalosi* serotype T10 on days 0, 21, 35, 49, and 77. Four other BHS were used as nonvaccinated controls. On the day of challenge, 12 days after the last immunization, the mean serum titers of Lkt-neutralizing antibodies and antibodies to surface antigens against *M. haemolytica* were 1:160 and 1:4,000, respectively. Following intranasal challenge with *M. haemolytica* A2 (1 x 10⁵ CFU), all four control BHS died within 48 h. Necropsy revealed acute fibrinonecrotic pneumonia characteristic of *M. haemolytica* infection. None of the vaccinated BHS died during the 8 weeks postchallenge

observation period. Radiography at 3 weeks postchallenge revealed no lung lesions in two vaccinated BHS and mild lesions in the other two, which resolved by 8 weeks postchallenge. These results indicate that if BHS can be induced to develop high titers of Lkt-neutralizing antibodies and antibodies to surface antigens, they are likely to survive *M. haemolytica* challenge which is likely to reduce the BHS population decline due to pneumonia.

DBC SAYS GOOD-BYE TO LONG-TIME FRIENDS

In Memory of Warren B. Ballard, Jr.

Submitted by Mara Weisenberger (U.S. Fish and Wildlife Service), DBC Tech Staff member

Wildlife and its managers lost a good friend in January 2012 with the passing of Warren Ballard. Warren touched the lives of many fellow biologists throughout his expansive career, many of whom he never met. I was fortunate to go to graduate school with Warren and quickly gravitated toward his positive energy, sense of humor, and work ethic. Through the past couple of decades he and Heather remained good friends and colleagues. Warren was always accessible and I knew I would get an honest answer every time I had a question, even if it wasn't the easiest to hear...but he was always right. With his perpetually direct approach, Warren helped shape my career, and countless other individuals. When I had doubts about my career path, he offered exasperated advice such as "what the h--- are you thinking?!" with uncompromising encouragement to be strong and stand up for the resource. His friendship was invaluable when standing strong was challenging and Warren lead by example by contributing to wildlife management and the lives of many students, regardless of his own circumstances. We are better for having known him.

Warren's obituary was printed on the Lubbock Avalanche-Journal Online site (<http://lubbockonline.com/obituaries/2012-01-15/dr-warren-b-ballard-jr>), and is reprinted here:



Dr. Warren B. Ballard, Jr., beloved husband of Heather A. Whitlaw and widely-published author and nationally-recognized professor in Texas Tech University's Department of Natural Resources Management passed away peacefully at his Lubbock home on January 12, 2012 after a brave fight with pancreatic cancer.

He is lovingly remembered by his mother, LaVerne Rosemary Ballard (nee Bernat); wife, Heather Whitlaw; children, Cindy Bergamo and husband, Greg, Laurina Wittig and husband, Thomas, Warren Ballard, III and Raymond Ballard; grandsons, Ezra Bergamo, and Blair and Brandon Ballard; mother-in-law, Nan McGhee, father-in-law, David Whitlaw, sister-in-law, Patricia Whitlaw; nieces, Elizabeth Jones and Paige Jones; and graduate students, colleagues, and friends around the world.

He was preceded in death by his father, Warren Baxter Ballard, Sr.

"His legacy lives on in the students, faculty and research projects he touched," said Michael Galyean, Interim Dean of the College of Agricultural Sciences and Natural Resources. During Warren's long career he produced more than 200 peer-reviewed journal articles and raised some \$3.2 million in grant, contract and research support.

"Warren was my friend since graduate school, an internationally-recognized research scientist, a major figure in this wildlife program, and an irreplaceable part of our department," said Mark Wallace, chairman of Tech's

Department of Natural Resources Management.

Warren was born on April 28, 1947 in Boston, MA, to LaVerne Rosemary Ballard (Bernat). LaVerne soon met her husband and Warren's adoptive father (Warren Baxter Ballard, Sr.) and the family moved to Albuquerque, NM in the early 1950s where Warren attended St Pius X High School. He earned a Bachelor's degree in fish and wildlife management from New Mexico State University and his Master's degree in environmental biology from Kansas State University. He earned his doctorate in wildlife science from the University of Arizona. On June 7, 1995, Warren married the love of his life, Heather Whitlaw in Fredericton, New Brunswick, Canada.

