

**BISON CONTROL AREA PROGRAM
ANNUAL REPORT OF SURVEY ACTIVITIES
JANUARY 2005 – APRIL 2005**

Wendy A. Bidwell, John S. Nishi, and Troy R. Ellsworth

Department of Environment and Natural Resources
Government of the Northwest Territories
Yellowknife, NT X0E 0P0

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ABSTRACT

Bovine tuberculosis (*Mycobacterium bovis*) and brucellosis (*Brucella abortus*) are endemic in bison (*Bison bison*) herds in and around Wood Buffalo National Park, and the adjacent Slave River Lowlands. In 1987, the Bison Control Area (BCA), along with a surveillance program, was created to minimise the risk of disease transmission to the disease-free Mackenzie and Nahanni-Liard herds in the Northwest Territories. During the 2004–2005 surveillance season, we used an Aviat Husky or Cessna 185, depending on aircraft availability in Yellowknife, NWT to fly 10 shoreline patrols along the northern boundary of the BCA on a weekly basis from 6 January 2005 to March 31 2005. An additional shoreline patrol was flown on 14 April 2005. A Cessna 210 was substituted for this patrol, as the aircraft initially reserved (Cessna 172) for this survey was down for maintenance in Fort Smith, NWT. The BCA Technician was present during this final flight. Total survey time during shoreline patrols was 28.9 hours. We used a Cessna 206 to fly one semi-comprehensive aerial survey of BCA zone I from the 8-10 of February 2005; total survey time was 14 hours. From 22 to 26 March 2005, we used a Cessna 206 to fly the annual comprehensive survey of BCA zones I and II; total survey time was 32.9 hours. In total, we flew 75.8 hours to systematically survey the BCA during the 2004–2005 surveillance season and did not observe any bison (or their sign, i.e., fresh tracks and/or feeding craters) within the BCA during our surveillance flights.

TABLE OF CONTENTS

INTRODUCTION	1
The Bison Control Area Program	5
Goals and Objectives	7
METHODS.....	7
RESULTS	12
Shoreline Patrols.....	12
Surveillance Surveys.....	19
Wildlife Observations.....	25
Communications	28
DISCUSSION.....	30
ACKNOWLEDGEMENTS	34
LITERATURE CITED.....	35
APPENDIX A. Summary of weather conditions during shoreline patrols and surveillance flights throughout the Bison Control Area Program surveillance season 2004-2005.....	38
APPENDIX B. Summary of surveillance activities and removals of bison from the Northwest Territories Bison Control Area Program (1988/89-2004/05)..	38
APPENDIX C. Public service announcement aired on CBC Radio North since January 2005	40
APPENDIX D. Half page colour article published in the 2003 Explorer's Guide & UP HERE magazine.....	41
APPENDIX E. Slideshow presentation utilized during BCA community meetings (read left to right).....	42

LIST OF TABLES

Table 1. Summary of shoreline patrols in the Bison Control Area from January to April 2005	20
Table 2. Summary of Surveillance flights in the Bison Control Area from February to March 2004. A Cessna-206 aircraft was used to complete both surveillance surveys.	20
Table 3. Recorded sightings of large mammals observed during all surveillance flights in the Bison Control Area from January to April 2004.	27

LIST OF FIGURES

Figure 1. Distribution of bison herds in Northern Canada.	4
Figure 2. The Northwest Territories Bison Control Area and three surveillance zones.....	6
Figure 3. Standardized shoreline patrol route for the Bison Control Area.	9
Figure 4.1. Shoreline patrol flown on 6 January 2005. 2.4 total hours flown on survey.....	13
Figure 4.2. Shoreline patrol flown on 11 January 2005. 2.3 total hours flown on survey.....	13
Figure 4.3. Shoreline patrol flown on 20 January 2005. 2.4 total hours flown on survey.....	14
Figure 4.4. Shoreline patrol flown on 26 January 2005. 2.6 total hours flown on survey.....	14
Figure 4.5. Shoreline patrol flown on 2 February 2005. 2.6 total hours flown on survey.....	15
Figure 4.6. Shoreline patrol flown on 16 February 2005. 2.6 total hours flown on survey.....	15
Figure 4.7. Shoreline patrol flown on 23 February 2005. 2.7 total hours flown on survey.....	16
Figure 4.8. Shoreline patrol flown on 7 March 2005. 2.7 total hours flown on survey.....	16
Figure 4.9. Shoreline patrol flown on 16 March 2005. 3.5 total hours flown on survey.....	17
Figure 4.10. Shoreline patrol flown on 31 March 2005. 3.0 total hours flown on survey.....	17
Figure 4.11. Shoreline patrol flown on 14 April 2005. 2.4 total hours flown on survey.....	18
Figure 5.1. Flightline of survey aircraft and large animals observed during the February Semi-Comprehensive survey of the bison control area. Zone I. 8 - 10 February, 2005.....	21
Figure 5.2. Flightline of survey aircraft and large animals observed during the February Semi-Comprehensive survey of the bison control area. Zone I. 8 - 10 February, 2005.....	22
Figure 6.1. Flightline of survey aircraft and large animals observed during the March Comprehensive survey of the bison control area. Zone 1 & 2. 22 - 26 March, 2005.	23

Figure 6.2. Flightline of survey aircraft and large animals observed during the
March Comprehensive survey of the bison control area. Zone 1 & 2. 22 -
26 March, 2005.24

INTRODUCTION

Free-ranging bison (*Bison bison*) in and around Wood Buffalo National Park (WBNP) and the Slave River Lowlands (SRL) are infected with bovine tuberculosis and brucellosis (Tessaro *et al.*, 1990; Joly and Messier, 2001) (Figure 1). These northern bison herds contracted the two cattle diseases when 6,673 diseased plains bison were trans-located from National Buffalo Park at Wainright, Alberta to WBNP between 1925 and 1928 (Fuller, 2002). Risk of infection to healthy free-ranging bison as well as commercial cattle and bison herds has been a chronic management problem ever since (see Connelly *et al.*, 1990; APFHRAN, 1999; RAC, 2001). Recent results from Jolly and Messier (2004) showed that bison within WBNP have overall apparent prevalence rates of 49% and 31% for tuberculosis and brucellosis respectively. These results suggest that the diseases will continue to persist in the affected bison in and around WBNP and further supports the need to mitigate the risk of infection to the health status of the Mackenzie wood bison herd (Tessaro *et al.*, 1993; Nishi, 2002), and the presumed disease free status of the Hay-Zama herd located in northwest Alberta, and the Nahanni-Liard herd located near the Mackenzie Mountains (Gates *et al.*, 1992a) (Figure 1). The diseased bison in and around WBNP also present the most important limiting factor to the reestablishment of other healthy free-roaming herds in the region that could contribute to the resource-based economies of surrounding communities (Gates *et al.*, 2001b).

In March 1996, because of ongoing concerns of the commercial bison industry, the Canadian Bison Association requested the Animal, Plant and Food

Health Risk Assessment Network (APFRAN), Canadian Food Inspection Agency to conduct a formal risk assessment. The objective was to determine the risk of infection with tuberculosis and/or brucellosis from bison in WBNP and surrounding area during a 12 month period, for each of three “at risk” groups: commercial cattle, commercial captive bison and disease-free, free-ranging bison. In January 1999, APFRAN completed the risk assessment and concluded that disease-free, free-ranging bison had the highest probability of becoming infected with bovine brucellosis and/or tuberculosis (APFRAN, 1999).

Because the APFRAN (1999) disease risk assessment was not based on terrain and habitat variability, a follow-up research project was initiated to compile local knowledge on bison movement and distribution around WBNP, define the relative influences of biophysical and management factors, and to integrate quantitative and local qualitative data on biophysical factors into a bison movement model (Gates *et al.*, 2001a; Mitchell, 2002). The research focused on bison movements and distribution in the region in order to provide a model and maps for informing the development of disease risk management measures and to update the APFRAN risk model. Main results suggested that the highest likelihood for bison dispersal occurred in corridors that were parallel to the Peace River in the area of Fort Vermillion, and with the broadest network of corridors between High Level and WBNP.

Additional results from Gates and Wierzchowski's (2003) movement corridor analysis indicate that potential movements of bison between WBNP and the Mackenzie Bison Range are most likely to occur in the northern section of

surveillance Zone I in the BCA. Gates and Wierzchowski (2003) recommended that in addition to the in situ surveillance of BCA Zone I, aerial surveillance of the area between Buffalo Lake and Highway #5 should be conducted to ensure that the disease-free Mackenzie herd do not come into contact with infected bison that may occupy this area. Due to the propensity of bison to use meadows near lakes and rivers, they also suggested that aerial reconnaissance of the northwest shore of Buffalo Lake may be worthwhile.

Because of the ongoing risk of disease transmission from WBNP bison to the Mackenzie and Nahanni bison herds, continuation of shoreline and surveillance surveys is critically important for early detection of bison in the control area.

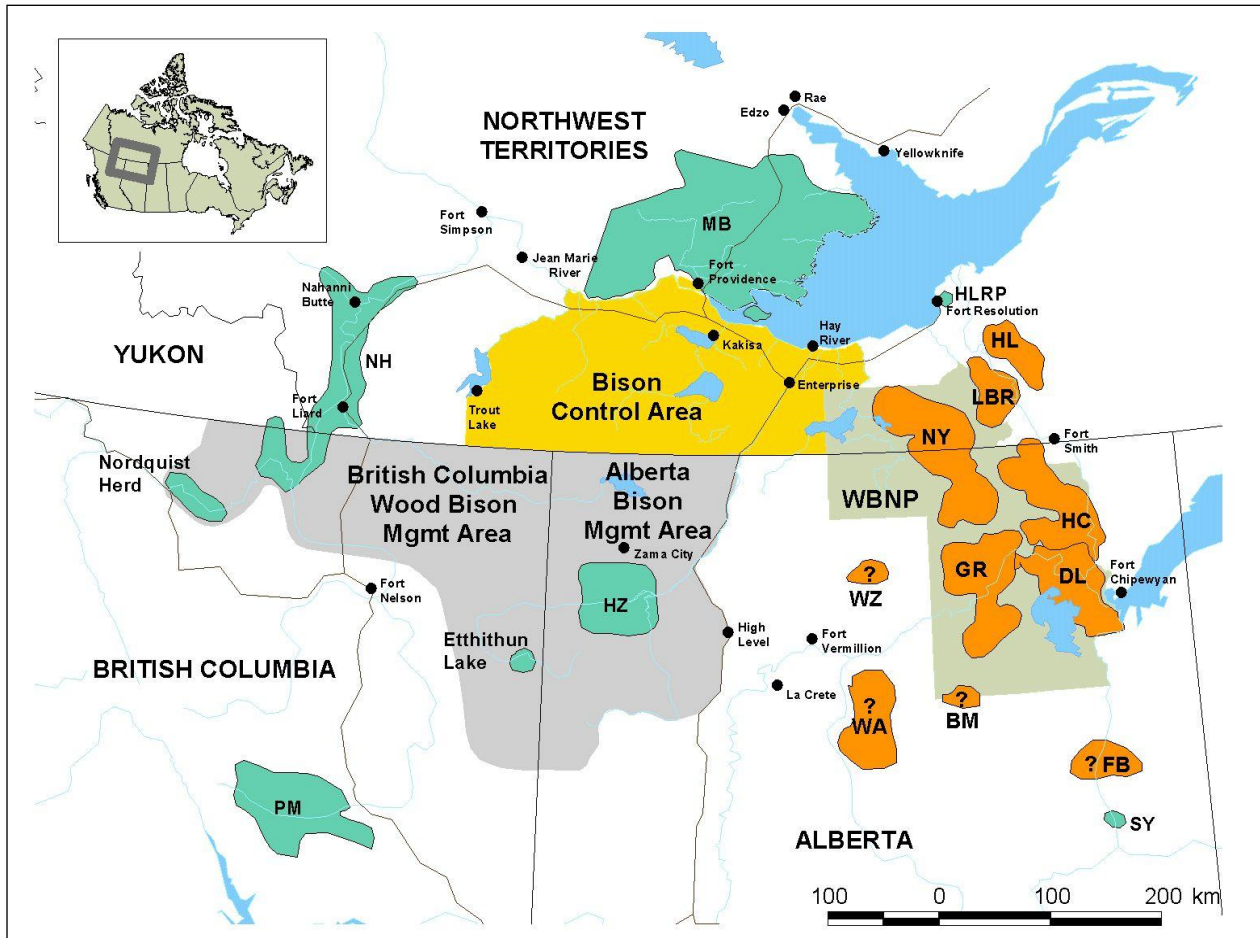


Figure 1. Distribution of bison herds in Northern Canada.

