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# Birding

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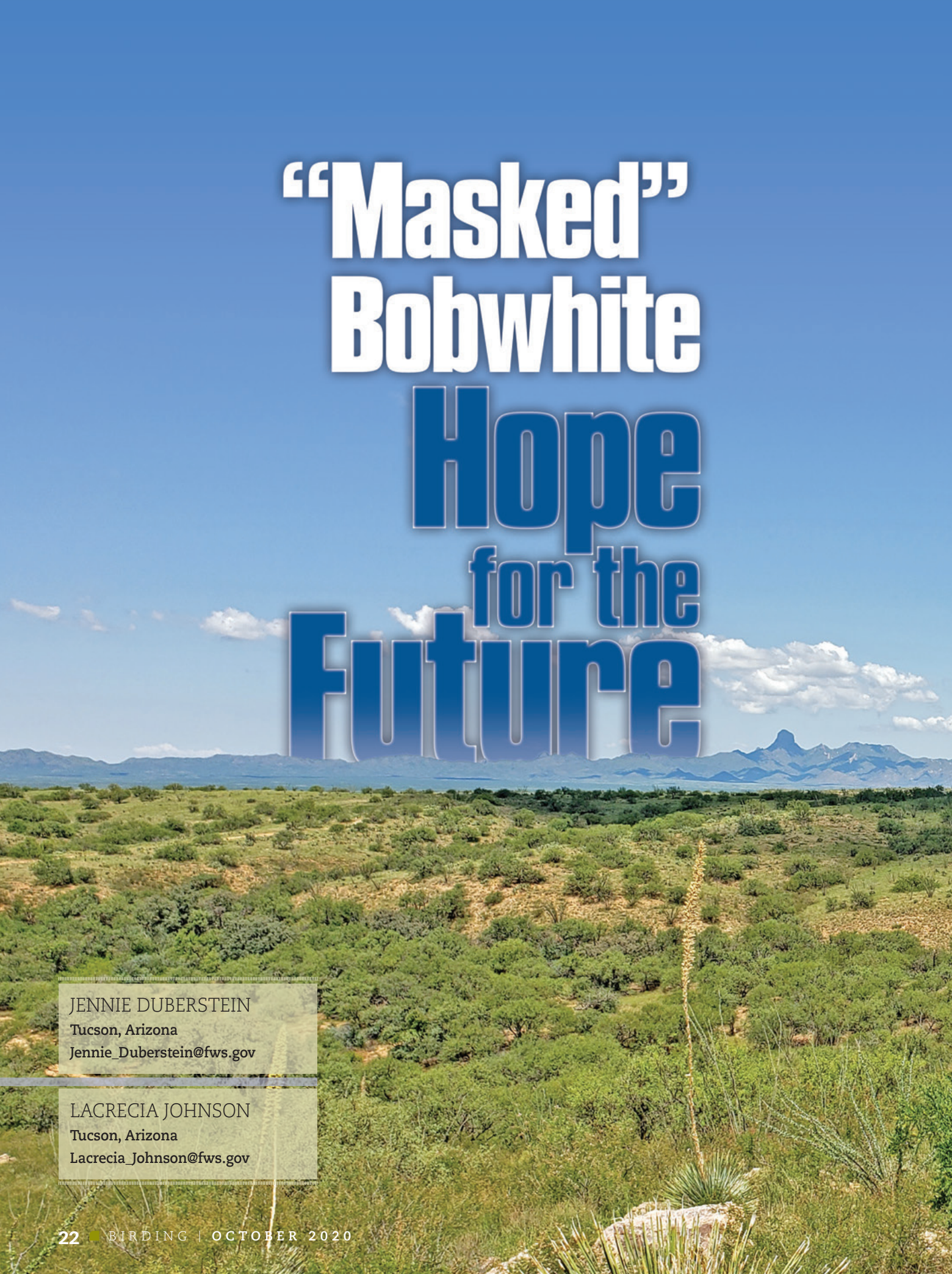
*Hope for the Future of*  
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# **“Masked” Bobwhite Hope for the Future**

