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Brian W. Johns
Canadian Wildlife Service

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PRELIMINARY IDENTIFICATION OF WHOOPING CRANE STAGING AREAS IN PRAIRIE CANADA

BRIAN W. JOHNS, *Canadian Wildlife Service, Saskatoon, Saskatchewan S7N 0X4*

Abstract: For 60 years a passive program has been in effect to monitor the migration of whooping cranes (*Grus americana*) through Saskatchewan, and currently the Canadian Wildlife Service coordinates a tri-provincial reporting network and operates a telephone Hot Line to receive reports of sightings of migrating cranes. Analyses of historical data reported through those efforts have identified the chronology of migration, the migration corridor through Canada, and major staging/stopover areas in Saskatchewan. Investigations are continuing to identify specific roost sites, feeding areas and the availability of suitable habitat within the staging/stopover area.

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The first whooping crane record from the Prairie Provinces of Canada occurred in 1748 when a skin from a white crane was shipped to England from the Hudson's Bay region of Manitoba (Allen 1952). Confirmed prairie nesting records date from 1871 to 1922 (Allen 1952). F. Bard (pers. comm.) and Roy (1964) indicated probable breeding as late as 1927. Whooping cranes at that time nested within the aspen parklands of Manitoba, Saskatchewan and eastern Alberta (Fig. 1)(Allen 1952). Although whooping cranes do not currently breed in the southern Prairies, nonbreeders occasionally summer in the region (Fig. 2).

Whooping cranes regularly occur in the southern Prairies for 2-3 months each year, when spring and fall they migrate across this area. This paper describes the nature of that use during those times.

STUDY AREA

In Canada, the whooping crane migration route covers a transition from grassland through aspen parkland and into boreal forest. My study area is limited to the southern or agricultural portions of Manitoba, Saskatchewan and Alberta.

METHODS

In 1922, Fred Bradshaw, Saskatchewan's Chief Game Guardian, began collecting reports of migrating Whooping Cranes for the Prairie Provinces, especially Saskatchewan (Bradshaw 1922), and upon joining the Saskatchewan Museum of Natural History (SMNH) in 1928 continued to monitor crane migration (Bard pers. comm.). In 1940, Fred

Bard (SMNH) began an active campaign of soliciting sightings, and the museum continued the program until the spring of 1977 when the Canadian Wildlife Service (CWS), Saskatoon, assumed this role (Stephen 1979).

In that effort, volunteers report their observations directly to the CWS, to local offices of provincial wildlife agencies, the Royal Canadian Mounted Police (RCMP) or the SMNH, which, in turn, forward them to the CWS (Stephen 1979; Johns 1987). Data recorded include the number of birds, date, time, location and activity. Sightings are classified as confirmed, probable or unconfirmed per the criteria outlined in the U.S. Whooping Crane Recovery Plan (U. S. Fish & Wildlife Service 1986; Johns 1987). Attempts are made to confirm all sightings.

In 1985, a database was established at CWS, Saskatoon, to provide rapid retrieval of Whooping Crane sightings for the Prairie Provinces. Historical records on file were added to the database in 1986 with the cooperation of the Saskatchewan Natural History Society (Didiuk 1986).

Beginning in 1985, news releases are issued prior to the migration periods, and the following year a 24-hour "Whooping Crane Hot Line" was established to receive reports (Johns 1986).

RESULTS AND DISCUSSION

I analyzed 1,217 sighting records from the period 1956-1987, of which 400 were classified as confirmed, 321 as probable and 496 as unconfirmed (Table 1). Only confirmed sightings are discussed in this paper.

Chronology of Migration

Spring migration through the Prairies begins 10 to 12 days after first departures from Aransas, and spans a 4-6-week period from early April to mid-May (Fig. 3a). Birds which have bred previously are usually the first birds to arrive, while nonbreeders arrive later and linger longer.

Autumn migration occurs from mid-September through late October, although a few cranes may begin migrating in late August and others may linger until early November (Fig. 3b). Since 1977, young whooping cranes have been individually marked with colored leg bands (Kuyt & Goossen 1987), and observations of those indicate that the earliest birds to arrive in the fall (from late August to early September) are yearlings. These birds often migrate separately from other whooping cranes, and in Saskatchewan are usually associated with large flocks of sandhill cranes. Nonbreeders, unsuccessful pairs and family groups begin arriving on the Prairies in mid-September, with numbers peaking the first 2 weeks of October.

Migration Corridor

The spring migration corridor through Canada was first described by Bradshaw (1923) as "... a northwesterly direction from the international boundary ...". Allen (1952) described it as "...into Saskatchewan southeast of Regina. Its course beyond the settled areas is unknown." More recently, sightings from both spring and fall migrations were combined, using axial line analysis (Bellrose 1972, Johnson & Temple 1980), to identify the migration corridor. The "primary" corridor (75% of the sightings) follows a line between southeastern and northwestern Saskatchewan, about 34° west of north (Fig. 4).

