

EMP FIELD TEAM ANNUAL REPORT 2023

Prepared by Hillary Thompson, International Crane Foundation

During 2023, there were about 75 Whooping Cranes in the Eastern Migratory Population. The majority spent the summer in Wisconsin, except for 2 birds that spent the summer in Michigan (Fig. 1). There were 3 confirmed mortalities during 2023, due to various causes.

Highlights related to monitoring and management of the EMP from 2023 include:

- We recorded a total of 25 nests by 22 different pairs breeding in Wisconsin. This does not include 1 nest of a hybrid Sandhill-Whooping Crane pair in Michigan, and 2 nests of a hybrid pair in Dodge County, Wisconsin. We collected 2 eggs from 1 first nest for forced re-nesting, to encourage the pair to re-nest after black flies were no longer on the landscape. Additionally, we recovered 2 eggs from an abandoned nest, and collected 9 additional eggs from 9 nests with 2 egg clutches (took 1 egg from two 2-egg clutches). In total we brought 13 eggs into captivity for rearing and release. Fourteen chicks hatched from 11 first nests and 2 re-nests (Table 2). Three wild-hatched chicks fledged and survived to migration (Table 3).
- Five adults were captured for transmitter replacement and three wild-hatched chicks were captured for initial banding. One adult Whooping Crane in Michigan was captured and brought into captivity due to breeding with a Sandhill Crane and producing hybrid chicks.
- We released 9 captive-reared Whooping cranes into the wild. Three were parent-reared (1 from ICF, 2 from Calgary Zoo) and 6 were costume-reared (from ICF). All 9 juveniles survived migration and are on the wintering grounds. The parent-reared cranes are all with adult Whooping Cranes and the 6 costume-reared juveniles are in a group together.

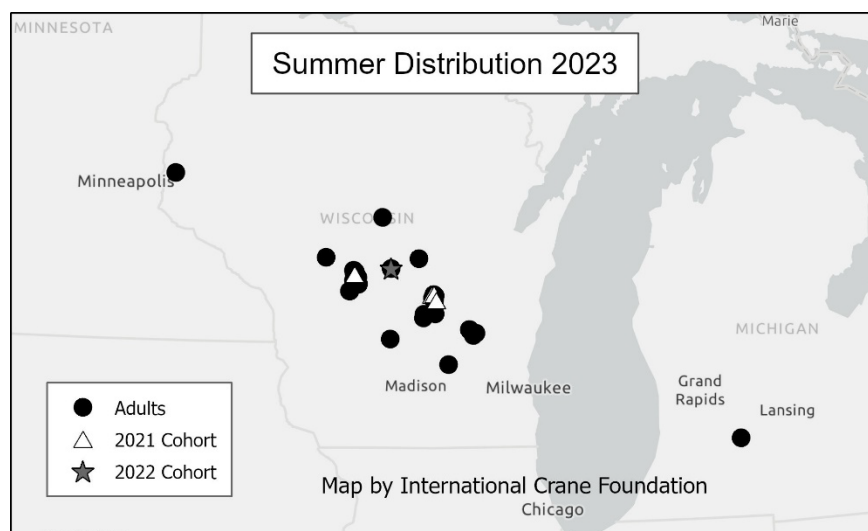


Figure 1. Summer distribution of the Eastern Migratory Population of Whooping Cranes during 2023. At least 62 cranes spent the summer in Wisconsin and 1 was in Michigan (after 14-12 was removed from Lenawee County, Michigan).

Winter 2022-23

The estimated population size as of 3 January 2023 was 75 (37 F, 35 M, 3 U). The final wintering locations of Whooping Cranes in the EMP during winter 2022-23 were as follows (Fig. 2): 27 in Indiana, 8 in Illinois, 6 in Kentucky, 2 in Tennessee, 17 in Alabama, 2 in Georgia, and 2 in Florida. There were 11 in unknown locations, including 1 family group, 1 pair, and 1 single bird who wintered in an unknown areas, and 5 birds who became long-term missing in 2023.

Winter distribution as of 1 January 2024

The maximum population size as of 1 January 2024 was 75 (42 Female, 31 Male, 2 Unknown). The distribution of these birds is as follows (Fig. 3): 28 in Indiana, 9 in Illinois, 6 in Kentucky, and 18 in Alabama. There were 14 in unknown locations, 12 of which have not been seen south of the breeding grounds.



