


The **Bighorn**

SPRING 2023



>>> PUBLICATION OF THE TEXAS BIGHORN SOCIETY

Restoring Bighorn Sheep to their Native Ranges in Texas, and Ensuring the Viability of their Habitat



Balcones Cement
2580 Wald Road
New Braunfels, TX 78132

Building the future™



EL CARMEN LAND & CONSERVATION CO. LLC
CEMEX USA & JOSIAH AUSTIN RANCHES

A WORKING PARTNER WITH THE TEXAS BIGHORN SOCIETY TO INSURE THE FUTURE OF
THE DESERT BIGHORN SHEEP IN WEST TEXAS

Bighorn

The official magazine of the Texas Bighorn Society
Advertising Rates Effective 1-1-2009
Bighorn is published 3 times annually

TECHNICAL SPECIFICATIONS

Bighorn is a four-color glossy publication, and the following is required:

Ads should be supplied via email and in one of the following formats:

- PDF (Preferred)
- TIFF
- JPEG

Each ad should be: 300dpi (minimum) in CMYK color space

All other formats must be approved by our production staff

SUBMISSION DEADLINES

Spring-Summer - June 20th

Fall - October 1st

Winter - February 10th

DISPLAY ADVERTISEMENT RATES

Location	Rate Per Issue
Inside Front Cover (Supply as full color bleed)	\$270.00
Inside Back Cover (Supply as full color bleed)	\$270.00
Back Cover (Supply as full color bleed)	\$315.00
Full Page (Supply as full color bleed)	\$225.00
Half Page (4-3/4" Tall x 8" Wide)	\$175.00
Third Page (4-3/4" Tall x 5-1/4" Wide)	\$120.00
Quarter Page (1-3/4" Tall x 8" Wide)	\$ 75.00

Note: An exchange of advertising for Donations, Sponsorships, and In-Kind Advertising will be considered on a case by case basis.

PRODUCTION

Bighorn's production staff is available to help you build your advertising copy. Production costs, hourly rates, and estimates are available upon request.

STAFF

Editor-in-Chief

Bonnie McKinney
bonnie2mckinney@gmail.com

Graphic Design

Cannon Graphics / Jenny Hunkin
www.cannon-graphics.com

Printing

Midtown Print / John Frullo
www.midtownprint.com

Marketing / Advertising

Kathy Boone & Crisy Stratton
info@texasbighornsociety.org

CONTENTS

- 05** New Members
- 06** A Letter from the President
- 07** Editor's Letter
- 08** This & That
- 09** Memorial Dedication
John Virgil Walter
- 10** TPWD News
- 14** Trans Pecos Wildlife Water
Quality Research
Christopher R. Carter, Ph.D.
- 19** Desert Bighorn Program Update
Froylán Hernández
- 22** Mitochondrial and Nuclear Gnomes
Reflect Different Evolutionary Trajectories
Emily Wright
- 25** TBS Work Project 2023



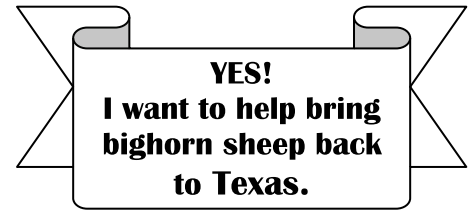
Photo by Chris Stahl

Spring 2023

BIGHORN



SIGN ME UP FOR:



- Annual TBS Individual Membership \$ 40.00
- Three-year TBS Individual Membership \$ 115.00
- Individual TBS Membership *PLUS* Joint Membership in Wild Sheep Foundation \$ 75.00
- Three-year TBS Membership *PLUS* Joint Membership in Wild Sheep Foundation \$ 210.00
- Active Military/Student TBS Individual Membership \$ 25.00
- Annual TBS Family Membership \$ 75.00
- Annual TBS Sponsor Membership \$ 250.00
- TBS Life Membership \$ 1,000.00
- WSF Life Membership (age bracket discounts available) \$ 1,000.00

GUZZLER SPONSORSHIPS

- Guzzler Full Curl Sponsorship \$10,000.00
- Three Fourths Curl Sponsorship \$ 5,000.00
- Half Curl Sponsorship \$ 2,500.00

Name _____ Spouse _____

Address _____

City _____ State _____ Zip _____

Home Phone _____ Cell Phone _____ Office Phone _____

Email _____

Date: _____

Payment Method: Cash Check Credit Card - (MasterCard, VISA, Discover, AMEX)

MC/Visa/Discover/AMEX Card Number: _____ Expiration Date: _____

CVV# _____

Signature _____

TEXAS BIGHORN SOCIETY
 1615 WEST LOOP 289, LUBBOCK, TEXAS 79416
 806-745-7783 | 806-745-8475 fax
www.texasbighornsociety.org
crisy@texasbighornsociety.org

OFFICERS

Sam Cunningham (Tracy) *President*
 6200 Willow Oak Place
 Amarillo, TX 79124
 806.282.6889 (M)
 scunningham@quailcreekent.com

Ace High (Karen) *Vice President*
 PO Box 39
 Westhoff, TX 77994
 361.275.4064 (M)
 ace.high.tx@gmail.com

Curt Brockmann (Tina) *Secretary*
 1714 Aspen Ridge
 San Antonio, TX 78248
 210.846.4516 (M)
 cdbrockmann@cpsenergy.com

Kathy Boone (Dan) *Treasurer*
 1615 West Loop 289
 Lubbock, TX 79416
 806.438.3939 (M)
 kboone@sonoramfg.com

DIRECTORS

Jim Breck Bean
 PO Box 1883
 Alpine, TX 79830
 915.526.3001 (M)
 highwestoutfitter@yahoo.com

Clay Brewer (Helen)
 131 County Road 458
 Rochelle, TX 76872
 325.792.4177 (M)
 claybrewer1@outlook.com

Charlie Butler
 327 Palmero
 Corpus Christi, TX 78404
 361.883.7506 (H)
 361.883.3811 (B)
 361.883.6275 (F)
 crbutlerlaw@sbcglobal.net

Tommy Caruthers (Patricia) (Emeritus)
 209 Ridgecrest Circle
 Denton, TX 76205
 940.391.1730 (M)
 tommy@caruthersoil.com

Lynton Holloway (Wendy)
 PO Box 79577
 Ft. Worth, TX 76179
 817.271.7558 (M)
 lyntonholl@netscape.net

Walker Netherton (Carson)
 2200 W. Golf Course Rd.
 Midland, TX 79701

Dirk Parks (Susan)
 3600 Timberwolf Trail
 Midland, TX 79705
 432.288.4784 (M)
 parks8@swbell.net

Terry Rathert
 3 Heritage Trail
 Magnolia, TX 77354
 713.504.1789
 flyfish2@sbcglobal.net

ADVISORY BOARD

Charlie Barnes
 Ron Bell
 Vernon Bleich
 J.D. Bolner
 Steve Bolner
 Jerrell Coburn
 Warren Conway
 Chuck Cox

Brian Fienhold
 Terry Fricks
 Parker Hall
 Froylan Hernandez
 Rutledge High
 Hunter Holloway
 Robert Joseph
 Carson Keys

Tyler Mansell
 Bob McCoy
 Billy Pat McKinney
 Bonnie McKinney
 John Meyer
 James Payne III
 Bill Scott
 Carleton Turner

Howdy, New Members!

