

Winging It: A Bold Step Toward the Whooping Crane's Return

by

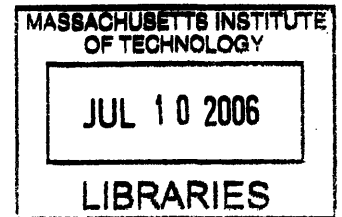
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ABSTRACT

Since the fall of 2001, biologists have taught endangered whooping cranes how to migrate over a once-lost course stretching from the wetlands of central Wisconsin to the mud flats of Florida's Gulf Coast. Wildlife biologists did this through an unusual method of reintroduction: training the endangered birds to follow behind ultralight airplanes for the entire 1,200-mile journey. The technique is highly invasive and expensive, but by the summer of 2005, it had established the first population of whooping cranes migrating east of the Mississippi in more than one hundred years.

To supplement these ultralight-led migrations, crane biologists tried a new approach in the fall of 2005. Biologists with the International Crane Foundation of Baraboo, Wisconsin, and the U.S. Fish and Wildlife Service released four captive-bred whooping cranes directly into the wild. Biologists hoped that there were enough graduates of the ultralight program already making the migration for a few first timers to simply follow the older birds south. But no one knew if this bold new experiment, which relied entirely on the young birds following older non-related birds, would work.

This thesis follows a year in the life of Maya, Poe, Waldo and Jumblies—the first four “Direct Autumn Release” birds. The story begins with their parent's artificial insemination in the spring of 2005, describes their last-minute Thanksgiving-Day departure, and follows their successful southern migrations through Tennessee and Florida. The thesis relates the concerns of the biologists, who spent countless hours raising and tracking these birds. It also recounts historic episodes in the 80-year ongoing effort to save *Grus americana*, the whooping crane, while providing a larger significance for why the conservation of biodiversity is needed now more than ever.

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Lastly, I'd like to send a big "Whoop! Whoop!" out to Maya, Poe, Waldo, and Jumblies. Without them, this story could not have been written.

Each year as the maples start to change color, tens of thousands of cranes, geese, swans, and ducks descend on the Necedah National Wildlife Refuge in central Wisconsin. The majority arrive from nesting grounds farther north. They fly in from the Land O' Lakes region of northern Wisconsin, the Boundary Waters of Minnesota, and the shoals of Lake Winnipeg in Manitoba. The refuge, an endless expanse of shallow waters and marshes, offers a place where the birds can feed, rest, and gather into flocks before continuing south. By early November the marshlands begin to freeze, and a flyway stretching from Wisconsin to Florida becomes a one-way superhighway for migrating birds.

For a group of four young whooping cranes, the refuge was all they had ever known. Each bird, five feet of gangly legs, a chopstick beak, and cinnamon-colored feathers, was part of a bold new experiment in a thirty-year effort to restore a migrating population of whooping cranes to eastern North America.

Hatched in captivity and then placed in the refuge, these four young birds had no parents in the wild to guide them. In their first summer of learning how to fly, they ventured no more than twenty miles from their home. To make the 1,200-mile migration while avoiding such pitfalls as Chicago, Atlanta, and the Appalachian mountains, they needed to follow older, non-related birds. And if they didn't migrate soon, their lives, and the life of the promising new experiment of which they were a part, were in jeopardy.

The temperature plummeted. Winter's first storm blanketed the region in several inches of snow. Older, more experienced whooping cranes and their close relatives, the sandhill cranes, were departing in droves. But the young birds seemed oblivious, preferring instead to continue cruising the refuge like a gang of delinquent teenagers. By

late November, only one flock of sandhills and two pairs of adult whooping cranes remained.

By Thanksgiving morning a jet stream of arctic air blasted down from the north at forty miles per hour, creating the perfect opportunity for the birds to depart. All they had to do was get airborne. The winds would practically blow them straight to central Florida. Instead, the four birds remained at a cranberry bog where they had spent the previous night. As winds howled past, they foraged for the few remaining berries left from the fall harvest.

About an hour after sunrise, the last group of adult whooping cranes—birds that knew not only the importance of migration but also how and where to go—departed. A wave of panic spread through the camp of crane biologists who were monitoring the birds. For weeks the presence of these remaining migration-savvy whoopers had given them hope that the young birds might yet make it south. Now, that hope had all but vanished with the fading call of the last departing pair.

Yet one additional group of guides, a flock of about sixty sandhill cranes, remained. At midmorning, the four young whoopers landed near the sandhill flock as it began its chaotic preflight departure rituals of flapping, squawking, and circling overhead. The sandhills circled higher and higher, a few hundred feet into the air when, hesitantly, the young whoopers began to follow. “Come on please get up there higher, please take air,” intern biologist Stacie Castelda pleaded as she watched the birds slowly gain altitude. Within seconds she was sure. “They’re flying!”

The young cranes Castelda watched take off were part of an unprecedented reintroduction effort known as the Direct Autumn Release, a project sponsored by the International Crane Foundation and the U.S. Fish and Wildlife Service. The biologists gave the birds numbers—27-05, 28-05, 32-05, and 33-05—which corresponded to the order and year they hatched and were used to identify the birds on migration. But, they also gave them names—Jumblyes, Poe, Waldo, and Maya—after literary figures and a character from a poem.

The birds were “reintroduced” in that they were released in an area where they were once common, but, until recently, hadn’t been seen in more than a hundred years. In the early 1940s, whooping cranes numbers reached an all-time low of just sixteen individuals, relegated to a single flyway between northern Canada and Texas. This “western flyway” population has slowly and steadily rebounded to the point where it now boasts more than 200 individuals. But the population, which winters on the Gulf Coast a short flight from a major oil refinery, could be wiped out at any moment by either a natural or manmade disaster. New populations were desperately needed as an insurance policy on the species’ survival. A non-migratory flock was started in Florida beginning in 1993 with some success. But for true protection to be realized, a second migrating population needed to be established.

Reintroductions for this population started in 2001 when the non-profit organization Operation Migration led six whooping cranes from Wisconsin to Florida behind an ultralight airplane. The technique was first made famous with Canada geese in the 1996 movie *Fly Away Home*, a film loosely based on Operation Migration’s founder,

Bill Lishman. This approach was successful for the whooping crane as well. After decades of false starts, biologists had finally found a method of reintroduction that worked.

The ultralights taught whooping cranes to migrate without becoming imprinted on another species. Most migratory birds hatch with an instinct of precisely when and where to go come fall. As a result, they fly solo, even on their first migration. For these birds, the ultralight method simply wouldn't work; the birds would go wherever they were genetically programmed to go. But such birds as cranes, geese, and swans have no such instinct. Instead, they are programmed to follow and learn from their parents. So long as the birds imprint on the ultralight or the person piloting the airplane, they will follow wherever it leads them and then return to the same general location year after year. If a young crane were left entirely to its own devices, it would probably still migrate south when the weather got cold, but there is no telling where it would end up.