Note: Bison herds considered to be infected with bovine tuberculosis and brucellosis are shown in light grey; HL = Hook Lake, LBR = Little Buffalo River, NY = Nyarling, HC=Hay Camp, GR=Garden River, DL=Peace-Athabasca Delta, FB=Fire Bag, WZ=Wentzel, WA=Wabasca, BM=Birch Mountain. Bison herds considered to be disease-free are shown in dark grey; MB = Mackenzie, NH = Nahanni, PM= Pink Mountain, HZ = Hay Zama, SY = Syncrude/Fort McKay. The delineation of home ranges originated from various research (Reynolds and Hawley, 1987; Joly and Messier, 2001; Harper *et.al.*, 2000; Wood Buffalo National Park; Resources, Wildlife and Economic Development; British Columbia Ministry of Environment; and Alberta Environment.)

The Bison Control Area Program

In 1987, the Government of the Northwest Territories (GNWT) implemented a program to reduce the risk of contact between infected and disease-free bison (Gates and Gray, 1992; Gates *et al.*, 1992b). The program entailed defining an area – the Bison Control Area (BCA) – from which bison are excluded through surveillance and active management. The BCA originally included lands south of the Mackenzie River and North of the Mackenzie Highway between Mills Lake (near Fort Providence) and Hay River. In 1990, the BCA was expanded to encompass the area between the Alberta-NWT border and southern shoreline of the Mackenzie River; the western boundary was delineated by Trout River; the eastern boundary was outlined by the Buffalo River and western boundary of WBNP (Figure 2). Presently, the BCA encompasses 3,936,339 ha.

Since 1993, the Government of the Northwest Territories (Department of Environment and Natural Resources) and the Government of Canada (Parks Canada) have jointly funded the Bison Control Area Program (BCAP). The cost of surveying the BCA is jointly funded under a Memorandum of Understanding between the two agencies. This report summarizes the results of the Bison Control Area Program for the 2004–2005 surveillance season (i.e. January 2005 to April 2005).

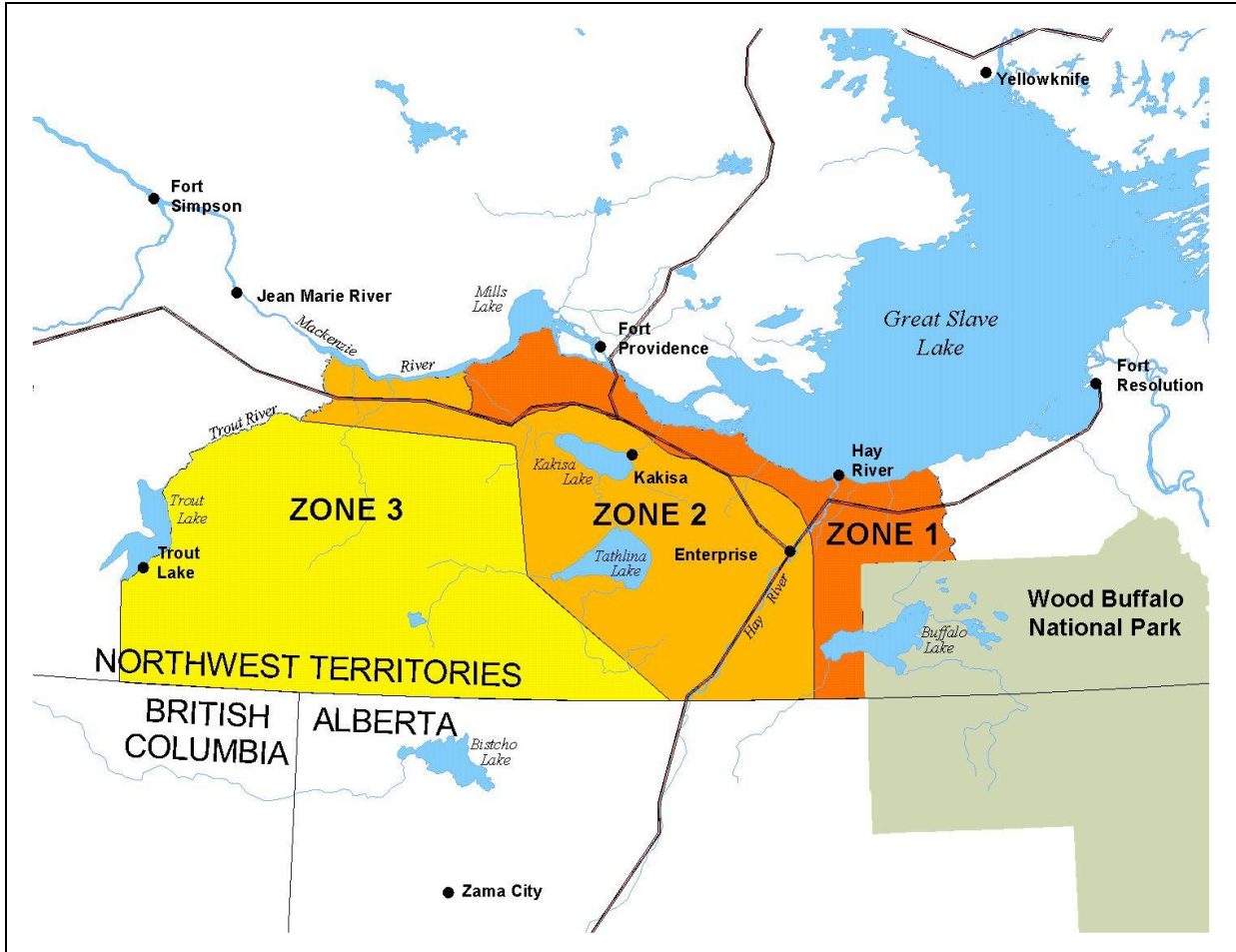


Figure 2. The Northwest Territories Bison Control Area and three surveillance zones.

Goals and Objectives

The specific goal of the Bison Control Area Program in the Northwest Territories is to reduce the risk of infection of the Mackenzie and Nahanni herds with tuberculosis and brucellosis. Our overall approach to achieve the goal of the BCA program is to conduct systematic aerial surveys with an extensive public communication program. The objectives of the Bison Control Area Program are to:

- Detect and remove any bison in the BCA, and to prevent establishment of bison herds or individuals in this area¹;
- Continue surveillance of the bison control area; and
- Increase public awareness of the Bison Control Program.

METHODS

We used a survey methodology from previous years (Gates and Gray, 1992; Gates *et al.*, 1992; Williamson *et al.*, 1995; Antoniak and Gates, 1996; Bohnet and Gates, 1997; Boulanger *et al.*, 1998; Tanguay *et al.*, in prep.; Potvin *et al.*, in prep.; Jewell *et al.*, in prep.; Campbell *et al.*, in prep.) to assure repeatability and comparability of search effort and resulting wildlife observations.

The Bison Control Area is stratified into three discrete zones (Figure 2). Active surveillance through aerial surveillance is conducted during winter months

¹ Wood bison (*Bison bison athabascae*) are considered a threatened subspecies of North American Bison by the committee on the Status of Endangered wildlife in Canada (COSEWIC); they are listed on Appendix II by the Convention on the International Trade In Endangered species (CITES). Because of the disease risk, any bison found in the BCA are considered nuisance wildlife under Section 61 of the NWT Wildlife Act (Government of the Northwest Territories, 1992). This regulation states that NWT residents may shoot any bison sighted in the BCA.

when observation of bison and bison sign (i.e. tracks and/or feeding craters) is optimal. Survey effort and frequency of monitoring is allocated according to the presumed likelihood of bison moving into the area, i.e. the risk of invasion (see AFRAN, 1999). Consequently, this survey design requires frequent (i.e. weekly) surveys of the shoreline areas that are closest to the range of Mackenzie bison herd and the range of bison in WBNP. Less frequent surveys (i.e. semi-comprehensive and annual comprehensive) are used to survey larger areas (BCA Zones I and II) in the BCA.

As part of this survey design, we flew three different types of aerial surveys to systematically survey the BCA throughout the surveillance season. The first type of survey was a weekly shoreline patrol of the high-risk area (Zone I). We continued to fly a standard shoreline patrol route as recommended by Tanguay *et al.* after the 1999–2000 season (Tanguay *et al.*, in prep.) (Figure 3). This survey was conducted at approximately seven-day intervals and had a planned flight time of approximately two to three hours per patrol flight.

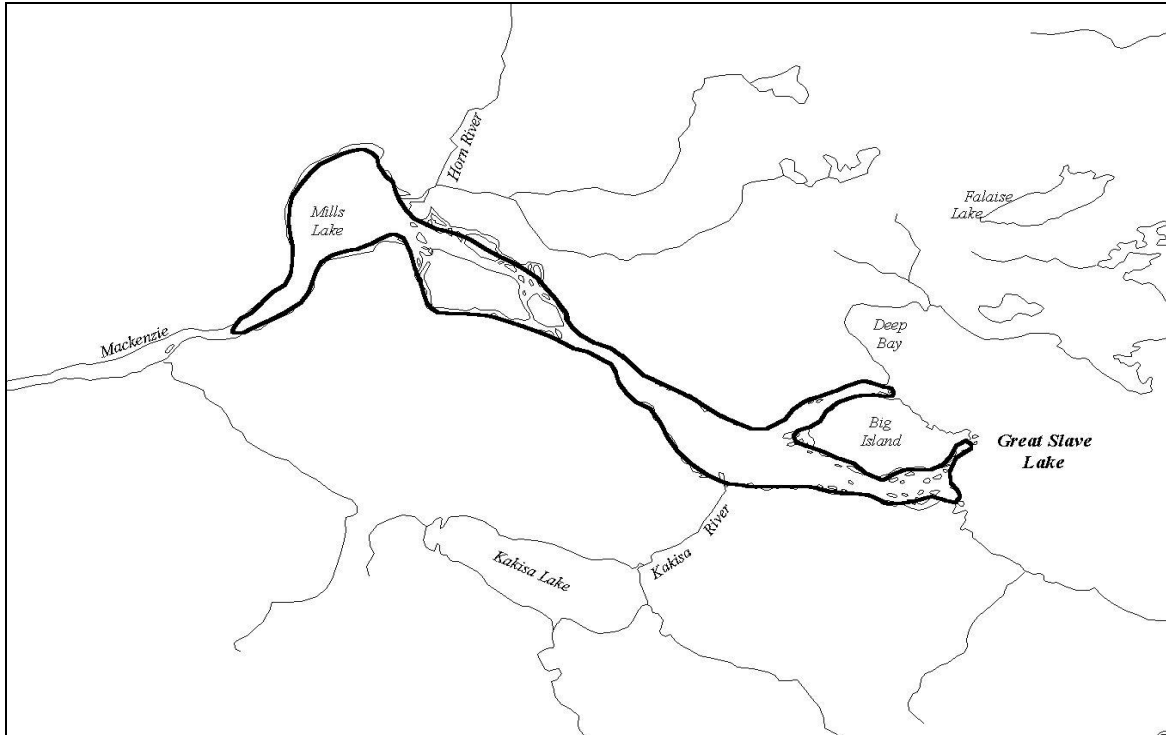


Figure 3. Standardized shoreline patrol route for the Bison Control Area.

The second type of survey was a one-time semi-comprehensive surveillance flight of Zone I; this survey was performed in February 2005. This survey covers a larger area and requires about 15 hours to complete. The final survey type was the annual comprehensive surveillance flight of Zones I and II. For this annual comprehensive survey performed in late March, we allocated approximately 35 hours of flight time. We did not conduct aerial surveys in Zone III of the BCA.

Shoreline patrols were flown in either an Aviat-Husky or Cessna 185, depending on aircraft availability. Both the semi-comprehensive survey and the annual comprehensive survey flights were performed with a Cessna 206. A Resource officer (Landry) and/or local community observers and pilot conducted

all shoreline patrols, with the exception of the final patrol flight. This survey was performed by a pilot and the BCA technician (Bidwell) and on April 14, 2005 in a Cessna 210. The survey crew for the surveillance flights of Zone I and the annual comprehensive survey of Zones I and II consisted of a pilot, the BCA Technician and two community observers. The technician sat in the front seat while the observers occupied the left and right rear seats of the aircraft. Survey aircraft were flown at approximately 250 to 300 metres above ground level at a speed of approximately 160 km/h.

