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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

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Spring-Summer - June 20th Fall - October 1st Winter - February 10th

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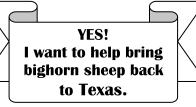
Photo by Chris Stahl

Summer / Fall 2023

BIGHORN



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Howly, 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

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*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**

L TBS Membership

We completed another fun filled and successful Round Up! A special thanks to everyone who bought raffle tickets and bid on our silent and live auction items.

Congratulations to Annabelle Grace Barnhisel, winner of our Youth Lifetime Hunting and Fishing License.

Congratulations to Froylan Hernandez who was the recipient of the President's Award.

Next year's event will be a one night only Round Up in Odessa. It will be on Saturday, June 8, 2024. You can find out more and register on the website.

Watch the website for upcoming details about the spring work project.

We will be sending out opportunities for signing up to help with the TBS booth at both Dallas Safari Club and Wild Sheep Foundations Sheep Show.

Thanks!







EDITOR'S letter



Bonnie McKinney Editor, The Bighorn

I think we can all say, whew, it has been one long hot summer with sparse rain. I am sure that TBS water guzzlers have been a life saver not only for desert bighorn sheep, but all wildlife and birds as well during the long hot summer. Hopefully there are some cooler temps and fall rains in our near future.

Roundup was great at Tapatio Springs and it is always fun to see everyone and welcome new members. Hope everyone is looking forward to Roundup in Odessa next June.

There are some great articles in this issue, Emily Wright has an article on diseases in desert bighorn as well as aoudad. Froylan has an update on aoudad removal, and Ace brought us up to date on the "Adopt A Guzzler Project."

Many thanks to Chris Stahl for the continued use of his great photos that have been gracing the covers of "Bighorn" for several issues.

TBS has web cams on Elephant Mountain WMA, check out the bighorns and other wildlife using the water sources, great way to see bighorns.

Thanks to Dallas Safari Club (DSC) for their great ad on the back cover of the magazine. TBS will have a booth at the annual convention in Dallas, volunteers to help with the booth are always appreciated.

Congratulations to Froylan Hernandez, TPWD for receiving the "President's Award" at roundup this year. Mitch Lockwood was also presented a life membership to TBS.

Bonnie Mc Finner

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



TEXAS WILD SHEEP FOUNDATION MEMBERS!

I was recently nominated for the Wild Sheep Foundation's Board of Directors. My name will be on that ballot when it is mailed out to WSF members at the end of September/first of October. I would greatly appreciate your vote. Thanks in Advance,

Sam J. Cunningham, President / Texas Bighorn Society

This & That

SEPTEMBER AND JUNE 2023 BOARD MEETINGS SUMMARY

by Curt Brockmann, Secretary

The June 9th TBS Board meeting was held during the Roundup at Tapatio Springs Resort. The meeting was called to order, and the Board approved the minutes from the March 9th Board meeting. We have 865 members as of June 2023, which is a 3.5% increase since March and includes 8 new Life Memberships. The financial report was presented and approved by the Board. The Board voted on and passed one funding requests, which was for additional helicopter survey time for the Van Horn area.

Jasper Klein reported that during the latest Van Horn area helicopter survey, 22 guzzlers were checked, and several repairs were made. All the guzzlers are back in working order and contain water. During the Roundup, members will be able to sign up for the Adopt-A-Guzzler program. The Board discussed and approved funding for annual helicopter time to check and repair guzzlers in the Van Horn area during the routine surveys. Sam Cunningham also reported that a link is available on the TBS website that allows members to purchase apparel with the TBS logo.

Billy Pat McKinney reported the Mountain Lion Stakeholder group has met several times to discuss and explore the issue of Mountain Lion management in Texas. The group is made up of members with diverse backgrounds. They are expected to draft a report for the TPWD Commission members consideration at a future TPWD Commission meeting.

