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James C. Lewis
U.S. Fish and Wildlife Service

F. Graham Cooch
Canadian Wildlife Service

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INTRODUCTION OF WHOOPING CRANES IN EASTERN NORTH AMERICA

JAMES C. LEWIS, *U.S. Fish and Wildlife Service, P. O. Box 1306,
Albuquerque, NM 87103*

F. GRAHAM COOCH, *Canadian Wildlife Service, Ottawa,
Ontario, Canada, K1A 0E7*

Abstract: Whooping cranes (*Grus americana*) historically occurred throughout most of North America. A migration route last used prior to 1857 crossed the Appalachians to Atlantic Coast wintering grounds in coastal areas of New Jersey, South Carolina and river deltas farther south. The species disappeared from most eastern North American locations in the late 1800's. The winter 1987 population consisted of 43 captive birds and 154 in 2 wild subpopulations. Pursuant to both Canadian and U.S. recovery plans, sites in Michigan-Ontario, Georgia and Florida are being considered as potential release locations for establishing an eastern population. Cross-fostering, gentle release and other introduction techniques are being considered to effect that release.

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Recovery plans (U.S. Fish & Wildlife Service 1980, 1986; Cooch et al. 1988) recommend self-sustaining wild populations be established in North America in addition to the population which winters on the Texas Gulf Coast; this paper describes a proposal, pursuant to that recommendation, to reintroduce whooping cranes to at least 1 site in eastern North America, progress to date, and plans for implementing the introduction. By about 1870 the whooping crane population was estimated at 500 to 1300 individuals (Allen 1952, Banks 1978). The primary nesting range was prairie wetlands in central Illinois, western Minnesota, northern Iowa, northeastern North Dakota, southern Manitoba, southern Saskatchewan and east central Alberta. The cause of their population decline is thought to be habitat destruction, shooting, and other types of disturbance by man. Whooping cranes were last recorded in the eastern states in the late 1800's (Allen 1952; Nesbitt 1982).

In winter 1987, the total population was 197 individuals in 2 wild populations, 1 captive flock of 41 birds maintained by the U.S. Fish and Wildlife Service near Laurel, Maryland, and a single male in captivity at each of 2 other sites.

The main wild population, which winters in Texas, migrates north northwesterly 4,000 km through the Great Plains, Saskatchewan and Alberta to nest in Wood Buffalo National Park.

This group in winter 1987 contained 134 individuals.

The second wild population winters primarily in New Mexico and migrates 1200 km northwesterly to summer in eastern Idaho and western Wyoming (Drewien & Bizeau 1981). This population originated from an experiment to test cross-fostering with greater sandhill cranes (*Grus canadensis tabida*) as a technique for reintroducing whooping cranes to western North America. In winter 1987, there were about 20 cross-fostered individuals in this flock. No birds have paired to date but the recovery plan goal for the population is a minimum of 25 pairs.

WHOOPING CRANES IN THE MIDWEST AND EAST

A minor migration route, last used before 1857, crossed the Appalachians to the Atlantic Coast (Allen 1952). Coastal areas of New Jersey, South Carolina, and river deltas farther south were the wintering grounds. The latest specimen records or sighting reports for some eastern locations are Alabama 1899; Arkansas 1889; Florida 1927 or 1928; Georgia 1885; Illinois 1891; Indiana 1881; Kentucky 1886; Manitoba 1948; Michigan 1882; Minnesota 1917; Mississippi 1902; Missouri 1884; New Jersey

1857; Ohio 1902; Ontario 1895, South Carolina 1850; and Wisconsin 1878 (Allen 1952; Burleigh 1944; Hallman 1965; Sprunt & Chamberlain 1949).

Atlantic Coast locations used by whooping cranes include the Cape May area and Beesley's Point at Great Egg Bay in New Jersey; the Waccamaw River in South Carolina; the deltas of the Savannah and Altamaha rivers, and St. Simon's Island in Georgia; and the St. Augustine area of Florida. Gulf Coast locations include Mobile Bay, Alabama; Bay St Louis in Mississippi; and the numerous records from southwestern Louisiana where the last bird was captured in 1949. Coastal Louisiana contained both a nonmigratory flock and wintering migrants (Allen 1952). Records from more interior areas of the southeast include the Montgomery, Alabama area; in Arkansas at Crocketts Bluff on the White River, and near Corning; in Missouri in Jackson County near Kansas City, near Corning, in Lawrence County southwest of Springfield, in Audrain County, and near St. Louis; and in Kentucky near Louisville and Hickman. It is unknown whether these records represent wintering locations, remnants of a nonmigratory population or simply wandering individuals.