We adapted flight paths from previous surveys to plan our routing for aerial surveys in the 2004–2005 surveillance season. However, routes used in previous years, for both the semi-comprehensive and comprehensive surveys were updated and restructured this season in order to meet specific survey effort requirements and recommendations as outlined in Bidwell *et al.* (2004). As suggested last year, we extended survey lines into the northwest corner of WBNP, in addition to concentrating more coverage in higher risk areas (see Figure 5.1 and 6.1). Utilising predetermined flight routes ensures maximum coverage for both surveillance surveys, and allows the BCA Technician to pre-plan fuel stops and breaks, which increases survey efficacy and improves safety. Although pre-planned routes were used as a guide, the actual flight paths were flown in a flexible, meandering manner to allow for variations in terrain, and habitat, and to follow animal tracks as and when required. This allowed us to survey Zones I & II with the greatest possible coverage given available flying hours.

To improve sampling quality and precision during surveillance surveys, we employed a known strip (transect) width of 500 metres and positioned streamers on the struts of the aircraft to define the boundaries of the strip within which the observers count animals. With the aid of observers, the BCA technician affixed streamers prior to flights using a known calculation ($w = W \times H \div h$). Once this exercise was complete, a test flight was carried out to ensure streamer placement accuracy; the test flight entailed positioning the aircraft along side a known 500-metre length on the ground, at survey altitude, and confirming whether the fixed streamer positions aligned with the known ground length. Implementing a known strip (transect) width enables us to accurately calculate percent cover.

Wildlife observations during weekly shoreline patrols were most often recorded on a NTS 1:250,000-reproduction map of the survey area. A hand-held Garmin GPS was used and then downloaded into the Ozzie Explorer Mapping program (Des Newman, version: 3.95.4) where the data could eventually be exported into ArcView 3.2a Geographic Information System (Environmental Systems Research Institute, 1992–2000). All observations of large mammals (i.e. moose, caribou, and wolves) during the semi-comprehensive and annual comprehensive flights were recorded using ASPEN Global Positioning System Field Software (Trimble Survey and Mapping Products, 1998). These data were prepared for export to ArcView 3.2a with Pathfinder Office Software (Trimble Survey and Mapping Products, 1998).

RESULTS

We attempted to conduct aerial surveys during optimum snow and light conditions; however, some flights were conducted in less suitable conditions in order to maintain adequate and regular surveillance (Appendix A).

Shoreline Patrols

Weekly shoreline patrols were initiated on 6 January 2005 and continued until 14 April 2005. (Figures 4.1–4.12 Maps) Total flight time for the 10 shoreline patrols flown was 28.9 hours² (Table.1) with a mean duration of 2.6 (\pm 0.3 Standard Deviation) hours. On 14 April 2005 the last scheduled shoreline patrol flight was flown. During this flight the BCA Tech observed that snow cover on land had receded substantially altering snow structure, due to warmer temperatures in March, so that existing tracks were near impossible to discern from the air. River conditions also showed clear signs of spring thaw; ice cover on the river exhibited deteriorated conditions between Big Island and the south shore of the Mackenzie, and off shore near the winter road crossing east of Fort Providence. It was determined that ice conditions in these areas would likely deter bison from crossing. Because of these observed conditions, we discontinued shoreline patrol surveys for the 2004–2005 season.

² Note: Shoreline Patrol # 9 scheduled for 9 March 2005 was cancelled due to mechanical maintenance

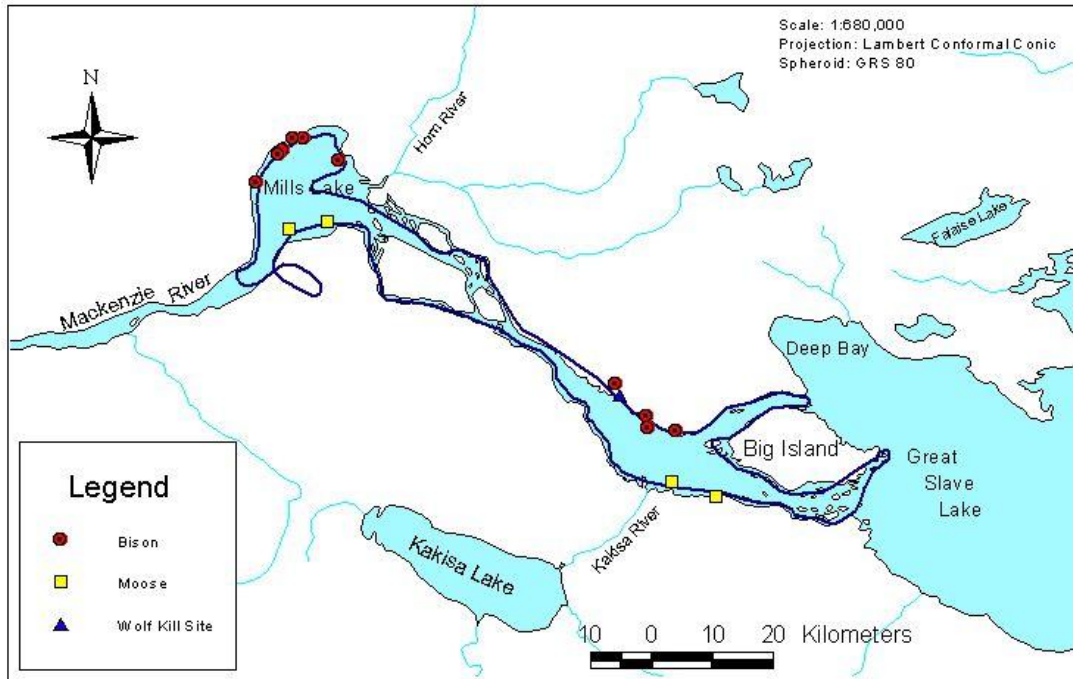


Figure 4.1 Shoreline patrol flown on 6 January 2005. 2.4 total hours flown on survey.

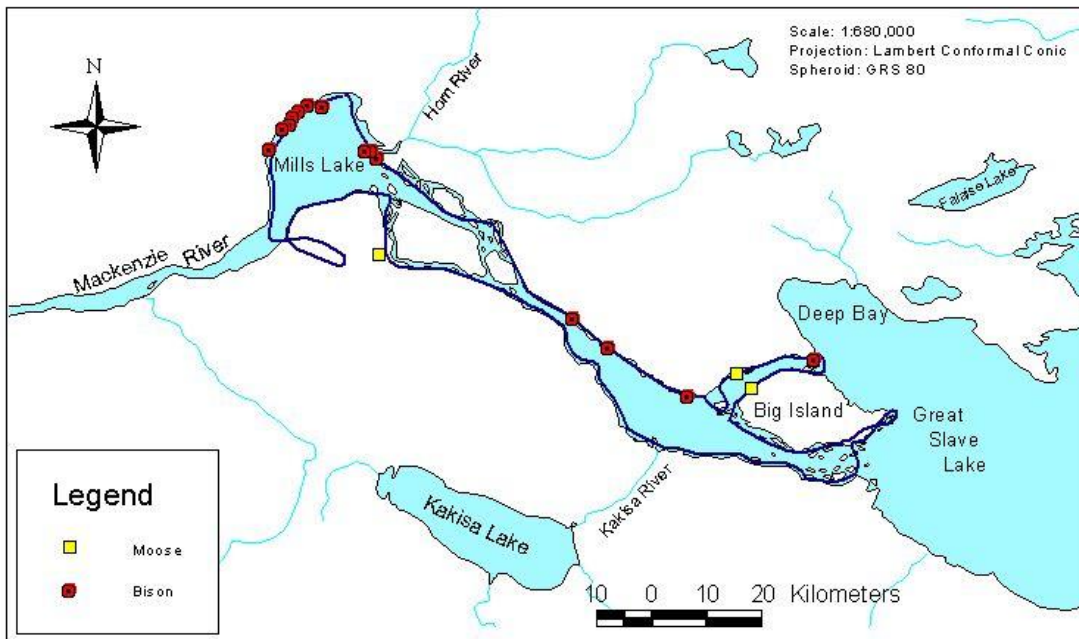


Figure 4.2 Shoreline patrol flown on 11 January 2005. 2.3 total hours flown on survey.

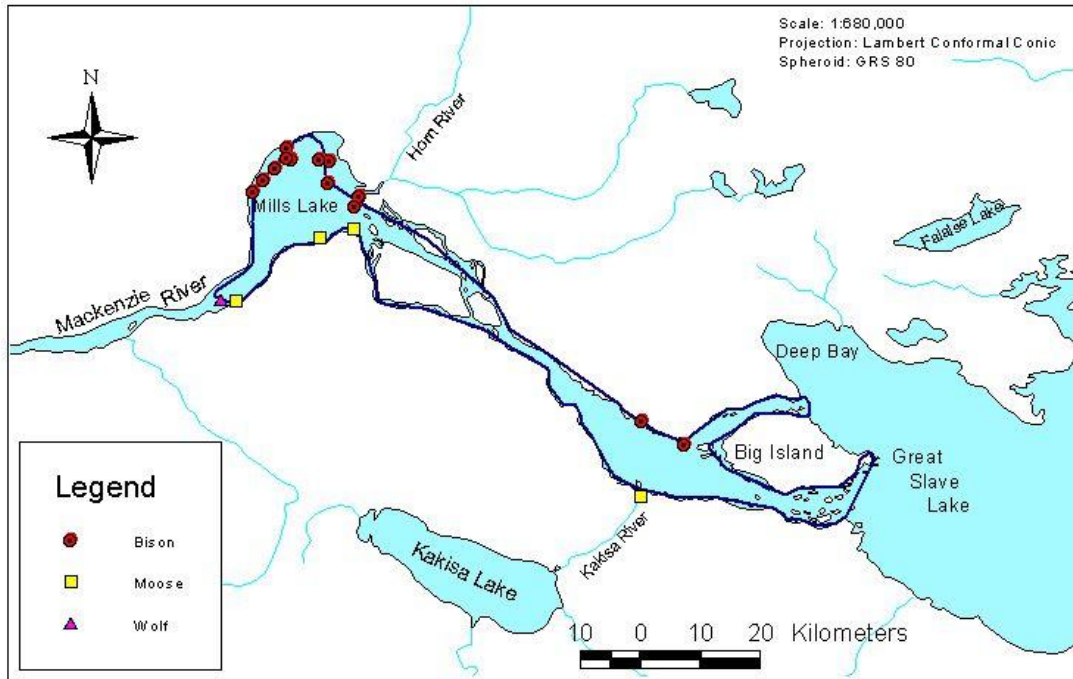


Figure 4.3 Shoreline patrol flown on 20 January 2005. 2.4 total hours flown on survey.

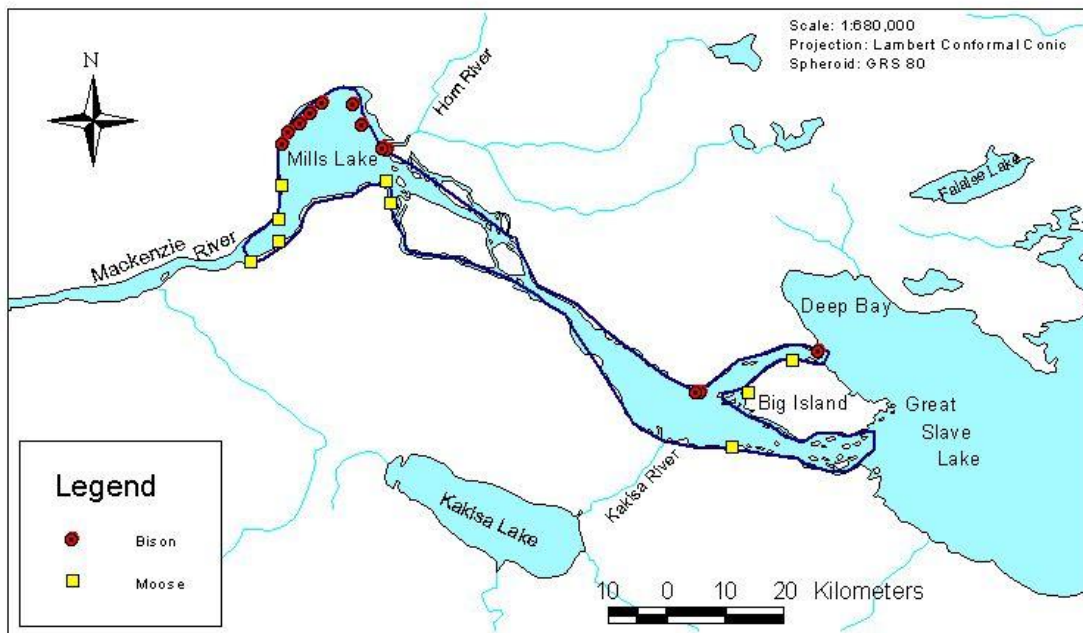


Figure 4.4 Shoreline patrol flown on 26 January 2005. 2.6 total hours flown on survey.