Froylan Hernandez provided updates on the Elephant Mountain WMA bighorn sheep ground survey and the Franklin Mountain restoration efforts. He reported there are over 200 bighorns on Elephant Mountain. TPWD is considering relocating some of these sheep to the Franklin Mountains north of El Paso. This an exciting opportunity to restore and expand sheep habitat to areas that have not had sheep in decades.

The final plans for the next Work Project are still being worked out. However, the 2024 Roundup will be a one-day Saturday event at the Odessa Marriott Hotel & Conference Center on June 8th. Please plan to attend, and we hope to see you there. I hope you all have a great fall and have a chance to spend some time in the field.

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



ADOPT A GUZZLER UPDATE:

HOLE-IN-THE-WALL-GUZZLER

By Ace High



This water guzzler on Black Gap wMA was built in 1995. The location of the guzzler is longitude 29.35.20 North and latitude 102.48.54 West and the elevation is 2,760 feet above sea level. Our starting point was longitude 29.35.43 North and 102.48.17 West and the elevation is 2,160 feet above sea level. From the point of the climb to the guzzler is only 600 feet, it took about 1 hour and 20 minutes to climb and the actual distance was 2.3 miles. The weather was pretty warm (got up to 96 degrees) and the climb was not that difficult.

The items that were noted are as follows:

- 1. General condition was in very good shape.
- 2. The tin only had one screw out and it was replaced.
- 3. The collection box was a solid galvanized construction and no leaks were seen.
- 4. The screen in front of the collection box was sheet metal screwed into the gutter. I note

- this because this could be a place to lose water, but the condition of the screws were in good shape, so we left them alone.
- 5. The irrigation line going to the collection tanks were in good shape up until the Y that splits the water into the tanks. The Y had been pushed below the level of the irrigation pipe going into the tanks. We used two T posts and slick wire to lift the Y and support it where it should not have that issue again. The reason for the problem was due to people using the top of the tank and the Y to support them on top of the tank.
- 6. The tanks were in good shape but the caps were taken off and gone. The left tank was empty and also had the remains of an animal we guessed to be a ringtail. There was no way to get the remains out. The right tank had about 1,800 gallons of water and the trough feed from there was working well.
- 7. The fast line from the left tank did have a hole the size to a small nail. We filled the hole with flex seal, covered by duct tape, and then flex seal over the duct tape to keep the sun from destroying the duct tape.





- 8. To check the float of the left trough that was empty, we connected the line to the tank that had water. This is how we found the leak in the fast line and adjusted the float so when the tank gets refilled it should work fine.
- 9. The concreate troughs were in good working order when we left.

These are my observations of this event, and can be used for future maintenance projects. We had the assistance of TPWD staff to show us where to start the trek up, and the path to take to the guzzler. This is important because they knew the best path to take. In looking at it from the starting point I would not have known the best path, and it would have taken a lot longer to get to the site, and for sure not the safest route. I mention this because the first time for the leader of group they need to be guided up the first time. I do not think it would smart to just give out sites and let people try to figure it out. Also, someone needs to sit back as adviser and let the group leader be in charge, which allows the adviser to see how well they do, and also be a resource on the project. I believe the communication between TPWD for public land or landowners, whichever the project is on, the group needs to know what is expected from them as far as the rules, etc. to keep everybody happy.

In looking at the tracks of animals we saw no real signs of traffic. The only prints we observed appeared to be a single mule deer track.

DESERT BIGHORN PROGRAM UPDATE

By Froylán Hernández Program Leader: Desert Bighorn Sheep, TPWD

In the last 5 years, TPWD has increased aoudad disease surveillance and monitoring efforts throughout mountain ranges currently inhabited by desert bighorns. Within the last 2 years, those efforts have expanded to include the mountain ranges that are not occupied by bighorns but still within historical range.

The most recent disease sampling efforts occurred in July-August 2023, with a goal to dispatch aoudad from the mountain ranges surrounding Elephant Mountain, as well as the Hueco, Wylie, Davis and Glass mountains (Figure 1). The mountains surrounding Elephant Mountain were particularly important because of their proximity and potential for aoudad to readily "infiltrate" Elephant Mountain.

