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# Canadian Whooping Crane Recovery Plan



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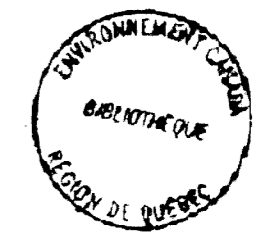
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Canadian Whooping Crane Recovery Plan

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1987/12/4

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Executive Summary

Canadian Whooping Crane Recovery Plan

Whooping Cranes are a symbol of Canadian efforts to preserve its rare and endangered species. Whooping Cranes are protected under the Migratory Birds Convention (1916) and the Canadian Wildlife Service (CWS) has taken the lead in Canada in developing and implementing programs designed to preserve and enhance the migratory population which breeds in and near Wood Buffalo National Park and winters in coastal Texas on or near the Aransas National Wildlife Refuge. While the legal mandate for conservation of Whooping Cranes in Canada rests with the CWS, a significant role has been played by Parks Canada, the provinces and, especially in the early years of the program, by the Saskatchewan Museum of Natural History and the Saskatchewan Natural History Society.

In April, 1985, the CWS and the United States Fish and Wildlife Service (USFWS) signed a Memorandum of Understanding on the Conservation of Whooping Cranes, to enhance cooperation and coordination between our two Nations and as a basis for development of National Whooping Crane Recovery Plans. This was deemed to be essential because all programs affecting Whooping Cranes undertaken in both countries must conform to the spirit of the Memorandum. The Canadian and U.S. Recovery Plans are closely integrated and each plan represents a course of action to be carried out within our respective countries. The U.S. Recovery Plan was approved in December 1986, and contains additional details of the breeding biology and

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history of Whooping Cranes both in the Aransas-Wood Buffalo National Park population and the Grays Lake experimental flock.

We now have in place objectives for the Canadian recovery plan, regional integrated implementation programs, a Contingency Plan in the event of an accident, and the Memorandum of Understanding with the USFWS.

In 1941 the wild migratory population had dropped to 15 birds. By 1966, when the present program began, the wild population had increased to 44 birds but the non-migratory flock in the southern United States had ceased to exist. Although progress has been slow, the population breeding in Canada passed the 110 bird mark in the winter of 1986/87 and we fully anticipate that by the year 2000 we will exceed 40 breeding pairs and 200 individuals of North America's tallest and most spectacular bird. While it is unlikely that there will ever be large numbers of Whooping Cranes we have every expectation of bringing back a part of Canada's heritage from the verge of extinction.

To bring into perspective the scope of the Recovery Plan and Appendices, the Canadian Whooping Crane Recovery Plan consists of the following broad objectives:

1. To provide for the welfare and expansion of the existing wild population of Whooping Cranes breeding in or near Wood Buffalo National Park; to increase the number of breeding pairs to 40, by 2000 A.D.

2. To protect Whooping Cranes and their habitat in Canada at places other than Wood Buffalo National Park by monitoring passage and staging in spring and autumn and developing and implementing a Public Information Program to stimulate public response and support for implementation of this plan.
3. To expand the breeding range of Whooping Cranes in Canada.
4. To develop and enhance co-ordination within Canada and between Canada and the United States; and maintain and implement the Memorandum of Understanding (M.O.U.) between Canada (CWS) and the United States (USFWS).
5. To ensure the efficient implementation of this plan, each flock being studied or created will be the subject of an integrated management plan.
6. To create a National Recovery Team and Regional Advisory Council to undertake an annual review of the existing program to determine if changes are required, to assess progress in reaching stated objectives, and to ensure that high priority is given to developing and maintaining clear lines of communication among the cooperators and general public.

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Disclaimer

The achievement of goals, objectives and specific projects identified herein and in the appendices will be contingent upon priorities and budgets available to the participating agencies and organizations. Therefore some aspects of this plan may not necessarily be implemented immediately or concurrently.

Acknowledgments

Earlier drafts of this document and its appendices have benefited greatly from comments received from the wildlife agencies of Ontario, Manitoba, Saskatchewan, Alberta and the Northwest Territories, the Saskatchewan Natural History Society, Wildlife Habitat Canada, Canadian Nature Federation, Canadian Wildlife Federation, Whooping Crane Conservation Association (Canada), G.W. Scotter, I.M. Price and H. Boyd, CWS, Dr. James Lewis, U.S. Whooping Crane Coordinator, Dr. James Carpenter, Patuxent Wildlife Research Center, Dr. Scott Derrickson, Curator/Ornithology, U.S. National Zoological Garden, Smithsonian Institution, Front Royal, Maryland, Dr. R. Drewien, Idaho Cooperative Wildlife Unit, L. Smith, U.S. Whooping Crane Recovery Team, and C. Fjetland, U.S. Fish and Wildlife Service.

Background Report on Whooping Cranes

Robert Porter Allen's Whooping Crane monograph (1952) indicates that in 1870 Whooping Cranes may have numbered about 1,400. Although exact figures will never be known, it is certain that these cranes were uncommon in North America in historic times. Loss of marshland habitat, shooting and egg collecting no doubt contributed to the severe decline in numbers to the point where, in 1941, the migratory population annually wintering on the Texas coast was reduced to 15 birds including perhaps four or five breeding pairs. In 1954, when the nesting area in Wood Buffalo National Park was discovered, the population, then 21 birds, still hovered on the brink of extinction.

By 1966, when the Canadian Wildlife Service (CWS) and United States Fish and Wildlife Service (USFWS) in response to growing public concern agreed to increase management efforts, the migratory Wood Buffalo National Park - Aransas National Wildlife Refuge, Texas population numbered 44 birds. Five birds, including an injured bird captured in the park as a juvenile in 1964, existed in captivity. These modest population increases were due to a number of factors including the signing of the Migratory Bird Convention between the United States and Great Britain (on behalf of Canada) in 1916, the establishment of Wood Buffalo National Park in Canada (1922) and of the Aransas National Wildlife Refuge in Texas (1937), as well as increased public awareness and interest in preservation efforts, largely as a result of Allen's (1952) monograph and publicity emanating from the Saskatchewan Natural History Society and from the Provincial Museum in Regina, Saskatchewan.

After it was learned that, though the usual clutch was two eggs, no more than one chick was usually reared by any pair, the possibility of increasing the number of cranes by removing one egg from a clutch and rearing it elsewhere gradually gained credibility. The transfer of surplus eggs from Wood Buffalo National Park to the Patuxent Wildlife Research Center in Maryland began in 1967 when six eggs were shipped (Table 1). The resulting chicks and those from subsequent egg transfers form the nucleus of the Patuxent captive flock which in 1986 numbered 39 birds.

Even though the primary objective of the transfer was to establish a captive population for propagation of young birds and their eventual release in the wild, the CWS was encouraged by the fact that there was no apparent reduction in the production of young wild Whooping Cranes during the first three years of egg transfers (Table 1). A serious, unexplained loss of 13 birds between fall of 1971 and fall of 1972 (largely nonbreeding birds) and below average survival of juveniles in 1973 and 1974 resulted in a population of 49 birds in 1974, almost the same as the flock size of 48 birds in 1967. From spring 1975 to spring 1977 the population shot up from 49 to 69 birds, a net gain of 20 birds over two consecutive breeding years; a record which was only exceeded in 1984-1986. Excellent production of juveniles (20) and absence of any mortality of older birds account for the 1975-1977 increase. During the next seven years, the population increased by only six birds, the annual production of chicks barely keeping ahead of losses of adult birds which averaged just over five birds per year. A second spurt in population occurred between fall of 1983 and fall of 1986 when a net gain of 35 birds was realized.

Table 1. Composition of Wood Buffalo National Park Whooping Crane Population, 1966-1986.

	Total population*	No. of known breeding pairs	No. of juveniles*	Max. no. of non-breeders (including juveniles)	Destination of eggs removed from WBNP	
					Patuxent	Grays Lake
1966	43	5**	5	**	-	-
1967	48	9**	9	**	6	-
1968	50	10	6	30	10	-
1969	56	12	8	32	10	-
1970	57	15	6	27	-	-
1971	59	13	5	33	11	-
1972	51	16	5	19	-	-
1973	49	14	2	21	-	-
1974	49	15	2	19	13	-
1975	57	16	8	25	-	14 (3)
1976	69	16	12	37	-	15
1977	72	17	10	38	-	16
1978	75	15	7	45	-	13 (2)
1979	76	19	6	38	-	19 (3)
1980	78	19	6	40	-	13 (2)
1981	73	17	2	39	-	12 (2)
1982	73	17	6	39	2	14 (1)
1983	75	24	7	27	2	16 (0)
1984	86	29	15	28	3 (2)	22 (0)
1985	97	28	16	41	4 (3)	23 (3)
1986	110	29	21	52	10 (6)	15 (2)
Total					71	192

\* Fall arrivals, Aransas NWR and area; data Refuge Manager, ANWR, Draft U.S. Whooping Crane Recovery Plan, 1986.

\*\* Data incomplete.

( ) Eggs known to have been addled or failed due to embryonic death (data from R.C. Drewien).

