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WINTER RELEASE OF ISOLATION-REARED GREATER SANDHILL CRANES IN SOUTH TEXAS

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Abstract: During the summer of 1988, 7 greater sandhill cranes (*Grus canadensis tabida*) hatched from 15 eggs collected at Seney National Wildlife Refuge (NWR), Michigan, were isolation-reared at Welder Wildlife Refuge (WWR) near Sinton, Texas, and fitted with radio transmitters prior to fledging. Because of severe drought conditions on WWR, 3 surviving juveniles were moved to Laguna Atascosa NWR (LANWR) in south Texas and released on 27 January 1989. On 12 March 1989 they left LANWR with 3 wild cranes. They were relocated on 4 April in Rosebud, Texas. The 3 cranes were captured and transported to Grand Island, Nebraska, and re-released on 7 April. They left the Platte River on 21 April with a large flock of wild cranes and migrated at least 160 km north before I lost radio contact with them. They reappeared in Waco, Texas, on 22 May, and in June they were 30 km from WWR. On 11 August, 2 surviving cranes returned to WWR; they were recaptured and transported to LANWR. In the absence of wild migrant cranes, the 2 remaining cranes began associating with domestic animals and humans. On 8 March 1990 they were removed from the wild because they displayed no intention to migrate with wild cranes. These birds showed a strong affinity for their natal area (WWR), suggesting that isolation-reared cranes should be released on breeding grounds rather than on wintering grounds.

Key Words: *Grus canadensis*, isolation-rearing, natal area, sandhill cranes, wintering grounds

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Reintroduction studies of cranes have been carried out on the species' breeding grounds, but not all of these studies have been equally successful. Cross-fostering, with chicks reared by congeners but not conspecifics, has so far not proven to be a viable reintroduction technique because whooping cranes (*G. americana*) raised by sandhill crane surrogates have not paired and bred in the wild (Drewien et al. 1989). Cranes hand-reared with extensive contact with humans are not good candidates for release to the wild (Nesbitt 1979). Cranes raised by conspecific parents in captivity have been successfully released to the wild (Zwank and Wilson 1987, Ellis et al. 1992). More recently, cranes hand-reared by humans using costumes, puppets, and crane vocalizations have been successfully released to the wild (Archibald and Archibald, in press; Ellis et al. 1992; Horwich et al., in press; Nagendran 1991; Urbanek and Bookhout 1992). Isolation-reared cranes have completed several successful migrations from their breeding grounds to wintering grounds and back, and in 1990, 1 of these cranes and his wild mate successfully raised a chick (G. W. Archibald, International Crane Foundation [ICF], pers. commun.). Releases of migratory greater sandhill cranes into areas in Florida occupied by resident Florida sandhill cranes (*G. c. pratensis*) resulted in the former becoming resident and not migrating (S. A. Nesbitt, Florida Game and Fresh Water Fish Commission, pers. commun.). My major objective was to experimentally release isolation-reared sandhill cranes in south Texas, a wintering area with no resident sandhill cranes, to determine if cranes can be induced to learn migration routes

from wintering conspecifics.

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STUDY AREA AND METHODS

The Welder Wildlife Refuge, located on Highway 77 near Sinton, Texas (Fig. 1), was the hatching and rearing site. WWR was chosen because several hundred sandhill cranes usually winter on and around this refuge. Greater sandhill crane eggs ($n = 15$), collected from nests on Seney NWR in the Upper Peninsula of Michigan, 21–23 May 1988, were transported by air to Texas in a portable incubator on 23 May. Eggs were kept warm with hot water bottles during transportation.

