Whooping Crane Eastern Partnership

2015 Condensed Annual Report

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INTRODUCTION

OPERATIONS TEAM

Sarah Warner, U.S. Fish and Wildlife Service
Davin Lopez, Wisconsin Department of Natural Resources

Each WCEP operational team has co-chairs. These team leaders make up the Operations Team. Project decisions that cannot be made within a team or between teams are made by the Operations Team. Beginning in 2015, the Operation Team is attempting to have more input and discussion between teams in order to capitalize on each team's strengths and expertise. The Operations Team Co-chairs are also charged with updating the Guidance Team on the project needs, operations, and decisions. Beginning in 2015, to help facilitate communications between the Guidance Team and the Operations Team, the Operations Team Co-chairs sit in on the monthly Guidance Team calls. If the Operations Team is unable to come to agreement on a decision that involves multiple teams, they seek the support of the Guidance Team. In 2015, the Operations Team accomplishments include:

- Monthly conference calls to discuss project operations held on the third Tuesday of each month; summary notes of the call are posted to the WCEP Google Drive.
- 2014 WCEP Annual Report was drafted by Operational Teams Co-chairs; compiled by the Communications and Outreach Team; reviewed and edited by the Operations Team and Guidance Team; finalized and posted on the BringBacktheCranes.org website in May. Drafting of 2015 Annual Report was initiated in February. 2016.
- Beginning the process of writing a 5-Year WCEP Implementation Plan that will expand on the upcoming WCEP 5-Year Strategic Plan. This plan purpose is to more fully integrate the WCEP teams in order to facilitate communications and cooperation between teams.

REARING & RELEASE TEAM

Jonathan Male, USGS Patuxent Wildlife Research Center
Marianne Wellington, International Crane Foundation

Fourteen costume-reared young whooping cranes (6 ultralight-led (UL) and 8 modified Direct Autumn Release (mDAR) were released in the Wisconsin Rectangle in 2015, bringing the total to 71 birds released since 2011. We had hoped to meet the minimum release number of 15 suggested by the 2012-13 Structured Decision Making Workshop, however, one chick was pulled from the aircraft led project in order to accommodate minimum numbers for the Louisiana Release Program. Overall the 2015 releases were successful with all 2015 chicks being soft released at St. Marks NWR in Florida or Horicon NWR, WI. All of the 8 mDAR birds migrated south without human assistance.

Release Projects

Ultralight-led Led Migration

Seven chicks were originally trained for the ultralight Program. One chick was transferred to the Louisiana Non-migratory Release Program because of the high mortality of developing eggs during incubation at Patuxent.

Through the generosity of Windway Capital Corporation, 6 chicks were shipped to Wisconsin on July 2nd. The average age of the chicks at shipping was 54.7 days of age (SD±2.9 days, range 52-60 days of age). The 6 birds spent 89 days acclimating to the introduction site at White River Marsh State Wildlife Area. They fledged as a group on July 31st at a mean age of 83.8 days. They were trained with the aircraft on 53 mornings. The 6 birds began migration on September 30th, 2015. They covered 1082.4 statute miles in 32.5 hours of flying, making 20 stops on private land. The migration was completed on February 6th, 2016 when the birds arrived at St. Marks NWR. The 2015-16 ultralight migration was the longest ever, totaling 115 days not including breaks for Christmas holidays and the January WCEP meeting in WI. The long delays were a result of unusual and consistent winds from the south, driven by what was reported as one of the strongest El Niño events on record. Despite the long delays at stopovers, Operation Migration was able to encourage the birds to follow the ultralights. Long range forecasts of high winds prompted the team to transport the birds the last 23 miles to St Marks rather than keeping them penned longer than necessary.
The birds were held in a top-netted pen until they were banded February 9th and released on February 13th, 2016 into the large 4 acre pen.
In the January 2016 WCEP meeting held at the International Crane Foundatio, it was communicated by the USFWS that there would be no more Whooping Crane ultralight-led migrations.

Modified Direct Autumn Release

Eight costume-reared chicks were transferred to Horicon as part of the mDAR project. 2015 was the second year that chicks remained at the International Crane Foundation until fledging and then moved to the holding pen on the Horicon National Wildlife Refuge. The situation at Horicon was the best since the program moved there. The temporary holding pen was in close proximity to a roost site used by 18-11 and lots of Sandhill Cranes, geese, and ducks. This allowed the young Whooping Cranes to acclimate to the roosting marsh (Stony) and roost with the Whooping and Sandhill cranes at night. On October 22nd the chicks were banded. It took 12 days after banding for them to return to a pattern of flying to the roost to join the wild cranes. On November 3rd they decided to roost in the marsh, and this was considered the day of release. Costume caretakers no longer visited the pen or attempted to interact

with the chicks. The gates on the pen were left open and food was no longer provided to the chicks. The chicks were observed interacting with Sandhill Cranes and Whooping Crane #18-11 in Stony as well as flying off the Refuge to forage. Three chicks migrated with Sandhill Cranes. Of these 3, only 1 bird was outfitted with a remote-tracking device (GSM). This chick migrated to central Florida. One chick was last observed at Jasper-Pulaski and the 3rd chick was last seen the day she started migration. The remaining 5 chicks stayed north of the Refuge until late December when they started their migration. Four of these chicks remained together and are wintering along the Mississippi River spending time between Missouri and Illinois. One chick, 65-15, left the group of 5 when they were in northern Illinois and migrated to Goose Pond Wildlife Area, IN with Sandhill Cranes. Since then she has been observed with a pair of Whooping Cranes.

MONITORING & MANAGEMENT TEAM

Davin Lopez, Wisconsin Department of Natural Resources
Anne Lacy, International Crane Foundation

In 2015, the majority of the older Whooping Cranes in the Eastern Migratory Population (EMP) summered in Wisconsin, in or around Necedah National Wildlife Refuge, Horicon National Wildlife Refuge, or White River Marsh State Wildlife Area (Figure 1). However, there was some considerable wandering by the yearling (hatch year 2014) cohort. Notable monitoring and management related information in 2015 included:

- In 2015, male 16-11 mated with a female Sandhill Crane near Horicon NWR. Their offspring was the first known Whooping Crane-Sandhill Crane hybrid or "whoophill" in the Eastern Migratory Population (EMP), though these crosses have been recorded elsewhere. On July 22nd the U.S. Fish and Wildlife Service (FWS) staff captured the hybrid chick from the wild and moved it to Milwaukee County Zoo. After a short time in captivity there he was moved to the International Crane Foundation where he is now being socialized with a female Sandhil Cranel who was raised by Whooping Cranes and recently lost her Whooping Crane mate.

- Fourteen mortalities were recorded in 2015: 9 in Wisconsin, 4 in Florida, 1 in Indiana.

- There were 24 chicks hatched from 37 nests (32 on Necedah NWR, 5 in other areas). There were 27 separate nesting pairs, 10 of which renested (including all 8 nests in the forced renesting experiment). Three chicks fledged, 2 of which migrated successfully and are currently with their parents on their wintering grounds.

Winter 2014/2015

The final wintering locations of the EMP were as follows (not including the 8 Ultralight cranes released in 2015 at St. Mark's National Wildlife Refuge).

