

2003 Report



*Government agencies & Non -profits Working to Safeguard
the Rarest Crane in the World...*



2003 WCEP Annual Report

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Eastern Migratory Whooping Crane Reintroduction

Summary of 2003 Activities and Accomplishments

During this third year of the migratory whooping crane reintroduction in the eastern United States, the Whooping Crane Eastern Partnership (WCEP) continued to meet or exceed all objectives. Since 2001, 36 whooping cranes have been reintroduced successfully and are migrating along a well-defined migration corridor between Wisconsin and Florida. Survival of whooping cranes after completion of their first fall migration behind ultralight aircraft has been 92%.

During winter 2002-2003, all 21 whooping cranes in the population successfully overwintered in Florida. Twenty of 21 birds migrated back to the upper Midwest in spring, while the last bird was captured and translocated to central Wisconsin after she went off course among the mountains north of Atlanta. Summering birds showed appropriate habitat selection and human avoidance behaviors, and used a variety of state, county and private wetlands in addition to Necedah and Horicon National Wildlife Refuges and other federal lands. Thirteen cranes spent the summer in the core reintroduction area, centered on Necedah National Wildlife Refuge, including all trackable males (one male did not have a fully functional transmitter and could not be monitored) and those females associating with males. The other seven birds, all females, spent the summer elsewhere in Wisconsin (2 birds), northern Illinois (1 bird), southeastern Minnesota (1 bird), and northeastern South Dakota (3 birds). The latter 3 birds were captured and moved back to central Wisconsin, where 1 bird developed capture myopathy and was euthanized after unsuccessful treatment efforts. The other 20 birds migrated south successfully along the desired Wisconsin-Florida corridor. Nineteen of 20 are now being monitored at wintering sites in central and northern Florida. Sixteen of these 19 birds are wintering at freshwater, inland sites; 3 are wintering at the release pen at Chassahowitzka with the 2003 cohort of chicks.

A third group of whooping crane chicks was hatched at Patuxent Wildlife Research Center and received early training in preparation for ultralight-led migration. Nineteen chicks were allocated to the project this year; one died at 11 days of age and another was removed from the project due to chronic illness. Special recognition is due this year to the San Antonio Zoo, a new WCEP partner, for contributing 2 eggs to the project. These eggs were hatched at Patuxent together with 16 Patuxent eggs and 1 egg from the International Crane Foundation. Half the chicks received West Nile virus vaccinations at Patuxent, to assist in tracking the efficacy of the vaccine and natural exposure of the birds to the virus. Windway Capital Corporation flew 17 chicks to Necedah National Wildlife Refuge in June. During the summer, one chick died following a collision with an ultralight aircraft.

Chicks were housed at three training facilities on the refuge that had been improved during the previous winter by refuge staff to provide better conditions for water roosting. Late summer drought, however, meant that access to water for roosting within the pens was limited. Cohort 1 had access to water on 113 of 119 nights. Cohort 2 was able to water roost on 110 of 119 nights, while Cohort 3 had access on 74 of 119 nights. To reduce disruption during the weeks before migration, the pre-migration health check minimized handling of the birds. Use of temporary snap-on bands with radios for the migration greatly speeded the banding process in comparison to previous years. Handling time was decreased by half and hardly any training time was lost. Previously, up to two weeks of critical training time was lost following banding/pre-migration health check. Changes in training techniques and favorable weather meant that the birds, this year, were better prepared than ever before. They routinely made 30-minute flights at Necedah in September, putting the project about two weeks ahead of previous years.

The migration began on October 16, and required 54 days to cover 1,191 miles. Unfavorable weather delayed the start of migration by over a week and made this the longest migration to date, including two 5-day breaks and four 4-day breaks. All 16 chicks completed the migration successfully, arriving at the wintering pen at Chassahowitzka National Wildlife Refuge on the Gulf Coast of Florida on December 8. A health check occurred after arrival, and permanent bands and new radios were attached.

A team of veterinarians worked to provide top quality health care to the birds, with an emphasis on preventive medicine approaches. We have developed a network of veterinary consultants along the flyway to provide emergency services for WCEP birds.

In 2003, flyway states played an expanded role in outreach efforts, especially during migration. Project staff worked closely with state agencies, particularly in states where whooping cranes spent considerable time including Wisconsin, Florida, Illinois, Iowa, Minnesota, and South Dakota.

The project's Outreach Team continued to work with media, interested individuals, organizations, school children and the general public to provide information and educational opportunities about whooping cranes and the reintroduction. Although 2003 was the third ultralight migration involving whooping cranes along the Wisconsin-Florida flyway, media and public interest continued to be strong, and the partnership fielded an estimated 300 media queries. Websites for WCEP and project partners received very heavy use, combining to register over six million hits. We devoted more effort to creating educational materials this year, and directly reached over 15,000 people with presentations.

The total direct-costs budget for 2003 (funds outside ordinary operating budgets) was \$1,203,891, of which 48.4% or \$583,112 was required by private organizations. In addition, capital equipment and facilities requirements for 2003 totalled \$205,118. By the year's end, most necessary funding requirements had been met. We anticipate the budget for 2004 will be slightly lower than in 2003. Although more birds are part of the new population, capital requirements should be less due to several major purchases and donations in 2003. WCEP is very grateful to all of our partners and supporters, who have made this project possible.

For 2004, the Whooping Crane Recovery Team (WCRT) has approved allocation of up to 20 chicks for the ultralight-led migration. The WCRT authorized WCEP to proceed with planning for a second release method, to supplement the ultralight-led migrations and add birds to the population beginning in 2005. This second method that involves releasing juvenile whooping cranes in the fall with older wild whooping cranes, is consistent with the original planning documents and approvals for the project. Detailed planning and needed coordination will be ongoing in 2004.

The Wisconsin Department of Natural Resources has recognized the need for a state comprehensive management plan for whooping cranes. WCEP partners have agreed that such a plan is also needed for the eastern migratory population, addressing issues beyond Wisconsin. These planning efforts will be undertaken during 2004, forecasting needs for management and monitoring of the population and the needs and interests of partner states where eastern migratory whooping cranes spend time. The plans will address priorities for monitoring, issues related to protection and management of birds and their habitats, health care, and creation of a database for partnership use.

31 January 2004

Field Team Report

Objectives:

In order to ensure the continued survival of Whooping cranes (*Grus americana*) the Whooping Crane Eastern Partnership (WCEP) is conducting a multi-year reintroduction project in Eastern North America. To establish this population in a migratory situation and encourage wild behaviour, each new generation of birds is costumed-reared in isolation from human environments and conditioned to follow specifically designed ultralight aircraft. In this manner they are led along a 1200-mile, pre-selected migration route from the Necedah National Wildlife Refuge in Wisconsin to the Chassahowitzka National Wildlife Refuge in Florida.

Twenty sub-adult Whooping cranes that were led along this route in the first two years of the project are currently selecting proper habitat, avoiding humans and migrating between the introduction site and the wintering grounds unaided. The goal of the project is to establish a discrete, self-sustaining flock of at least 25 breeding pairs of wild, migratory Whooping cranes as proposed by the Canada/United States Whooping Crane Recovery Team. This pioneering flock will augment the only naturally occurring population that migrates between northern Canada and southern United States, and the non-migratory flock reintroduced into central Florida beginning in 1993.



Summary:

Between 21 April and 23 May nineteen Whooping crane chicks were hatched at the USGS Patuxent Wildlife Research Center in Maryland (PWRC). Sixteen of these birds were from the Patuxent captive stock, two were from eggs produced at the San Antonio Zoo in Texas and the International Crane Foundation (ICF) in Wisconsin supplied one egg.



Early conditioning began at an average age of 8.38 days with each being trained on approximately 47 days using a variety of methods from revving of the aircraft engine to circle pen training. In total each chick received an average of 11.2 hours of training with the aircraft or sound recordings of its engine; 28.7 hours imprinting and socializing without the aircraft and they were allowed pond exposure for 21.7 hours. Chicks were handled approximately 28 times for medical examinations or record-keeping purposes. On average each was handled for a total of 55 minutes.

On 5 May at an age of 10 days Chick #08-03 was found dead (See PWRC Medical Report).

Bird #15-03 was diagnosed with scoliosis and was removed from the study. (See PWRC Disposition Report)

On 19 June at an average age of 51 days three females and seven males were transported in individual containers from PWRC to Necedah National Wildlife Refuge (NNWR) in central Wisconsin courtesy of Windway Capital. Birds 01-03, 02-03, 03-03, 04-03, 05-03 and 06-03 were housed at the north training site as cohort one and birds 07-03, 09-03, 10-03 and 11-03 were moved to the east training site as cohort two.



On 1 July at an average age of 43 days three females and four males were transported in individual containers by Windway Capital to NNWR. These birds made up cohort three and were housed at the West-training site.

Most of the birds fared well during the shipping ordeal however broken blood feathers were noted on 04-03 and 06-03. Damage to feathers was extensive on 02-03 and the bird had to be treated. The Health Team recommended the use of some modified crates to

accommodate larger birds next season. During the arrival medical examination all the birds were radio graphed while still in their container and 09-03 was discovered to have ingested a 2-inch metal screw. The bird was moved to the International Crane Foundation where it underwent an endoscopic procedure to remove the object. This operation was successful and the bird fully recovered (See Health Team Report).

On 7 August during a regular training session #14-03 was struck by the aircraft during a take off run and injured. It was removed to ICF where it suffered a fatal cardiopulmonary arrest while under anaesthesia. (See HEALTH MANAGEMENT, WCEP 2003 – Interim Report Health Team Report)

On 14 August cohorts two and three were penned together at the West training site. Cohort one was added to this group on 29 August.

Good flying weather early in the season allowed for more training than in previous years. These favourable conditions led to improvements in performance and record early flight durations. On 18 August, Brooke Pennypacker led the combined cohort 2/3 on a 32-minute flight. It is interesting to note that the longest pre-migration flight during the 2002 training season was only 24 minutes 20 seconds and occurred on 26 September.



Both cohorts one and two received training on 73 of their 118-day stay at Necedah. The cohort three birds were trained on 65 of their 107 days of residence.

As our birds are captive and only allowed to fly during exercise sessions it is difficult to determine the exact date when individuals fledge. Often they are able to fly the length of the runway behind the aircraft but unable to climb above a few feet. Flights of this type are easier because of a condition known as ground effect.

For the purposes of this study and to facilitate comparisons to previous years we have defined “fledging” as the point in time when all the birds from a cohort are able to fly short circuits around the pen area. Cohorts one, two and three fledged on July 19th, 22nd and 30th respectively, however, individual birds may have been able to sustain flight for short periods well before these dates.

The first health check and banding was conducted on 27 August in the evening and ten birds, 01-03 through 11-03 were examined. The snap-on bands constructed by Richard Urbanek greatly reduced the handling time and from collection until the birds were returned to the pen took approximately nine minutes each. The collection team of Sara Zimorski, Marianne Wellington and Dan Sprague wore dark grey costumes in an effort to avoid the birds being handled by familiar white costumes, however, when they entered the pen all the birds began to fly into the top net. The handlers exited the pen immediately and thereafter a white costume was used to herd individual birds to the gate where they were passed to the grey costumes for hooding.



The birds all recovered well from the handling except 13-03, which suffered a minor wing injury and was held out of training for a few days. Number 03-03 suffered a leg injury, which reoccurred periodically for the rest of the field season. Fearing the bird would not be able to migrate it was removed to ICF on 8 October and underwent surgery on 9 October to repair a fractured tibia. The bird was returned on 18 October; two days after the migration began and was penned with its flockmates in order to maintain its social status. It was crated for the first few legs of the migration and was again able to fly with the other birds on 26 October. In total the bird missed 186.6 miles due to its injuries. It completed the rest of the migration without further medical complications.



Over the '02/'03 winter season the Necedah staff made many improvements to the training facilities. The wet areas of the East and West sites were originally constructed of plastic fence and used to house the birds during the day. These enclosures were rebuilt using chain-link material making them much more secure. As well, the areas were dredged to improve water quality within these pens. These changes allowed us to give the birds more access to water roosting over the training season.

Unfortunately, August and September were unusually dry months in Wisconsin and water levels in the wet pens dropped substantially. For this study water roosting is defined as the number of nights the birds had access to the wet pens, however, this is not conclusive evidence that they did roost in water. We used a night scope to view the birds after nightfall on several occasions but without disturbing the flock it was difficult to determine if they were actually standing in water or on the dry areas that increased in size as the season progressed. Of the 119 days that cohort one was at Necedah the birds had access to water roosting on 113 nights (95%) as well as most days. Cohort two had access to water roosting on 110 of 119 days (92%) and cohort three had the opportunity to roost in water 74 of 107 days (69%).

Due to improvements in the training techniques and favourable flying conditions early in the season the birds raised this year were better prepared than any before. By early September, 30-minute flights became routine, putting the project at least two weeks ahead of previous years. This came as a pleasant surprise but caught us off guard and unprepared. The team of volunteers, drivers, ground crew, flight crew and vehicles was not ready until the early part of October as in earlier studies. This excess time spent at Necedah allowed the birds to become too familiar with the area. Additionally they were moved from site to site to make use of dwindling water levels in the wet pens. This familiarity resulted in birds breaking from the aircraft to return to the pen or landing at other training areas as we passed overhead. Unfortunately, the weather deteriorated in late September and early October and the birds were only trained intermittently. These factors eroded our advantage and added concern about the outcome of the first migration leg.



Poor flying conditions prevented training for eight consecutive days and delayed the departure from the proposed date of 8 Oct to 16 October. As expected, several birds turned back on this initial flight and the team of three pilots, each with a small group of birds became separated. In total nine birds arrived at the first destination, four returned to the North training site at Necedah and two dropped out. (Number 03-03 was still recovering from surgery).

Weather, as always, plagued the migration and we experienced many delays including two 5-day breaks and four 4-day periods of no flying. (Table 1)

The most difficult portion of the migration, as usual, is the crossing of the Appalachian Mountains. After four days of poor weather we had to force-climb the birds 2500 feet to clear the Cumberland Ridge. Eight birds followed the aircraft in three separated groups eventually, arriving at the destination. Four turned back. One dropped out near the departure site and another three cleared the ridge on their own, well after all three aircraft left the area. These birds continued south in the direction the aircraft were last seen and Don and Paula Lounsbury tracked them in the top-cover Cessna. After several hours this team broke off and was replaced by the airborne tracking team from ICF and Windway Capital. They managed to follow the birds to a location approximately 27-miles east of the original destination.



After 5 hours and 20 minutes in the air these three birds landed in an isolated field next to the ground crew who called them down using the vocalizer. The eight errant birds were crated and transported to Hiwassee State Wildlife Refuge in Tennessee, which coincidentally is our halfway point. After forty-one days of travel the birds were allowed to roost in water for the first time at Hiwassee.

Again, we experienced four days of poor weather. Historically this opportunity to forage in water after a long dry period has made the birds reluctant to leave the area. During the next leg, four birds had to be crated and moved to the next destination.



The long delay and reluctance in the birds was discouraging to the team, however, the next day the weather conditions were ideal and all sixteen birds followed one aircraft for a record distance of 200 miles. Access to a hangar eliminated the recurring frost problem and calm, cold air aided the birds as we climbed into a strong but smooth tail wind.

The combined airspeed of the birds and the tailwind resulted in a ground speed of over 80 mph and we over-flew three scheduled stopovers covering 200 miles in just over 3 hours.

The remaining flights to Chassahowitzka National Wildlife Refuge were uneventful and we finally arrived on 8 December 03 with all sixteen birds. The migration took fifty-four days; covered 1191-miles and used twenty stopovers. Four birds experienced the complete migration without missing portions of the journey. The birds were housed in a temporary enclosure within the release pen until the banding and arrival health exams were conducted on 11 and 12 December.

Improvements for 2004:

During the 2003 season the field team discussed possible improvements to the training facilities at Necedah with refuge manager Larry Wargowsky.

- These include extending portions of the runways at both the North and East sites to allow for takeoffs into the wind in both directions.
- The East site will be modified to eliminate a descending entrance into the dry pen that has caused problems in the past.
- Improvements to the wet pens were effective in minimizing the build up of water-borne bacteria however we also explored several options for a better pump system to deliver a fresh water supply to all pen sites. These discussions are ongoing.
- Good flying conditions, improved training techniques and better facilities at Necedah resulted in birds that were prepared to begin migration earlier than in previous years. The Field Team will make every effort to have the Migration Team in place by mid to late September if the option of an early departure is again available.
- Historically, crossing the Appalachian Mountains has been the most difficult and time-consuming portion of the migration. We originally designed the route to veer to the east once we were south of Chicago to pass close to the Jasper Pulaski area before turning south again.

Although we pass within 40 miles of this important natural staging area only a small portion of our birds use the site on the return migration. This questionable advantage is far outweighed by the obstacle posed by the mountains we must cross as we proceed south from there. During the 2004 field season we will investigate a new route heading directly south from Necedah and deviating from the original course in La Salle County, Illinois. From there we will proceed in a more southerly direction through Illinois and passing into Indiana near Mount Carmel. We would fly over the western tip of Indiana and Kentucky crossing into Tennessee near Clarksville. We would pass into Alabama near Athens and turn easterly around Montgomery. We would enter Florida north of Tallahassee and follow the Gulf coast in a direct line to Chassahowitzka. At its widest separation the new route would be approximately 120 miles west of the original course. The proposed route would cover roughly the same distance, yet avoids the hazards created by the mountains. Often the winds aloft over open country are strong yet smooth because there are no prominent geographic features to cause mechanical turbulences. An example of this type of weather system is the 200-mile day we experienced in Georgia during this last migration. Additionally, low-pressure systems that are common in autumn often move across the lower states and up the eastern coast. Our old route situates us on the front side of these systems and results in long periods of headwinds. Moving the route farther west would place us on the west side of the pressure cells and could provide more frequent tailwinds.



- Prior to the birds arrival at Chassahowitzka we erect a temporary enclosure within the release pen. Even the sides of this structure are made of top net only and it is meant to hold the birds for a day or two only until the health examination is performed. In the event of weather delays the birds could be in this less than secure pen for longer than expected. We recommend that removable panels be constructed to create a more appropriate temporary pen that can contain the birds in a safer environment.

- o Pandering to the superstitious nature of most pilots, Operation Migration suggests that in the future we avoid the use of the number 10 to identify birds. Just as the numbering systems in high-rise buildings skips from 12 to 14 to circumvent the use of the plagued number 13 we propose to skip from 9 to 11 and retire forever the beleaguered number 10.

We present the following history of birds that have been condemned with this ominous identifier as justification for our dubious logic. We believe that by avoiding this numerical designation we can increase our survival rate by one bird every year.

- 2000: #10-00 = Aircraft strike
- 2001: #10-01 = Bobcat predation
- 2002: #10-02 = Aircraft strike
- 2003: #10-03 = Living in fear

Field Team:

Beth Anderson - Operation Migration; Brian Clauss - USGS Patuxent Wildlife Research Center; Joe Duff - Operation Migration; Mark Nipper - Operation Migration; Brooke Pennypacker - Operation Migration; Dan Sprague - USGS Patuxent Wildlife Research Center; Richard van Heuvelen - Operation Migration; Sara Zimorski - International Crane Foundation.

Migration Team:

Jane Chandler - USGS Patuxent Wildlife Research Center; Joe Duff - Operation Migration; Joan Garland - International Crane Foundation; Jeff Huxmann - Operation Migration; Don Lounsbury - Operation Migration; Paula Lounsbury - Operation Migration; Mark Nipper - Operation Migration; Brooke Pennypacker - Operation Migration; Heather Ray - Operation Migration; Charlie Shafer - Operation Migration; Dan Sprague - USGS Patuxent Wildlife Research Center; Richard van Heuvelen - Operation Migration; Sara Zimorski - International Crane Foundation.



Report prepared and submitted by Joseph W. Duff – C.E.O. Operation Migration Inc.

Operation Migration wishes to thank the many contributors to this reintroduction of Whooping cranes.

We are very thankful for the efforts of Heather Ray who keeps us all informed through our website and for her fundraising, writing and communication abilities. Special thanks to Dan Sprague (Patuxent WRC) for again sharing his expertise. We appreciate the efforts of Brian Clauss (Patuxent WRC) and Mark Nipper (OM) who worked tirelessly for a very long season. Thanks also to Sara Zimorski (ICF) for working on all of her weekends off and interns Beth Anderson and Charlie Shafer (OM). We are grateful to Richard van Heuvelen and Brooke Pennypacker (OM) for their hard work and flying skills. Don and Paula Lounsbury again provided top-cover assistance during another migration and we thank them. We would like to thank Deke Clark and Rebecca Cohen-Pardo for their continued support. We are grateful to Larry Wargowsky and all the staff at Necedah National Wildlife Refuge for making us part of their team and Jerry and Sandy Ulrikson for support on many fronts.

Special thanks to all the migration landowners (first names only for privacy) for their hospitality and generosity including Dick and Jane D., Bob and Nancy R., Vicky W., Tom W., Steve and Carolyn B., Mark and Nancy F., along with their extended family; Al and Pat R.: Kevin and Sheila P. and the little ones; the staff at Muscatatuck NWR, Mark and Jackie T., Charles and Anna H., Mike and Sue L., Tom P., Wally Aikens and the staff at Hiwassee, Juanita B., Vickie T., Doug and Bonnie R., Dr. Gray R., Brother and Jamie B. Ron and Maryanne M., Chip and uncle Herb C. Jim Kraus and the entire staff at Chassahowitzka National Wildlife Refuge.

We sincerely thank Terry Kohler and Windway Capital Corp. for their assistance on so many levels: from donations of funds and aircraft, to tracking wayward birds. Thanks also to Jane Stedman and Sandy Blakeney for the use of their Hornet and Darlene Lambert and Cindy Lokin for the boredom packages and summer meals on wheels. Last but certainly not least, we thank all the contributors to our Mile-Maker campaign and the members and supporters of Operation Migration.

Without the help of these generous people, Whooping cranes would not be migrating in eastern North America.