As successful as the ultralight migrations have been, they are also labor intensive and expensive. To condition the birds to follow the small aircraft, biologists start playing tape-recorded engine sounds to the chicks before they even hatch. They then spend the spring acclimating the birds to the foreign machines. Dressed in "crane suits," large white costumes designed to look like cranes and mask the human form, biologists spend countless hours with the young whoopers walking around the parked airplanes. The birds are given treats like mealworms and grapes for positive reinforcement. After a period of several weeks, biologists are able to turn on the ultralights' engines and get the birds to run after the planes as they taxi down grass runways. They then spend the summer following the aircraft on short flights. In the fall, the birds and a crew of more

than a dozen pilots, bird handlers, and support staff spend two full months making their way south.

As the ultralight method took flight, other biologists wondered if there might be a less expensive and less intrusive way to get birds to Florida. Back in 1988, U.S. Fish and Wildlife biologist Richard Urbanek had tested a new hands-off method of release, with sandhill cranes as his test subjects. Urbanek essentially kicked the captive-bred cranes into the wild in the fall, with the hope that older non-related sandhills in the area would point them in the right direction. At the time, the experiment was a total gamble: the young birds hadn't gone through the process of imprinting on the wild sandhill cranes, and there was no way of knowing if they would follow them south. But, in the end, the method proved largely successful.

Urbanek yearned to try out his new method on whoopers, but the endangered birds were at such a premium they could never be put into service for new experiments. Then something unusual happened. In the summer of 2004, a bird known simply as 18-04 was being groomed for ultralight migration with a gaggle of other young whoopers when his feathers started to fall out. For reasons that are still unclear, the bird lost seven of his primary flight feathers rendering him unable to fly. The feathers eventually grew back, but not before the bird's ultralight buddies had already departed. When adult whoopers were later getting ready to fly south, Urbanek got permission to release 18-04 on his own and see what happened. The bird performed magnificently, hitching rides behind three different whoopers and sandhill cranes before arriving in Florida. In the spring, he returned on his own, including a stopover in the south side of Chicago where he was photographed in a small pond with a flock of Canada geese. The bird later died after

flying into a power line near the Necedah refuge—a man-made hazard that continues to take a few birds each year—but his successful migration paved the way for a full-scale test of Urbanek’s idea.

Biologists dressed in the same type of crane suits worn by the ultralight pilots spent the summer preparing Jumblies, Poe, Waldo, and Maya for their solo migration. Then last fall, in addition to a 19-bird ultralight-led migration, a team of biologists headed up by Urbanek released the four birds directly into the wild. They believed that there were enough graduates of the ultralight program already making the migration for a few first-timers to simply follow the older birds, or the more abundant sandhill cranes, south.

The project’s first major hurdle was surmounted on Thanksgiving morning when the four young birds left Necedah, although the departure didn’t go exactly as planned. Instead of each bird bonding with a pair of older whoopers, the four young birds quickly grouped together. This “brat-pack” had formed such a tight bond that they very nearly missed joining the last group of birds heading south.

As imposing and graceful as adult whooping cranes appear—with their crimson heads, bleach-white feathers, and black wingtips—they remain particularly fussy creatures. When Europeans first arrived in North America, it is estimated that only 1,500 whoopers populated the continent. By comparison, sandhill cranes, their close cousins, continue to number more than 100,000. Sandhills are an “upland” species, a bird that is as

content to dine on bugs in a dry field as dig for worms in the mud. Not so for the whooping crane which insists on wetlands.

While whooping crane populations were never great, its range was. The giant birds could once be seen across the United States from Utah to the eastern seaboard. One of the earliest confirmed records of whooping cranes comes from a French explorer who in 1744 wrote, “we have [in Canada] cranes of two colors; some are all white, the others pale grey, all make excellent soup.” In her natural history classic *The Whooping Crane*, Faith McNulty writes that whooping cranes were even more of a target than their slightly smaller, drab gray sandhill cousins. “Its double curse of size and beauty seems especially to arouse the killing instinct of gunners.”

Until about the time of the Civil War, whooping cranes were migrating from the Gulf Coast to summer nesting grounds in the Midwest and Canada. But as America moved west, hunting and the draining of wetlands for farming and settlements, as well as the collection of “specimens” and eggs by scientists and laypeople alike, all conspired against the species. And ironically, the more rare the whooping crane became, the more highly prized a dead crane or egg became. No one was thinking in terms of conservation: If a species was going extinct, common wisdom suggested that representative samples had to be preserved for future generations. No accurate numbers exist for how many birds died at the hands of collectors, but they were highly prized possessions whose price only increased with their shrinking supply. In 1887, whooping crane “skins,” the feathers and skeletal remains of a bird, sold for \$2.50 each. Just three years later, the price jumped to as high as \$18.00, depending on availability and condition. After 1894, there were no known whooping cranes nesting in the United States.

The epitome of how humanity very nearly preserved the species to death occurred two decades later on May 28, 1922. On that day, Fred Bradshaw a game warden at Muddy Lake, Saskatchewan, came upon a pair of nesting whooping cranes. Bradshaw later recounted how the birds tried to lead him away from the nest. Then he heard a “strange, piping whistle,” of a young whooping crane that had just hatched from the shell. The warden quickly seized the bird and wrung its neck so that it could live forever in the annals of science. It was the last whooping crane nestling that anyone would see in the wild for more than thirty years.

In 1939, as America was still struggling to pull itself out of the Great Depression, biologist Robert Allen was on a beach in Texas looking for birds. Allen, then 34 years old, was the director of research for an up-and-coming organization called the National Audubon Society. Named after the 19th century ornithologist and painter John James Audubon, the organization formed in 1905 to save the great egret from the many high society women who coveted the large shorebird’s garish white plumage for their hats.

Thirty years later, having saved the egret, the Society called on Allen to head a new research program. The goal was to learn as much about the life history and possible reasons for decline of America’s most critically endangered birds. Exhaustive biological studies on the ivory-billed woodpecker and the California condor were quickly undertaken. A third bird, the roseate spoonbill, a gaudy pink shorebird native to Florida and Texas, was assigned to Allen. Recommendations he made at the end of the yearlong study undoubtedly saved the species.

As Allen walked along the Texas Coast one day looking for spoonbills, he also saw his first whooping crane. His initial impression wasn't one of awe, but the prospect of unending labor. "I wondered idly," he later wrote of the whooper sighting, "what poor, unsuspecting soul would some day be assigned the rugged task of making a full-scale study of them." Allen was fairly confident the "honor" would not be his. Before his spoonbill study went to press, the United States Army deployed him to the Pacific for World War II.