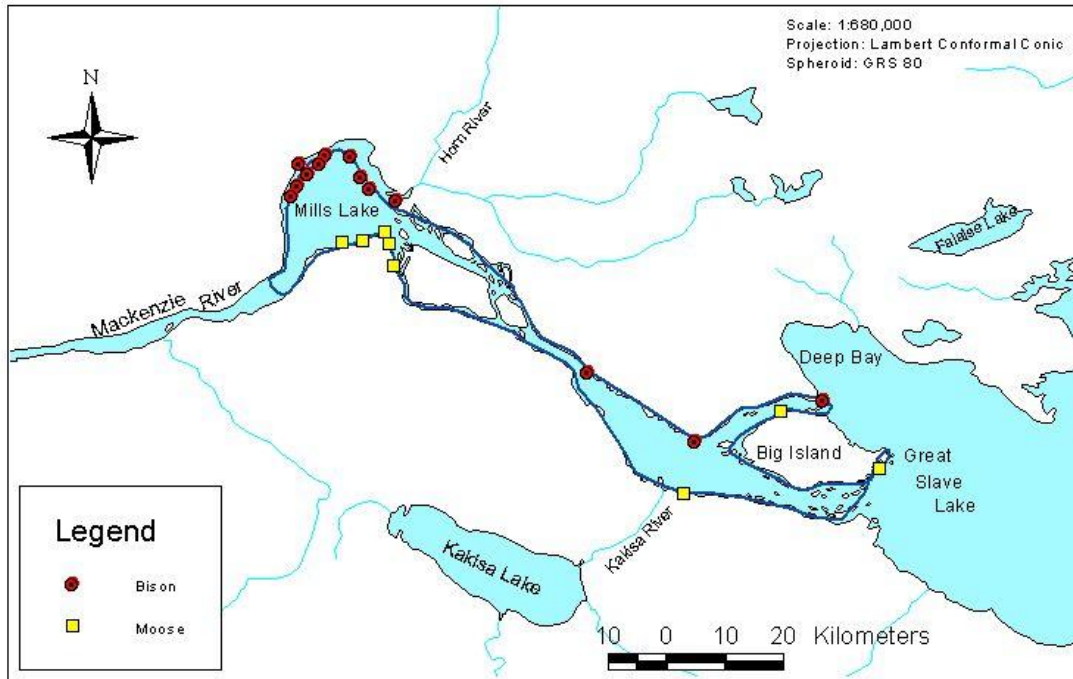


Figure 4.5 Shoreline patrol flown on 2 February 2005. 2.6 total hours flown on survey.

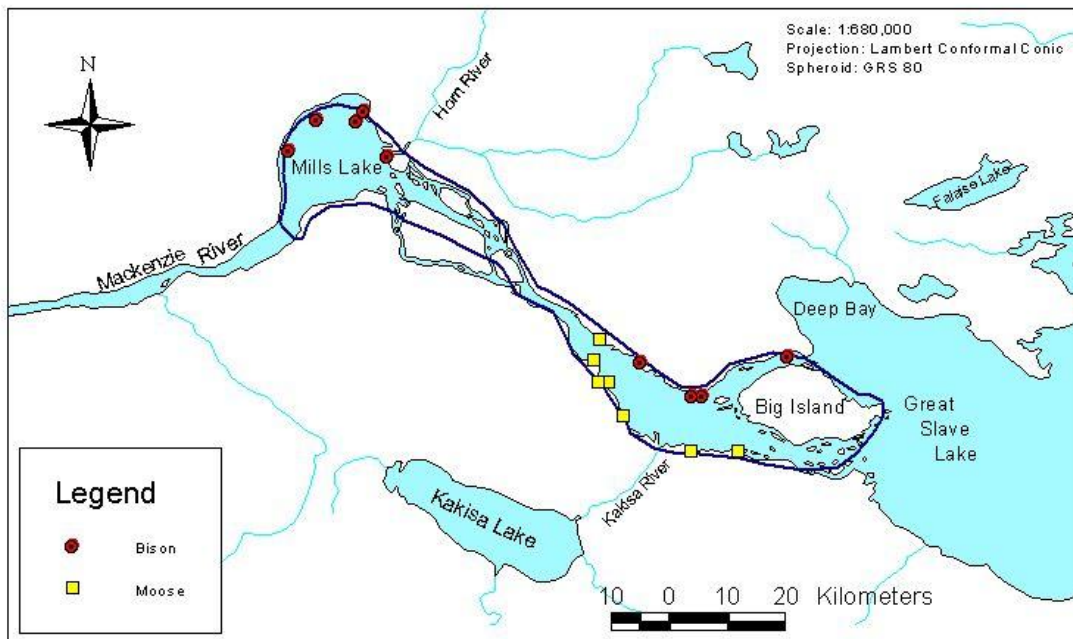


Figure 4.6 Shoreline patrol flown on 16 February 2005. 2.6 total hours flown on survey.

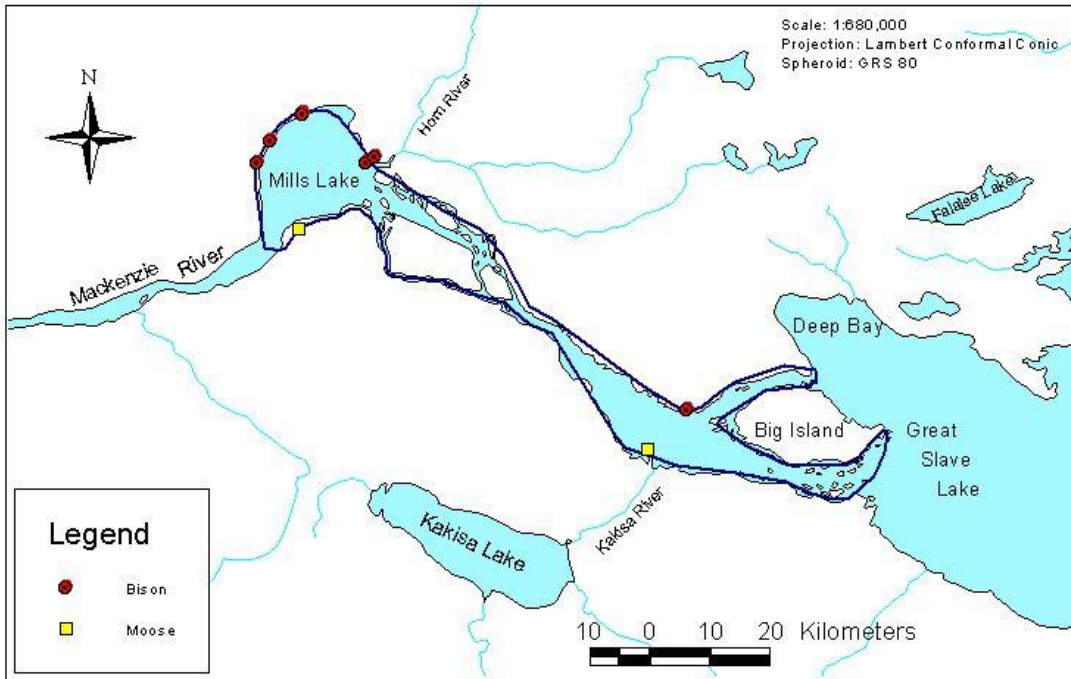


Figure 4.7 Shoreline patrol flown on 23 February 2005. 2.7 total hours flown on survey.

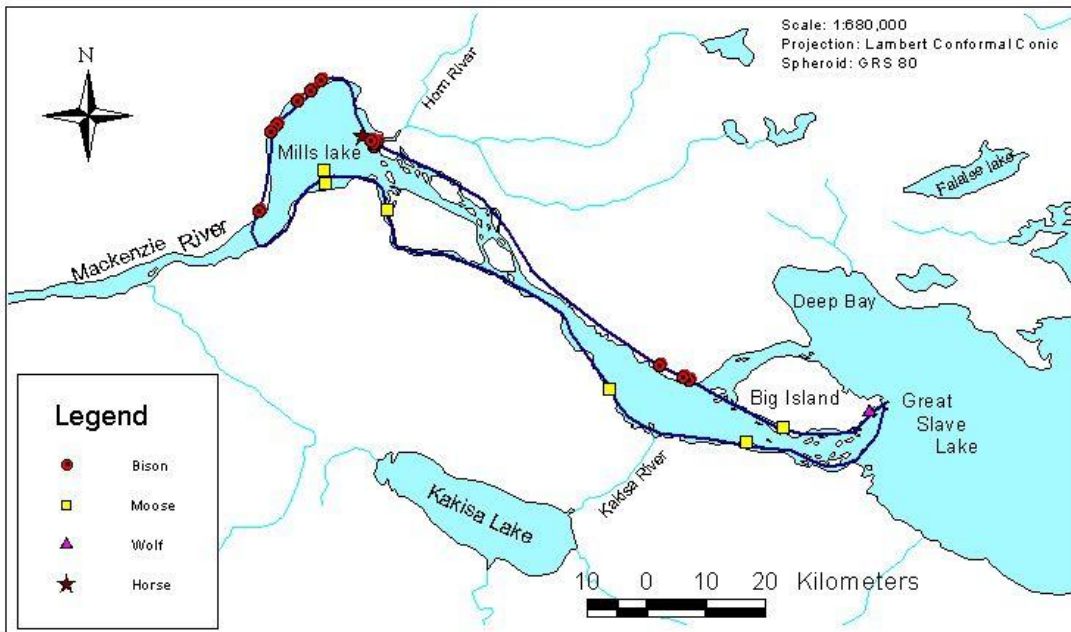


Figure 4.8 Shoreline patrol flown on 7 March 2005. 2.7 total hours flown on survey.

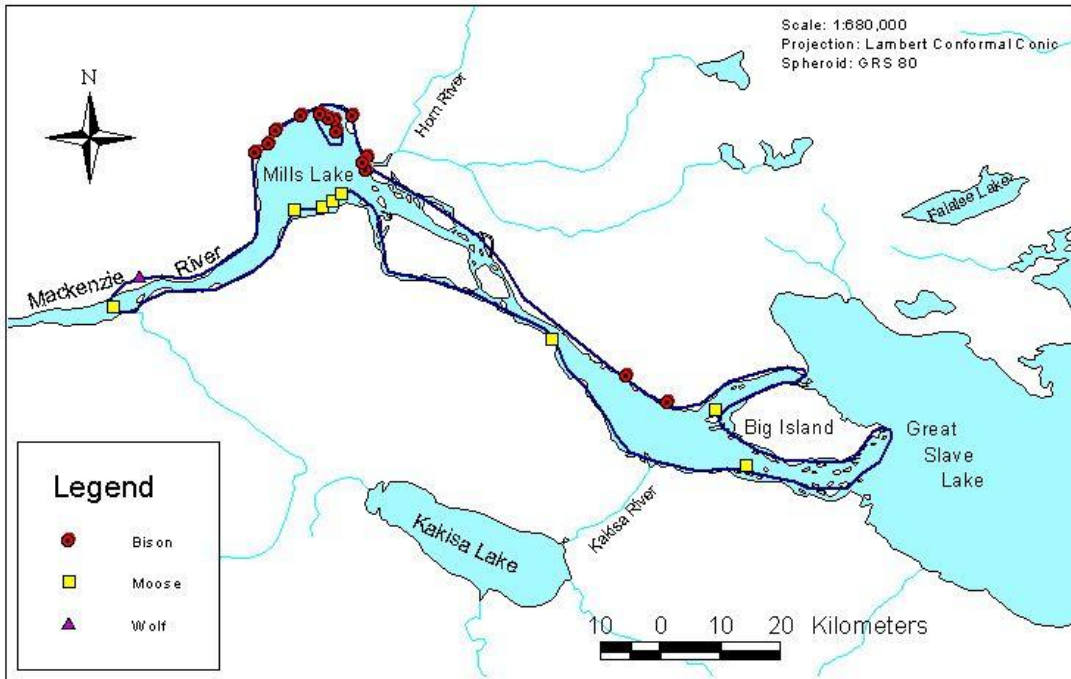


Figure 4.9 Shoreline patrol flown on 16 March 2005. 3.5 total hours flown on survey.