Staging/Stopover Areas

Sandhill crane "staging areas", as described by Melvin and Temple (1981), are sites where cranes accumulate during the first segment of their fall migration, usually no more than 1 day's flight from the nesting area and within the first 20% of the migration route. Central Saskatchewan is within the first 20-25% of the migration route. Adults and young may use these staging areas for several weeks, primarily feeding on waste grain in stubble fields (Cooch et al. 1988). Traditional stopover areas are located farther along the migration route,

usually between 25 and 75% of the distance between breeding and wintering areas (Melvin & Temple 1981).

Didiuk (1986), using confirmed and probable sightings from the period 1964 through 1985, delineated 18 areas traditionally used by whooping cranes in Saskatchewan, and ranked them based on amount of use and year of last use. I conducted a subsequent analysis of confirmed sightings from 1956 through 1987, which reemphasized the importance of 7 of those areas. Of these 7 intensively used areas, 6 are considered fall staging areas with limited spring use, and 1 (the Meadow Lake area) is a frequent spring stopover with limited fall use (Fig. 5).

Whooping cranes migrate as single birds (24% of the sightings), as pairs (27%) as groups of 3, usually 2 adults and 1 young (23%) and groups of 4 (9%). Larger groups up to 11 birds are occasionally seen on a staging area (Table 2).

Successful breeders, i.e. pairs with young during migration, and nonbreeders concentrate on different areas during the staging period ($X^2 = 13.41$, $p < 0.01$). In Saskatchewan, Buffer Lake and the Last Mountain-Kutawagan Lakes area are used primarily by nonbreeders. Only 1 (2%) of the 46 groups reported from these areas contained young. Radisson Lake, Midnight Lake and Blaine Lake are used more intensively by breeding birds, with young in 78% of 9 flocks at Radisson Lake, 43% of 14 flocks at Midnight Lake and 36% of 11 flocks in the Blaine Lake area. Witchekan Lake was used by both nonbreeding and breeding segments of the population (young present in 13% of 16 flocks). The spring stopover area, near Meadow Lake, also was used by both successful breeders (young observed in 23% of 22 flocks) and nonbreeders. In areas where several young were recorded, many other sightings of groups of 3 birds were made, probably family groups that had not been recorded as such because young were not specifically mentioned.

The use of a particular site may reflect traditional use within a staging area by specific individual cranes (Kuyt 1984). After the staging period, the cranes make a rapid migration to the wintering area (Kuyt 1984) using traditional and nontraditional stopover areas (Johnson & Temple 1980).

The CWS plans to expand its program to include identification and evaluation of specific roosting and feeding sites within staging areas. Identification of color-banded individuals will provide information on critical staging habitat used by particular individuals or groups of cranes. Once iden-

tified, these traditional use sites will require protection in order to ensure the safety of the whooping crane during migration.

I would like to thank the many people who reported sightings of whooping cranes and the cooperating agencies—Saskatchewan Department of Parks Recreation and Culture, Alberta Fish and Wildlife Division, Manitoba Department of Natural Resources, Saskatchewan Museum of Natural History, Royal Canadian Mounted Police, Saskatchewan Wildlife Federation, Saskatchewan Natural History Society and the U.S. Fish and Wildlife Service, Grand Island. I would also like to thank A.B. Didiuk and B. Miles for plotting locations on maps and entering historical data into the computer, and E.A. Driver, A.W. Diamond, E. Kuyt and J.B. Gollop for comments on the manuscript.

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Table 1. Whooping crane sightings in the Prairie Provinces by season and status, 1956-1987.

	CONFIRMED		PROBABLE		UNCONFIRMED		TOTAL
	Spring	Autumn	Spring	Autumn	Spring	Autumn	
MANITOBA	3	0	7	0	17	3	30
SASKATCHEWAN	90	296	136	163	215	210	1110
ALBERTA	2	9	12	3	26	25	77
Subtotal	95	305	155	166	258	238	
TOTAL	400		321		496		1217

Table 2. Frequency at which various groupings of whooping cranes were observed at Saskatchewan staging areas, 1956-1987.

NUMBER OF WHOOPING CRANES PER OBSERVATION (FLOCK SIZE)												
STAGING AREA	1	2	3	4	5	6	7	8	9	10	11	MEAN
Last Mountain-Kutawagan Lakes	22 ¹	13	0	1	2	1	0	1	0	0	0	1.9
Meadow Lake	3	5	5	5	2	1	0	1	0	0	0	3.3
Witchekan Lake	3	7	5	1	0	0	0	0	0	0	0	2.3
Midnight Lake	0	3	9	0	0	1	0	0	0	1	1	4.0
Buffer Lake	0	4	0	2	0	2	0	1	0	0	0	4.0
Blaine Lake	2	2	3	1	0	2	1	0	0	1	1	4.5
Radisson Lake	0	0	7	1	0	1	0	0	0	0	0	3.4
TOTALS	30	34	29	11	4	8	1	3	0	2	2	3.0
%	24	27	23	8.8	3.2	6.5	0.8	2.4	0	1.6	1.6	

¹ Number of sightings for each flock size.