At WWR the eggs were further incubated in an automatic incubator until hatching. Chicks were hand-reared in audio-visual isolation from humans using

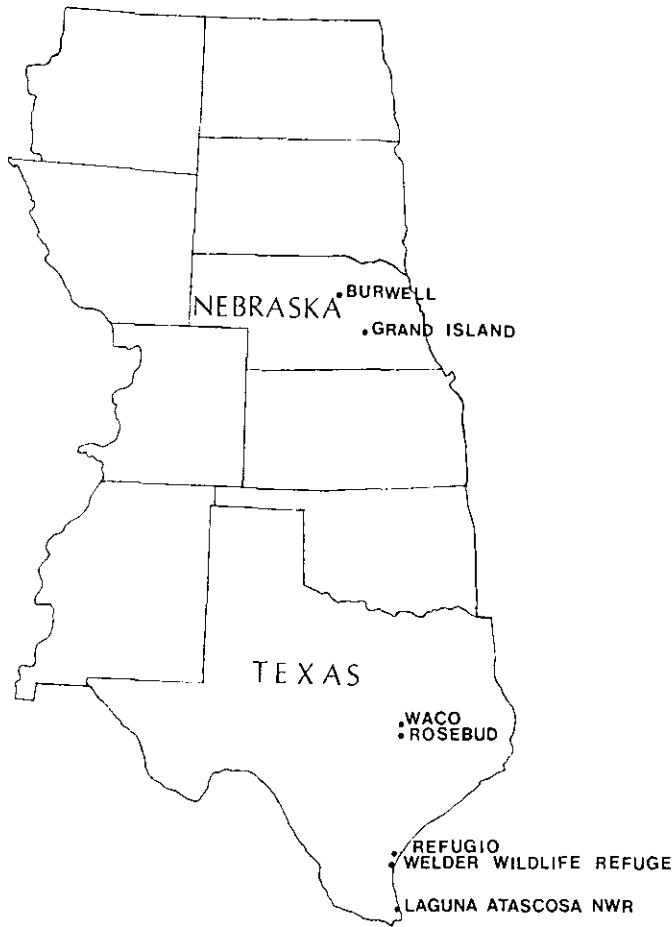


Fig. 1. Locations where project cranes were raised, released, and resighted, 1989–90.

costumes, hand puppets resembling sandhill crane heads, taped sandhill crane vocalizations, and realistic brooding models; chicks were in audio-visual contact with each other (Horwich 1989). They were initially reared in a facility adjacent to the refuge headquarters. Each chick had an individual corral approximately 2.5 m × 1.5 m. Daily routine included weighing the chicks, general physical examination, and exercising the chicks together. When young chicks were together, they were under constant vigil to avert any fatalities/injuries as young chicks are aggressive toward each other. Chicks were fed an artificial crane starter diet in crumble form for the first 2 weeks. They also consumed grasshoppers and other insects captured in the exercise yard, where they spent most of each day. When the chicks were about 2–3 weeks old they began eating the crane starter in pelleted form.

In early August the chicks were split into 2 groups and moved to 2 release sites near Big Lake on WWR, an area

where wild, wintering sandhill cranes traditionally roost. In September–October the chicks were fitted with leg-hold or backpack radio transmitters (Telonics Telemetry Systems, Mesa, AZ). Chicks were sexed behaviorally (Archibald 1976) or by size comparisons.

RESULTS

May–August 1988

The first chick hatched on 24 May, followed closely by 10 more chicks, with the last chick hatching on 16 June. Four of these chicks died, 2 presumably killed by snakes, 1 from an eye injury, and 1 from unknown causes. The 7 remaining chicks were very aggressive towards each other during the first 10 days, but by 1 month of age this aggression had dissipated and a hierarchy was established with the oldest chick most dominant.

The chicks were very attached to the costumed "parent" (henceforth parent) during the first few weeks. They followed closely behind the parent during walks, especially when the taped brood call was played, and remained next to the parent while it hunted for grasshoppers. Only 1 chick had health problems soon after hatching; it had to be tube fed on 2 successive days and administered saline subcutaneously to prevent dehydration. All chicks fed and drank without parental assistance when they were 3–4 days old. When 1 month old they spent considerable time foraging and less time following the parent. Chicks spent more than 50% of their time in a plastic baby pool during the many hot Texas days. Chicks responded to armadillos (*Dasypus novemcinctus*) by squealing and approaching with great curiosity, and to the taped sandhill crane unison calls by immediately assuming an alert posture.