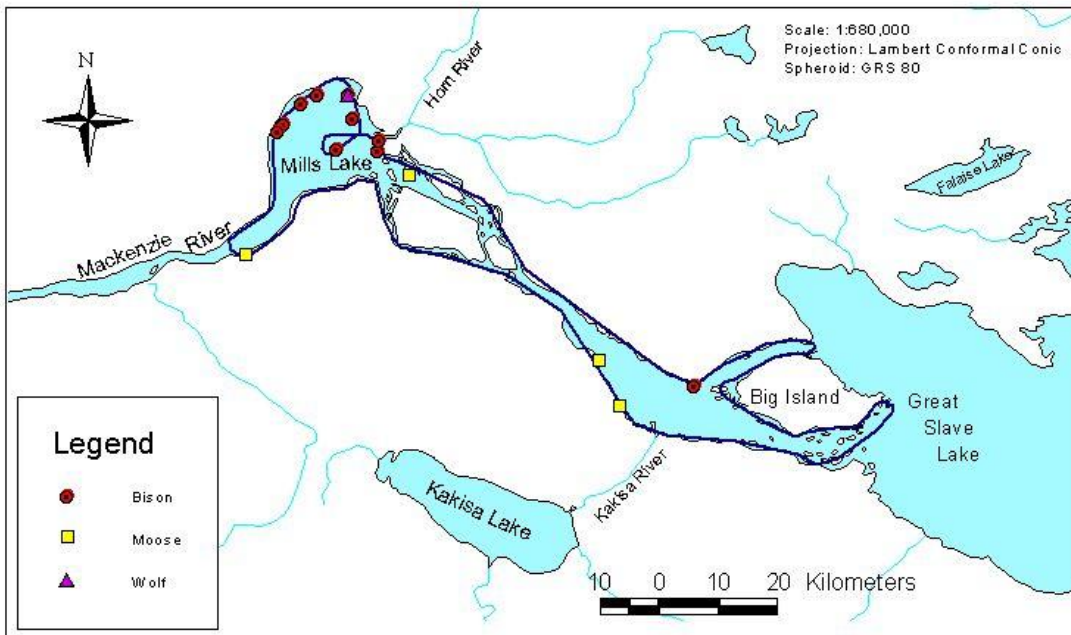


Figure 4.10 Shoreline patrol flown on 31 March 2005. 3.0 total hours flown on survey.

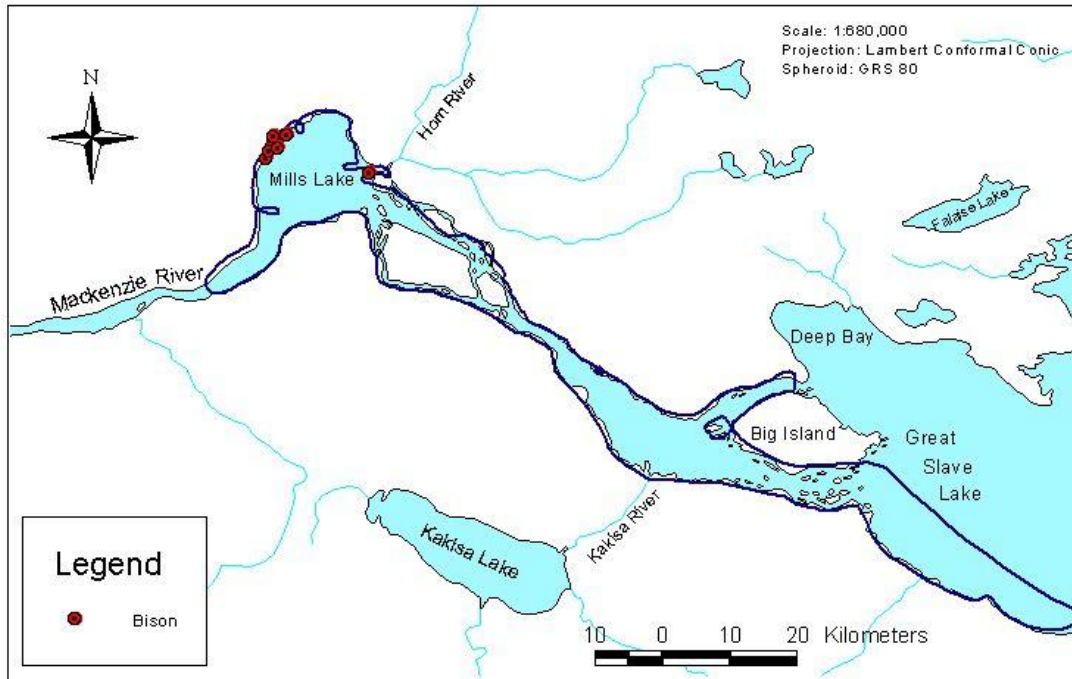


Figure 4.11 Shoreline patrol flown on 14 April 2005. 2.4 total hours flown on survey.

Surveillance Surveys

We conducted one semi-comprehensive surveillance flight of BCA Zone I this season. This survey was conducted from February 8-10 2005 (see Figures 5.1 and 5.2). The total time flown on the semi-comprehensive survey was 14.0 hours. The annual comprehensive surveillance flight of BCA Zones I and II was conducted from March 22 to 26 2005 (Figures 6.1 and 6.2), and required 32.9 hours to complete (Table 2). In total, we spent 75.8 hours surveying the BCA in the 2004–2005 surveillance season (Appendix B).

Table 1. Summary of shoreline patrols in the Bison Control Area from January to April 2005³.

Date	Ferry Hrs	Survey Hrs	Date	Ferry Hrs	Survey Hrs
06 Jan. 2005	2.5	2.4	07 Mar. 2005	2.1	2.7
11 Jan. 2005	2.5	2.3	09 Mar. 2005	0.0 ⁴	0.0
20 Jan. 2005	2.5	2.4	16 Mar. 2005	2.3	3.6
26 Jan. 2005	2.5	2.6	31 Mar. 2005	2.5	2.6
02 Feb. 2005	2.5	2.6	14 Apr. 2005	2.6	2.4
16 Feb. 2005	2.4	2.6			
23 Feb. 2005	2.4	2.7			
			Total ferry hours: 26.8	Total survey hours: 28.9	

Table 2. Summary of Surveillance flights in the Bison Control Area from February to March 2004. A Cessna 206 aircraft was used to complete both surveillance surveys.

Date	BCA Zone	Hours Flown
8-10 Feb.2005	I (Semi)	14.0
22-26 Mar.2005	I&II (Comp)	32.9
Total Hours: 46.9		

³ The aircrafts used to fly the shoreline patrols were an Aviat Husky and a Cessna 185.

⁴ Note: Flight cancelled due to mechanical maintenance

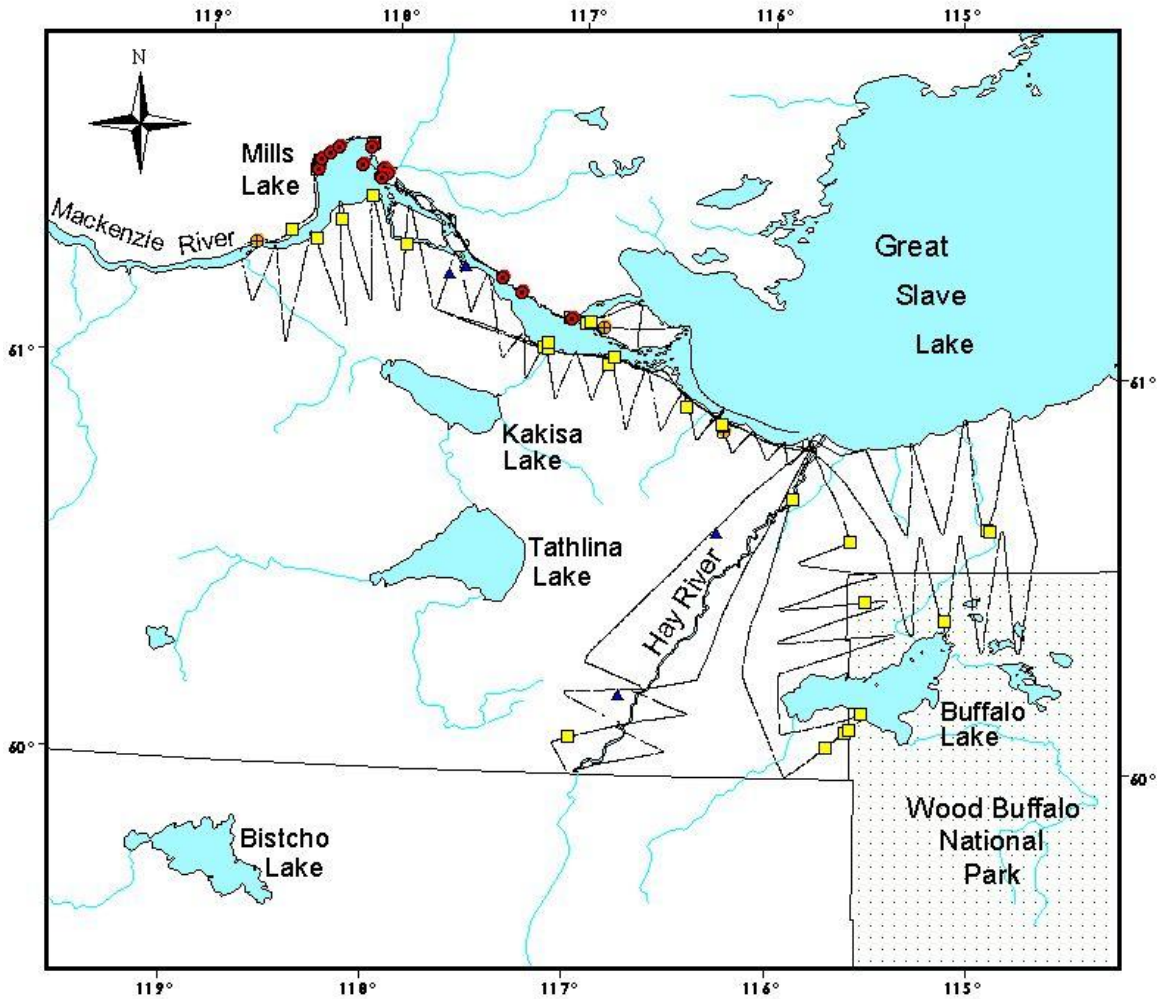
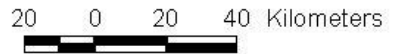


Figure 5.1

Flightline of survey aircraft and large animals observed during the February Semi-Comprehensive survey of the bison control area, Zone 1. 8-10 February, 2005.



Map Scale: 1: 1,300,000
 Projection: Lambert Conformal Conic
 Spheroid: GRS 80



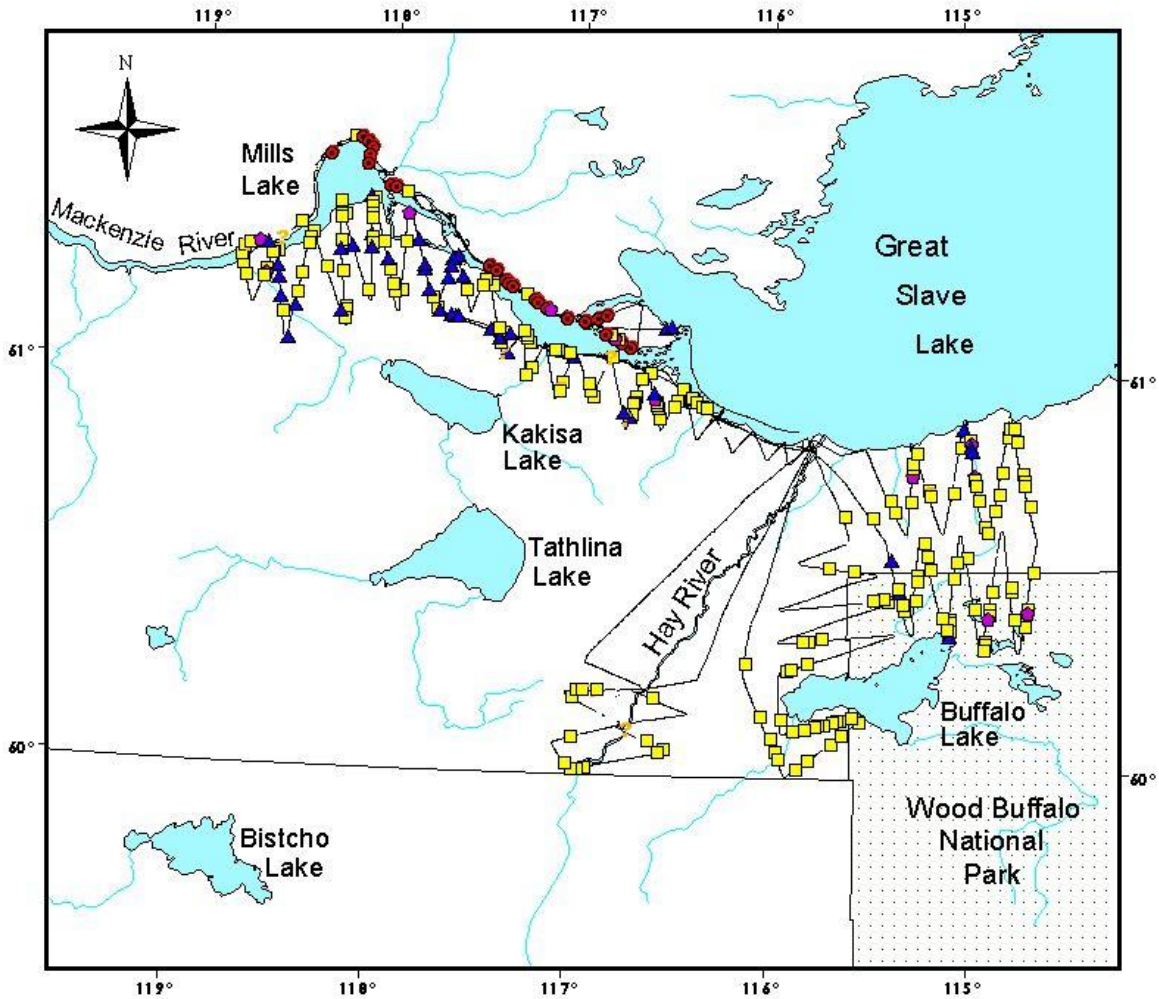


Figure 5.2

Flightline of survey aircraft and large animal tracks observed during the February Semi-Comprehensive survey of the bison control area, Zone 1. 8-10 February, 2005.