EASTERN STUDY AREAS

Pursuant to the recovery plan recommendations, in early 1984, 3 potential whooping crane release areas in the East were selected (primarily because they were supporting sandhill crane populations and might also have the capability to simultaneously support whooping cranes) — the upper peninsula of Michigan and adjacent areas of Ontario, the Okefenokee Swamp in southern Georgia, and central Florida. Three-year studies were initiated at each site in October 1984 to evaluate their respective suitabilities.

The Michigan-Ontario study, centered at Seney NWR, was conducted by the Ohio Cooperative Fish and Wildlife Research Unit at the University of Ohio, the project at Okefenokee NWR by the Georgia Cooperative Fish and Wildlife Research unit at the University of Georgia, and the project in Florida by the Florida Game and Fresh Water Fish Commission and the Florida Cooperative Fish and Wildlife Research Unit at the University of Florida. Three disjunct sites in Florida were concentrated on, the Kissimmee Prairie, C.M. Webb Wildlife Management Area and Myakka River State Park (Bishop & Collopy 1987).

Seney NWR encompasses 38,630 ha, including 25,109 ha of wetlands (McMillan et al. in press). Other wetland habitats exist in the nearby Hiawatha National Forest, lands in private ownership and in Ontario. Areas occupied by sandhill cranes in southern Ontario (Tebbel 1981) might contain suitable habitat for whooping cranes and would provide Canada an opportunity to support a second nesting population. Resident greater sandhill cranes are part of the eastern population of greaters (Lovvorn & Kirkpatrick 1982), and winter in southern Georgia and Florida (Walkinshaw 1960; McMillan et al. in press).

Okefenokee NWR encompasses 188,993 ha, including 21,999 ha of emergent marsh (Bennett & Bennett 1987). The refuge boundary delimits most of Okefenokee swamp, which is a national wilderness area. Year-round nonmigratory resident sandhills are of the Florida subspecies (*G.c. pratensis*). The size of this population, its ecology, behavior and other information were unknown previous to the study. Greater sandhill cranes are winter residents.

The central Florida study sites range from 44,987 to 104,969 ha (Bishop & Collopy 1987). Florida sandhill cranes are resident year-round on each site and greater sandhill cranes are winter residents. The 3-year projects were completed in October 1987 and their respective final reports used to compare the merits of each potential release area. If the Michigan-Ontario area was selected, the introduction technique would necessarily involve cross-fostering because release of captive-reared birds is not yet considered a practical technique for establishing a migratory population (Drewien et al. 1982; Bizeau et al. 1987). The candidacy of the Michigan-Ontario site is therefore dependent on a successful conclusion to the cross-fostering experiment in the Rocky Mountain population.

In contrast to the problems inherent in establishing a nonmigratory whooping crane population, establishing a nonmigratory population seems favorable regardless of the outcome of the cross-fostering experiment. A nonmigratory population might be established using several techniques other than cross-fostering. The cross-fostering technique, even if it proves successful in the Rocky Mountains experiment, may not be satisfactory for establishing a whooping crane population in Georgia or Florida. Sandhill cranes in Florida nest from early February to mid-April (Walkinshaw 1976), with a peak in mid-March. Sandhill cranes in Georgia nest from March through June with a peak in mid-March (Bennett & Bennett 1987). The peak nesting

period of Florida sandhill cranes precedes egg production in Canada (May) and in the captive flock (April-May peak) by 1 to 2 months. Thus, many of the local sandhill cranes have completed nesting by the time whooping crane eggs would be available from wild or captive flocks. Logan & Nesbitt (1987) tested cross-fostering of greater sandhill crane eggs taken from the eastern population and the captive sandhill crane flock at Laurel, Maryland. Nesting activity by the Florida foster-parents was prolonged by robbing clutches or replacing eggs with dummy eggs. However, it appears to be counter-productive to extend incubation more than a few days beyond the normal 30-day incubation because Florida sandhill cranes seem more inclined to abandon nests and show reduced attentiveness after 40 days of incubation (Logan & Nesbitt 1987).