On behalf of the current members, the TBS Officers & Directors, and all the Texas Bighorn Sheep your patronage will go to support, we'd like to welcome you to our organization! We appreciate your support and look forward to seeing you at the next TBS event!

individual

Todd Allen	Denis Foley	Ed Prybil
Dr. Jamie Benn	Hailey Folsom	Ravin Reddy
Brooke Bowman	Douglass Fontaine	Alphonse Schwenke
Cody Cook	Phil Jones	Cole Trichell
Kenny Danielson	David Lytle	Dallas Wacker
Matthew De Shields	Benjamin Morlang	John Wasserburger
Sterling Ellis	Ryan Ownings	Frank Watrous

three year membership

Lee Bernhoft (Upgrade)	Clifton Ladd
John Boehm	David Morris
Timothy Dahlstrom	Lance Trebesch

sponsor

Jim and Nancy Higdon (Upgrade)

family

Zachary and Isabel Banks
 Brandon and Leslyn Boyles
 Nathan and Kim East

student/military

Kagen Burkett	Matt McGinnis
Caleb Clarkson	Trevor Meier
Rebecca De La Riva	Rhett Payne
Jenna Le Blanc	Dray Schmidt
Meghan Martinski	Tanya Trevino

life

Michael McComas	John Moncrief (Upgrade)
Coley Means	Steve Quisenberry
Jon Means	Jay Webster, JR

*** please,**

Help us stay current with your address and email information! Contact Kathy Boone if you have moved, changed email addresses, or have questions about your membership. She can be reached at: **info@texasbighornsociety.org** or **806.745.7783**

A LETTER FROM THE PRESIDENT

“Members,

Congratulations on another successful work project. Weather cooperated fully and we completed everything on Friday. Thanks to Ace and Lynton for running the sites, to all the hard working volunteers, and to our TPWD partners. A special “Thank You” goes out to Panhandle Chapter of the Dallas Safari Club for sponsoring Site 1. Their generous support cannot be overstated.

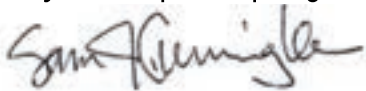
Our Adopt A Guzzler program is gaining support. We recently had participants from the Texas Tech University School of Veterinary Medicine “adopt” two more guzzlers on Black Gap WMA. Thanks to those vet students! Also, Ace High has agreed to coordinate all Adopt A Guzzler activities in the future. Please see the website for more information.

It is with great sadness that all Texans are bidding a fond farewell to retiring TPWD Executive Director Carter Smith. Congratulations to Carter for an outstanding 15 year career as Executive Director, protecting the wildlife of Texas. We also congratulate and welcome our new Executive Director, David Yoskowitz. Texas is fortunate to have David as our new Executive Director and TBS is looking forward to working with him.

Don't forget our RoundUp this year in Tapatio Springs on June 9 and 10, If you haven't registered, please do so on the website. Also, if you haven't had the opportunity to purchase tickets for our upcoming raffles, you can do that on line also.

Finally, a reminder that the Desert Bighorn Council will be held in Alpine, Texas on the Sul Ross campus on April 11-14. The Desert Bighorn Council was established to promote the advancement of knowledge concerning the desert bighorn sheep and the long-range welfare of these animals. ”

See you at Tapatio Springs!



Sam Cunningham, President
Texas Bighorn Society



EDITOR'S *letter*



Bonnie McKinney
Editor, *The Bighorn*

Many thanks to Chris Stahl for the great cover photo for this issue of "The Bighorn." A outstanding photo, I think that lamb should have a banner that says "Don't Mess With Texas Bighorns," great to see this healthy lamb and ewe.

The new year kicked off with Dallas Safari Club Convention, followed shortly by Wild Sheep Show in Reno, Nevada. TBS had booths at both conventions sharing with the public information about TBS and desert bighorns in west Texas, many thanks to the members that helped with the booths.

The 2023 Work Project was a return to the Eagle Mountains to build two more water guzzlers for desert bighorns. The turnout was great with many young people participating which is always good to see. We also had the great pleasure of meeting 5 ½ year old Miss Emma Boyles, who put in a full day's work on top of the mountain. In a personal interview with Miss Emma that afternoon, she shared with me how much fun she had on the mountain and what all she did, like shoveling and hauling rocks, and even taking a tumble with two scratch marks to prove it. Later that evening at dinner, President, Sam Cunningham personally thanked her for her efforts and gave her a TBS cap. Great to have Miss Emily on board with TBS.

Prior to the work project at board meeting Thursday, TTU, Emily Wright who has been completing her doctorate on desert bighorn genetics and disease factors in aoudad and bighorn sheep presented her findings; followed by Dr. Robert Bradley who summarized her genomic and disease data sets, and made several recommendations for consideration by TBS, TPWD and landowners. He also made a plea for samples from captures and hunts to be placed in the Natural Science Resource Lab at TTU to continue expansion of their "living genomic database." Dr. Warren Conway, TTU, introduced Christopher Carter, who will be conducting research using water sampling in the Trans-Pecos to detect diseases that may be present in water sources used by desert bighorns, aoudad and other wildlife.

The 57th meeting of the Desert Bighorn Council will be held in Alpine, Texas on April 11-14, 2023. The theme of meeting this year is: "The Good, The Bad, and The Ugly: success, disease and aoudad/predators. Details are on the web page for Desert Bighorn Council. This will be a great conference and covers the southwestern states.

ROUNDUP is set for June 9-10th at Tapatio Springs, registration and details are included in this issue. Hope to see everyone there!

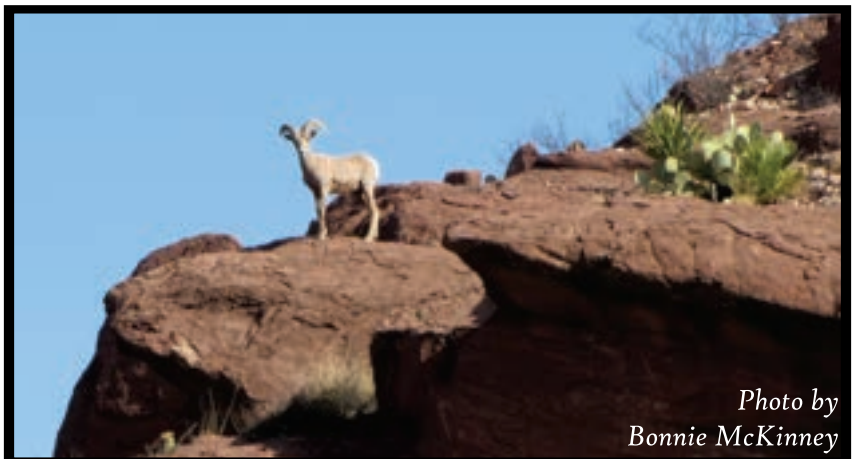


Photo by
Bonnie McKinney

Bonnie McKinney

Bonnie McKinney, Editor
Wildlife Coordinator, Cemex-Texas
El Carmen Land & Conservation Co.

This & That

JANUARY 2023 BOARD MEETINGS SUMMARY

by Curt Brockmann, Secretary

The TBS Board meeting was held on January 7th in Dallas, Texas during the Dallas Safari Club Convention. The meeting was called to order, and the Board approved the minutes from the October 15th Board meeting.

We have 819 members as of January 2023, which is 28 more than we had at the end of 2021. The financial report was presented and approved by the Board. The Board voted on and passed three funding requests. One request was to fund Dr. Warren Conway's research on disease surveillance and the quality of water sources in the Trans Pecos Region. The second approval was granted for an Honorary TBS Life Membership for retiring TPWD Executive Director Carter Smith. The third approval was for sponsorship of the Desert Bighorn Council meeting which will be held in Alpine, Texas on April 11th.

