Our Stories

Southwest Science Applications

Bringing Sonoran Pronghorn Back from the Brink

Partners' ingenuity intensifies amid changing climate conditions

Photo Credit: USFWS. Contrary to popular belief, the Sonoran pronghorn is actually not an antelope. It is a geographically and genetically distinct sub-species of the American pronghorn, the sole remaining member of a distinct family known as prongbucks endemic to interior western and central North America. The Sonoran pronghorn was first considered endangered in 1967 and now numbers about 150 in the United States and about 250 in Mexico.

The Wake-Up Call

Jim Atkinson refers to 2002 as "The Pivotal Year." That's when large swaths of the Sonoran desert experienced a drought more severe than any other on record.

And it's when the only remaining population of Sonoran pronghorn in the United States came dangerously close to being lost forever.

Those working to recover it at that time got a serious wake-up call, explained Atkinson, the U.S. Fish and Wildlife Service's Sonoran pronghorn recovery coordinator since 2008. He is based at the 860,000-acre Cabeza Prieta National Wildlife Refuge on the Arizona/Mexico border, the epicenter of the U.S. recovery effort.

"Up to that point, it seemed sufficient to have this pretty well-protected area to recover the pronghorn," he said, noting that 93 percent of the refuge is a designated Wilderness Area. "There wasn't a compelling reason to pursue active management."

That was before dramatically changing climate conditions began to wreak havoc on the wildlife and habitat of the desert Southwest. "When the 2002 drought came along, we realized we could actually lose this population," Atkinson said.

The Arizona Game and Fish Department, with funding from the Fish and Wildlife Service, has been monitoring Sonoran pronghorn for 20 years. Although the population fluctuated considerably, it averaged about 140 animals in the United States over the first 10 years of surveys.

In 2002, the population plummeted to only 19 pronghorn. According to the recovery coordinator at that time, they all would have been lost if it hadn't rained when it finally did.

Atkinson explained that annual pronghorn numbers are greatly influenced by fawn survival, with twin fawns generally born to each breeding female in the spring. That's just when the hot, dry season hits, with the period between March and June typically getting increasingly hotter and drier until the summer monsoons hit in July. In 2002, the monsoons didn't come until September, breaking a 13-month drought cycle, and by then every one of the year's fawns had died, along with scores of adults.

"The prolonged drought changed all of our assumptions…and presumptions," Atkinson said. "Then we realized we were going to have to do some active

Photo Credit: USFWS. *Sonoran Pronhorn Doe*

management to recover and stabilize these animals. That's what led us to the program we have now."

Emergency Action

Captive breeding is a wildlife management tool of last resort, and it's not an action any wildlife manager chooses lightly or often. It can be difficult, expensive, and rife with risk. But when so few animals are left, the Fish and Wildlife Service and its conservation partners must do whatever it takes to prevent extinction.

A captive-breeding program for the Sonoran pronghorn began over the winter of 2003-2004 when seven of the remaining animals were captured and placed in a specially constructed, one-square-mile pen on Cabeza Prieta Refuge.

In the captive-breeding pen, one carefully selected buck breeds with all of the herd's does. Breeding bucks are rotated to ensure as much genetic diversity as possible. In the future, Atkinson said, breeding bucks may be brought in from one of the Mexican populations "to mix up the genetics and ensure the population stays robust."

But, he added, "We're not going to be in the captive-breeding business forever. The whole goal of our efforts right now is to put a floor under this herd and keep it from cratering again and again. For now, we can focus on restoring the herd and stabilizing it for the long haul." Other habitat enhancement efforts are essential elements of a broader effort to recover the pronghorn.

Along with Arizona Game and Fish, primary partners in the recovery effort are the National Park Service, U.S. Air Force, U.S. Marine Corps, and the Bureau of Land Management. Many others support specific activities, such as professionals at the Phoenix and Los Angeles zoos who share their expertise in captive breeding.