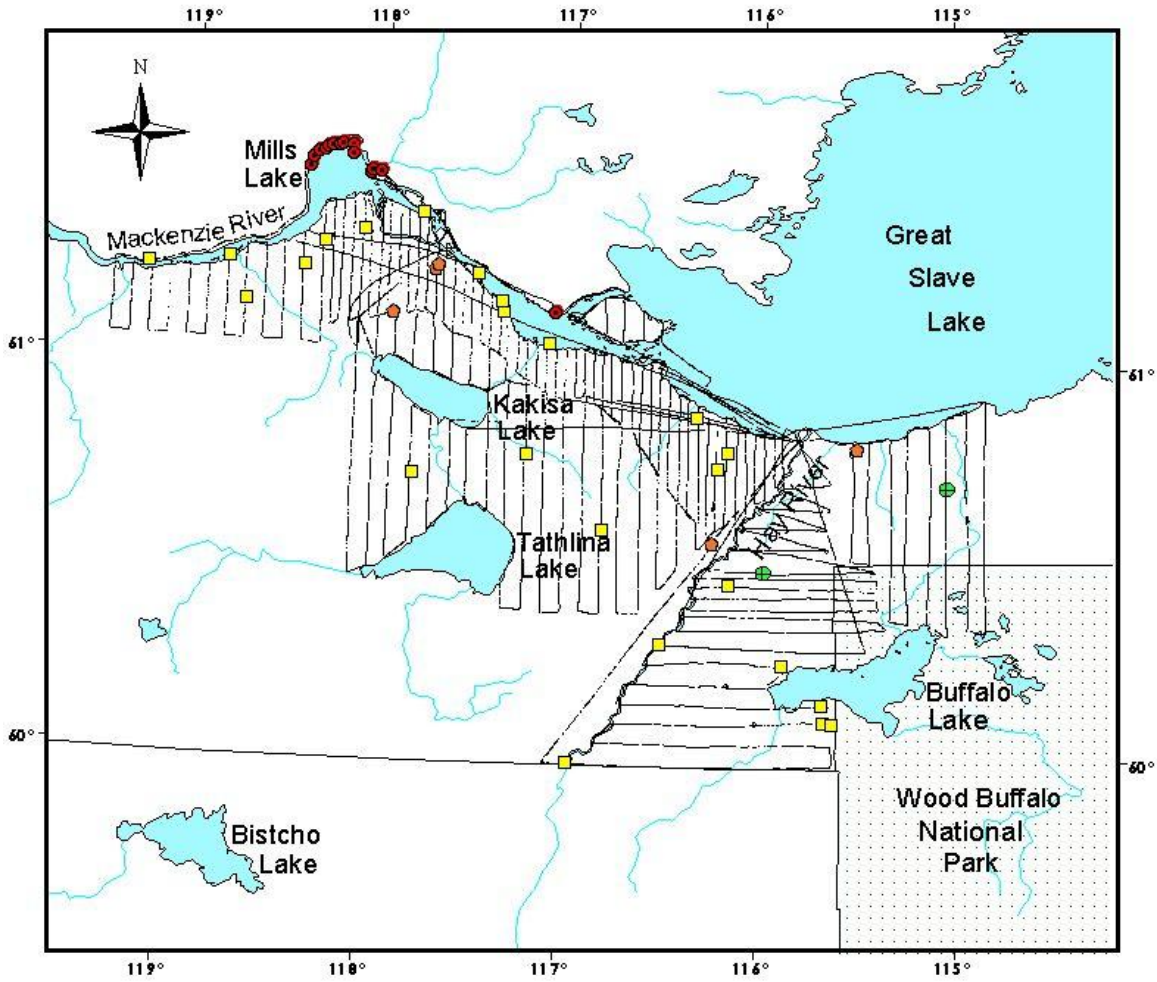
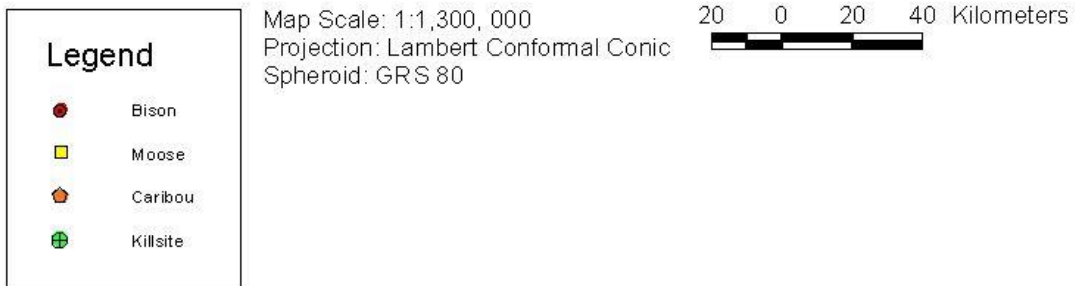


Figure 6.1

Flightline of survey aircraft and large animals observed during the March Comprehensive survey of the bison control area, Zones 1 & 2. 22-26 March, 2005



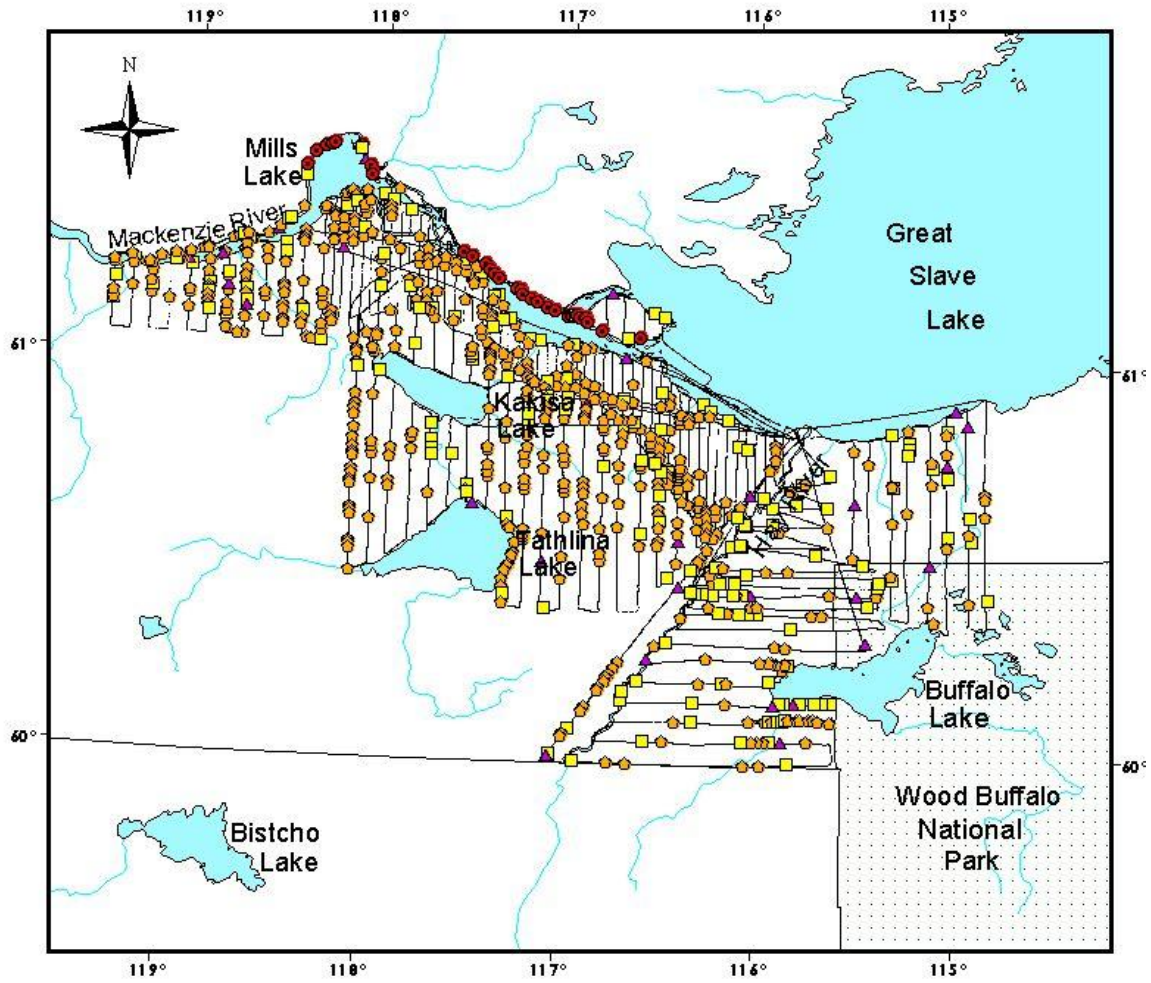


Figure 6.2

Flightline of survey aircraft and large animal tracks observed during the March Comprehensive survey of the bison control area, Zones 1 & 2. 22-26 March, 2005



Wildlife Observations

Although bison have been observed in the BCA in the past, we did not observe any bison, nor did we receive any reports of bison sightings in the BCA during the 2004–2005 surveillance season.

During surveillance flights we did not observe any attempts by bison (i.e. fresh tracks) to cross the Mackenzie River. All bison observed during shoreline patrols or surveillance flights were located on the north side of the Mackenzie River in the Mackenzie Bison Sanctuary (MBS).

The cumulative totals of large mammals observed during shoreline patrols and surveillance flights were 3144 bison, 38 caribou, 174 moose, and 17 wolves (Table 3).

Bison were most often observed along the north shore of Mills Lake. (Figures 4.1–4.11, Figure 5.1, and Figure 6.1). During shoreline patrols moose were generally observed along the south shore of the Mackenzie River southwest of Mills Lake, and around Big Island, also south of this along the shore to Kakisa River. On surveillance surveys moose were again observed most often along the south shore of the Mackenzie and down into Zone II near the southwest corner of Buffalo Lake (figures 4.1–4.10, 5.1, 6.1). No caribou were observed during shoreline patrols. During surveillance surveys most caribou were observed north of Kakisa Lake up to the south shore of the Mackenzie and east of this to Hay River (figures 5.1, 6.1). Many Wolves were observed during shoreline patrols this season. Most were seen along the north shore of the Mackenzie and southwest of Mills Lake. A few were spotted along the eastern shore of Big Island. During

the semi-comprehensive surveillance survey, a pack of wolves was seen at a bison kill site on the west shore of Big Island (Figures 4.3, 4.8–4.10, 5.1).

Table 3. Recorded sightings of large mammals observed during all surveillance flights in the Bison Control Area from January to April 2004.