Dr. Ballard was a Texas Tech Horn Professor and the Bricker Chair in Wildlife Management. A Horn professorship is the highest honor a faculty member can receive from the university. "Horn Professors are a testament to the quality of our academics because they represent the very best of our faculty," said Guy Bailey, Texas Tech president.

Warren was the Editor-in-Chief of the Wildlife Society Bulletin, an international scientific journal for wildlife scientists. In 2009, Ballard was awarded the Outstanding Research Award from Texas Tech's College of Agricultural Sciences and Natural Resources, and the Outstanding Achievement Award from the Texas Chapter of the Wildlife Society in 2007.

He was named a Wildlife Society Fellow by the National Wildlife Society in 2005, and was presented the Chancellor's Council Distinguished Research Award at Texas Tech in 2002. He was presented a special service recognition award from the Wildlife Society that same year. In 1989, Warren was honored by his peers with the Distinguished Moose Biologist award.

Prior to joining the Tech faculty in 1998, Dr. Ballard worked as a research supervisor with the Arizona Game and Fish Department. He also served as director and associate professor with the New Brunswick Cooperative Fish and Wildlife Research Unit at the University of New Brunswick (Canada). Warren spent 18 years as a wildlife biologist and research scientist with Alaska Department of Fish and Game. His ground-breaking research on predator-prey relationships, wolf ecology, and ungulate populations is still widely recognized.

In Memory of Dr. Clarence "Clancy" Gansberg

Submitted by Ray Lee, DBC Tech Staff Chair



Wildlife professionals, by definition, are paid to travel to/from and to participate in field projects. Many of these projects are difficult; some even dangerous. A group that often makes these projects possible, frequently adding skills and talents not generally possessed by wildlife professionals, is comprised of volunteers. These people donate not only their time and talents, but they also pay their own way to participate in these projects. These volunteers are truly dedicated to wildlife conservation.

We recently lost one of the most dedicated of these volunteers. Dr. Clarence "Clancy" Gansberg, DVM, died at home in Yuma, Arizona, December 5, 2011, at the age of 88.

Clancy was born January 24, 1923, in Webster, South Dakota, and grew up in Stanwood, Washington. He worked as a sheet metal fitter in the ship yards before joining the Army Air Corps during WWII. As a First Lieutenant, he flew the Boeing B29 Superfortress. He survived 30 missions over Japan; and was awarded the Distinguished Flying Cross, the Air Medal with four Oak Leaf Clusters, six Asiatic-Pacific ribbons, and the Presidential Unit Citation.

After the war, he studied to become a Doctor of Veterinary Medicine at Washington State University. He then moved to Klamath Falls, Oregon, where he lived and practiced for 30 years. He, and his first wife Marjorie Petty, raised 3 boys - James, Ronald, and Jeffrey. Clancy was an avid hunter and fisherman; and was active in several service organizations.

After retiring in 1981, he traveled in the summer and wintered in Yuma, Arizona. After learning of a WWII B17 bomber that had crashed into the Gila Mountains during training, he climbed to the crash site many times, and spearheaded an effort to construct a monument to the crew. In Yuma, he met his second wife Loree Wirt, and continued his associations with service organizations.

Annually he volunteered with the Arizona Game and Fish Department as a veterinarian during captures of desert bighorn sheep and Sonoran pronghorn. Clancy first showed up at some of our bighorn sheep capture sites near Yuma in the mid-1980s; eventually showing up at nearly every wildlife capture the Arizona Game and Fish Department did.

The level of care at our wildlife captures changed significantly after Clancy showed up - they went from rather amateurish efforts to carefully orchestrated mobile hospitals - with the mortality rates during captures plunging. During the 20 year period from 1985-2005, he handled 748 bighorn sheep during translocations. During these events he had the opportunity to pioneer some new techniques. One of these was published in the Desert Bighorn Council Transactions, "Survival of bighorn sheep following surgical amputation of fractured limbs" co-authored with his long time partner and fellow veterinarian Bob Kreycik. Clancy even sewed up the kneecap (with no anesthetic) of one of our net gunners, who had accidentally shot himself in the knee.

