

**MONITORING AND MANAGEMENT ACTIVITIES
FOR THE AISHIHIK BISON (*BISON BISON*) HERD,
SOUTHWESTERN YUKON:**

2013-14 ANNUAL REPORT

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**Yukon Department of Environment
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Summary

- Bison are among the most closely managed wildlife species in Yukon because they are listed as threatened under federal Species at Risk legislation and are a highly sought after big game species. They are also a species of concern for local First Nations.
- In 2013–2014, the primary goals for the bison program were to conduct a composition count of the Aishihik Herd; and to replenish and relocate VHF radio-collared bison in order to document distribution, habitat use, and survival. In addition, we collected biological samples for testing, produced maps to aid hunters, and provided a variety of outreach initiatives and products.
- A composition count was conducted in July 2011; the results were communicated to the Yukon Wood Bison Technical Team.
- We captured 13 adult female bison and gave them VHF radio-collars.
- Five radio-telemetry flights were flown in 2013–2014 to relocate radio-collared bison and produce a map to aid hunters in selecting hunting locations.
- The study on niche overlap and potential competition between bison and resident ungulates (caribou, moose and sheep) was completed in August 2013 and presented to the Yukon Fish and Wildlife Management Board and the Yukon Wood Bison Technical Team.

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Background and Objectives

Beginning in 1980, a large conservation initiative was undertaken to reintroduce wood bison to portions of their historic range in northwestern Canada and interior Alaska. Yukon was part of this initiative; between 1988 and 1992, 170 animals were released into the wild from a temporary enclosure near the Nisling River (Gates et al. 2001, Government of Yukon 2012). Since then, the herd has grown and has been closely monitored in order to assess its population status, and provide current information to guide an annual harvest by licensed hunters. Since the herd has few natural predators, it has steadily increased in size.

Limited hunting began in March 1998. In following years more liberal harvest strategies were implemented with the goal of reducing population growth and size. The most recent census occurred in July 2014 and provided an estimate of 1470 (90% confidence intervals = 1,306 to 1,684) bison in the population (Jung and Egli 2014).

Here we report on the activities undertaken in 2013–2014 by Environment Yukon’s Bison Program. Specifically, our objectives for the fiscal year were as follows:

1. *Monitor population trends* : Population monitoring was the bulk of the work in 2013–2014. Because of the high harvest rate, inherent small population size, and conservation status of the herd, we require regular population censuses and surveys to obtain key

demographic data to gauge the status of the herd. These data are crucial for setting Annual Allowable Harvests and deciding upon annual harvest regimes under an adaptive framework. In 2013-2014, the monitoring objectives included the following:

- Composition count: A composition count provides information on the percent of calves in the population, which is variable from year-to-year. This data allows wildlife managers to gauge the anticipated growth of the herd and set harvest targets.
 - Radio-collaring: Radio-collared bison are needed to facilitate population monitoring. Through telemetry flights and various counts—mainly composition and census—of radio-collared bison, we collect data on productivity, recruitment, and adult survival.
2. *Monitor the movements and spatial distribution of wood bison* : Better information is needed on the distribution—including range expansion—and habitat use of populations in order to provide data to regional planning processes. We collect data from GPS-collared animals to examine seasonal distribution (range use).
 3. *Monitor bison harvest*: Harvest statistics are tracked annually and used by the Yukon Wood

Bison Technical Team to develop bison harvest models and make harvest recommendations for the next bison hunting season.

4. *Ecological impacts of bison:* Local people have long been concerned about the ecological impacts of bison. A major thrust for 2013–2014 was to summarize data collected between 2008 and 2010 on the potential for competition between reintroduced bison and resident ungulates (caribou, moose and sheep).

Monitoring and Management Activities

Radio-telemetry Flights

Radio-collared bison are used to facilitate population monitoring and provide information on the distribution and habitat use of the herd. Several times a year, radio-collared bison are located via an aerial survey. These aerial telemetry surveys are frequently conducted

prior to a population census, composition count, or capture session, in order to increase the efficiency and cost-effectiveness of those operations. Telemetry flights were flown in a Maule M7 fixed wing aircraft at elevations between 8,000 and 13,500 feet asl (above sea level). Transects that comprise a north-south grid over the core bison range, and spaced 15 km apart, were flown to ensure reasonable coverage of the area.

During 2013–2014, 5 radio-telemetry flights were flown (Table 1). The first flight of the season occurred on 21 May 2013. On 16 July 2013, a radio-telemetry flight was flown prior to a scheduled composition count (see Population Monitoring). The subsequent radio-telemetry flights—done on 31 October 2013, 10 to 19 February 2014, and 12 to 13 March 2014—facilitated the production of maps to aid hunters (see Harvest Management). The final telemetry flight also served to ensure that all of the animals radio-collared in early March (see Live Capture and Radio-Collaring) were still alive.