- Indiana - 23
- Kentucky - 6
- Tennessee - 10
- Alabama - 35
- Georgia - 2
- Florida - 7

Captures and Banding

- The Whoophill chick was caught by USFWS staff on July 22nd and was housed temporarily at Milwaukee County Zoo. The Whoophill is now permanently housed at the International Crane Foundation (ICF). International Crane Foundation staff are attempting to pair him with a Sandhill Crane that was raised by Whooping Cranes.
- Parent-reared male 20-15 was reported being alone in highly populated area in Dubuque, IA. When it became clear he would not move on his own and was getting too close to humans and cars, WCEP personnel captured him and released him in Spring Green near 14-15, another parent reared chick. 20-15 subsequently migrated, possibly alone, straight south to Louisiana, where he spent the winter. To our knowledge, he never encountered any of the Whooping Cranes in the Louisiana Non-Migratory Population.
- Wild-hatched chick W3-15 was captured and banded on August 20th by Necedah NWR staff.

Winter 2015

- The maximum population size as of 31 December 2015 was 100 birds (52 males, 46 females, 2 unknown). This estimate does not include the 2015 Ultralight Cohort as they have not been released at St. Marks as of the end of 2015.
- Distribution as of early 2016 (Figure 2)
    - Alabama - 14
    - Indiana - 38
    - Illinois - 16
    - Florida - 12
    - Georgia - 2
    - Kentucky - 5
    - Tennessee - 2
    - Louisiana - 1
    - Unknown - 10

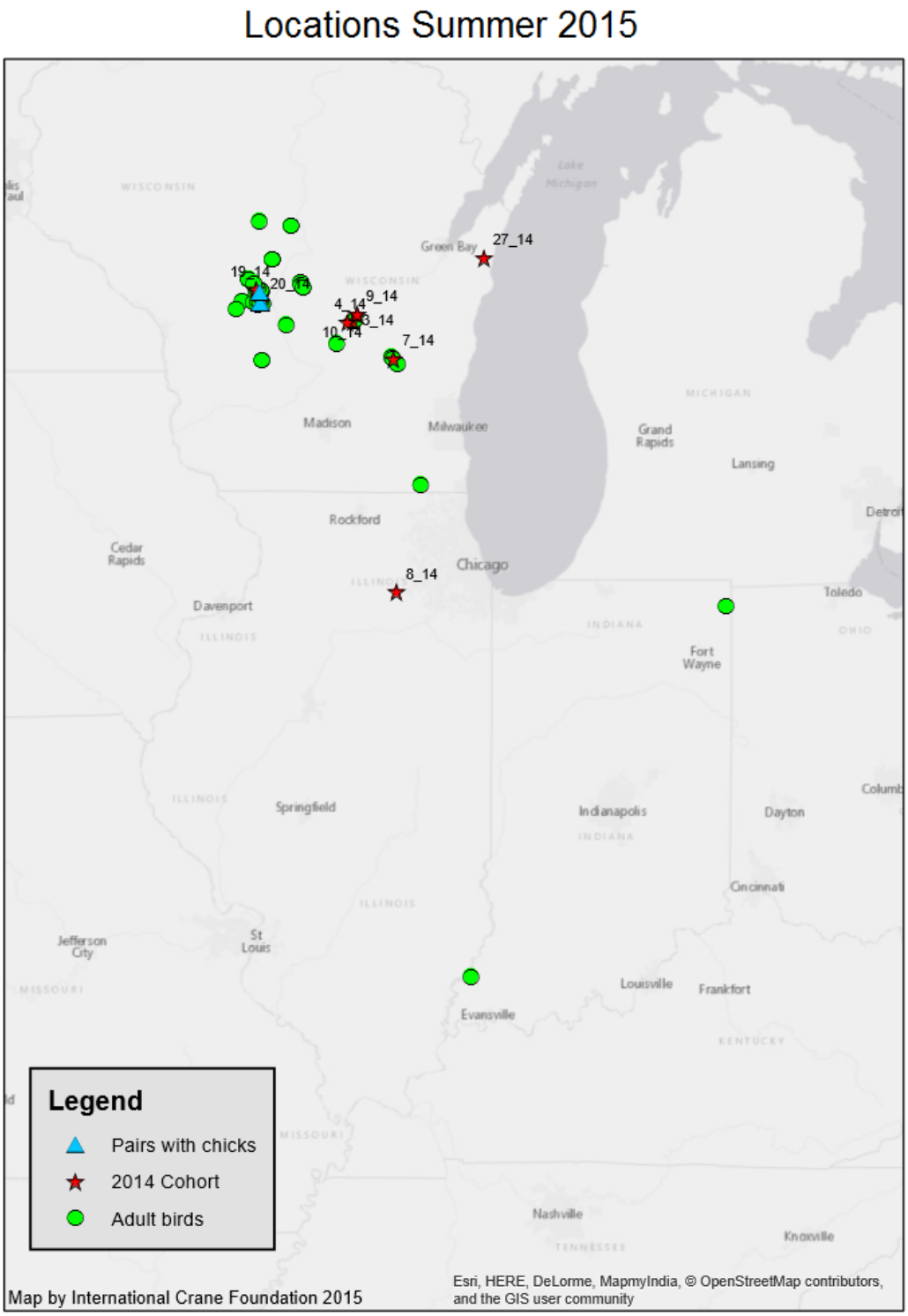


Figure 1. Summer whooping crane locations in Wisconsin, Indiana, and Illinois in the summer (July-August) of 2015. Distribution was primarily focused in Necedah National Wildlife Refuge and the Wisconsin Rectangle.

