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RELEASING PUPPET-REARED SANDHILL CRANES INTO THE WILD: A PROGRESS REPORT

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Abstract: In 1982, 2 eggs from an abandoned greater sandhill crane (*Grus canadensis tabida*) nest were artificially incubated and hatched. Chicks were hand reared in partial visual isolation from humans with the aid of puppet heads. At 4-5 weeks of age, the chicks were placed in a fenced compound in a marsh frequented by their parents. During daylight hours the chicks were continually monitored by an observer in a blind. Until fully feathered, they were returned at night to an indoor shelter. Upon fledging, the chicks were released daily in the field where their parents foraged. The adults and the chicks were mildly attracted to each other. In late August, immediately after being color-marked, the chicks disappeared from the study area. Their parents remained in the region until mid-October. During winter 1984-85, 1 of the released birds was observed with other greater sandhills in northcentral Florida. The same bird was observed once during the summer of 1985 at the release site. It was accompanied by another crane. During winters 1986-87 and 1987-88, this crane wintered in the same general area of northcentral Florida. In 1990 this crane was located with a mate and a chick, 5 km from the marsh on which the bird was released in 1982.

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It seems possible to modify and apply Dayton Hyde's (pers. comm. 1968) technique for rearing migratory cranes in captivity and return these birds to the wild. Hyde hatched and reared 5 greater sandhill cranes under bantam hens. "V-shaped" rearing pens were constructed to block visual contact with humans, but were arranged such that the birds could observe wetlands populated by wild cranes. At fledging, the juveniles were released, and although initially confused about appropriate associates (they tried fence posts and horses), they eventually joined the wild cranes, migrated south with them and returned with them in spring. Although the released juveniles were not color-marked or banded, in spring what were likely the same birds returned with marked adults they had joined the previous autumn. Sometimes they foraged near, in, and beside their rearing pens, further suggesting that the pen-reared birds reared in visual isolation from humans had survived 2 migrations.

In contrast to Hyde's success, 14 hand-reared, 5-month-old Florida sandhill cranes (*G.c. pratensis*), released in southcentral Florida in September 1971, had all perished by December (Nesbitt 1979). These cranes, raised in visual contact with humans, were tame and dependent on humans.

Rather than risk disease transmission from bantam hens, and in an effort to produce fledglings

that were not dependent on humans, we reared cranes using hand puppets that resembled the head and neck of sandhills. The chicks were kept in partial visual isolation from humans and they were color-marked and banded.

The project was conducted at the Leopold Memorial Reserve (LMR), a 587-ha private reserve in Wisconsin. This area is a riparian and hilly habitat bordered on the north by the Wisconsin River and on the south by agricultural fields. An 89 ha marsh and several ponds cover the eastern edge of the reserve and constitute the breeding territory of 1 pair of cranes (Fig. 1). These cranes frequently flew from their territory to forage in nearby agricultural fields. The adults were observed from arrival until they abandoned their nest near the end of the incubation period, when eggs were retrieved, hatched in an incubator, and the chicks were used as described in this experiment.

METHODS

On 25 May 1982, 2 eggs were collected from a deserted greater sandhill crane nest in Sauk County, Wisconsin. On 30 May and 1 June, respectively, the eggs hatched in an incubator. During the first 10 days following hatching, the chicks were reared in separate but adjacent enclosures in visual contact with each other, but in visual isolation from

