

Testing the Waters in the Desert: Establishing a Bolson Tortoise Colony Where Bolson Tortoises Haven't Tread in over 10,000 Years



Adult male Bolson tortoises like the one shown here are generally smaller than the adult females (by ~15%). The largest of the males in our colony have shell lengths of ~325 mm, the largest females reach ~390 mm.

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CHRISTIANE WIESE AND SCOTT HILLARD

In 2006, the Turner Endangered Species Fund (TESF) accepted responsibility for a group of tortoises collected and bred since the early 1970s by the late Ariel Appleton. In the summer and fall of 2006, TESF staff and volunteers rounded up Ariel's tortoises near Elgin, Arizona, and transferred them to their new home on the Armendaris Ranch in southern New Mexico. The Armendaris, owned by media mogul and

conservationist Ted Turner, lies at the northern tip of the tortoise's prehistoric range in the Chihuahuan Desert.

Largest of the five North American tortoise species, the Bolson Tortoise (*Gopherus flavomarginatus*) is believed to have once roamed throughout most of the Chihuahuan Desert. The tortoises' current range is now restricted to the small "Bolson de Mapimi" area in north central Mexico.

Their scientific name, *flavomarginatus*, meaning "yellow-margined", describes how Bolson Tortoises have yellow marginal scutes with most individuals also displaying yellow toenails. Known as the "Tortuga Grande" and the "Running Tortoise", their propensity for a running take off to the nearest burrow distinguishes them from other tortoises who are more likely to stay put and retreat into their shells.

BREEDING PROGRAM SUCCESS

We've developed a robust breeding program on the Armendaris Ranch over the last 9 years; resulting in over 500 new Bolson Tortoises. Young tortoises are housed in outdoor holding pens to protect them from predators until they are large enough to fend for themselves. What it precisely means scientifically for them to be "large enough" is a research question still under investigation. Until that question is answered, the animals are being released at four to seven years old.

In the fall of 2012, we began outfitting larger juveniles (>100 mm shell length) with transmitters and moving them from the protected pens to large (7.5 hectare) unprotected, predator-accessible enclosures fenced to comply with current permit requirements, but not covered. Because of such releases, over 100 captive born tortoises experience life as wild animals with minimal human interference. We weigh, measure, and assess health twice a year. Beyond that, the tortoises are on their own.

Survivorship is an astounding 85 percent. Predators known to eat tortoises, such as ravens, roadrunners, hawks, ground squirrels, ringtails, raccoons, coyotes, mountain lions, bobcats, bears, and snakes are present on the Turner Ranches, but may pass up the Bolson Tortoise 'tortellinis' for more accessible prey. Bolsons spend upwards of 90 percent of the time in their burrows, and generally emerge only for



Dr. Jim Jarchow watches as a juvenile tortoise with transmitter slowly advances to check out the burrow the tortoise team has chosen for its release in the large unprotected pen. This Bolson Tortoise juvenile was the 100th tortoise released to live as a wild tortoise in the northern portion of its species' prehistoric range with minimal human support or interference. PHOTO CREDIT: CHRISTIANE WIESE



Coaxing an adult tortoise out of its burrow requires getting up close (or down close, as the case may be) and personal. Here, one of the authors is patiently taking advantage of the tortoise's natural behavior to defend its burrow by pretending to be an intruder. In most cases, the tortoise's efforts to evict the intruder will eventually bring it close enough to the burrow entrance to be captured. PHOTO CREDIT: SCOTT HILLARD

basking sessions close to the security of the burrow opening. They're out for relatively brief foraging bouts, so unless it rains, young tortoises are rarely encountered away from their burrows.

WILD POPULATION STATUS UNKNOWN

Little is known about the current status of the Bolson Tortoise in the wild. The last of-

ficial population count was conducted in the early 1980s. Even then, the wild population was thought to comprise a mere 8,000 to 10,000 animals existing in six separate colonies. One of these colonies was protected inside the Mapimi Biosphere Reserve, but the continued threats of habitat degradation and human consumption are likely to have significantly reduced the number of

wild Bolson Tortoises. Fewer than 2,000 adults are estimated to remain in the wild today.

There is good news from other quarters. Given the current rates of reproduction of our semi-captive colony on the Turner Ranches, the U.S. population of Bolson Tortoises may soon rival the size of the wild population.

MOVING BEYOND ASSURANCE COLONIES

TESF's ultimate goal is to move beyond maintaining captive assurance colonies, and establish free-ranging populations in what was the historic Bolson habitat before early humans greatly reduced their range, and modern humans brought them close to the brink of extinction.

Monitoring the growth and fecundity of our colony has convinced us that Bolson Tortoises not only survive, but actually *thrive* in the northern Chihuahuan desert grasslands. About half of our 13 females routinely triple clutch, and clutch size is similar to wild counterparts. Moreover, released juvenile tortoises find enough high quality, native forage to manage normal growth rates. What remains to be established is whether nests and hatchlings in unmanaged or minimally managed populations can survive at rates high enough to maintain and increase the population.

Concerns about future landscapes, in the face of inevitable climate change, prompt careful consideration of potential reintroduction sites. In addition to establishing free ranging, minimally managed Bolson Tortoise populations on Turner lands, we envision them once again roaming the desert shrublands of places like Big Bend National Park.

Many thoughtful conversations will need to take place to fully address lingering concerns about reintroducing a species not present in a region since before the time of Christopher Columbus. But hopes are that truly wild Bolson Tortoises will once again tread on northern, public Chihuahuan Desert lands.

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