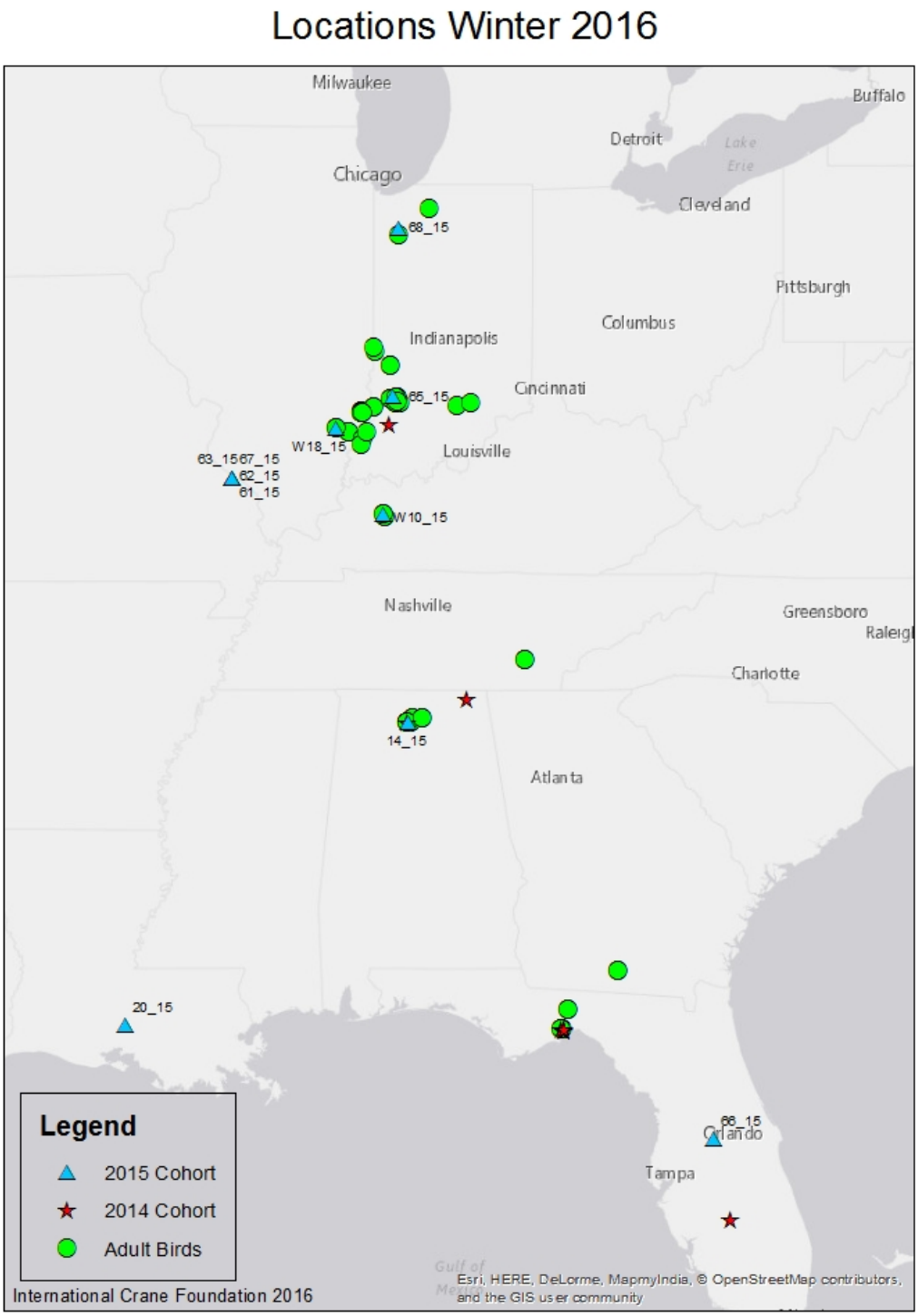


Figure 2. Winter EMP whooping crane locations as of December 31, 2015 or last report. EMP cranes continue to utilize areas throughout the Midwest and Southeast in winter.

Survival

- As of 31 December 2015, 250 Whooping Cranes have been released as juveniles since the reintroduction began in 2001. This number does not include the 17 HY2006 ultralight-led juveniles that died during confinement in a storm and one HY2007 ultralight-led juvenile that was removed from the project prior to release. It also does not include the six HY2015 ultralight-led juveniles still on migration at the end of 2015. In addition, there have been ten wild hatched chicks that survived to fledging (one in 2006, two in 2010, one in 2013, one in 2014, and three in 2015) resulted in a grand total of 260 reintroduced individuals (Figure 3), of which 100 (38.5%) may currently survive (Figure 4) in the EMP.
- There were 14 mortalities recorded in 2015:
    - 8-13: 5 January, Wakulla Co, FL – Euthanized
    - 7-13: 5 January, Wakulla Co, FL – Predation
    - 2-13: 5 January, Wakulla Co, FL – Predation
    - 2-14: 15 March, Wakulla Co, FL - Predation
    - 14-09: 17 April, Gibson Co, IN – Predation
    - W3-14: 22 April, Juneau Co, WI – Unknown
    - 26-07: 5 May, Juneau Co, WI – Unknown
    - 57-13: 10 May, Fond du Lac Co, WI – Unknown
    - 20-11: 19 June, Green Lake Co, WI – Unknown
    - 6-09: 24 June, Juneau Co, WI – Unknown, possible collision (molt)
    - 7-12: 5 July, Juneau Co, WI – Unknown
    - 22-13: 10 September, Juneau Co, WI – predation (molt)
    - W3-15: 21 September, Juneau Co, WI – disease (pneumonia caused by *Aspergillus fumigatus*)
    - 16-15: 6 October, Juneau Co, WI – Predation

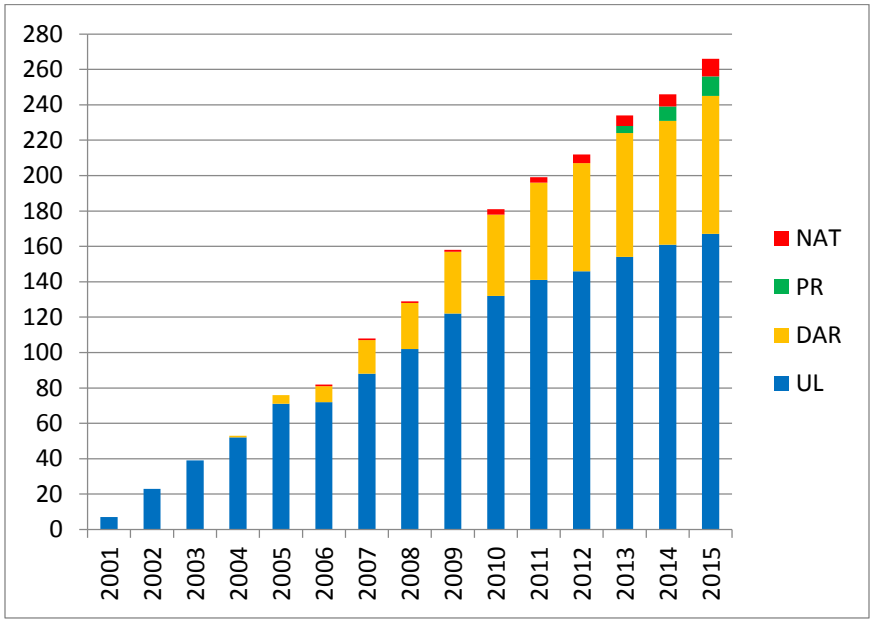


Figure 3. Cumulative number of cranes added to EMP: 266 (includes 2015 UL Cohort)

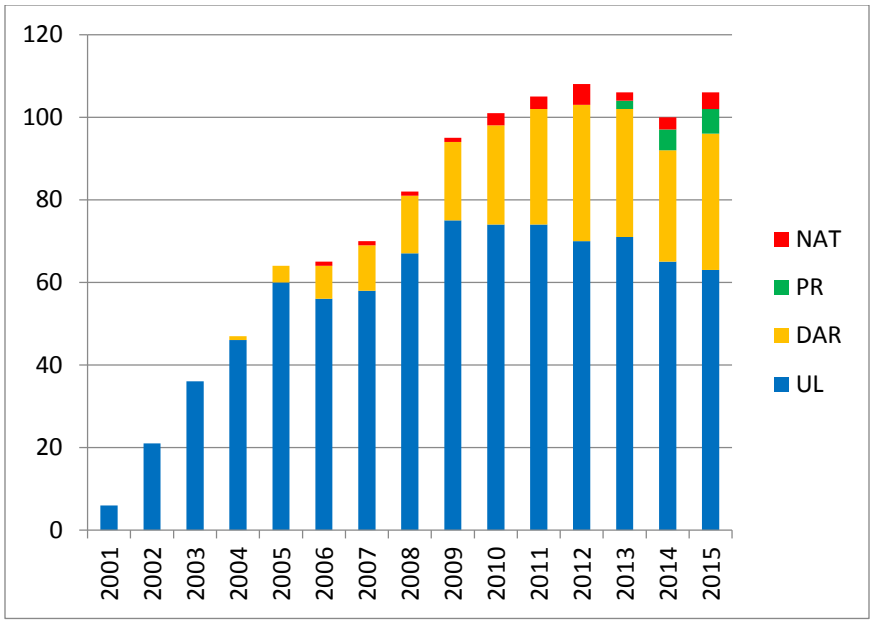


Figure 4. Population size at end of the year: 100 birds (52 males, 46 females, 2 unknown) as of 31 December 2015 (includes 2015 UL Cohort)