Good survival of the 1977-1978 year classes, absorption of these birds into the breeding population, and excellent habitat conditions in 1984, 1985 and 1986, resulted in three record years when 15, 16 and 21 chicks were produced. The number of breeding pairs doubled between 1967 and 1979 and in 1984 reached an all-time record of 29 pairs (32 in 1987). Knowledge of the age composition of the wild population (Kuyt and Goossen, 1987) indicates that the age of about 50% of the December 1984 population was known: 30 birds were sexually immature (1-4 years old), about 14 birds were between five and seven years and the rest were older. There will be no significant increase in the breeding population until 1989, although without mortality of breeding adults and continued good habitat conditions the population should continue to climb. Over 76% of chicks banded in Canada survived their first fall migration, and of these birds, survival up to seven years varied between 84% and 100%. From 1988 to 1990 the population should show another increase in the number of breeding pairs and it is estimated that in 1990 there might be as many as 40-45 breeding pairs and a total population of 150 birds in the Wood Buffalo flock.

Canadian support to establish a second wild Whooping Crane population began in 1975, when 14 eggs were shipped from Wood Buffalo National Park to the Grays Lake National Wildlife Refuge in Idaho. Single Whooping Crane eggs are exchanged for Greater Sandhill Crane eggs (Drewien and Bizeau 1978). The Sandhill Cranes then accept and rear the resultant chick and guide it on its first fall migration. The foster parent scheme will hopefully result in a self-perpetuating, free-flying Whooping Crane population annually migrating between Idaho and New Mexico.

The CWS has supplied Whooping Crane eggs to the Grays Lake project each year since 1975, and by 1986, 192 eggs have been transported (Table 1). An additional 73 eggs have been transferred to Grays Lake from the captive flock at the Patuxent Wildlife Research Center. The new migrating population, usually referred to as the Rocky Mountain Whooping Crane population, now contains about 25 birds (R.C. Drewien, pers. commun.). One third of the birds are from eggs produced by captive birds at Patuxent. This cross-fostered flock winters in the vicinity of the Bosque del Apache National Wildlife Refuge, New Mexico. To date, while no breeding pairs have formed, a vast array of data has been acquired which will be invaluable when attempts are made to establish other flocks.

#### Whooping Crane Biology

Spring migration from the Aransas National Wildlife Refuge begins in late March or early April and all birds have usually left the refuge by the end of April. Family groups, each consisting of a pair of adults and the juvenile from the previous year, and breeding pairs which failed to raise a young bird are the first birds to move north, followed by young breeding adults and nonbreeders. Although several observations of colour-banded birds as well as radio-tracking studies indicate that separation of adults and juveniles normally occurs after the family group has returned to the breeding range, there is some evidence that in early spring, other family groups may separate during brief stopovers in Saskatchewan. Whether separation occurs as a result of adult aggression or is a voluntary act by the juvenile remains unclear.



Migration of a family group, radio-tracked from Texas in 1983, began on 9 April and ended on 22 April when the three birds landed on the nesting range in the Northwest Territories. Breeding birds return to that part of the breeding range where they have nested before. Several pairs of Whooping Cranes have nested in the same areas for 19 consecutive years. With sexual maturity reached at a minimum of three years, these birds could now be at least 23 years old (Kuyt and Goossen, 1987). Binkley and Miller (1980), from a theoretical analysis of the demographic data estimated lifespan of Whooping Cranes in the wild to be from 22-24 years.

The nesting area used by a pair over a number of years may be as much as 47 km<sup>2</sup>, but averages about 7 km<sup>2</sup>. Adjoining Whooping Crane pairs usually nest at least 1 km apart (Kuyt 1981a). Nests are built in marshes and are composed of bulrush and sedge, rarely of cattail. The average diameter of 46 nests measured in 1984 and 1985 was about 115 cm and the mean height above water was about 16 cm. Pond water depth at one metre from the edge of nests examined during "wet years" in 1984 and 1985 averaged about 25 cm but in dry years such as 1980 and 1981 may average only from 13-16 cm. Whooping Cranes' eggs are predominantly light brown or buffy olive in colour and have dark brown and purplish blotches particularly on the blunt pole of the egg. Clutch size is usually two eggs (92.1% of 317 clutches observed), sometimes one egg (6.9%) and rarely three (1.0%). Mean length and width of 74 eggs examined in 1984 and 1985 was 101.5 mm and 62.7 mm. Weights of 53 eggs collected during the third week of incubation in 1984 and 1985 averaged 196.1 g.

In the wild, incubation is 29-30 days (Kuyt 1982) and both adults share incubation duties. Egg predation is rare and re-nesting by Whooping Cranes has only been documented a few times (Kuyt 1981b). Several chicks disappear each year and wolf predation has been documented on a few occasions (Kuyt et al. 1981, Kuyt 1984a). Little is known about summer food habits of Whooping Cranes but feeding areas (margins of shallow ponds and marshes) provide a clue. Larval forms of insects, snails, leeches, frogs and minnows are probably taken in these areas as well as small rodents and berries in drier areas. Whooping Cranes are capable of taking larger vertebrate prey and observations have been made of a juvenile Whooping Crane with a live blackbird in its bill, adults stalking after ducklings, adults feeding on a dead grebe (possibly carrion) and a flightless young crane feeding on a recently dead juvenile American Bittern.

Family groups leave the nest site a day or so after hatching. Chicks are capable of swimming shortly after hatching and have been observed swimming as late as two months of age. During the summer, family groups generally remain within the borders of their Composite Nesting Area (Kuyt 1981a). Juveniles are capable of flight at about 80-90 days but are rarely seen flying before onset of migration. The sex ratio of pre-flight chicks is even (Kuyt and Goossen, 1987).

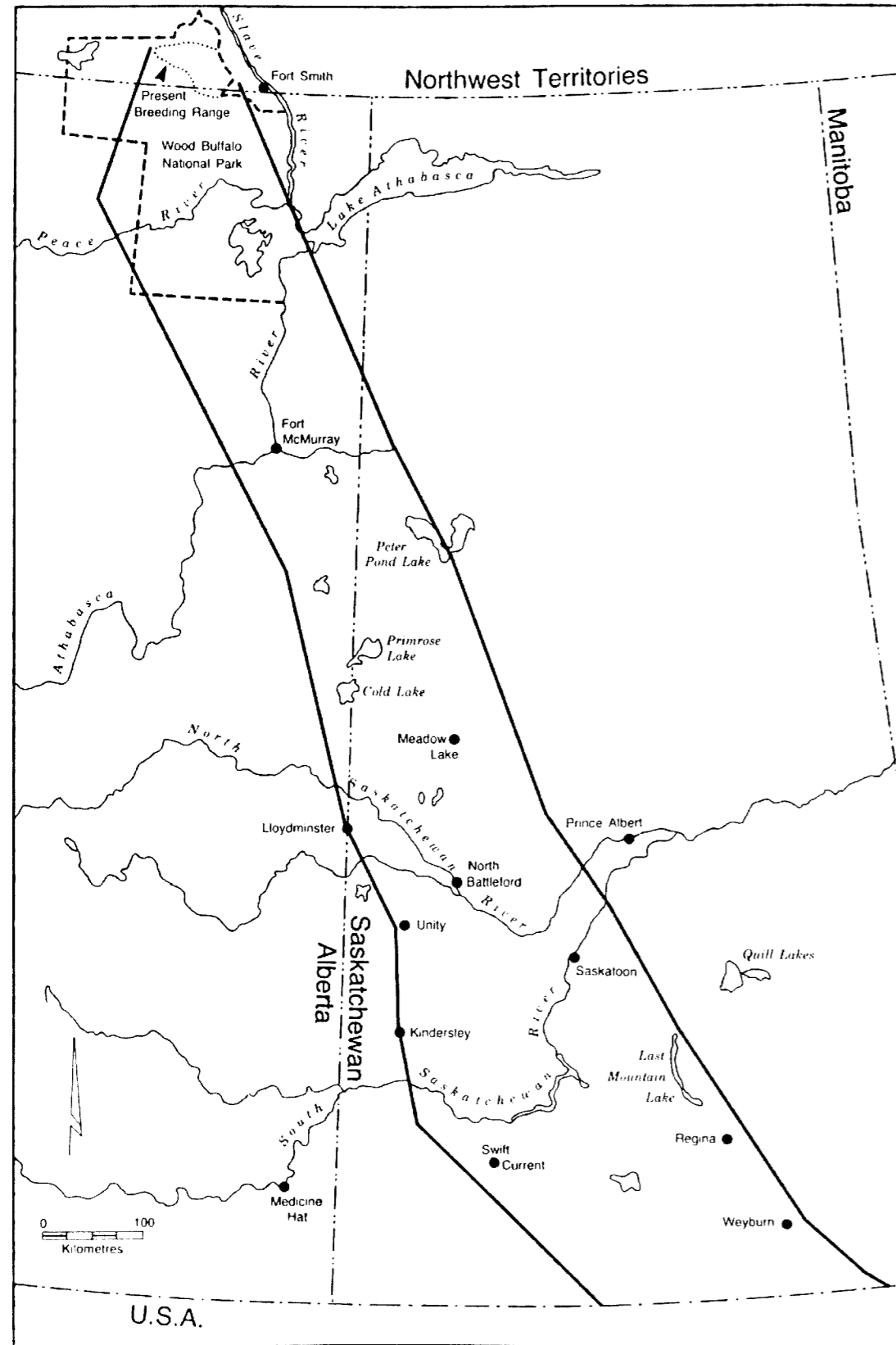
In September, the observation of family groups on successive days in different places frequently implies that the juvenile is now capable of flight and several families may travel to a distinct area where other families have congregated, possibly as a prelude to southward migration.