Recovery partners developed several adaptive management measures after the pronghorn plummeted in 2002. Central to their success is the establishment of a second U.S. population so that the sub-species is less vulnerable to a catastrophic event that would put it back on the brink of extinction. Kofa National Wildlife Refuge, about 90 miles northwest of Cabeza Prieta Refuge and historically part of the Sonoran pronghorn's range, was the chosen location for the second U.S. population.

Since 2006, almost 100 captive-bred pronghorn have been released to supplement the original U.S. population, all within the current range, including areas of Cabeza Prieta Refuge, Organ Pipe Cactus National Monument, and the Barry M. Goldwater Range East (Air Force) and West (Marine Corps). The first pronghorn to establish the second population on Kofa Refuge were released just recently—returning the pronghorn to a part of its range it hadn't inhabited for more than 100 years.

That momentous event occurred in January 2013, when nine pronghorn fitted with GPS collars were taken by helicopter from Cabeza Prieta Refuge to their new home on Kofa Refuge. They were released into the King Valley, in an acclimation area within a half-square-mile breeding pen, so they can be monitored prior to their full release.

That initial monitoring helps ensure the pronghorn rebound from any effects of anesthesia or the stress of capture and transport, Atkinson explained. After that, they were released through a gate without further handling. Now their movements and fawn production are monitored remotely by GPS and from both air and ground surveys to get visual confirmation of their status. Additional pronghorn releases within the U.S. range are planned for at least a few more years or until recovery goals are met.

Ever since 1992 when surveys began, the U.S. population is counted in the even years and the Mexican population in the odd years, Atkinson explained. The latest surveys show the total U.S. population numbers 159 animals and the Mexican population, broken into two herds separated by a major highway, stands at 241.

"Ever since 2002, the U.S. population has shown an increasing trend and more

stability than the population preceding 2002," Atkinson said, attributing it to the active management measures. "It doesn't fluctuate as much, it's just been steadily climbing." The population in the Mexican region of Sonora has been declining, however, and no recovery actions other than monitoring have been identified. Atkinson expects that will change with an effort underway for collaboration with Mexico in updating the pronghorn recovery plan.

Toward Sustainability

Recovery partners' adaptive management measures, spurred by the wake-up call of 2002, also included special habitat enhancement projects. In the pens on Cabeza Prieta and Kofa, and in other areas of these refuges, the projects ensure Sonoran pronghorn have enough water and forage.

Recovery partners began putting in water catchment systems on Cabeza Prieta Refuge in 2003. Rainwater is captured and diverted to underground storage tanks, then gravity-fed through piping that leads to ground-level troughs for the pronghorn. The biggest systems store 18,000 gallons, Atkinson said, providing a stable water supply for potentially a year or longer.

This is hugely significant since wildlife managers are now trying to recover a species on a dramatically altered landscape that no longer functions as it did historically.

"The current range of the pronghorn is hemmed in by major highways with right-of-way fencing," Atkinson said, "so it's pretty much dry range they're left in, with significant barriers to their movement. In the past, if things dried up here, they would have simply moved by either going north to the Gila River drainage or the vicinity of the Sea of Cortez or Rio Sonoyta in Mexico. But there are no perennial water sources within the current range now."

The good news, however, is that re-creating perennial water sources and forage areas can make a big difference in recovery success because it's the key to fawn survival and recruitment into the herd. "The population can really take off when pronghorn numbers are up and conditions are good," Atkinson said.

Along with the water catchments, recovery partners created five separate forage plots ranging from about 5-10 square acres in size, Atkinson said. Much like irrigation systems commonly used in agriculture, they include wells with pumps and generators and a lot of above-ground piping to ensure the areas pronghorn prefer to forage have green vegetation available during dry periods.

"Keeping the water and forage there for the pronghorn has helped us maintain annual fawn crops that may otherwise have died," Atkinson said. "From our monitoring, we know this is making a difference in stabilizing the herd."

Today's Challenges

The Fish and Wildlife Service's modernized approach to conservation, called Strategic Habitat Conservation, emphasizes the very issues recovery partners are taking into account for the Sonoran pronghorn, Atkinson said.