Dustin Cole with Scarborough Specialties Merchandizing presented during the meeting. Mr. Cole offered to place a link on the TBS website that will direct users to their website where members can purchase various kinds of apparel with the TBS logo. The Board is considering Mr. Cole's proposal.

John Silovsky, TPWD's Wildlife Division Director, attended the meeting and thanked TBS for our support over the many years, and for our support of the Black Gap WMA Memorial. He stated that he spent some time with TPWD's new Executive Director, David Yoskowitz and showed him around the Trans Pecos Region and the Wildlife Management Areas (Elephant WMA, Black Gap WMA and Sierra Diablo WMA).



Many times we all forget to say thank you to people that do a tremendous amount of work behind the scenes at TBS, so here's to you Crisy... **A HUGE THANKS FOR ALL YOU DO FOR THE BOARD AND TBS, we all appreciate you very much...**

Froylan Hernandez, Program Leader for Desert Bighorn Sheep reported on the 2022 desert bighorn sheep survey results. Of note, results indicated that bighorns numbers are the lowest in many years. Froylan attributed the decline in numbers in part to the recent disease event, changed survey methods, new staff and schedules. TPWD is also considering a bighorn sheep relocation later this year.

The 2023 Roundup is scheduled for June 9 & 10th at the Tapatio Springs Resort in Boerne, Texas. Several raffles are being conducted and the winners will be drawn during the event. Buy your tickets, and I hope to see you there. Have a great spring.

REMINDER TO ALL TBS MEMBERS:

TBS uses "mail chimp" service to email our members upcoming news and events. If you are one of our long-time members please make sure we have your most recent and up-to-date email address.

Please send to:
info@texasbighornsociety.org
or call 806-745-7783

John Virgil Walter

September 15, 1931 - October 29, 2022

John, our beloved "wildcatter", went to rest with the Lord on October 29, 2022. John was born on September 15, 1931, in Muenster, Texas to Alois (Shorty) and Marie Catherine Hartman Walter. He was also raised in Muenster, Texas, and attended Sacred Heart Elementary School and graduated high school from St. Mary's Catholic School in Gainesville, Texas.

John is survived by his wife, Sammie Walter; John's sons, Doug (Wendy) Walter, Brian (Karen) Walter, Craig (Tracy) Walter, Blake (Taunya) Walter; and daughter, Laura Walter Becker; 15 grandchildren; sister, Jeanette Karr; brothers, Eugene Walter, Claude (Nancy) Walter.

John was preceded in death by his first wife, Agnes Marie Hodges Walter; his parents, Alois and Marie Walter; sisters, Dolores Swirczynski, and Sandra Corcoran.

A special recognition to Mayala Quintanilla, Laura Asay and Irene Mata for their devotion and care for John in his later years.

John lived a full and complete life that could only be described as "extraordinary". He graduated and obtained his undergraduate degree at Texas A&M, in College Station, for his first degree. John's graduation from A&M as an officer in the United States Army paved the way for his service in the Korean Conflict where he served in "Intelligence". John would never say more about his Korean service than just "intelligence".

Returning from Korea, John subsequently entered Texas Tech University where he obtained his second degree in Petroleum Engineering. Always a leader and business success in the oil field, John also was inducted into the Texas Tech Hall of Fame for Petroleum Engineers. Reflecting his adult concept to always give back more than he took, John established and contributed the Walter Petroleum Lab at Texas Tech University. When asked about his generosity, John's reply was that "A&M made him ready for Korea, but Texas Tech taught him how to make money".

After many years in the oil industry working for others, John formed his own very successful exploration company known as Walter Exploration Company which he operated for many years before his death. As a reflection of John's business success and character, he again "gave back" by also being a substantial contributor to the St. Jude Children's Research Hospital in Memphis, Tennessee. John's designated interest was to fund special equipment for childhood patients with cancer.

In addition to his industry success reflected as a member of the Dallas Petroleum Club, John was also an international hunter and member of several conservation organizations including the Dallas Safari Club and the Dallas Gun Club. He also made special contributions to the Texas Bighorn Society, and made affirmative steps to advance the re-establishment of the Desert Bighorn Sheep in Texas. John will be remembered by many for his extensive African Safaris, and the fellowship and his participation in bird shooting in England for many years.

Throughout his life, John felt his greatest gift was an inquisitive mind and "PMA" . . . Positive Mental Attitude.





NEWS

TPWD Executive Director Carter Smith Announces Retirement

AUSTIN—Texas Parks and Wildlife Department (TPWD) Executive Director Carter Smith announced today he will retire effective January 2023, ending a nearly 15-year tenure that strengthened private-lands stewardship, expanded state parks and wildlife management areas, bolstered conservation, law enforcement, and park funding, and brought a renewed focus on connecting Texans young and old with the state's natural resources.

"The opportunity to work alongside the immensely talented and dedicated men and women of this Department has been the privilege of a lifetime," said Carter Smith, Executive Director of the Texas Parks and Wildlife Department. "Their unending passion for stewarding and protecting Texas' rich bounty of fish and wildlife resources, creating new opportunities for Texas families to get out and make lasting memories in the outdoors, and helping to leave the lands and waters, habitats and parks of our home ground better than before has been a great inspiration to me, personally and professionally. I owe a huge debt of gratitude to Chairman Aplin and to the entire TPW Commission, past and present, for placing their trust in me, as well as for their leadership, mentorship and commitment to advancing our mission. Last, but not least, as a Dad, a sportsman, a conservationist, and as a proud Texan, I am grateful beyond measure for all the landowners, land stewards, outdoor enthusiasts, and partners across Texas who not only make conservation possible, but actually happen."



Smith, who began his professional career in 1992 as a TPWD management intern in the Wildlife Division, has served as executive director since January 2008, overseeing policy, personnel, funding, and strategy for an agency of more than 3,300 professionals in 13 divisions. During his tenure the department has acquired significant new public lands such as Palo Pinto Mountains State Park and the Powderhorn Wildlife Management Area; directed major initiatives towards enhancing and restoring freshwater and coastal habitats; added important new biologist, park, and law enforcement positions; constructed new facilities such as the Game Warden Training Center and the John D. Parker State Fish Hatchery; launched the Texas Outdoor Family and Texas Children in Nature programs; secured significant new funding for state and local parks through the dedication of the Sporting Goods Sales Tax and strongly championed the need for the Recovering America's Wildlife Act.

Prior to his naming as executive director, Smith was state director of The Nature Conservancy of Texas, which he first joined in 1998. He was the first executive director of the Katy Prairie Conservancy. An accomplished wildlife conservationist, his work as a biologist spanned from Mexico to Canada.

In addition to his work at the department, Smith has served on conservation-related boards of directors and advisory councils, including as Chairman and executive committee member of the Association of Fish and Wildlife Agencies. He is also a Professional member of the Boone & Crockett Club and a lifetime member of the Texas Bighorn Society, The Dallas Safari Club and the Houston Safari Club. He is an outstanding alumnus of departments at Yale University and Texas Tech and was honored by the Botanical Research Institute of Texas International Award of Excellence in Conservation, the Texas Wildlife Association's Sam Beasom Conservation Leader Award, and the Harvey Weil Professional Conservationist Award.

"Working alongside Carter Smith for the last five years, I can say without reservation that he is one of the finest Executive Directors to ever run the Texas Parks and Wildlife Department," said Texas Parks and Wildlife (TPW) Commission Chairman Arch "Beaver" Aplin III. "He has stewarded the state and our resources with vision and integrity since his tenure began in 2008. In an agency full of incredible individuals, he has been an inspiring leader. Though he will be missed, I wish him and his family the very best as they embark on a new chapter of life. We will work hard to find the next head of the Texas Parks and Wildlife Department, but there is no replacing Carter Smith."