Reproduction

- Thirty-seven nests were initiated by 27 pairs (32 at Necedah NWR, 5 off refuge). Eight of the 10 renests were part of the forced renesting experiment conducted by the USFWS to try to mitigate the effects of blackflies on the breeding success of Whooping Cranes. All pairs whose eggs were taken for the experiment did renest and successfully hatch chicks, though only one of the renest chicks survived to fledging. In total, 24 chicks hatched and 3 fledged. Two wild-hatched chicks (W10-15 and W18-15) successfully migrated with their parents and are currently on wintering grounds.
- In addition to these Whooping Crane pairings, male 16-11 paired and nested with a Sandhill Crane, both the first successful nest at Horicon NWR and the first Whoophill in the EMP. This chick was removed from the wild and placed in captivity (see above, "Captures and Banding" section).
    - To date in the EMP there have been a total of 197 nests (161 first nests, 36 renests) leading to 64 chicks hatched in the wild and 10 fledged chicks (Tables 1 and 2). Currently, four of these survive in the wild.

Table 1. Nest initiation dates, number of nests, number chicks hatched, and number of chicks fledged 2005-2015

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
First Nest Initiation	16-Apr	5-6-Apr	03-Apr	07-Apr	02-Apr	<1 Apr	3-4-Apr	<26-Mar	15-Apr	07-Apr	1-3-Apr	
# First Nests	2	5	4	11	12	12	20	22	21	25	27	161
# Renests	0	1	1	0	5	5	2	7	2	3	10	36
Total Nests	2	6	5	11	17	17	22	29	23	28	37	197
# Hatched	0	2	0	0	2	7	4	9	3	13	24	64
# Fledged	0	1	0	0	2	0	2	1	1	1	3	11

Table 2. Pairs that have successfully fledged chicks with years of fledging

Dam	Sire	Year(s)		
11_02	17_02	2006		
2_04	9_03	2010	2013	2015
12_02	19_04	2010	2012	2014
13_03	9_05	2012		
17_07	10_09	2015		
25_09	2_04	2015		

RESEARCH & SCIENCE TEAM

Sarah J. Converse, USGS Patuxent Wildlife Research Center
Bradley N. Strobel, Necedah National Wildlife Refuge

INTRODUCTION

Prepared by Sarah J Converse, USGS Patuxent Wildlife Research Center

The WCEP Research and Science Team (RST) is a venue for scientists from Partner organizations and from outside the Partnership to collaborate on identifying high priority uncertainties, advancing efforts to address these uncertainties, and providing peer feedback on research proposals and products. The 2015 RST annual report highlights major areas of RST focus in 2015.

We also report on the WCEP Science Reboot. In March 2015, we held the Reboot at the International Crane Foundation. In this meeting, we brought together experts from inside and outside WCEP, with the goal of revising and prioritizing hypotheses about the causes of reproductive failure in this population. Given all that we have learned in the past several years, 2015 seemed to be an opportune time to revisit the vision for how research and science efforts can contribute to solving the major challenge of this reintroduction effort.

With the upcoming changes planned in the reintroduction effort – namely the decision to terminate ultralight-led migrations and to focus more intensely on increasing the amount of contact young birds have with adult birds – there will be many new opportunities to address priority uncertainties. In the next few years, we will have the opportunity to address major questions about Whooping Crane reintroduction, and answers to these questions will be critical to the future of any Whooping Crane reintroduction effort.

WCEP SCIENCE REBOOT

Prepared by Sarah J. Converse, USGS Patuxent Wildlife Research Center

In March 2015, the WCEP Research and Science Team organized a meeting of experts to identify hypotheses for nest failure, and associated management approaches conditional on each hypothesis. In August, a subset of the experts participated in an elicitation process to develop predictions about how management actions would perform, conditional on hypotheses, for nest survival and chick survival. We used value of information methods to calculate improvement in management outcomes expected from resolving uncertainty.

In the short term (3-year time scale), results indicate that valuable hypotheses to resolve to improve nest survival include the black fly, genetic structure, and costume rearing hypotheses. For chick survival, the predator, lack of experience, and genetic structure hypotheses are most valuable to resolve. In the longer term (10-year time scale), valuable hypotheses to resolve to improve nest survival include the genetic structure and black fly hypotheses. For chick survival, the genetic structure and predator hypotheses are most valuable to resolve.

These results indicate that ongoing testing of the costume rearing hypothesis is warranted (this is the goal of the parent-rearing project), as is continued investigation of environmental factors affecting nest survival (e.g., the predator hypothesis for chick mortality, which is being investigated by Brad Strobel). In the long term, however, testing the genetic structure hypothesis also appears to be warranted. The RST has continued to advocate for testing the captive selection hypothesis, which hypothesizes that captive genetic selection has resulted in heritable, non-adaptive changes in animals released to the Eastern

Migratory Population. In 2014-2015, the RST reviewed a proposal for release of wild-sourced individuals into the population, which was developed with the goal of testing this hypothesis. The International Whooping Crane Recovery Team has now become involved in this effort through their ongoing recovery planning effort.

BREEDING ECOLOGY AND MANAGEMENT RESEARCH ON NECEDAH NWR

Prepared by Bradley N. Strobel, Wildlife Biologist, Necedah National Wildlife Refuge, 11385 Headquarters Road, Necedah WI 54646

Forced Renesting

In 2014, we implemented the first year of a 3-year program of forced-renesting to assess the method's ability to increase the reproduction of Whooping Cranes in the EMP. The project was funded with a U.S. Fish & Wildlife Service Cooperative Recovery Initiative grant. Our objectives were to (1) determine if egg salvage-induced nest failure can increase the population's renesting propensity, (2) quantify and compare the reproductive success (i.e., hatch rate, fledging rate) of forced renests, natural renests, and first nests of Whooping Cranes and (3) evaluate the financial costs and the biological benefits to the population of the forced-renesting management action to inform future decisions about if and how the strategy should be implemented on an operational basis.

During April and May 2015, Whooping Cranes initiated 21 first-nests and 10 second-nests on the Necedah NWR, and 27 first-nests population wide, including areas outside of Necedah NWR (Figure 1). On 16 April 2015, we collected 15 eggs from 8 nests, and transferred them to the International Crane Foundation, and subsequently to the USGS Patuxent Wildlife Research Center in Maryland. Of the 8 nests subjected to forced renesting, 100% of these pairs renested. We monitored black fly abundance periodically throughout the summer using artificial nests but detected far fewer black flies than during similar efforts in 2014 (Figure 1). This may have contributed to the higher than usual apparent nest survival rates for control nests in the EMP (control nests were those 21-8 = 13 nests on Necedah NWR that were not subjected to forced renesting; Table 1).