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It is a hot summer morning in the semi-desert grasslands of southern Arizona. The monsoon has arrived, although it has not yet rained today. You drive down a bumpy two-track road on the 117,464-acre (47,536-hectare) Buenos Aires National Wildlife Refuge (BANWR), southwest of Tucson. Your partner keeps an eye on a GPS unit, watching to see when you have arrived at the predetermined location. The road peters out, but according to the GPS, you are still more than half a mile from your destination. There is no other option. You park, open the back of the vehicle, and together lift an awkward wooden transport box and gently place it on the ground. Inside the box is hope for the future: a brood of captive-bred “Masked” Northern Bobwhite (*Colinus virginianus ridgwayi*) and their foster parent, an “Eastern” Northern Bobwhite, flown in from a breeding program in Oklahoma one week earlier by volunteer pilots. You grab your backpack with water and snacks, take a deep breath, pick up your side of the heavy box, and begin to hike it into the release spot, sighing resignedly as it bumps uncomfortably against your legs with each step.

TOP: “Masked” Bobwhite. Male on left. Photo © Dan Reinking, George Miksch Sutton Avian Research Center.

BACKGROUND: The Baboquivari Mountains provide a breathtaking backdrop looking west from the Buenos Aires National Wildlife Refuge. Photo © Emily Clark, Sonoran Joint Venture.







“Masked” Bobwhite is an endangered subspecies of Northern Bobwhite. Its historical range barely reached into Arizona within small fingers of habitat stretching across the U.S.–Mexico border into the Sonoran Desert grasslands south and west of Tucson. The heart of its range was in the grasslands surrounding Sonora’s capital city of Hermosillo, almost smack-dab in the middle of the state. Incompatible livestock grazing practices, drought, invasive plant species, and perhaps other unknown stresses led to the extirpation of this subspecies from the U.S. and to its dramatic decline in Sonora by the early 1900s.

In the late 1960s, biologists from the U.S. Fish and Wildlife Service (“Service”) were studying “Masked” Bobwhite in Sonora, conducting surveys, studying habitat, and trying to understand food and shelter needs. What was different about the habitat in Sonora that allowed the birds to persist, while they had disappeared in Arizona? The Camou family owned a series of ranches northwest of Hermosillo near the town of Benjamín Hill that were home to wild “Masked” Bobwhite, and the family was committed to helping the birds. Starting in



TOP: Rancho San Dario is one of several ranches in Sonora owned by the Camou family that were the last known strongholds of “Masked” Bobwhite. Photo © Lacrechia Johnson, USFWS.

BOTTOM: This captive-born “Masked” Bobwhite chick and its “siblings” will be introduced to a foster parent and taken to Arizona to expand the population at Buenos Aires National Wildlife Refuge. Photo © Dan Reinking, George Miksch Sutton Avian Research Center.