As soon as he returned to Audubon after the war, though, he was quickly assigned a new species, *Grus americana*, the whooping crane. Over the next three years he learned more about the whooping crane than anyone had ever known. He traveled more than 20,000 miles by plane and 6,000 by jeep, falling in love along the way with the elusive bird he once hoped to avoid.

When Allen first began his study, no one had a clue how many whooping cranes still existed. As early as 1923 the *Saturday Evening Post* eulogized the birds' extinction stating, "the Whooping Crane, perhaps the most majestic bird of all our feathered hosts, has traveled the long trail into oblivion." Others believed the species was doing just fine, hidden away somewhere in a yet-to-be-discovered "great flock."

In addition to establishing an accurate count of the remaining population, Allen needed to find out basic things like what the birds ate, where it lived, and how they interacted with their habitat. He moved with his wife and two children to the Aransas Wildlife Refuge on the gulf coast of Texas where the birds wintered. There he made detailed studies of their habitat. He once counted a total of two hundred marine worms per cubic foot in the Aransas mud.

When he wasn't digging in the dirt, he conducted airplane searches up and down the Gulf Coast to rule out the existence of other wintering populations in Louisiana, Texas, and northern Mexico. This was crucial to disproving the great-flock theory that for years had delayed recovery efforts.

The biggest contribution Allen made, however, was uncovering where these last remaining whooping cranes nested during the summer. Each spring the birds migrated north from their Texas wintering grounds to an unknown location in the Canadian wilderness. Finding where in this vast wilderness the flock nested before the land could be inadvertently developed was crucial to the species' protection. It would also shed light on where and how the birds were dying. Were they being preyed upon at their summering grounds? Or, as Allen suspected and would later prove to be the case, were they being shot during migration?

For three months, Allen flew with a Canadian Fish and Wildlife Service pilot across northern Canada and as far north as Point Barrow, Alaska. They followed up on even the most tenuous reports of large white birds with no luck. It would take nine more years of searching with the help of Canadian and U.S. wildlife services before a fire suppression helicopter came upon the nesting birds on an already protected national park in northern Alberta.

In the end Allen's study not only provided a thorough understanding of the once elusive bird, but an impassioned call to do everything in our power to save it. In his 1952 monograph, he writes:

When you sit crouched in a blind and watch an adult Whooper stride close by you, his head high and proud, his bearing arrogant and imposing, you feel the presence of a strength and of a stubborn will to survive that is one of the

vital intangibles of this entire situation. Certainly it cannot be overlooked. We have a strong conviction that the Whooping Crane will keep his part of the bargain and will fight for survival every inch of the way. What are we going to do to help? Here, in this report, is the challenge, here is the job that must be done.

Since Allen's study, the population of whooping cranes migrating between the Gulf Coast of Texas and northwestern Canada has grown steadily from a low of 21 individuals in the 1940s to more than 200 today. With the western population secured but still vulnerable to natural or man-made disaster, it was now time to reintroduce additional populations into the east.

November 24

Urbanek had been watching the sandhills all morning from a nearby truck. As soon as he saw the whoopers join them he pulled up next to Castelda and lowered his window excitedly. "They're with the sandhills, the sandhills are migrating, don't let them out of your sight!" he yelled, before speeding after the departing birds.

Castelda and a co-worker, each in separate vehicles, tore down the gravel road in hot pursuit of Urbanek and the quickly departing birds. With winds out of the northwest approaching forty miles per hour, it was nearly impossible for biologists on the ground to keep up, but they had to try. At some point in the day, perhaps minutes or hours later, the birds would attempt to land. If they picked a bad spot, like a crowded public park or the fenced-in yard of a high security prison—both of which had been attempted by young cranes in the past—the biologists needed to be there to quickly move the birds to a safer location.

Since late October, a group of pilots had been on call seven days a week. With an hour's notice they could be airborne and supporting the tracking effort from one of two small airplanes. But on Thanksgiving Day, the pilots were off. The ground crew was on its own. The replacement cost per bird was estimated at \$160,000. The human investment the biologists placed in hatching, rearing, and personally nurturing each bird prior to migration was incalculable. Losing even one of the four was not something they wanted to consider.

For weeks, Castelda had been ready to follow the whoopers whenever they departed. She kept a backpack in her work vehicle with a sleeping bag and enough clothes to last several weeks. Detailed atlases of every state between Wisconsin and Florida were stacked in a crate behind her seat. To keep an eye on the birds, she carried a pair of binoculars, a spotting scope, a hand-held radio antenna, and a laptop computer to download satellite tracking information. A larger antenna, the size of an old home TV antenna, was mounted to her vehicle's rooftop.

Each whooping crane had a lightweight radio transmitter affixed to a leg. In that way, biologists could detect an individual bird's signals up to thirty miles away from the ground or as far as a hundred miles away from an airplane. Three of the four direct release birds also carried small satellite transmitters. These devices gave precise locations for the birds—sometimes within a few meters—every few days.

Moreover, Castelda carried a large white crane suit that would provide enough of a disguise to allow her to approach and capture any of the young fledglings that might lose their way or get into trouble.

Taking separate routes, the three biologists triangulated the birds' positions as they sped down southern Wisconsin's highways. They tracked the birds southeast from Necedah before hitting heavy traffic near the Wisconsin-Illinois border just north of Chicago. Tied up by tollbooths, the biologists soon lost the young whoopers' signals. The birds most likely continued on ahead out of the biologists' range, but they could also have landed in a low-lying area where their signal couldn't be detected. Unsure of the birds' location, they fanned out and continued searching through Illinois and across northern Indiana. By nightfall, they were still unable to locate the birds and went to bed hoping the satellite transmitters would soon reveal their locations.

* * *

It has taken biologists more than thirty years to reach this point—successfully releasing whooping cranes into a semi-established migrating flock. The first attempt to start a new flock of migrating cranes began in Grays Lake, Idaho, in 1975. Over the next thirteen years, a total of 289 whooping crane eggs were placed in the nests of sandhill cranes. Biologists hoped the sandhill parents would “cross foster” the whooping cranes over the summer and lead them on migration to New Mexico come fall. For a while, everything worked as planned. The sandhills raised the chicks as their own and taught them how to migrate. The whooping cranes, however, ended up imprinting on their sandhill parents. When they reached sexual maturity a few years later, they looked to sandhills for mates. Twenty-five years after the project began, only one offspring, a “whoophill” hybrid between a whooping crane male and a sandhill female, was produced.

Perhaps the most bizarre crane reintroduction experiment ever undertaken involved teaching sandhill cranes to follow behind an old army ambulance with the silhouette of a full sized crane painted on the rooftop. The “cranemobile,” as those who drove it affectionately knew it, led 22 sandhill cranes on a 350-mile migration from northern Arizona to the Mexican border. Over the course of two years, 19 of the birds, an astonishing 86 percent success rate, survived. This admittedly unusual method of leading birds south was once a serious contender for the whooper’s eastern reintroduction. But as successful as it was, there were problems. The birds often lost the ambulance under tree cover in forested areas. The cranemobile also had to maintain a constant speed of 30 miles per hour or risk being passed by the birds. It, therefore, needed to be escorted through stoplights and stop signs. Tollbooths at the Wisconsin-Illinois border were out of the question entirely.