humans except for brief intrusions when the pens were cleaned. The chicks were given minimal opportunity to follow the researchers. A puppet resembling the head and neck of a sandhill crane was extended through a small opening in the wall above the food dish and was used to teach the chicks to eat the dry pelleted food. This method had been used at the International Crane Foundation in 1981 to produce blue cranes (*Anthropoides paradisea*) (Putnam 1982). On 11-18 June, the chicks were carried in small boxes in early morning from the rearing room to a grassy upland area in the LMR not far from the foraging and roosting areas of adult cranes. The vegetation was cut over an area measuring about 8 m in diameter, and the chicks were kept in a 1.5-m x 2-m, 2.5 cm² mesh chicken wire enclosure at the edge of the mowed area. The area was subdivided with a 1-m high plexiglass barrier allowing the chicks to see each other but preventing physical contact. Mowing facilitated visual contact between chicks and adults, encouraged by baiting the adults near the pens with scattered corn along the perimeter. A taped recording of unison calls was also broadcast to attract the adults. To prevent predation, an observer watched the chicks continuously from a blind. Each evening the observer carried the chicks back to the rearing room, and during inclement weather the chicks were placed in temporary shelters. One chick received antibiotics when it developed a swollen and inflamed tarsometatarsal joint. Beginning 14 July, the chicks were placed together in a 7-m diameter chicken wire enclosure surrounding the smaller enclosure. The chicks spent nights in this pen while an observer slept in a tent nearby. From 2 August, the chicks were placed in a 1.5-m diameter wire enclosure in an upland field 7-km from the marsh in a region where the adults foraged (Fig. 2). On August 12 the chicks were banded with U.S. Fish & Wildlife Service (USFWS) bands and color-marked with plastic bands. Fearing that the chicks might be attacked by dogs or wander onto a nearby road and be struck by a vehicle, we moved the chicks back to the marsh on 18 August. During the day they were given freedom to socialize with a single crane and with their parents when they returned from their upland foraging sites. From August 23-30, the chicks were left afield overnight and human contact with them was minimized.

RESULTS

The chicks readily responded to puppets and

quickly learned to feed on pelleted food. They did not exhibit fear when the attendants entered their pen for cleaning.

The chicks often paced the subdivision barrier trying to peck each other. The first day chicks were placed in their outdoor enclosure, there was a great deal of pacing, attack attempts and stress calling. Aggression was greatly reduced over the next 2 days. Aggression was particularly noticeable from 1 chick when the other chased a food item. After the chicks were placed together on 16 June, the larger chick exerted dominance over its sibling, and this relationship persisted until observations were discontinued on 30 August.

Although the adults remained in the marsh most of June and July, they were silent and secretive, presumed to be molting, and did not approach the chicks' enclosure. On 1 August, the adults flew from the marsh to an alfalfa field, 1.5 km from the marsh, where they foraged daily until autumn. In early August when the chicks were placed in an enclosure in that field, the adults assumed rigid upright threatening postures or "Parade Walks" (Voss 1976) and approached the chicks. Unable to make direct contact, the adults soon relaxed but remained near the enclosure. Presumably wanting to lead the chicks away with them, the adults elevated their beaks about 45 degrees above the horizontal. Within a few minutes the adults relaxed, and foraging and preening activities of the chicks and the adults were frequently synchronized. When the chicks were released, however, the adults exhibited low-intensity aggression toward them. The 4 birds were often together although 2 sub-groups were obvious. Throughout this period the chicks readily approached observers and/or the vehicle in which they were transported whenever possible.

The bond between the chicks and the adults was weak, although they occasionally flew as a group to the marsh. When the chicks subsequently spent their days at the marsh and the adults continued to forage in the alfalfa field, on several occasions the chicks interacted with a single crane at the marsh. These interactions were much more relaxed than the earlier observed interactions with the adults. When the adults discovered the single crane, they drove it from their territory although they tolerated the presence of the chicks. The chicks disappeared from the area 30 August, 1 week after the single crane was driven off. The adults remained in the vicinity until 17 October.

The dominant bird was observed with a sandhill crane flock on their wintering grounds in

northcentral Florida in January and February 1984 (S. Nesbitt pers. comm.). The same bird was briefly observed near the release site in July 1985 (S. Knight pers. comm.). The crane was spotted in the same winter area in Florida in February 1987 and 1988; in 1987 it seemed to be paired with another crane, but in 1988 it was an unpaired member of a flock of wintering cranes (S. Nesbitt pers. comm.). The behavior of this bird in Florida and in Wisconsin was indistinguishable from that of other wild cranes.

In July 1990, an unusually tame crane family was reported in agricultural fields 5 km from the wetland on which the 2 cranes were released in 1982. The family sometimes foraged in a garden near a farmhouse. The male crane was banded with a USFWS metal band, and was much tamer than the female and the juvenile. In August, the male was captured and determined to be one of the cranes released in 1982. It was re-banded with a new USFWS colored plastic leg band and an attached radio transmitter. In September, the family moved 8 km northeastward to join a large congregation of staging sandhills. In November, the family was observed at the Jasper-Pulaski Fish and Wildlife Area in Indiana. Within flocks of cranes, the family group was much more afraid of humans than when on their breeding territory.