The oldest chick had a badly twisted hock which could not be corrected, although I tried every reasonable therapy. Although the chick managed to lead a normal life and remained dominant over others, I decided not to further handicap it with a transmitter and harness.

September–December 1988

By mid-August the chicks (hereafter project cranes) were fledging age and were moved to the release site. Due to extended drought, Big Lake became dry at the end of September. Without water the lake would not attract any wild cranes, and a successful release of the project cranes would be impossible. A hurricane brought 7.5 cm of rain to the refuge, barely sufficient to muddy the lake bed for a few days. Wild sandhill cranes began arriving in late September, but none roosted at WWR. It became apparent

that another release site was needed, and an active search for a new site began in October. The project cranes had become extremely attached to their parents and stayed next to them for more than 8 hours each day, completely ignoring the occasional wild sandhill crane that would land nearby. It was very important to transfer this attachment to wild cranes.

On 17 November the project cranes were moved to a private ranch near Seadrift, Texas (near Refugio, Fig. 1), where hundreds of wild sandhill cranes and waterfowl roosted. The first night 1 project crane disappeared. On 18 November the remaining 6 project cranes were moved back to WWR rather than risk another loss. The missing crane was located on 21 November by radio telemetry and recaptured while she was walking along a street in the town of Seadrift. When I approached her in my costume playing a tape recorded brood call, she ran up to me. I returned her to her cohort at WWR.

I located a third potential release site 25 km from WWR in early December and moved the project cranes to this site on 7 December. Heavy rainfall washed out our camp site, forcing me to release the project cranes abruptly and earlier than planned. Three project cranes were killed by a bobcat (*Felis rufus*) during 2 successive nights. The remaining 4 cranes were captured and brought back to WWR. Permission was obtained to move them to Laguna Atascosa NWR, 200 km southwest of WWR (Fig. 1), where 600–1,000 sandhill cranes were wintering.

January – December 1989

On 6 January 1989, the 4 remaining project cranes were moved to LANWR from WWR, and exposure to wild sandhill cranes began immediately. The temporary night holding pens, each approximately 1 m³, were a few hundred meters away from Lake Atascosa, the roost site of wild sandhill cranes. On 9 January a project crane died from gout. I forced the remaining 3 to interact with wild cranes by attracting wild cranes to an area heavily baited with corn and sorghum. This forced association was necessary because project cranes had little time remaining to bond with wild cranes before spring migration northward, which could begin by late February. Hand-reared cranes needed to identify with their wild counterparts so that they could migrate successfully.

The wild cranes flew to corn and sorghum fields away from the refuge to feed. By baiting I was able to induce 300–400 cranes to remain on LANWR, thus enabling the project cranes to associate with wild birds for extended periods of time. On 27 January they roosted with wild cranes on Lake Atascosa for the first time. During February and March, 3 wild adult cranes were captured and

fitted with radio transmitters so that I could also monitor the movements of associated wild cranes.

On 12 March the 3 project cranes migrated to the northwest from LANWR with 3 wild cranes. These 6 cranes were the last to leave LANWR. I lost radio contact outside LANWR and spent the afternoon radio-tracking by aircraft, attempting to ascertain whether they had left the area. From 13 to 18 March I searched by vehicle with a receiver for these birds between south Texas and Grand Island, Nebraska. By 3 April, all 3 wild cranes with transmitters were on the Platte River, but there were no radio signals from the project cranes. On 4 April the project cranes were found in Rosebud, Texas, approximately 600 km north of LANWR (Fig. 1). I returned to Texas, and on 6 April I donned my crane costume and used my tape player to retrieve the cranes, placed them into compartments in my enclosed pickup truck, and drove 1,100 km north through the night to Nebraska. I arrived in Grand Island (Fig. 1) at 0700 hours, and the 3 project cranes were re-released on the Platte River before 0900 hours. After a few moments of hesitation, they joined wild cranes.