Figure 2. Distribution of the Eastern Migratory Population of Whooping Cranes during winter 2022-23.

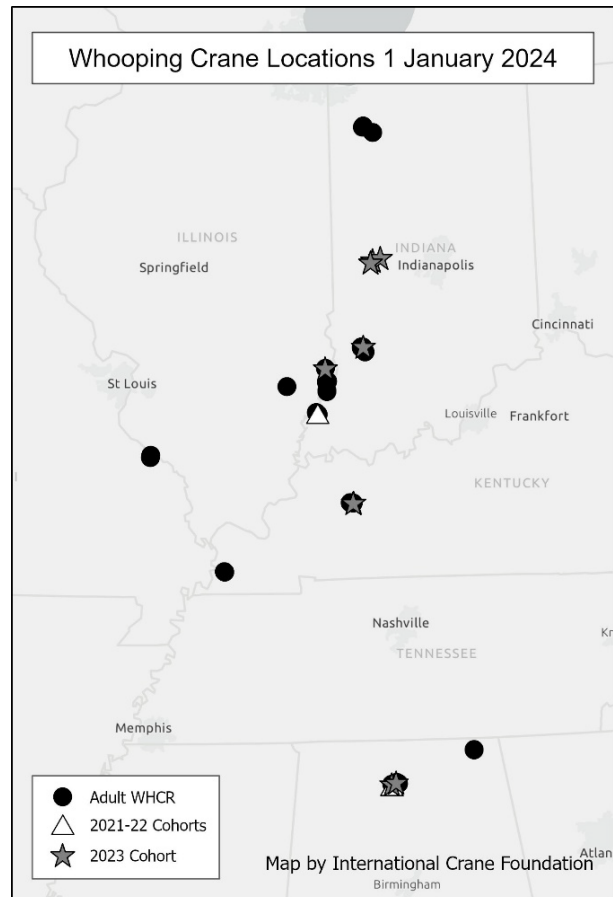


Figure 3. Distribution of wintering Whooping Cranes in the EMP as of 1 Jan 2024.

Captures and Banding in 2023

- Capture for removal from the population
 - 14-12, Lenawee County, Michigan, 7 June
- Captures for transmitter replacement:
 - 3-04, Juneau County, Wisconsin, 8 Sept
 - 63-15, Dodge County, Wisconsin, 13 Sept
 - 7-07, Juneau County, Wisconsin, 17 Oct
 - 19-09, Gibson County, Indiana, 18 Dec
 - 16-04, Lawrence County, Indiana, 20 Dec
- Captures of pre-fledged wild-hatched chick (transmitter and bands):
 - W3-23, Portage County, Wisconsin, 20 July
 - W9-23, Juneau County, Wisconsin, 1 Aug
 - W12-23, Juneau County, Wisconsin, 10 Aug
- Banding prior to release for captive-reared birds:
 - 16-23, 18-23, 23-23, ICF, 5 Sept
 - 15-23, 17-23, 19-23, 20-23, ICF, 6 Sept
 - 21-23 and 22-23, Juneau County, Wisconsin, 27 Sept

Releases of captive-reared cranes

Nine captive-reared juvenile cranes were released in the Eastern Migratory Population during 2023. Three of these were parent-reared in captivity, two at the Wilder Institute/Calgary Zoo and one at the International Crane Foundation. Six costume-reared cranes were raised at the International Crane Foundation and released in Wisconsin as well.

- 15-23 (F) was parent-reared at the International Crane Foundation and released at Necedah National Wildlife Refuge on 20 September 2023 near a family group (15-11, W6-18, W9-23). 15-23 associated quickly with the family group and migrated with the adults to Goose Pond Fish and Wildlife Area in Greene County, Indiana, while the wild-hatched chick (W9-23) split off from the group and went to Wheeler National Wildlife Refuge in Morgan County, Alabama.
- 21-23 (M) and 22-23 (F) were parent-reared at the Wilder Institute/Calgary Zoo and were transferred to Necedah National Wildlife Refuge on 6 September 2023, where they were banded and kept in an acclimation pen until their release on 4 October 2023. They quickly associated with adults 2-04 and W14-19 and sometimes also with adults 16-04 and 6-17. Both juveniles migrated and spent the winter in Kentucky with adults 2-04 and W14-19.
- Six juveniles, 16-23 (F), 17-23 (F), 18-23 (F), 19-23 (M), 20-23 (F), and 23-23 (M), were costume-reared at the International Crane Foundation and transferred to a pen at Horicon National Wildlife Refuge on 21 September 2023, where they were eventually released on 25 October 2023. The six birds were seen associating and roosting with Sandhill Cranes at Horicon but were