The TPW Commission will launch an executive search committee to recruit TPWD's next executive director. The search committee will identify and interview prospective candidates and provide a recommendation to the commission in time to ensure a smooth transition and continuity of leadership for agency operations.

Reprinted with permission from TPWD



NEWS

David Yoskowitz Named TPWD Executive Director

AUSTIN, Texas – David Yoskowitz, Ph.D. was named executive director of the Texas Parks and Wildlife Department today at a special meeting of the TPW Commission in Austin, Texas. Yoskowitz is currently the senior executive director and Endowed Chair for Socioeconomics at the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University-Corpus Christi.

Commissioners took action to accept the recommendation of the search committee in a public meeting. The search committee included TPW Commission Chairman Arch Aplin, and commissioners Anna Galo, Jeffery Hildebrand, and Oliver Bell.

"As an avid outdoorsman, David lives the mission of TPWD," said Chairman Arch "Beaver" Aplin III. His business and economic acumen in the field of our cultural and natural resources will suit TPWD perfectly. David will continue a culture of inclusion with stakeholders and staff at the agency. Sixteen years at the Harte Institute in Corpus Christi has been a wonderful training ground preparing David to be our new executive director. Carter Smith will be missed immensely, but I could not be happier handing off the baton to David Yoskowitz."

At Texas A&M University-Corpus Christi, Yoskowitz served in many roles including professor of environmental economics, associate director for research, policy and development, Endowed Chair for Socioeconomics, and since 2020 the senior executive director of the Harte Research Institute for Gulf of Mexico Studies (HRI). His experience as an economist and his interest in critical environmental and natural resource issues paved the way for collaboration with natural science colleagues to study the links between environmental and human well-being with a particular focus on the resilience of the Gulf of Mexico region. During his time in Corpus Christi, Yoskowitz and the HRI team of scientists and researchers worked to develop science-based solutions for pressing fisheries, watershed, coastal, and ocean challenges.

"It's such an honor to join the Texas Parks and Wildlife Department and a privilege to work alongside the talented women and men throughout the agency that dedicate themselves to conserving the natural and cultural resources, and the outdoor legacies, that make Texas such a special place," Yoskowitz said. "As a lifelong outdoorsman, a father, and someone who has spent the last several years of my career working toward creating a better future for the Gulf of Mexico, the TPWD mission is near and dear to my heart. I am incredibly grateful for the work I've done for the last 16 years at the Harte Research Institute for Gulf of Mexico Studies and at Texas A&M University-Corpus Christi, and that work has really been about developing the science, as well as some of the solutions, that help support TPWD's mission and philosophy. I'm so excited to now be a part of the implementation of that science for present and future generations of Texans."

Yoskowitz's passion for pursuing connection with the natural environment reaches back to younger years when he fought forest fires and gained an appreciation for the connection between humans and nature. Yoskowitz spent much of his career as a leader on the Texas A&M Corpus Christi campus, with research extending his presence through much of North and Central America including Cuba, Nicaragua, Belize, El Salvador, and Mexico.

"This is bittersweet news for the Island University, as Dr. Yoskowitz has been an integral part of a highly successful and dedicated team at the Harte Research Institute for Gulf of Mexico Studies (HRI)," said Dr. Kelly M. Miller, President & CEO of Texas A&M University-Corpus Christi (TAMU-CC). "At the same, this is an amazing opportunity for him, and his appointment to such a prestigious role brings a great deal of pride to our campus. We appreciate his service and look forward to a continued relationship with him in his new role."

Yoskowitz served as the chief economist of the National Oceanic and Atmospheric Administration (2014 – 2015) where he helped develop the agency's first Social Science Vision and Strategy. He also served on the National Research Council Committee on the Effects of the Deepwater Horizon Mississippi Canyon-252 Oil Spill on Ecosystem Services in the Gulf of Mexico. He previously sat on the Socioeconomic Scientific and Statistical Committee for the Gulf of Mexico Fishery Management Council. He serves on the Board of Directors of Indifly, an organization dedicated to using recreational fisheries to create sustainable livelihoods for indigenous peoples around the world.

Yoskowitz earned a Ph.D. in Economics and an M.A. in Economics from Texas Tech University, and a B.S. in Economics and Finance from Bentley College.

Carter Smith, TPWD's current executive director, announced his retirement in June after almost 15 years of leading the department. Smith's retirement will be effective in January 2023. Yoskowitz will be working closely with Smith, the Texas Parks and Wildlife Commission, and other TPWD executive staff on transitioning into the role in the coming months.



Reprinted with permission from TPWD

Sierra del Carmen Desert Mule Deer and Carmen Mountain Whitetail Hunt Package

\$200 - Only 250 Raffle Tickets Will Be Sold

All funds generated go to support the Texas/Mexico Border Desert Bighorn Sheep Initiative. The Initiative includes desert bighorn reintroduction, exotics management, aerial and ground surveys, wildlife technician training and conservation and environmental education to local communities.



El Carmen is offering a 7 to 10-day hunt for a Desert Mule Deer and a Carmen Mountain Whitetail Deer. El Carmen is in the northeast corner of the Mexican state of Coahuila. The hunting area is a 400,000+ acre ranch situated in the Sierra del Carmen Mountain range. There are good populations of both species of deer with great trophy opportunity. The hunt will be offered for one hunter and one non-hunting companion.

The hunt package contains:

Transportation by private plane from the International Airport in Del Rio, Texas to the El Carmen Ranch in Coahuila, Mexico. Hunting permits. Full Guide services and field prep of your trophy.

Trophy export permits. Transfer of your trophies to Del Rio, Tx., including requisite paperwork.

Hunter pays the shipment to your taxidermist from Del Rio.

Use of a hunting rifle and ammunition or you can bring your own. If you bring your rifle, the supporting paperwork will be provided. The hunter pays the transfer fee. Hunting is done in high rack 4x4 trucks and by spot and stalk.

First class lodging and Mexican hospitality with laundry service while at the ranch.

All food and drinks provided.

Wifi and satellite phone available.

Raffles!



806-745-7783
321-525-6724
www.texasbighornsociety.org



Scope not included

Series 004
Horizon Custom
TBS Rifle
6.5 PRC

\$50

Limited to 300
Tickets

Louis Vuitton
Marceau Monogram
Handbag

\$100

Limited to 100
Tickets



2023 Polaris Ranger
WITH Trailer

\$100

Limited to 500
Tickets





Trans Pecos Wildlife Water Quality Research

*Christopher R. Carter, Ph.D. Graduate Research Assistant,
Department of Natural Resources Management, Texas Tech University*

Natural and constructed water sources are utilized by a diverse array of species in arid ecosystems, and surface water is often a limiting factor in these environments. For the last several decades, the Texas Bighorn Society has invested significant money and efforts towards installing water sources to provide accessible surface water with the goal to increase desert bighorn numbers on the landscape. We are embarking on a new research project with financial and logistical support from the Texas Bighorn Society, that is focused upon the interplay of water resources and disease risks in the Texas-bighorn landscape.