While the goal was to collect 60 samples from aoudad in the mountains surrounding Elephant Mountain and 30 samples in equal proportion of rams and ewes from each mountain range or target area, we were opportunistically dispatching what was readily available and/or encountered. In total, we were able to collect tissue samples from 180 aoudad (53 rams, 127 ewes) (Table 1).

Table 1. July-August 2023 aoudad tissue sampling summary.

Mtn Range	Rams	Ewes	Total
EMWMA Surrounding	16	44	60
Hueco	14	16	30
Wylie	0	30	30
Davis	11	19	30
Glass	12	18	30
Total	53	127	180

These sampling efforts were in collaboration with Texas Tech University (TTU). TTU is also interested in aoudad pathogen surveillance, and their research will help us gain a greater understanding of Mycoplasma ovipneumoniae (M. ovi) transmission dynamics within aoudad herds.

During this sampling efforts, blood, nasal swabs, tonsil swabs, feces, ear and ticks were collected. TTU had tonsil and nasal swabs collected for their project. TPWD had nasal swabs and blood for M. ovi surveillance which were submitted to Washington Animal Disease Diagnostic Laboratory (WADDL).

Though the focus of the aerial gunning efforts was disease surveillance and monitoring, due to increasing landowner concern, in some areas we were able to lethally remove more acoudad in addition to the ones being sampled. During the Jul-Aug operation, a total of 1,135 acoudad were observed, of which 505 were removed (Table 2). The 180 animals sampled are included in the 505 removed.

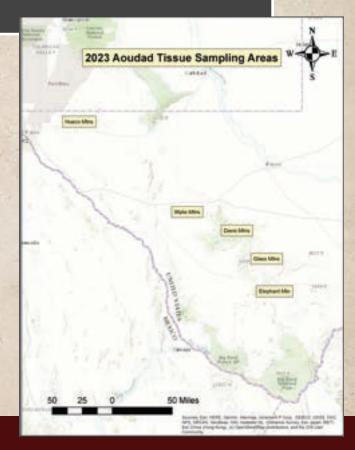
Table 2. Total aoudad observed and removed during 2023 Jul-Aug.

Mtn Range	Aoudad Observed	Aoudad Removed ¹
EMWMA Surrounding	212	75
Hueco	357	285
Wylie	209	89
Davis	303	26
Glass	54	30
Total	1134	505

¹The 180 aoudad sampled are include in the total "Aoudad Removed".

Due to time and logistical constraints, none of the mountain ranges or areas were not flown or sampled in their entirety, particularly the Davis and Glass mountains. Therefore, the totals for "Aoudad Observed" do not actually reflect potential aoudad densities, which are believed to be higher.

Because the sampling efforts were completed at the end of August, no results were available at the time of print. These results will be provided in the upcoming issue of the Bighorn. TPWD intends on continuing the aoudad disease surveillance and monitoring program as well as expanding sampling efforts to include other mountain ranges.





Hi TBS! Although I graduated last May, I'm still finishing up projects and starting new ones on wild sheep. You could say I have sheep fever and there might not be a cure for it. As we are all aware, desert bighorn sheep (DBS) in Texas are susceptible to several diseases and the brief report below details some of the research that Drs. Bradley, Phillips and I, along with several undergraduate students have worked on for about a year. We are aiming to submit this research for publication as soon as possible.

Outbreaks of pneumonia in bighorn sheep are common occurrences in the western United States and Canada and usually are initiated by commingling between bighorn sheep and either domestic sheep or goats. Until recently, it was thought that the Texas populations of DBS were the exception and that they were free of Mycoplasma. However, evidence of disease and potential decline from outbreaks of M. ovipneumoniae and bluetongue are now apparent in several populations (Van Horn Mountains and Black Gap WMA) across the Trans-Pecos Ecoregion. With high numbers of aoudad in sympatry with bighorn, a pathogen spillover event is likely to have occurred recently in the Trans-Pecos Ecoregion of Texas.