Dr. Gansberg's family has asked that memorial donations be sent to the Shriners Children's Hospital and the Desert Bighorn Council's Hansen-Welles Scholarship Fund.



Clancy at work at a bighorn sheep capture (in yellow shirt and white hat)

In Memory of Stephen Holl

Submitted by Vern Bleich, DBC Member

Stephen A. Holl (1949-2012), who is best known for his work on bighorn sheep in the San Gabriel Mountains of California, passed away on 13 January 2012 at the age of 62 following a valiant battle with brain cancer. Steve held B.S. and M.S. degrees from the University of California Davis, and Fresno State University, respectively. His early work centered on the relationships between body condition and productivity among mule deer occupying the western slope of the Sierra Nevada.

In 1978, Mr. Holl was hired as a wildlife biologist on the San Bernardino National Forest (SBNF), where his sole duty was to investigate the ecology of bighorn sheep in the San Gabriel Mountains, a southern California mountain range dominated by chaparral vegetation. Steve spent the next 5 years compiling the most detailed

information ever assembled on habitat characteristics, population dynamics, behavior, and food habits of bighorn sheep in that range, and in 1983 published an extensive report title, "San Gabriel Mountain Sheep: Biological and Management Considerations." Steve worked diligently with conservation organizations and sportsman's groups to refine and formalize the San Gabriel Mountains bighorn sheep survey, which has continued largely on an annual basis for >30 years, and will take place again this Winter.



While with the SBNF, Steve mentored two graduate students—Kathleen (Hamilton) Longshore and William Perry. He also was responsible for the translocation of bighorn sheep to historical habitat within the San Gabriel Mountains—the first translocation of desert bighorn sheep ever to occur in California—and to formerly occupied habitat in the Coast Range of Ventura County. Steve also collaborated on two papers positing that bighorn sheep are distributed across the landscape as metapopulations, a concept that has evolved into a conservation paradigm.

Steve left federal employment in 1987 to pursue opportunities in private enterprise. Nonetheless, he maintained a strong focus on bighorn sheep and, as his interests broadened and he gained expertise in fire ecology, he spent countless hours developing ideas, analyzing data, and preparing manuscripts. Steve also played a prominent role in the recent decision by the California Department of Transportation to not re-open California Highway 39 because of potential impacts bighorn sheep. He recognized the role of fire in the chaparral ecosystems of southern California, was critical of the fire suppression policies of land management agencies, remained a staunch proponent of the value of wildfires, and strongly advocated prescribed fire as a habitat enhancement tool.

As chaparral vegetation matured in the San Gabriel Mountains, bighorn sheep declined from approximately 750 animals in 1980 to fewer than 200 in the late 1990s. That decline was of considerable concern and, in 2004 at the request of the Los Angeles County Fish and Game Commission and the USFS, Steve prepared a detailed conservation and restoration strategy. That document was signed by the forest supervisors on the Angeles and San Bernardino national forests and by 2 regional managers from the California Department of Fish and Game, and provides the basis for actions on behalf of bighorn sheep that may be forthcoming. Although management agencies failed to implement most of the recommendations contained in the 1983 report, the 2004 document called for extensive stakeholder involvement in an effort to enhance the probability of implementation. While preparing the recent strategy, Steve published three professional papers detailing the long-term population history of bighorn sheep in that range; three other papers were in preparation at the time of his death, and will be completed by his collaborators.

Steve was a member of The Wildlife Society, and served as Vice-President, President, and Past President of The Western Section. He was also a member of the Desert Bighorn Council, and most recently attended the meeting at Grand Junction, Colorado, where the results of some of his work was presented. His public service included tenure as Chairman of the Parks and Recreation Commission of the City of Folsom, where he was instrumental in setting aside land for local parks. Steve's efforts on behalf of conservation were recognized in May 2010, when he was the recipient of the Lifetime Achievement Award from the Society for the Conservation of Bighorn Sheep and the Trail Blazer Award from the California Chapter of The Wild Sheep Foundation.