Sexually immature birds (up to four-year-olds) spend the summer as pairs or in small "bachelor" groups of 3-5 birds, rarely as singles. These birds usually occur on the peripheries of territories of breeding pairs but they are found in the same summer range. No doubt some of the nonbreeding pairs in their third year scout the summer range for potential breeding sites, because colour-banded first-time breeders have been found nesting in the same area where they were observed the previous year.

The autumn migration of yearlings and other subadults begins about the middle of September. Family groups are amongst the last birds to leave the breeding range. In 1983, a family group and a pair of adults were still present in the Sass River area on 18 October when all water bodies except a few of the larger creeks were frozen and at a time when some Whooping Cranes had already arrived at the Aransas National Wildlife Refuge.

Whooping Cranes migrate as pairs, family groups or as small flocks (3-5 birds). They generally start out in the morning, aided by northerly winds, usually under clear or partly cloudy sky conditions and often (but not always) during a period of rising barometric pressure (Kuyt 1984a). Their first stop generally occurs in northeast Alberta or northwest Saskatchewan, about 500 km southeast of their departure area

in Wood Buffalo National Park (Fig. 1). Local weather conditions influence distance and direction of travel but in general, Whooping Cranes are capable of reaching the north-central portion of the Saskatchewan agricultural area on the second day of migration. Here, in the large triangle between Regina, Swift Current and Meadow Lake most of the cranes will remain for 2-4 weeks as they feed on waste grain in barley and wheat stubble fields and roost in the many wetlands. There is some evidence of traditional use of certain areas by paired adults or nonbreeders and some of the latter may unite on the staging area in small flocks of up to 10 birds. Presumably, some of these small flocks migrate as a unit. The rest of the migration from Saskatchewan is usually rapid, probably weather-induced and may be completed in a week, with some birds arriving at the Aransas National Wildlife Refuge during the first week in November (Kuyt 1984b).



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Canadian Whooping Crane Recovery Plan Objectives

Purpose

To outline a course of cooperative action to be carried out in Canada, designed to protect and increase Whooping Crane populations in Canada and elsewhere, resulting in an eventual recovery of the species from its present endangered status.

The Canadian Recovery Plan is intended to establish primary objectives which will set priorities for activities carried out within Canada.

The means of meeting these objectives are established by programs developed by the Regions and Headquarters of the CWS, by agreements with Parks Canada, provincial and territorial governments and the private sector, and by the Memorandum of Understanding concluded between the Director General, CWS, and the Director, USFWS, on April 17, 1985 (Appendix I); and supplements to that agreement which will be developed as required.

Circumstances and opportunities will change over time and the present document will require updating and revision at intervals of not more than five years. Responsibility for the fate of the Whooping Crane rests with the citizens of three countries; Canada, the United States and Mexico.

The wildlife agencies of Canada and the United States have signed a Memorandum of Understanding for the Conservation of Whooping Cranes, which provides a template for the Canadian and United States Whooping Crane Recovery Plans. These two plans outline the programs being carried out in our respective countries, designed to secure the continued existence of the species. The two plans are closely linked.

Objectives

Broadly stated, the objectives are:

1. To provide for the protection of habitat and the welfare and enhancement of the existing wild population of Whooping Cranes breeding in or near Wood Buffalo National Park:
  - 1.1 To increase the number of breeding pairs to 40 by 2000 A.D. as established in the CWS/USFWS Memorandum of Understanding.
  - 1.2 To increase the survival of all age classes.
  - 1.3 To determine the relationship between the various age classes of Whooping Cranes and their habitats, to identify ways in which preferred habitats can be maintained, protected and if possible, improved.
  - 1.4 To develop contingency plans for actions to be taken to rescue the wild population or their progeny should Canadian breeding or staging habitat become permanently or temporarily insecure.
  - 1.5 To investigate local Sandhill Cranes breeding at Wood Buffalo National Park in the event that cross-fostering becomes a desirable means of accelerating or maintaining population growth of Whooping Cranes.
2. To protect Whooping Cranes in Canada at places other than Wood Buffalo National Park.
  - 2.1 To stimulate public response and support for implementation of this plan and to promote public appreciation of Whooping Cranes and other endangered species.

- 2.1.1 To increase the number and quality of confirmed observations of cranes during spring and autumn migration and staging.
- 2.1.2 To assist in the identification of essential habitat used by cranes.
- 2.2 To provide a mechanism for the reporting of sick or injured cranes and to develop a Contingency Plan outlining possible courses of action.
- 2.3 To identify and protect essential habitat and food base.
- 2.4 To regulate sport hunting of Sandhill Cranes and, when necessary of waterfowl, while Whooping Cranes are present or at a perceived risk.
- 2.5 To identify and mitigate the impact of structural and other hazards and disturbance to Whooping Cranes.
3. To establish one independent breeding population of 5 pairs of Whooping Cranes in Canada, separate from the Wood Buffalo National Park population, by 2010:
  - 3.1 Identifying suitable unexploited habitat in the vicinity of Wood Buffalo National Park, recently vacated nesting areas in Saskatchewan and other potential breeding areas in Canada.
  - 3.2 Developing and implementing release programs in Canada.
  - 3.3 Expanding the stock suitable for release and perpetuation of the species by creating an additional captive flock.
  - 3.4 Searching for and identifying potential sites for cross-fostering experiments in other parts of Canada.
  - 3.5 Evaluating most recently vacated parts of nesting range in Saskatchewan.

4. To develop and enhance coordination between Canada and the United States. Whooping Cranes are under the joint stewardship of the Governments of Canada (CWS) and the United States (USFWS), as agreed to in the Memorandum of Understanding between the CWS and USFWS, dated April 17, 1985.
5. To ensure the efficient implementation of this plan, each flock being studied or created will have a management plan and program which deals specifically with that flock.
  - 5.1 All management plans will conform with the Canada/U.S. Memorandum of Understanding (Appendix 1).
  - 5.2 Specific management plans for each population will be integrated into a National Plan.
  - 5.3 Responsibility for development and implementation of the plans will rest with national and regional coordinators, subject to approval by appropriate levels of management within the CWS and where appropriate, close consultation with other jurisdictions.
6. To create National and Regional Recovery Teams and Advisory Councils to undertake an annual review of existing programs, to determine if changes are required, and to assess progress made toward meeting stated objectives. For internal management within CWS it is agreed that:
  - 6.1 International coordination is the primary responsibility of the National Coordinator.

- 6.2 Regional coordination will be provided by appropriate regional authorities in conjunction with the National Coordinator.
- 6.3 Nothing should interfere with direct contact with agencies or individuals as required to implement approved population management plans.
- 6.4 It is the responsibility of all levels of coordination and implementation to ensure rapid exchange of relevant information to all other coordinators.
- 6.5 To ensure that the cooperative nature of this program is clearly demonstrated, cooperating agencies such as provincial and territorial governments, Parks Canada and organizations in the private sector will be given an opportunity to review this document and subsequent amendments, and be asked to comment on their specific areas of concern and jurisdiction.
- 6.6 Publication, preparation, and rapid transmittal of reports on results of investigations and management activities are essential elements of the Canadian Whooping Crane Recovery Program and Plan.

Appendix 1  
Memorandum of Understanding  
Between  
The United States Fish and Wildlife Service  
of the  
United States Department of the Interior  
and  
The Canadian Wildlife Service  
Environment Canada  
on the  
Conservation of the Whooping Crane  
Relating to Coordinated Management Activities

The longstanding cooperation of the Canadian Wildlife Service and the United States Fish and Wildlife Service in recovering the Whooping Crane from the virtual brink of extinction is a model of international cooperation for all nations. The crane species, along with other shared species, were noted in the United States-Canada Convention for the Protection of Migratory Birds (August 16, 1916) as appropriate subjects for a uniform system of protection and conservation. To assure that such cooperation is well planned, adequately managed and that the goals and responsibilities of both Parties are clearly understood, the Canadian Wildlife Service (CWS), Environment Canada, and the United States Fish and Wildlife Service (USFWS), Department of the Interior, have entered into this Memorandum of Understanding, hereinafter referred to as the "Memorandum".