Southward Migration: Daily Summary

Day	Segment	Date	Dist.	Acc. Dist.	Flight dur.	County, State	Stand Down Reason	Crated Cranes
1	1	10/16	23.2	23.2	: 50	S. Juneau, WI		3-03,2-03, 0-03,11-03,13-03,07-03,9-03
2	2	10/17	22.6	45.8	: 41	Sauk, WI		03-03 Recovering from surgery
3		10/18	0	45.8			Wind WSW@10mph	03-03 Recovering from surgery
4		10/19	0	45.8			Wind S@7mph	03-03 Recovering from surgery
5		10/20	0	45.8			Wind S@20mph	03-03 Recovering from surgery
6		10/21	0	45.8			Wind NW@10-15mph and gusting	03-03 Recovering from surgery
7	3	10/22	46.1	91.9	1:19	Green, WI		03-03 Recovering from surgery
8	4	10/23	47.1	139.0	1:42	Ogle, IL		17-03 ~8 miles out from destination. 3-03
9		10/24	0	139.0			Wind S@10-12mph	3-03 Recovering from surgery
10	5	10/25	47.6	186.6	: 58.5	LaSalle, IL		3-03 Recovering from surgery
11	6	10/26	56.7	243.3	1:05	Kankakee, IL		
12	7	10/27	43.2	286.5	1:08	Benton, IN		
13		10/28	0	286.5			Rain & wind	
14	8	10/29	49.2	335.7	: 57	Boone, IN		
15		10/30	0	335.7			Wind S@8mph	
16		10/31	0	335.7			Wind SE@10-15 gusting	
17	9	11/1	55.6	391.3	1:34	Morgan, IN		
18		11/2	0	391.3			Wind S@10mph	
19		11/3	0	391.3			Wind SSW@5mph	
20		11/4	0	391.3			Wind S@16mph	
21		11/5	0	391.3			Rain	
22		11/6	0	391.3			Wind SSE@7mph	
23	10	11/7	41.7	433.0	1:06	Jackson, IN		
24	11	11/8	47.8	480.8	1:29	Oldham, KY		2-03
25		11/9	0	480.8			Wind SW@7mph	
26	12	11/10	42.3	523.1	1:33	Washington, KY		
27		11/11	0	523.1			Wind sheer advisory issued	
28		11/12	0	523.1			Wind - T-storms	
29		11/13	0	523.1			Wind W@15mph	
30	13	11/14	54.7	577.8	1:26	Adair, KY		
31		11/15	0	577.8			Rain	
32		11/16	0	577.8			Rain	
33		11/17	0	577.8			Rain/Fog	
34		11/18	0	577.8			Rain	
35		11/19	0	577.8			Rain	
36	14	11/20	74.9	652.7	1:51	Cumberland, TN		
37		11/21	0	652.7			Wind S@3-5mph	
38		11/22	0	652.7			Wind SW@15mph	
39		11/23	0	652.7			Wind S@15mph	
40		11/24	0	652.7			Rain	
41	15	11/25	33.1	685.8	2:52	Meigs, TN		1-03,7-03,10-03,12-03,16-03, #2-03, 9-03, 11-03 from 27m ESE of Hiwassee.
42		11/26	0	685.8			Wind S@8mph	
43		11/27	0	685.8			Rain	
44		11/28	0	685.8			Wind NW 10-15 gusting to 25mph	
45		11/29	0	685.8			Wind NW@10mph	
46	15	11/30	68.3	754.1	2:50	Gordon, GA		2-03, 7-03, 11-03, 18-03
47	17	12/1	200.0	954.1	3:04	Terrell, GA	NW@3mph	
48		12/2	0	954.1			Wind ESE@8mph	
49		12/3	0	954.1			Wind ESE@12mph	
50		12/4	0	954.1			Wind E@7mph	
51		12/5	0	954.1			Wind NW@6mph. Fog	
52	18	12/6	98.5	1052.6	1:51	Hamilton, FL		
53	19	12/7	60.6	1113.2	2:03	Gilchrist, FL		
54	20	12/8	77.8	1191.0	2:05	Citrus, FL		Chassahowitzka NWR - FINAL DESTINATION

Table 1 – Day-by-day southward ultralight-guided migration.

History & Disposition 2003 Whooping Cranes

ID #	WCEP Colour-code	Gender	Hatch date	Trained at PWRC (hours)	Pond experience at PWRC (hours)	Age at Shipping	Cohort	Days trained at	Nights of Water roosting at NNWR	Migration segment not completed, crated to next stop. Distance indicates total miles missed	Disposition
01-03	L W(PTT):L G/R	F	4/21	14.1	30.38	59	1	73	119	seg. 14 - 33.1miles	Wintering in Florida
02-03	G/W:L G/R	M	4/22	15.6	31.21	58	1	73	119	Seg. 1,11,14,16 - 166.3miles (b)	Wintering in Florida
03-03	L G/R:W	F	4/22	11	31.80	58	1	69	119	seg. 1 to 5: 186.6 miles	Wintering in Florida
04-03	R/W :L G/R	M	4/24	13.9	31.38	56	1	73	119	Completed entire migration	Wintering in Florida
05-03	W/R/G :L G/R	M	4/29	14.50	30.08	51	1	73	119	Completed entire migration	Wintering in Florida
06-03	G/W/G :L G/R	M	5/01	13.6	30.16	49	1	73	119	Completed entire migration	Wintering in Florida
07-03	R/W/G :L G/R	M	5/04	9.25	26.16	46	2	73	110	seg. 15: 35.1 miles (a)	Wintering in Florida
08-03	Died 05/05/03 not shipped								Died 05/05/03 not shipped		
09-03	L W/G(PTT): L G/R	F	5/05	9.20	25.16	45	2	70	110	seg. 15: 29 miles (a, b)	Wintering in Florida
10-03	W/G/R :L G/R	M	5/06	7.83	13.41	44	2	73	110	seg. 1, 15: 56.3 miles	Wintering in Florida
11-03	G/W/R :L G/R	M	5/06	4.71	12.80	44	2	73	110	seg. 1, 15, 16: 118.5 (b)	Wintering in Florida
12-03	L W/R (PTT):L G/R	F	5/14	13.23	16.36	48	3	65	74	seg. 15: 33.1 miles	Wintering in Florida
13-03	R/W/R :L G/R	F	5/17	13.28	15.91	45	3	59	72	seg. 1: 23.2 miles	Wintering in Florida
14-03		F	5/17	11.45	15.83	45	3			Died: (aircraft strike) 08/07/03	
15-03	Not shipped Scoliosis								Not shipped Scoliosis		
16-03	R/G/W :L G/R	M	5/19	5.45	11.00	43	3	65	74	seg. 15 / total 33.1 miles	Wintering in Florida
17-03	W/G/W :L G/R	M	5/20	11.63	16.08	42	3	65	74	seg. 4: 8 miles (c)	Wintering in Florida
18-03	G/R/W :L G/R	M	5/21	11.66	16.58	41	3	65	74	seg. 16: 68.3	Wintering in Florida
19-03	W/R/W :L G/R	M	5/23	10.33	16.00	39	3	65	74	Completed entire migration	Wintering in Florida

(a): 07-03 & 09-03 dropped out 2 miles east of south Juneau County (stop #1) and crated.

(b): 02-03, 09-03 and 11-03 dropped out at Cumberland County (stop #14) but headed south alone. They were tracked by OM and Windway and called down by handlers 27 miles east of Hiwassee (stop #15) and crated.

(c): 17-03 dropped out 8 miles short of Ogle County (stop# 4) and crated.

Table 2

Comparison of Training History and Disposition of '01 - '03 Generations of Reintroduced Whooping Cranes

Event	2001	2002	2003
Hatch period	May 7 - May24	Apr. 12 - May 21	Apr 21 - May 23
Age span	17 days	39 days	32 days
Gender	4F 6M	10F 7M	6F 11M
Age at first exposure to aircraft	6.60 days	9.05 days	8.38 days
Avg time trained at PWRC (hrs./min.)	7h 18m	11h 56m	11h 02m
Avg. pond exposure at PWRC (hrs/min)	19h 6m	180h 40m	21h 42m
No. of cranes shipped to NNWR	ten	seventeen	seventeen
Shipping date	10 Jul	12 Jun 27 Jun	19 Jun 1 Jul
Avg age at shipping	55.6 days	53.5 days 44.6 days	51 days 43.3 days
Cohort 1 ID#s	1, 2, 3, 5, 6	1, 2, 3, 4, 5, 7, 8	1, 2, 3, 4, 5, 6
Cohort 2 ID#s	4, 7, 9, 10, 11	9, 10, 11, 12	7, 9, 10, 11
Cohort 3 ID#s	NA	13, 14, 15, 16, 17, 18	12, 13, 14, 16, 17, 18, 19
# days at NNWR	98	112 107	118 106
# days trained at NNWR	41	62	69
# water roost nights at NNWR	9	95	99
Fledge date- cohort 1 - 2 - 3	29 Jul - 6 Aug	18 - 24 - 30 Jul	19 - 22 - 30 Jul
Cohorts introduced	5-Sep	25 Aug - 16 Sep	14 Aug - 29 Aug
Longest training flight (min.)	27m	24m	33m
Migration departure	17-Oct	13-Oct	16-Oct
Birds to start migration	8	17	16
Stopovers used	26	22	20
Total flight days	26	23	20
Days To Complete Migration	50	49	54
Total Distance (statute miles)	1227.28	1204	1191
Arrival date	5-Dec	30-Nov	8-Dec
Total flight time	35h 46m	38h 36m	31h 53m
Longest flight	94.7 miles	107.2 miles	204 miles
Longest flight time	2h 9m	2h 15m	3h 3m
No. of birds to complete migration	6 + *1 crated	16	16
No. of birds that flew entire route	3	4	5
Date of departure from chass.	9-Apr-02	1-Apr-03	
Days at winter site	126	121	
Birds survived first winter	5	16	
Birds returned to NNWR	5	14	
# of cranes focused on NNWR (first summer)	3	8	
Birds returned to outlying reintroduction area		2 *a, b	
No of birds lost - cause:	5: (3-01) Powerline Impact (11-01) capture myopathy (4-01) winter predation (10-01) winter predation (9-01) *handling injury	2: (7-02) capture myopathy (10-02)Aircraft Strike	1: (14-03) aircraft strike
*Crane #9-01 removed from study - ACRES			
No. Of Surviving Birds 5	5	15	16

a: #9-02 Retrieved from Ohio

b: #14-02 Summered Carroll & Jo Daviess Counties, IL

Health Team Report

HEALTH MANAGEMENT, WCEP 2003

WCEP Health Team: Barry Hartup (ICF & UW-Madison), Julie Langenberg (WDNR), Kim Miller (USGS NWHC), Glenn Olsen (USGS PWRC), Marilyn Spalding (UF-Gainesville)

The Health Team provides veterinary support to the WCEP project at all points before and after release. Our mission is to maximize individual and population health and fitness to promote survival and reproduction in the introduced cranes. Our primary method to accomplish this goal is to utilize preventative medicine approaches based on objective assessment of disease risks. When needed, veterinary care and consultations have been provided on a 24/7/365 basis, and a network of veterinary consultants is available in cases of emergency along the migration route.

In 2003, 16 of 19 (84%) whooping cranes intended for the project were released. Two birds died and one was withdrawn from the project due to chronic illness concerns. In addition, a 2002 cohort member died following capture and relocation.

The Health Team continues to update a disposition protocol for birds unable to continue with the release to facilitate decisions that promote bird welfare while maintaining the bio-security of the primary captive breeding centers. A new challenge will be the coordination of treatment and rehabilitation of released birds throughout the reintroduction area and realization of the limitations of personnel, facilities and management options to handle these cases.

The following summary includes highlights of the 2003 season and a listing of recommendations and objectives for 2004.

Summary of Health Management Activities 2003

Mortality

- On May 16, the 11 day-old chick 08-03 was found dead in its pen. Necropsy results suggested the cause of death was acute peritonitis, likely from bacterial ulcerative enteritis. No evidence of parasitism was seen in the small intestines.
- On Aug 7, 14-03 collided with the ultralight aircraft during takeoff for training. Necropsy revealed severe internal trauma, incidental gastrointestinal parasites, and microscopic evidence of disseminated visceral coccidiosis that was not considered sufficiently severe to have interfered with the bird's survival. This case is the fourth instance of accidental aircraft-related trauma since 2000.
- On Aug 18, 07-02 was captured in SD for translocation to the Necedah area. The bird suffered from exertional myopathy, and was treated for 12 days. Necropsy confirmed extensive myopathy lesions, with widespread muscle necrosis, a chip fracture involving the left humerus (likely sustained during capture or during hospitalization), sawdust impaction in the proventriculus that led to aspiration of tube feeding mixture, and acanthocephalan parasites in the intestine. This case represents the third instance of exertional myopathy since 2001: 2 following capture and 1 following collision with an aircraft. These cases are currently being summarized for publication.

Morbidity

- 15-03 was removed from the project following protracted upper respiratory illness that was not responsive to treatment and the presence of cervical scoliosis. This bird was also seropositive for infectious bursal disease virus serotype 2. The bird continues to reside at PWRC and may become a behavioral role model for future WCEP cohorts.
- Trauma to blood feathers was observed in 3 birds on arrival at Necedah (compared to 7 birds with hock scrapes and one with severe feather damage in 2002, and 4 birds with feather damage in 2001). However, 02-03 was in shock and unable to stand due to trauma and blood loss from shipment in an unsuitably sized container. The bird recovered uneventfully after treatment.

- 16-03 developed a chronic abscess above the left foot despite long-term antibiotic treatment, likely associated with a wound sustained prior to Aug 17. The swelling had decreased when the bird arrived in FL, but the area remained sensitive to palpation. This bird also exhibited a mild periocular swelling of unknown origin during migration in IN. The condition responded to anti-inflammatory and antibiotic treatment, and did not recur.
- 03-03 experienced an injury during handling for the pre-migration evaluation and banding. She was eventually diagnosed with a fracture of the lateral tibial crest that was surgically repaired on Oct 7. A hardware foreign body (washer) was also removed that day with endoscopy. Recovery was accomplished under isolation in an ICF quarantine pen. The bird was reunited with the migration team in North Freedom, WI, and the bird flew with the cohort beginning in northern IL. The bird completed the migration with no apparent problems.
- At the health exam in FL, 12 of 16 birds had bill bruises (mostly maxilla) about 5 cm from the tip. This may indicate a design problem in the temporary pen.

Parasite Issues

- Fecal parasite evaluation showed gapeworm infections developed within 2 wks of arrival at Necedah. Regular weekly deworming began in July, and subsequent fecal exams were negative and all birds were free of clinical signs of tracheal obstruction until departure on migration.
- Despite regular treatment, one fecal exam was positive for *Capillaria* sp. at Necedah, suggesting either medication delivery failure, too low a dose, or potential parasite resistance. This finding is so far isolated, and delivery failure or too low a dose are likely explanations.
- Medication and a schedule for weekly deworming of the cohort was provided to the migration team but only partially implemented prior to arrival in FL. Arrival fecal exams are pending for 2003 cohort. These treatments are important in order to decrease the potential burden of parasites in the Chassahowitzka release pen after arrival.
- Trematode, or fluke, ova were observed in fecal exams from groups at all pen sites. Generally non-pathogenic, these infestations are not susceptible to the drugs used to control gapeworm and *Capillaria* in cranes. The Health Team will monitor this issue throughout 2004.
- No coccidia were observed on fecal examinations during 2003, but the necropsy of 14-03 suggests a low level of disseminated visceral coccidiosis (DVC) occurs in WCEP cranes despite the use of coccidiostat containing feed. This monitoring will continue with future necropsies.

Bacterial Disease Issues

- Monthly fecal coliform counts from water samples was conducted at Necedah. All counts were low at arrival and increased to 1,030 to 21,000 cfu/100 ml within one month. At pre-migration health check, the East site was 26,000, reflecting the presence of the high number of birds maintained nearby. Within 2 weeks, the East site count was up to 250,000. Evaluation of the North site shortly after "flushing" visible fecal material from the dry pen in preparation for moving birds back into the pen resulted in an unacceptable coliform count of 1,050,000. A follow-up sample 12 days after activation of sand-point wells and heavy rains contained 6,200.
- A non-pathogenic strain of *Salmonella typhimurium* (Group B) was detected in 7 of 17 cranes at 27 to 44 days of age (3 prior to shipment from PWRC, 4 others on arrival at Necedah). All 7 appear to have self-cleared, but another bird was positive at pre-migration health check. Final analysis will be possible after the FL arrival health check data is available.
- *Mycobacterium gordonae* was isolated in feces from 03-03 on July 17. This organism is a free-living mycobacteria species, common in surface waters, with low pathogenic potential. The bacterium was likely acquired at Necedah or in the last 2 wks at PWRC. M. Spalding reports she has isolated the bacterium from 2 healthy sandhill cranes in FL previously. A repeat sample from this bird at arrival in FL is pending.

Viral Disease Issues

- Eastern equine encephalitis vaccination was given to all birds at pre-migration health check, a booster was given at the arrival health check in FL.
- West Nile virus vaccinations were given at PWRC. One bird exhibited weak seropositivity prior to shipment from PWRC (03-03, a non-vaccinated bird). Two birds were strongly seropositive at pre-migration testing (07-03 a control, and 13-03 vaccinated). All three birds were likely exposed to WNV, indicating a flock exposure rate ~17%. Samples from all birds on arrival in FL will complete the vaccination/natural exposure study.
- Infectious bursal disease serology prior to shipment from PWRC revealed one seropositive bird (15-03); this bird was subsequently removed from the cohort due to scoliosis and chronic illness concerns. At pre-migration health check, 1 bird was seropositive (17-03) with another a weak positive (19-03). Further information from the FL arrival health check is pending. No WCEP bird has been observed with disease linked to IBDV exposure to date.

Florida Field Monitoring Prior to Spring Migration 2003

- Opportunistic evaluation of four birds (05-01, 03-02, 11-02 and 16-02) was performed on Mar 4 during band replacement. All birds appeared healthy and test results were within normal limits except for poor pectoral muscle mass in 03-02 and a healing beak injury in 16-02.

Health Team Recommendations and Objectives for 2004

Recommendations

- PWRC should continue to investigate ways to control or eliminate *Salmonella typhimurium* exposure in WCEP cranes.
- Continue with annual application of lime at Necedah dry pen sites. Maintain bleach footbaths for boot dipping at each site prior to travel to neighboring pen. Consider limited fecal pickup in the Necedah dry pen sites during the training period.
- Crates of different sizes must be available for shipping large birds to Necedah to prevent traumatic injury to emerging feathers.
- Weekly anthelmintic treatment should continue after leaving PWRC and start within one week of arrival at Necedah in 2004 for each cohort.
- Continue to move cohorts as often as possible between sites after fledging to prevent buildup of fecal coliform bacteria in ponds at Necedah pen sites. Monitor water coliform counts monthly. Flushing of fecal material directly into water bodies intended for bird use should not occur.
- Perform pre-migration health checks using handlers wearing gray costumes to minimize the negative behavioral effects of this event. Examinations can occur in early morning or late in the day depending on conditions.
- Encourage the migration team to re-double efforts to follow the migration deworming schedule in 2004, and address problems with drug delivery if needed.
- The migration & field teams should improve communication with the local veterinarians during migration and in Florida by providing regular updates on behavior & health status.
- The migration team should investigate potential problems with the bottom of the temporary pen that could cause bruising of the cranes' bills that was observed shortly after arrival this year.
- Remove corn from diet of overwintering cranes at the pen in Chassahowitzka except as a modest top dressing only.
- In cooperation with the Whooping Crane Recovery Team and WCHAT, WCEP personnel should draft a set of guidelines for the safe capture of whooping cranes to ensure the highest probability of success and lowest associated morbidity.

Objectives

- Present an overview of WCEP Health Management at the Jan 2004 North American Veterinary Conference and publish the results of our program in the Proceedings of the North American Crane Workshop from Jan 2003.
- Secure recommendations for future EEE and WNV vaccination from WCHAT and present at the Feb 2004 meeting.
- Work with WCHAT to update the whooping crane necropsy protocol, coordinate information across institutions and improve accessibility of findings relevant to WCEP. The structure of the database maintained at ICF needs to be reviewed.
- Develop additional resources for the hospitalization and potential rehabilitation of injured WCEP cranes in WI and FL. In cooperation with the Whooping Crane Recovery Team and WCHAT, draft a set of guidelines for intervention and rehabilitation of ill or injured free-ranging whooping cranes. Also, initiate discussion on the appropriateness of releasing individuals that require weeks to months of rehabilitation where isolation protocols cannot be followed.
- Encourage the Whooping Crane Recovery Team to streamline the institutional review process in order to increase the number of facilities capable of taking non-releasable whooping cranes for display purposes.
- Work with Necedah staff to design an effective acute care facility for ill or injured WCEP cranes under isolation conditions. Guidelines for the staffing associated with nursing these cases must be decided as soon as possible.
- Acknowledge the contribution of the network veterinarians' willingness to help in an email following spring 2004 migration, and recheck the listings prior to fall migration 2004.
- Strive for no handling induced injuries during restraint for examinations, banding or relocation. A review of handling techniques should be conducted prior to the 2004 season with WCEP personnel.
- Initiate a discussion of the impact of the supplemental release plan on provision of health care to ICF FL non-migratory chicks and the WCEP ultralight cohort, and assess the challenges that three projects presents (available personnel, workload & priorities, bird movements and risks of cross-contamination).

Submitted by: Barry Hartup, DVM, PhD, Health Team Leader, December 2003

Year 2003 Monitoring Summary

Richard P. Urbanek
International Crane Foundation and U.S. Fish and Wildlife Service

15 January 2004

This account documents the biology of reintroduced whooping cranes in the eastern migratory flock during 1 January 2003 to 15 January 2004. Movements and geographic distribution are emphasized. Identification information for all whooping cranes currently in the eastern migratory population appears in Appendix A.