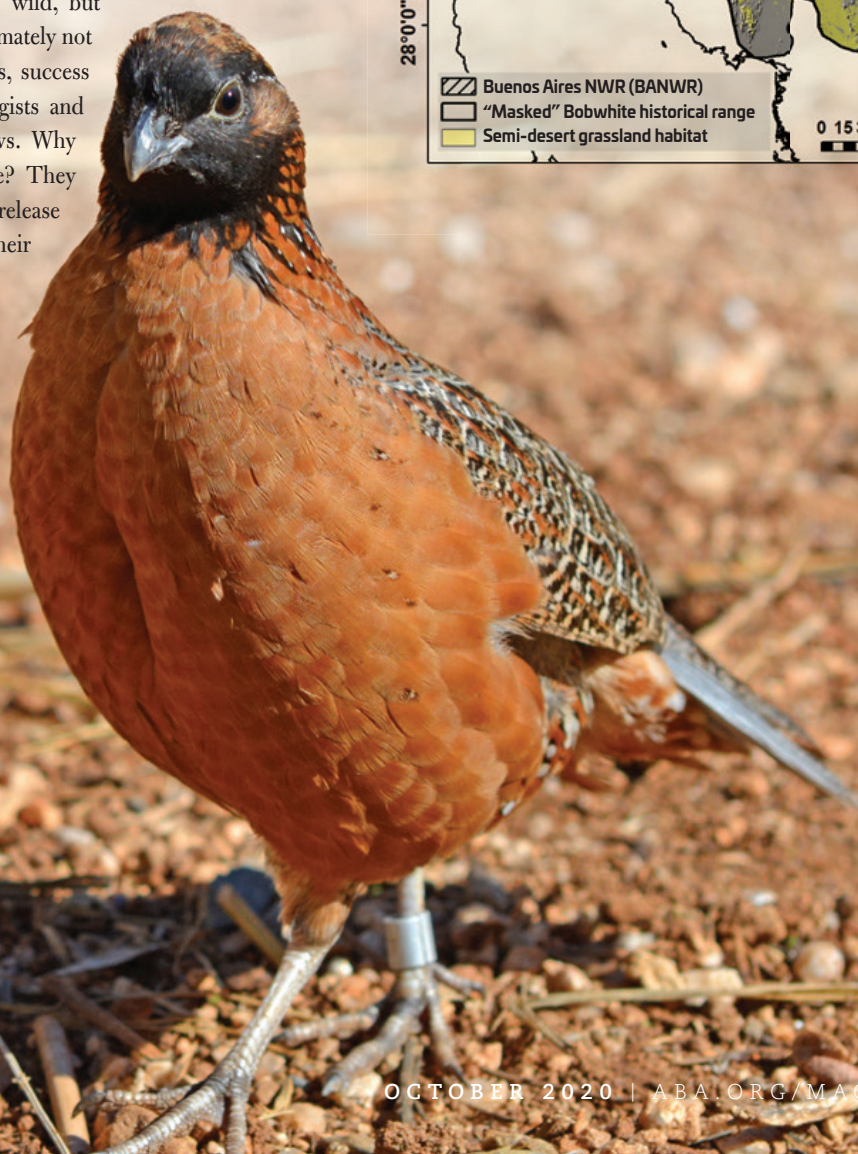
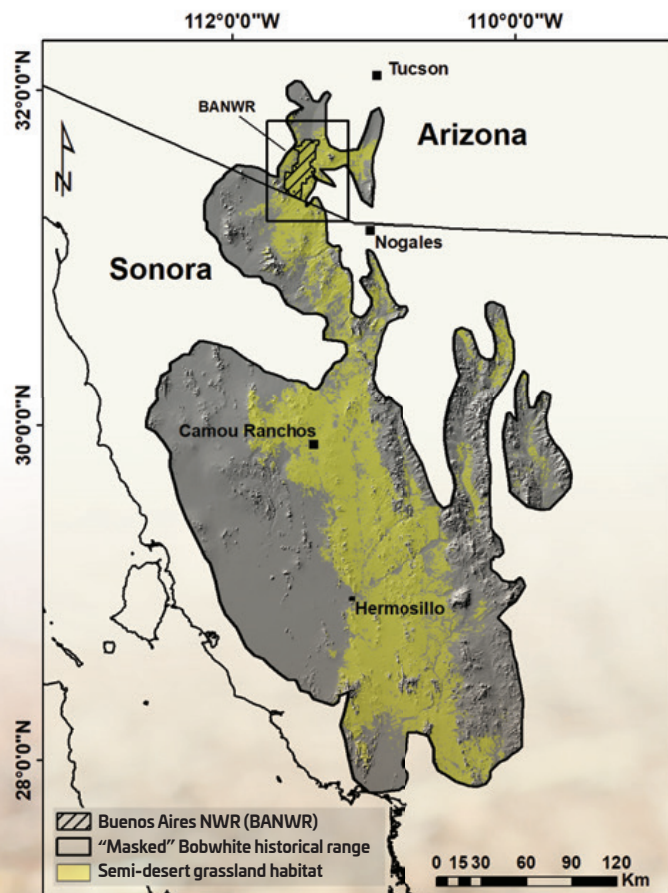


MAP: Historic range of "Masked" Bobwhite. Map © Steve Sesnie, USFWS.

BELOW: Adult male "Masked" Bobwhite. Photo © Paula O'Brient, USFWS.

the 1960s and continuing today, the Camou family has not only allowed research on their property, but also has allowed biologists to trap wild "Masked" Bobwhites multiple times across three decades. Biologists transported the majority of these birds to the Service's facilities in Patuxent, Maryland to found a captive breeding population with the ultimate goal of repatriating "Masked" Bobwhite to areas from which it had been extirpated.