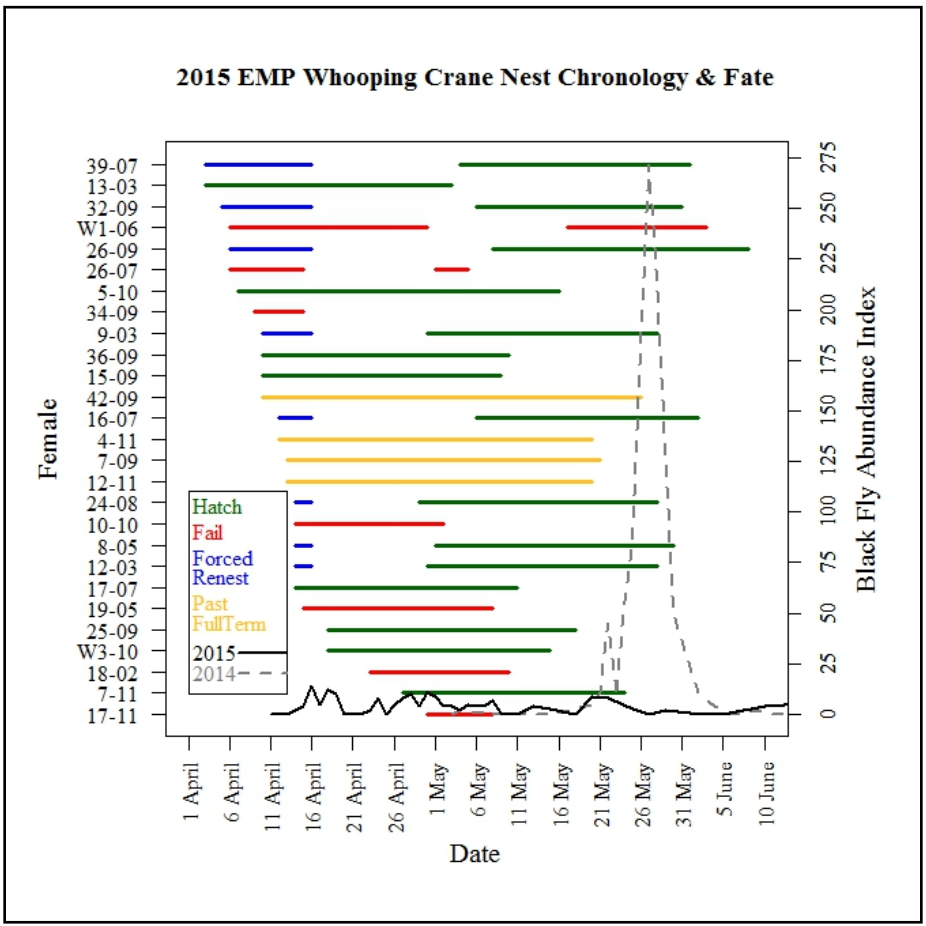


Figure 1. Whooping Crane nest chronology and fates during the spring of 2015 on the Necedah NWR. Colored bars indicate the period of activity for each Whooping Crane nest. Green bars indicate successfully hatched nests, red bars indicate failed nesting attempts and blue bars indicate nests subjected to forced-renesting. The black line shows the black fly abundance index measure as the total number of *Simulium annulus* and

Simulium johannseni captured using sweep net samples of artificial nests with Sandhill Crane brood mounts. The dashed grey line indicates the black fly abundance index from 2014.

Comparing Breeding Ecology and Reproductive Success of Sandhill Cranes and Whooping Cranes

We located 27 Whooping Crane first nests and 35 Sandhill Crane nests on Necedah NWR or the adjacent federally-owned lands. Excluding nests that were part of the forced-renesting management strategy, the apparent nest success of Whooping Cranes was 38%, slightly less than the 51% apparent nest success of Sandhill Cranes (Table 1). Most of the Whooping Crane nest failures were of unknown causes (Table 2). Sandhill Crane nest failures did not appear to be caused by a single factor disproportionately. Whooping Crane nest initiation dates were often obtained through direct observations of radio-marked adults. Sandhill Cranes were not radio-marked and therefore, nest initiation dates were estimated by floating eggs in warm water and referencing the float angle and shell exposed according to Fisher and Swengel (1991). The first Whooping Crane nest was initiated on April 3, 2015, and the first Sandhill Crane nest was initiated on April 9, 2015. Nesting chronology of Whooping Cranes and Sandhill Cranes appeared similar in 2015 (Figure 2).

From 11 April – 22 May, we recorded nesting behavior with trail cameras placed at 19 Whooping Crane nests and 27 Sandhill Crane nests. We monitored nests until either eggs hatched or nests were abandoned. We are currently completing the data collection by identifying behaviors (incubating, away from nest, manipulating nest platform, etc.) from diurnal photos. Due to the relatively large number of nests observed, data collection and analysis is ongoing. However, preliminary results from a discriminant function analyses on the behaviors of incubating cranes during the 2014 and 2015 seasons showed that the failed Whooping Crane nests were associated with higher rates of “bill flicking” and “head rubbing” than all other nests (i.e., successful Whooping Cranes, failed Sandhill Cranes and successful Sandhill Cranes).

Table 1. Apparent survival rates of sandhill and whoopng crane nests on Necedah National Wildlfie Refuge in 2014 and 2015.

		Assumed Initial Nests (no FRs)				Renests (FRs and Others)			
Year	Species	# Nests	# Successful	ANS	# Chicks	# Nests	# Successful	ANS	# Chicks
2014	SACR	16	9	56%	4	-	-	-	-
2014	WHCR	17[a]	5	29%	9	3[b]	0	0%	0
2015	SACR	35	18	51%	25	-	-	-	-
2015	WHCR	13[c]	5	38%	9	10[d]	8[e]	80%	12

a - 20 total initial nest, 3 nests were forced to fail
b - 2 forced renests
c - 21 total initial nests, 8 nests were forced to fail
d - 8 forced renests
e - all were forced renests

Table 1. Fates of crane nests monitored on Necedah NWR April-June 2015.

	Whooping Crane			Sandhill Crane		
FATE	N	% Total	% Relevant[a]	N	% Total	% Relevant[a]
Abandonment	2	6.7%	9.1%	0	0.0%	0.0%
Inviable	1[b]	3.2%	4.3%	1	2.9%	4.5%
Predation (Mammal)	2	6.7%	9.1%	2	5.7%	9.1%
Predation (Unknown)	0	0.0%	0.0%	1	2.9%	4.5%
Failure (Unkown cause)	4	13.3%	18.2%	1	2.9%	4.5%
Hatch	14	46.7%	63.6%	17	48.6%	77.3%
Human Caused Failure	8	26.7%	-	2	5.7%	-
Unknown Fate	0	0.0%	-	11	31.4%	-
TOTAL	**30**			**35**		

[a] - excludes nests of unknown fate or fates affected by research or monitoring activities, but includes the fates of "forced renests".