I appreciate the cooperation and information sharing of Wisconsin Department of Natural Resources (WDNR), Operation Migration, Natural Resources Foundation of Wisconsin, and other WCEP partners. I particularly wish to thank the following individuals: Lara Fondow, International Crane Foundation (ICF) was primarily responsible for most bird tracking during the year. Colleen Satyshur, ICF, provided equal tracking effort during winter, spring, and fall. Anne Lacy, ICF; Rich King, Necedah NWR; and Mark Nipper, ICF, provided additional assistance during migrations, spring/summer, and winter, respectively. We greatly appreciate the contributions of Terry Kohler, Windway Capital Corporation, for supplying tracking aircraft and providing pilots Mike Voechting, Mike Frakes, and Charles Koehler. Jim Bergens, Jasper-Pulaski SFWA, and Wally Akins, Hiwassee Wildlife Refuge, monitored cranes at key migration stopover areas. Many others also provided assistance, most notably Beth Goodman and Wayne Hall, WDNR; Patti Meyers, Horicon NWR; Jack Knowles, Blue River, Wisconsin; Todd Bittner, Illinois Department of Natural Resources; Deb Dee, Savanna District, Upper Mississippi NWFR; Tim Loose, McGregor District, Upper Mississippi NWFR; Will Morlock, South Dakota Game, Fish and Parks; Larry Martin, Waubay NWR; and Steve Nesbitt, Florida Fish and Wildlife Conservation Commission. Sara Zimorski, ICF, collected data and cared for juveniles at the winter pensite. Larry Wargowsky and staff at Necedah NWR; Jim Kraus and staff at Chassahowitzka NWR; Seth Blitch, Keith Laakkonen, and staff at St. Martins Marsh Aquatic Preserve; and Nick Robbins and staff at Crystal River Preserve State Park provided essential field housing and other logistical support. Without the contributions of these and many others, this monitoring effort, the most intensive ever done for a population of migratory cranes, would not have been possible.

WINTER 2002/03

HY2001 COHORT

Nos. 1 and 2 wintered together on a cattle ranch south of Gowers Corner, Pasco County. The ranchland was typical of the area, and consisted of closely grazed pasture with numerous ponds and associated marshes. The two birds were not consistently associated with any sandhill cranes, although several nonmigratory pairs occurred on the same property.

Nos. 6 and 7 wintered separately in the Hixtown Swamp region, Madison County, and both associated with large numbers of wintering, migratory sandhills. No. 6 wintered at Hundred Acre Pond and was not observable because of lack of landowner permission to enter the property. No. 7 was at Plant Pond, an 80-acre wetland on a cattle ranch. Unlike most of the sandhill cranes, which spent much time in nearby agricultural uplands, no. 7 rarely left the wetland.

No. 5 wintered at the pensite on Chassahowitzka NWR, Citrus County, as dominant member of the flock containing the 16 HY2002 juveniles (see below).

HY2002 COHORT

The release pen on Chassahowitzka NWR had been expanded from 1.5 acres in winter 2001/02 to 4.0 acres in winter 2002/03. The expanded portions included (1) a deeper pool, (2) an artificially constructed oyster bar (on top of an existing natural oyster bar), and (3) an area of salt grass, originally just outside the southeast boundary of the old pen, that had been a favorite loafing area for the HY2001 birds during their first winter and on which they frequently attempted to roost.

Predator Control

In winter 2001/02 two of seven juvenile whooping cranes were killed by bobcats within 1.5 months after release on the wintering site. After these mortalities, rigorous overnight protection measures (i.e., making sure the juveniles roosted either within the predator-proofed pen or in water more than 20 feet from shore) were implemented. This protocol was continued in winter 2002/03, and no further mortalities occurred. A continuous trapping effort was also implemented. Although occasional bobcat sign reappeared near the pen, no bobcats other than the two offending animals in the first winter were captured.

Roosting

During the 2001/02 winter the HY2001 cohort occupied the original 1.5-acre release pen. Based on behavior at roost time, cranes would roost in water as deep as 9 inches, but optimal depth was 6 inches or less. They would not roost on exposed mudflat. Data on water depth in the pool in the pen are available for each night (n = 81) at roosting time during the period 18 January - 8 April 2002. During this period, water depth at dusk was optimal for roosting on 17 nights (21%), marginally suitable, i.e., adequate but somewhat high on 8 nights (10%), too low on 4 nights (5%), too high (but within banks) on 43 nights (53%), and the entire surrounding landscape was flooded, i.e., tidal creeks and pools exceeded their banks, on 9 nights (11%). The adjoining part of the pool southwest of the original fenced part was deeper; therefore, this larger part of the pool, unfenced in winter 2001/02, was rarely usable by the cranes at roosting time. On the majority of nights, there also appeared to be few or no safe places for cranes to initiate roosting in the surrounding tidal landscape because water was too deep, i.e., the bays, creeks, and pools to the west were even deeper than the pool at the release pen.

In winter 2002/03 the expanded pen with its artificial, constructed oyster bar provided water of suitable roosting depth somewhere in the pen at most tidal levels. Gauge readings indicating suitable water depth for roosting at specific roosting sites within the pen were as follows:

Roost area in old part of pen: 18-23 good (1-6 inches depth), to 26 marginal.

Center of oyster bar: 26-31 good, to 34 marginal.

Deep end of oyster bar: 20-25 good, to 28 marginal.

Pool in southwest corner of pen: 18 and below.

Tidal floodplain: above 42.

Shallow end of oyster bar: 29-34 good, to 37 marginal (however, most of this area was within 20 feet of shore).

At gauge readings between 37 and 42, the pen contained little or no area with water depth suitable for roosting.

In winter 2001/02, birds had frequently flown out of the pen at roosting time, landed on the adjacent salt grass area that was unsuitable for roosting, and then had to be led back into the pen by a costumed caretaker as darkness fell. During the period 18 January - 8 April 2002, birds were led back into the pen on 37% of nights. Except on 3 of these nights, all five birds needed to be led into the pen. This problem was, however, minimal in winter 2002/03. During 30 November - 31 March, cranes only needed to be led (on one evening harassed/flushed) into the pen on 8 nights and then only a few individuals (a single bird

on 5 nights; three, four, and seven birds on 1 night each). The flock of 17 cranes usually roosted of its own volition in the pen because:

(a) the pen was significantly larger and near the preferred, perhaps critical, size (5 acres) of acclimation pens used in other successful release studies (i.e., Mississippi Sandhill and Seney NWR's).

(b) the constructed oyster bar provided a preferred substrate for roosting, i.e., a firm, smooth bottom. The natural bottom substrate of the tidal pools was predominantly deep, soft muck with occasional patches of natural oyster bar consisting of sharp, jagged rock.

(c) most of the previous year's preferred site, i.e., the salt grass loafing area on the southeast side of the old pen, was contained within the new pen. Unlike in that winter, however, it was no longer a preferred use site. Preferential use in winter 2002/03 was focused on the new oyster bar and adjacent shoreline in the new part of the pen.

A plastic whooping crane decoy was posted on both the old roost site in the old part of the pen and at the end of the constructed oyster bar, although attraction to the decoy was weak. Suitable roosting conditions were present at nightfall with equal frequency (on 41% of nights) on both the old roost site and on the constructed oyster bar or immediately adjacent shore. However, birds roosted on the oyster bar or adjacent shore 90.6% of the time (based on birdnights at onset of darkness) but on the roost area in the old part of the pen on only 1.9% of nights. Birds showed strong preference for roosting on the constructed oyster bar even when it was not covered or was only partially covered with water and the old roosting area actually provided water of better roosting depth.

Birds sometimes roosted safely outside of the pen. This roosting occurred on 17% of nights during 18 January - 8 April 2002; these nights were usually characterized by extremely low tides (when birds usually roosted in "Bobcat Lake", a tidal pool 0.15 miles east of the pen) or extremely high tides (birds were allowed to roost on the flooded salt grass loafing area adjacent to the pen). During 30 November 2002 - 31 March 2003, cranes went to roost outside the pen on 8 nights (3, 7, 5, 15, and 16 birds; all 17 birds on 3 nights). Two of these nights occurred while water levels were high in late March, and birds roosted on the flooded plain adjacent to the west pen boundary. Otherwise, roosting outside the pen occurred during low tides in a 40-50-m wide portion of tidal "E-Creek" 0.25 miles south of the pen.

During 18 January - 8 April 2002, cranes went to roost in water a safe distance from shore on 34% of nights. Otherwise, they roosted on land. In winter 2002/03 the cranes strongly preferred to roost on or near the constructed oyster bar, even when it was only partially or not covered with water. With a large flock of cranes on or near this small area (the surface of the bar was approximately 55 feet long by 30 feet wide at the center) and a poor angle of view from the observation blind, it was often difficult for an observer to determine how far individual birds were from the shore or even if they were in water at all as darkness fell.

Tidal Limits to Roosting

While several habitat conditions on the Central Gulf Coast (e.g., excessively soft or rocky substrates, high salinity, or dominance by rank growth of black needlerush) contributed negatively to suitability of the wintering area, tidal fluctuations had the most serious effect because of limitations which they imposed on water roosting opportunity.

Overnight: --Changing water levels during the night made roosting difficult and encouraged the birds to roost on areas that were not covered by water during part or all of the night. Lunar tides cycle every 12 hours. According to lunar tide charts, these water levels rose or dropped through a range of 4 to 22 inches overnight (mean = 11.8 inches) with least variation in December and greatest in March (Table 1). These values do not account for wind effects, which lent unpredictability to actual overnight water levels.

Table 1. Overnight lunar tidal fluctuations (inches), Central Gulf Coast release area, Florida, winter 2002/03.

Month	Mean	Min	Max
December	9.5	6	12
January	10.2	5	16
February	12.1	6	18
March	14.6	6	22
April (1-15)	13.8	4	20
All months	11.8	4	22

Conditions at Dusk :--In addition to these overnight changes, water levels were unstable from the beginning of one night to the next. According to lunar tide charts, tide levels cycle twice per month. Lunar tides at dusk exhibited an increase of roughly an inch from day to day for the first half of each cycle followed by a decrease of roughly an inch from day to day for the second half of each cycle (Fig. 1). While these changing water levels alone would make roosting at a single site difficult, actual changes in the water levels were influenced by wind and hence were irregular and much greater, making consistent roosting in water at any single site impossible. Dusk-to-dusk differences of 1 or more feet were common (Fig. 1).

Geographical Extent: --These same tides determine water levels across the wetlands of the Central Gulf Coast. In addition, water levels measured at dusk west of the Chassahowitzka pensite were greater and even less stable than those at the pensite. Within 4 miles west of the pen, depth was less than or equal to that at the pensite at 3% of locations, 1-5 inches greater at 22%, and 6-40 inches greater at 75% of 20 sites sampled in winter 2002/03.

Salinity

Salinities (ppt) near the pen site varied as follows:

Winter 2001/02: January (19-21), February (17-24), March (19-23), April (23-25)

Winter 2002/03: December (9-15), January (11-20), February (13-20), March (9-15)

Salinity usually decreased briefly after heavy rains. Salinity was higher in winter 2001/02 than in 2002/03 and tended to increase slightly through winter 2001/02. Whooping cranes will drink water up to 21 ppt salinity. Birds were largely dependent on fresh water provided in a guzzler during the first winter and preferred this source in the second winter.

Foraging and Movements

In winter 2001/02 cranes ranged 0-1.5 miles from the pen. The small size of the pen and large amount of habitat created by prescribed burning in the vicinity of the pen contributed to their movement. However, by mid-February needlerush had regrown on the burn, rendering most of this habitat unusable. In late winter until migration, cranes focused their away-from-pen movements on two barrens (i.e., open dry land with sparse vegetative ground cover), one 1 mile east near Rose Creek and the other 0.5 miles south at Pumpkin Creek Impoundment. In winter 2002/03 birds ranged less, 0-0.5 miles, the farthest movements being south to E-Creek and Pumpkin Creek Impoundment. A small burned area, which the birds also used, occurred just northeast of the pen. Birds foraged on natural foods, but neither food use nor availability was quantified. Most food needs were met by pelleted feed supplied in feeders within the pen.

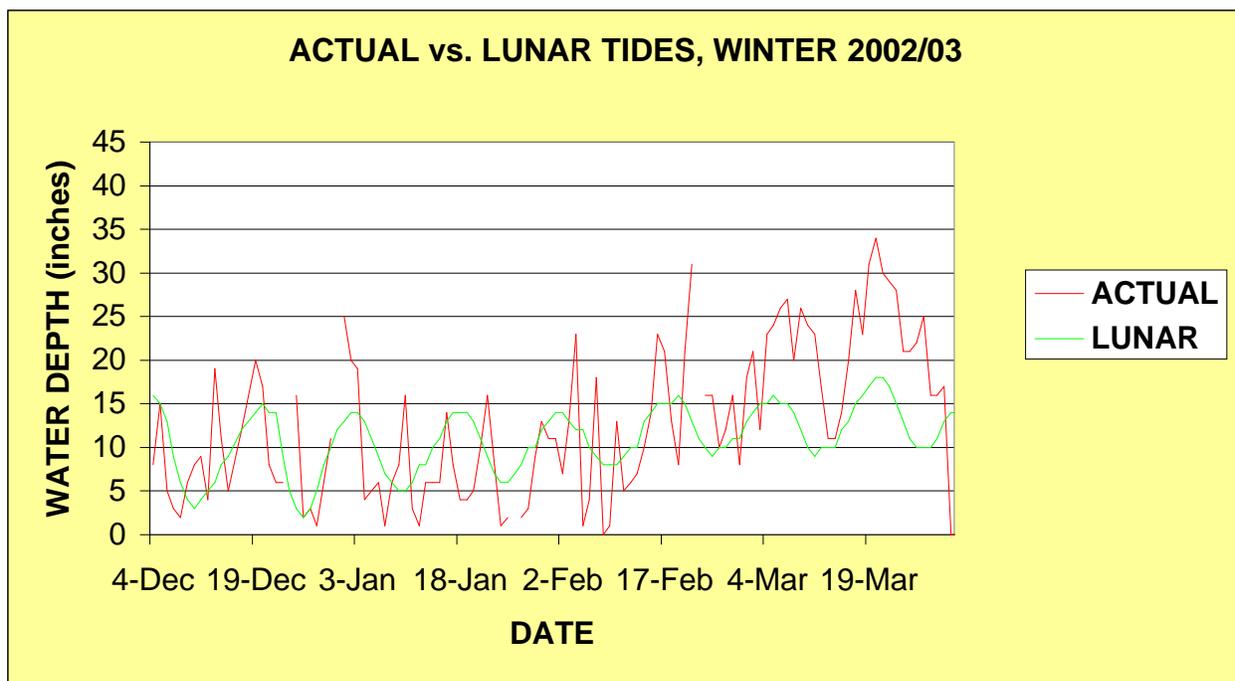
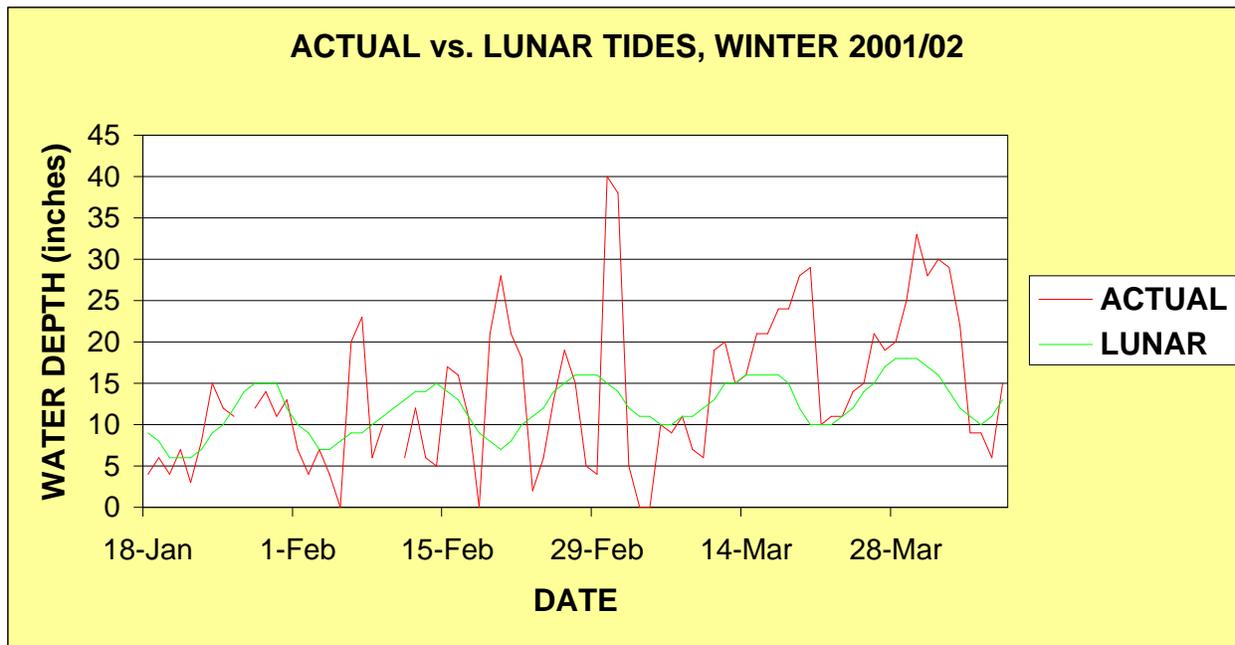


Fig. 1. Comparison of actual and lunar tidal levels at dusk on roost area in old part of pen, Chassahowitzka NWR, winters 2001/02 and 2002/03. Several greater depths occurred during storms when the pen could not be safely reached for measurements (breaks in red line).

Summary of Habitat and Pensite Suitability at Chassahowitzka

The release pen on Chassahowitzka NWR is located in an area representative of the surrounding salt marsh. The typical salt/brackish marsh habitats characteristic of the Central Gulf Coast are located within 0-1.5 miles of the pen. Habitat of the Central Gulf Coast does not provide optimal roosting needs of whooping cranes and does not encourage safe water roosting. However, the pensite on Chassahowitzka NWR is highly suitable as a winter release site. The site is well-protected with no physical public access and has excellent constructed facilities. The pen area is frequently cleaned by tidal flushing with salt water. Returning cranes have successfully overwintered in subsequent winters. Their winter distribution is largely inland and is skewed westward in comparison to that of wintering greater sandhill cranes. Because of aggression and competition for food and space at the pen by older whooping cranes, the absence of most wintering older whooping cranes from the pensite has made care and protection of the juveniles there less difficult and more effective than it might otherwise be.

SPRING MIGRATION

HY2001 COHORT

Nos. 1 and 2 left their wintering site in Pasco County on 25 March and landed to roost in Berrien County, Georgia. Stops on the next two nights were in Henry County, Georgia, and at an undetermined site in Central Kentucky. The pair continued northward at least as far north as Central Indiana on 28 March, when tracking was discontinued. They were reported from Lake County, northwestern Indiana, on 30 March. They left that site on 31 March and completed migration to the Necedah area, where they were observed on Necedah NWR the next day.

No. 6 departed with sandhill cranes from Hixtown Swamp on 15 February. He was found with sandhills along Nolan Creek, Dodge County, Wisconsin, on 25 March and later arrived at Necedah NWR, where he was observed on 11 April.

No. 7 left Hixtown Swamp between 18 February and 1 March, presumably with sandhill cranes. She was observed in a cornfield with 100 sandhills near Seymour, Jackson County, Indiana, on 17 March. She was found at Poygan Marsh, Waushara County, Wisconsin, on 14-15 April and on Horicon NWR on 19 April. She remained to summer at Horicon NWR as she had done the previous summer.

A whooping crane (either no. 6 or no. 7 above) arrived at Grand Kankakee Marsh, Lake County, Indiana, on the afternoon of 20 March and was in a flock of 25-30 sandhills. Another report indicated that the bird was still present on 22 March.

No. 5 migrated with the HY2002 cranes (see below).

HY2002 COHORT

HY2001 no. 5 (5-01) and the 16 juveniles departed from Chassahowitzka NWR on 1 April. Their migration is summarized in Fig. 2 and Table 2. Females nos. 9 and 14 dropped out separately on the first day of migration. The remaining flock of 15 birds migrated to southern Indiana in three days before confronting bad weather that stopped further migration for a week. They arrived in Wisconsin on 13 April in three different groups. Two groups returned to the Necedah NWR area on that date. A third group consisting of nos. 1, 11, and 12 returned to the Necedah NWR area on 28 April after spending the interim in eastern/northeastern Wisconsin. Of the two females that dropped out on the first day of migration, no. 14 migrated to and remained through early summer in wetlands along the Illinois River in Putnam and Bureau Counties, northern Illinois. No. 9 got off track in the mountains of northern Georgia and migrated well east of the migration route used by the other birds. On 4 May she was retrieved in southeastern Ohio and released at Volk Field, Juneau County, Wisconsin, with the trio composed of no. 5-01 and the HY2002 females nos. 4 and 18, the largest group near Necedah NWR at that time.



Fig. 2. Migration stops of whooping cranes that began spring migration from Chassahowitzka NWR, Citrus County, Florida, on 1 April 2003. Key to map appears in Table 2.

Table 2. Migration stops and other notes for whooping cranes that began spring migration from Chassahowitzka NWR, Citrus County, Florida, on 1 April 2003. Numerals in parentheses refer to points on map, Fig. 2. Birds remained at or near indicated stop on intervening, non-reported dates unless indicated otherwise.

Group 1: HY2001 no. 5, HY2002 nos. 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 15, 16, 17, 18

1 April: (1) Near Armena, Lee County, Georgia, 235 miles in 8.9 hours.
2 April: (2) Sale Creek, Hamilton County, Tennessee, 254 miles in 9.2 hours.
3 April: (3) Vernon Fork, Muscatatuck River bottoms, Jackson County, Indiana, 241 miles in 7.7 hours.
11 April: Group separated at stop (3) in Jackson County, Indiana.

Group 1A: HY2001 no. 5, HY2002 nos. 2, 4, 13, 18

11 April: (4) Lake Waveland, Montgomery/Parke Counties, Indiana, 97 miles in 7.3 hours.
12 April: (5) Troy Grove, LaSalle County, Illinois, 153 miles in 10.3 hours.
13 April: Rice Pool, Necedah NWR, Juneau County, Wisconsin, 189 miles in 7.0 hours. MIGRATION COMPLETED.