November 25

A little after midnight, before going to bed, Urbanek checked his e-mail one last time to see if there were any updates on the birds. A satellite posting placed number 28-05, or Jumblies, in southern Indiana. The bird was just north of Louisville, Kentucky, much farther south than anyone had anticipated. In one day, she had flown an unbelievable 450 miles, more than one-third of her entire migration. In five years of monitoring, it was the most any bird—young or old—had ever flown in a single day. Though it was far too early to get excited, the Direct Autumn Release seemed headed toward success.

Still, Urbanek was concerned about the bird roosting so close to an urban area and feared it may have fallen behind the more experienced sandhill cranes. Moreover, the three remaining direct release birds could be anywhere between Illinois and Kentucky. Later that day a pair of airplanes picked up Castelda and Crane Foundation biologist Sara Zimorski in Louisville. The planes would head in separate directions to check up on Jumblies and to continue searching for the three missing birds.

One day later and several hundred miles to the south, Castelda and pilot Charles Koehler found one of the birds they were looking for flying over the hills of southeastern Tennessee. One thousand feet below their airplane, the young female whooping crane named Poe flew in a “V” formation with more than fifty sandhill cranes. In the next few miles, the birds would have to climb nearly 2,000 ft to clear the southeastern tip of the Appalachian Mountains, the highest point on a 1,200-mile migration from Wisconsin to Florida. Past the ridge, Poe would join more than 5,000 other cranes at the Hiawassee Wildlife Refuge, one of the largest staging grounds for migrating cranes in North America.

Yet, as the sky darkened, the young whooper, whose white feathers sharply contrasted with those of its sandhill companions, appeared to be running out of steam.

“She was obviously sucking air,” said Koehler, who was making his fifth whooper migration. “Every time we saw her, she was farther back in the ‘V.’ The last time I saw the formation, she was only six birds from the end.”

For the next hour, Koehler circled over the dark ridgeline while Castelda used radio telemetry to monitor the bird’s progress. Whether on her own, or clinging to the “V,” Poe finally made it over the mountains and landed at the refuge.

For Castelda, who spent the summer training the birds on the ground, the experience was unforgettable. It was “surreal, like being able to fly with her,” she said.

Less than an hour’s drive from Necedah, the headquarters of the International Crane Foundation is nestled into the hills and farmland surrounding the town of Baraboo, Wisconsin. In a remote corner of the Foundation grounds is a group of pens known as Crane City. Gravel “roads” with names like Whooper Way and Sibe Street (for Siberian cranes) divide a grid-work of aluminum fencing. The pens hold sixteen pairs of whooping cranes, the core of the Foundation’s captive breeding program. Tourists are kept far from the city, and biologists limit their visits to a minimum so as not to disturb the birds.

It was, therefore, unusual to find Marianne Wellington, co-chair of the Direct Autumn Release program, standing inside one of the pens with feet spread wide and knees slightly bent. Between her legs was Bubba, a male whooping crane. Bubba is a stud, a crane hatched in captivity that will never soar over the wetlands of Wisconsin or migrate south to Florida. Instead, the bird’s freedom has been sacrificed for something much more valuable—namely, his sperm.

To the outside observer, the behavior of both bird and human seems bizarre. Wellington faced one direction while Bubba tried to run through the biologist’s legs in the opposite direction. The bird was held in place by Wellington’s knees, which caught his outstretched wings whenever he tried to make a break for it. Then, bending further, Wellington reached down on both sides with her hands and started stroking the bird’s

inner thighs. Soon Bubba stopped trying to escape and appeared rather to be enjoying the attention. On a good day, Bubba will raise his tail. If you listened closely, you could actually hear him purr. Two other biologists, a “teaser” and a “collector” joined Wellington, the “stroker,” inside the pen. One of the biologists gently squeezed Bubba’s cloaca, teasing out a few drops of semen that were caught by the third biologist in a clear one-and-a-half-ounce shot glass. Wellington and her co-workers perform the ritual three times a week through the months of March and April. Each time Bubba’s semen is quickly injected into the oviducts of two different female cranes that, collectively, will hatch the eggs of Maya, Poe, and Jumblies. (Waldo was laid at a second breeding center in Patuxent, Maryland. Soon after he was laid, the egg was packed in a special insulated case and flown by private jet directly to the Crane Foundation.)

In the wild, whooping cranes generally lay one or two eggs. The parents then settle down to sit on the egg or eggs for about a month until they hatch. Collectors knew more than a hundred years ago that if you remove recently laid eggs from the nest of any bird species, females will often lay a new clutch of replacement eggs. Biologists at the Crane Foundation manipulate this phenomenon, known as double clutching, to maximize egg production in their captive breeding program. Testing the method on sandhill cranes, they once got a female to lay an astonishing nineteen eggs in one season before she called it quits.

A problem arises, however, when it comes time to incubate. If you let the mother sit on the egg, she stops laying additional eggs. But if no one sits on the egg, it won’t survive. As a solution to this impasse, biologists turned to surrogates, sort of like Horton in the Doctor Seuss book *Horton Hatches An Egg*. Yet instead of using an

elephant, they employ different species of cranes as foster incubators. Maya, Poe, and Jumbly were all incubated by Red-crowned Cranes for a couple of weeks. By their final weeks of development the eggs are stable enough to be transferred to commercial incubators, much like those used in the poultry industry to bring eggs to term. At the same time, biologists start playing sound recordings of adult whooping cranes to begin imprinting the developing chicks on their own species.

Soon after the eggs are hatched, they are transferred in cardboard boxes about a quarter mile to a remote rearing facility out of earshot from the rest of the Foundation buildings. When they are about a month old, they are moved again, this time by truck to Necedah. It's crucial that the birds arrive at the refuge before they learn to fly. Whatever they see from the air on their first flight will be the place they return to each spring on their return migration.

As much as the fall migration of the young whooping cranes was hands off, the summer leading up to their release involved intense human interaction. With one caveat: the birds couldn't know they were being handled by humans.

From July to October at Necedah a group of biologists led by Wellington spent seven days a week from sunup to sundown teaching the young birds how to be whooping cranes. To keep the birds from noticing—and imprinting—on their human supervisors, the biologists didn't allow themselves to be either seen or heard in front of the birds. They never spoke in front of the birds and kept themselves covered at all times in the large sheet-like crane-suit costumes.