[b] - past term incubation, eggs collected to terminate nest

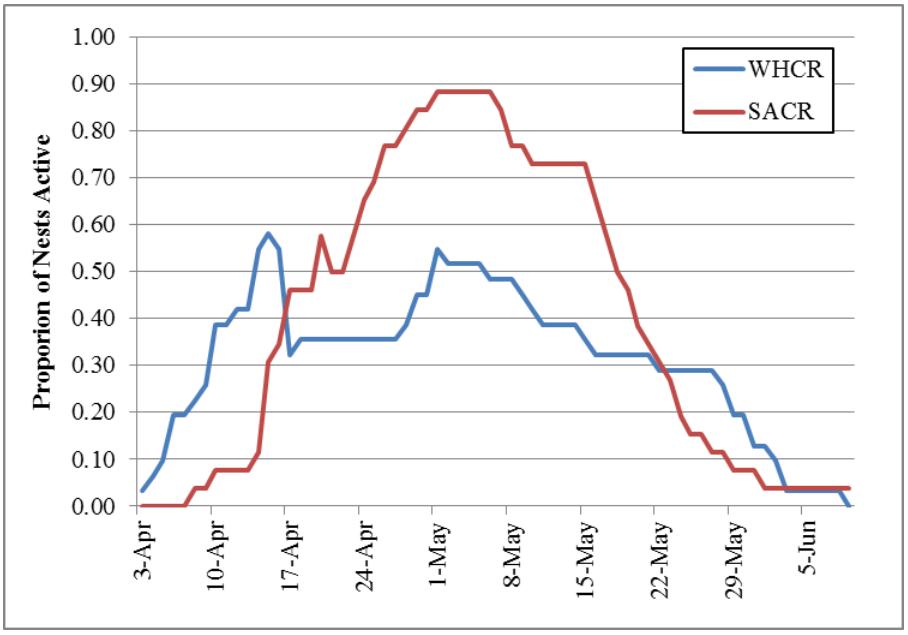


Figure 2. Whooping Crane and Sandhill Crane nesting chronology during the spring of 2015 on the Necedah NWR. Proportion of total nests active by date. The sharp drop in the proortion of Whooping Crane nests in mid-April was caused by the implementation of the forced renesting action.

PARENT-REARING EXPERIMENT

Prepared by Glenn H. Olsen, USGS Patuxent Wildlife Research Center

At the start of 2015 there were 5 parent-reared Whooping Cranes in the Eastern Migratory Population. All 5 Whooping Cranes wintered in areas with other Whooping Cranes or with Sandhill Cranes and all 5 successfully returned to Wisconsin in the spring of 2015. One of these 5 birds has died since: bird 22-13 was molting on a small wetland on Necedah National Wildlife Refuge when it died, possibly due to depredation. Scavenged remains, including working VHF and PTT radios, were recovered on 16 September 2015 by Eva Szyszkoski and Glenn Olsen.

In 2015, 4 Whooping Crane chicks were assigned to the parent-rearing program at USGS Patuxent Wildlife Research Center; these chicks hatched beginning in June. None of the 4 chicks died, but one was removed from the release program when it developed cervical scoliosis, thought to be of genetic origin.

That bird is currently slated to be used as a role-model for costume-reared birds at Patuxent. The other 3 birds were moved from their parents' pens on 25 August and placed together in a large pen with a pond to encourage water-roosting behavior. These birds were shipped to Necedah NWR by Windway Corporation on 16 September, banded the next day, placed in temporary pens, and released to the wild 3-5 days later. One bird was killed by predators on 16 October 2015. One bird moved to Dubuque, Iowa where it was in a compromised situation close to humans and, with help from Anne Lacy and the International Crane Foundation, was moved to a known crane roost site on the Wisconsin River. The bird (20-15) has since migrated to Louisiana but is currently not with any cranes. The other surviving parent-reared bird (14-15) migrated, possibly accompanied by Whooping Cranes, to Wheeler NWR where it is with Whooping Cranes (Table 3).

Table 3. Current status of captive-bred and parent-reared Whooping Cranes in the Eastern Migratory Population, as of January 1, 2016.

WCEP #	Sex	Status	Current Disposition
20-13	F	Dead	Recovered 15 Oct. 2013, heavily scavenged, no mortality cause
21-13	F	Dead	Recovered 21 Oct. 2013, impact trauma (vehicle)
22-13	M	Dead	Recovered 16 Sept. 2015, molting, possible predation
24-13	M	Alive	Winter 2015-16, Knox and Davies Co. Indiana
19-14	F	Alive	Winter 2015-16, Knox Co. Indiana
20-14	F	Alive	Winter 2015-16, Jackson Co. Alabama
21-14	F	Dead	Recovered 8 Oct. 2014, blunt trauma
27-14	F	Alive	Winter 2015-16, Morgan Co. Alabama
14-15	F	Alive	Winter 2015-16, Morgan Co. Alabama
16-15	M	Dead	Recovered 6 Oct. 2015, suspected viral infection
20-15	M	Alive	Winter 2015-16, St. Martin Parish, Louisiana

ANALYSES OF MOVEMENT PATTERNS AND OVERWINTERING LOCATIONS OF THE EMP

Prepared by Claire Teitelbaum and Thomas Mueller, Goethe University

The long-term monitoring data collected by WCEP provides a unique opportunity to analyze the movement patterns of the entire Eastern Migratory Population of Whooping Cranes. Because this database contains lifelong information on movement of single individuals as well as the composition of groups of migrating birds, we have been able to describe and analyze the movement patterns of individuals and groups since the beginning of the reintroduction effort. During the summer, the population spends time in a fairly small area of central Wisconsin, concentrated within the protected areas used as release sites. One exception is juvenile birds, which wander as far as hundreds of kilometers from their release area. On average, the population migrates for 17-31 days in November and December and 10-27 days in March and April, with no detectable changes in the duration of migration over time. In contrast, since 2006, a large portion of the population has shifted its overwintering range north from the reintroduced wintering grounds in Florida. This shift has led to a winter distribution that is much larger than the summering area, spreading from central Florida to southern Illinois. Further, this shift in overwintering location was driven by changes in the behavior of individual Whooping Cranes over the course of their lifetimes, where some birds have even used a different site in each year of migration. These results highlight that some aspects of Whooping Crane migration behavior, particularly overwintering behavior, are very flexible, while others appear to be relatively fixed. In the future, we plan to use the long-term monitoring data to identify links between movements, social associations, and social relationships within the population.

Investigating Reproductive Behaviors in the EMP

Prepared by Misty McPhee, University of Wisconsin-Oshkosh

One of the current approaches to conservation of the EMP is forced renesting of birds at Necedah National Wildlife Refuge. The downside to this strategy is that if cranes are not able to shift their date of nest initiation, this could be a management strategy with no end in sight. Thus, my collaborator and I built an individual-based computer model that will let managers explore the impact of different management decisions and environmental conditions on the success of nesting, which is crucial to the success of Whooping Cranes in the wild. Preliminary results suggest that when the wild population has more than 80% early nesters, the population crashes with no forced renesting. By forcing half of the pairs to renest, the population is relatively stable but there is no natural shift to nesting late, which means that reintroduction and forced renesting will be needed in perpetuity.