Bighorn sheep pneumonia complex is a disease of concern to bighorn sheep managers due to associated high mortality rates (50-80%) within infected herds. Previous research has identified *Mycoplasma ovipneumoniae* (*M. ovi*) as one of the more important bacterial species responsible for causing pneumonia in sheep, but the complex also includes other *Mycoplasma* species, as well as *Pasturella multocida*, *Pasturella trehalose*, and *Mannheimia haemolytica*. The recent outbreak of pneumonia among bighorn sheep in the region has caused significant concerns for all sheep enthusiasts in Texas. Managing pneumonia is challenging throughout bighorn sheep ranges due to issues associated with chronic shedders; the wildlife-livestock interface; and the limited management options available. Domestic sheep and aoudad have been shown to not only carry this disease, but may provide a significant risk to bighorn populations where they are sympatric. Part of Logan Thomas' dissertation research at Texas A&M University demonstrated that indirect pneumonia transmission from aoudad to native bighorn sheep is possible via shared water supply in captive experiments. We are looking to expand upon previous work, examining whether *M. ovi* and other members of the pneumonia complex can be detected using environmental DNA (eDNA) collection methods. This portion of our new project is designed to provide proof of concept as a tool for surveilling wildlife diseases, as well as identifying regional hotspots for potential risks of disease transmission that may need management intervention.

As part of these previous table-setting projects, Rachael Wiedmeier began this water-centric research by assessing the bacterial communities within surface water samples collected near Van Horn, Texas and Black Gap Wildlife Management Area (BGWMA) in March and April, 2020. Using molecular techniques such as 16S sequencing, she identified 55 bacterial classes at a 95% probability level, which is the threshold that microbiologists use to confirm identifications. We are working together to complete the analyses, identify bacterial species within those classes and their roles, if any, in potential disease, and complete this manuscript for publication. We will continue collaborating

with Rachael in her new position at the University of Minnesota, where our water samples and eDNA sampling devices will be sent for 16S sequencing for pneumonia complex members, including *M. ovi*. These efforts will hopefully further elucidate the disease conditions in the region and identify potential points of transmission.

Beyond these current efforts, there were a few key elements that we learned from Rachael's preliminary research. First, we need better water quality (water chemistry) information from the sampled locations to tease out potential factors that limit the amount of time pneumonia complex members might be available in the water supply. We plan on collecting water quality data such as pH, nitrates, sulfates, hardness, turbidity, coliform bacteria, and others. Second, since *M. ovi* (and other bacteria) do not persist in water for very long, data on how what wildlife species, how often/when, and how many individuals visit water sources is important to assess disease transmission potential and confirm visitation via other molecular techniques. We plan on deploying game cameras at some accessible water source locations in an effort to collect evidence of inter-species interactions which could inform whether there are instances of potential interactions that might result in disease transmission. Finally, other environmental data such as water location(s) relative to roads; slopes; distances to cover; and other topographic features will also inform how these water sources may be influenced by these environmental features. Collectively, these data will form a key element of my dissertation research, and we will be reaching out to TBS leadership to partner with the Adopt-A-Guzzler program to get better location and water quality data on guzzlers throughout the region.

Beyond these elements, we have also continued our partnerships with colleagues and collaborators with Texas Parks and Wildlife Department and Borderlands Research Institute at Sul Ross University, we began performing some preliminary screening of nasal and tonsil swabs from free-ranging aoudad in the Chinati and Quitman Mountain ranges in August, 2022. As we look to continue and expand the work Rachael performed for her thesis research, I will be working to expand our partnerships to really focus upon environmental elements related to disease, and develop relevant and meaningful data for water resource management in the region. I hope to be

providing new information about both natural and manmade water sources comprehensively across the Trans Pecos, including checking locations where springs were previously noted, and mapping those, as well as constructed water sources, to update information on current surface water distribution.

We would not be able to sample with near the intensity without your continued support. If you would like to contribute to these efforts, I have a mountain of collection kits ready to send out, please contact me and let me know (contact information below). As this new project begins, I am looking forward to the meeting many of our members, exploring the Trans Pecos region, and collecting as many samples as possible for testing. I am thankful for TBS's support for this project and looking forward to continuing this work and learning more about how we can best manage bighorn sheep.

Christopher Carter
2903 15th St., Goddard Bldg., Room 007
(please contact me before sending frozen samples)
christopher.carter@ttu.edu 806-548-4564





34th Annual Roundup

June 9th & 10th

Full Registration ONLY \$150!

Join TBS in the beautiful Boerne, TX with auctions, games, raffles, prizes, and much more! You won't want to miss our biggest event of the year!

Reserved Tables \$2000



*Registration available by mail, by phone, or online.
See contact info below.*

**Restoring bighorn sheep to their native ranges in Texas,
and ensuring the viability of their habitat"**



**TAPATIO
SPRINGS**

HILL COUNTRY RESORT

1 Resort Way, Boerne, TX 78006

(830) 443-9681

See rates on Registration Form

1615 West Loop 289, Lubbock, TX 79416

806-745-7783 | www.texasbighornsociety.org



SPONSORSHIP OPPORTUNITY

*Become a Sponsor
at our
34th Annual Roundup*

\$5000

- *Acknowledgement as a Sponsor on our website*
- *Acknowledgement as a Sponsor in the Roundup Auction Catalog*
- *Company banner displayed at our Roundup*
- *8 Full Roundup Registrations*
- *Full page ad in our Roundup Auction Catalog*
- *Pistol Gift for Sponsor*



34th ANNUAL TBS ROUNDUP

June 9th & 10th, 2023

Tapatio Springs Resort, Boerne, TX

*A 3% Credit Card Service Charge will be added to all auction purchases!
To avoid this, please bring your checkbook!*

Name	Guest Name	
Address	City/State	Zip Code
Phone Number	Email Address	

*****SAVE WHEN YOU PURCHASE BOTH NIGHTS*****

Full Registration:	(per person)	Amount		(per person)	Amount
Friday & Saturday Nights					
Before May 18th	\$150.00	\$ _____		After May 18th	\$175.00 \$ _____
Kids 12 & under	\$100.00	\$ _____	OR	Kids 12 & under	\$125.00 \$ _____
Friday Only:					
Before May 18th	\$75.00	\$ _____		After May 18th	\$90.00 \$ _____
Kids 12 & under	\$50.00	\$ _____	OR	Kids 12 & under	\$65.00 \$ _____
Saturday Only:					
Before May 18th	\$100.00	\$ _____		After May 18th	\$125.00 \$ _____
Kids 12 & under	\$75.00	\$ _____	OR	Kids 12 & under	\$100.00 \$ _____
Saturday Golf:					
	\$100.00	\$ _____			

ROUNDUP SPONSORSHIP OPTION

- RESERVED TABLES: \$2,000
- ROUNDUP SPONSORSHIP: \$5,000

*Please call the TBS office at 806-745-7783
for information or to become a sponsor.*

MEMBERSHIP OPTIONS

- | | | |
|--|---|--|
| <input type="checkbox"/> \$40.00 Individual/Renew | <input type="checkbox"/> \$115.00 3-Year Individual | <i>Dual Membership</i> |
| <input type="checkbox"/> \$75.00 Family Membership | <input type="checkbox"/> \$250.00 Sponsorship | <input type="checkbox"/> \$ 75.00 Annual Individual PLUS Wild Sheep Foundation |
| <input type="checkbox"/> \$25.00 Student/Active Military | <input type="checkbox"/> \$1000.00 Life Membership | <input type="checkbox"/> \$210.00 3-Year Individual PLUS Wild Sheep Foundation |

Please Call 806-745-7783 for Membership Questions

PAYMENT METHOD

Check Enclosed
 Bill Credit Card
 Signature _____

Credit Card # _____ Exp. Date _____ CVV _____

HOTEL INFORMATION

Reservation Cut-Off Date: May 18, 2023
TBS GROUP RATE: \$159 Thursday \$179 Friday and Saturday
GROUP CODE BY PHONE ONLY: Texas Bighorn Society
(830)537-4611 – Tapatio Springs Resort, 1 Resort Way, Boerne, TX 78006

MAIL TO: TBS, 1615 West Loop 289, Lubbock, TX 79416, or FAX to 806-745-8475

Telephone: 806-745-7783 email: crisy@texasbighornsociety.org
 Full Refund less \$10.00 handling fee for cancellations received on or before May 18, 2023
 No refunds for cancellations after May 18, 2023
 Value of Meals: \$75.00 Friday and \$90.00 Saturday
www.texasbighornsociety.org

DESERT BIGHORN PROGRAM UPDATE

By Froylán Hernández,
TPWD Desert Bighorn Sheep Program Leader



The 2022 Desert Bighorn Sheep aerial surveys began in mid-October 2022 with the first 2 days dedicated to Bighorn Survey and Aerial Gunning Training. This training is mandatory for all staff helping with bighorn surveys, and focuses on survey technique, ram classifications, data collection, weapon safety and handling, and helicopter and aerial gunning procedures and safety.