never seen associating with other Whooping Cranes. They migrated fairly quickly after release to Putnam County, Indiana, where they spent the winter. Unfortunately, 18-23 was found dead in Indiana on 10 Jan 2024, likely due to a powerline or fence collision.

Survival

- The total (both captive releases and wild-hatched chicks) coming into this population since 2001 is 345 (Fig. 4), of which 75 (22%) may be alive as of 31 December 2023 (Fig. 5). There have been 311 captive raised Whooping Cranes released since the beginning of the reintroduction 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. There have been 37 wild-hatched chicks that survived to fledging (see Reproduction section below).
- There were 3 confirmed mortalities of post-fledged cranes recorded in 2023 (pre-fledge wild-hatched chicks born in 2023 – see below, Table 1, Fig. 6):
 - W4-22 - remains collected 23 Jan 2023 in Greene County, IN, cause unknown
 - W11-21 - remains collected 10 Feb 2023 in Greene County, IN, cause pending but suspect powerline collision
 - W13-20 - remains collected 11 July in Dodge County, WI, due to emaciation during flightless molt
- There were 2 confirmed mortalities of pre-fledged cranes recorded in 2023 that were submitted for necropsy:
 - W2-23 – collected 7 July 2023 at Horicon. Cause of death was due to suspected visceral coccidiosis and trauma to the leg.
 - W3-23 – collected 20 July 2023 in Portage County, WI. Crane died in hand, necropsy noted endarteritis affecting the pulmonary artery, esophagitis, myocarditis, and ganglioneuritis. Cause of death was not determined. No evidence to suggest capture myopathy.
- There were 8 cranes classified as long-term missing during 2023.
 - W10-18 – last seen 17 June 2022 in Juneau County, WI
 - 18-03 – last seen 7 June 2022 in Juneau County, WI
 - 30-16 – last seen 4 November 2022 in Green Lake County, WI
 - 74-18 – last seen 22 September 2022 in Jackson County, WI
 - 80-19 – last seen 14 October 2022 in Juneau County, WI
 - 28-17 – last seen 18 July 2023 in Marquette County, WI after having a broken leg where the bottom part of his leg had broken off and healed over earlier in the year.
 - W10-15 – last seen 14 August 2023, but then mate seen without him on the breeding grounds, she lost their territory, and then showed up without him on the wintering grounds

- 29-08 – last confirmed on 29 July and assumed on 2 September 2023 in Juneau County, WI with mate and chick. However, W6-18 replaced him in the pair so seamlessly that it could have been W6-18 with female 15-11 and chick W9-23 during August and early September. 29-08 was not seen again on the breeding nor wintering grounds.

Table 1. Causes of death for fledged, wild-hatched and captive-reared Whooping Cranes in the Eastern Migratory Population. We did not include confirmed mortalities for wild-hatched pre-fledged chicks. “Other” causes of mortality included euthanasia due to injuries, hemorrhages, capture myopathy, emaciation, and egg binding.

| Cause of Death | Number of cases cumulatively 2001-2022 | Number of cases 2023 |
|---|---|-----------------------------|
| Predation | 41 | 0 |
| Impact Trauma – confirmed or suspected power line collision | 10 | 1 |
| Impact Trauma – other (vehicle or aircraft collision, unknown source of trauma) | 12 | 0 |
| Gunshot | 14 | 0 |
| Disease (including lead poisoning) | 8 | 0 |
| Other | 15 | 1 |
| Unknown | 78 | 1 |
| Total confirmed mortalities | 178 | 3 |