The most important part of this disguise was a metal beak, resembling the beak of a whooping crane, and a tape player that the biologists carried with them at all times. To

properly imprint the birds on their own species, it was crucial that they were fed by something resembling the head of a whooping crane. It didn't have to be an actual crane head. But the shape—a long narrow bill attached to a head and neck—and color—black bill and throat, red crown, yellow eye iris and white nape—had to be pretty close. To provide the right sound cues, biologists played recordings of whooping crane calls on their tape players whenever they needed to get the attention of the young birds. So long as the “mom” that fed them had the beak and overall coloration of a whooping crane and sounded like a whooping crane, these birds believed that they too were whooping cranes.

Working in disguise, the biologists spent the summer leading the birds into shallow ponds and teaching them how to catch tadpoles. They showed the birds how to run down crickets and grasshoppers and even how to kill and eat small snakes.

Self described “recess supervisors,” the biologists kept the adolescent birds from beating up on each other. They also kept the birds safe, teaching them to avoid rattlesnakes, bobcats, and older territorial whoopers and sandhills. If left on their own, the birds turned into couch potatoes. Part of the biologists’ job was to keep the birds moving, keep them actively looking for food. Despite the exercise, Maya gained weight a little too quickly at one point in her development and became slightly bowlegged as a result.

The biologists have no idea what the young cranes really make of the costumed figures. But by providing the right visual and sound cues, they hope the birds learn to be whooping cranes. And as goofy as the crane costumes look, they’ve worked on more than just the captive-bred whooping cranes. Wellington has had wild deer and sandhill cranes walk within five feet of her.

But spending each workday dressed up as a bird, with four young whooping cranes as sole company, eventually does something to a biologist. Wellington talks about the challenges of “being a parent of another species.” She recalls how the birds “will run to you for food, or if something freaks them out, they expect you to protect them, to chase away any predators. I know this sounds corny, but the most frustrating aspect of my job is not being able to fly,” she said.

When Wellington first started working at the Crane Foundation she had dreams about flying with the birds she cared for. “I’d go out and check on the chicks and chick parents and see them flying. I would then jump, take a few hops, and take off with them.” As she spoke, there was a slight sense of regret in her voice. “Part of me knows if I was a crane, I’d be flying with them.”

November 27

From an altitude of 3,000 ft, the Hiwassee Wildlife Refuge looks at first glance like an idyllic country farm. Its 2,000 acres of hilly woodlands and fertile agricultural fields are surrounded on three sides by a sweeping horseshoe bend in the Tennessee River.

But this idyllic farm is filled with lots of visitors. From the air, the fields are covered with a sea of gray dots—thousands of sandhill cranes—that blanket nearly every square foot of the refuge. Among them are a handful of white whooping cranes. Most of the gray and white specs are stationary. Others, flocks of cranes flying low over the fields, move in discordant waves. From the ground, these waves fill the sky. Their calls, heard day and night, are deafening.

Somewhere among the thousands of birds are three of the direct release birds, contentedly feeding and relaxing after departing Wisconsin two days before. After just two days of flying, these young cranes completed more than half of their migratory journey and landed at the safest haven for cranes between Wisconsin and Florida. The ultralight-led birds took more than a month to travel the same distance.

The fourth bird, however, was still nearly 300 miles to the north. Since her initial 450-mile day, Jumbly was still near Louisville, Tennessee, trying to find her way south.

“She’s probably very confused and trying to figure out what to do,” Crane Foundation biologist Sara Zimorski said, noting that the lone bird probably dropped from the sky when it could no longer keep up with other cranes.

After circling the skies over central Kentucky earlier in the week, Zimorski had located Jumbly perilously close to a public walking path at an arboretum south of Louisville. She quickly notified her supervisor, Urbanek, who was providing ground support. Urbanek monitored the park for a day to keep people away and to see if the bird would move on. When she didn’t, he donned a crane suit and slowly approached the bird with a cardboard box and an ear of corn. Jumbly, who had been raised by biologists wearing these same suits, cautiously approached the costumed figure. After several minutes, Urbanek was able to get behind the bird and quickly push her into the box. He then drove the bird thirty miles east to a remote wildlife management area where she was released near a group of sandhill cranes.

Over the next couple of days, Jumbly slowly made her way south as Zimorski followed the bird by plane. When last seen on November 30, Jumbly had cleared the Appalachians and landed in a mud flat near the refuge where she was soon joined by

more than 300 sandhill cranes. As soon as Zimorski confirmed the bird's location, she took off south, in search of Waldo, another direct release bird that left the refuge earlier in the day.

A cold front out of the north—excellent migration weather—was predicted for the next few days. Jumblies would probably sit out the winds to refuel on corn, bugs, and fish at the refuge. Yet with one bird already on the move and a strong chance that the other two direct release birds would follow suit, there promised to be lots of travel in the coming days with no telling where the birds would lead.

Each September, the Lion's Club of Necedah, Wisconsin, a town of less than 1,000 people, holds their annual whooping crane festival. The daylong event features updates by biologists on the reintroduction program and behind-the-scenes tours of the nearby refuge where both the direct release birds and the ultralight-led birds are raised. Club members decked out in purple Lion's vests with pins from past years' festivals serve bratwurst, grilled chicken, and a beer made special for the event, Whooper Brew. The festival is an annual sendoff for the new batch of migrating cranes as well as the pilots and biologists that lead or follow them south.

Working his way through the crowd is George Archibald, co-founder of the International Crane Foundation. In 1973 Archibald and classmate Ron Sauey, both recent graduates of Cornell University's Ornithology laboratory, launched an ambitious plan to conserve the world's diverse species of cranes. They leased the horse barn of Sauey's

parents in rural Wisconsin for one dollar per year, hoping to fill it with breeding pairs of each of the fifteen different species of cranes. Appealing to zoos around the world, they started to assemble a motley crew of oddball cranes—some blind, others with broken wings—that the more established institutions would just as soon do without. One such bird was a whooper named Tex, a female crane hopelessly imprinted on humans and apparently infertile.

Over several years, Archibald nurtured a relationship with Tex, eventually “shacking up” with the bird. He spent months living with Tex in a small wooden shack divided down the middle by a mesh fence. There Archibald worked at a desk and typewriter by day and slept near the by then smitten crane at night. Before long, the balding researcher with thick-rimmed glasses started to engage Tex in an elaborate mating dance previously reserved only for pairs of graceful winged creatures. The fluttering, jumping, and cackling exchange between bird and man, later broadcast by late night talk show host Johnny Carson, got the fickle bird to start laying eggs. With artificial insemination, the eggs proved fertile. This year’s direct autumn release birds are the end products of a decades-long captive breeding effort that began with Tex and other birds collected by Archibald.

December 2

“They've picked out all the shrimp, but help yourselves to as much as you like,” Mary Lou Smith, receptionist at the Decatur, Alabama, municipal airport told the weary travelers. For two days Zimorski and her pilot flew across Alabama, Georgia, and northern Florida in search of a bird that was last seen leaving Tennessee’s Hiwassee

Refuge. The airports they visited, such as Decatur's with its Friday afternoon shrimp boil, or the one in Americus, Georgia, with its row of rocking chairs facing the tarmac, began to meld into one giant small-town airstrip.