Over the next year and a half, I will be on sabbatical and focusing all of my attention on the EMP. My overarching objective for this sabbatical work is to better understand why Whooping Cranes are abandoning their nests and experiencing such low reproductive success in the wild. To this end, I plan to focus my efforts on three different approaches to this problem. First, I will spend time in the field with Brad Strobel, several students, and others collecting basic population data on wild Whooping Cranes as well as their close relative, the Sandhill Crane (*G. canadensis*). Second, I will conduct experiments testing the hypothesis that cranes do not have appropriate predator response behaviors, resulting in unnecessarily flighty behavior and abandonment of the nest. I would also like to develop methods to test differences in brooding behavior between birds and whether or not these differences impact chick survival. These behavioral tests will be conducted in the field and hopefully with captive animals at the Patuxent Wildlife Research Center and/or the International Crane Foundation. Third, I will conduct an extensive literature review on the other 13 species of crane to characterize similarities and differences in their ecology, behavior, and habitats in the hopes of identifying factors that could explain the Whooping Crane's current situation.

Science Impact of the Eastern Migratory Population Reintroduction Effort

Prepared by Sarah J. Converse, USGS Patuxent Wildlife Research Center

The science output from the Eastern Migratory Population reintroduction effort has been growing substantially in recent years. To date, a total of 37 journal articles have been published, focused on topic areas including health, medicine, demography, behavior, and management. In addition, 17 published abstracts and 3 student theses have been produced.

The scientific impact of EMP-focused publications is also growing. Three of the published papers have more than 20 citations each (scholar.google.com, accessed 26 January 2016) including: Runge et al. 2011 (124 citations), Mueller et al. 2014 (27 citations), and Hartup et al. 2005 (22 citations).

Journal impact factors are a widely used tool to assess the visibility of publication outlets. The journal impact factors for selected outlets have generally been less than 2 (Table 4). Five papers have been published in journals with impact factors >2. One publication, Proceedings of the North American Crane Workshop, stands out in terms of number of publications; 12 papers have been published there. It is important to recognize that this journal is not indexed by major indexing services such as Web of Science, and this severely limits the reach of these publications. Greater emphasis on publishing in indexed and more widely-available journals would increase the science impact of this reintroduction effort.

In 2016, the RST hopes to work with the Communications and Outreach Team to increase the visibility of EMP-related science. An example is a proposed effort to feature particular research projects on the WCEP web page or social media posts, with the post including information and photos that would be of interest to and accessible by the general public as well as other researchers. There is also a need to make the list of WCEP science products more accessible via improved placement on the WCEP web page.

Table 4. Journal Impact Factors for journals in which Eastern Migratory Population research has been published, through February 2016.

Journal	Number of Articles	Journal Impact Factor[a]
Biological Conservation	1	3.762
Bird Conservation International	1	1.784
Ecological Applications	1	4.093
Ecology and Evolution	1	2.320
J American Mosquito Control Association	1	0.948
J Avian Medicine and Surgery	1	0.393
J Fish and Wildlife Management	2	0.757
J Ornithology	1	1.711
J Vector Ecology	1	1.172
J Wildlife Diseases	1	1.355
J Wildlife Management	2	1.726
J Zoo and Wildlife Medicine	1	0.424
North American Bird Bander	1	NI[b]
PloS ONE	1	3.234
Proc North American Crane Workshop	12	NI[b]
Science	1	33.611
Veterinary Radiology and Ultrasound	1	1.453
Veterinary Surgery	1	1.041
Waterbirds	1	0.637
Wildlife Biology	1	0.880
Wildlife Rehabilitation	1	NI[b]
Zoo Biology	2	0.831

[a]From ISI Web of Science 2014
[b]Non-Indexed

COMMUNICATIONS & OUTREACH TEAM

Davin Lopez, Wisconsin Department of Natural Resources
Lizzie Condon, International Crane Foundation

The WCEP Communications and Outreach Team (COT) is responsible for all external communications on behalf of WCEP. It is also the main group responsible for maintaining the WCEP Google Drive, the main repository for notes and documents generated by the various WCEP teams. The COT draws from the expertise of our members, many of whom have experience in public communications and media relations. On occasion we also pull in other employees of WCEP partners when we feel it is necessary to get additional perspective on press releases and other COT activities. Many partners in WCEP this year participated in external outreach efforts.

Communications this year followed similar patterns to previous years, although we issued fewer press releases than usual, mainly due to a lack of a second team co-chair. We have decided that this year (2016) we will make major changes to our communications, including writing a new communications plan with a new set of core messages to define how we want the public and key partners to perceive WCEP's work. This plan will also include a schedule for press releases, social media posts, and other major communications for WCEP.

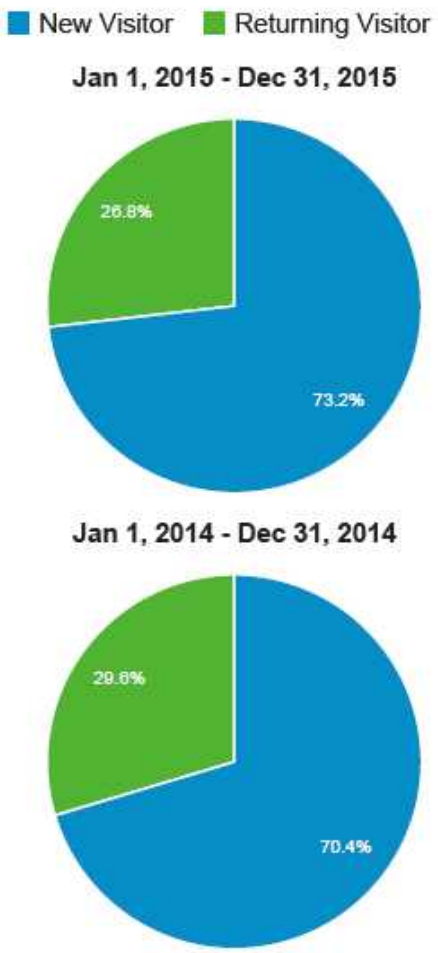
WCEP Website

www.bringbackthecranes.org had **18,443** unique visitors in 2015. This represents an increase of 33% from 2014 when the site had **13,869** visitors. When combined with founding-partner websites: http://www.operationmigration.org (140,454) and www.savingcranes.org (30,699), a total of 189,586 unique visitors were reached with WCEP specific information in 2015.

The number of "pageviews" also increased with **49,348 versus 37,804 (2014).** A "pageview" is defined as the total number of pages viewed. Repeated views of a single page are counted.

Our "sessions" total likewise saw an increase for 2015 with **24,904 vs 19,251** for the previous year. A "session" is the period time a user is actively engaged with multiple pages on a website.

Of the total number of unique visitors, we can see that the number of **new** visitors increased slightly over last year.



Where are they coming from?

Of the 24,904 sessions, search engines generated 9,356 visits, while referring websites and social media sites generated the majority of the balance.

The top two traffic-generating sites in each category are listed below.

Search Engine	**Sessions**
All	**9,356**
Top Two: Google **Yahoo**	**8,271** **497**
Referring Websites	
All	**7,307**
Top Two: operationmigration.org **4webmasters.org**	**1,592** **842**
Direct Traffic	**5,268**
Social Media	
All	**2,973**
Top Two: Facebook **Twitter**	**2,701** **138**

WCEP also continues to work on developing a new website that will use a WordPress platform. The WordPress platform is a much easier interface than the current HTML platform, which will enable multiple WCEP personnel to be able to update and add content. Currently only two people in WCEP have the required HTML technical skills to update the existing website. Ideally, this will allow WCEP to make the website much more dynamic than in years past. On the heels of the new website, WCEP also plans to launch a new Whooping Crane reporting site that will provide feedback and relatively up to date individual location information (following WCEP guidelines on the precision of location reporting).