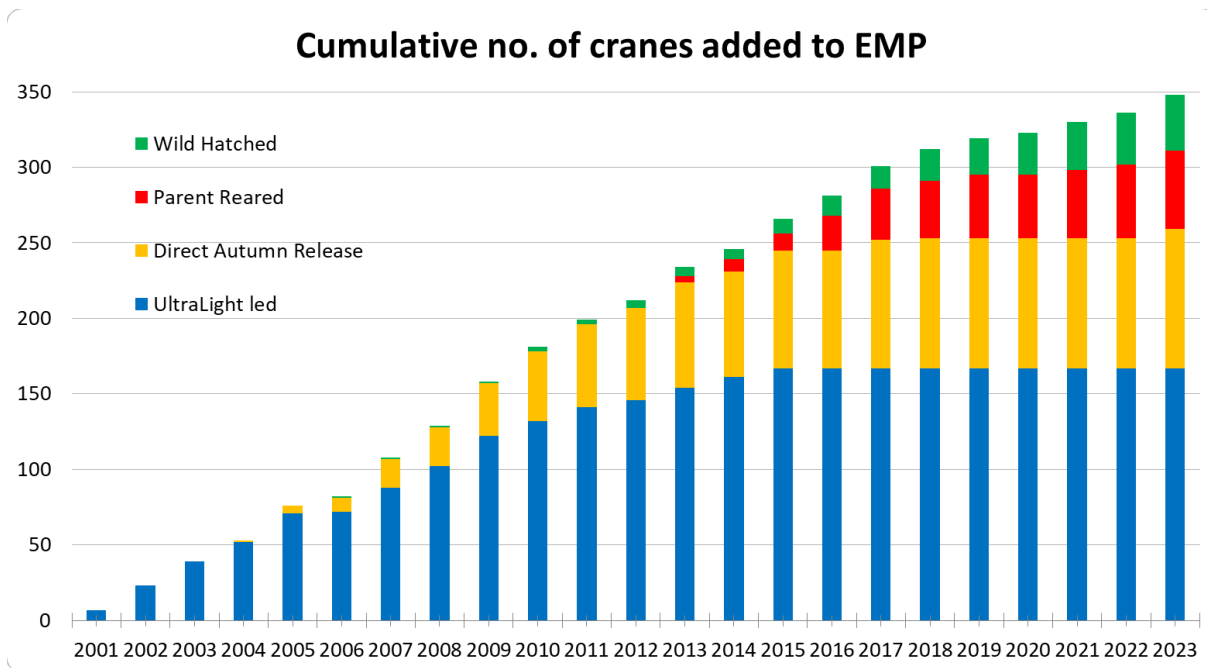


Figure 4. Cumulative number of cranes added to the Eastern Migratory Population by rearing method since 2001. As of 2023, there have been 167 UltraLight led, 92 Direct Autumn Release, 52 Parent Reared, and 37 Wild Hatched Whooping Cranes added to the EMP.