Steve's spirit lives on through Mary, his best friend and devoted wife of 37 years, twin daughters Amy and Eryn and their families, his mother and 6 brothers, and 11 nephews and nieces. The family is extremely grateful for the care Steve received at UCSF in a clinical trial involving a vaccine treatment for malignant brain tumors, which provided him the gift of time and allowed him to walk Eryn down the aisle and be here for the births of two of Amy's children.

The family suggests that friends wishing to honor Steve can best do so through a gift to any of the following

organizations: The Society for the Conservation of Bighorn Sheep, P.O. Box 94182, Pasadena, CA 91109; The Parsa Vaccine Fund or the Neuro-Oncology Fund in the brain tumor program at UCSF. Checks may be made out to the UCSF Foundation (with the fund specified) and sent in c/o Eileen Murphy, 220 Montgomery Street, 5th Floor, San Francisco, CA 94104.

In Memory of Gale Monson

Prepared by Esther Rubin, DBC Secretary

When I started studying bighorn sheep, the book “The Desert Bighorn” served as an invaluable resource on these incredible animals. Today, my copy of this book is well-worn, with notes and dog-eared pages throughout. Many of you may also have relied on this book, which is still one of the most complete sources of information on desert bighorn sheep. I never had the opportunity to meet Gale Monson, but the names “Monson and Sumner” will always stick in my mind as editors of this well-used book. Gale Monson passed away at the age of 99 this past February, after a lifetime committed to the study of the natural world – birds, bighorn sheep, and beyond. The following obituary was presented in The Arizona Daily Star (<http://www.legacy.com/obituaries/tucson/obituary.aspx?n=gale-wendell-monson&pid=156261232>). An amazing career and life-long dedication to the natural world.

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*Gale Wendell Monson Naturalist and Author Gale W. Monson, born August 1, 1912, passed away peacefully at his Albuquerque home on February 19, 2012. He was preceded in death by his beloved wife of 54 years, Sally. He is survived by his five children: Rosemary Remacle (Sunnyvale, CA); Margaret Monson (Seattle, WA); Fred Monson (Lehigh Acres, FL) and his Albuquerque daughters, Anne Monson and Ruth Bear and their respective husbands, J.G. Alaimo and David Bear. He is also survived by eight grandchildren and seven great-grandchildren. Born in Munich, North Dakota, Gale studied the natural world throughout his life, from his early years on his parents' farm and through almost a century of living, this was his passion. He spent his professional life working for the U.S. Bureau of Indian Affairs, the Soil Conservation Service and the U.S. Fish and Wildlife Service. His work assignments took him and his family to Albuquerque, Gallup and Socorro, New Mexico; Parker, Yuma, and Tucson, Arizona and Washington D.C. As part of the "greatest generation,"*

*he served in the U.S. Army medical service corps in the Burma-India theater during WWII. Gale loved the Sonoran Desert and spent the bulk of his life's work there, where he contributed greatly to its study. His greatest passion was ornithology, but he had an abiding love for the study of the natural world in its entirety. He moved to Arizona in 1934 where he worked until 1940 as a biologist on Papago (now Tohono O'Odham) and Navajo tribal lands, as well as for the Soil Conservation Service in Arizona and New Mexico. In 1940 until 1969, except for time spent in the Army during WWII, he worked for the U.S. Fish and Wildlife Service at refuges in New Mexico and Havasu and Imperial National Wildlife Refuges on the Colorado River, and on the Kofa and Cabeza Prieta Game Ranges in Arizona. From 1971-1977, Gale served the Arizona-Sonora Desert Museum as the supervisor in charge of weekends, holidays and as acting director in the absence of the director. He is best known as one of the authors of *The Birds of Arizona*, as well as *The Desert Bighorn*, *The Birds of Sonora*, and *The Annotated Checklist of Arizona Birds*. Gale also authored and edited numerous other publications during his career. He was a prolific writer and record keeper; Southwestern ornithologists continue to refer to his extensive written records of bird sightings. Gale influenced numerous people throughout his life and will live on in the hearts and memories of his family and many friends. A Memorial Service will be held in Tucson on*

*Sunday, March 18, 2012 please contact a family member for details. Contributions in his memory can be made to the Gale Monson Research Grant fund of the Arizona Field Ornithologists at [www.azfo.org/grants.html](http://www.azfo.org/grants.html).*

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