I. Purpose

The purpose of this Memorandum is to clarify and document existing arrangements and understandings to improve the coordination of and joint cooperation in, Whooping Crane management and conservation programs, and research activities undertaken by the United States and Canada. This cooperation is essential (1) to improve the habitat and survival rate of these birds in North America; (2) to enhance and maximize program capabilities in both countries; (3) to avoid unplanned duplication of effort; (4) to improve existing practices for the exchange of information and material (birds and eggs); and (5) to create new flocks and populations.

II. Authority

This Memorandum is hereby entered into for the United States under the authority of Section 8 of the Endangered Species Act, as amended (16 U.S.C. 1537), Section 7 of the Fish and Wildlife Act of 1956, as amended (16 U.S.C. 742 f(a)(4)), Section 1 of the Fish and Wildlife Coordination Act (16 U.S.C. 661) and the Migratory Bird Treaty Act (16 U.S.C. 703, et seq), and for Canada under the authority of the Migratory Birds Convention Act, R.S.C. 1970 C. M-12 and the Canada Wildlife Act, S.C. 1973-74, C. 21.

III. General Provisions

A. Stewardship of the Parties

All eggs and resulting progeny emanating from either Canadian or United States breeding grounds, including birds held for breeding purposes or scheduled for release into the wild, will be under the common stewardship of both Parties.

B. Disposition of Birds and Eggs

The disposition of all birds and eggs, and parts thereof, whether alive or dead, will be undertaken by the appropriate Party following consultation with designated officials of the other Party. Each Party will make every effort to ensure the timely transfer of material, whether living or dead, to the other. In Canada, the repository for specimen material is the National Museum of Natural Sciences in Ottawa. In the United States, repository for specimen material is the National Museum of Natural History, in Washington, D.C.

C. Postmortem Analysis

The Parties will develop and adopt standardized procedures of postmortem analysis of eggs and birds which die within their respective jurisdictions, and will share such specimens and analyses as equally as possible.

D. Population Restoration

Every reasonable effort will be made to create new wild populations using eggs or birds surplus to existing requirements. All reasonable efforts will be made to maintain the genetic diversity of the captive breeding flock at the Patuxent Wildlife Research Center (WRC) at Laurel, Maryland, or other captive flocks which may be created.

E. Population Objectives

The Parties will jointly establish population goals for all populations of Whooping Cranes whether wild, artificially developed or in captive flocks intended for propagation or display. Interim objectives for the Whooping Crane population now breeding in Wood Buffalo National Park, Northwest Territories and wintering at and in the vicinity of the Aransas National Wildlife Refuge, Texas, have been established at forty (40) breeding pairs. Additional wild populations established under this Memorandum will have an interim population objective of twenty-five (25) breeding pairs. The Parties will investigate the possibility of establishing additional populations and extending the breeding range of the Wood Buffalo-Aransas population in anticipation of surplus eggs and/or progeny becoming available as population objectives elsewhere are achieved.

F. Distribution of Eggs and Birds Between Sites

The experimental cross-fostering of Whooping Crane eggs carried out at the U.S. National Wildlife Refuge at Grays Lake, Idaho, will continue. Suitable eggs from Wood Buffalo National Park and Patuxent WRC will be transferred to Grays Lake when habitat conditions at that site are conducive to survival of the eggs. When the number of birds or eggs available from Patuxent WRC is deemed sufficient to sustain the Grays Lake experiment, eggs from Wood Buffalo National Park may be used to establish new flocks or populations.

G. New Population Sites

Sites considered for the establishment of new populations will be selected with the intention of creating both resident and migratory populations. Criteria are to be developed governing the release of birds or eggs to new sites and will include, among others, consideration of impacts on resident populations of Sandhill Cranes and possible conflict with established hunting practices in areas likely to be used by Whooping Cranes. Both Parties will approve the sites before birds or eggs are placed there.



H. International Management

It is the intent of the Parties that the next migratory population be implemented cooperatively. The establishment of a migratory or a non-migratory flock need not be mutually exclusive and could proceed simultaneously. Birds or eggs used in the establishment of any non-migratory population will be provided from stocks at Patuxent WRC that are not suitable for use at Grays Lake or that are surplus to the requirements at Patuxent WRC to meet population goals established for that captive flock(s).

I. Recovery Plans

The Parties will prepare and implement national recovery or action plans in accordance with their respective needs.

These national plans will reflect the terms and intent of the Memorandum.

IV. Consultation and Coordination

The Parties agree to maintain close consultation. Canada will be represented as an ex officio member of the recovery team in the United States. Each Party will appoint one person and an alternate to coordinate the day-to-day implementation of this Memorandum.

These coordinators will work closely to:

A. Ensure that both countries are informed on (1) any environmental problems or activities that could adversely affect the welfare of the Whooping Crane; and (2) progress of research and management activities on a continuing basis.

B. Arrange for disposition of birds and eggs, as per Section III.B of this Memorandum.

C. Evaluate rescued wild birds that have recuperated for their suitability for release back into the wild or placement in a captive breeding facility, and make appropriate recommendations as to their disposition.

V. Criteria and Procedures

A. Criteria and procedures developed in support of this Memorandum will be appended to and form part of this Memorandum, following signature by the officers of the USFWS and CWS designated in the Memorandum. The existing joint USFWS/CWS Program Review Committee will review and, as deemed appropriate, recommend changes in this Memorandum or criteria and procedures attached to this Memorandum.

B. It is understood that the program of cooperation set forth in this Memorandum will be contingent upon the availability of funds on each side.

VI. Participants

In addition to CWS and USFWS, other agencies and organizations may be specifically included as participants as appropriate and as mutually agreed upon in writing.

VII. Effective Date

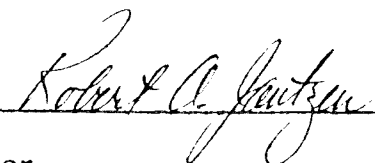
This Memorandum will enter into force on the date of the last signature and will remain in force for five (5) years unless terminated earlier by either Party upon ninety (90) days written notice to the other Party. The Memorandum may be renewed for additional five- (5) year terms and may be amended at any time by mutual agreement of the parties. This Memorandum supersedes all previous arrangements and understandings made with regard to the conservation and protection of the Whooping Crane.

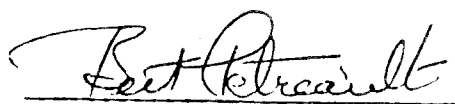
Signed at Washington, D.C. this 17th of April 1985

FOR:

The Department of the Interior,  
The United States Fish and  
Wildlife Service

Environment Canada  
Canadian Wildlife Service

  
\_\_\_\_\_  
Director

  
\_\_\_\_\_  
Director-General

Appendix 2

Outline for Canadian Whooping Crane Conservation

- Western Implementation Plan

Objective

Through systematic studies of the Wood Buffalo National Park-Aransas National Wildlife Refuge Whooping Crane population and its habitats, contribute to an increase in the number of Whooping Cranes in that population and assist when required, in the establishment of other wild migratory Whooping Crane flocks within the region, or elsewhere in Canada or the United States.

1. Carry out population studies of Whooping Cranes within the known breeding range in Western Canada, and attempt to maximize production of young in Wood Buffalo National Park and vicinity, and collect eggs for cross-foster/captive or other experimental programs.

1.1 Nesting Period

- 1.1.1 Undertake aerial surveys in Wood Buffalo National Park to locate breeding pairs and determine subsequent fate of nesting attempts.
- 1.1.2 Determine egg laying dates and clutch size at each nest.
- 1.1.3 Determine and map location of each nest.
  - 1.1.3.1 Document as fully as possible the history of each pair, and provide an annual update.
  - 1.1.3.2 Document history and subsequent nest location of surviving progeny.

- 1.1.3.3 Assign permanent identification codes to each pair or territory to the degree possible.
- 1.1.3.4 Create a file making it possible to trace the ancestral tree of all pairs and their contribution to the population.
- 1.1.4 Test viability of eggs at nests and remove one egg from 2-egg clutches and 2 eggs from 3-egg clutches, leaving one live egg in each nest.
- 1.1.5 Transfer live eggs from quality breeding pairs to nests of birds with unsatisfactory reproductive history.
  - 1.1.5.1 Remove entire clutch of eggs from unsatisfactory breeders; use live eggs for transplant or transfer.
  - 1.1.5.2 Undertake an analysis of unhatched eggs and embryos.
- 1.1.6 Transfer removed eggs from 1.1.4 and 1.1.5 to reintroduction site(s), a designated rearing facility or to other nests.
- 1.1.7 Prepare annual maps to record distribution of nesting pairs and nonbreeders in Wood Buffalo National Park and environs.
- 1.2 Post-Hatch Period
  - 1.2.1 At regular intervals determine survival and family movement.
  - 1.2.2 Colour band and/or radio mark surviving chicks to:
    - 1.2.2.1 determine survival;

- 1.2.2.2 assist in identification of critical areas used by birds during breeding and migration;
  - 1.2.2.3 monitor subsequent pair formation and fidelity to natal breeding areas.
- 1.2.3 Determine sex of surviving chicks at Wood Buffalo National Park and progeny from eggs delivered to transplant sites or rearing facilities.
  - 1.2.3.1 Compare sex ratios of sibling subsets at Wood Buffalo National Park and Grays Lake National Wildlife Refuge, Idaho.
  - 1.2.3.2 Compare survival of sibling subsets at Wood Buffalo National Park, Grays Lake National Wildlife Refuge and the Patuxent Wildlife Research Center.
- 1.2.4 Determine size of area used by individual pairs and progeny to assist in assessing carrying capacity of the habitat.
- 1.2.5 Determine timing, location and cause of chick mortality to provide a basis for mitigating or preventing those losses.
  - 1.2.5.1 In Wood Buffalo National Park.
  - 1.2.5.1 Elsewhere in Western Canada.
- 1.2.6 In conjunction with the U.S. Fish and Wildlife Service develop plans to annually map territories of wintering Whooping Cranes to determine survival of young, stability of pair bonds, and onset of pair formation.

