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Tracking Data Show Us One of North America's Most Epic Migrations

Advancements in technology help conservationists protect Sandhill Cranes along their awe-inspiring journey.



Sandhill Cranes on the Platte River in Rowe Sanctuary, Nebraska. Photo: Luke Franke/Audubon



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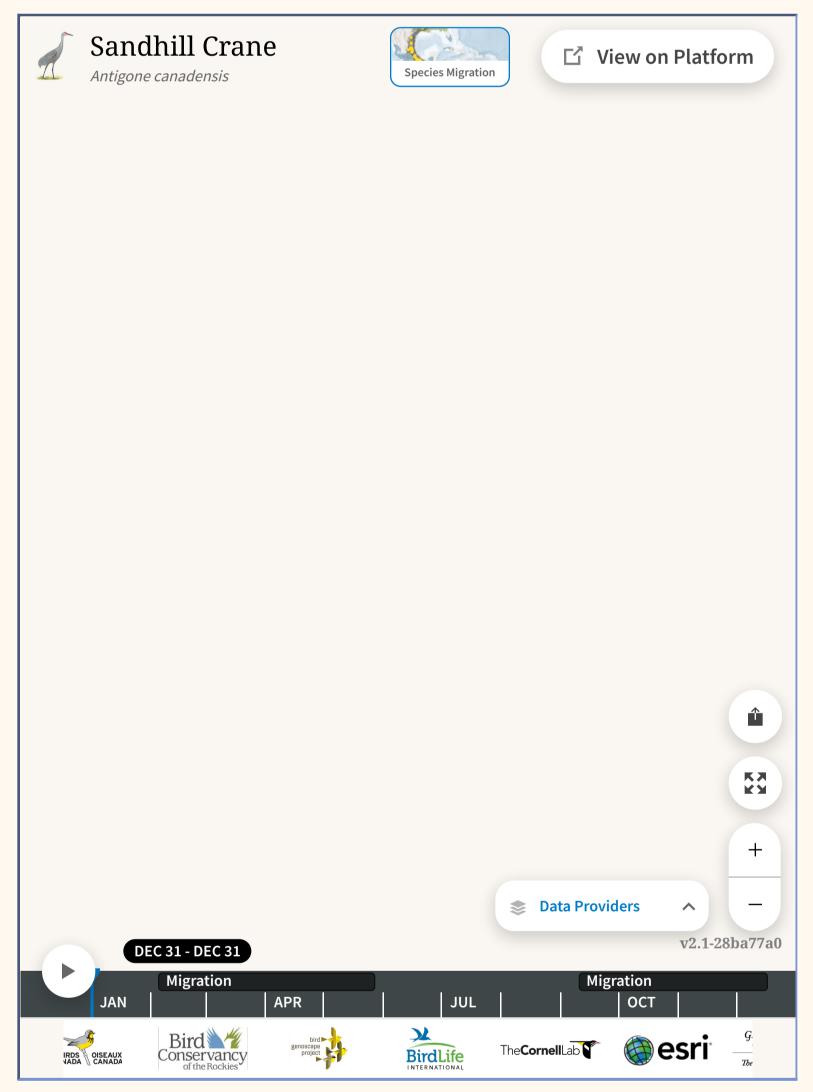
In the heart of America's Great Plains, a remarkable spectacle unfolds in the spring which rivals many of the great migrations of our planet's history. Overhead, skeins of Sandhill Cranes grace the vast skies with their presence. Their trumpeting calls resound across the landscape as they embark on their timeless journey from non-breeding ranges in the southern United States and Mexico to their northern breeding grounds. Within the patchwork quilt of landscapes that shape their annual cycle, Nebraska's Platte River emerges as the centerpiece of their migration—an indispensable thread of a river in the intricate tapestry of their journey.