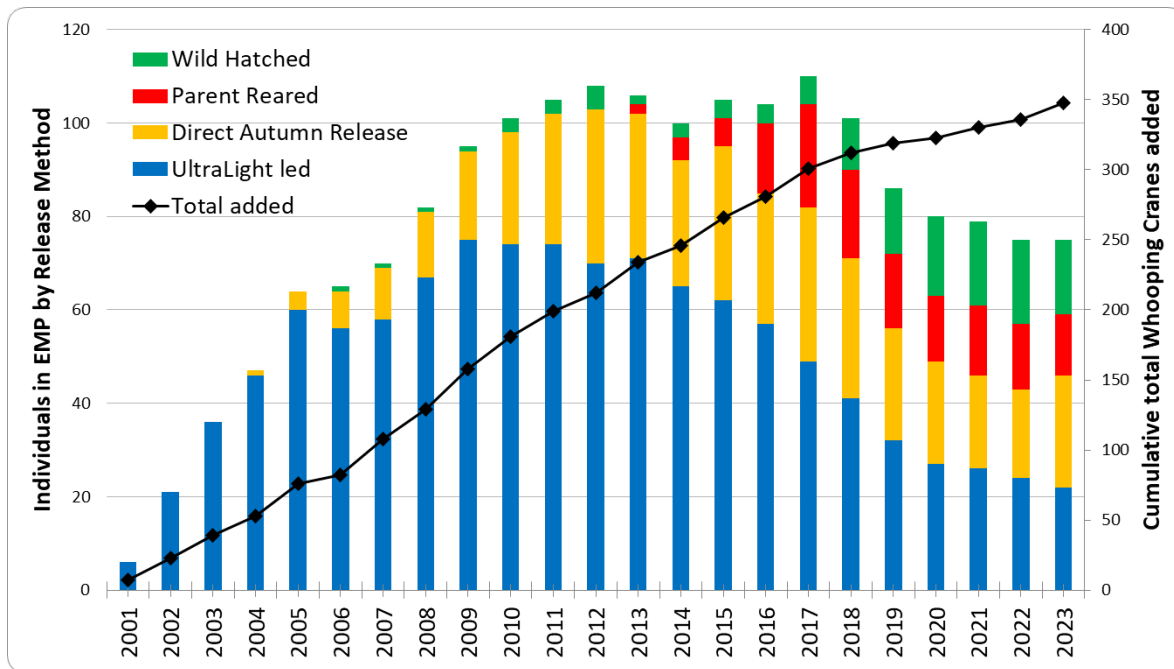


Figure 5. Population size of EMP by rearing method. As of 1 January 2024, there were 75 birds recorded in the EMP (left axis; 31 M, 42 F, 2 U). Black line indicates the total birds released (or wild-fledged) into the population cumulatively (right axis).

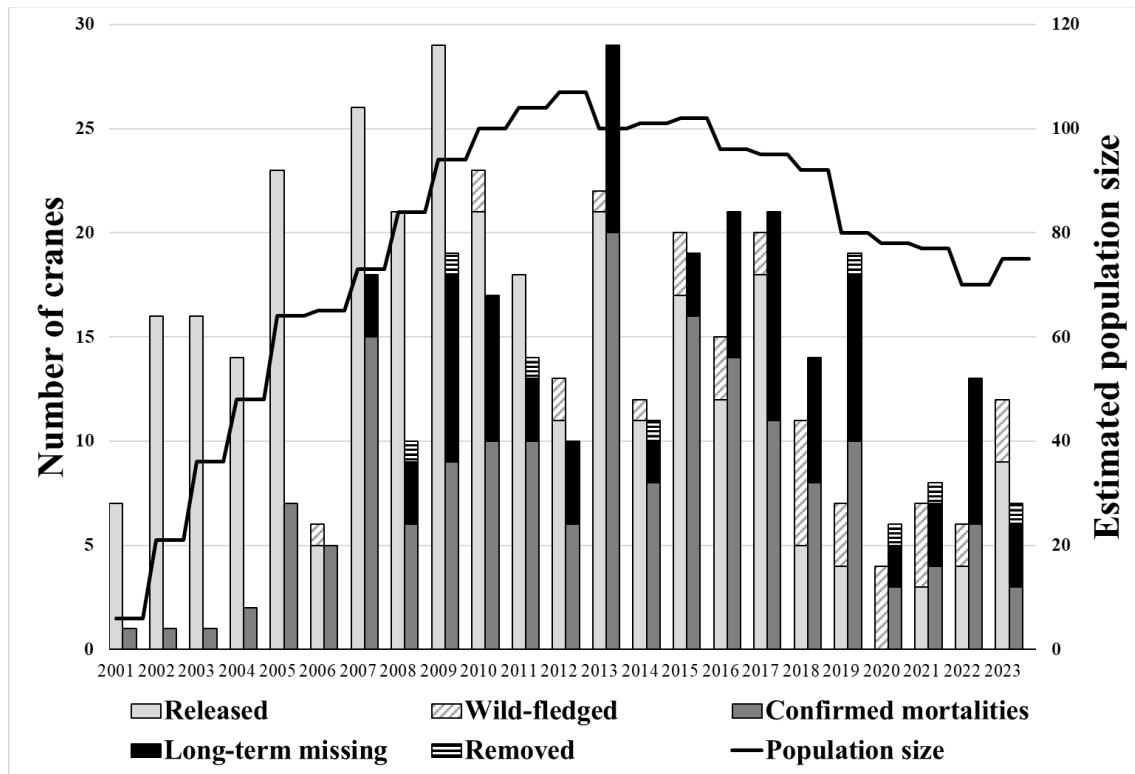


Figure 6. Estimated population size of the Eastern Migratory Population of Whooping Cranes from 2001-23 (right axis). The number of cranes added into the population each year are shown in a stacked bar on the left, those subtracted on the right bar (left axis).