Tenets of this approach include conservation through extensive collaboration and applying the best available science to understand present landscape ecology and the effects of changing climate conditions. "That kind of understanding is so important when we're trying to find new ways to restore habitat value to a severely altered landscape," he said.

Another aspect of Strategic Habitat Conservation, now being further developed by the Fish and Wildlife Service and its partners, is a focus on "surrogate" species that signal the health of the broader environment. For example, while the emerging drought patterns had unmistakable effects on the Sonoran pronghorn, those same conditions depressed populations of many other Sonoran desert species, Atkinson said. Low numbers of small mammals, bats, and reptiles in turn affected larger predators such as kit foxes, coyotes, and bobcats. These species and countless others are now benefitting from habitat enhancements that support pronghorn recovery.

"There were a lot of extreme effects of the 2002 drought that we'd never seen before," Atkinson said. "There was mortality across the board. Even decades-old desert trees such as ironwood and mesquite that withstood lots of dry seasons before then died that year."

Photo Credit: USFWS. *To address changing climate conditions and prevent extreme drought hazards, recovery partners developed habitat enhancement measures, including rainwater catchments and troughs, that ensure water and forage for pronghorn during dry periods.*

Another significant change to the landscape, especially over the last 15 years, is an escalating human presence along the U.S./Mexico border. Atkinson described the Cabeza Prieta Refuge as a "sieve" for all kinds of activities related to illegal smuggling of people and drugs, as well as the law enforcement manpower and infrastructure aligned to prevent it.

Surveillance of all kinds—from high tech unmanned aircraft to horseback—is taking place across the range. "There's a lot of movement throughout the entire area south of Interstate 8," Atkinson said, referring to the thoroughfare cutting across the bottom quarter of the state.

"Pronghorn are visually acute animals that easily sense movement and can even distinguish objects that are four to seven miles away," Atkinson said. "They can probably tell a person from another pronghorn at those ranges depending on visibility, and may be able to detect vehicles at even greater distances."

The danger is, he explained, that too much disturbance could cause pronghorn to abandon high value sites; for example, if people use the troughs as water sources, move through the forage plots, or linger nearby, pronghorn may begin to avoid those areas. There's also disturbance from vehicles and aircraft and other mobile surveillance, Atkinson added. "We're trying to learn more about the pronghorn's disturbance thresholds," he said. "Right now we don't know enough about the definitive impacts, but we have a study underway to investigate that."

Atkinson added, "All the activity is the current reality for us and the pronghorn—it defines this area of the Sonoran Desert today. It's as much a part of the landscape as all of the other factors we've traditionally dealt with as wildlife managers."

Photo Credit: USFWS. *Sonoran Pronghorn Recovery Coordinator Jim Atkinson and recovery partners care for a Sonoran pronghorn captured for captive breeding. Part of a broader recovery effort, the captive breeding program is allowing partners to bolster the original U.S. population and start a second one in southern Arizona.*

Road to Recovery

Recovery partners are a big group, ranging from sister federal land management agencies to branches of the military to academia and zoos. Atkinson invests a lot of time coordinating the network and cultivating the relationships necessary to keep progressing.

While adaptive management measures are moving along successfully, Atkinson is getting the process going to update the Sonoran pronghorn's formal recovery plan, which was originally developed in 1982 and revised in 1998. This time, he said, it will be a bi-national plan, including efforts in Mexico, too.

The updated recovery plan will set specific criteria for upgrading the pronghorn's status from endangered to the less dire threatened category, and additional criteria for removing it from the Federal Endangered Species List altogether. If progress continues at its current rate, Atkinson said, it's foreseeable that the pronghorn could be considered for upgraded status within five years and possibly delisted over the next decade, as long as the population remains viable and stable.

Remarkably, even with less than 8 percent of its historic habitat left, recovery partners have found a way to give the Sonoran pronghorn a home on the range. ❖ *Science Applications Team, USFWS*

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