DISCUSSION

Although only 2 birds were involved, this project demonstrated that a puppet-reared sandhill crane, partially isolated from humans, can successfully enter a wild flock and learn the migration route and eventually breed in the wild. One crane made 17 successful migrations, paired, and reproduced. These findings confirm the pioneering work of Hyde (1968). Horwich (1986) expanded the approach by using puppets and crane-costumed researchers in rearing and releasing 5 greater sandhill cranes in central Wisconsin. Three of 5 birds successfully integrated with wild cranes and were observed with them on migration. Two of the 5 cranes apparently migrated independently of the wild cranes on an alternate route. Four of the 5 birds that migrated in autumn were located in central Wisconsin the following summer (J. Wood pers. comm.). The missing crane was one that had migrated with the wild cranes. From a total of 7 cranes released in 1982 and 1985, 5 are known to have returned to near their release area the following spring. This is a remarkable number considering the vastness of the areas into which the cranes

dispersed.

During 1988-90, 38 greater sandhill crane chicks were gently-released on Seney National Wildlife Refuge (NWR) in the Upper Peninsula of Michigan after being reared on site in isolation from humans by the same techniques employed by Horwich (Urbanek pers. comm.). For 29 chicks released in 1988-90, minimum survival, 1 year after release, was 83%, and minimum return rate to the Upper Michigan study area, for both males and females, was 69 %. These results were attained in spite of significant transmitter failure and subsequent difficulties in monitoring released birds.

Although they interacted freely with wild cranes, after release chicks preferentially associated with other members of their release cohort. This resulted in some problems with initiation of first migration. In 1988, 8 of 16 released juveniles remained at Seney after all wild birds had departed; therefore, these 8 chicks were transported 370 km to Wisconsin staging areas for re-release. Despite this displacement, 3 of these birds returned to Seney NWR the following spring. In 1989, after similar cohort loyalty was apparent, manipulations to remedy this problem were developed, and in 1990, by break up of the release cohort into small groups and redistribution on different staging areas within the study area just before peak departure of wild cranes, all 9 chicks in that cohort were induced to both depart the release area on their own and migrate to appropriate staging areas along the Wisconsin route. In all releases, juveniles that initiated migration correctly also tended to be those that proceeded fully southward to winter on the major areas used by most of the wild population. Wintering on these areas also appeared to increase as birds aged.

Two experimental releases in Idaho in 1980 and 1984 of subadult (between 1 year and 3 years of age) greater sandhills reared by captive parents at Patuxent Wildlife Research Center, Maryland, met with limited success. In 1980, cranes were directly released into the wild, a "hard release." In 1985 the birds were held in a fenced enclosure to promote acclimatization to the region before their release, a "soft release." In both studies, the cranes did not integrate well with the wild cranes and many fell victim to predators. Only 4 and possibly 5 birds of the 28 released were known to have successfully reached their wintering grounds. At least 2 of these survived a minimum of 2 years (Drewien et. al. 1981; Bizeau et. al. 1987; Drewien pers. comm.). In contrast, yearlings and older subadult non-migratory Mississippi sandhill cranes (*G.c. pulla*) reared

under similar conditions were more successful, and some captive-produced cranes are now breeding in the wild (Mitchell & Zwank 1987).

Crane chicks remain with their parents for approximately 10 months, during which time they learn to feed on a wide variety of foods at many foraging sites. Also during this period they experience their first migration. Captive juveniles display two conspicuous tendencies that are reduced in yearlings and older birds. First, juveniles are extremely inquisitive and often peck at and explore novel items. Second, captives are prone to follow people. Wild juvenile cranes use this inquisitiveness to find the proper foods, and their tendency to follow their parents or other cranes helps them learn the migration route. The high survival rates of sandhills released as fledglings, compared with the survival of birds released as yearlings or older, further supports the idea that it is important for cranes to learn these things during the first few months.

Although the 2 cranes in this experiment were not initially afraid of people, by the time they were last seen in late August 1982, they had, after joining wild cranes, become fearful of humans. At the International Crane Foundation, hand-reared red-crowned cranes (*G. japonensis*), penned with wild-caught or puppet-reared conspecifics, acquired fear of humans even if human contact was not minimized.

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