Species	Shoreline Patrols (n=12)	Surveillance Flights		Totals
		Semi- Comprehensive (n=1)	Comprehensive (n=1)	
Bison	2493	283	368	3144
Caribou	0	18	20	38
Moose	97	45	32	174
Wolf	7	10	0	17

Communications

This program year's public communications plan incorporated a combination of print distribution, radio broadcast, and community meetings. The information and resources used within these communication mediums were specifically designed to alert people to the BCA and our program objectives, in addition to soliciting public participation.

The BCA technician contacted several band offices to inform them that we were interested in any reported bison sightings, and that this information should be relayed to a local ENR office as soon as possible. Posters and pamphlets were distributed to various band offices within and adjacent to the BCA to better inform the general public about the Bison Control Area Program and to emphasise their importance as participants in making this project more comprehensive.

A half page colour advertisement was included in the 2005 Explorers guide as well as *Up Here* magazine (Appendix D). This advertisement was designed with the intent of reaching a wider audience; its aim was again to inform the public about the Bison Control Program, its goals and to solicit public participation.

A radio announcement was aired periodically on the Canadian Broadcasting Corporation (CBC) to inform residents, as well as tourists visiting the Territories, about the Bison Control Program and to alert anyone travelling through the BCA to report bison sightings to the nearest Environment and Natural Resource office (Appendix C). We attempted to place the "Anik-info" spot that

has run in previous years on CBC-North Television, but were informed that the CBC no longer runs television stills (J. McClinton, pers. comm.). As an alternative, the CBC offered to create an updated televised spot for the BCA program and to date is currently working to develop a message that will be ready to air next season.

Thus far, the BCA Website is on the verge of activation; once the final edits are completed, the site should be posted next month (May 2005) at the following web address: <http://www.nwtbisoncontrolarea.enr.gov.nt.ca> (D. Hartt, pers. comm.).

Meetings with relevant communities within and near the BCA were organized early this season; we were able to meet with community representatives from Fort Providence (Fort Providence First Nation/Deh Gah Got'ie Dene Council) and Hay River (Katlodeeche First Nation and West Point First Nation) on 31 January 2005 and 01 February 2005, respectively. A power point production was created and utilized during these meetings to make presentations more dynamic and engaging (Appendix E). Response from meeting participants was positive, and the majority found the presentations to be informative. No bison sightings were reported at these meetings; however, important feedback regarding the BCA and related program activities were provided. Overall, support for the BCA in the visited communities seemed strong.

DISCUSSION

In the 2004–2005 surveillance season we did not observe bison or bison sign (i.e. tracks and/or feeding craters) in the BCA during weekly shoreline patrols, or the semi-comprehensive and comprehensive surveillance surveys. However, the occurrence of bison crossing the river is important. Thus, absence of bison in the BCA should not be presumed. It is important that these surveys remain ongoing to ensure that the BCA is maintained free of bison.

Before the beginning of the annual winter shoreline surveys, contracted pilots, Resource Officers, and observers who participated in the patrols were informed as to the practices involved in properly executing these surveys. The BCA technician relayed and distributed important information and instructions to all survey participants in order that each person was prepared and equipped by survey commencement. As a result, we saw overall improvement in logistical organization this season, and obtained higher quality data due to increased technical competence with observers. Thus, in addition to ensuring that proper procedure was followed at all times, informing all participants of survey protocol led to enhanced survey performance.

Surveillance survey routes were updated this season to reflect recommendations made by Bidwell *et al.* (2004)⁵. We extended survey coverage

⁵ These recommendations were based on the main objectives of the BCA program and results of Gates and Wierzchowski's bison movements model. Gates and Wierzchowski (2003) recommended aerial surveillance between Buffalo Lake and Highway #5, and due to the propensity of bison to use meadows near lakes and rivers. These areas were generally included in the 2003–2004 surveillance flights. However, aerial reconnaissance of the northwest shore of Buffalo Lake was also suggested, thus, we updated survey routes this season to include this area.

during the semi-comprehensive and comprehensive surveys in to the northwest corner of WBNP in the area north of Buffalo Lake and west of ca. longitude 114 45' W. Although no bison were observed in this area, the addition of such coverage improves our knowledge of areas along the northwest park border where bison would most likely disperse from (Gates and Wierzchowski, 2003). To further increase our knowledge of bison usage in this quarter, we contacted WBNP to inquire whether they observed any bison sightings in or near this area while executing their bison survey in March 2005. They reported that the only bison observations made in the northwest corner of the park were at Needle Lake (60.320277 N; - 114.446555 W) approximately 18 km northeast of Copp Lake (60.246472 N; -114.729166 W), which is approximately 20 km east of Buffalo Lake (see figures 5.1 and 6.1). Because no bison or their sign (tracks) were observed between Needle Lake and the eastern of edge Copp Lake, Parks personnel decided against extending their survey beyond the Lake (S. Macmillan, pers. comm.). Thus, the extent of their survey lines in the northwest corner of the park ceased at the western boundary of Copp Lake, as there was no evidence to suggest that bison were beyond this point. We suggest that survey effort for surveillance surveys in subsequent years continue to reflect the existing updated flight routes, as there are bison in the northwest park area, and their presence makes bison dispersal from the park a distinct possibility.

This season we improved sampling quality and precision by utilizing a known strip (transect) width (500 metres) during surveillance surveys. Implementing a strip (transect) width enabled us to accurately calculate percent

cover prior to surveys, which ensured that we maintained the greatest possible coverage, given the available flying hours. By continuing to employ this technique, we will enhance forthcoming surveillance surveys with heightened precision and increased methodical strength.

Public consultation and communication should be expanded further next season, as a well-informed public is more likely to report bison sightings. In addition to impending media placements and those currently in position next season we encourage the following:

- Meetings should be held with community members in Zone III of the BCA, as there is currently no surveillance in this area. Because we rely solely on reported public sightings to monitor this region, it is essential that we meet with community residents in order to obtain feedback. A formal request to conduct a meeting this season was sent to the Trout Lake Band Office; however, we did not receive any response. Thus, follow-up action should be exercised early next season in order to secure a future meeting. Early development of a provisional meeting schedule next season, in concurrence with consistent band office communication, would give the community consultation aspect of the BCA program the direction and attention it solicits.
- Publishing information about the Bison Control Program in major newspapers of the Northwest Territories during summer months should be considered. This will maximise exposure to both residents and tourists.

- All relevant BCA information pamphlets currently on display and in circulation should be inventoried and, if necessary, updated. We recommended contacting applicable Band offices and tourist centres in the NWT to inquire whether supplies need replenishing. Any low stock should be re-ordered and replaced.
- Once it is activated next month, the Bison Control Area website should be maintained on a regular basis next season; It should updated whenever changes in program information or figures occur. Because it will be an effective medium for informing the public on a year round basis, it is imperative that site information be current and accurate.
- Development of a database that stores location coordinates of probable areas of interest to bison (i.e. meadows, high density corridors, etc.) around standard surveillance routes should be seriously considered next season. These locations may be selected in a number of ways:
 - by conducting habitat analysis using satellite imagery based on vegetation types and proximity to diseased herds;
 - locating areas based on results from studies such as Gates and Wierzchowski's landscape evaluation of bison movements and distribution (2003); and
 - with the use of compiled survey data to extrapolate potential areas of interest, creation of a Prospective Bison Habitat database would be beneficial to the BCA program in terms of aiding in future survey planning and increasing our knowledge of potential bison habitat around BCA.

ACKNOWLEDGEMENTS

The BCA program for the 2004–2005 surveillance year was funded by ENR South Slave Region, Fort Smith, NT. and WBNP, Parks Canada Agency, Fort Smith, NT.

Several individuals played an important role in conducting the Bison Control Area Program during the 2004–2005 surveillance season. Shared Services personnel Gladys Schaeffer and Melissa Johns in Fort Smith handled administrative aspects such as staffing and pay records. Resource Officer Evelyn Krutko and trainee Edward Landry from Fort Providence assisted with logistics and shared their concerns and advice for on-going success of the Bison control Program. We thank the community participants who assisted in the surveillance flights; they are Lucas Elleze, Robert Sambelle, and Henry Bonnetrouge of Fort Providence; and from Hay River, Ken Thomas and Leon Thomas. Thanks also go to aircraft pilots, Dave Oleson and Sue Meritt from Air Tindi, Ivan Bourque from Reliance Airways, and Trevor Weaver from Big River Air for their input and expertise during surveillance flights. Gratitude also goes out to ENR's Wildlife Management Support Services, Data Coordinator, Doug Hartt, who assisted with the development and activation of the BCA website.

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APPENDIX A.

Summary of weather conditions during shoreline patrols and surveillance flights throughout the Bison Control Area Program surveillance season 2004–2005.

Summary of weather data during shoreline patrols - BCA 2004/05 surveillance season.

Date	Patrol #	Zone	Temp	Winds	Sky	Light	Intensity	Snow Cover
06-Jan-05	1	I	-18 C	10 kts - E	Overcast	Flat	Medium	Complete
11-Jan-05	2	I	-29 C	5 kts - W	Clear	Bright	High	Complete
20-Jan-05	3	I	-29 C	5 kts - W	Clear	Bright	High	Complete
26-Jan-05	4	I	-19 C	7 kts - SE	Overcast	Flat	Medium	Complete
02-Feb-05	5	I	-28 C	4 Kts - NW	Broken	Bright	High	Complete
16-Feb-05	6	I	-20 C	4 Kts - E	Overcast	Flat	Medium	Complete
23-Feb-05	7	I	-16 C	3 Kts - E	Overcast	Flat	Low	Complete
07-Mar-05	8	I	-14 C	Calm	Overcast	Flat	Medium	Complete
16-Mar-05	10	I	-13 C	3 Kts - E	Overcast	Flat	Medium	Complete
31-Mar-05	11	I	-2 C	10 Kts - SE	Broken	Bright	High	Low veg showing
14-Apr-05	12	I	4 C	5 kts - NE	Clear	Bright	High	Low veg showing

Summary of weather data during surveillance surveys - BCA 2004/05 surveillance season.

Date	Survey	Zone	Temp	Winds	Sky	Light	Intensity	Snow Cover
08-Feb-05	Semi	I	-28 C	5 Kts - SE	Clear	Bright	High	Complete
09-Feb-05	Semi	I	-9 C	10 Kts - S	Overcast	Flat	Medium	Complete
10-Feb-05	Semi	I	-17 C	5 Kts - SE	Overcast	Flat	Medium	Complete
22-Mar-05	Comp	I&II	-10 C	10 Kts - N	Broken	Bright	High	Complete
23-Mar-05	Comp	I&II	-18 C	5 Kts - SW	Clear	Bright	High	Complete
24-Mar-05	Comp	I&II	-10 C	5 Kts - SE	Scattered	Bright	Medium	Complete
25-Mar-05	Comp	I&II	-10 C	5 Kts - W	Clear	Bright	High	Complete
26-Mar-05	Comp	I&II	-10 C	5 Kts - W	Scattered	Bright	Medium	Complete

APPENDIX B.

Summary of surveillance activities and removals of bison from the Northwest Territories Bison Control Area Program (1988/89-2004/05).

Aerial surveillance

Year	Shoreline Patrols	Semi-Comprehensive Surveys	Comprehensive Surveys	Total Hours	Snow-mobile Ground Patrols	Bison Removals
1988 / 89	1					
1989 / 90	2					
1990 / 91	2					
1991 / 92		7				
1992 / 93			3			9 ^a
1993 / 94	14 ^b		1		23	
1994 / 95	10 (26) ^c	6 (94)	1 (34)	153	33	2 ^d
1995 / 96	11 (35)	3 (48)	1 (41)	123		3 ^e
1996 / 97	21 (62)	3 (45)	1 (46)	153		
1997 / 98	14 (43)	3 (46)	1 (48)	137		
1998 / 99	14 (43)	2 (30)	1 (45)	117		
1999 / 00	14 (42)	2 (28)	1 (46)	115		
2000 / 01	13 (40)	2 (30)	1 (50)	120		
2001 / 02	14 (42)	2 (29)	1 (42)	113		
2002 / 03	11 (25)	2 (22)	1 (40)	87		
2003 / 04	13 (31)	1 (11)	1 (37)	78		
2004 / 05	12 (29)	1 (14)	1 (33)	76		

^a 17 May 1992: 8 bulls shot near Point de Roche 31 May 1992: 1 bull shot near Point de Roche (no lymph nodes collected). Serological testing for Brucella was negative for all 9 bulls, no lesions consistent with tuberculosis observed on gross pathology or histopathology.

^b Four patrols covered the Hay River area and extended inland to the northwest park boundary.

^c Numbers in brackets represent survey hours(rounded off to the nearest hour).