- 1.2.6.1 Record colour-banded individuals.
- 1.2.6.2 Follow history of colour-marked birds.
- 1.2.6.3 Record missing and overlapped bands.
- 1.2.6.4 Record changes in pair bonds.

2. Carry out studies to identify areas used by nonbreeding Whooping Cranes in Wood Buffalo National Park and elsewhere and to determine the amount of potential habitat available.

2.1 Pre-nesting Period

- 2.1.1 Monitor Whooping Cranes to determine arrival dates in nesting area or summer range of family groups and nonbreeders.
- 2.1.2 Determine and map movement of subadult birds and other nonbreeders in vicinity of nesting area and identify areas used.

2.2 Post-hatch Period

- 2.2.1 Map movements of family groups with young on summer range.
- 2.2.2 Map movements of failed breeders, non-breeders and sexually immature birds on summer range to determine location of areas used by those cohorts.

2.3 Migration Period

Minimize conflict with hunting seasons and alert network of observers.

- 2.3.1 Determine autumn departure dates from Wood Buffalo National Park.

- 2.3.1.1 Nonbreeders, including failed breeders.
- 2.3.1.2 Family groups.

2.3.2 Inform CWS Saskatoon and other Responsibility Centres as designated in Appendix 2 of date of departure of various cohorts of cranes from Wood Buffalo National Park.

2.4 Staging Period

2.4.1 Collect, collate and publish information on Whooping Crane sightings, movement and habitat used during migration within the region (Alberta, Manitoba and Saskatchewan).

2.4.1.1 Maintain a network of crane observers including CWS staff, provincial conservation officers, R.C.M. Police, Park Wardens, hunters and naturalists.

2.4.1.2 Maintain a special recording telephone in Saskatoon which will have the capability of responding to coded requests during non-business hours to facilitate receipt of timely information.

2.4.2 Determine location of essential staging habitat and develop a program to ensure security of that habitat and assess risk to cranes using that habitat.

2.4.2.1 Verify reports of staging cranes by field inspection whenever possible.

- 2.4.2.2 Locate and describe Whooping Crane staging habitat identified in 2.4.1 and 2.4.2.
  - 2.4.2.3 Manage potential disturbance to staging cranes by tourists or other visitors.
  - 2.4.2.4 Work with landowners to secure seasonal and long term security for staging habitats.
  - 2.4.3 Record number, location and movement of staging birds, banding data, including recording of colour bands.
  - 2.4.4 Record association between Whooping Cranes, Sandhill Cranes and waterfowl.
  - 2.4.5 Record dates of crane arrival and departure from staging areas.
  - 2.4.6 Distribute reports to cooperators, including maps of current and cumulative sightings.
  - 2.4.7 Inform USFWS of southward movement of Whooping Cranes.
3. Carry out studies on potential breeding areas at Wood Buffalo National Park and vicinity to search for birds suspected to be missing from known breeding areas.
- 3.1 Extend surveys to locate new breeders when number of known pairs located at Wood Buffalo National Park is below the numbers expected based on the appearance at Aransas National Wildlife Refuge of pairs with young not previously located on the breeding grounds.
  - 3.2 When required, monitor birds captured, banded and/or radio-equipped at Aransas National Wildlife Refuge.

- 3.3 When appropriate, locate birds equipped in 3.2 in Wood Buffalo National Park and vicinity and search for new breeders.
  - 3.4 During regular breeding pair surveys, plot occurrence of all Whooping Cranes outside known breeding range.
4. Carry out studies in Wood Buffalo National Park to determine seasonal and year to year trends in water levels on selected wetland habitat within the general nesting area of the Wood Buffalo/Aransas Whooping Crane population and to determine the relative importance of the major components of the hydrological system including the contribution of groundwater recharge/discharge to the marl ponds by:
- 4.1 Monitoring surface water levels in the Whooping Crane nesting area.
    - 4.1.1 Install and maintain benchmarks and surface water gauges in six separate locations.
    - 4.1.2 Prepare and maintain guidelines which describe procedures to follow when monitoring water levels.
    - 4.1.3 Monitor surface water levels (i.e., marl ponds) on a monthly basis from May to October.
    - 4.1.4 Compile and analyze trends in surface water levels in both a local and regional context.
  - 4.2 Investigating those environmental factors which are most critical in determining surface water levels (i.e., marl ponds) in the Whooping Crane nesting area.

- 4.2.1 Prepare Terms of Reference and a study proposal which describe in detail the methods and responsibilities for the study.
  - 4.2.2 Install and maintain piezometers and deep wells in appropriate locations.
  - 4.2.3 Monitor ground water levels on a monthly basis from May to October.
  - 4.2.4 Compile, analyze and interpret the results of the study.
- 4.3 Investigating the impact of water level fluctuations on the limnology of marl ponds in the Whooping Crane nesting area.
- 4.3.1 Prepare Terms of Reference or a proposal to study the limnology of marl ponds in the Whooping Crane nesting area.
  - 4.3.2 Conduct a study to determine the impact of water level fluctuations on the Whooping Crane.
  - 4.3.3 Compile, analyze and interpret the results of the study and adjust the surface water monitoring project as necessary.
- 4.4 Carry out a limnological study of Whooping Crane habitat in Wood Buffalo National Park in order to assess impact of water level fluctuation on invertebrate abundance and relate those levels to Whooping Crane reproductive success.

- 4.4.1 Sample potential food resources of crane feeding areas, Wood Buffalo National Park, to establish carrying capacity of individual territories.
  - 4.4.2 Sample potential food resources of nearby areas where Whooping Cranes do not occur in the event that remedial steps can be taken to make them attractive to Whooping Cranes.
  - 4.4.3 Collect and analyze fecal droppings when possible as adjunct to feeding studies.
  - 4.4.4 Analyze droppings for parasites or other disease organisms.
  - 4.4.5 Carry out observations of feeding cranes from blinds and observation towers to study familial interactions and general behaviour of pairs.
  - 4.4.6 Undertake a time/energy budget analysis of feeding and food availability in relation to water levels.
  - 4.4.7 Undertake an analysis of survival of chicks in relation to food supply and fluctuations in water levels.
5. Apply the Environmental Assessment and Review Process and manage the users and resources of Wood Buffalo National Park to minimize potentially harmful impacts on Whooping Cranes.
6. Undertake a study of identification and possible utilization of Canadian foster parent Sandhill Crane populations; to be carried out simultaneously, if possible, with ongoing studies of Whooping Cranes,

to provide a basis for possible enhancement of existing Whooping Crane populations or as a basis for a Contingency Plan, should present usage of eggs be terminated.

- 6.1 Conduct a thorough literature survey and become familiar with other unpublished material on Sandhill Crane distribution.
- 6.2 Coordinate and consult with Parks Canada, provincial, territorial, USFWS and non-governmental organizations (NGOs).
- 6.3 Conduct field studies to locate Sandhill Crane breeding populations and/or habitat, possibly aided by use of Landsat imagery.
- 6.4 Band, colour mark, and equip juvenile Sandhill Cranes with radio transmitters as required.
- 6.5 Determine migration pathways and locate Sandhill Crane winter range.
- 6.6 Determine long range land use pattern of winter range.
- 6.7 Carry out summer range habitat studies.
- 6.8 From the findings of 5.1 to 5.5, identify suitable foster parent populations, eliminating those whose winter ranges or migration staging areas are in places where waterfowl hunting is well established.
- 6.9 Colour-band adult Sandhill Cranes and determine which adults are good prospects for foster-parenthood.
- 6.10 Transfer Whooping Crane eggs from Wood Buffalo National Park and/or Patuxent Wildlife Research Center to foster parents or release sites.