Reproduction

- This year we recorded a total of 25 nests by 22 different Whooping Crane pairs breeding in Wisconsin. The numbers reported here are the total we observed but there may have been a few missed nests or young chicks.
- We collected 2 eggs from 1 first nests for forced renesting, to encourage pairs to renest after black flies were gone. We recovered 2 eggs from an abandoned nest and collected 9 eggs from 9 re-nests with 2 egg clutches. In total we brought 13 eggs into captivity for rearing and release.
- Nine nests failed due to a variety of known and unknown causes (predation, abandonment, Table 2). Additionally, 2 nests were incubated full term, but we could not confirm if the eggs hatched. Those pairs were confirmed later without chicks.
- There was 1 hybrid Sandhill-Whooping Crane pair in Michigan and 1 in Dodge County, Wisconsin. In Michigan, the pair hatched a hybrid chick and subsequently the adult male Whooping Crane was captured and brought into captivity. The hybrid nests in Dodge County were destroyed (Table 2).
- 14 chicks hatched from 11 first nests and 2 re-nests (Table 2). Three wild-hatched chicks fledged and survived to migration (Table 3).
- At the end of 2023, there have been a total of 433 nests (340 first nests, and 93 re-nests). 195 chicks hatched in the wild, of which 37 have fledged. As of 1 January 2024, 16 of those survive in the wild (Tables 3 and 4).

Table 2. Nesting summary for 2023. Asterisks indicate a re-nest. Some nests with two-egg clutches had one egg removed as a part of Partial Clutch Collection (PCC) to increase the number of eggs and chicks raised in captivity for release into reintroduced populations.

| Female | Male | Nest Outcome | Date Completed | County | Chicks | Notes |
|--------|--------|------------------------|----------------|----------------|--------|---|
| 12-11 | 5-11 | Failed – unknown | 4/22/23 | Juneau | | Possibly black flies |
| 12-03 | 12-05 | Active nest management | 4/13/23 | Juneau | | |
| 42-09 | 37-07 | Failed – abandoned | 4/13/23 | Juneau | | Black flies. 2 eggs collected |
| 73-18 | 3-04 | Failed – unknown | 4/28/23 | Juneau | | |
| 8-17 | 28-17 | Failed – unknown | 4/29/23 | Marquette | | Male lost part of leg |
| 67-15 | 3-17 | Failed – abandoned | 4/27/23 | Green Lake | | Black flies on eggs |
| 10-15 | 4-13 | Hatched | 5/4/23 | Green Lake | W1 | |
| 38-17 | 63-15 | Hatched | 5/7/23 | Dodge | W2 | |
| W1-19 | 1-17 | Hatched | 5/11/23 | Portage | W3 | |
| 24-17 | 4-17 | Hatched | 5/14/23 | Sauk | W4 | PCC |
| 3-14 | 4-12 | Hatched | 5/15/23 | Green Lake | W5, W6 | |
| W14-19 | 2-04 | Failed – unknown | 5/10/23 | Juneau | | |
| 36-09 | W5-18 | Failed – unknown | 5/15/23 | Juneau | | PCC |
| 59-13 | 1-11 | Hatched | 5/24/23 | St. Croix | W7 | |
| 79-19 | W13-20 | Hatched | 5/26/23 | Dodge | W8 | |
| 15-11 | 29-08 | Hatched | 5/30/23 | Juneau | W9 | PCC, W9 fledged |
| W1-18 | W6-18 | Hatched | 5/30/23 | Juneau | W10 | PCC |
| W1-06 | W10-15 | Hatched | 6/1/23 | Juneau | W11 | |
| 24-08 | 13-02 | Hatched | 6/1/23 | Juneau | W12 | PCC, W12 fledged |
| 6-15 | 19-09 | Unknown – Full term | 6/1/23 | Juneau | | PCC |
| 12-03 | 12-05 | Unknown – Full term* | 5/31/23 | Juneau | | PCC |
| 12-11 | 5-11 | Hatched* | 6/5/23 | Juneau | W13 | W13 fledged |
| 42-09 | 37-07 | Hatched* | 6/3/23 | Juneau | W14 | PCC |
| W3-10 | 7-07 | Failed – predation | 5/30/23 | Juneau | | PCC |
| 6-17 | 16-04 | Failed – unknown | 5/23/23 | Juneau | | |
| SACR | 14-12 | Hatched | ~4/16/23 | Lenawee Co, MI | | Hybrid chick. 14-12 captured and brought into captivity in June. |
| SACR | 16-11 | Failed - management | 4/28/23 | Dodge | | Removed hybrid eggs from the nest. |
| SACR | 16-11 | Failed* - management | 6/1/23 | Dodge | | Removed 2 hybrid eggs from the nest on 18 May. Removed a new 3 rd egg from the nest on 1 June. |