Group 1B: HY2002 nos. 1, 3, 5, 7, 8, 11, 12, 15, 16, 17 (dotted line on map)

12 April: (6) Near Tuscola, Douglas County, Illinois, 143 miles in 8.7 hours.
13 April: Group separated in flight over Ogle County, Illinois.

Group 1B-a: HY2002 nos. 3, 5, 7, 8, 15, 16, 17

13 April: Amundsen cranberry, Wood County, Wisconsin, 316 miles to Necedah NWR in 10.3 hours plus additional 14 straight-line miles by nonlinear route in 1.4 hours. Landed on Necedah NWR next morning. MIGRATION COMPLETED.

Group 1B-b: HY2002 nos. 1, 11, 12 (dashed line on map)

13 April: (7) Near Brandon, Fond du Lac County, Wisconsin, 279 miles in 10.4 hours.
15 April: (8) Near Suring, Oconto County, Wisconsin, 91 miles in 4.1 hours.
28 April: General Necedah NWR area (documented from local telemetry readings, not continuous tracking). MIGRATION COMPLETED.

Group 2: HY2002 no. 9 (red line on map)

1 April: Fish Creek, St. Martins Marsh, Citrus County, Florida (only 7 miles from winter pen).
2 April: (9) Near Moultrie, Colquitt County, Georgia.
3 April: (10) Between McDonough (Henry County) and Covington (Newton County), Georgia (exact location undetermined).
4 April: Landed in morning in (11) Stone Mountain, DeKalb County, Georgia. Later resumed flight to (12) Blue Ridge Lake, Fannin County, Georgia.
5 April: (13) Nottely Lake, Union County, Georgia.
6 April: Headed northeast to unknown location.
7-10 April: Location(s) unknown.
11 April: Found (14) near Burnett Reservoir, Buncombe County, North Carolina (exact location undetermined).
12 April: (15) Near North Wilkesboro, Wilkes County, North Carolina.
17 April: Migration resumed but bird not tracked.
18-28 April: Location(s) unknown.
29 April: Found in (16) Montgomery County, Virginia, near Radford.
1 May: (17) Near Buckhannon, Upshur County, West Virginia.
3 May: (18) Near Bristol, Morgan County, Ohio.
4 May: Retrieved at stop (18) and released near Necedah NWR at Volk Field, Juneau County, Wisconsin. MIGRATION COMPLETED WITH INTERVENTION.

Group 3: HY2002 no. 14 (green line on map)

1 April: (19) Horseshoe Cove, Dixie County, Florida.

2 April: (20) Near Bethany/Elmodel, Baker County, Georgia.
3 April: (21) Near New Mexico, Carroll County, Georgia.
4 April: (22) Near Rosalie, Jackson County, Alabama (exact location undetermined).
5 April: (23) Near Shelbyville, Bedford County, Tennessee.
6 April: Migration resumed but bird not tracked. Roost location not determined.
7 April: (24) Near Dawson Springs, Hopkins County, Kentucky.
8 April: (25) Cave-in-Rock, Hardin County, Illinois.
10 April: (26) Near Elkhaville, Jackson County, Illinois.
11 April: (27) Lake Springfield, Sangamon County, Illinois.
12 April: (28) Clear Lake, Illinois River, Mason County, Illinois.
13 April: Migration resumed but bird lost during tracking. Roost location not determined.
14 April-12 May: Location(s) unknown.
13 May: Found (29) near Lyons Lake, Illinois River, Putnam County, Illinois, only 72 miles from last recorded location.
MIGRATION AT EXTENDED STOP IN NORTHERN PART OF MIGRATION ROUTE.

SPRING WANDERING

Numerals in parentheses below refer to points on maps, Figs. 3 and 3 (inset).

HY2001 COHORT (Males: nos. 1, 5, and 6. Females: nos. 2 and 7)

Unlike in their yearling spring, movements of nos. 1, 5, and 7 were less extensive in their spring as 2-year-olds. Movements of nos. 2 and 6 were poorly documented because of malfunctional transmitters.

Nos. 1 and 2:

31 Mar: Returned to (1) Rynearson Pools, Necedah NWR. Separated shortly after returning.

No. 1:

26 Apr: Left Necedah NWR and moved (2) near and northeast of Mauston. Usually with sandhills.

3 May: Overflight of Necedah NWR before returning to Mauston.

8 May: Morning flight to Necedah NWR before returning to Mauston.

15 May: Morning flight to Necedah NWR before returning to Mauston.

19 May: Roosted in (3) cranberry property west of Necedah NWR. Flights from Mauston on this and preceding day.

20 May: Returned to Necedah NWR and roosted on West Rynearson Pool.

18 June: Moved to primary summering area on East Rynearson Pool, Necedah NWR. Roosted with main sandhill flock, which had switched roost location to this Pool.

No. 2:

25 Apr: On Necedah NWR, then not observed again until 17 June. Could not be tracked because of nonfunctional transmitter.

17 June: Reappeared with yearling male 5-02 on East Rynearson Pool, Necedah NWR. Later joined by six arriving yearlings from Oakdale (see below).

18 June: Transmitter replaced. In subsequent days usually apart from other whooping cranes and roosted in main sandhill crane flock.

No. 5: Dominant member of group including two yearlings (see below).

No. 6:

11 Apr: First observed on Necedah NWR after completing migration. Last previous observation was at (47) Nolan Creek, Dodge County, 25-29 March. With sandhill cranes (4) near LaValle, Sauk Co., until 21 Apr, then moved to undetermined location and periodically appeared on Necedah NWR. He could not be consistently tracked because of a broken transmitter antenna.

27 or 28 Apr: Returned to Necedah NWR. Roosted with sandhills on West Rynearson Pool.

29 Apr: Left Necedah to undetermined location.

8 May: Returned to Necedah NWR. Usually with sandhills on West Rynearson Pool.

10 May: Departed Necedah NWR. Not observed again until 15 September in southeastern Clark County.

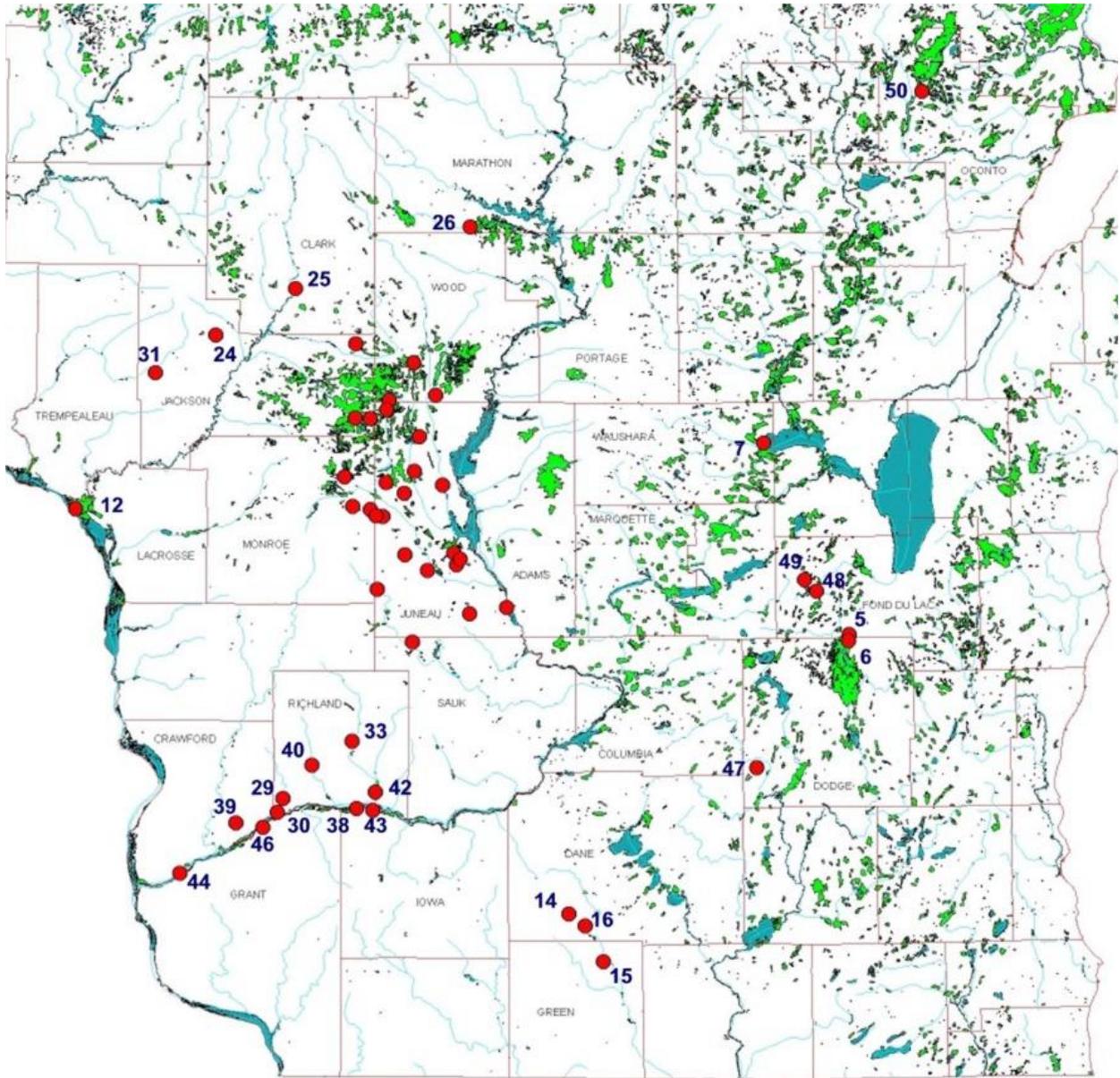


Fig. 3. Spring wandering locations, i.e., movements that occurred after spring migration, of whooping cranes in Wisconsin, April-June 2003. Key to codes appears in text. Codes for locations in and near Necedah NWR appear in following inset.

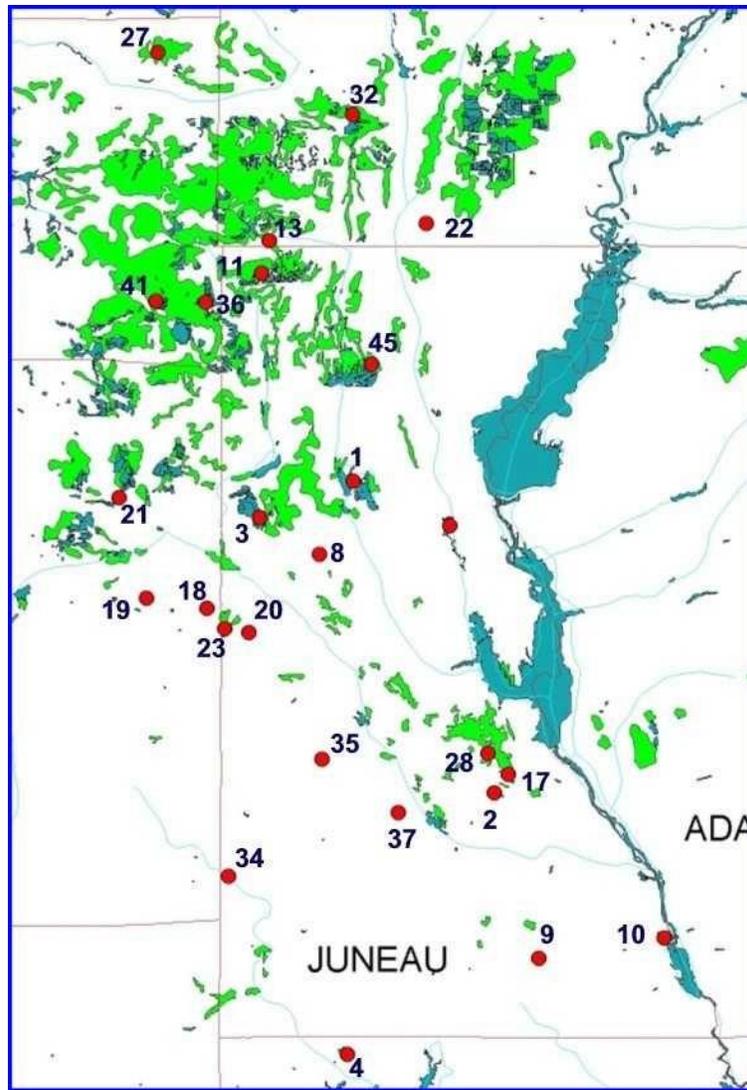


Fig. 3 (inset). Spring wandering locations, i.e., movements that occurred after spring migration, of whooping cranes near Necedah NWR, Central Wisconsin, April-June 2003. Key to codes appears in text. Rynearson Pools = Location 1.

No. 7:

19 Apr: Observed at Horicon NWR, (5) Radke and (6) Teal Pools. Last previous observation was at (7) Poygan Marsh, Waushara County, on 15 April. Occasionally with or near small numbers of sandhills. Remained to summer on northern Horicon NWR and vicinity as she had done the previous summer.

HY2002 COHORT (Males: nos. 5, 8, 11, 12, 13, and 16. Females: nos. 1, 2, 3, 4, 7, 9, 14, 15, 17, and 18)

Like yearlings of the previous year, most of these whooping cranes moved about central and southern Wisconsin after completing spring migration and before settling on their summer home ranges. There were two main regions used during this period: the core reintroduction area in Central Wisconsin, and the Lower Wisconsin River in southwestern Wisconsin.

Nos. 1, 11, and 12:

28 Apr: Returned to Necedah NWR. No. 1-02 separated from nos. 11-02 and 12-02 this or next day.

No. 1:

29 Apr: Roosted in (8) Juneau County Forest, Juneau County.
1 May: Joined sandhills at (9) Sevenmile Creek tributary, west of Lyndon Station, Juneau County.
21 May: Flew to (Fig. 4, Loc. A) Carlos Avery SWMA, Anoka County, Minnesota, and roosted with sandhills.
23 May: Left Carlos Avery SWMA and returned to undetermined location in core reintroduction area of Central Wisconsin.
24 May: Returned to previous location at Sevenmile Creek, Juneau County.
27 May: Moved to (10) Clark Island, intersection of Lyndon Creek and Wisconsin River, Juneau County. With sandhills.
14 June: Left Wisconsin River, Juneau County.
18 June: Found (Fig. 4, Loc. B) near Hayfield, Dodge County, Minnesota, with five sandhills.
22 June: Roosted in (11) Meadow Valley Flowage, Juneau County.
23 June: Roosted on (12) Upper Mississippi River NWFR, LaCrosse County.
24 June: Roosted (Fig. 4, Loc. C) near Viola, Olmsted County, Minnesota.
25 June: Roosted at (Fig. 4, Loc. D) Silver Creek Reservoir, Olmsted County, Minnesota.
27 June: Flew to primary summering area (Fig. 4, Loc. 6) near Rice Lake, Steele County, Minnesota. Usually in area with a resident sandhill pair.

Nos. 11, and 12: .

29 Apr: Roosted on (13) cranberry farm, Wood County, or adjacent Meadow Valley Flowage, Juneau County.
30 Apr: Apparently roosted near and southwest of Necedah NWR.
1 May: Arrived (14) Mt. Vernon Creek bottoms, Dane County. During the next few days they made several local movements downstream along the West Branch of the Sugar River, Dane County, and the (15) Sugar River, Green County. They eventually settled in the (16) West Branch Sugar River bottoms, Dane County.
1 June: Left southern Dane County; roosted (17) southwest of Castle Rock Lake, Juneau County.
3 June: Moved to (18) cranberry farm northwest of Mill Bluff State Park, Monroe County.
4 June: Joined nos. 2, 13, 16, and 17 at farm (19) near Oakdale, Monroe County.
16 June: Separated from other four birds and flew to Necedah NWR but returned to shortly to site near Oakdale.
17 June: These two and the other four birds left Oakdale site and moved to East Rynearson Pool, Necedah NWR. Nos. 11 and 12 separated from the other birds during the next few days and established summer range including the southern half of East Rynearson Pool.

Nos. 5-01 and HY2002 nos. 4 and 18:

20 Apr: Left Necedah NWR and moved to (20) Volk Field and adjacent WRP wetland, Juneau County.
22 Apr: Moved to (21) Valley Junction, Monroe County.
23 Apr: Returned to Volk Field area.
2 May: Returned to Necedah NWR to roost on West Rynearson Pool.
3 May: Returned to Volk Field area.
4 May: No. 9 released into group (see below).
10 May: Extensive flight as far north as Biron Flowage, Wisconsin River, Wood/Portage Counties, with landings in Cranmoor region (specific location undetermined) and near (22) Babcock, Wood County, before returning to Mill Bluff.
4 June: Flew without no. 9 to West Rynearson Pool, Necedah NWR, in morning, then returned to Volk Field area.
16 June: The group shifted much activity to (23) interior wetland of Mill Bluff State Park. Although yearling females nos. 4, 18, and 9 continued to forage in nearby agricultural fields, no. 5-01 no longer accompanied them and instead remained in the wetland.

No. 9:

4 May: Captured in Morgan County, Ohio, and released at Volk Field, Juneau County, Wisconsin, with nos. 5-01, and HY2002 nos. 4 and 18. Rebuffed by no. 5-01 during following week and often thereafter.
10 May: Extensive flight as far northwest as Osseo, Trempealeau County, with a brief landing (24) near Alma Center, Jackson County, before landing to roost (25) near Neillsville, Clark County. Foraging with sandhills a few miles away next day.
12 May: Returned to Volk Field.
13 May: Up in undirected flight with nos. 5-01 and two females, then flew alone to between Wisconsin Rapids and Cranmoor before returning.
25 May: Left group at Volk Field and moved to Mead SWA, Marathon County. Roosted on North Rice Lake. Moved 2 miles to (26) Rangeline Flowage next day and roosted with sandhills.

28 May: Left Mead SWA, landed briefly in (27) Ammundson Marsh, Jackson County, and roosted in (28) Juneau County Ditch Marsh, Juneau County.

29 May: Returned to Volk Field and rejoined group (5-01 and HY2002 nos. 4 and 18).

Nos. 2, 3, 5, 7, 8, 13, 15, 16, and 17:

24 Apr: Left Necedah NWR and arrived (4) near LaValle, Sauk County.

25 Apr: Arrived at (29) Knapp Creek, north of Wisconsin River, Richland County.

9 May: Flock separated.

Nos. 5 and 8:

9 May: Remained at Knapp Creek

18 May: No. 8 flew to Necedah NWR; roosted with sandhills on West Ryneerson, and next day roosted on farmland just south of the refuge. No. 5 remained in flooded, closed canopy hardwood forest near lower Knapp Creek during the following week.

20 May: No. 8 returned to lower Knapp Creek and (30) Lower Lake near Wisconsin River. No. 5 rejoined no. 8 at Lower Lake about 3-4 June.

13 June: No. 8 remained at Lower Lake while no. 5 departed.

15 June: No. 5 returned to West Ryneerson Pool, Necedah NWR. Moved to East Ryneerson Pool next day.

29 June: No. 5 left East Ryneerson Pool and moved to (8) Juneau County Forest. No. 8 left Lower Lake and returned to East Ryneerson Pool.

30 June: No. 5 returned to Lower Lake, Knapp Creek Unit of Lower Wisconsin River SWA, Richland County.

31 June: No. 5 returned to East Ryneerson Pool.

Nos. 2, 3, 7, 13, 15, 16, and 17:

9 May: Arrived (31) near Taylor, Jackson County.

13 May: Arrived near or at Sandhill Wildlife Area, Wood County; roosted there following night on (32) North Gallagher Marsh.

15 May: Arrived near LaValle, Sauk County, spent most of day there, then roosted (33) near Richland Center, Richland County.

16 May: Extensive flight as far southwest as Galena, Jo Daviess County, Illinois, before returning northward and landing twice (34) near Elroy, Juneau County, before roosting (35) near New Lisbon, Juneau County.

17 May: Flew back to Taylor, Jackson County, on ground briefly before flying eastward to roost in reservoir, (36) Meadow Valley Division of Northland Cranberry, Jackson County.

18 May: Left cranberry reservoir, Jackson County; not tracked.

20 May: Roosted (37) near Mauston, Juneau County, at undetermined location (approx. location based on PTT readings).

21 May: Extensive flight northeast through Adams County, south through Marquette County, and west back to Mauston before flock separated in flight.

Nos. 2, 13, and 17:

21 May: After more extensive flight, roosted (38) along Wisconsin River near Avoca, Iowa County.

1 June: Joined by no. 16.

Nos. 3, 7, 15, and 16:

21 May: After more extensive flight, roosted (39) near Steuben, Crawford County.

22 May: Extensive flight as far west as Decorah, Winneshiek County, Iowa, before returning to Wisconsin and later roosting (40) along Mill Creek, near Boaz, Richland County.

24 May: Left Mill Creek. Roosted in (41) Goodyear Marsh, Bear Bluff area, Jackson County.

25 May: Left Bear Bluff area, Jackson County. Group separated in flight.

No. 16:

25 May: Returned to Necedah NWR and roosted with sandhills on West Ryneerson Pool.

26 May: Moved to (42) area including Pine River, near Gotham, Richland County, and (43) near Avoca Lake, Iowa County.

1 June: Joined group (nos. 2, 13, and 17) along (38) Wisconsin River, near Avoca, Iowa County.

Nos. 2, 13, 16, and 17:

1 June: Moved to (44) mouth of Gran Grae Creek, Crawford County.

4 June: Moved to farmland (19) near Oakdale, Monroe County. Joined nos. 11 and 12 at this site. All six birds typically roosted together in a cranberry reservoir, but they frequently separated into their former groups of four and two when foraging.

17 June: These four birds left the Oakdale site with nos. 11 and 12 and moved to East Rynearson Pool, Necedah NWR.

29 June: Left East Rynearson Pool and returned to previous site near Oakdale.

30 June: Left Oakdale. Group separated into two pairs. Nos. 2 and 13 returned to East Rynearson Pool. Nos. 16 and 17 landed at (45) northeastern Sprague Pool, Necedah NWR, and remained there most of the summer.

Nos. 3, 7, and 15:

25 May: Roosted (46) near Boscobel, Grant County.

26 May: Left Boscobel, Grant County. Not tracked.

4 June: Observed by landowner on (Fig. 4, Loc. 10) Coteau Prairie, Deuel County, South Dakota (reported by an observer on 16 June).