Between February and April, the Platte River emerges as a vital corridor for migratory birds and a lifeline for about one million Sandhill Cranes, the world's largest population of this ancient species. Through millennia, the braided channels of the Platte have sculpted the landscape, creating ideal roosting sandbars spread between the vast banks of the river lined by wet meadows. While the river offers critical resting habitat, the surrounding landscape, including human agriculture, provides essential sustenance for the cranes on their northward journey. In today's age, sustaining the Platte as the lifeblood of migrating cranes demands an understanding of their full annual cycle and intensive, careful landscape management. Thanks to extensive tracking efforts, researchers studying crane migrations have unveiled the remarkable journeys of these birds in recent decades, underscoring the urgency of conservation efforts to preserve their habitats along the Platte.

Among these researchers, few are as deeply entwined with understanding their migrations from the Platte River Valley as Aaron Pearse, David Brandt, and Gary Krapu, wildlife biologists with the U.S. Geological Survey Northern Prairie Wildlife Research Center. What began with Krapu as pioneering population phenology research on cranes in the late 1970s has blossomed into one of North America's most comprehensive studies on a migratory species, producing a top-tier tracking dataset now brought to life on the <u>Bird Migration Explorer</u>.

Two decades after Krapu's initial foray into crane research along the Platte, he and his colleagues embarked on a monumental 10year tracking study from 1998 to 2007. Driven by a shortage of comprehensive data on crane migrations, Krapu and colleagues initiated comparative studies to delve deeper into Sandhill Crane migration dynamics. They meticulously marked and monitored cranes stopping within the Central Platte River Valley to unveil migration corridors, pinpoint stopover locations, and chronicle migration timing. Their groundbreaking findings from these and, later on, additional deployments were unveiled in Wildlife Monographs in <u>2011</u> and <u>2014</u>, enriching our comprehension of crane behavior but also spotlighting the pivotal role of the Platte River in sustaining the mid-continent population of Sandhill Cranes throughout their annual odyssey.





Advancements in tracking technology, including the introduction of satellite-linked Platform Transmitting Terminals (PTTs) and later GPS transmitters with their ten-meter accuracy, revolutionized the scope and precision of their crane migration research and illuminated previously unknown aspects of their habitat preferences, migration routes, and seasonal behaviors. The 2011 published study on the mid-continent population of Sandhill Cranes by Krapu, Brandt, and others presented information from 153 birds that were tagged using PTTs. The study's number of tagged cranes is no small feat; Brandt says cranes are very wary, not easily captured, and never captured twice. "Over my career of tagging cranes, capturing over three thousand birds, we've never had a banded bird that we recaptured, which is extremely unexpected."

This research tripled the known breeding range of Sandhill Cranes in northeast Asia. "Our research identified northeastern Russia as the breeding ground for nearly a quarter of the mid-continent population that utilizes the Platte River."

The study also highlighted the remarkable philopatry of tagged cranes, with cranes returning to the same breeding areas annually and staying segregated among four breeding subpopulations during fall staging and wintering periods. These findings emphasized the need for tailored management strategies to ensure the sustainability of Sandhill Crane populations across their vast breeding range. The research also underscored the importance of international collaboration in Sandhill Crane studies and management, offering a roadmap for informed decision-making and conservation actions across borders.

Expanding on the groundbreaking studies presented in the 2011 monograph, a subsequent 10-year investigation from 1998 to 2007 delved deeper into the spring migration ecology and behavior of the cranes. This extensive research, led by Krapu, Brandt, and now Pearse, resulted in the 2014 publication mentioned earlier, which aimed to identify migration corridors, Central Flyway stopover locations, and migration chronology across the four breeding subpopulations.

The study revealed that of the over half-million Sandhill Cranes staging in the Central Platte River Valley during spring, 36 percent were Greater Sandhill Cranes, and 64 percent were Lesser Sandhill Cranes. Each subgroup exhibited distinct habitat use and movement patterns, spending an average of 20 and 25 days in the valley, respectively. These revelations have considerable conservation implications at the Platte and further afield. Another significant finding of this research was that only 14 percent of cranes marked with PTTs spent more than five days at stopovers south of Nebraska during spring migration. This insight indicates that a majority of the mid-continent population does not linger long enough in these areas to acquire the large fat reserves necessary for completing migration.