- 6.11 Transfer Sandhill Crane eggs to a reputable research organization or zoo.
  - 6.12 Colour-band and radio-equip surviving juvenile Whooping Cranes and monitor foster parent families, similar to 1.2, 2.3 and 2.4.
    - 6.12.1 Request cooperation from enforcement officials (CWS, province) to protect foster parent nesting areas.
    - 6.12.2 Request cooperation from provinces, territories and Parks Canada should predator control become a matter of urgency.
    - 6.12.3 Seek assistance of Parks Canada staff in locating and reporting Sandhill Cranes in Wood Buffalo National Park.
  - 6.13 Discuss feasibility of changes in Sandhill Crane hunting seasons in provinces, where and when appropriate.
7. Develop and implement Contingency Plans to rescue sick or injured cranes and establish Responsibility Centres.
    - 7.1 Locate and designate competent veterinarians in Saskatoon and Edmonton to attend to rescued cranes.
    - 7.2 Develop capture, handling and transport protocols to be used when retrieving Whooping Cranes from the wild.
    - 7.3 Inform National Coordinator of any and all requirements to implement the Contingency Plan.
    - 7.4 Ensure that provincial wildlife agencies, R.C.M.P. and NGOs are aware of Contingency Plan and points of contact within CWS.

8. Develop and implement a comprehensive public relations program to encourage increased awareness and support for the goals and objectives as stated in this work plan.
  - 8.1 Issue press releases on a regular basis to announce significant events such as:
    - 8.1.1 December population counts at Aransas National Wildlife Refuge and number of surviving young.
    - 8.1.2 Spring arrival in Saskatchewan and request for reports of sightings.
    - 8.1.3 Number of breeding pairs in Wood Buffalo National Park.
    - 8.1.4 Egg pick up and banding.
    - 8.1.5 Number of chicks surviving to autumn in and near Wood Buffalo National Park.
    - 8.1.6 Autumn arrival in Saskatchewan and other provinces and requests for reports on sightings.
  - 8.2 Implement a program to increase the number of cooperators reporting the presence of Whooping Cranes during spring and autumn passage through the territories and provinces.
    - 8.2.1 Prepare public information kits.
    - 8.2.2 In cooperation with the provinces incorporate a request to hunters to report sightings of Whooping Cranes as part of synopses of hunting regulations, including address and phone number of designated CWS staff member, Winnipeg, Saskatoon or Edmonton and provincial wildlife agency.

- 8.2.3 Seek support of NGOs and Provincial Governments in distributing published material.
9. Establish Regional Whooping Crane Recovery and Advisory Committees, chaired by the National Coordinator, to provide an annual assessment of progress made toward meeting the goals and objectives set forth in the Regional Program. Until the creation of an Ontario Regional Program and Committee, this group will serve as the National Advisory Committee.
    - 9.1 Representation to include National Coordinator, Parks Canada, CWS Regional Program Managers and biologists, representatives from Provincial and Territorial Governments and delegates from cooperating non-governmental organizations.
    - 9.2 The U.S. Fish and Wildlife Service Whooping Crane Coordinator or a designated alternate will be an ex officio member of the Recovery Team.
  10. Prepare and distribute annual and interim reports of activities carried out under this program.



Appendix 3

Canadian Whooping Crane Contingency Plan

Preamble

As of December 31, 1986, the Wood Buffalo/Aransas flock of Whooping Cranes had increased to 110 birds. As the size of the migratory flock increases so does the possibility of an emergency situation involving Whooping Cranes. While the numbers are increasing, the loss of even a single bird is still significant and a matter of public and professional concern. The CWS and cooperating agencies must be prepared to address any emergency in a rapid and coordinated manner.

Objectives

1. To put in place plans to meet emergency situations wherein Whooping Cranes are perceived to be at risk; to designate appropriate response options and reporting procedures whenever Whooping Cranes are reported as sick, injured, or dead, or if they are healthy but in locations where they face hazards such as contaminants, disease, power lines or where hunting of similar species that resemble immature or adult Whooping Cranes (such as Snow Geese or Sandhill Cranes) is occurring.
2. To reduce Whooping Crane use of sites deemed to represent a disease, pollutant, or structural hazard.

3. To provide protection for Whooping Cranes where hunting is in progress for Sandhill Cranes, and/or Snow Geese, or in some situations where general waterfowl hunting is in progress.
4. To optimize the opportunity to recover and rehabilitate wild Whooping Cranes found injured or sick, and to assist in identifying and removing causes of mortality or injury.
5. To optimize the opportunity to recover dead Whooping Cranes for preservation as scientific specimens and for necropsy to determine cause of death.
6. To identify areas used by Whooping Cranes and use such information to guide landowners in carrying out practices that are not potentially damaging to Whooping Cranes.

Administration

To facilitate prompt response to situations involving Whooping Cranes, the following procedures will be implemented.

1. Responsibility Centres will be established at Edmonton, Alberta, Saskatoon and Regina, Saskatchewan, Winnipeg, Manitoba, and Fort Smith, N.W.T.
  - 1.1 CWS Edmonton, (403) 495-2525, E. Kuyt will have primary responsibility for Alberta and the N.W.T.

- 1.1.1 Parks Canada, Fort Smith, N.W.T., J. Sacquet  
(403) 872-2349 (Office), 872-3051 (Home), R. Bromley  
(403) 873-7761 (Office), Wildlife Management Branch,  
Yellowknife, N.W.T., and CWS Edmonton (Ft. Smith) will  
serve as Responsibility Centres for situations involving  
Whooping Cranes in or near Wood Buffalo National Park.
- 1.1.2 CWS Edmonton and the Alberta Fish and Wildlife Division  
will be responsible for situations within the province of  
Alberta falling outside Wood Buffalo National Park.
  - 1.1.2.1 The Director, Fish and Wildlife Division,  
Department of Forestry, Lands and Wildlife,  
Government of Alberta, (403) 427-4192, will serve  
as the alternate Responsibility Centre for  
Alberta.
- 1.2 CWS, Saskatoon, (306) 975-5595, will have responsibility for  
situations arising in Saskatchewan. The phone at Saskatoon is on  
24 hour call, 7 days per week during periods of migration and  
staging.
  - 1.2.1 The Director, Wildlife Branch, Government of Saskatchewan,  
(306) 787-2309, will serve as the alternate Responsibility  
Centre for Saskatchewan.
- 1.3 CWS, Winnipeg, (204) 983-5260, will have responsibility for  
situations arising in Manitoba.
  - 1.3.1 The Director, Wildlife Branch, Government of Manitoba,  
(204) 786-9483, will serve as the alternate Responsibility  
Centre for Manitoba.
- 1.4 Alternate Responsibility Centres will be kept up to date on  
current sightings and any relevant situations which might arise.

- 1.5 If the birds are perceived to be at risk the Responsibility  
Centres will immediately inform:
  - 1.5.1 Regional Director, Western and Northern Region, Canadian  
Wildlife Service, (403) 495-2536, and/or the Biologist in  
charge of the Whooping Crane Program, E. Kuyt  
(403) 495-2525 (Office) and (403) 434-6349 (Home).
  - 1.5.2 National Coordinator, F.G. Cooch (819) 953-1417 (Office),  
(613) 226-5615 (Home), who will inform the  
U.S. Coordinator, Dr. James C. Lewis (505) 766-3972  
(Office).
  - 1.5.3 Appropriate CWS, Provincial, Territorial and/or Park  
staff.
- 1.6 Upon receipt of the report and having alerted others identified  
under 1.3, CWS/Provincial/Territorial/Park Responsibility Centre  
will implement the appropriate Contingency procedure as outlined  
in 2. et seq.
2. The Responsibility Centres in conjunction with Parks Canada,  
Provincial and Territorial Responsibility Centres, will make an  
assessment of the type of risk to Whooping Cranes.
  - 2.1 In the event that Whooping Cranes are present during a hunting  
season they will determine if action to close the season is  
required under Sections 18 or 37 of the Migratory Birds  
Regulations.
    - 2.1.1 Determine if the hunting season for Sandhill Cranes is  
open.

- 2.1.2 Determine if general waterfowl hunting season is open but crane season is closed.
  - 2.1.3 If the birds are free flying and healthy, immediately contact local radio, cable and T.V. stations informing them of the presence of Whooping Cranes and warning hunters to take extreme caution when hunting.
  - 2.1.4 Alert nearest CWS, RCMP and Conservation Office of the location of the crane(s) requesting them to investigate promptly and report back about bird(s) activities.
  - 2.1.5 Contact landowner and neighbours requesting that permission to hunt be deferred until after the departure of the crane(s).
  - 2.1.6 Meet with landowner to determine if normal farming practices can be suspended or modified until cranes have left.
  - 2.1.7 If crane(s) are in heavily hunted areas, close season as provided in Sections 18 and 37 of the Migratory Bird Regulations.
- 2.2 In the event that a Whooping Crane is reported to be sick or injured, immediate implementation of the approved rescue procedure is required.
- 2.2.1 Advise veterinary Responsibility Centre.
    - 2.2.1.1 In Saskatchewan the Veterinary Contact is Dr. Gary Wobeser, Saskatoon, Saskatchewan. His office number is (306) 966-7310 and Residence (306) 374-5605.