No. 14:

13 May: Found near Lyons Lake, Illinois River, Putnam County, Illinois.

5 June: Had moved locally by this date to (Fig. 4, Loc. 7) Spring Lake, DePue SWA, Bureau County. In interim had also been reported from nearby locations in adjacent Putnam County.

SUMMER

Cranes had settled on their summering areas by mid-July. Of the 21 birds in the eastern migratory population, no. 6-01 had a malfunctional transmitter and was not found during the summer; the other 20 were monitored. All of the 8 males summered in the core reintroduction area in Central Wisconsin. Of the 12 females, 5 that were associated with males (or in the case of no. 2-01 had been associated with a male as a yearling) summered in the core reintroduction area. Another summered in Central Wisconsin but north of the core reintroduction area, and the other 6 were widely distributed in Horicon NWR in southeastern Wisconsin (1), northwestern Illinois (1), southeastern Minnesota (1), and eastern South Dakota (3) (Fig. 4).

CORE REINTRODUCTION AREA, NECEDAH NWR

Locations referenced in southern part of refuge appear in Fig. 5.

No. 1-01: Had no consistent, close associates. Usually foraged at (1) Site 4, West Rynearson Pool, or Upper Rice Pool, and occasionally at Site 2, DU units, and south East Rynearson Pool (ERP). Usually roosted alone or with small number of sandhill cranes at Site 4 or Upper Rice Pool and occasionally in the main sandhill flock on ERP.

No. 2-01: Had no close associates until she joined other whooping cranes in late summer. Usually foraged on Upper Rice Pool, ERP, or Site 2, and occasionally at Sites 1 and 4, West Rynearson Pool, Canfield Pool, and along north Williams Road. Roosted in main sandhill flock until 21-22 August, when she began to associate often with yearling males nos. 5-02 and 8-02. Occasionally roosted on Upper Rice Pool. Resumed mainly solitary pattern after 27 August until she rejoined the yearling males on the main sandhill roost on 18 September and then remained with them and nos. 16-02 and 17-02 during fall staging.

Nos. 5-02 and 8-02: Usually not together in July, occasionally together in August, and consistently together by late August and thereafter. Foraged on north ERP or between Sites 2 and 4, at Site 4, Rice and Upper Rice Pools, and near north Williams Road. Began associating with no. 2-01 on 21-23 August. Usually roosted in main sandhill flock through 27 August. Roosted on Canfield Pool until moving to drawdown Sprague Pool on 4 September and sometimes associated there with nos. 16-02 and 17-02.

During 7-13 September on Canfield/Egret or Sprague Pools. Left Canfield on 21 September and foraged and roosted with nos. 2-01, 16-02, and 17-02 on Goose Pool (pool at west end of Sprague-Mather Flowage).

Nos. 16-02 and 17-02: Always together. Often near sandhill cranes. Remained on (2) northeastern Sprague Pool through mid-August except for infrequent visits to ERP, when they roosted in the main sandhill flock. Wider distribution on Sprague Pool after it was drawn down in late August. Began using Goose Pool and associating with nos. 5-02, 8-02, and 2-01 at beginning of fall staging period in mid-September.

Nos. 11-02 and 12-02: Always together. Foraged on south half of ERP, Site 1, and Site 3 including Pharm-Becker Pool and Field. Roosted alone or with small number of sandhills on mid-south ERP or in Pharm-Becker Pool.

Nos. 2-02 and 13-02: Almost always together. Usually foraged on east side of mid-ERP or on ERP south of Site 2, and sometimes on West Rynearson Pool. Usually roosted on mid-east ERP or in ERP just south of the main sandhill flock, and sometimes in the main flock. On 10 September they moved to Pharm-Becker Field and Pool. They left the refuge from ERP on 15 September at the beginning of the fall staging period.

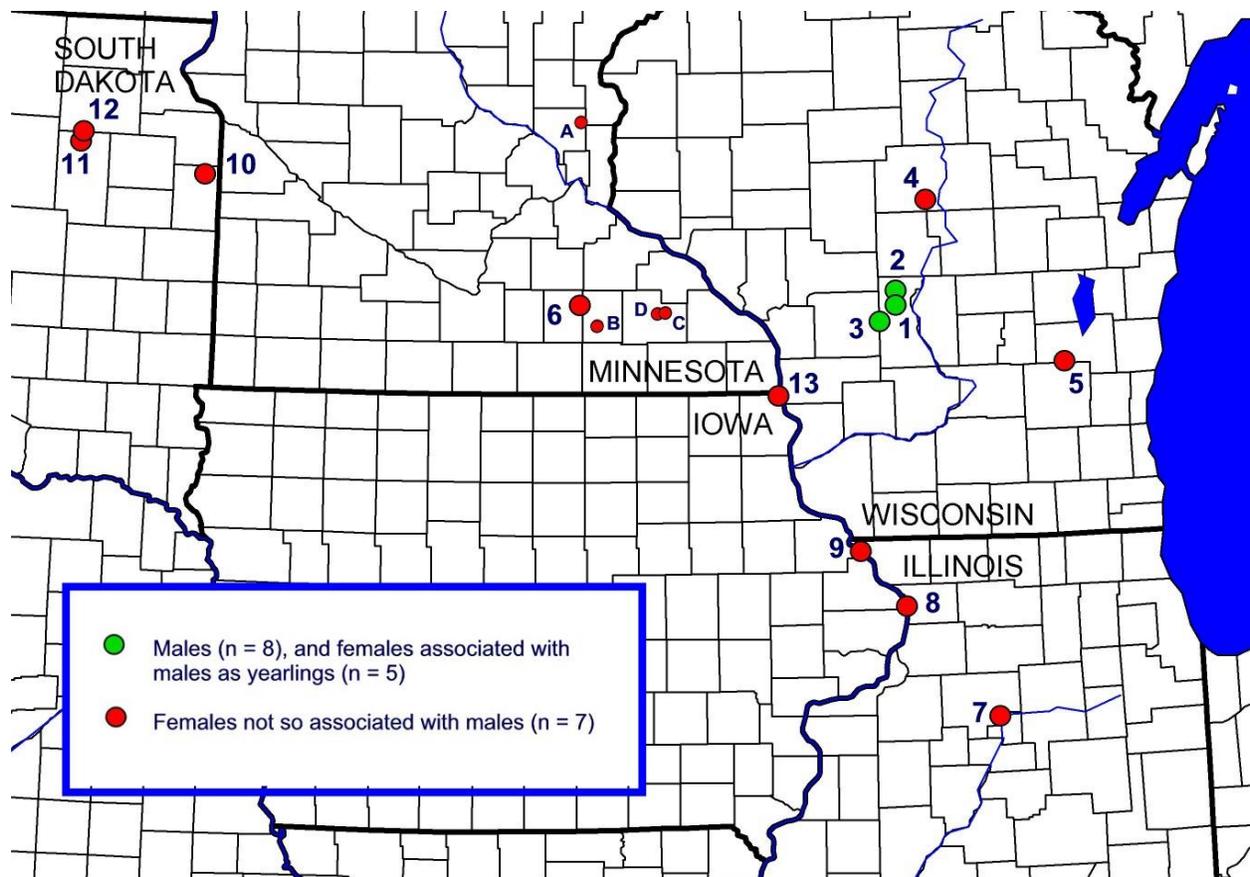


Fig. 4. Summer distribution of reintroduced whooping cranes in the eastern migratory population, July-August 2003. Key to codes appears in text. Also included (A-D) are locations of no. 1-02 in Minnesota during spring wandering, May-June.



Fig. 5. Areas used by reintroduced whooping cranes on southern Necedah NWR, summer 2003.

CORE REINTRODUCTION AREA, MILL BLUFF

Nos. 5-01, 4-02, and 18-02: Roosted in (3) interior wetland of Mill Bluff State Park. Male no. 5-01 was never observed flying or leaving the wetland from 16 June until the first week of September. No. 9-02 left the group permanently on 11 July. The two other females continued to forage, sometimes with a few sandhills, in the wetland or in farm fields near an adjacent Wetlands Reserve Program (WRP) wetland. The male adopted the female pattern in September.

BIG EAU PLEINE COUNTY PARK

No. 9-02: After persistent but ultimately unsuccessful efforts to assume membership in the group of three other whooping cranes at Mill Bluff/Volk Field, she left that group permanently on 11 July, returned to southern Necedah NWR, and settled near Upper Rice Pool. After negative interactions with other whooping cranes and costumed caretakers at Site 4, she left the refuge on 14 July. On 1 August she was found in a secluded wetland on (4) the edge of Big Eau Pleine Reservoir, Big Eau Pleine County Park, Marathon County, where she remained, either alone or near small numbers of sandhills, for most of the summer. By 14 September she had moved to North Townline and Townline Flowages on nearby Mead SWA. In late September, she was noted at other locations on Mead, nearby harvested cornfields, and her previously used site in Big Eau Pleine County Park. She returned to Necedah NWR on 4 October, and roosted that night in the main sandhill flock on ERP.

HORICON NWR

No. 7-01: Usually in wetlands of (5) Radke Pool or sometimes Teal Pool. Occasionally in nearby farm fields, alone or with small numbers of sandhill cranes.

RICE LAKE, SOUTHEASTERN MINNESOTA

No. 1-02: After arriving on 27 June, she remained (6) near Rice Lake, Steele County, Minnesota, or was occasionally in immediately adjacent areas in Dodge County, through the summer. She usually roosted in a pond that also contained a resident sandhill pair. She apparently returned to the core reintroduction area in Wisconsin during the second week of September and was found in a large staging flock of sandhill cranes at Bear Bluff, Jackson County, on 15 September.

ILLINOIS RIVER AND UPPER MISSISSIPPI NWFR, NORTHWESTERN ILLINOIS

No. 14-02: After deep flooding of her location on (7) Spring Lake, Depue SFWA, on 11 or 12 July, she moved locally to Upper Goose Lake, Bureau and Putnam Counties, Illinois. During the last week of July she moved 70 miles northwest to a marsh (8) near Ayers, Carroll County, Illinois, where she remained until 1 August. She was not located again until 27 August, when she was found 34 miles upriver in (9) Menominee Slough, Savanna District of Upper Mississippi NWFR, west of Galena, Jo Daviess County, Illinois. This site was less than 6 miles from the Wisconsin state line. She left this site on approximately 18 October but remained on the refuge on Spring Lake, near her previous location near Ayers, Carroll County.

NORTHEASTERN SOUTH DAKOTA AND NORTHEASTERN IOWA

Nos. 3-02, 7-02, and 15-02: Remained in sloughs and adjacent farmland on (10) the Coteau Prairie, Deuel County, South Dakota, until their primary roosting slough became dry; they apparently departed on 17 July. They reappeared 62 miles west near (11) Crocker, Clark County, South Dakota, on 27 July, and moved locally to a slough and adjacent farmland (12) near Lily, Day County, on 30 July. All whooping cranes that enter the Central Flyway are considered fully endangered, even those from the eastern migratory flock, which is classified as an experimental non-essential population in the states in and adjacent to the Wisconsin-to-Florida migration route. The presence of the latter birds in South Dakota therefore generated political and biological concerns that resulted in direction for their removal and

transfer back to Wisconsin. On 17-18 August, project personnel translocated the three whooping cranes. The dominant bird, no. 7-02, developed capture myopathy, and within a few days could not stand. After unsuccessful treatment efforts, she was euthanized on 30 August. On 18 August nos. 3-02 and 15-02 were released at different locations on ERP, where they reunited on 23 August. After local movements on and off the refuge, on 29 August they flew to wetlands along the Mississippi River (13) near New Albin, Allamakee County, Iowa, where they stayed for the remainder of the summer.

FALL STAGING

All 20 remaining birds were found. The 9 males and 7 of the females staged in the core reintroduction area in Central Wisconsin. The other 4 females staged at their late summer locations in Horicon NWR, northeastern Iowa, and northwestern Illinois. Locations are identified under Fall Migration.

NECEDAH NWR

No. 1-01: Expanded movements to include additional areas on southern Necedah NWR and a cornfield south of the refuge in mid-September. Roosted on ERP. By early October he was usually near Site 4 during the day and roosted on Upper Rice Pool with a few sandhills. He occasionally associated with the other whooping cranes in the Rynearson Pools area. By November he was often with these eight other cranes; however, he spent more time alone or with sandhill cranes than did the other whooping cranes. Just before migrating with sandhills on 7 November, he usually roosted in the large, staging sandhill flock on Rice Pool.

Nos. 2-01, 5-02, 8-02, 16-02, 17-02: No 2-01 rejoined males nos. 5-02 and 8-02 on 18 September. They joined nos. 16-02 and 17-02 on Goose Pool (west pool of Sprague-Mather Flowage) on 19-20 September, where the group of five birds remained consistently together by late September. They were usually with a few to 65 staging sandhills. In mid-October they returned to the southern part of the refuge, began associating with nos. 11-02 and 12-02, and eventually began roosting on Upper Rice Pool. The latter pool had been recently drawn down and provided a concentrated food source of fish. The birds began remaining there during the day to feed on animals trapped by the receding water. Nos. 1-01 and 9-02 were also attracted to the area, and by late October, all nine whooping cranes roosted together. They were usually not with sandhills at this site, but they did sometimes join sandhills to feed in cornfields south of the refuge in early November. These five whooping cranes plus nos. 9-02, 11-02, and 12-02 migrated together without sandhills on 13 November.

Nos. 9-02, 11-02, and 12-02: On 25 September nos. 11 and 12 began spending daytime foraging with no. 1-01 and a small number of sandhill cranes in a harvested cornfield just south of refuge. No. 9-02 returned to Necedah NWR on 4 October and over the next several weeks moved frequently and associated with nos. 11-02 and 12-02, nos. 1-01, and with staging sandhills, including those roosting off the refuge. On 13 October nos. 11-02 and 12-02 moved to Upper Rice Pool and began associating with the other whooping cranes there. By late October a group of 8-9 whooping cranes including these three birds plus the group of five (above) and sometimes no. 1-01 had formed on Upper Rice Pool. Eight whooping cranes migrated together on 13 November.

MILL BLUFF

Nos. 5-01, 4-02, and 18-02: Roosted in the interior wetland of Mill Bluff State Park. Foraged in an adjacent WRP wetland, Volk Field, and nearby farm fields. Usually not with sandhills during daily forays though mid-October but with varying numbers by late October. They made brief visits to Necedah NWR on 19 October and 27 October, and by November were roosting most nights on Rice Pool with several hundred sandhills. They migrated from Mill Bluff on 13 November.

Nos. 2-02 and 13-02: On 15 September this pair left Necedah NWR and returned to a spring use area in southwestern Richland County. However, they flew back the next day to the same farm used during

spring near Oakdale, Monroe County. There they foraged with staging sandhill cranes mainly in harvested cornfields and roosted in a cranberry reservoir. At the end of September they began roosting with the flock of 200-300 sandhills in northwestern Mill Bluff State Park. They also sometimes roosted in the interior park wetland used by nos. 5-01, 4-02, and 18-02, but they had no close relationship with these other whooping cranes. They migrated on 7 November.

BEAR BLUFF

No. 1-02: Staged with 150-300 sandhills. First noted at location on 15 September. Roosted in cranberry reservoirs and foraged there or in an adjacent cornfield. Left on 5 October after reservoir was drained during cranberry harvest, but returned on 7 October. Migrated on 7 November with sandhills.

RATTLESNAKE MARSH, WOOD COUNTY, TO LEWISTON, COLUMBIA COUNTY

No. 6-01: Apparently sighted with staging sandhills in a cornfield near Sherwood, Clark County, on 15 September. Observed several times during the next month and confirmed by project personnel after a local landowner reported the bird on 3 November. In a staging flock of ~400 sandhills. Roosted in Rattlesnake Marsh, Wood County. On 7 November moved south to a staging area near Lewiston, Wisconsin River, Columbia County. Departed on migration with sandhills on 20 November.

HORICON NWR

No. 7-01: Staged with sandhills. Foraged in nearby farm fields and roosted in Radke, Teal, or Luehring Pools. Apparently migrated on 7 November.

NORTHEASTERN IOWA

Nos. 3-02 and 15-02: In Upper Iowa River; adjacent harvested fields; and Duck Lake, New Albin Big Lake WMA near New Albin, Allamakee County, Iowa. Often with small number of sandhill cranes. Migrated on 8 November.

SAVANNA DISTRICT, UPPER MISSISSIPPI NWFR, ILLINOIS

No. 14-02: After leaving Menominee Slough, near Galena, in mid-October, moved downriver to Spring Lake, where 150-200 sandhill cranes were also staging. Migrated on 28 November.

FALL MIGRATION

Of 18 whooping cranes with fully functional transmitters, all migrated by an approximately direct route toward Chassahowitzka NWR, Central Gulf of Florida, 7 November - 2 December. Migration of individual birds or groups was completed in 5-23 days of which 4-8 were flight days. Fourteen of these birds arrived at the pensite in saltmarsh on Chassahowitzka, 16-29 November, before moving to inland winter locations. Peak count on Chassahowitzka was 12 birds on 30 November. The 2 whooping cranes with malfunctional transmitters were confirmed as far south as Hiwassee Wildlife Refuge, Tennessee, before apparently continuing migration farther south. Of these, no. 6-01 was later found in north-central Florida. Fall migration is summarized in Fig. 6 and Table 3.

HY2001 whooping cranes, except for no. 2, apparently migrated mainly in association with sandhill cranes. HY2002 whooping cranes, were more variable: nos. 1 and 14 apparently migrated with sandhill cranes, while a group of eight whooping cranes (7 HY2002 birds plus no. 2-01) was not observed with sandhill cranes at any point on migration. With a few possible exceptions, e.g., no. 6-01, whooping cranes determined their final destinations. Their associations with sandhills were casual, and except for brief deviations from the route, they flew with different groups of sandhills and with those groups sharing a compatible flightpath.

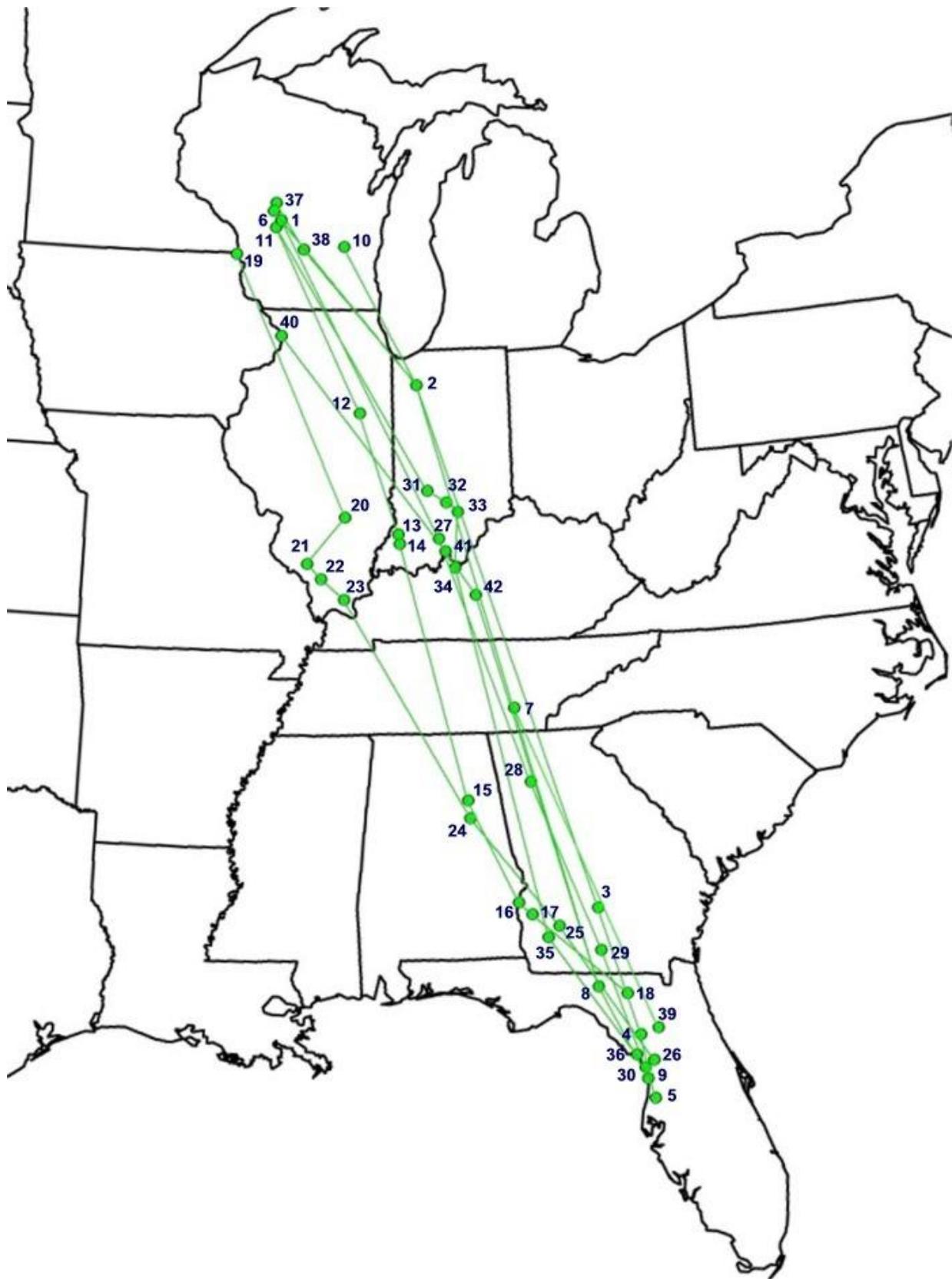


Fig. 6. Migration stops and flightpaths of HY2001 and HY2002 whooping cranes, fall migration 2003. Key to map appears in Table 3.

Table 3. Migration stops of HY2001 and HY2002 whooping cranes, fall migration 2003. Numerals in parentheses refer to points on Fig. 6. Birds remained at or near indicated stop on intervening, non-reported dates unless indicated otherwise.