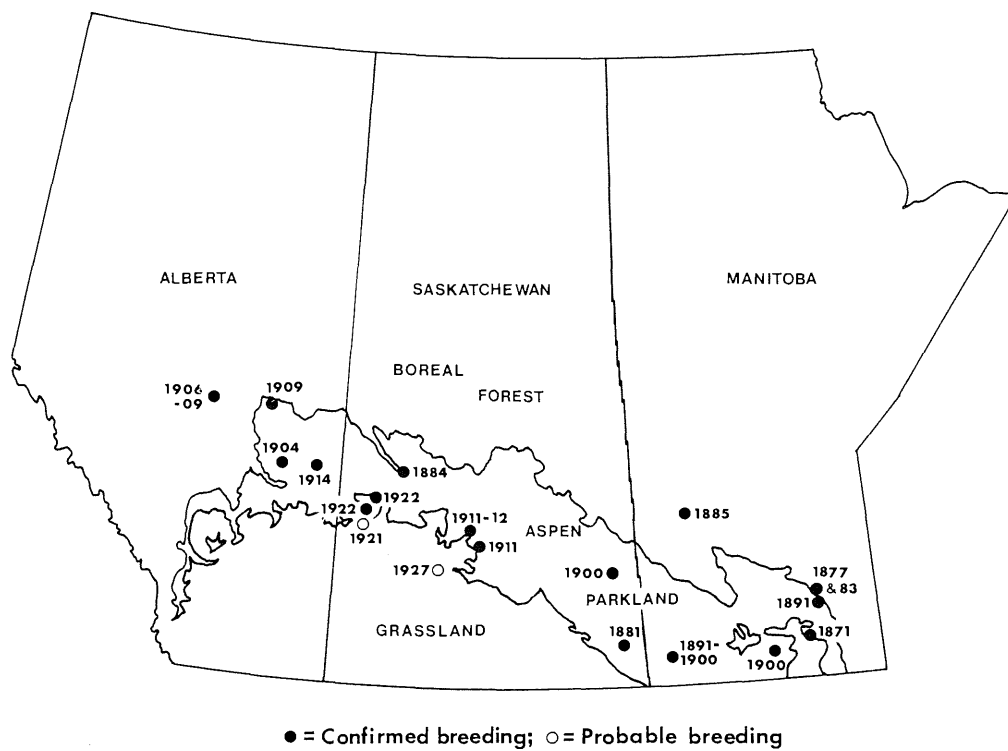


Figure 1. Whooping crane breeding locations, Prairie Provinces, 1871-1927.

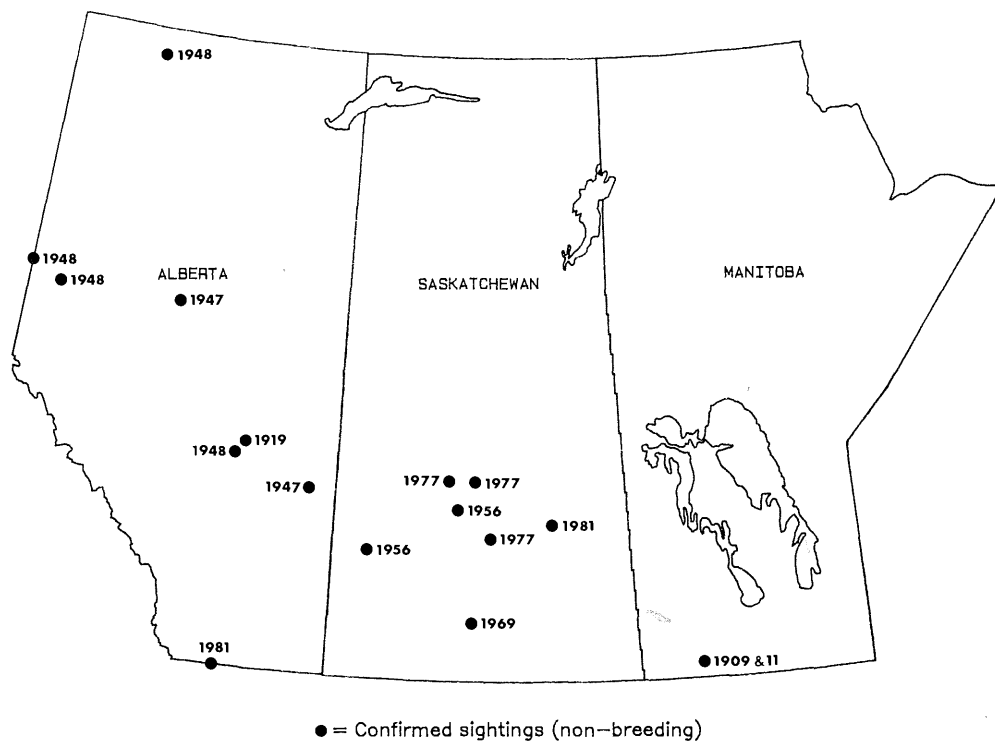
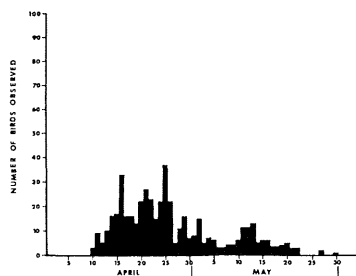