To test this scenario, we reengineered the multi-locus sequence typing (MLST) offered by the Washington Animal Disease Diagnostic Laboratory (WADDL) at Washington State University to determine the genetic identity of Mycoplasma strains or species within the nasal microbiome of DBS and aoudad in the Trans-Pecos Ecoregion. To date, we identified three DBS and five aoudad individuals with M. ovipneumoniae, three aoudad with bacterial sequences genetically similar to M. conjunctivae, one aoudad with bacterial sequences genetically similar *M. hyopneumoniae*, and nine aoudad with bacterial sequences genetically similar to both M. conjunctivae and M. hyopneumoniae, indicating that infection of multiple strains is possible.

M. conjunctivae is the causative agent of keratoconjunctivitis (i.e., pinkeye) and was documented in DBS in Arizona. However, the strains of *M. conjunctivae* of aoudad detected in Texas were approximately 7% genetically different from the strains of M. conjunctivae detected in domestic goats and DBS in Arizona. M. hyopneumoniae is an etiologic agent of enzootic pneumonia, which negatively impacts the swine industry worldwide. However, the strains of M. hyopneumoniae detected within the nasal microbiome of aoudad in Texas were approximately 6-10% genetically different from the strains of *M. hyopneumoniae* in domestic pigs. This indicates that there is perhaps a unique aoudad strain for both M. conjunctivae and M. hyopneumoniae.

It is unknown how pneumonia initially was introduced into the population of acudad and DBS. The most likely scenario is a spillover from domestic goat and sheep populations, especially given the phylogenetic similarity of the DNA sequences recovered from nasal swabs of DBS to sequences previously published for domestic goats. Alternatively, it could be that the original translocated aoudad possessed Mycoplasma, were infectious but asymptomatic, and transmitted the bacteria to other individuals and their progeny. This model would be similar to the transmission pathways documented in domestic sheep and goats where aoudad are not the original reservoirs and may have encountered the bacterial disease through contact with domestic livestock or native and nonnative wildlife species such as javelina (Pecari tajacu), mouflon (O. gmelini), or red sheep (O. aries). A third postulate is that reintroduced DBS from the Black Mountains situated along the border of Arizona and Nevada possessed M. ovipneumoniae and potentially were infectious and transmitted the bacteria to other DBS in the breeding pens at Sierra Diablo WMA in the 1980s based on animals that previously tested positive from the Black Mountains at the Glaze

Veterinary Clinic (Kerrville, TX).

Whatever the method of introduction, with large population sizes and movement patterns similar to DBS, aoudad presumably are the reservoir and potential vector for bacterial and viral pathogens into DBS, such as pneumonia and bluetongue, and are possibly contributing to the decline of DBS. As aoudad do not seem to be negatively impacted by pneumonia and may have similar resistance mechanisms or asymptomatic levels similar to domestic sheep and goats, unlike naïve DBS, it seems likely they are providing for a rapid spread of *M. ovipneumoniae* across the Trans-Pecos landscape.

Future sampling efforts of seemingly asymptomatic aoudad, as well as visibly sick or deceased DBS, are critical to monitor the spread of disease in DBS populations across mountain ranges in western Texas. It is imperative, that where DBS occur, aoudad removal plans are implemented to reduce and eliminate current infections and putative transmission of *M. ovipneumoniae*, prevent future disease outbreaks of pneumonia, and ultimately conserve DBS for future generations.