No. 1-01:

7 Nov: Began migration from (1) Rice Pool, Necedah NWR, Juneau County, Wisconsin. Arrived (2) Jasper-Pulaski SFWA, Jasper/Pulaski Counties, Indiana.

13 Nov: Departed (2), not tracked, next stop undetermined.

14 Nov: Arrived (3) near Rebecca, Ben Hill County, Georgia.

15 Nov: Arrived (4) Sawgrass Springs, Waccasassa River, Levy County, Florida.

16 Nov: Arrived (5) Crews Lake, Pasco County, Florida.

MIGRATION COMPLETED in 10 days (5 flight days).

No. 1-02:

7 Nov: Began migration from (6) Bear Bluff, Jackson County, Wisconsin. Arrived (2) Jasper-Pulaski SFWA, Jasper/Pulaski Counties, Indiana.

13 Nov: Departed (2), arrived (7) Hiwassee Wildlife Refuge, Meigs County, Tennessee.

24 Nov: Estimated departure (7).

26 Nov: Arrived (8) Hixtown Swamp, Madison County, Florida.

29 Nov: Arrived (9) Chassahowitzka NWR pensite, Citrus County, Florida.

MIGRATION COMPLETED in 23 days (5 estimated flight days).

No. 7-01: (This bird had a nonfunctional transmitter and was not trackable.)

7 Nov: Began migration (estimated) from (10) northern Horicon NWR area, Dodge County, Wisconsin, and arrived (2) Jasper-Pulaski SFWA, Jasper/Pulaski Counties, Indiana.

16-26 Nov: Observed at (7) Hiwassee Wildlife Refuge, Meigs County, Tennessee.

29 Nov: Possibly departed (7) (last report of a whooping crane at Hiwassee).

Nos. 2-02 and 13-02:

7 Nov: Began migration from (11) Mill Bluff, Juneau County, Wisconsin. Arrived (estimated) near (12) Turtle Pond, Livingston County, Illinois.

8 Nov: Arrived (13) near Iona, White River, Knox County, Indiana.

17 Nov: Moved to (14) near Francisco, Gibson County, Indiana.

19 Nov: Departed (14). Arrived (15) Coosa River valley near (estimated) H. Neely Henry Lake, St. Clair County, Alabama.

20 Nov: Arrived (16) Eufaula NWR, Barbour County, Alabama, landed but took flight and roosted near (17) Cuthbert, Randolph County, Georgia.

21 Nov: Arrived (18) Gum Slough, near Live Oak, Suwannee County, Florida.

MIGRATION COMPLETED in 15 days (6 flight days).

Nos. 3-02 and 15-02:

8 Nov: Began migration from (19) Mississippi River near New Albin, Allamakee County, Iowa. Arrived (20) tributary of Crooked Creek, Clay County, Illinois.

9 Nov: Arrived (21) reclaimed surface mine, Sixmile Prairie, Perry County, Illinois.

12 Nov: Arrived (22) near Carbondale, Jackson County, Illinois, landed at midday, took flight and roosted (23) near Dixon Springs, Shawnee NF, Pope County, Illinois.

13 Nov: Arrived (24) near Curry, Talladega County, Alabama.

14 Nov: Arrived (25) near Lockett Crossing, Dougherty County, Georgia.

15 Nov: Arrived (26) Lake Rousseau, Marion County, Florida.

16 Nov: Arrived (9) Chassahowitzka NWR pensite, Citrus County, Florida.

MIGRATION COMPLETED in 9 days (7 flight days).

Nos. 2-01, 5-02, 8-02, 9-02, 11-02, 12-02, 16-02, and 17-02:

13 Nov: Began migration from (1) Upper Rice Pool, Necedah NWR, Juneau County, Wisconsin. Arrived (27) Youngs Creek Marsh SWA, Patoka Lake, Orange County, Indiana.

19 Nov: Arrived (estimated) (28) Allatoona Lake, Bartow County, Georgia.

20 Nov: Arrived (29) Heart Pine Pond, Cook County, Georgia.

21 Nov: Arrived (30) Red Level, Citrus County, Florida, landed, took flight, and roosted at (9) Chassahowitzka NWR pensite.

MIGRATION COMPLETED in 9 days (4 flight days).

Nos. 5-01, 4-02, and 18-02:

13 Nov: Began migration from (11) Mill Bluff, Juneau County, Wisconsin. Arrived (estimated) near (31) Spencer, Owen County, Indiana.

14 Nov: Arrived (32) Monroe Reservoir, Brown County, Indiana.

15 Nov: Moved to (33) East Fork of White River, near Ewing, Jackson County, Indiana.

16 Nov: Not tracked; reported in flight probably approaching roost near (34) Ekron, Meade County, Kentucky.

19 Nov: Found in flight in northern Georgia. Arrived (35) Elmodel WMA, Baker County, Georgia.

20 Nov: Arrived (36) Wassasassa Bay, Levy County, Florida.

21 Nov: Arrived (9) Chassahowitzka NWR pensite, Citrus County, Florida.

MIGRATION COMPLETED in 9 days (8 flight days).

No. 6-01: (This bird had an intermittent transmitter with a broken antenna and was not trackable.)

7 Nov: Moved from staging area at (37) Rattlesnake Marsh, Wood County, Wisconsin, to staging area (38) near Lewiston, Wisconsin River, Columbia County, Wisconsin.

20 Nov: Began migration; arrived (2) Jasper-Pulaski SFWA, Jasper/Pulaski Counties, Indiana.

24 Nov: Departed (estimated) (2).

25 Nov: Arrived (estimated) (7) Hiwassee Wildlife Refuge, Meigs County, Tennessee.

29 Nov: Possibly departed (7) (last report of a whooping crane at Hiwassee).

3 Jan: Found (39) Gainesville/Paynes Prairie, Alachua County, Florida.

No. 14-02:

28 Nov: Began migration from (40) Spring Lake, Savanna District, Upper Mississippi NWFR, Carroll County, Illinois. Not tracked; roost undetermined.

29 Nov: Arrived (crude estimate) (41) near Leavenworth, Crawford County, Indiana.

30 Nov: Arrived (42) near Magnolia, Larue County, Kentucky (roosted 5 miles away after being flushed by dog as darkness fell).

1 Dec: Departed (42) early; could not be tracked from ground; roost undetermined.

2 Dec: Found (8) Hixtown Swamp, Madison County, Florida.

MIGRATION COMPLETED in 5 (possibly 4) days (all flight days).

WINTER 2003/04

HY2001-02 COHORTS

As of 15 January 2004, the winter location of no. 7-01, with a nonfunctional transmitter, has not been discovered. The other 19 whooping cranes appeared settled on winter locations in the following counties of west-central, north-central, and northwestern peninsular Florida: Pasco (9), Citrus (3), Sumter (2), Suwannee (2), Lake (1), Alachua (1), and Madison (1). The latter three cranes were within large flocks of wintering sandhill cranes. The three birds in Citrus County were nos. 5-01, 4-02, and 18-02; after returning to Chassahowitzka NWR in November, they left the pensite area before arrival of the HY2003 juveniles and moved to ranchland in nearby Hernando County. They returned to the pensite on 8 January and, with pelleted feed supplied ad libitum for the juveniles, they have remained. The other whooping cranes (in Pasco, Sumter, and Suwannee Counties) were all wintering on ranchland. Those in Pasco and

Sumter Counties shared the areas with small numbers of nonmigratory sandhills. The pair in Suwannee County has not associated with sandhills since arrival. Whooping cranes remained largely sedentary on their final selected wintering areas. This behavior is typical of wild migratory sandhill and whooping cranes. Winter locations are summarized in Fig. 7 and Table 4.

HY2003 COHORT

The flock of 16 juveniles, led by Operation Migration ultralight aircraft, arrived at the release pen on Chassahowitzka NWR on 8 December. They were initially held in a topnetted holding pen within the larger pen. They were colorbanded and equipped with permanent transmitters on 11-12 December. On 14 December the temporary holding pen was removed, and the chicks were allowed to roam freely. Like the HY2002 cohort during the previous winter, they adapted well to the pensite and used the area within 0.5 miles of the pen.

SURVIVAL

Only two natural or environmentally-induced mortalities of released whooping cranes have occurred during the course of the project, now in its third year of releases. These two mortalities (nos. 4-01 and 10-01) were due to bobcat predation that occurred in December 2001 and January 2002, shortly after release of the first cohort. Changes in the winter management protocol have been largely responsible for the absence of further similar mortalities. The only other mortality occurred in August 2003 after no. 7-02 developed myopathy from capture/transport in South Dakota, did not recover after treatment, and was subsequently euthanized. Other than these three mortalities, post-release survival of the 39 birds in the migratory whooping crane flock has been 100%.

DISTRIBUTION

With few exceptions (see below), released whooping cranes generally remained within the desired migration corridor between Wisconsin and Florida (Fig. 8). Migration routes used generally consisted of the mainstream eastern greater sandhill crane migration route, i.e., on a line from northwestern Indiana to north-central Florida, plus areas on a direct line from west-central Wisconsin to the west-central Florida Gulf Coast. This westward bias, relative to the sandhill route, could be related to the approximately direct route used by ultralight aircraft to lead birds on their first migration between Wisconsin and Florida (rather than heading through the major stopover area at Jasper-Pulaski SFWA [J-P] in northwestern Indiana) and/or to the relatively direct migration behavior exhibited by whooping cranes as compared to sandhills. The latter usually stopover for extended periods at key areas such as J-P. This westward bias increases the importance of possible summering areas in Minnesota and Iowa and migration areas such as central/southern Illinois and eastern Alabama, which were not given much consideration before these data were available.

Likewise, the westward bias applies to the wintering grounds. Whooping cranes have so far not occupied major, more eastern sandhill crane wintering areas in the Okefenokee Region, St. Johns River watershed, or Kissimmee Prairie. Rather Hixtown Swamp, the largest sandhill crane wintering area in the northwestern part of the Florida wintering range, has hosted migrating or wintering whooping cranes so far each year. Whooping cranes leaving Central Gulf Coastal wetlands to search inland for wintering sites containing open wetlands have selected mainly cattle ranches in Pasco and other counties in west-central Florida. This winter range selection will be in increasing conflict with development, particularly in Pasco County, where suitable habitat is rapidly disappearing as metro-Tampa sprawls northward. Although wintering whooping cranes may be able to find suitable habitat elsewhere, the expansion of development across Florida will significantly affect future winter distribution and remains reason for concern.

There has so far been a northern latitude limit, between 45.0 and 45.5 degrees, which whooping cranes have approached at widespread geographical locations in spring and summer but have not continued

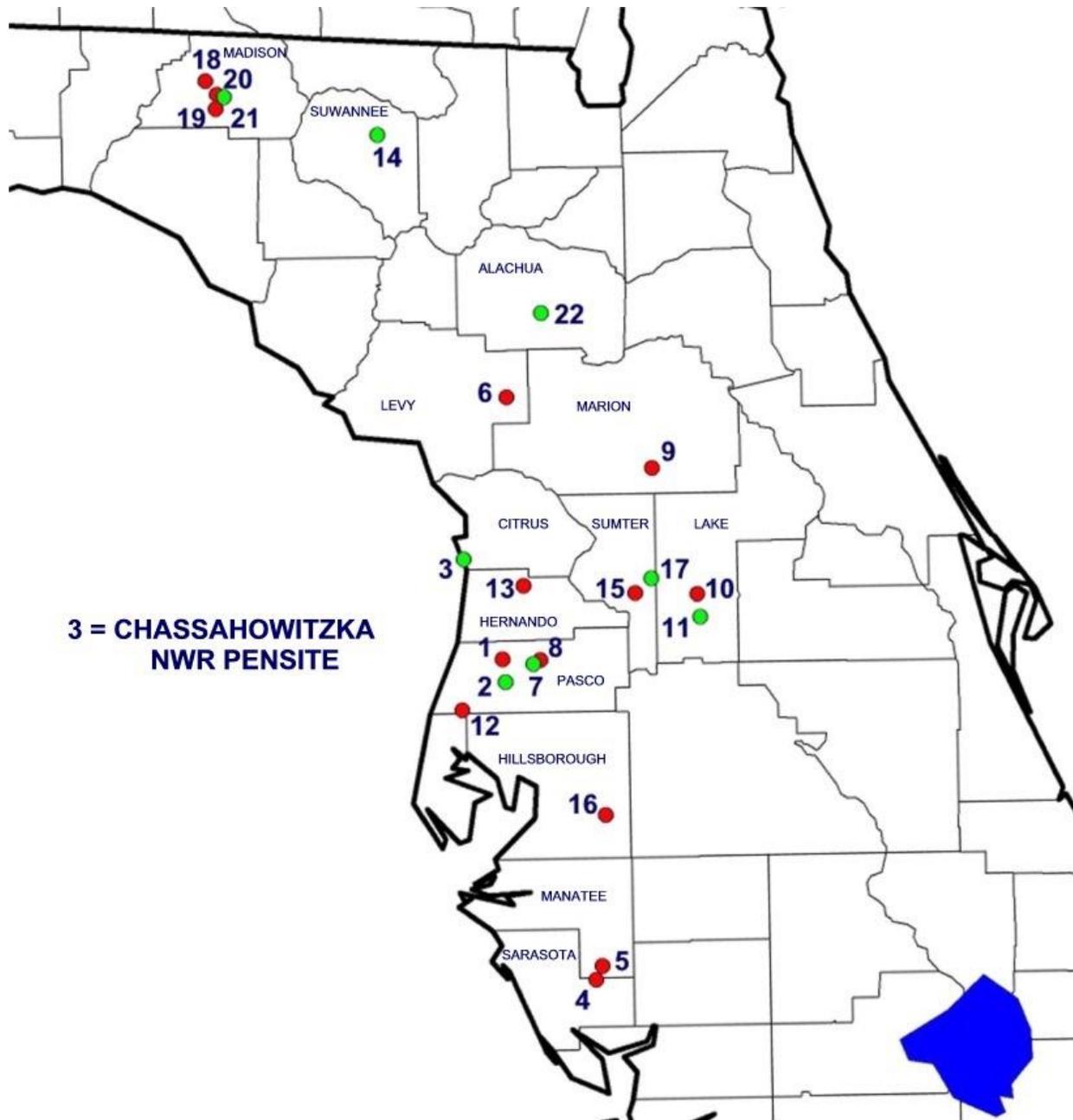


Fig. 7. Locations of HY2001 and HY2002 whooping cranes, peninsular Florida, winter 2003/04. Green = current locations as of 15 January 2004. Red = earlier locations. Key to map appears in Table 4.

Table 4. Locations of HY2001 and HY2002 whooping cranes, winter 2003/04. Numerals in parentheses refer to points on Fig. 7. Present refers to location as of 15 January 2004.

No. 1-01:

- (1) Crews Lake, Pasco County: 16 November - 12 January
- (2) Five Mile Ranch, Pasco County: 13 January - present

Nos. 2-01, 5-02, 8-02, 16-02, 17-02, 9-02, 11-02, and 12-02:

- (3) Chassahowitzka NWR, Citrus County: 21-26 November
- (4) northwest of Big Slough, Sarasota County: 26-27 November
- (5) Coker Gully, Manatee County: 27 November
- (6) Lake Stafford, Levy County: 28 November - 30 November
- (3) Chassahowitzka NWR, Citrus County: 30 November - 1 December

No. 1-02:

- (3) Chassahowitzka NWR, Citrus County: 29 November - 1 December

Nos. 2-01, 5-02, 8-02, 16-02, and 17-02:

- (2) Five Mile Ranch, Pasco County: 1 December - present

Nos. 1-02, 9-02, 11-02, and 12-02:

- (7) Way Pond and vicinity, Pasco County: 1-4 December

Nos. 9-02, 11-02, and 12-02:

- (8) Bird Island Lakes, Pasco County: 4-6 December
- (7) Way Pond and vicinity, Pasco County: 6 December- present

No. 1-02:

- (9) Bowers Lake, Marion County: 4-6 December
- (10) Cook Lake, east of Cherry Lake, Lake County, 6- ~23 December
- (11) wetland southwest of Lake Minnehaha, Lake County, by 26 December - present

Nos. 5-01, 4-02, and 18-02:

- (3) Chassahowitzka NWR, Citrus County: 21-29 November
- (12) Triangle Area, Pasco County, 29-30 November
- (3) Chassahowitzka NWR, Citrus County: 30 November - 2 December
- (13) Stafford Lake, Hernando County: 2 December - 8 January
- (3) Chassahowitzka NWR, Citrus County: 8 January - present

Nos. 2-02 and 13-02:

- (14) Gum Slough, near Live Oak, Suwannee County: 21 November - present

Nos. 3-02 and 15-02:

- (3) Chassahowitzka NWR, Citrus County: 16-19 November
- (15) near Oak Grove, Sumter County: 19-20 November
- (16) Chito Branch, near Lillibridge, Hillsborough County: 21-24 November
- (17) near Center Hill, Sumter County: 24 November - present

No. 14-02:

- Hixtown Swamp complex, Madison County: 2 December - present
- (18) north: 2-3 December, (19) Sampala Swamp and (20) southeast: 3-13 December, (21) Hankings Prairie: by 17 December - present

No. 6-01:

- (22) Gainesville/Paynes Prairie, Alachua County: by 3 January - present.
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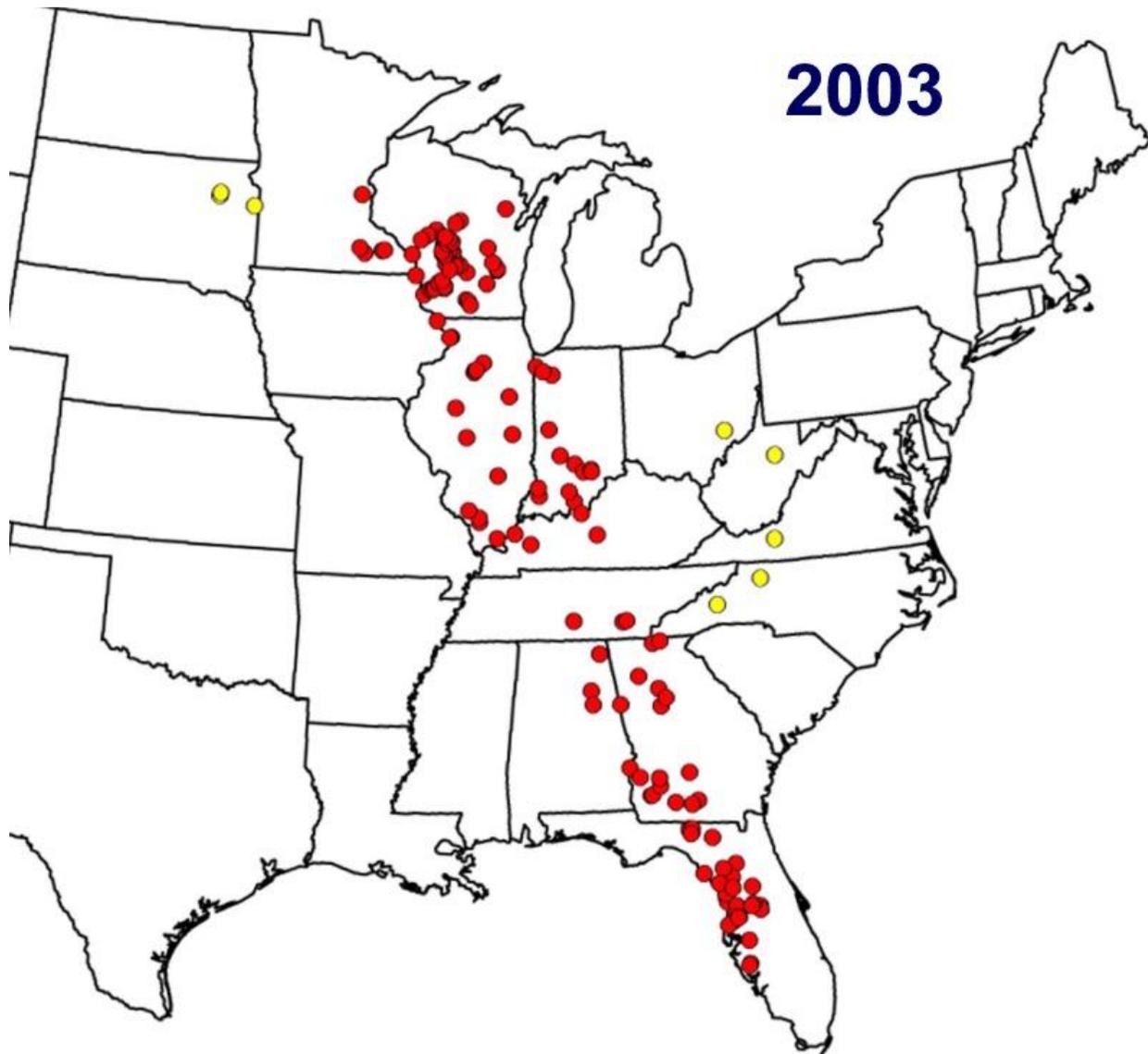


Fig. 8. Distribution of reintroduced whooping cranes, eastern migratory flock, all recorded ground locations, 2003. Outlier locations (indicated by yellow) are discussed in text.

beyond. The three most northern locations have been in Oconto County, Wisconsin (45.04 deg), Anoka County, Minnesota (45.32 deg), and Day County, South Dakota (45.16 deg).

Male whooping cranes demonstrated strong homing to the natal area, while females tended to disperse unless they were associated with males (Fig. 4). This sex-dependent distribution was similar to that exhibited by isolation-reared sandhill cranes released in the Upper Peninsula of Michigan (Urbanek and Bookhout 1994), but the magnitude of the female whooping crane movements was much greater. Released whooping cranes generally remained within the desired migration corridor between Wisconsin and Florida. However, the sex ratio in the HY2002 cohort was highly skewed toward females (10 females, 6 males), and the two notable exceptions to this distribution were by females:

(1) Upon reaching northern Georgia during spring migration, no. 9-02, migrating alone, deviated eastward and failed to cross the Appalachians at the appropriate latitude in northern Georgia/eastern Tennessee. As a juvenile on the previous fall migration, she had been transported in a box by truck over

this 175-mile part of the route rather than being led by ultralight aircraft. In spring she migrated northward through North Carolina, Virginia, and West Virginia. By 3 May she had corrected course, was in southeastern Ohio, and was on a flightpath directed toward Wisconsin. However, if she remained on that course, she would eventually encounter southern Lake Michigan, a barrier that she would not likely be able to cross. In view of this concern and the expense and logistical difficulties of monitoring this bird, she was captured, transported to Central Wisconsin, and re-released. She subsequently demonstrated satisfactory movement patterns and in fall migrated as a member of a group of eight whooping cranes from Necedah NWR, Wisconsin, to Chassahowitzka NWR, Florida.