^d 8 March 1995, 1 cow shot by hunter along south shore of Mackenzie River. Cow had likely been wounded by wolves. Blood serum and retropharyngeal lymph nodes collected 13 October 1994, prior to the surveillance season beginning, 1 bison shot by hunter near the east boundary of the BCA. Blood and tissue samples collected but no evidence of brucellosis or tuberculosis.

^e 19 March 1996: 3 cows killed by hunter on the south shore of Mackenzie River. Blood serum (n=2) and retropharyngeal lymph nodes (n=3) collected. No serological reactors to brucella, and lymphatic tissue normal on gross examination.

APPENDIX C

Public service announcement aired on CBC Radio North since January 2005.

Script: **Public Service Announcement**

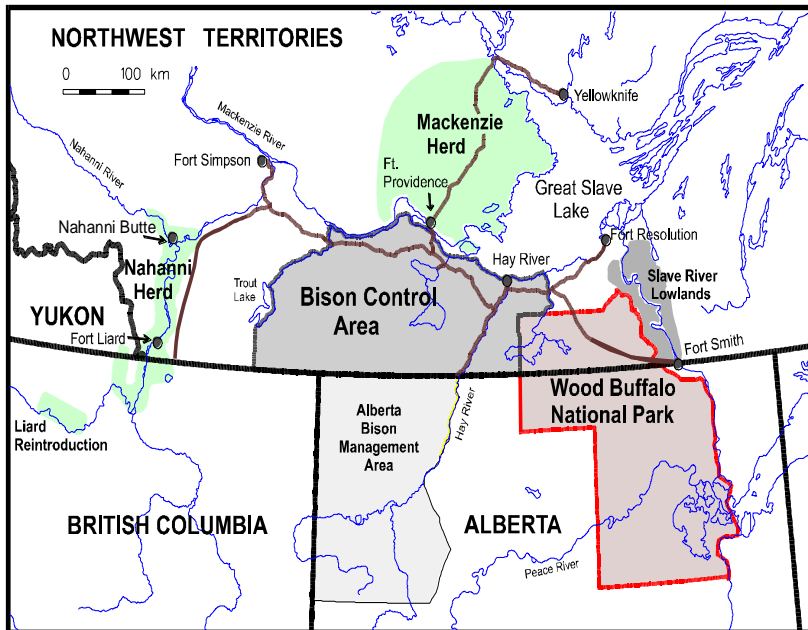
A buffer zone, preventing contact between diseased bison and healthy bison in the Mackenzie and Nahanni ranges, lies south of the Mackenzie River to the Alberta border, between Trout River in the west and Buffalo River in the east. All bison in the buffer zone must be removed for testing. Motorists and hunters are requested to report any sightings of bison in the buffer zone to the nearest Resources, Wildlife and Economic Development office. Resident hunters may shoot bison in this area at any time. Hunters are required to report any kills as soon as possible. Public participation is an important part of the Bison Control Program. Please report all sightings.

APPENDIX D.

Half-page colour article published in the 2003 Explorer's Guide & UP HERE magazine.

IF YOU SEE A BISON *In the Control Area...*

Bison populations in the Slave River Lowlands and the Wood Buffalo National Park area are infected with bovine tuberculosis and brucellosis. In 1987, the Bison Control Area (BCA) was created to prevent the spread of these diseases to the healthy Mackenzie and Nahanni herds. The BCA program is jointly funded by the Parks Canada Agency and the Government of the Northwest Territories.



All bison in the BCA are presumed to be diseased and must be removed and tested.

In the Northwest Territories, two herds have been re-established and are disease-free. The Mackenzie herd numbers approximately 2000 animals, and represent the largest herd of healthy wood bison in Canada and a cornerstone in the nation's wood bison recovery program. The Nahanni herd now numbers about 300 animals.

Please report any bison sightings in the BCA as soon as possible to the nearest Resources, Wildlife and Economic Development (RWED) office.

Under the Northwest Territories Wildlife regulations, a resident may at anytime, hunt bison within the BCA. A hunter who kills a bison in the BCA is required to report the incident as soon as practical.

If you would like more information regarding the Bison Control Program, please contact any RWED office.

PHONE : Hay River (867) 875-5550
Fort Smith (867) 872-6400

Fort Providence (867) 699-4271
Fort Simpson (867) 699-2231

Fort Liard (867) 770-4311



APPENDIX E.

Slideshow presentation utilized during BCA community meetings (read left to right).

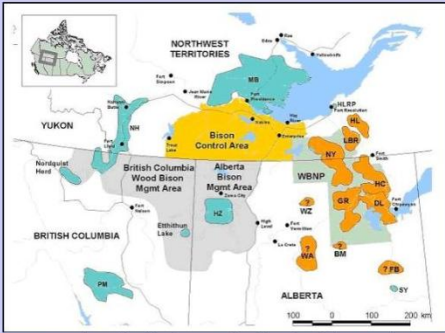
NWT Bison Control Area

Community Meeting and Information Session



Background History

- Wood Bison in and around Wood Buffalo National Park (WBNP) in the NWT are infected with tuberculosis and brucellosis due to the transplant of 6673 plains bison to the park between the years of 1925-1928
- 1987: The Bison Control Area (BCA) was created to prevent the spread of tuberculosis and brucellosis from infected bison populations to healthy herds in the Mackenzie Bison Sanctuary and Nahanni region
- 1993: The BCA program became co-funded by RWED and the Parks Canada Agency



Location of healthy free-roaming bison herds (**GREEN**)
Location of free-roaming bison herds infected with tuberculosis and brucellosis (**ORANGE**)

Tuberculosis and Brucellosis: *What you should know*

- Causes of TB and Brucellosis
- Signs and symptoms of these diseases in bison
- Protecting yourself from exposure
- Reference Wildlife Diseases Web Page

<http://www.nwtwildlife.rwed.gov.nt.ca/Publications/diseasepamphletweb/diseasesindex.htm>

Tuberculosis

What causes TB?


- TB is caused by a bacteria (*Mycobacterium bovis*)

What are the signs of TB?

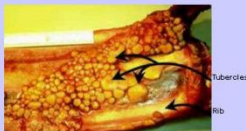
- In bison, laboured breathing, coughing, or discharge from nose or mouth
- Small, pale rounded lumps (tubercles) in the lungs or on the lining of the ribcage, or in other organs

How can I protect myself?

- Butcher the animal carefully and do not cut into infected parts.
- Wash your hands, knives and clothes with hot soapy water after handling the animal



"Cheesy" tubercle within normal pink lung tissue



Tubercles
Rib
Tubercles on inside of rib cage

Brucellosis

What causes Brucellosis?

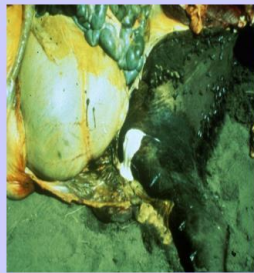
- In bison, brucellosis is caused by a bacteria (*Brucella abortus*)

What are the signs of Brucellosis?

- Swollen leg joints causing limping or lameness
- Swollen womb in female bison
- Pus-filled swellings under the skin, in the meat or in the internal organs.

What can I do to Protect Myself?

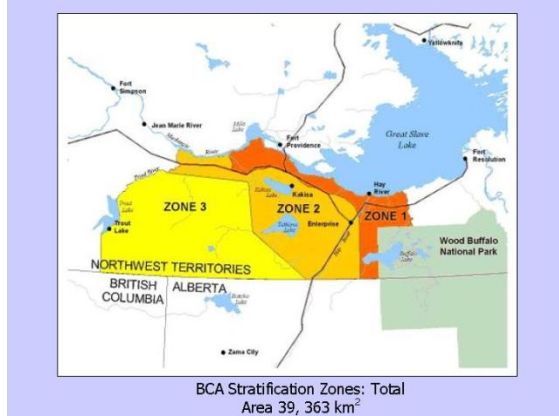
- Do not cut into diseased parts.
- Do not spill fluid from the womb onto the meat.
- Wash your hands, knives and clothes with hot soapy water after handling the animal



BCA Program Objective

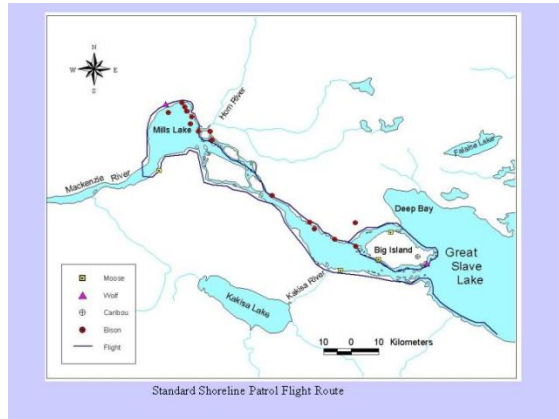
To prevent the movement or establishment of bison in the BCA regardless of their disease status

Bison are excluded from the BCA through surveillance and active management



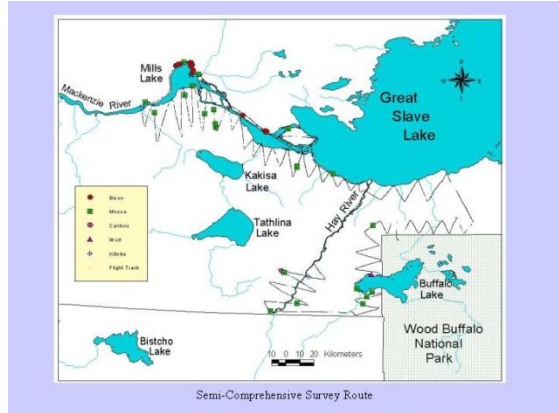
Zone 1

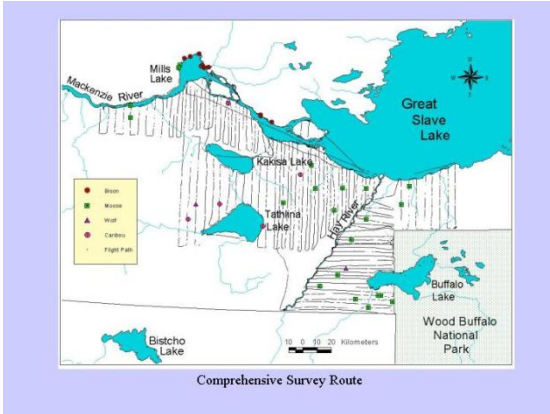
- Range: Extends from Axe Point on the south shore of the Mackenzie in the west to Little Buffalo River in the east
- Degree of monitoring: Weekly Shoreline flights, Semi-Comprehensive & Comprehensive Survey
- High Risk: Bison groups consistently use habitat along the north shore of the Mackenzie River



Zone 2


- Range: Covers more southern areas down to the border that include Kakisa and Tathlina Lake
- Degree of Monitoring: Semi-Comprehensive Survey once or twice per season and Comprehensive Survey once per season
- Moderate Risk

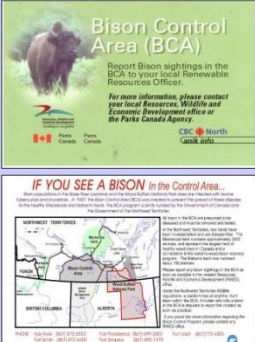




- ### Zone 3
- Range: Extends from Trout Lake to near the western edge of Tathlina and down to where the west shore of Hay River intersects the border
 - Degree of Monitoring: Monitored through the general public and area residents. The program includes a comprehensive public awareness component that solicits reports of any bison sighted
 - Low Risk: No aerial surveillance

- ### Verification Patrols
- Follow up reported sightings in the BCA
 - How we get to sighting locations: access and situation dependent
- 

- ### Harvesting Bison in the BCA
- Resident hunters may shoot bison in the control area at any time, but are required to report kills to nearest RWED office as soon as possible
- 

- ### Public Awareness Program
- Various media are used to inform and educate the public about the BCA program: Radio, TV, Internet and other promotional material
 - Community meetings and information sessions also provide important feedback
- 

- ### Facts
- Tuberculosis and Brucellosis are of cattle origin
 - Wood bison are considered a threatened subspecies of North American Bison by the committee on the Status of Endangered wildlife in Canada (COSEWIC)
 - The Mackenzie Bison herd is only 100km away from WBNP and due to a bison's tendency to roam, it is very likely that contact could occur
 - In 1992-May 17 & 31st: 9 bison shot near Point de Roche
 - In 1995-March 7th: 1 cow was tracked and shot by Providence hunters
 - In 1996-March 19th: 3 cows killed by a Fort Providence hunter.
- *All animals tested negative for TB and Brucellosis

Questions???



Thanks for coming out and
remember to *report any bison
sightings to your nearest RWED
office*