Table 3. Nest initiation dates, number of nests, number of chicks hatched, and number of chicks fledged 2005-2023. This does not include hybrid nests or chicks, nor does it include same-sex pairs. There was one same-sex female pair that nested in 2020, was given fertile eggs, and hatched a chick that did not fledge. This chick is included in the number of chicks hatched, but the nest is not included in nest totals.

| Year | First Nest Initiation | # First Nests | # Re-nests | Total Nests | # Hatched | # Fledged |
|-------|-----------------------|---------------|------------|-------------|-----------|-----------|
| 2005 | 16 Apr | 2 | 0 | 2 | 0 | 0 |
| 2006 | 5-6 Apr | 5 | 1 | 6 | 2 | 1 |
| 2007 | 3 Apr | 4 | 1 | 5 | 0 | 0 |
| 2008 | 7 Apr | 11 | 0 | 11 | 0 | 0 |
| 2009 | 2 Apr | 12 | 5 | 17 | 2 | 0 |
| 2010 | <1 Apr | 12 | 5 | 17 | 7 | 2 |
| 2011 | 3-4 Apr | 20 | 2 | 22 | 4 | 0 |
| 2012 | <26 Mar | 22 | 7 | 29 | 9 | 2 |
| 2013 | 15 Apr | 21 | 2 | 23 | 3 | 1 |
| 2014 | 7 Apr | 25 | 3 | 28 | 13 | 1 |
| 2015 | 1-3 Apr | 27 | 9 | 36 | 24 | 3 |
| 2016 | 29-31 Mar | 25 | 16 | 41 | 24 | 3* |
| 2017 | 30 Mar | 25 | 10 | 35 | 18 | 2 |
| 2018 | 8 Apr | 17 | 6 | 23 | 10 | 6* |
| 2019 | 30 Mar | 25 | 11 | 36 | 19 | 3 |
| 2020 | 25 Mar | 20 | 3 | 23 | 18 | 4 |
| 2021 | <31 Mar | 21 | 2 | 23 | 14 | 4 |
| 2022 | 30 Mar - 2 Apr | 24 | 7 | 31 | 14 | 2 |
| 2023 | 30 Mar | 22 | 3 | 25 | 14 | 3 |
| Total | | 340 | 93 | 433 | 195 | 37 |

*One chick was old enough to have fledged when it died, but flights were never observed.

Table 4. Pairs that have successfully fledged chicks with years of fledging

| Sire | Dam | Year(s) | | | |
|-------|-------|---------|--------|------|------|
| 11-02 | 17-02 | 2006 | | | |
| 3-04 | 9-03 | 2010 | 2013 | 2015 | |
| 12-02 | 19-04 | 2010 | 2012 | 2014 | |
| 9-05 | 13-03 | 2012 | 2019 | | |
| 10-09 | 17-07 | 2015 | | | |
| 2-04 | 25-09 | 2015 | 2021 | | |
| 29-09 | 12-03 | 2016 | | | |
| 12-05 | 12-03 | 2019 | 2020 | 2021 | |
| 1-04 | 8-05 | 2016 | | | |
| 12-02 | 4-11 | 2016* | | | |
| 14-08 | 24-08 | 2017 | 2018** | | |
| 13-02 | 24-08 | 2020 | 2023 | | |
| 24-09 | 42-09 | 2017 | 2018 | | |
| 11-15 | 42-09 | 2020 | | | |
| 5-11 | 12-11 | 2018 | 2019 | 2022 | 2023 |
| 4-08 | 23-10 | 2018 | | | |
| 8-04 | W3-10 | 2018 | | | |