(2) During the spring wandering period and after separation from all previous male associates, yearling females nos. 3-02, 7-02, and 15-02 flew to northeastern South Dakota, where they settled for the summer. Because of concerns related to their entry into the Central Flyway, they were removed and transported back to Wisconsin (see Summer section above). Based on the growing body of movement and migration data available for eastern migratory whooping cranes (note particularly Figs. 4 and 6), it is highly likely that this group of three birds, if left undisturbed, would have returned to the Wisconsin-to-Florida corridor and migrated correctly during the coming fall. The two birds that survived the translocation moved to northeastern Iowa for the remainder of the summer and fall staging period. During migration through southern Illinois, they were flying with a group of five sandhill cranes. The flock was headed southwestward (the sandhills possibly en route to Louisiana). The two whooping cranes disassociated from the sandhills, remained locally on reclaimed surface-mined lands for three days, and then resumed migration on a direct course to Chassahowitzka NWR, where on 16 November they were the first whooping cranes to arrive.

HABITAT USE

ROOSTING

During spring and early summer 2002, yearling HY2001 whooping cranes frequently roosted on land, in small wetlands near shore, or in farm fields with a very limited extent of standing water. Some of this behavior was associated with use of farm fields west of Mauston. In the wet early spring of 2002, these fields contained numerous small, flooded areas. Some of these pools were initially suitable for roosting, but by June most were dry or reduced to small puddles. The birds, however, continued to use them. This area was also moderately populated by humans. Spring 2003 was, however, drier. Although yearlings had some of the same roosting tendencies as those in the previous spring, the reduction in spring flooding facilitated, for the most part, use of more permanent marshlands farther removed from humans. It is also likely that rearing protocol modifications, which encouraged chicks to roost in water in the pens on Necedah NWR in summer 2002, promoted better roost site selection after release. By summer of both 2002 and 2003, the yearling whooping cranes began associating with wild sandhill cranes. From that time on, they consistently selected safe roosting habitat. Association of yearling with older whooping cranes also encouraged appropriate roosting by yearlings.

Stopover habitat used by migrating whooping cranes was opportunistic and highly variable. This habitat ranged from extensive, permanent wetlands to relatively small stock ponds. Sites used generally satisfied safe, short-term habitat requirements. During spring migration HY2002 cranes generally appeared to choose safer roost sites, i.e., in water and more than 20 feet from shore, then did their predecessors of the previous spring. In general, whooping cranes also improved roost site selection in their first unassisted fall migration over that in their first spring migration. Because of the broad range of potentially usable sites and the need to use them for only a few days, adequate stopover habitat does not appear limiting even in mountainous parts of the migration route.

FORAGING

Like sandhills, whooping cranes fed in grain fields near the roost sites. Use was greatest in spring and fall, and harvested cornfields were preferred feeding areas. Whooping cranes, in contrast to sandhills,

preferred wetlands for foraging, especially in summer. Sandhills roosted in wetlands, but frequently flew to forage in uplands or croplands during the day while whooping cranes often remained in wetlands for most or all of the day. Whooping cranes spent much of the day foraging, unlike sandhills, which foraged mainly in the morning and evening and frequently loafed for much of the day. Whooping cranes, while feeding on grain, tubers, rhizomes, blueberries, and terrestrial insects, especially grasshoppers, as did sandhills, appeared to have a much broader diet including more animal material such as fish, frogs, and aquatic invertebrates. As they were for sandhill cranes, mudflats or shallows on drawn down pools were a preferred habitat for whooping cranes. Whooping cranes, however, made more efficient use of these areas by feeding heavily on animals trapped in the receding water. Bullheads were a major component of the diet of whooping cranes, especially on drawn down Rice and West Rynearson Pools in spring 2003 and Upper Rice Pool in fall 2003. Crayfish were a preferred food item where they occurred, e.g., in the prairie sloughs of South Dakota.

Whooping cranes preferred open country, e.g., grassland and savanna, lacking much woody cover and with numerous shallow wetlands. During winter cattle ranches provided this habitat and were the main areas selected by the majority of wintering whooping cranes. Whooping cranes wintering with migratory sandhill flocks usually foraged in daytime in the same wetlands used by both species for roosting. The sandhills, however, spent much more of the day in adjacent harvested fields or cattle pastures.

MIGRATION

The majority of whooping cranes demonstrated a direct migration route with opportunistic stops at whatever wetlands were available in the area they reached by the end of the flight day. These sites included natural or managed palustrine, lacustrine, and riverine wetlands as well as farm ponds, reclaimed surface mines, flooded agricultural fields, catfish production ponds, mountain reservoirs, and river sandbars. They usually remained at such stops only overnight or for extended periods during days of poor flying weather. Some whooping cranes, e.g., nos. 1-01, 6-01, 7-01, and 1-02, because of their greater association with sandhill cranes, also used large, managed, wetlands at Jasper-Pulaski SFWA, Indiana, and Hiwassee Wildlife Refuge, Tennessee, on the traditional eastern greater sandhill crane migration route.

USE OF COASTAL WETLANDS BY RETURNING BIRDS

Most whooping cranes returned but did not remain to winter on the Central Gulf Coast after their first winters. Primarily tidal fluctuations, but also high salinity, unstable or rocky bottom substrates, and general habitat dominance by needlerush, have presented challenges to habitation of the area by whooping cranes. Usable roosting habitat was not consistently available at any given site.

In winter 2003/04, 14 of 18 trackable whooping cranes returned to the release site at Chassahowitzka NWR. These 14 birds were groups of 2, 3, and 8, and a single bird that arrived later. Four other trackable birds did not return to the Central Gulf Coast. Of 2 untrackable birds, 1 is wintering with large flocks in north-central Florida and probably did not return to the coastal wetlands. This HY2001 bird also did not return in the previous winter. No wintering data are available for the other untrackable bird, but she was never observed at the pensite in winter 2003/04.

The birds that returned spent 2-10 nights on the refuge before leaving to winter at inland sites. This initial return period to Chassahowitzka also contained one 4-day trip inland for the group of 8 birds and one 1-day trip inland for the group of 3 birds. The peak count on Chassahowitzka was 12 whooping cranes on 30 November. While on the refuge, the birds used areas within 0.5 miles of the pen as well as salt grass habitat on the northwest shore of Flatrock Bay 1.5-2.0 miles west of the pen.

In 2002 returning no. 5-01 had arrived at the pensite 2 days before arrival of the HY2002 chicks led by ultralight aircraft. He was therefore still there when the younger birds arrived and the feeding station in the pen became operable. He joined the chick flock as dominant member and remained for the winter. By

2 December in 2003, all of the 14 birds that had returned to the pensite had moved to inland sites. The HY2003 chicks being led by ultralight aircraft did not arrive until 8 December, therefore the older birds left before supplied feed in the feeding station was available. On 8 January the group of 3 birds (nos. 5-01, 4-02, and 18-02) did return to the pen again and, with supplemental food now available, they have remained.

INTERACTIONS AMONG WHOOPING CRANES

Within the coming year, it is likely that permanent pair bonds will begin forming among some project cranes. It is encouraging that subadult groups have formed in late summer. In fall 2003 a group of eight whooping cranes, including one HY2001 and seven HY2002 birds, migrated intact from Necedah NWR to Chassahowitzka NWR. This group had formed on Necedah NWR by late October from smaller groups of 3 and 5 birds. They separated back into their earlier two groups on 1 December, when they left Chassahowitzka and moved to their respective wintering areas in Pasco County.

The trio of male no. 5-01 and females nos. 4-02 and 18-02 formed in winter/spring 2003, and these birds have remained together. On 4 May no. 9-02, retrieved from Ohio, was released into this group. Although she persisted in attempts to become a member, she was not tolerated by no. 5-01 and left the group permanently on 11 July.

An adult pair is likely to form from within the trio. Since returning to the Chassahowitzka pen on 8 January 2004, no. 18-02 has maintained attempts to drive no. 4-02 away. All three birds, especially no. 5-01, have also continued to harass the HY2003 juveniles. The older birds have displaced the juveniles from feeding and roosting sites within the pen. Aggression of older birds toward fledged juveniles is typical. This behavior was also been commonly observed at the training sites on Necedah NWR in previous summers.

HUMAN AVOIDANCE AND CONFLICTS WITH HUMAN ACTIVITY

In general, released whooping cranes satisfactorily avoided close proximity to humans and human structures. Inadequate human avoidance was most notable by birds migrating alone during spring migration (e.g., no. 9-02 landed in an industrial park in northern Georgia, and no. 14-02 roosted in a soccer field on the Springfield campus of the University of Illinois) or just after returning from spring migration (e.g., nos. 5-01, 4-02, and 18-02 were observed dancing in a yard and walking on a public road). Although these incidents occurred in 2003, overall such behaviors have been limited, and improvement was apparent over 2002 when several birds were near Mauston (see Roosting above).

The main areas of concern were at Volk Field, a U.S. Air Force Base used for Air National Guard training, where the group of three resident birds (nos. 5-01, 4-02, and 18-02) selected a flooded ditch along the main runway as a preferred use site in spring and late summer. Efforts of base personnel to haze the birds from the area were largely unsuccessful, and the birds became further habituated to humans and vehicles during these unsuccessful attempts. The problem was relieved, but not solved, when no. 5-01 (possibly molting, although molting was not confirmed) retreated into a nearby wetland at Mill Bluff State Park from mid-June through August. During this period the females either remained in the wetland with the male or they foraged in nearby farm fields. A WRP project, which will create additional wetland habitat between and immediately adjacent to both the base and the park, is nearing completion and will encourage whooping cranes to continue to inhabit this area in the future.

Of minor but not negligible concern was habituation to vehicles by whooping cranes on southern Necedah NWR. This is the natal area for reintroduced birds, and most of the whooping cranes have returned and attempted to crowd into this limited area. The cranes often use habitats near roads. Because most refuge and crane project traffic is necessary, this situation is expected to continue.

There is also some concern about wintering sites in Florida. In winter 2002/03, for example, nos. 1-01 and 2-01 used an area near a human residence on a cattle ranch containing nonmigratory sandhill cranes that were tolerant of people. Occupation of this site was therefore not conducive to reinforcement of desired human avoidance behavior. In winter 2003/04 six whooping cranes, including these two, are again on this area. Inability to obtain landowner permission to enter the property has made recent observation almost impossible. Part of this property has also recently been sold for a housing development.

There have been no significant conflicts noted between whooping cranes and farmers. No crop damage has been apparent, and most farmers have expressed positive interest in having whooping cranes on their property. There have been some instances of landowners denying permission to project personnel to enter their lands; however this denial appeared mainly due to privacy concerns, distrust of strangers, or distrust of personnel in government vehicles rather than antipathy toward the cranes.

INTERACTION WITH NONMIGRATORY WHOOPING CRANES

There have been no observed interactions between members of the migratory and nonmigratory whooping crane flocks. Once settled on a winter site, migratory whooping cranes have been generally sedentary with a home range of 1-2 square miles or less. In winter 2003/04 only two areas--in Sumter and Lake Counties--are inhabited by migratory wintering whooping cranes that are near nonmigratory whooping cranes. The migratory whooping crane in Lake County (no. 1-02) has remained in a wetland used by a large flock of wintering migratory sandhill cranes. Distance to nearest nonmigratory whooping cranes is unknown. The two birds in Sumter County (nos. 3-02 and 15-02) are on a cattle ranch 7 miles south of a group of nonmigratory whooping cranes just west of Okahumpka, Lake County, which is one of the release sites used for the nonmigratory whooping crane reintroduction.

LAND OWNERSHIP

Whooping cranes have used a mixture of federal, state, and private lands during summer, migration, and winter based on the habitat these areas provide in the geographical area that the birds occupy. Some localities, such as cattle ranches on wintering grounds or cornfields in the north and on migration, are almost all privately owned. Whooping cranes often use areas containing extensive wetlands. These habitats tend to be on public lands such as National Wildlife Refuges and State Wildlife Areas.

RADIOTRANSMITTERS AND MONITORING INTENSITY

Consistent monitoring of project cranes is entirely dependent on functioning transmitters. All routine tracking is done by conventional (VHF) telemetry. Most of this tracking is done from vehicles on the ground, although aircraft are used when available and are especially useful on migration and to search for missing birds. Satellite transmitters (PTT's) may be useful to identify search locations for missing birds and to assist in monitoring birds that occur at distant sites and cannot be frequently checked. All project whooping cranes (Appendix A) carry one legband-mounted VHF (164-166 MHz) transmitter. A small number of cranes also carry a PTT on the other leg.

It should be noted that individual life expectancy of transmitters is at best a few years. Thorough, even daily, monitoring of newly released and young subadults will always be possible if adequate personnel and vehicles are available to do so. It will be very difficult if not impossible, however, to recapture many of these birds as their transmitters fail. As the population ages, these older birds will not be consistently tracked. But once they are paired and establish breeding and wintering territories, it should be possible to locate most birds periodically, even without functioning transmitters.

EXPERIMENTAL SANDHILL CRANES

Because of transmitter failure, these isolation-reared sandhill cranes, released in 2000, can no longer be tracked. Only two transmitters, on Cohort 3 nos. 4 and 6, remain partially functional with weak and intermittent signals. Following is a summary of birds observed during 2003 (OM = ultralight-led, Cohort 3 = reared from hatching on Necedah NWR and released into fall staging sandhill flocks). Five individuals from each group were observed in 2003.

SPRING MIGRATION

Cohort 3 no. 4: Signal detected at Jasper-Pulaski SFWA (J-P), Indiana, 9-10 March.

Cohort 3 no. 6: Signal detected at J-P, 3 March.

SPRING AND SUMMER

OM #1: Occasionally observed with mate on territory, northeastern Sprague Pool, Necedah NWR.

OM #6: Observed in subadult flocks on West Rynearson Pool, Necedah NWR, on 8 May and northeast of Mauston, Juneau County, on 10 July. Missing left lower tarsus and foot.

OM #11: Occasionally observed with mate, East Rynearson Pool (ERP), Necedah NWR.

OM #14: Occasionally observed with small group of subadults in spring and with mate in summer, ERP.

Cohort 3 no. 2: Occasionally observed with mate, ERP. Sometimes with small number of cranes in nearby Laske Field.

Cohort 3 no. 6: Signal occasionally detected at Bear Bluff, Jackson County.

Cohort 3 no. 7: Regularly observed with mate on territory, ERP.

FALL STAGING

OM #1: Observed with mate on territory until mid-October.

OM #3: Regularly observed in staging flock at Bear Bluff.

OM #14: Observed on main roost on ERP on 6 October.

Cohort 3 no. 2: Regularly observed in staging flock on ERP.

Cohort 3 no. 3: Observed in staging flock northwest of Mill Bluff State Park on 26 October and in staging flock on ERP on 27 October.

Cohort 3 no. 4: Signal regularly detected and bird sometimes seen in staging flock on ERP until 13 November. Signal occasionally detected in cornfield south of refuge. Signal detected at Necedah Lake on 15 October.

Cohort 3 no. 6: Signal regularly detected in staging flock at Bear Bluff until 7 November. On that date she moved to the staging flock on ERP and also used the cornfield south of the refuge. Signal detected until 13 November.

Cohort 3 no. 7: He and mate apparently joined staging flock on ERP and were less frequently observed during daytime on territory. Frequently seen roosting with small number of other cranes just south of territory. No longer observed by 5 November.

FALL MIGRATION

OM #11: Observed at J-P on 31 October.

Cohort 3 no. 4: Signal detected at J-P on 17 November and at northern Hixtown Swamp, Madison County, Florida, on 2-3 December.

SUMMARY AND CONCLUSIONS

Exclusive of one translocation-related mortality in August 2003, survival of the migratory whooping crane flock has been 100% since improved measures to protect juveniles from predators at the winter release pen were implemented in mid-January 2002. With few exceptions, migrations, return to the natal area, and subsequent wintering have been satisfactory. Female distribution in summer is wide, but implications of this pattern are not yet known. Foraging, roosting, and human avoidance behaviors are currently meeting draft behavioral goals.

LITERATURE CITED

Urbanek, R. P., and T. A. Bookhout. 1994. Performance of captive-reared cranes released into a migration route in eastern North America. Pages 121-129 in H. Higuchi and J. Minton, eds. *The future of cranes and wetlands*. Wild Bird Soc. Japan, Tokyo.

ADDENDUM

On 7 February 2004 no. 14-02 left the Hixtown Swamp region in Madison County and returned to the Chassahowitzka pensite. As far as is known, this was her first contact with other whooping cranes since 1 April 2003, when she separated from the flock on the first day of spring migration. She spent last summer in northwestern Illinois, first alone and then later staging and migrating with sandhills. Her appearance increased the number of whooping cranes returning to Chassahowitzka to 15 in winter 2003/04.

APPENDIX A. Whooping cranes in eastern migratory flock, 15 January 2004.

Hatch year	Crane no.	Sex	BBL Band no.	Frequency (MHz) ^a	Color code (left:right) ^b	PTT ID	Studbook no.		
							Own	Sire	Dam
2001	1	M	659-00215	164.516	L G/W:G/R/G		1629	1114 ^c	1119
2001	2	F	659-00201	164.705	L G/W:R		1630	1147	1142
2001	5	M	659-00213	164.556	L G/W:R/G		1633	1147	1142
2001	6	M	none	164.971sol	L G/W:R/G/R		1634	1162	1153
2001	7	F	659-00214	164.354	L G/W:W/R		1635	1127	1154
2002	1	F	599-32111	164.124	L R/W:L G(PTT)	38634	1660	1133	1135
2002	2	F	599-32112	164.144	L R/W:L G/W(PTT)	38635	1661	1133	1135
2002	3	F	599-32116	164.785	L R/W:W/G/W		1662	1114	1119
2002	4	F	599-32117	164.065	L R/W:R/G/W		1663	1114	1119
2002	5	M	599-32118	164.855sol	L R/W:G/R/W		1664	1133	1135
2002	8	M	599-32113	164.535	L R/W:L W/G(PTT)	38636	1668	1144	1136
2002	9	F	599-32127	164.375	G/W:L R/W		1670	1133	1135
2002	11	M	599-32114	164.394	L R/W:L R/G(PTT)	38637	1672	1147	1142
2002	12	M	599-32121	165.671sol	L R/W:W/R/G		1673	1114	1119
2002	13	M	599-32122	164.494	L R/W:G/R/G		1674	1127	1154
2002	14	F	599-32123	164.274	L R/W:G/W/R		1675	1128	1101
2002	15	F	599-32124	164.744	L R/W:W/G/R		1676	1127	1154
2002	16	M	599-32125	164.294	L R/W:R/G/R		1677	1147	1142
2002	17	F	599-32115	164.315	L R/W:L G/R(PTT)	15331	1678	1144	1136
2002	18	F	599-32126	164.335	G:L R/W		1679	1128	1101
2003	1	F	599-34041	164.255	L W(PTT):L G/R	15050	1696	1175	1188
2003	2	M	599-34044	164.356	G/W:L G/R		1697	1133	1135
2003	3	F	599-34056	164.445	L G/R:W		1698	1144	1136
2003	4	M	599-34045	164.475	R/W:L G/R		1699	1144	1136
2003	5	M	599-34046	164.654	W/R/G:L G/R		1700	1147	1142
2003	6	M	599-34047	164.726	G/W/G:L G/R		1701	1133	1135
2003	7	M	599-34048	164.764	R/W/G:L G/R		1702	1133	1135
2003	9	F	599-34042	164.815	L W/G(PTT):L G/R	44263	1704	1144	1136
2003	10	M	599-34049	165.175	W/G/R:L G/R		1705	1175	1188
2003	11	M	599-34050	165.193	G/W/R:L G/R		1706	1127	1154
2003	12	F	599-34043	165.243	L W/R(PTT):L G/R	15330	1707	1133	1135
2003	13	F	599-34051	165.271	R/W/R:L G/R		1708	1133	1135
2003	16	M	599-34052	165.304	R/G/W:L G/R		1711	1144	1136
2003	17	M	599-34053	165.323	W/G/W:L G/R		1712	1144	1136
2003	18	M	599-34054	165.371	G/R/W:L G/R		1713	1147	1142
2003	19	M	599-34055	165.401	W/R/W:L G/R		1714	1147	1142

^a sol = solar/NiCad transmitter.

^b L = long (38mm) bands for transmitter attachment.

^c Sire could be either 1114 or 1144.

Finance and Budget Committee

The mission of the Finance and Budget Committee is to: A) raise funds to meet project needs as determined by each partner and agreed to by the Committee; B) coordinate the development of and reporting against budget of both the total project and grants specified by the project team; and C) coordinate fund raising requests from non-governmental partners to avoid duplicate grant requests to the same potential donors. In addition, the Finance and Budget Committee works closely with the Outreach Committee to plan and implement donor recognition programs.

Included on the Committee are Bob Lange, chairperson (ICF), Jim Harris (ICF), George Archibald (ICF), John Christian (USFWS), Robert Russell (USFWS), Joe Duff (OM), Heather Ray (OM), Beth Goodman (WDNR), Don Waage (NFWF), and Jim Kraus (USFWS). The committee meets once a month via conference call.

Budget

The total direct costs budget for 2003 (new funds required by the various partners) was \$1,203,891 of which 48.4% or \$583,112 was required by private organizations. In addition, capital equipment requirements for the project totalled almost \$205,118 in 2003. By year-end most necessary funding requirements had been met. A last minute need for top net replacement (4 @ \$300 each, \$1,200 total and possible 3 additional nets for \$900 more if supplemental release goes ahead) will need to be addressed in 2004.