The initial aerial gunning training was conducted by USDA-Wildlife Services in June 2017 when a select group of staff traveled to a Wildlife Services facility in Kerrville. Afterwards, we developed our own aerial gunning training program modeling it after what was learned in Kerrville but tailoring the training to fit the Trans-Pecos needs using staff that had participated in the Wildlife Services training as instructors.

Through the last 6 years, we have adjusted the training to enhance its applicability. One adjustment includes having actual qualified instructors teach parts of the course. These include the Weapon Safety and Handling which was led by Sgt David Dotter, SP Police and Weapons Instructor, and ACETA training (animal capture, eradication, tagging of animals) taught by Mr. Gary Brennan, Specialized Helicopter Training.

We will continue to adjust the training program in efforts to enhance aerial safety, improve our techniques and increase effectiveness.

Once the training was completed, we were off to the surveys beginning with Elephant Mtn and subsequently moving on to Black Gap/S. Brewster County. Over 120 hours were flown, of which 101.2 hours were actual survey time. In total, 785 bighorns were observed (251 rams, 420 ewes, 114 lambs) (Table 1.)

Table 1. 2022 DBS Survey Summary

LOCATION	RAM AGE CLASS				TOTAL			TOTAL SHEEP	RATIOS		
	I	II	III	IV	RAMS	EWES	LAMBS		M	: 100F :	L
Baylor	4	4	8	5	21	28	12	61	75.00	100	42.86
Beach	1	3	4	4	12	40	6	58	30.00	100	15.00
BG/S. Brewster Co.	3	1	12	13	29	66	22	117	43.94	100	33.33
BBRSP	0		0	0	0	4	2	6	0.00	100	50.00
Carrizo.	0	3	0	0	3	2	1	6	150.00	100	50.00
Eagle.	1	2	1	0	4	13	2	19	30.77	100	15.38
EMWMA*	9	11	12	24	56	78	18	152	71.79	100	23.08
Sierra Diablo	17	39	51	13	120	170	49	339	70.59	100	28.82
Sierra Vieja	0	0	0	0	0	0	0	0	#DIV/0!	100	#DIV/0!
Van Horn	0	0	1	0	1	3	2	6	33.33	100	66.67
9 Point Mesa	2	1	1	1	5	16	0	21	31.25	100	0.00
TOTALS	37	64	90	60	251	420	114	785	59.76	100	27.14

*Note: 3 counts were conducted May 2022 (n=197), Oct 2022 (n=109), Nov 2022 (n=152)

The 2022 count was lower than the previous years' counts. The last time the count was similarly low was 2006 when 822 bighorns were observed. Several possible contributing factors include:

1. Survey timing (Aug vs Oct/Nov) – bighorn surveys used to be conducted in August, when animals were congregated. Animals are a little more spread out and in smaller groups in Oct/Nov, making them harder to spot and easier to miss.
2. Inexperience – new staff in the Trans-Pecos
3. 3-4 different pilots in one survey season – though all pilots used were highly qualified, they were not familiar with survey area and had to adjust to TPWD survey protocol.

But, likely the major factor for the low count was disease related. The recent disease events that occurred in the Van Horn Mountains in the fall of 2019, followed by the disease event at Black Gap WMA in the Spring of 2020 undoubtedly influenced the low count. Though several bighorns have been observed in the Van Horn Mountains since the disease event, including some lambs, the Van Horn Mountains populations are still significantly low.

At Black Gap WMA adult bighorns, as well as lambs are routinely observed. However, time will tell if this population has somewhat stabilized. Monitoring of these two populations will continue using lamb recruitment as one indicator of herd health.

Other ranges with below normal counts include the Eagle, Beach and Baylor Mountains. Big Bend Ranch State Park and 9 Point Mesa Ranch have also had low counts the last couple of years. Several options (e.g., disease testing, radio-collaring, test/remove, etc.) are currently being explored to investigate further into the low counts.

But not all is bad news!

The Sierra Diablo populations appears to be doing well, after losing the older-aged rams and certainly some ewes in 2015-2016. The peak of the Sierra Diablo population occurred in 2008 when over 500 animals were counted. The population held at that level the following several years but in 2015 dipped to just over 350 animals (Table 2).

To investigate the reason for the dip, tissue samples were collected from bighorn carcasses, as well as from live-captured animals in the Sierra Diablo, Beach and Baylor Mountains. However, the results failed to identify or pinpoint a particular pathogen that would help explain the dip.

Since, the Sierra Diablo population has stabilized and landowners, outfitters and TPWD biologists are now reporting observations of older-aged class rams. Trail cameras are also capturing the older rams and a fair number of lambs as well.

Table 2. 2002-2022 Sierra Diablo Mtns survey summary.

YEAR	RAMS	EWES	LAMBS	TOTAL	YEAR	RAMS	EWES	LAMBS	TOTAL
2002	46	76	38	160	2013	135	266	96	497
2003	47	87	54	188	2014	122	246	115	483
2004	74	126	52	252	2015	110	167	79	356
2005	48	96	44	188	2016	102	140	91	333
2006	106	198	85	389	2017	71	150	76	297
2007	120	206	90	416	2018	87	141	60	288
2008	163	253	94	510	2019	89	158	79	326
2009	148	253	86	487	2020*	39	64	30	133
2010	155	243	75	473	2021	125	200	55	380
2011	109	266	83	458	2022	120	170	49	339
2012	143	223	90	456	*Note: partial ground count				

We were also anticipating conducting aerial surveys in Mexico. Working collaboratively with Mexican counterparts, several areas of interest have been identified in mountain ranges in the Mexican states of Chihuahua and Coahuila. These flights, in addition to bighorn surveys, would also serve as aoudad assessment flights. Unfortunately, due to logistical and aerial contractor constraints, these flights did not occur. However, the intent is still present and planning for future flights continues.

TPWD intends to collaborate with and assist Mexican natural resource agencies in the implementation of management strategies related to desert bighorn restoration and aoudad management in Mexico. This collaboration will supplement restoration and management efforts on respective sides of the Rio Grande River.

One key partner is TBS member, Alejandro Espinosa Treviño, CEMEX-Mexico. Alejandro has been integral in the planning and coordination of these efforts on the Mexican side. Because of his connections he will continue to fill a vital role in this collaborative work.

As for aoudad, the challenges are still very much present, and only appear to be increasing. A total of 3052 aoudad were observed, of which only 287 removed (Figure 3).