Figure 2. Whooping crane summering locations, Prairie Provinces, 1909-1987.

3a. Spring migration.



3b. Autumn migration.

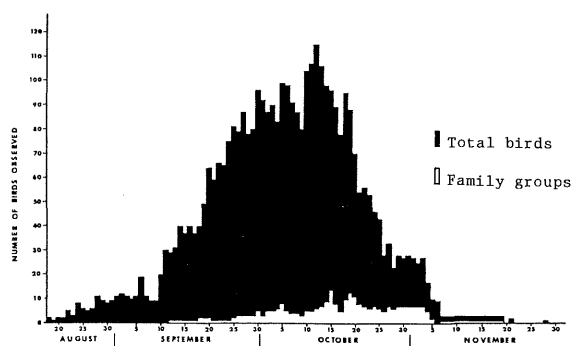
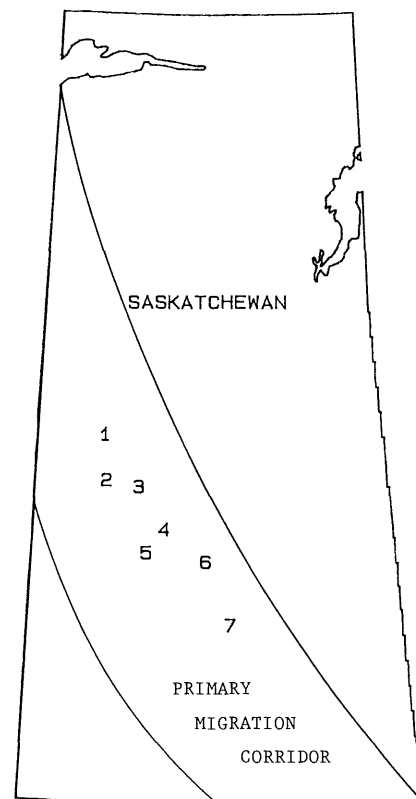


Figure 3. Number of whooping cranes seen on each day during migration through Prairie Provinces, 1956-1987



1 = Meadow Lake; 2 = Midnight Lake; 3 = Witchekan Lake; 4 = Blaine Lake; 5 = Radisson Lake; 6 = Buffer Lake; 7 = Last Mountain - Kutawagan Lakes

Figure 5. Whooping crane staging areas, Saskatchewan.

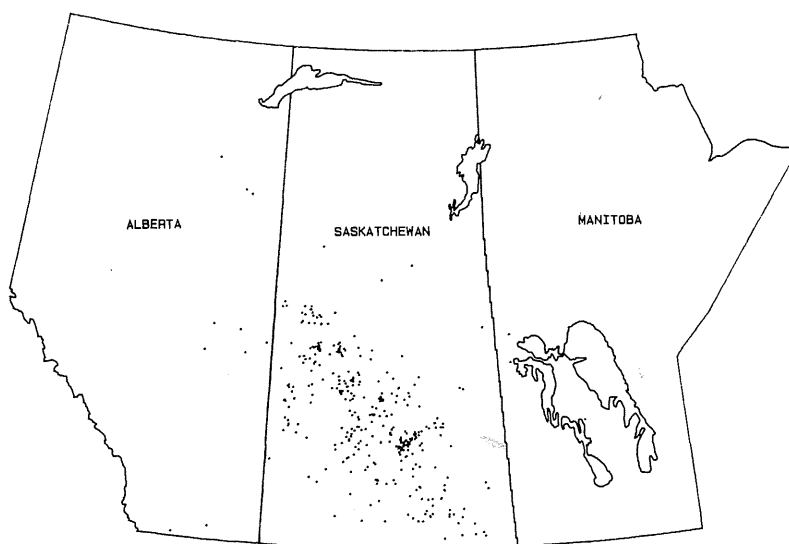


Figure 4. Confirmed whooping crane sightings, Prairie Provinces, 1956-1987.