Two days after the bird's disappearance, Zimorski continued her real-life "Where's Waldo" search with the help of radio telemetry antennas mounted to the wing struts of their single engine airplane. "It's really frustrating not knowing where he is," Zimorski said of the missing whooper.

Zimorski hoped the three birds still lingering at the refuge would fly straight to Florida, where the majority of the adult whooping cranes spend the winter. But even if they remained in Tennessee until the spring, the project would still be successful. "I would like to see them go a little further south, but I don't think it means disaster or failure if they stay in Tennessee," Zimorski said, noting that adult whooping cranes have remained at the refuge in the past. "As long as they are in appropriate habitat and come back to Wisconsin in the spring, I think they'll be all right."

Even if Jumblies, Poe, Maya, and Waldo successfully complete this year's migration, the reintroduction project, which has an estimated \$1.8 million annual budget in private and public funding, is expected to take another 15 years to complete. The project will be determined a success when the eastern population reaches a self-sustaining population of at least 125 birds. Prior to the 2005 migration, there were only 41

individuals in the eastern population, with the oldest birds just starting to reach breeding age.

Such large-scale reintroductions—where animals bred in captivity are released into the wild to increase the population of a critically endangered species—can only be undertaken for a select number of animals. In the United States, only a handful of rescues for species-on-the-brink have been, or are being, attempted. Examples include the peregrine falcon, the black-footed ferret, the Mexican grey wolf, and the California condor. Biologists increasingly consider such attempts “emergency-room conservation”—a last-ditch, high-cost, high-risk approach to preserving biodiversity. Choosing which species to save and which to let go are difficult decisions that are often based on the amount of popular support that can be generated for a given species. And while reintroductions can bring a species back, the recovered species is often dependent on humans for its continued survival.

J. Michael Scott, a wildlife biologist at the University of Idaho and editor of a recent two-volume book on the Endangered Species Act, has taken a long hard look at the future of wildlife conservation. Scott and his colleagues have defined a new class of endangered animals called “conservation reliant species,” animals that are essentially wards of the federal government. For the past eighty years the whooping crane, a species dependent on intensive protection and captive breeding to boost its numbers, has fallen into this category. As long as a species is in recovery, such reliance isn’t unusual. But other species, like many of the indigenous birds of Hawaii, may remain reliant on humans forever. As long as non-native predators such as feral cats, rats, and mongoose run free on the islands, the birds are dependent on human protection. Other species, such as the

peregrine falcon, can fend for themselves once their cause for decline, in this case the pesticide DDT, is removed from the environment.

The future of the whooping crane most likely lies somewhere between the two ends of this human-reliance spectrum. At present, the eastern flocks of whooping cranes are closely monitored and strongly managed for population growth. A prime example of this manipulation recently occurred when two misguided birds migrated to upstate New York this spring instead of returning to Wisconsin. Instead of letting nature run its course, biologists trapped the birds and returned them to Wisconsin to maximize breeding opportunities within the flock. To keep a close eye on the birds, biologists have fastened radio and/or satellite transmitters around each of the birds' legs. In addition, every whooping crane in the eastern migratory population has a microchip with identification information imbedded beneath its skin. The chips, which have been around for decades and are also imbedded in pet cats and dogs, can be read much like a bar code at a grocery store checkout. These small hidden chips are a precautionary measure that allows biologists to identify a dead bird even if the transmitters around its legs have been tampered with or removed. From a management perspective the chips, which will most likely be removed when the species' recovery goals have been met, make perfect sense. But, knowing that every "free-flying" whooping crane has essentially been bar-coded like a box of cereal somehow makes them seem less wild.

Scott is confident the chips will someday be removed. "If we don't ever get to that point, we've lost," he said. But other management practices will probably continue in perpetuity. The Hiwassee Refuge in Tennessee, which supports more than 10,000 sandhill and whooping cranes each winter, is a veritable soup kitchen for migrating as

well as over-wintering cranes and other waterfowl. Each year 2000 acres are planted with soybeans, winter wheat, and sorghum solely for the avian visitors.

“That wouldn’t be a huge investment,” Scott said of the continued need to plant crops for the birds. “But, if we’re still leading them on the migration route, that makes them much more conservation reliant.”

Eleventh-hour reintroductions will most likely continue for a few chosen species that capture our imagination, like the whooping crane. A much more cost effective approach to conservation, however, is protecting the overall habitat of species whose potential extinction looms less imminent.

Some conservation organizations, such as The Nature Conservancy, have gone this route entirely. Since its founding in 1951, the Conservancy has protected more than a hundred million acres of critical habitat worldwide for threatened and endangered species. Their projects range in size from tiny islands in the South Pacific to hundreds of square mile tracts in the Amazon rainforest. Such acquisitions (or the leasing of logging and mining rights) are not made blindly. Rather, they are carefully selected by conservation biologists, an emerging profession that combines population genetics, ecology, and natural resource management to secure critical habitat for the greatest number of the most endangered species possible.

Another rapidly emerging tool for land acquisition is the public bond measure. In this rapidly growing segment of conservation, voters get to decide if they would like their local, state, or federal government to raise funds to purchase open spaces. Between 1998 and 2004 voters approved more than \$26 billion nationwide to preserve park space,

ranchlands, and wetlands. The measures seek to counter the 2 to 3 million acres that are lost to development each year.

Straddling the species and habitat approaches to conservation, the Crane Foundation employs what biologists refer to as the umbrella approach. Basically, they use the conservation of a charismatic species and the habitat it requires to protect a number of other lesser-known species as well. The Foundation has had a hand in the conservation of 13 million acres of crane habitat in 64 countries. The protected lands support a host of other species. In China, a protected wintering area for Siberian cranes also harbors half the world's population of swan geese, an endangered goose of East Asia, as well as tens of thousands of egrets, spoonbills, and ducks. In Texas, the Aransas National Wildlife Refuge, which was established specifically for the protection of whooping cranes, also offers a critical resting area for birds migrating across the Gulf of Mexico each spring and fall.

As conservationists work to save species through elaborate reintroduction programs and extensive land grabs, others wonder why society should even bother. Much has been written about the aesthetic value and practical contributions, or "ecosystem services," of biodiversity. But what makes conservation critical now more than ever, ecologists argue, is that we are currently experiencing a period of mass extinction as a direct result of human development. Some, including noted Harvard ecologist E.O. Wilson, go even further. In his 2002 book *The Future of Life*, Wilson described what he calls the human bottleneck. Wilson essentially argued that the current period of mass extinction will diminish after the planet's human population peaks and begins to decline sometime in the coming century. According to Wilson, whatever

biodiversity we can maintain through this current “bottleneck” will be under less of a threat once we make it to the other side.