- 2.2.1.2 In Alberta, the Veterinary Contact is Dr. James Hanson, Edmonton, Alberta. His office number is (403) 436-8643 and Residence (403) 922-2824.
  - 2.2.1.3 If additional veterinary assistance or advice is needed contact either Dr. Milton Friend, National Wildlife Health Laboratory, Madison, Wisconsin, (608) 271-4640 or Dr. James W. Carpenter, Patuxent Wildlife Research Center, Laurel, Maryland, (301) 498-6324.
- 2.2.2 CWS Regional Responsibility officers will immediately proceed to the area and retrieve the sick or injured crane.
- 2.2.3 In anticipation of an event under 2.2, the primary Responsibility Centres will have on standby all materials required to capture, immobilize and transport the sick or injured crane to the designated veterinary centre.
- 2.2.3.1 Loose burlap or vet wrap and tape for immobilizing birds' wings.
  - 2.2.3.2 Crate for transport.
    - 2.2.3.2.1 Acceptable dimensions are 50 cm wide, 65 cm long and 105 cm high.
    - 2.2.3.2.2 Outdoor carpeting to be placed on bottom of crate to prevent bird from slipping.

- 2.2.3.2.3 Ensure adequate ventilation by drilling 5 rows of 1.5 cm holes, 5 per row on each side of box.

3. Recommended procedures to be followed when capturing, immobilizing, transporting or housing a sick or injured Whooping Crane include:
  - 3.1 Do not alert the media or public action groups until the crane has been successfully captured and removed, in order to avoid undue alarm to the bird during capture which might result from crowds of people.
  - 3.2 The designated veterinarian should be present if at all possible or provide advice in advance, since general practitioners may lack experience in handling sick or injured wild birds. In the event that the designated veterinarian is not available, use nearest veterinary assistance.
  - 3.3 Once crated, make every effort to keep bird standing, since once it sits down, prognosis for eventual recovery lessens.
  - 3.4 If bird can make short escape flights and if capture and removal is deemed to be desirable, the bird should be kept under scrutiny during daylight hours and captured by lights during dark nights.
  - 3.5 Personnel involved in any capture attempts of adult birds should wear protective eye shields because of danger from the bill of a frightened bird or from toe nails.
  - 3.6 Ensure that the bird's wings are immobilized during transportation but not bound so tightly as to impair circulation or breathing.

- 3.7 Ensure that housing area is free of all foreign objects which might be ingested by cranes (especially plastic and metal).
  - 3.8 Ensure that housing area is kept dimly lit or dark.
  - 3.9 Ensure that area has not previously been used for domestic birds since cranes are susceptible to avian diseases.
4. Recommended procedures to be followed when retrieving a dead bird.
    - 4.1 No commitments as to future disposition of the specimen are to be made since the Memorandum of Understanding with the United States clearly states that all specimen material is to be shared between the two countries. In Canada the final repository is the National Museum of Canada.
    - 4.2 The specimen should be kept cool, not frozen, and transported immediately to Dr. Gary Wobeser or Dr. James Hanson for necropsy.
    - 4.3 Care is to be taken during necropsy to save as much of the internal parts of the specimen as possible in addition to the skin.
    - 4.4 Upon completion of the necropsy - the entire carcass is to be frozen and sent to Dr. Henri Ouellet, National Museum of Canada, (613) 954-2657 pending final disposition.
    - 4.5 Copies of the necropsy report are to be forwarded to the National Coordinator, the Regional Director, CWS, the National Coordinator, USFWS, and the jurisdiction from which it was removed.

4.6 Even if toxic chemicals are not suspected as contributing to the death of the bird, appropriate aliquots are to be sent to the Wildlife Toxicology and Pathology Division, CWS National Wildlife Research Centre, 100 Gamelin Boulevard, Hull, (819) 997-1410, as per their instructions.

4.7 All efforts will be made to develop a coordinated United States/Canada necropsy report and examination protocol as provided by the Canada/United States Memorandum of Understanding.

Figure 1. Response options when a Whooping Crane report is received.

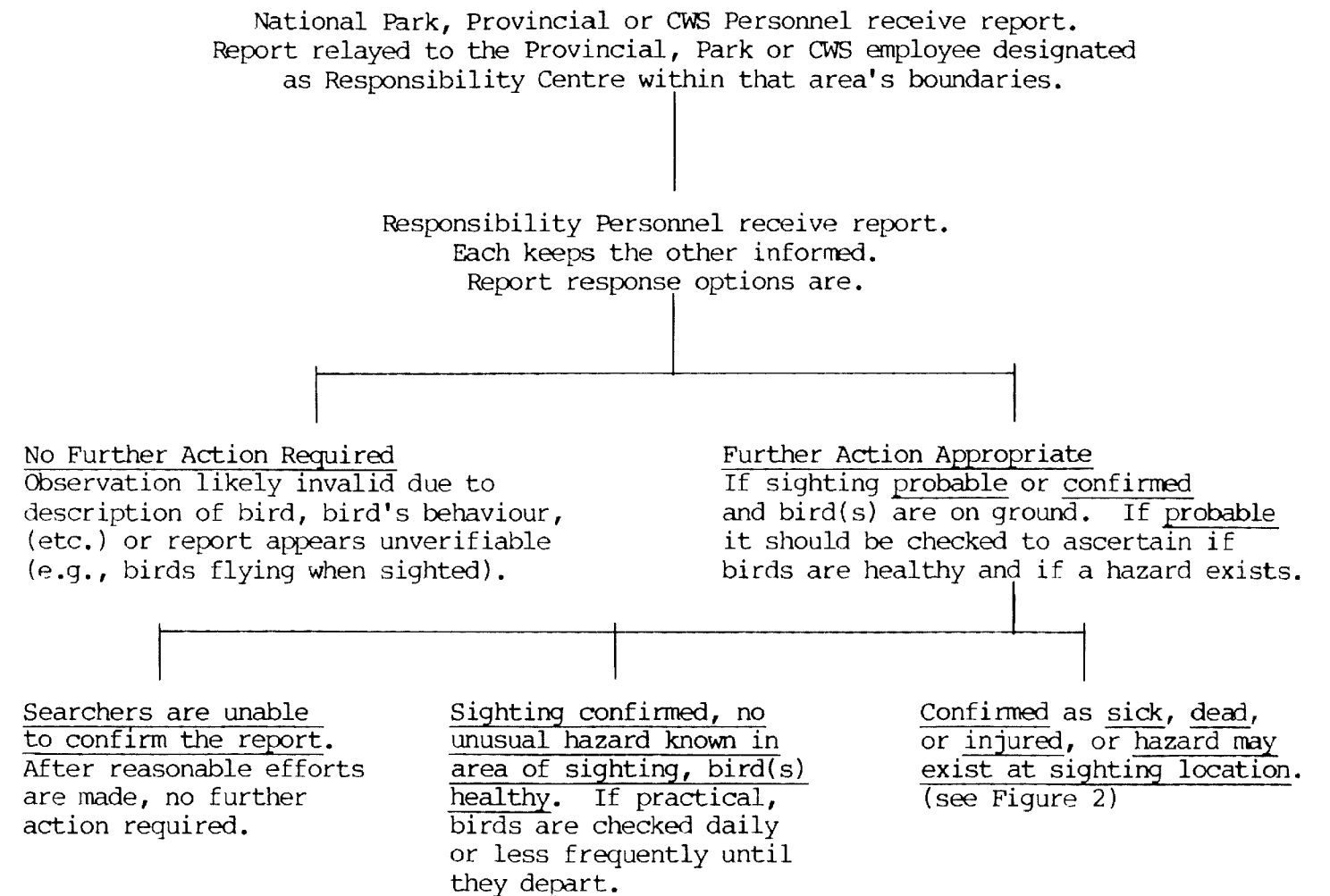


Figure 2. Response options when a sick, injured, or dead Whooping Crane is observed or a healthy Whooping Crane is discovered in a hazardous circumstance.