We anticipate the budget for 2004 will be slightly less than in 2003. Although more birds are part of the flock and we take in to account a 5% or less inflation rate, capital requirements are predicted to be lower due to several major purchases and donations in 2003. Both state and Federal budgets are tightly restricted due to budgetary restraints in 2004.

More than \$1.5 million has been raised by private organizations for the project in the 1999-2003 period. In addition, a grant from the National Fish and Wildlife Foundation (NFWF) to Necedah National Wildlife Refuge (NWR) contributed \$7,000 for project radio antennae used for tracking. There were several "in-kind" contributions from individuals and corporations. The Necedah Lions Club donated \$1,000 to the whooping crane program through NFWF. Notable contributions are flight time from Windway Capital Corporation assisting in gathering eggs and transporting eggs and chicks between Necedah and Patuxent, use of a 20-foot GMC "Hornet" motorhome by Jane Stedman of Wisconsin, use of one vehicle and radio telemetry tracking equipment for the entire year loaned by the Wisconsin Department of Natural Resources (DNR), 4 trailers and 6 vehicles for 4 months by Necedah NWR including electricity and motor fuel, and more than \$123,548 for non-crane funded project costs for labor, of which \$99,134 was volunteer labor including Friends group, Necedah NWR volunteer staff, the Wisconsin Conservation Corps, interns, and staff from other partners. The remainder was in-kind from permanent refuge staff.

The Natural Resources Foundation of Wisconsin (NRFW) donated a Ford 250 diesel long-bed extended cab 8-cylinder truck to Operation Migration valued at \$29,984.00 and a minivan to International Crane Foundation valued at \$17,805. Other major NRFW contributions included \$3,800 to the Wisconsin DNR for crane travel veterinary support, \$6,000 for DNR minivan instate use for WCEP and migration expenses, and \$2,180 to Necedah NWR for a stationary binocular spotting scope, which is used by the public at the observation tower.

Non-governmental Partner Fund Raising Coordination

We continued in 2003 to follow the procedures established in 2000 to coordinate fundraising efforts. Before communicating with a new potential donor, a partner requests "clearance" from the Budget team. When more than one partner has a previous relationship with a potential donor, or where the donor may have multiple interests in the project, interested partners determined together which partner should make the request, or if there should be a joint request. With a promised 24-hour turnaround between inquiry and decision, the procedure continues to work very well.

Outreach Activities – 2003

Members and Responsibilities:

The Outreach Team comprises public affairs, outreach, environmental education, information and communication specialists. All WCEP founding and state partners have a representative on the outreach team. A majority of the nine founding members of WCEP, as well as several other members, participate regularly in conference calls and meetings.

The outreach team's purpose is to coordinate, plan and create informational materials promoting the project and informing the media, the general public, stakeholders, and project partners on developments and progress made toward the WCEP goal of establishing an eastern North American migrating flock of whooping cranes.

Our goal is to provide accurate and current information on project news and educational opportunities, and to give visibility to the partnership as a whole.

The 2003 WCEP Outreach Team was co-chaired by Joan Garland, education outreach specialist with the International Crane Foundation, and Rachel Levin, public affairs specialist with the U.S. Fish and Wildlife Service, Region 3.

Accomplishments for 2003

Web sites:

Web sites once again proved effective means for getting up-to-date information to stakeholders and the general public. Diminishing on-site media interest during the migration, with increasing general public interest supports Outreach Team projections for shifting toward broadening and deepening our messages through education and general public opportunities, as opposed to relying on media exposure as our primary focus. (See also later section on "Media Interest vs. Public Interest.")

Web-based outreach is becoming more effective. For example, Journey North reported that use of its Web site in December 2003, when the ultralight-led cranes landed at Chassahowitzka NWR, was up by more than 60 percent over the previous December.

These WCEP Web sites received a combined total of 6.1 million hits during calendar year 2003:

- WCEP site: www.bringbackthecranes.org, 74,841
- Operation Migration, Inc.: www.operationmigration.org, 269,366
- International Crane Foundation: www.savingcranes.org, 255,759
- USGS Patuxent Wildlife Research Center: www.pwrc.usgs.gov/cranes.htm, 45,509
- Journey North: www.learner.org/jnorth, 5,526,329

Updated brochure: Produced updated WCEP partnership brochure in four colors for wide distribution to all partners as an information and education tool. (Copy of brochure enclosed in this report) The team distributed additional copies of the WCEP partnership video "Bringing Back the Cranes" (generic version) to all WCEP partners. Sales of the video will benefit a newly established WCEP "video fund" at the National Fish and Wildlife Foundation, and monies in this fund will in turn be used to reproduce more copies of the video. The team developed a small, four-color fundraising insert to be enclosed in each video, so that people can easily contribute to the video fund. (Copy of the insert enclosed in this report)

Staffed WCEP exhibit at the Necedah Crane Festival, Sept. 20, 2003. Attendance was approximately 2,500 people.

Staffed a WCEP booth at the Midwest Birding Symposium in Green Bay, Wis., September 9-11. About 400 people from around the Midwest attended.

Staffed a WCEP exhibit at the 2003 Florida Birding and Nature Festival, Oct. 10 - 12, St. Petersburg, FL. Estimated 315 visitors toured the exhibit.

Staffed a WCEP exhibit at the Colonial Coast Birding Festival, October 10-12 in Jekyll Island, GA. Approximately 450 people attended.

Staffed a WCEP exhibit at the Whittlesey Creek NWR Centennial Celebration, August 9 in Ashland, WI. About 300 people attended.

Assisted with the creation of a WCEP display as part of a new exhibit at the Smithsonian Institution's Museum of Natural History in Washington, D.C. "America's Wildest Places: Our National Wildlife Refuge System," which opened November 7, 2003, celebrates the National Wildlife Refuge System Centennial by examining the pioneering conservation work of the Refuge System during its first 100 years—including Necedah and Chassahowitzka refuges' roles in reintroducing the whooping crane in eastern North America. The WCEP portion of this exhibit includes a 3-minute video and images from the ultralight-led migration. A day-long lecture series in March will give WCEP an opportunity to present one or more speakers.

Reviewed and updated WCEP key messages for education and outreach activities.

Refined the Outreach Team budget for 2003, prioritized budget requests and obtained funding for a number of high-priority projects, including the revised brochure and reproduction of the video.

Fulfilling one of the team's goals for 2003, state partners played a much more visible role in outreach efforts this year, especially during the migration. Nearly every flyway state issued at least one press release, most doing so as the birds crossed their borders. States added quotes from their own natural resources agency heads and distributed these releases to their media lists and on their Web sites. For 2003, WCEP provided the templates for these releases and encouraged our state partners to customize them.

The outreach team distributed nine press releases and media alerts marking WCEP milestones throughout the year and inviting the media to public events, including the arrival of crane chicks at Necedah to begin training, the departure of the new ultralight-led class from Necedah and the successful unassisted migrations of the classes of 2001 and 2002.

(Top to bottom: Molly Mehl (I) and Joan Garland at the Midwest Birding Symposium; John Christian works the crowd at the Florida arrival event; spectators await the flyover at the Crystal River mall.)



Media Relations

Despite the fact that WCEP is in its third year of reintroductions and therefore the project may be considered to have less “news value,” media interest in the project and partners remained strong throughout 2003. (See also next section, “Media Interest vs. Public Interest”) Media interest peaked during the ultralight-led migration, October through December but there was also steady coverage of the spring return of wild cranes, the summer training at Necedah and the fall migration of the wild cranes.

Highlights of media coverage during 2003:

- During the 2003 project year, WCEP partners responded to an estimated 300 media inquiries. Many media representatives were accommodated at the Necedah and Chassahowitzka blinds, and along the migration route at public flyovers and other stopovers.



- The U.S. Fish and Wildlife Service contracted with the public relations firm of D.J. Case and Associates to place refuge-oriented stories in 2003, the Centennial year for the refuge system. A Case staff member worked with media in major markets along and near the migration route to place stories focusing on the National Wildlife Refuge System’s role in WCEP. She was successful in garnering both on-site coverage and media hits in outlets from Milwaukee to Indianapolis to Louisville, and in outlets further a field such as Cincinnati.

2003 Media Coverage

The following represent known media inquiries/coverage for 2003. In most cases it does not include coverage where WCEP was not the focus of the story. WCEP was mentioned (by name and not by name) in many more articles about whooping cranes, ultralights and endangered species conservation.

Key:

Bold text indicates the number of stories produced or used by the individual media outlet (if more than one). "AP" after an entry denotes media outlet used an Associated Press report one or more times.

Adair Progress/Columbia News (KY) x2	Indianapolis Star (IN) x12
Aero magazine	Island Magazine (CA)
Aero-News Network	Juneau County Star-Times (WI) x3 AP
Associated Press (AP), various bureau offices produced multiple reports	Juneau County Visitor Guide (WI)
Atlanta Journal-Constitution (GA)	Kankakee County Farm Bureau (IL)
AVWeb	Kentucky Afield radio and TV
Awake! magazine	KnowNews
Baraboo Republic (WI) x2	Knoxville News Sentinel (TN) x2
Bay News 9 TV, Tampa (FL) x3	KZIM Radio, Cape Girardeau (MO)
Bedford Times-Mail (IN)	LaCrosse Tribune (WI) x12
Birders World magazine	Lafayette Journal and Courier (IN)
Birdscapes (USFWS/Canadian Wildlife Service)	Lake Geneva Register News (WI) x2
Birmingham Register (AL) AP	Lakeland Ledger (FL) AP
Bloomington Herald-Times (IN) x4	Land Letter
Bradenton Herald (FL) AP	Louisville Courier-Journal (KY) AP
Burlington Times-News (NC)	Madison Courier (IN) AP
Canadian Geographic magazine and television	Marquette Public Radio (MI)
Capital Times, Madison (WI) x3 AP	Marshall County Journal (SD)
Channel 9 – CHAT (TN)	McLean's Magazine (Toronto, ON)
Chattanooga, (TN) x8	Meadowlark, Journal of Illinois Birds
Chicago Sun-Times	Metro Networks (IN) x3
Chicago Wilderness magazine (IL)	Miami Herald x2 AP
Christian Science Monitor (MA)	Midwest Airlines magazine
Cincinnati Enquirer (OH) x2 AP	Milwaukee Journal Sentinel (WI) x9
Citrus County Chronicle (FL) x9	Minneapolis Star-Tribune (MN) AP
Columbus Ledger Inquirer (GA)	Minnesota News Network (MN)
Columbus Republic (IN) x2	Mobile Register (AL) AP
Commercial Appeal, Memphis (TN)	Monroe County Democrat (WI)
Compass, Chicago Audubon Society (IL)	Mooresville Reporter-Times (IN)
Congressional Green Sheets	Naples Daily News (FL) AP
Dallas Morning News (TX) x2	National Wildlife magazine, World Edition (National Wildlife Federation)
Dawson News (GA)	Oak Ridger (TN) x2
Discovery Canada	Pilot-Independent (MN)
Elkhart Truth (IN) x3	Progressive, Muscoda (WI)
Evansville Courier and Press (IN) x2	Purdue University (IN)
Eyewitness Kids News	Rail Communities Messenger (WI) x15
Fish and Wildlife News (USFWS)	Rockport Pilot (TX)
Fort Wayne News-Sentinel (IN)	San Antonio Express News (TX)
Fort Worth Star Telegram (TX) AP	Sarasota Herald-Tribune (FL) x4 AP
Fort Myers News-Press (FL) x2 AP	Seymour Tribune (IN)
Freelancer of Ireland x2	Shelbyville News (IN)
Gainesville Sun (FL) x2 AP	Sioux Falls (SD) Argus LeaderSouth 107 Radio, Rome (GA) x3
Georgia Public Television	South Florida Sun-Sentinel (FL) x4 AP
Great Lakes Radio Consortium	South Jetty, Mustang Island (TX)
Green Bay Press Gazette (WI) x3	Springfield Sun (KY)
Greensburg Daily News (IN)	St. Augustine Record (FL)
Herald Times, Bloomington (IN) x5	St. Paul Pioneer-Press (MN) x5
HMS Historical Transportation Foundation (IL)	St. Petersburg Times (FL) x12
Houston Chronicle (TX) AP	State College Centre Daily (PA) wire service
Huntsville Times (AL) AP	

Tallahassee Democrat (FL) x3 AP
Tampa Tribune (FL) x6
Tennessean, Nashville (TN) x2
Tennessee Conservationist
TheOmahaChannel.com (NE)
Tomah Monitor-Herald (WI) x6
Ultramarathonworld.com
USA Today
WALB-TV, Albany (GA)
Washington Post (DC) AP
WAVE TV, Louisville (KY) x3
WCJB-TV 20 News (FL) AP
WCPO-TV, Cincinnati (OH) AP
WFAA-TV, Dallas (TX)
WFIU, public radio, Bloomington (IN)
WGN radio, Chicago x3
WHAS-TV, Louisville (KY) AP
WHBY Radio, Appleton (WI)
Wiedza I Zycie magazine (Poland)

Wilmington Star News (NC)
Wisconsin Public Radio x3
Wisconsin Rapids Daily Tribune (WI) x14*
Wisconsin State Journal, Madison (WI) x6 AP
WJXT- TV, Jacksonville (FL) – AP
WKBT-TV, La Crosse (WI) x2
WKOW-TV, Madison (WI)
WLKY-TV, Louisville (KY)
WNEG-TV (GA)
WOSH Radio, Oshkosh (WI)
WRCB-TV, Chattanooga (TN)
WSPT Radio, Stevens Point (WI) x6
WTEV-TV, Jacksonville (FL) AP
WTHR-TV, Indianapolis (IN)
WTMJ radio (WI)
WTSP-TV, Tampa-St. Petersburg (FL) x7
WUFT, Mid-Florida Public Radio, Gainesville (FL) x13
WVLT-TV, Louisville (KY) x3

*articles that appeared in this newspaper also may have appeared in one or more of the following Wisconsin papers: Appleton Post-Crescent, Green Bay Press-Gazette, Fond du Lac Reporter, Oshkosh Northwestern, Manitowoc Herald Times Reporter, Marshfield News Herald, Sheboygan Press, Stevens Point Journal and Wausau Daily Herald.

Media Interest vs. Public Interest

At the beginning of the reintroduction project, the WCEP Outreach Team chose to focus its efforts on raising media awareness and interest on the reintroduction. This made sense as a cost-effective way to reach both our key stakeholders and the general public. The team's attention was focused primarily on meeting the needs of various media outlets. This effort paid large dividends during the sandhill crane experiment and the two subsequent whooping crane reintroductions in 2001 and 2002. On-site media interest was extremely high despite world events and economic trends. Public awareness of the project and its partners skyrocketed as a result of this early effort.

While the team's early efforts were focused on media outreach, plans were also being formulated to begin shifting the focus to our public and private stakeholders and the general public. As media interest begins to wane (originally expected to begin in year three of whooping crane reintroduction), the team identified the need to build on the public awareness and interest created by the earlier media frenzy of coverage.

In 2003, the team noted media interest remained high in 2003. However, media on-site access requirements have been replaced by an increasing number of telephone and e-mail interviews. Major market, and many smaller market, outlets have the project b-roll tapes and CD-ROMs, as well as their own archive video/photos upon which to build reports. Telephone interviews allow them to update information and get sound bites without the need to commit resources to travel to the migration's remote locations.

Simultaneously with the marked reduction in on-site media interest has been a phenomenal increase in public interest in the project: its partners and the birds. This interest is most clearly reflected in the increased traffic to project-related web sites. No place is this increase more notable than with project education partner Journey North, whose 2003 Web site activity nearly doubled that of the 2002 migration, and represented a 375 percent increase over the first year. (See Education Section for details.)

In addition to this, outreach team partners, including Operation Migration, International Crane Foundation, Wisconsin DNR, and U.S. Fish and Wildlife Service refuges in Florida and Wisconsin, increased the educational outreach effort throughout the 2003 migration cycle. Presentations to schools, civic groups, and other private organizations increased dramatically in 2003. (See Presentation Section for details.)

The outreach team will continue building on this phenomenal interest by researching and developing new and innovative outreach tools and methods. We will also actively encourage project partners at all levels to expand on the successes of the project to date, and broaden their outreach effort to local communities, as well as traditional and non-traditional stakeholder groups.

Environmental Education

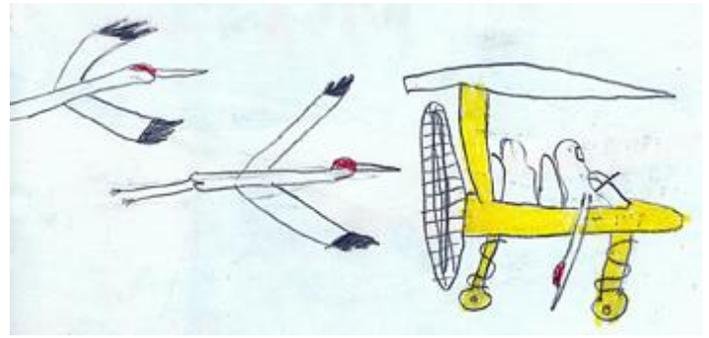
- Environmental education accomplishments in 2003 involved the continued partner arrangement with Journey North to extend educational outreach efforts into schools throughout North America. Journey North is an internet-based education project that links students across North America to track wildlife migration and seasonal change. Now in its 11th year, Journey North reaches 11,000 schools and 540,000 students, and is the nation's largest "citizen science" project specifically for children. (Journey North's work has been featured on the NBC, ABC and CBS national news, USA Today, the Washington Post, the Boston Globe, and other publications in the U.S., Canada and Mexico.) Through Journey North's website, students and teachers track the WCEP cranes' status and general locations through the fall and spring migrations.
- This year, the Outreach Team contacted approximately 1,225 registered Journey North teachers in the Eastern flyway states prior to migration. The teachers were informed of WCEP's educational offerings, including the opportunity to have a member of WCEP present a program at their school. Through these contacts, we were able to reach more schools during the migration. An additional member of the Outreach Team accompanied the migration to provide education programs to these schools. See table on next page for number of students contacted.
- WCEP partners including the International Crane Foundation, Operation Migration, Wisconsin Department of Natural Resources, and the U.S. Fish and Wildlife Service provided environmental education outreach programs to adults and children throughout the Eastern flyway and other states. These programs were given during migration and throughout the year to schools, universities, conservation and birding clubs, civic organizations, home school groups, government agency staff, and museum visitors.



Environmental education programs in 2003 reached more than 15,000 adults and children in 14 states and Canada. This represents an increase of 11,500 people from last year. The following table provides a breakdown of numbers of adults and students reached by WCEP education programs in 2003:

State	Adults	Children	Total
WI	1,648	1,661	3,309
IL	348	2,800	3,148
TN	587	1,751	2,338
FL	1,295	588	1,883
IN	85	895	980
KY	55	850	905
GA	70	375	445
TX	400	775	1,175
CA	320	0	320
AZ	300	0	300
KS	112	0	112
WV	55	0	55
MI	50	0	50
OR	36	0	36
Port Perry, ON	0	36	36
TOTAL	5,361	9,731	15,092

- WCEP booths at festivals in Georgia, Tennessee, Texas, Florida and Wisconsin reached an additional 23,000 people, including 2,500 people at the Necedah Whooping Crane Festival. WCEP partners represented at this festival included Operation Migration, U.S. Fish and Wildlife Service, International Crane Foundation, USGS Patuxent Wildlife Research Center, Natural Resources Foundation, and the Necedah National Wildlife Refuge.
- Visitors to the International Crane Foundation and the Necedah National Wildlife Refuge received WCEP education programs included with their tour.
 - Programs at the International Crane Foundation reached 26,000 visitors.
 - Programs at the Necedah NWR reached an estimated 17,750 people.
 - Visitation in 2003 at Chassahowitzka NWR was 3,944 people. The Chassahowitzka visitor center is staffed by volunteers who are knowledgeable advocates for WCEP.
- A small but dedicated group of people returned to Necedah NWR each day for more than a week as departure was delayed by weather, finally witnessing lift-off on October 16. On October 26, just outside of Chicago at the Northview Square Mall in Kankakee, about 25 spectators showed up for a flyover-- an impressive figure for an early Sunday morning. Approximately 300 spectators ventured out in the frost to Muscatatuck NWR as the cranes and planes left Indiana in early November.
- Approximately 1,000 people observed the arrival-day flyover in Crystal River, Florida. Many stayed to hear an informative talk and project summary by WCEP partners from U.S. Fish and Wildlife Service, Operation Migration, International Crane Foundation, and volunteers of the Chassahowitzka National Wildlife Refuge. The Friends of the Chassahowitzka National Wildlife Refuge, volunteers from Chassahowitzka NWR, and the Citrus County Chapter of the Audubon Society volunteered their time to coordinate this event.



Recognition & Awards

The U.S. Secretary of the Interior, Gale Norton, bestowed the Department's highest award for partnerships to WCEP in 2003. The Secretaries 4 C's Award (Consultation, Cooperation, Communication, Conservation) was inaugurated this year and the WCEP partnership was the first recipient. The award was presented by John Christian, U.S. Fish and Wildlife Service on behalf of the Secretary to the WCEP partners in a ceremony at the International Crane Foundation.

In June, Operation Migration received the silver award in the category of "Rehabilitation and Restoration" during the annual Canadian Geographic sponsored contest. Joe Duff and others, including former volunteer Deke Clark who is well on his way towards recovery from stroke, attended the Canadian Environmental Awards gala event June 2nd in Toronto, Ontario.



Operation Migration was selected from over 150 nominees to receive the award. Joe Duff and Bill Lishman, co-founders of OM, each received one of sixteen 2002 Conservation Achievement Awards presented by the National Wildlife Federation at a ceremony held in Washington, DC in May 2003. The two received their Special Achievement Awards for their "Extraordinary Contribution to the Conservation of Wildlife and Natural Resources."

In recognition of WCEP's efforts, Frank and Mariana Weinhold donated three of five signed, limited edition art prints made from Victor Bakhtins' painting titled "Whooping Crane Eastern Partnership Inaugural Wisconsin -Florida Flight, October 2001" to the International Crane Foundation, Operation Migration and the Wisconsin Department of Natural Resources. The Wisconsin Natural Resources Board gratefully expressed appreciation for this gift and provided recognition at its April 2003 meeting.