In the meantime, thousands of species are thought to go extinct each year, but nobody knows for sure just how many are lost. Ecologists have devised complex theoretical models to hazard guesses on the global rate of extinction. They plug in figures on the number of species that exist in a given habitat and the amount of that habitat lost to development each year. The models then churn out global figures for species loss. When pressed, ecologists admit that the figures are a best guess. But they also add that with a problem as serious as extinction, they can never be too careful. Or can they?

In 2001 Danish statistician and political scientist Bjorn Lomborg published a highly controversial book called *The Skeptical Environmentalist*. In his book, Lomborg argued that claims made about the rate of biodiversity loss, as well as overpopulation, global warming, and a variety of other environmental problems, were exaggerations. After reevaluating the data, Lomborg proposed that on nearly every front environment concerns weren't deteriorating, but were actually improving. He then backed up his assessment in a peer-reviewed book with a 71-page bibliography and nearly 3,000 footnotes published by Cambridge University.

Lomborg challenged the environmental movement on everything it held sacred and received his just desserts, including a pie in the face at an Oxford book signing. What made Lomborg so dangerous in the eyes of environmentalists—and so lauded by the media—is that he was one of their own. A *New York Times* review of *Skeptical Environmentalist* stated Lomborg wasn't “a steely-eyed economist at a conservative Washington think tank but a vegetarian, backpack-toting academic who was a member of

Greenpeace for four years." The *Washington Post* hailed the book as a "magnificent achievement" and "the most significant work on the environment since the appearance of its polar opposite, Rachel Carson's *Silent Spring* in 1962." In 2004, Lomborg was selected as one of the hundred most influential scientists and thinkers by *Time* magazine, which suggested he may be the "Martin Luther of the environmental movement."

The scientific community, however, was not impressed. The journal *Nature* wrote a scathing review which compared Lomborg's methodologies to those who "argue that gay men aren't dying of AIDS" and "that Jews weren't singled out by the Nazis for extermination." Similar reviews from leading British and American ecologists, including Wilson, ran in *Science* and *Scientific American*.

But some scientists, such as Peter Kareiva of The Nature Conservancy, think such arguments over numbers are not only groundless, but do more harm than good. "Trying to get global estimates of extinction for total diversity is pretty silly," Kareiva said. "We don't even know how many species there are in a lot of the taxa. It's making a calculation for dramatic effect that I think most ecologists, if they stopped to think about it, would say is really hard to do scientifically." Kareiva doesn't question that we are in a period of mass extinction but is concerned about the many baseless claims being made by his colleagues. "We have good records of cases where you destroy this specific habitat you lose this species. But that's very different from saying you destroy one thousand acres of forest and with a statistical model you expect to lose fifty species," he notes.

Kareiva believes ecologists are starting to rein in their figures, but not because of Lomborg. "Frankly, I don't think *The Skeptical Environmentalist* has had that much impact," Kareiva said. "I think that what's had an impact is environmentalists in general

have gotten the message that stories of doom are getting kind of tiresome and the public just doesn't respond or care about them. Instead of dramatic statements there is an attempt I think to be a little bit more solution oriented."

One of the first to start thinking about solutions to environmental degradation was conservationist Aldo Leopold, generally considered to be the father of wildlife ecology. In 1935, Leopold bought an abandoned dust-swept farm along the Wisconsin River and lovingly began to restore the overgrazed land to the productive wetlands it had once been. Leopold's conservation classic, *A Sand County Almanac*, recounts a year on the farm, where he lived with his family in a converted chicken coop. Leopold's shack, little changed since Leopold's death in 1948, is a short drive from the Sauvey farm and Crane Foundation headquarters. After putting in an appearance at the Crane Festival in Necedah, Archibald took a couple of visiting Russian biologists to the shack. One of them, Kirill Postelnykh, was about to join the fall ultralight migration to Florida. This fall Postelnykh will be part of an all-Russian team leading Siberian cranes on a nearly 3,000-mile migration from the Arctic Circle to wetlands in central Uzbekistan. The project, which Archibald helped organize and secure funding for, will attempt to restore an eastern population of Siberian cranes that disappeared from that area in the 1990s. The Siberian Crane reintroduction is just one of several ongoing international efforts spearheaded by Archibald to protect the most endangered of the world's crane species. It's also an example of what the Crane Foundation feels is their most effective tool in conservation: training and inspiring others to do similar work in their own countries. "I'm very averse to sort of imperialistic conservation where foreigners come in and do all this stuff and then they leave; things fall apart," Archibald said about the need to train

others. “Getting them educated on the possibilities and then working with them within the limitations of their own society is the best way to go. We are like fish out of water in these countries.”

January 12

“I hate them!” biologist Lara Fondow yelled as she passed a string of billboards for new housing developments. “They’re these gated communities with euphemistic names like Walden Point or Rocky River Preserve.”

“See that,” she said, pointing to a small manmade pool hemmed in by half completed box houses on all sides, “That’s not a preserve!”

Fondow spent the past six hours checking up on a dozen whooping cranes wintering in northern Florida. Of the sites she visited, each has the same key features: a pair of tall white cranes forage in a large open field; horses or cattle often graze nearby; at least a few sandhill cranes are present; and usually there is some sort of wetland within walking distance.

Another common trait is that most of these pastures will be gone within ten years. “This ranch is being rezoned for a housing development and will most likely be sold,” Fondow said at one location. “That used to be the entrance to the ranch I’m headed to now,” she said of a 40-acre subdivision under construction.

As housing developments reach deeper into the peninsula, cattle ranches, long the mainstay of the Florida economy, are quickly disappearing. Cattle were first introduced to Florida by the Spanish soon after Ponce de Leon landed in 1513. By the time Florida became a state in 1845, ranchers were driving large herds across the state and loading

them onto barges bound for markets in Cuba. Descendants of these first Spanish herds roamed wild in Florida until the 1940s. For much of the state, ranching remains an integral part of the local economy. But even here, in towns like Greenfield and Odessa, the old economy is giving way to new developments.

Fondow is not alone in her concern over the disappearance of Florida ranchland. Steve Nesbitt, a biologist with Florida Fish and Wildlife, has monitored cranes in Florida for more than thirty years. Between 1982 and 2002 he recorded a fifteen percent reduction in habitat for cranes and noted that “it’s gone dramatically downhill since then.” The recent housing boom led federal biologists to draft a letter urging the state to do more to conserve crane habitat.

The state of Florida has already done a lot when it comes to conservation. Florida Forever, the nation's largest state-run conservation land-buying program, spends \$300 million each year purchasing land that would otherwise be developed. The money comes from taxes on real estate transactions. Since Florida Forever and its predecessor, Preservation 2000, began in 1990, the two programs have spent \$4 billion on 2.2 million acres.