WCEP Media Releases/Press statements

The COT issued the following press releases this year:

- First wild Whoopers hatching
- Whooping crane chicks getting ready for fall migration

We also issued the following statements and project updates:

- Project updates for January, February, March April, early May, late May, June, late July (2), September, and November
- WCEP statement about the USFWS vision document

Traditional Media Coverage

News articles that included "Whooping Crane" from states within the EMP range

AL.com

Alabama News Center

Alabama Public Radio
Associated Press
Audubon Magazine
Baltimore Sun
Baraboo News Republic
Clanton Advertiser
Daily Caller
Decatur Daily
Examiner.com
Gettin' Outdoors Radio Show (several live interviews)
Green County Daily World
Iowa Gazette
Knoxville News Sentinel
KWWL.com
LaCrosse Tribune
Madison Record
Milwaukee Journal Sentinel (several stories)
Mother Nature Network (several stories)
Rhett Turner & Greg Pope, Red Sky Productions
Tallahassee Democrat
The Clanton Advertiser
The Southern Illinoisan
Victoria Advocate
WALB TV, GA (several stories)
Washington Times
WEAU.com
WHNT News
Wisconsin Gazette
Wisconsin Public Radio
Wisconsin Public Radio News
WISN Milwaukee
wisn.com
WMTV
WTTV Chicago Tonight

Magazine articles focusing on the Eastern Migratory Population

Month	**Magazine**	**Article title**
Nov	Outdoor Alabama Magazine	It's time to Give a Whoop!
Jan	Alabama Wildlife Federation Magazine	Endangered Whooping Cranes
October	Ducks Unlimited Magazine	Hunters can help one of our rarest birds

WCEP partners conducted interviews with many radio and television media sources about Whooping Cranes and the EMP reintroduction project. These sources include Wisconsin Public Radio, Alabama

Public Radio, several country and pop radio stations in Alabama, AL.com, and local television stations in northern Alabama.

WCEP Social Media Sites

WCEP has social media accounts on both Twitter and Facebook. We currently have around 700 Twitter followers and 1,500 Facebook followers. We post updates on Facebook, as well as articles related to other endangered species recovery efforts and linking to WCEP partner projects.

Social media sites provide WCEP with an additional tool to better reach new and existing audiences about the project and its partners.

Through increased usage and exposure, the number of "Likes" on the WCEP Facebook page grew from **1203** on 1 January 2015 to **1509** on 31 December 2015, representing a **25%** growth rate over the 12 months. Comparatively, in 2014 the page grew in size by 80%. During 2015 a total of 169 stories were shared/published on the WCEP Facebook Page (facebook.com/WhoopingCraneEasternPartnership). It is important to note the type of post that gets the most attention so that we can continue to provide this type of content and continue to build the WCEP Facebook audience. Last year's top two stories in terms of audience engagement were: The hybrid crane at Horicon and the start of the (final) ultralight-guided whooping Crane migration.

WCEP primarily uses Twitter to broadcast press releases and updates. During 2015, WCEP sent out 9 Tweets that garnered nearly 8,000 "impressions". An "impression" is defined as a Tweet that was delivered to an account, although not necessarily read. The main focus of Twitter for WCEP is to get news stories into the hands of like-minded conservation organizations and into newsrooms. Twitter is a free service that is very easy to use and takes little time to maintain, thus the COT deems it a worthwhile outreach tool.

Education and outreach programs and events

WCEP partners conducted many programs and outreach events designed to raise awareness about Whooping Cranes and the EMP reintroduction project. We continued to work with our core audience, as well as building our following with outreach events and materials designed to reach non-traditional audiences. Presentations about Whooping Cranes were given at schools, assisted living facilities, and other venues.

Birding and crane-specific festivals are an important part of WCEP outreach. This year WCEP partners tabled and presented at the Whooping Crane Festival in Port Aransas, Texas; the Whooping Crane Festival in Princeton, Wisconsin; the Sandhill Crane Festival in Lodi, California; International Migratory Bird Day in Florida; and the Festival of the Cranes in Decatur, Alabama.

Operation Migration's outreach efforts through its Field Journal and social media websites continued to reach a wide audience with frequent updates. Other outreach efforts included public tours at the International Crane Foundation, with specialized tours dedicated to Whooping Crane conservation efforts, and special tours at Patuxent Wildlife Research Center. Operation Migration also offered Whooping Crane viewing opportunities at White River Marsh State Wildlife Area and at flyovers along the ultralight migration route to Florida on behalf of WCEP. Visitors to the blind at White River numbered 225 people who got the opportunity to witness the young cranes up close in their pen, while roughly 2,000 people attended the flyover events.

This year we continued our relationship with Journey North, an educational website that reaches an audience of over 250,000 visitors per month. Journey North helps foster a personal connection to the Whooping Cranes in the EMP through providing in-depth information and updates about each individual Whooping Crane chick throughout its lifetime. WCEP links to these individual histories on the WCEP website. Operation Migration continues to fund the Whooping Crane component of Journey North, and provides them with updates during the fall and winter months to help keep the biography pages up to date. Journey North's Whooping Crane website pages were viewed almost 250,000 times. I addition to their website, regular updates are sent out via Facebook, Twitter, and email to roughly 64,000 subscribers.

COT members also participated in Wisconsin Department of Natural Resources (WDNR) "Ask the Experts" chat sessions. These chats are a text based online format designed to provide feedback and answers to the public. The WDNR held two chats in 2015 that were focused on Whooping Cranes. The first was in May, where we had 65 participants, 86 later views, and answered 77 questions. The second was in October, where there were 211 participants, 307 later views, and 1,370 questions answered.

The International Crane Foundation (ICF) spearheaded a new campaign called "Keeping Whooping Cranes Safe", which focuses on reducing human-caused mortality of Whooping Cranes across all wild populations. The first pilot community for this campaign is northern Alabama, an important wintering area for cranes in the Eastern Migratory Population. The campaign is centered on Wheeler National Wildlife Refuge in Decatur, Alabama, although many activities covered the entire state. As part of this campaign, ICF created a Whooping Crane mascot that attends outreach events; posted billboards; produced a 30 second radio and television public service announcement with a local spokesperson; conducted radio, television and newspaper interviews; worked with partners to increase K-12 and public outreach programs; tabled at gun shows and other local events; conducted workshops on Whooping Crane outreach for environmental educators and teachers; provided materials for hunter education classrooms; added ten new Whooping Crane education trunks to schools, museums and other outreach facilities; and helped grow the Festival of the Cranes at Wheeler NWR to over 3,000 participants. A local brewery also made a Whooping Crane beer with conservation messaging on the can. ICF started a pledge campaign that is not exclusive to Alabama, although it was advertised heavily in Alabama.

Pledge campaign logo

Whooping Crane Red Ale, made by Old Black Bear Brewing Company in Madison, Alabama.