

DESERT TRACKS

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Using Satellite Technology and Fecal Samples to Support Texas' Desert Bighorn Sheep Sustainability

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Collecting monthly fecal samples from mule deer and desert bighorn help to measure fecal nitrogen content, which indicates an animal's nutritional status.

Elephant Mountain Wildlife Management Area (EMWMA) sits at the heart of desert bighorn sheep restoration in Texas. Its acquisition in 1985 was intended primarily to replenish desert bighorn sheep populations and conserve other native species, such as mule deer. Desert bighorn sheep on EMWMA are incredibly reproductively successful.

This steady increase in population has allowed managers with Texas Parks and Wildlife Department (TPWD) to translocate over 500 desert bighorn sheep from EMWMA to other areas in Texas in 10 different translocation events since 1995.

While restoration has been successful thus far, there are lingering concerns about disease outbreaks and possible competition for resources with other species. With that in mind, managers are interested in protecting EMWMA for its crucial role in bolstering struggling bighorn herd numbers in different areas. Protecting the nursery herd of EMWMA involves protecting the resources it depends on. To obtain the best outcome for desert bighorn sheep, mule deer, and the landscape, TPWD and Borderlands Research Institute researchers have teamed up to

determine the carrying capacity of desert bighorn sheep on EMWMA. While we already have a current estimate of how many desert bighorn sheep we think EMWMA can support, we know carrying capacity changes yearly with variable weather patterns and the available vegetation. Estimating carrying capacity involves a lot of work that is time-consuming and too cost-prohibitive to conduct annually. To circumvent this, we use satellite imagery to monitor available vegetation, allowing us to estimate carrying capacity quickly, more precisely, and more often.

This project involves collecting monthly fecal samples from mule deer and desert bighorn sheep to measure fecal nitrogen content, which indicates an animal's nutritional status. Fecal nitrogen content from both species is compared with the average monthly Modified Soil Adjusted Vegetative Index (MSAVI) value taken from satellite imagery, which indicates "greenness" of the vegetation on the landscape. These data were collected before and after a translocation of 77 desert bighorn sheep from EMWMA to Franklin Mountains State Park to observe the nutritional status of mule deer and desert bighorn sheep on the mountain.

While the project is ongoing and more years of data will be required to calibrate the estimation model, preliminary results showed that fecal nitrogen content of both desert bighorn sheep and mule deer increased, indicating an increase in nutritional performance after the translocation. This is an important first step in estimating carrying capacity for desert bighorn sheep on the WMA.



From the Director—Putting Science to Work on the Land

At BRI, we focus on making science that matters for those that manage our landscapes every day. That is our mission. Research and teaching are essential, but if what we learn does not reach landowners, managers, and communities, we have missed the mark.

Closing that gap takes intention. We share our work through publications like *Desert Tracks*, *Borderlands Bulletin*, *Borderlands News in Texas Wildlife* magazine, biannual research reports, and a growing digital presence.

Some of our most important work happens face to face. Field days, workshops, and symposia create space for conversation. Over the past year, we hosted 33 events and reached more than 1,500 participants.

That work continues at the 2026 Trans-Pecos Wildlife Conference this August, one of our signature events. Join us in Alpine as we bring people together, share ideas, and keep moving conservation forward.

—Louis A. Harveson

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Nau Gift Advances Habitat Restoration in West Texas



BRI students work on habitat restoration projects at Nine Point Mesa Ranch in Brewster County.

The Borderlands Research Institute has received a \$975,000 gift from John L. Nau III to advance habitat restoration efforts at Nine Point Mesa Ranch in Brewster County. The investment builds on Nau's earlier \$1 million contribution that launched the project and established the ranch as a hub for long-term, applied research in the Trans-Pecos.

With this new funding, BRI is moving into Phase 2 of its multi-year initiative, scaling restoration strategies developed over the past five years. Initial research focused on hydrology, soil erosion,

native reseeding, brush management and wildlife monitoring. Now, those findings are being applied across the landscape to improve habitat for scaled quail and other native species.

"The work at Nine Point Mesa Ranch represents exactly the kind of science-based stewardship we need to sustain and improve working lands in Texas," said Nau. "I'm proud to support BRI in taking what has been learned and putting it into action on the ground. My hope is that other ranch owners will be able to learn from this research and apply these targeted methods to their ranches."

Nyle Maxwell Honored as 2026 West Texas Conservationist of the Year



Nyle Maxwell (center) receiving an award for the 2026 West Texas Conservationist of the Year from Dr. Louis Harveson (left) and Dan Allen Hughes, Jr.

On May 20, Nyle Maxwell was honored as the 2026 West Texas Conservationist of the Year, recognizing a lifetime of leadership rooted in stewardship, science and a deep respect for the land.

Though he built his career in the automotive industry, Maxwell's legacy has taken shape across more than 125,000 acres of working ranchland in Texas. What began as a first ranch purchase more than two decades ago grew into a hands-on commitment to habitat improvement, water management and sustainable wildlife practices. Today, his properties support healthy

populations of native species while demonstrating the value of long-term, science-based land stewardship.

Maxwell's influence extends beyond his ranch gates. As president of the Texas Wildlife Association, he has championed private land stewardship and worked alongside policymakers to advance conservation across the state.

The award reflects not only what Maxwell has built, but how he has led—by example, with an eye toward ensuring Texas landscapes remain resilient and productive for generations to come.

Water in the Desert Conference Signals Momentum for West Texas Water

More than 350 landowners, scientists, policymakers and community leaders gathered in Alpine in February for Water in the Desert 2026.

Hosted by the Meadows Research Institute for West Texas Water, the conference underscored both the urgency of regional water challenges and the importance of collaboration. Discussions ranged from groundwater management to infrastructure investment, with a shared focus on practical, science-driven solutions.

The event also marked a milestone for the Meadows Research Institute, positioning it as a hub for connecting research, people and ideas across the region.

All conference materials, including session writeups and videos are now available online at meadowsresearchinstitute.sulross.edu.





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Register Now: 2026 Trans-Pecos Wildlife Conference



In 2026, wildlife and land management challenges across West Texas are growing more complex, from border infrastructure and light pollution to emerging diseases and habitat shifts. Addressing them requires communication and collaboration.

The Trans-Pecos Wildlife Conference, taking place **August 5–7, 2026**, is hosted by the Borderlands Research Institute with partners Texas Wildlife

Association and Texas Parks and Wildlife Department. This event brings landowners, researchers, and conservationists together to share insights and solutions.

West Texas is a place like no other; let's come together to strengthen partnerships and shape the future of its wildlife and working lands.

Register Now!

bri.sulross.edu/events