But they are having an increasingly difficult time keeping pace. Development has driven the price of Florida ranchland up, between 65 and 80 percent in each of the last two years. And even if they could keep up, state acquisition of land is only the beginning. “Buying more land is not going to solve the problem,” Nesbitt said. “There is little public land and of that little is managed for cranes. We need to start taking some responsibility.”

Meanwhile, Fondow was looking forward to spring when the birds return to Wisconsin, a state in relatively little danger of overdevelopment. “I’m glad our birds only have to spend the winter here,” she said.

Fondow, a graduate student at the University of Wisconsin, Madison, working for the International Crane Foundation, has spent the past four years crisscrossing the back roads of northern Florida keeping close tabs on free flying whooping cranes at their wintering grounds. Most of the birds winter on ranchlands just inland from the Gulf Coast. The open pastures provide plenty of foraging grounds and make it hard for predators to sneak up on the birds. Furthermore, low-lying pastures often drain into surrounding wetlands, providing the birds with the standing water they need to roost in at night.

Urbanek, Fondow’s co-worker, had picked up a signal from one of the direct autumn release birds in the region in late December. It was Maya. After spending several weeks at the Hiwassee National Wildlife Refuge in Tennessee, Maya had made her way south in early December, most likely traveling with a group of sandhill cranes. She was the first known direct release bird hunkering down for the winter in Florida thus far.

A strong *tic, tic, tic* from Fondow’s radio tracking equipment suggested the bird was still in the area. She traveled down a narrow lane between open pastures on a large cattle ranch. As Fondow drove, the rooftop-tracking antenna brushed against live-oak trees, plucking Spanish moss from the low hanging limbs.

As Fondow continued through the ranch, she picked up an increasingly strong signal for Maya. Following the signal to a low-lying pasture, Fondow drove across a

muddy field in search of the bird. Fondow's signal was booming now as she scanned the field for the bird.

"There she is," she said, pointing to a white spec on the horizon while looking through a pair of binoculars. Rising air currents on the field blurred the image, but Maya could be seen standing in shallow water at the far edge of the pasture with a group of four sandhill cranes. Her bleach white feathers stood in stark contrast against the other cranes. The young whooping crane only had only a trace of the cinnamon colored feathers she had earlier in the year.

Fondow drove closer, but soon came to a stop before her truck got too bogged down. Using a hand-held rangefinder, she estimated her distance to be about 600 meters from the bird. Fondow mounted a spotting scope to the driver's side window and recorded observations on the bird. Unfortunately, it was the middle of the day when well fed cranes such as Maya, according to Fondow, "just kind of loaf." She watched the bird as it stood in what looked to be about a foot of water casually preening her flight feathers and occasionally picking at food with her beak. Later in the afternoon she saw other whooping cranes actively working the fields and wetlands in search of food. Whoopers in Florida feed primarily on insects such as water striders, grasshoppers, and dragonflies that they catch off plant leaves. They have also been known to feed on snakes and recently hatched alligators. As Maya preened, cattle grazed only yards away, yet neither seemed to notice the other's presence.

Before leaving, Fondow took a GPS coordinate of the location. At the end of the each day, she plotted the locations on her computer. The data she collected will be used in her master's thesis examining the birds wintering locations and habitats. Through her

thesis, Fondow is striving to show how crucial these remaining pastures are for the endangered birds. She hopes her study can someday be used by conservationists to set aside some of the region's ranchland.

"I'm hoping that if there is something out there that says conservation is needed, it will help," Fondow said.

Epilogue: Where Are They Now

As first light crept over the Necedah National Wildlife Refuge on the morning of April 24, a bleary-eyed Richard Urbanek was up looking for birds. The U.S. Fish and Wildlife biologist and brainchild of the Direct Autumn Release had been up all night working the giant radio antenna on the roof of his pick-up truck. Urbanek was trying to pinpoint the exact locations of the many whooping cranes that had recently returned from Florida. It wasn't at all unusual for him to be up all night; a confirmed night owl, his co-workers know not to call him before noon. What was unusual was that the biologist was still awake as sunlight crept over the marsh. During the night Urbanek picked up the signal of whooping crane number 33-05, better known as Poe. If his telemetry equipment was working correctly, the first of the four direct release birds had just made it back to the refuge. When the sun came up, Urbanek spotted the bird in the very marsh where she and her crane suited "parents" spent the previous summer. Over the next month and a half, two of the three remaining direct release birds returned to the same location before dispersing into the surrounding wetlands.

To date, the first Direct Autumn Release has been a triumph. The birds made successful fall migrations, over-wintered in Florida and Tennessee, and three out of the

four found their way back home this spring. The fourth bird, Jumblies, remains in southwestern Michigan and is being closely monitored to see if she can still make it back on her own. On the strength of this overall performance, crane biologists decided to more than double the number of direct release birds for this coming fall to ten individuals.

It will take another three to four years before the program's four pioneers reach sexual maturity and start hatching chicks of their own. The oldest members of the eastern migratory flock, however, are getting close. This year, five pairs of adults laid eggs. Biologists kept careful watch for what would be the first wild hatching of a migratory whooping crane in eastern North America in more than a hundred years. Unfortunately, none of the eggs made it on the nest for the full incubation period, a fate that is not uncommon for the eggs of first-time parents.

As for Waldo, after his disappearance in late November, he resurfaced two months later on a cattle ranch in central Florida. Local ranchers claimed he had been there since early December, not long after he was last seen in Tennessee. After spending the winter in Florida, Waldo disappeared again on March 8. Without the use of satellite transmitters—Waldo was the only direct release bird that didn't have the device—biologists could only hope that the bird had begun his spring migration. Then, nearly two months later, on May 4, biologists picked up the bird's radio signal in a marsh just west of Necedah.

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McGuire, Kelly. Aviculturist, International Crane Foundation. 1-06, via phone 3-06.

Nesbitt, Steve. Biologist, Florida Fish and Game. Via phone 04-05

Nipper, Mark. Supervisor of field operations, Operation Migration. 08-05.

Putnam, Michael. Curator of birds, International Crane Foundation. 01-06.

Scott, J. Michael. University of Idaho wildlife biologist and U.S. Geological Survey research scientist. Via phone 04-06 and 05-06.

Swain, Hilary. Executive director, Archbold Biological Station. Via phone 04-06.

Tucker, Kelley. Vice president of programs, International Crane Foundation. Via phone 03-05.

Urbanek, Richard. Biologist, U.S. Fish and Wildlife Service and Direct Autumn Release program co-chair. 11-05, 12-05, via phone 05-06.

Wellington, Marianne. Biologist, International Crane Foundation and Direct Autumn Release co-chair. 9-05, 1-06.

Zimorski, Sara. Biologist, International Crane Foundation. 11-05, 12-05, 1-06, via phone 03-06 and 05-06.