In 1985, the Service established Buenos Aires National Wildlife Refuge to restore and protect habitat to bring back "Masked" Bobwhite. It created a formal captive breeding and release program at the refuge with the descendants of the birds captured on the Camou ranches; prescribed fire became the primary habitat restoration tool. These early years had some success, including the establishment of a population of about 500 "Masked" Bobwhite within the refuge boundary. Birds survived the winter and even reproduced in the wild, but these fragile populations were ultimately not self-sustaining. By the mid-1990s, success had turned to failure, and biologists and managers were grasping at straws. Why didn't the released birds survive? They thought the answer was in their release technique and quickly adjusted their







TOP: Female “Masked” Bobwhite.  
Photo © Dan Reinking, George  
Miksch Sutton Avian Research Center.

BOTTOM: Volunteers carry a wooden transport  
box to a release site at Buenos Aires NWR.  
The box contains an “Eastern” Northern  
Bobwhite foster father and his brood of  
adopted “Masked” Bobwhite chicks.  
Photo © Molly Condit.

practices. Unfortunately, these changes didn’t lead to any measurable improvement in survival. In fact, the nascent population declined. Meanwhile, managers continued using fire at

an unprecedented scale and frequency to improve the habitat.

In Mexico, the story was a bit different. The Camou family had confirmed sightings of “Masked” Bobwhite on their property in Sonora at least through 2006, and their cowboys reported sightings as recently as 2016.



Researchers from the Service and the San Diego Natural History Museum surveyed the Camou ranches in 2016. Biologists heard bobwhite-like vocalizations but had no visual confirmation. If populations remain, they are very low in number. With this precipitous decline, these birds could soon be—if not already—extinct in the wild, and the captive population now the only hope.

In 2009, the Service revived a Masked Bobwhite Recovery Team to bring together people on both sides of the U.S.–Mexico border and to guide a process for repatriating/strengthening populations of “Masked” Bobwhite in Arizona and Sonora. An immediate concern was the fact that there was just a single captive breeding population (at BANWR). If anything happened to these birds, the captive population would be no more. Over several years, the Recovery Team and the Service worked to minimize this risk and created two new captive breeding programs. In 2011–2012, they created one in Mexico (at Africam Safari, a zoo in Puebla) with the longer-term goal of repatriating birds in Sonora (without having to bring them across the international border). From 2015 to 2016, the Service transferred a total of 140 adult “Masked” Bobwhite back to Mexico to begin captive breeding at the new facility in Puebla. To bolster and improve the U.S. captive breeding program, partners established a second U.S. facility in 2017 when the Service began collaborating with the George Miksch Sutton Avian Research Center in Oklahoma to build a captive breeding facility and raise birds to release at BANWR.

While these new captive breeding programs were getting off the ground, the Recovery Team and other Service scientists worked to understand why the released birds did not survive. One clue was that “Masked” Bobwhite prefer more mature landscapes, unlike their Northern Bobwhite cousins to the east, which thrive in young landscapes. What this meant was that fire—the primary habitat restoration tool used in the 1980s and 1990s at BANWR—was reducing the quality of habitat. The program was burning up the very vegetation “Masked” Bobwhite needed for winter



food, nesting, and shelter from predators and extreme temperatures.

The program underwent a major shift. Biologists reverted to the successful release techniques from the 1980s, and land managers changed the way they restored habitat. Fire still plays an important role at BANWR, but on a much smaller scale and only in targeted areas. Today, managers primarily use mechanical techniques to improve habitat. This includes cutting and sometimes removing invasive native mesquite, and controlling erosion and restoring washes in ways that encourage native vegetation to grow. The goal is to create microhabitats with enough food and shelter for “Masked” Bobwhite. Managers carefully plan habitat restoration and enhancement efforts to improve connectivity. They try to ensure that these “quail-ready” areas are not islands, but instead connect to other suitable habitat across the landscape. At the same time, biologists have refined captive breeding, artificial incubation, and conditioning techniques to increase survival of released birds.

By mid-2017, with the new program framework in place and the Sutton Center’s captive breeding program in full swing, the Recovery Team, Service, and key partners decided that the time was ripe to attempt large-scale repatriations at BANWR for the first time since 2005. We consider a 20% annual survival rate successful in wild quail. In 2018 (426 birds released) and 2019 (623 birds released), biologists documented 20–23% survival in chicks fostered by wild “Eastern” Northern Bobwhite; broods fostered by pen-reared “Masked” Bobwhite survived at about half that rate. Encouraged, we were excited to document wild reproduction from birds



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TOP: “Masked” Bobwhite foster father and chicks at Sutton Center captive breeding facility. Photo © Dan Reinking, George Miksch Sutton Avian Research Center.