TPWD typically conducts opportunistic aerial gunning of aoudad in conjunction with bighorn surveys. And, in past years, many landowners allowed aerial gunning on their properties during those surveys. However, with increase of aoudad hunting and supplemental income, aerial gunning opportunities are becoming restrictive. While some landowners have developed exotic management programs and conduct their own aerial gunning, restrictive aoudad removal reduces aerial gunning effectiveness in the long term.

Figure 3. Aoudad observed/removed during 2022 aerial bighorn surveys

Mtn Range	Observed Removed	
Baylor Mtns.	18	0
Beach Mtns.	1	1
Black Gap/S. Brewster County	269	104
Big Bend Ranch State Park	503	149
Carrizo Mtns.	238	0
Eagle Mtns.	66	0
EMWMA	9	9
Sierra Diablo Mtns.	10	4
Sierra Vieja Mtns.	1758	0
Van Horn Mtns.	145	0
9 Point Mesa	35	20
TOTAL	3052	287

However, we recognize the importance of supplemental income through aoudad hunting, particularly during environmental harsh times, such as droughts when landowners are forced to destock. Therefore, we will continue working with landowners to achieve habitat and wildlife goals.

Lastly, and to end on an exciting note, bighorn restoration opportunities are still very much alive! Recent aoudad tissue sampling results revealed potential disease transmission risks. Because most, if not all, mountain ranges within historical bighorn habit are likely occupied by aoudad, it has forced us to consider mountain ranges that at one time were lower priority. Namely, the Franklin Mountains. Though the Franklin Mountains are bordered by a city (El Paso) on 3 sides, they are made up of high-quality bighorn habitat. Additionally, and of equal importance, they are aoudad-free! These two things, among other important points, make the Franklin Mountains a suitable candidate for a bighorn restoration site.

But I won't spoil the story for the next Bighorn magazine article. Please stay tuned, Franklin Mountains restoration story will be shared in the next edition...

Mitochondrial And Nuclear Gnomes Reflect Different Evolutionary Trajectories For Two Ungulate Species: Tales From Aoudad (*Ammotragus lervia*) And Desert Bighorn Sheep (*Ovis canadensis*) In Texas

by Emily Wright, Texas Tech University

The original focus of my dissertation was solely on desert bighorn sheep (*Ovis canadensis*) in Texas. With no genetic studies on these populations to date, there was a paucity of information that this study intended to rectify through mitochondrial and nuclear DNA studies. During the initial stages of this endeavor, it became clear that another montane ungulate, aoudad (*Ammotragus lervia*) also lacked genetic information and directly competed for resources, occupied similar niches, and possibly posed a disease-risk to desert bighorn sheep. Therefore, the aims of my dissertation shifted to examine the genetic diversity, population structure, kinship, connectivity, and other genetic parameters of desert bighorn sheep and aoudad in Texas.

In Texas, desert bighorn sheep (DBS) historically occupied 16 mountain ranges in the Trans-Pecos Region. Described as *O. c. texianus* in 1912, this subspecies of DBS was extirpated and presumed to be extinct in the 1960s due to overharvesting, competition, and diseases. Historical restocking efforts relied on translocating *O. c. nelsoni* and *O. c. mexicanus* from Arizona, Nevada, Utah, and Mexico. These efforts allowed populations to increase from < 14 to > 1,500 individuals across 11 mountain ranges by 2018. The goal of this study was to discern the effects of inter- and intra-state translocations on contemporary populations. Double digest restriction site-associated DNA sequencing was used to determine the population structure, genetic variation, and relatedness in contemporary populations. Strong signatures of inbreeding and other deleterious mechanisms were not detected in Texas DBS based on genetic diversity and F-statistic



estimates. Three analyses (principal components, maximum likelihood, and admixture) demonstrated that DBS west of -104° longitude (Sierra Diablo, Beach, Baylor, and Van Horn Mountains) genetically were similar to populations in Arizona whereas DBS east of -104° longitude (Elephant, Black Gap, Dove, and Basse Mountains) were similar to populations in Nevada. Consequently, reintroduction efforts from multiple out-of-state sources were successful to some degree considering genetic similarities between source location and contemporary populations in Texas. In addition, kinship analyses identified movement between mountain ranges of sheep, examples of mating among closely related individuals, reproductively successful males, and prolific females. This is the first study to genomically compare several subspecies and detect genetic distinction between Rocky Mountain bighorn sheep and desert subspecies of bighorn sheep. Distinctions between northwestern and southern populations in Nevada were also detected with an individual from Colorado possessing similar genomic signatures to both Nevada populations, suggesting a possible corridor from southern Nevada to the four corners region.

Over the last century, Texas has been inundated with exotic ungulates, with as many as 67 species represented by captive and free-ranging populations. One of the most successful species to have established free-ranging populations are aoudad (*Ammotragus lervia*). Herein, we expand on previous genetic studies in aoudad by including new genomic profiles based on double digest restriction site-associated DNA sequencing methods with the intent of better understanding the effects of > 70 years of human-mediated translocations, population expansion, and gene flow among populations. Using thousands of single nucleotide polymorphisms obtained from 73 individuals, we measured genetic patterns of diversity and connectivity between source populations from California and New Mexico and resultant aoudad populations in Texas. Principal components analyses identified phylogeographically structured populations across Texas. Further, we identified a signature of isolation by distance among Texas

populations. To assess geographic regions that facilitated or blocked gene flow between populations, we used Estimation of Effective Migration Surfaces, which indicated three barriers to movement between populations as well as connectivity among populations in close proximity. Although *A. l. blainei* appeared to be genetically unique from other subspecies, comparison of mtDNA haplogroups and nuclear genotypes were discordant indicating that the current subspecific taxonomic classification needs refinement. Given the vulnerable status of aoudad in their native range of northern Africa and the exponential population growth and competition with native ungulates in Texas, management and conservation efforts of aoudad need to maintain and preserve unique genetic units while minimizing competition and other detriments to native species.

Further, another project that is not part of my dissertation, but perhaps equally important, currently is the detection of *Mycoplasma* in nasal swabs of desert bighorn sheep and aoudad. To date, three species of *Mycoplasma* have been detected in aoudad populations in the Trans-Pecos Region. One of these species is *Mycoplasma ovipneumoniae* which both desert bighorn sheep and aoudad possess in the microbiome of their nasal cavity. It is important to note that this strain of *M. ovipneumoniae* is identical between desert bighorn sheep and aoudad in Texas and is extremely similar when compared to strains characteristic of Rocky Mountain bighorn sheep and domestic sheep and goats. The second species is *M. conjunctivae*, which has only been detected in aoudad in the Trans-Pecos Region. The presence of *M. conjunctivae* most likely indicates that aoudad carry pinkeye to some extent. We currently do not know if aoudad show symptoms of pinkeye or are able to transmit the bacteria to desert bighorn sheep or other native ungulates such as elk, mule deer, and pronghorn. Analyses currently are being conducted to determine the third species of *Mycoplasma*, which has only been observed in aoudad. This disease research is exciting and we are hoping to obtain permission from Dr. Hunter Reed, TPWD, to utilize the *Mycoplasma* sequence data banked at the

Washington Animal Disease Diagnostic Laboratory in order to better determine the different species and strains of *Mycoplasma* circulating in Texas. With our current data and the WADDL data, we will be able to 1) determine if species of *Mycoplasma* have changed between 2018 and 2022 and 2) examine genetic similarities of species of *Mycoplasma* among bighorn sheep, aoudad, domestic sheep and goats, and other wildlife (i.e., Dall sheep, mountain goat, deer, moose, elk, reindeer, etc.).