During their migration, the Platte River with its expansive sandbars and surrounding landscape have historically served as crucial stopover sites for Sandhill Cranes. In the 1930s and 1940s, changes in agriculture resulted in an abundance of corn residues becoming available to cranes, adding markedly to the number that could be supported along the river. This increased high-energy food supply allowed the cranes to spend a month or more to build up significant fat reserves before continuing their northward journey. However, recent changes in agricultural practices, including the decline in available corn due to increased harvesting efficiency and crop composition, have impacted the cranes' ability to accumulate sufficient fat reserves. The shift from monotypic corn fields to soybean cultivation has further affected the nutritional value of the food available to cranes. As Krapu states, "The cranes now fly longer distances to access the corn they need. Energy conservation during migration is critical for cranes." In response to declining high-energy foods at the Platte, Greater Sandhill Cranes, which are most affected by diminished corn residues due to their larger body sizes and thus higher energy expenditures, use staging areas in East-Central South Dakota from early to mid-April to acquire more fat before continuing northward to their breeding sites. Even in the Platte region, cranes are shifting. "Since the early 2000s, we're seeing Sandhill Cranes grouping into smaller areas, further east," says Pearse.

And it is no wonder. Demands on the Platte River are already enormous, as almost five million people rely on the water it provides as communities and agriculture grow throughout the basin. Inconsistencies in annual precipitation have reduced streamflow in the Central Platte River, and more than 70 percent of the historic flows are diverted before they reach central Nebraska. This has resulted in the river being a fraction of its former self, with nearly 90 percent of open-channel sandbar habitat lost. Much of the critical remaining sandbar habitat is now choked out by invasive plant growth.

Organizations like Audubon play a pivotal role in crane conservation, especially along the Platte River, where the <u>Iain</u> <u>Nicolson Audubon Center at Rowe Sanctuary</u> is an institution, hosting as many as 35,000 crane enthusiasts annually to view roosting cranes, with up to 200,000 individual cranes present on the sanctuary at a time. Spearheaded by Audubon and partners, efforts like the Platte River Initiative and the Platte River Recovery Implementation Program prioritize increasing in-stream flows, protecting critical habitat lands, and recovering threatened and endangered species at a watershed scale. Thanks to these initiatives, active management strategies include clearing channels, removing invasive vegetation, and enhancing water quality through native buffers. Further, Rowe Sanctuary's grasslands provide critical foraging meadows managed through prescribed fire, grazing, and invasive plant control.

Thankfully, Sandhill Crane populations have surged recently, including in areas of the Arctic where there has been a temporary gain in potential breeding sites due to warming. However, climate change and habitat loss remain significant long-term threats to Sandhill Crane populations across the continent, even as an everadapting ancient species. New challenges, like disease outbreaks such as avian influenza, are also emerging, causing scientists like Krapu to keep a watchful eye. "They're not as vulnerable to disease as other species, but seeing large numbers of Snow Geese dying off to avian influenza is concerning, especially as cranes might become more crowded together due to habitat loss." Preserving breeding grounds, addressing habitat loss, and implementing robust conservation efforts in critical places like the Platte River ensures crane survival at historic levels.

As researchers and conservationists witness these evolving dynamics, the imperative of preserving the Platte River ecosystem becomes increasingly apparent for the flourishing of future crane populations and the well-being of communities reliant on its waters. Insights from tracking studies serve as invaluable compass points for policymakers and conservationists alike. For Brandt, Krapu, Pearse, and their collaborators, the research represents a pinnacle in wildlife conservation efforts—a comprehensive endeavor illuminating the intricacies of crane behavior and migration. For Brandt, "This is one of the prouder moments of my career; this is how wildlife research should be done." Their work is a testament to the power of collaboration and informed decisionmaking in safeguarding future generations of Sandhill Cranes.



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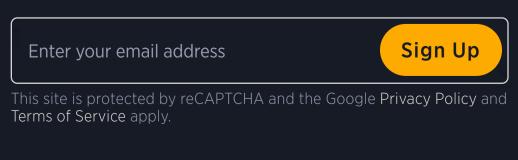
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