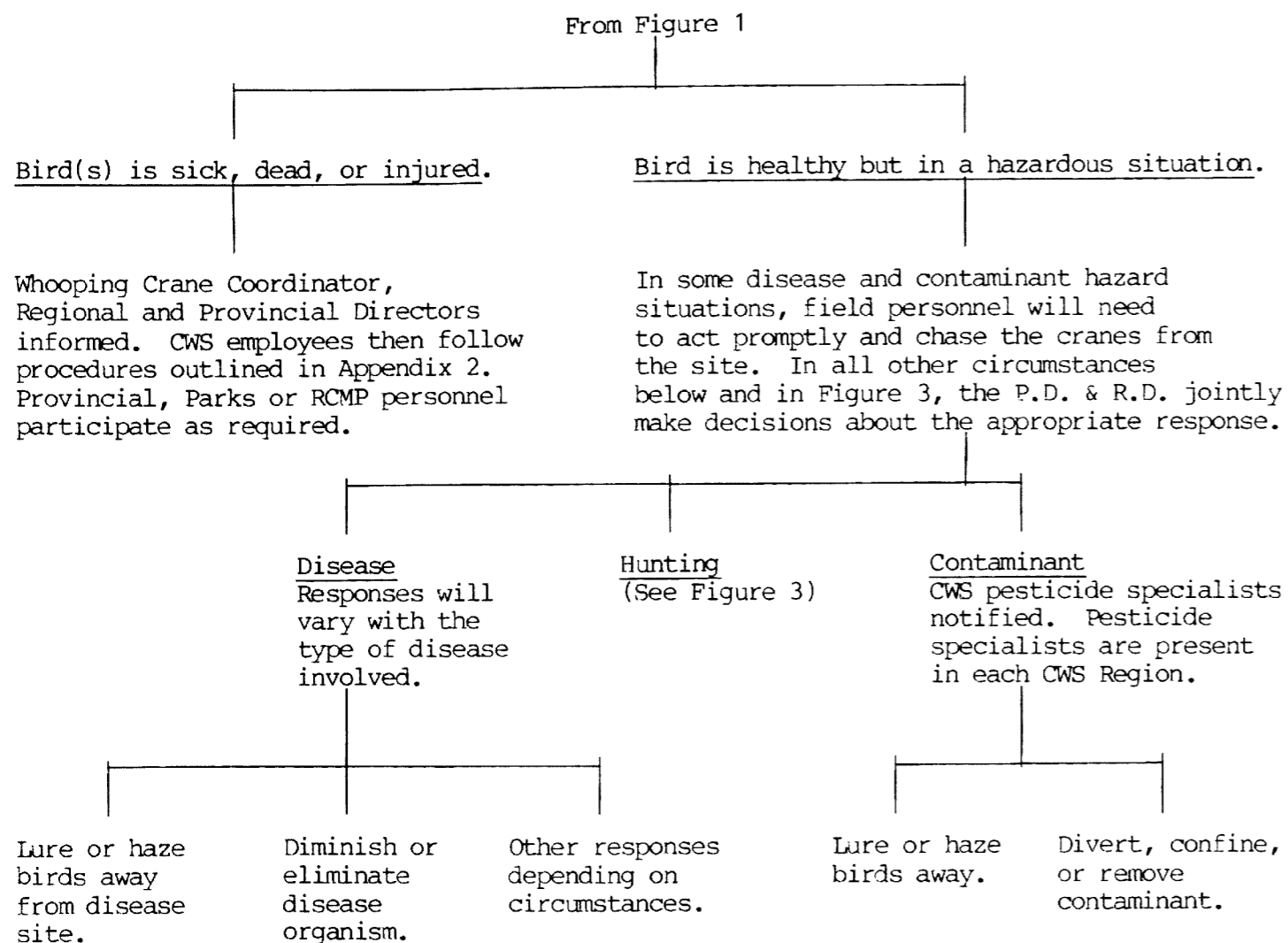
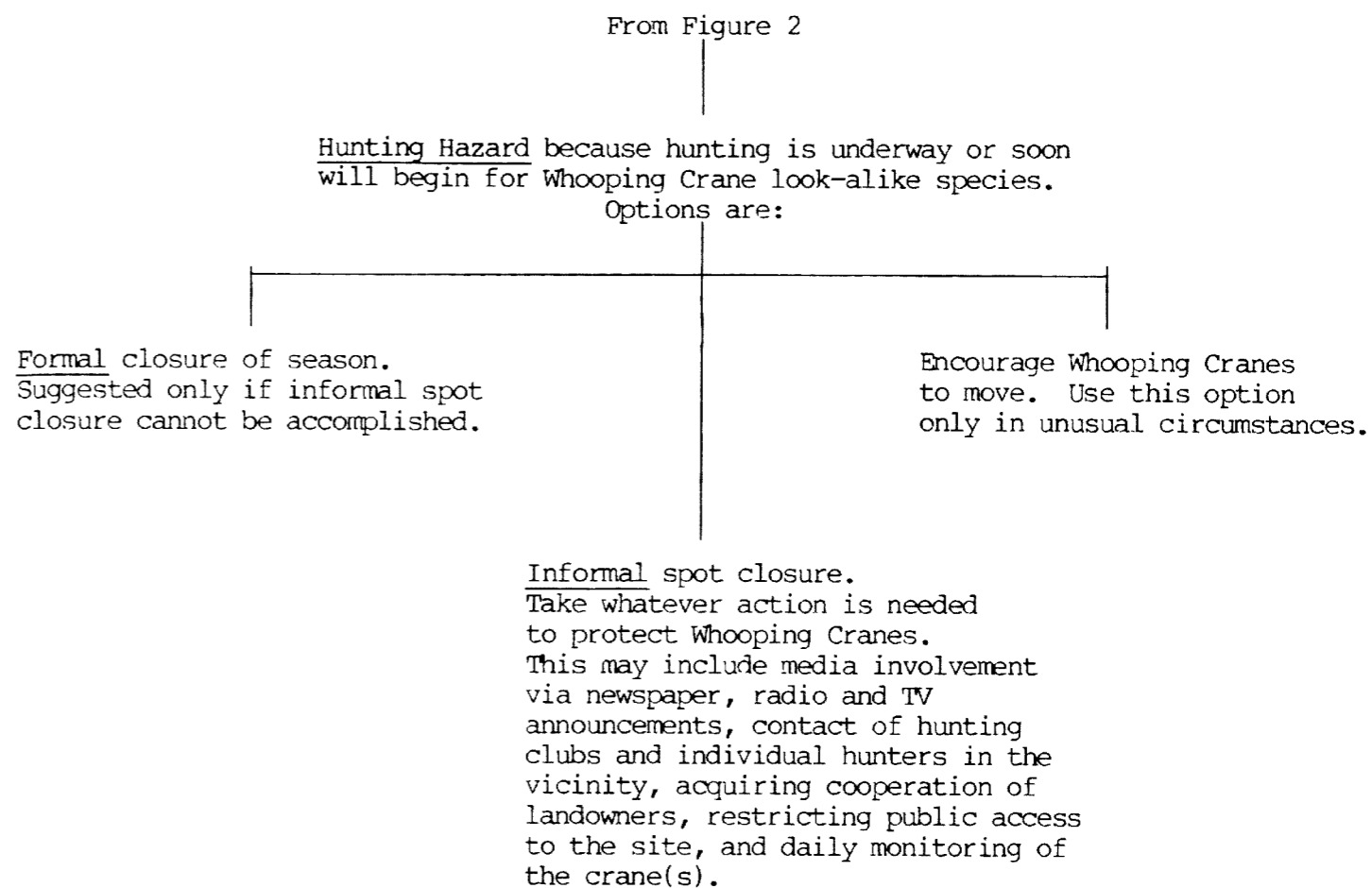


Figure 3. Response options when a Whooping Crane(s) is in a hazardous situation due to hunting of look-alike species.



Appendix 4

Agency Responsibility for Implementation

Although the CWS, by virtue of the Migratory Birds Convention, has the legal mandate for implementation of this recovery plan and associated work plans, the assistance and cooperation of other agencies, governments, private sector organizations and individuals is essential if the program of rehabilitation is to succeed. To facilitate an understanding of the complexity of this task, this Appendix is intended to identify primary as well as cooperating agencies and individuals. This is presented below by task, separate identification is presented for the Western and Ontario Work Plans respectively. Agencies with primary responsibility are underlined.

Western Region Program

- 1. CWS, Parks Canada, USFWS
- 1.1 CWS, Parks Canada, USFWS
- 1.2 CWS, Parks Canada, USFWS
- 1.2.3 CWS, University of Alberta, USFWS
- 1.2.6 USFWS, CWS
- 1.2.6.1 Provincial Responsibility Centres, CWS, Provincial Agencies, NGOs
- 2. CWS, Parks Canada, USFWS
- 2.3 CWS, Parks Canada
- 2.4 CWS, Provincial Wildlife Agencies, RCMP, Private Sector
- 3. CWS, Parks Canada
- 3.2 USFWS, CWS, Parks Canada
- 4. Parks Canada, IWD (NHRI), CWS

- 4.4 CWS, Parks Canada
- 5. CWS, Parks Canada, USFWS
- 6. CWS, Parks Canada, Provincial Authorities, Private Sector
- 7. CWS, Provincial Authorities, Private Sector
- 8. CWS, Parks Canada, USFWS, Provincial Authorities, Private Sector
- 9. Parks Canada, CWS, IWD (NHRI)

Appendix 5

Canadian Whooping Crane Recovery Team

F.G. Cooch            Canadian Whooping Crane Coordinator  
                          Canadian Wildlife Service  
                          Environment Canada  
                          Ottawa, Ontario  
                          K1A 0H3  
                          (819) 953-1417

E. Kuyt                Regional Whooping Crane Coordinator  
                          Canadian Wildlife Service  
                          Environment Canada  
                          2nd Floor, 4999 - 98 Avenue  
                          Edmonton, Alberta  
                          T6B 2X3  
                          (403) 495-2525

William Dolan        Area 1 Manager  
                          Wood Buffalo National Park  
                          Fort Smith, Northwest Territories  
                          X0E 0P0  
                          (403) 872-2349

Robert Nero            Wildlife Specialist  
                          Department of Natural Resources  
                          P.O. Box 14  
                          1495 St. James Street  
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Additional members of Advisory Council will be nominated as required.

\* Positions only listed because of changes in personnel.

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