Together, the data obtained from these studies are crucial in developing long-term management and conservation strategies for DBS in Texas. First, it is clear that there are four genotypic groups that perhaps should be given careful consideration during any translocation event. Second, the genotypic groups indicate that two subspecies are represented in Texas; therefore, TPWD may need to develop independent conservation plans for these groups. Third, it is clear that *M. ovipneumoniae* is prevalent in both DBS and aoudad; therefore, efforts should shift to determining synergistic interactions of the various bacteria in the respiratory microbiomes. Fourth, serious efforts should be undertaken by both landowners and TPWD to continue to collect tissue samples so that the “Living Genotypic Database” at the Natural Science Research Laboratory developed during the last five years can be updated, expanded, and serve as a critical resource for DBS research, management, and conservation in perpetuity.

I would like to extend my sincerest thanks to the Texas Bighorn Society and its members. Because of this conservation society, I was afforded an excellent education with countless opportunities to experience field work, live-captures, guzzler construction, conversations with interested and invested stakeholders and wildlife managers, and so much more. I can never repay TBS for the last five years, but I will do my best to provide Texas Bighorn Society, Texas Parks and Wildlife Department, landowners, hunters, and other interested parties with the latest and greatest research. One of my aoudad papers on mitochondrial lineages and corresponding subspecies in Texas already is published in *Ecology and Evolution*. A second

aoudad manuscript currently is under review at *Molecular Ecology Resources*. The two bighorn manuscripts (mitochondrial and RAD-seq datasets) will be submitted and hopefully published within the next year. We would like to obtain more samples of pre-1960 Texas desert bighorn sheep and samples from the Mormon Mountains, Nevada before submitting these bighorn papers for publication. I suspect that at least three more manuscripts will be generated from the genetic and disease datasets of desert bighorn sheep and aoudad in Texas. When these papers are completed, you can be sure that I will send a copy to the Texas Bighorn Society.

I am set to defend my dissertation research on March 31, 2022 at 9 am on campus at Texas Tech University. Please feel free to join in person or attend via Zoom:

(<https://ttuhscshp.zoom.us/j/97510268027>). After graduating this May, I will head to the CDC in Atlanta, Georgia as an Oak Ridge Institute for Science and Education (ORISE) Fellow with the Viral Special Pathogens Branch. I will be examining Ebola, Marburg's, and other viruses that have major impacts on human health by collecting tissue samples from bats and possibly human samples from areas recently known for outbreaks. This fellowship is for two years and although I cannot predict the future, desert bighorn sheep and even aoudad will remain close to my heart. Maybe I will come back home to Texas and continue to work on these incredible wild sheep!

None of this research or my dissertation or future job would have come to fruition without the Texas Bighorn Society, hunting outfitters, and the many landowners that have so graciously contributed samples, advice, and comradery during this research project. Thank you again to all the members for supporting me the last five years and affording me an opportunity to pursue my graduate education.

Guns Up!,

Emily Wright



RETURN TO THE EAGLE'S TBS WORK PROJECT 2023

ATTENDEES

Brian Andrews
Bill Applegate
Cody Bailey
Charlie Barnes
Jim Breck Bean
Benjamin Benavidez
Steve Bolner
Kathy Bolner
Dan Boone
Kathy Boone
Brooke Bowman
Brandon Boyles
Leslyn Boyles
Emma Boyles
Clay Brewer
Curt Brockmann
Brandt Buchanan
Kagen Burkett
Charlie Butler
Chris Carter
Gary Chesnutt
Pam Chesnutt
Caleb Cox

Chuck Cox
Rob Cinclair
Caleb Clarkson
Josh Cross
Sam Cunningham
Rebecca De La Riva
Chevy De La Serna
Nathan East
Kim East
Jed East
Joseph Edling
Sterling Ellis
Denis Foley
Bennett Folsom
Hailey Folsom
Kenneth Garcia
Mark Garrett
Joseph Geiger
Bryan Giles
Richard Gutierrez
John Gutz
Parker Hall
Marc Haile

David Harrell
Bobby Harrison
John Hart
Froylan Hernandez
David Hertenberger
Matthew Hicks
Ace High
Lynton Holloway
Donald Hudson
David Jalufka
Michael Janis
Robert Joseph
Whitney Leavell
Mitch Lockwood
Gaylon Kilcrease
Heath Kilcrease
Jasper Klein
Hill Krause
Hannah Mary Marshall
Meghan Martinski
Bob McCoy
Cody McEntire
Matt McGinnis

Billy Pat McKinney
Bonnie McKinney
Connor McMichael
Doug McNeese
Wallace Meeks
Trevor Meier
John Meyer
Walker Netherton
Rhett Payne
Dirk Parks
Terry Rathert
Ravin Reddy
Elias Salcido
Ryan Scarborough
Don Schmidt
Sloane Schmidt
Alphonse Schwenke
Travis Smith
Keith Smotherman
Randy Stolte
Crisy Stratton
Cole Trichell
Mike Wilson
Michael Zumar

*Thanks to photographers:
John Meyer, Brian Andrews and Dirk Parks
for the use of their photos.*

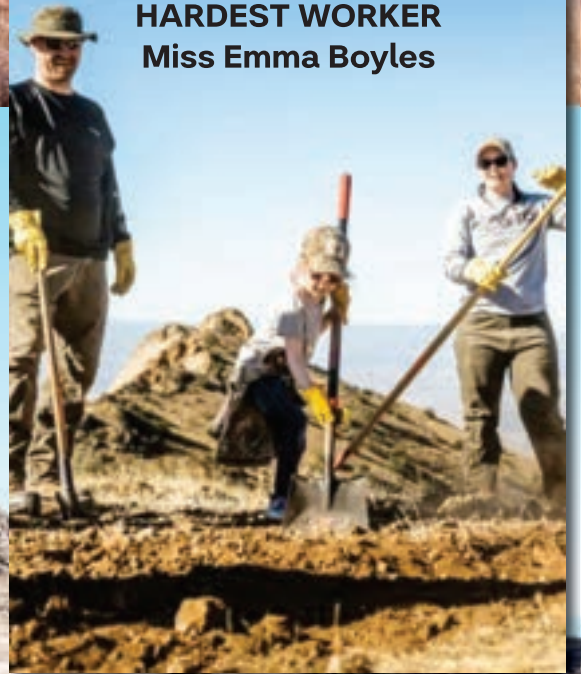








**A TBS STAR IS BORN
THE LITTLEST
HARDEST WORKER
Miss Emma Boyles**



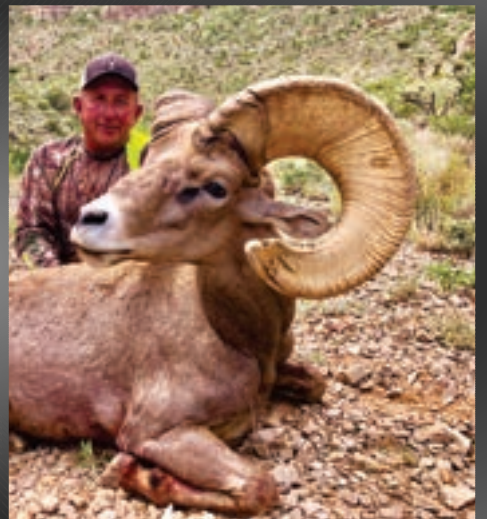
DESERT TAXIDERMY



Tye Vick
(432) 207-0953
DesertTaxidermy.com
Alpine, Texas



HIGH WEST OUTFITTERS



JIM BRECK BEAN
WWW.HIGHWESTOUTFITTER.COM

915-526-3001
HIGHWESTOUTFITTER@YAHOO.COM



Photo by Bonnie McKinney