This research was the brainchild of Rachel Wiedmeier and although she did not want to be an author due to obligations at U. of Minnesota, we would like to extend our thanks to her. We would also like to thank TPWD (Froylán Hernández, Dr. Hunter Reed, Dr. Sara Wyckoff, and the late Dr. Robert Dittmar) for initial sample collection from 2018-2020 as well as sharing WADDL reports. Thanks to Jace Taylor and Kezia Manlove for providing the six pneumonia-positive Rocky Mountain sheep. Thanks to Daniel Wilcox, previously associated with Sul Ross State University, for providing three Texas desert bighorn sheep samples from mortalities on a private ranch in the Van Horn Mountains. Special thanks to Kai Buckert for allowing genetic, and disease studies to be conducted on the bighorn populations in the Van Horn Mountains. Thanks to

H. Garner and K. MacDonald of the Natural Science Research Laboratory at the Museum of Texas Tech University for assisting with tissue loans. This research was funded by a State of Texas line-item to Robert Bradley.

As y'all can tell, it takes a village for research to happen. We are grateful to our collaborators for their fellowship and commitment to the conservation of the Texas desert bighorn sheep. This research would not be possible without their support and cooperation.

Guns up! Emily



TBS ROUNDUP TAPATIO SPRINGS





Photos by Claiborne Myers and Dirk Parks

















































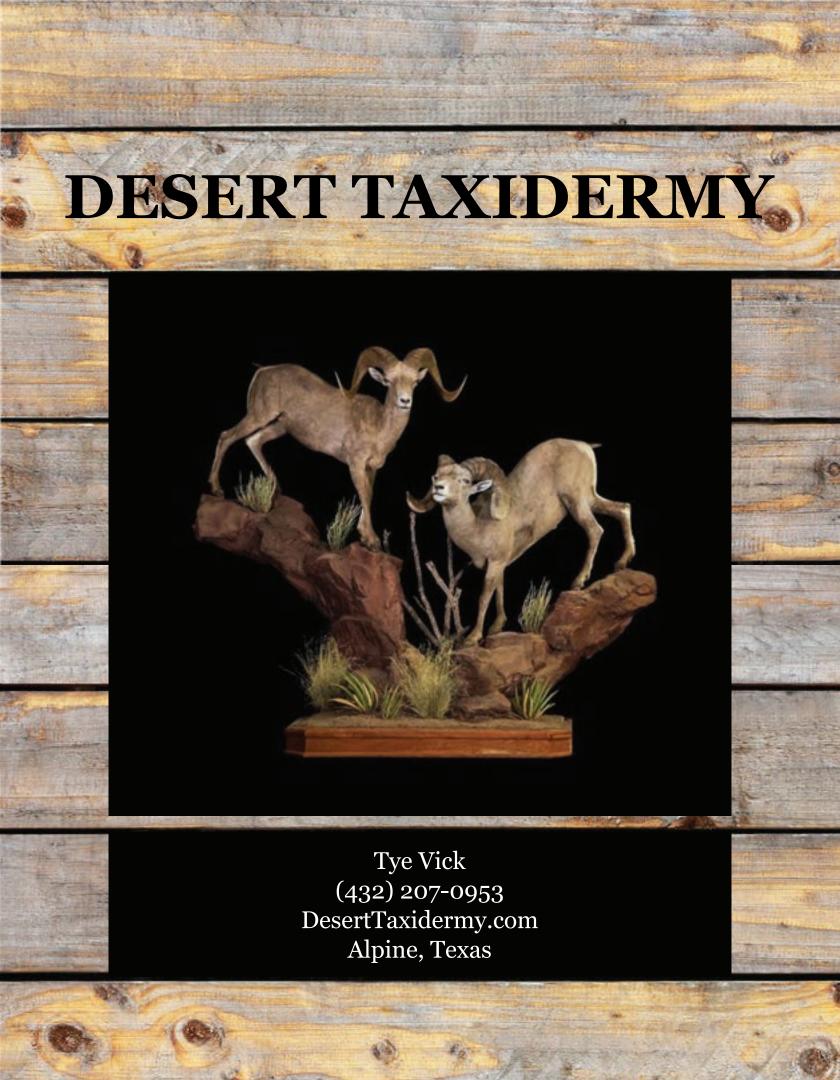




















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