| | | | | | |
|-------|-------|------|--|--|--|
| 1-04 | 16-07 | 2018 | | | |
| 63-15 | 38-17 | 2020 | | | |
| 18-03 | 36-09 | 2021 | | | |
| 4-12 | 3-14 | 2021 | | | |
| 1-17 | W1-19 | 2022 | | | |
| 29-08 | 15-11 | 2023 | | | |

*12-02 died before chick fledged. Chick was old enough to have fledged when it died, but flights were never observed. 4-11 was found shot at her wintering area at the beginning of 2017.

** 14-08 disappeared before chick fledged and 14-08 is believed to be dead. The chick (W9-18) was old enough to have fledged when it died, but flights were never observed.

Research

During 2023, members of the Field Team had research papers in the review process, and one completed MS thesis. Below are research products that were recently published (since 2020) that focus on the Eastern Migratory Population.

van Vianen, V. M. 2023. Factors affecting time budgets of two populations of wintering whooping cranes: a video behavior analysis. Thesis, University of Wisconsin, Madison, USA.

Gordon, N. M., D. P. Bolt, and H. L. Thompson. 2022. Vigilance of nesting whooping cranes in Juneau County, Wisconsin. Proceedings of the North American Crane Workshop 15:81-89.

Kearns, A. J., H. L. Thompson, and A-M. T. Y. Gillet. 2022. Whooping Crane nest building in southwest Indiana. Proceedings of the North American Crane Workshop 15:128-133.

Szyszkoski, E. K., and H. L. Thompson. 2022. A roundtrip long-distance movement within one season by a nonmigratory Whooping Crane (*Grus americana*). Wilson Journal of Ornithology 134:97-102.

Thompson, H. L., M. S. Glass, M. M. Wellington, and K. H. Boardman. 2022. Effects of release techniques on parent-reared whooping cranes in the Eastern Migratory Population. Proceedings of the North American Crane Workshop 15:53-71.

Thompson, H. L., N. M. Gordon, D. P. Bolt, J. R. Lee, and E. K. Szyszkoski. 2022. Twenty-year status of the eastern migratory whooping crane reintroduction. Proceedings of the North American Crane Workshop 15:34-52.

Thompson, H. L., and L. R. Ratanawong. 2022. First Description of a Whooping Crane Flying Over Lake Michigan. Passenger Pigeon 84:3-9.

Abrahms, B., C. S. Teitelbaum, T. Mueller, and S. J. Converse. 2021. Ontogenetic shifts from social to experiential learning drive avian migration timing. Nature Communications 12:7326.

Thompson, H. L., A. J. Caven, M. A. Hayes, A. E. Lacy. 2021. Natal dispersal of Whooping Cranes in the reintroduced Eastern Migratory Population. Ecology and Evolution 11:12630-12638.

- Urbanek, R. P., and P. H. Adler. 2021. Black fly survey of a whooping crane reintroduction area in eastern Wisconsin. *Proceedings of the North American Crane Workshop* 15:72-80.
- Gondek, M. 2020. Habitat preferences of whooping crane (*Grus americana*) in Wisconsin, USA. Thesis, University of Wisconsin, Oshkosh, USA.
- Stewart, K. L. 2020. Investigating cause-specific mortality of whooping crane (*Grus americana*) chicks at Necedah National Wildlife Refuge. Thesis, University of Wisconsin, Oshkosh, USA.
- Thompson, H. L., and N. M. Gordon. 2020. First description of nesting behavior of a same-sex pair of whooping cranes (*Grus americana*) in the reintroduced Eastern Migratory Population. *Waterbirds* 3:326-332.
- Yaw, T. J., K. J. G. Miller, J. S. Lankton, and B. K. Hartup. 2020. Postmortem evaluation of reintroduced migratory whooping cranes (*Grus americana*) in eastern North America. *Journal of Wildlife Diseases* 56:673-678.