BOTTOM: “Masked” Bobwhite chick in hand at Buenos Aires NWR. Photo © Molly Condit.





*“Masked” Bobwhite chicks.  
Photo © Dan Reinking, George  
Miksch Sutton Avian Research Center.*

released in 2018. As we go to press, we have conducted the first in a series of releases of a total of 1,000 birds for summer and fall 2020 and are cautiously hopeful for the first time since the mid-1990s.

It is a delicate situation, full of uncertainty. “Masked” Bobwhite are sensitive. They do not easily adapt to environmental change, especially when it occurs rapidly. BANWR, along with southern Arizona and northern Mexico, will likely experience increased drought and more extreme temperatures in coming years, making the future precarious. But there are reasons to be positive. We now have a better understanding of quail habitat needs. We have a proven release technique. Chicks from the captive breeding population have what it takes to survive and reproduce in the wild. Still, questions remain. Will these birds be able to sustain themselves over time? Are they

reproducing in the wild at a high-enough rate to grow the wild population without recurring repatriation efforts? Will they need ongoing support from biologists to survive, like long-term supplemental feeding? Can we address factors that limit their success? Only time will tell. But a recent sighting of a wild-born “Masked” Bobwhite on a wildlife camera is a promise of possibility.

The morning sun is over the horizon now. “This is it,” your partner says, taking one last look at the GPS unit to confirm before stowing it. It has taken you over an hour to bushwhack the half-mile stretch from your vehicle to the release site. Your hands, back, and legs are sore from lugging the wooden crate over rocks and through the scratchy brush. But this site was selected after careful monitoring and consideration. It has all of the characteristics that will help this quail family not just survive, but also thrive. You set down the crate and carefully slide open the door. For 30

seconds, there is silence. Then an adult male “Eastern” Northern Bobwhite, the dedicated foster father, pokes his head out and looks around. Apparently liking what he sees, he takes a few steps into the desert grassland. His 15 foster chicks quickly follow. In their quick-stepping quail way, they move away from the transport box and fade into nearby ground cover, sowing seeds of hope for the future.

## Acknowledgments

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*The perspectives and opinions in this article are those of the authors and do not necessarily represent those of the U.S. Fish and Wildlife Service.*

## Learn More

- **Buenos Aires National Wildlife Refuge:**  
[fws.gov/refuge/buenos\\_aires/](https://fws.gov/refuge/buenos_aires/)
- **George Miksch Sutton Avian Research Center:** [tinyurl.com/yy4hu8mu](https://tinyurl.com/yy4hu8mu)
- **“Masked” Bobwhite Story Map:**  
[tinyurl.com/y3hv6pn7](https://tinyurl.com/y3hv6pn7)
- **Adoptive Fathers for “Masked” Bobwhite:**  
[youtube.com/watch?v=Ai4bIE60zMY](https://youtube.com/watch?v=Ai4bIE60zMY)
- **“Masked” Bobwhite Release:**  
[youtube.com/watch?v=b5UgT4sOR6k](https://youtube.com/watch?v=b5UgT4sOR6k) 📺

## How Do We Release “Masked” Bobwhite?

While bobwhite chicks hatch covered in natal down and ready to run around, they still need parental care to survive. How do we do this with a captive-bred brood, with adult “Masked” Bobwhite staying in the breeding facility? We bring in out-of-state specialists! Biologists pair broods of “Masked” Bobwhite chicks with wild-caught “Eastern” Northern Bobwhite foster fathers from Texas and Oklahoma. Veterinarians sterilize these birds before they meet their new families so that they cannot interbreed with the endangered “Masked” Bobwhite; we use males because they accept foster chicks more readily than females and are easier to sterilize. After spending a few days together in the captive breeding facility, these adult birds become excellent and effective stewards for their wards. We also release some chicks with unsterilized male “Masked” Bobwhite foster parents when “Eastern” bobwhite are not available,

but we’ve found that the wild-born “Eastern” bobwhite make better parents than captive-bred adult “Masked” Bobwhite, and their adopted chicks have much higher survival rates.

An “Eastern” Northern Bobwhite foster father and his foster family being released at Buenos Aires NWR.

Photo © Lacreia Johnson, USFWS.

