

Drone helps conservation group with the threatened sandhill crane

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Look! Up in the sky! It's a bird! It's a plane! Actually, it's tens of thousands of birds and a single drone, an unmanned flying machine with a wingspan the size of an extra-large pizza. And on a recent afternoon, while the birds land, flit and flutter in the plowed cornfields and watering holes of the California Delta, it's not Superman we see but a drone hovering 125 feet overhead, whirring like a weed-whacker, its attached camera recording the avian lovefest down on the ground.

In a novel use of [drone](#) technology to further [conservation efforts](#), researchers from The Nature Conservancy have brought their \$2,000 DJI Phantom quadcopter into the heart of Staten Island, a working farm west of Lodi acquired by the group in 2001 as both a living laboratory and a refuge for [migratory birds](#). Their mission: to use the drone-generated aerial photos and videos to get a more accurate count of the threatened greater sandhill crane, the island's largest and most majestic winter visitor.

"We're standing in the middle of one of the world's greatest migratory routes," says Rodd Kelsey, the group's lead scientist for working landscapes. "But even while the cranes' numbers have slowly increased in the past 20 years, we continue to lose more and more habitat, which means they're still in peril."

Kelsey and his colleagues have been testing out the drone for the past few months. They're hoping the clear and easily countable images of birds photographed from above - both in daylight and at night with a

fixed-wing machine and infrared camera - will provide a better census than volunteers could gather gazing over a hard-to-read landscape full of frenetic feathered residents.

Better numbers will help scientists manage this crucial 9,200-acre home away from home, part of the 46,000-acre Cosumnes River Preserve and home to 15 percent of the Central Valley's 9,000 greater sandhill cranes during migratory seasons. Armed with this data, they can then fine-tune their conservation-management efforts, flooding certain fields, for example, while leaving others dry.

On a recent afternoon, Chris McColl, a conservation analyst and the team's go-to drone operator, unpacked the quadcopter and, after a few tweaks, sent it skyward. While Kelsey conducted his own telescope-aided audit of cranes partially hidden in the shaved corn fields before him, McColl used a [remote control](#) to steer the drone to the edge of the same plot. From there, he used his remote to take an oblique shot of the area with a wide-angle lens. The image appears in real time in the iPhone screen attached to McColl's handheld remote, giving the team a "first-person view" of the roosting birds.

"Eventually we'll do more night flights to capture the cranes," said Matt Merrifield, director of mapping and design with The Nature Conservancy in California. "Night is the Holy Grail because the birds' images are so clearly defined against the dark water they're standing in, so they're really easy to count, one by one."

Throughout the afternoon, the crew experiments with different counting methods - taking a single long shot from the edge of the field; flying a back-and-forth pattern and taking a still frame every three seconds; and shooting a video as the drone makes a programmed autonomous flight above the area, with McColl sitting back as the drone flies itself.

Crane-counting with a drone has challenges. The battery lasts only 20 minutes. Other birds, like the Aleutian geese, crash the party like dive bombers, sending the cranes scattering for the nearest exit. And lingering in the shadows is the prospect of new FAA regulations for commercial drone use, expected by the year-end and potentially hampering the team's research.

Still, the technology is exciting and promising, say the scientists who have used drones in other conservation efforts, including aerial surveys of estuaries near Santa Cruz to monitor the impacts of flooding on salmon habitat. "This is just the beginning," says Merrifield. "We hope to do more and more projects with drones, and what makes it even better is that they're relatively cheap and easy to use."

The team next sends the drone over the pond to capture another video. While the cranes tower above neighbors like the American coot, canvasback and Northern shoveler, the flying machine slowly crawls across the sky. When the drone returns to earth, the team brings up the video on a laptop in the trunk of Merrifield's Honda SUV. With the help of software that lets him speed up, zoom in and superimpose grid lines over the video to digitally fence off specific groups of cranes, Merrifield can essentially do a perfect tally. The consensus: Video beats the still images.

"It turns out you can't really see the birds in the corn with that first oblique shot we did," says Kelsey. "The resolution is just not good enough to see the cranes that I was able to count from the ground."

Looking at the laptop screen, he can now easily count cranes that would have been nearly impossible to see by someone standing at the edge of the field.

"I like the video," says Kelsey. "I think we'd get a better count with it."

"I do, too," says Merrifield. "Video is underrated."

And with that, the team sends the machine up for one more sortie above this Shangri-La on the Pacific Flyover, a 10,000-acre farm ringed by a 26-mile levee and a must for every self-respecting birder's bucket list. Slowly floating high above the autumn-tinged terrain of copper, rust and amber, the drone opens wide its [video](#) eye, trying like crazy to take in all the beauty below.

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