One alternative technique would be the gentle release of captive-reared birds. Such has been successful in supplementing the population of endangered Mississippi sandhill cranes (*G.c. pulla*) (Zwank & Derrickson 1982; Valentine & Logan in press). The term "gentle release" refers to retaining juveniles in enclosures at the release site to gradually adjust to their new surroundings. Conceptually, enclosures would be about 2 ha in size, and contain some natural foods and water. Commercial foods would be provided *ad libitum*. After 4 to 6 weeks, the birds would be allowed to fly from the pen. The soft-released Mississippi sandhill cranes gradually became acquainted with their surroundings, became primarily dependent on natural foods and learned to avoid predators (Valentine & Logan in press). Forty-one have been released and 45% survived from 1 to almost 6 years (Zwank & Wilson 1987). In 1987, captive-reared and released individuals comprised 1 or both members of one-half (5) of the 9 nesting pairs in the population (Valentine & Logan in press). Another technique potentially useful would be releasing captive-reared pairs in the wild, as has been done to supplement a population of wild red-crowned cranes (*G. japonensis*) in China (Xu Jie et al. in press). Eggs would be removed early to increase egg production, and the pairs allowed to incubate some of their later eggs. The wild-raised progeny could join the wild flock, and chicks from collected eggs would be reared in captivity for later release. Some cranes could also be released as unpaired adults at the beginning of the nesting season so they could pair with wild cranes.

SELECTION OF THE RELEASE AREA

Canadian Wildlife Service and the U.S. Fish and Wildlife Service have primary responsibility for final selection of the third release site, guided by recommendations of their staff, the recovery teams, by input from other affected federal agencies, states, and provinces, by private groups and the public.

The recovery teams have identified biological factors that will be considered when evaluating the potential release areas, including hazards presented by powerlines, the presence of avian disease pathogens or environmental contaminants, and potential of the habitats to simultaneously support whooping cranes and sandhill cranes.

TIMING OF THE RELEASE

The release of whooping cranes or transfer of eggs is unlikely to begin before 1990 and may occur several years later. Both nations are committed to using surplus eggs and birds through 1989 in continuing experiments with the Rocky Mountain population. Subsequently, the availability of eggs or young will largely depend on the outcome of the cross-fostering experiment and on egg requirements for a second captive flock that may be started in Canada. However, egg production in the Canada-United States population and in captivity should be much increased by 1990. The captive flock contains 5 experienced breeding pairs and 9 newly formed pairs that should be producing eggs in the next 2-3 years. The wild population contained 33 pairs in 1987 and should exceed 40 in the early 1990's.

WILL WHOOPING CRANES INTERFERE WITH WATERFOWL HUNTING?

Several people have expressed concerns that if whooping cranes are restored in the east their presence will lead to restrictions on hunting migratory waterfowl or will complicate the jobs of waterfowl managers. These concerns are based on past events and present management activities in the range of the two existent wild populations. The last time a whooping crane is known to have been killed by a hunter was in 1968 when a snow goose hunter shot an adult near Aransas NWR. Several whooping cranes in the Rocky Mountain population have been shot since then but recovered. Historically, the hunting hazard has been viewed as being greatest

when hunting activities for look-alike species, i.e. sandhill cranes and snow geese (*Chen caerulescens*), coincided with the presence of whooping cranes. Sandhill cranes have a profile similar to that of whooping cranes, and in bright sunlight the light gray plumage of sandhill crane can appear whitish. Also, the dark gray wingtips of the sandhill can appear like the black wingtips of whooping cranes. Whooping cranes can also be mistaken for snow geese which have white plumage and black wingtips.

But sandhill cranes are not hunted east of the Mississippi River, and snow geese are not present in the potential release areas or in greater sandhill crane wintering areas of Georgia and Florida. Snow geese also are not abundant along the migration pathway that would be used if whooping cranes are cross-fostered in northern Michigan. Thus the likelihood of conflict between migratory bird hunting and introduced whooping cranes seems remote.

When a release site is chosen, conservation education efforts will be directed at hunters and the general public to minimize the likelihood of a whooping crane being mistaken for a legal game species. The contingency plan for federal-state and federal-provincial cooperative protection of whooping cranes has proven effective in increasing protection of migrating whooping cranes (Lewis 1990), and could be implemented in the east to minimize the opportunity for any conflict with hunting of other migratory birds.

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