One of the project cranes separated from the other 2 on 11 April. On 15 April she appeared to head north with a small flock of cranes. That night she did not roost on the Platte River, but she was back the following night. The 3 cranes reunited on 20 April. At 1102 hours on 21 April, they left the Platte River with a large flock of wild cranes. The temperature was >28 C, and there were strong southeasterly winds. I followed the cranes for approximately 160 km and then lost radio contact with them north of Burwell, Nebraska (Fig. 1). They were migrating at a ground speed of 72 km/hour. I returned to the Platte but had no radio contact along the river the next morning. The cranes had left the area.

There were no reports of the project cranes until 22 May, when they were seen in Waco, Texas, approximately 72 km north of Rosebud (Fig. 1). In June I received a report that the project cranes were seen on the Herd Ranch near Refugio, approximately 32 km from WWR. On 26 July, 1 of the females was killed by a bobcat just before 1930 hours (Texas Parks and Wildlife Department, pers. commun.). The remaining 2 project cranes (1 male and 1 female) moved adjacent to WWR and started visiting a horse barn to feed. I retrieved them when they returned to WWR on 11 August, and I transported them once again to LANWR, where roosting and foraging habitats far exceeded those at WWR. I hoped that the project cranes would be able to survive at LANWR without too much human intrusion and would associate with wild cranes again in the fall of 1989. In the absence of wild cranes, they foraged with domestic animals and associated with people living near the refuge, but they

apparently continued to roost at LANWR. For a short period after the wild cranes arrived, the 2 project cranes stopped these foreign associations and remained in the company of wild cranes, but this did not last very long. They did, however, continue to roost at LANWR, according to the people they visited during the day. Efforts to discourage people from feeding and taming the project cranes produced mixed results, with some residents wanting to retain the cranes as pets, some complying with my request, and 1 particular individual wanting to shoot them.

January – March 1990

In January 1990 I returned to LANWR and changed the radio transmitter on the remaining male project crane. The female was very wary of me and could not be captured. During this visit I contacted many people and distributed fliers requesting them to discourage the 2 cranes from visiting their yards. One individual did not heed this request and further tamed them. On 8 March, because they had become too tame and displayed no intention to migrate, the 2 subadult hand-reared sandhill cranes were removed from the wild and shipped to Rio Grande Zoo in Albuquerque, New Mexico.

DISCUSSION

Availability of crane habitats at WWR was at an all-time low because of drought conditions during the project, making it difficult to properly test the release of cranes on wintering grounds. Notwithstanding, this experiment suggests that the natal area plays a significant role in the movements of cranes. The ability of the isolation-reared cranes to navigate accurately back to their natal area (WWR), even after making a significant portion of their northbound journey in an enclosed pickup in the dark, raises intriguing questions about cranes' migratory behavior. I believe the following factors severely affected the experiment: (a) the absence of an adult sandhill crane for early imprinting purposes, (b) Big Lake becoming dry for the first time in recent years, (c) frequent handling of these cranes by humans to change release sites, and, most serious of all, (d) the resultant postponement of the release from October 1988 to January 1989. Without these extenuating circumstances the results might have been different, and only a similar experiment carried out under more suitable conditions would answer questions on migration and homing by released cranes.

The importance of the natal area to cranes suggests that releases would best be accomplished on the species' breeding or staging areas (in the north). A stable body of water for roosting and a stable wild crane population with which the hand-reared cranes can integrate are crucial requirements. The time of release and the length of the acclimation phase are crucial factors for successful release because the longer the cranes remain with their costumed parent, the more difficult it is to transfer this attachment to wild cranes.

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