Table 1. Summary data for 5 wood bison telemetry flights flown in southwestern Yukon between April 2013 and March 2014. The number of radio-collared bison varied throughout the year due to mortalities, returned collars, and newly collared animals.

Date	Number of Collars Found (%)	Number of Hours Flown
21 May 2013	30 (75%)	7.8
16 July 2013	35 (88%)	7.5
31 October 2103	33 (92%)	6.7
10, 17, 19 February 2014	20 (57%)	11.8
12-13 March 2014	43 (90%)	9.6

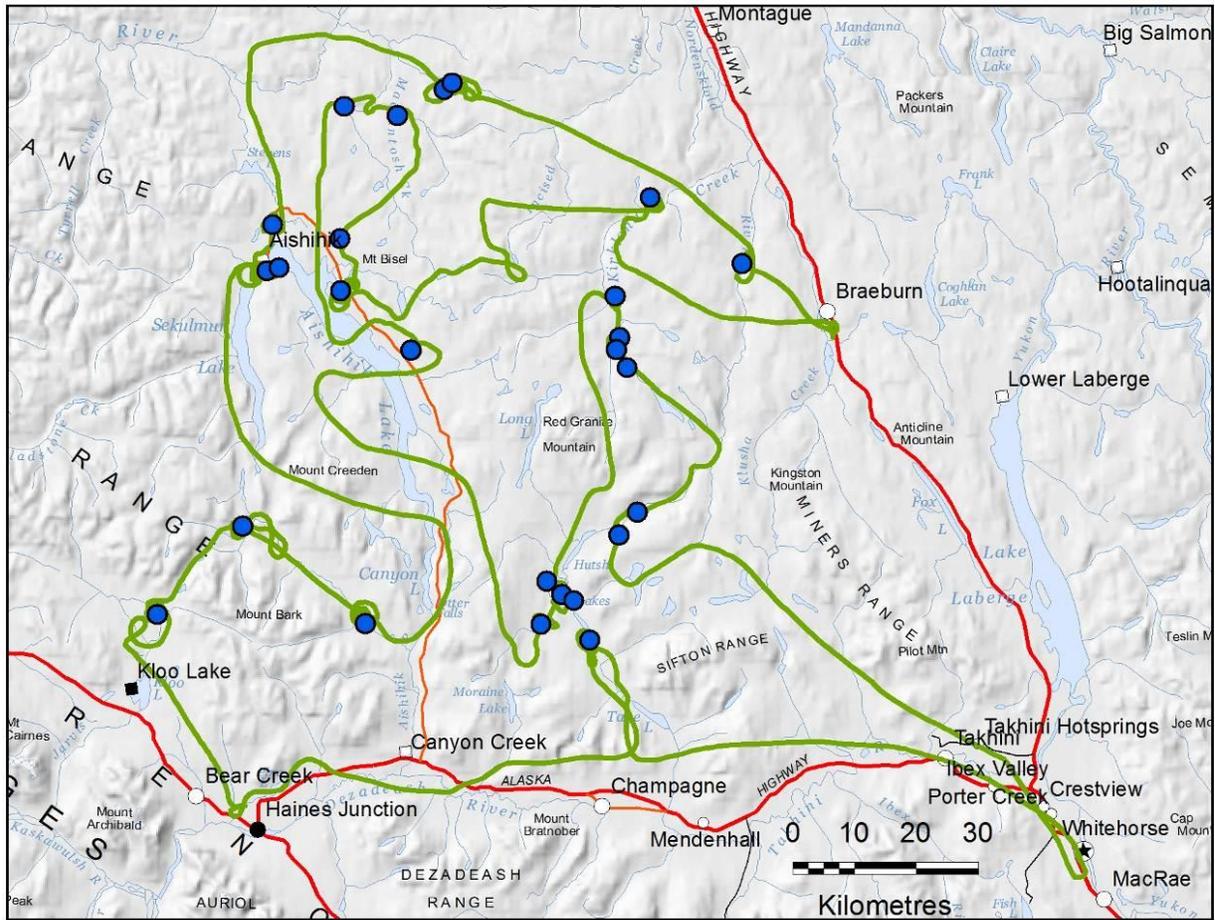


Figure 1. Bison telemetry flight flown on 21 May 2013. Blue circles are locations where radio-collared bison were found. Green line is the flight line flown.

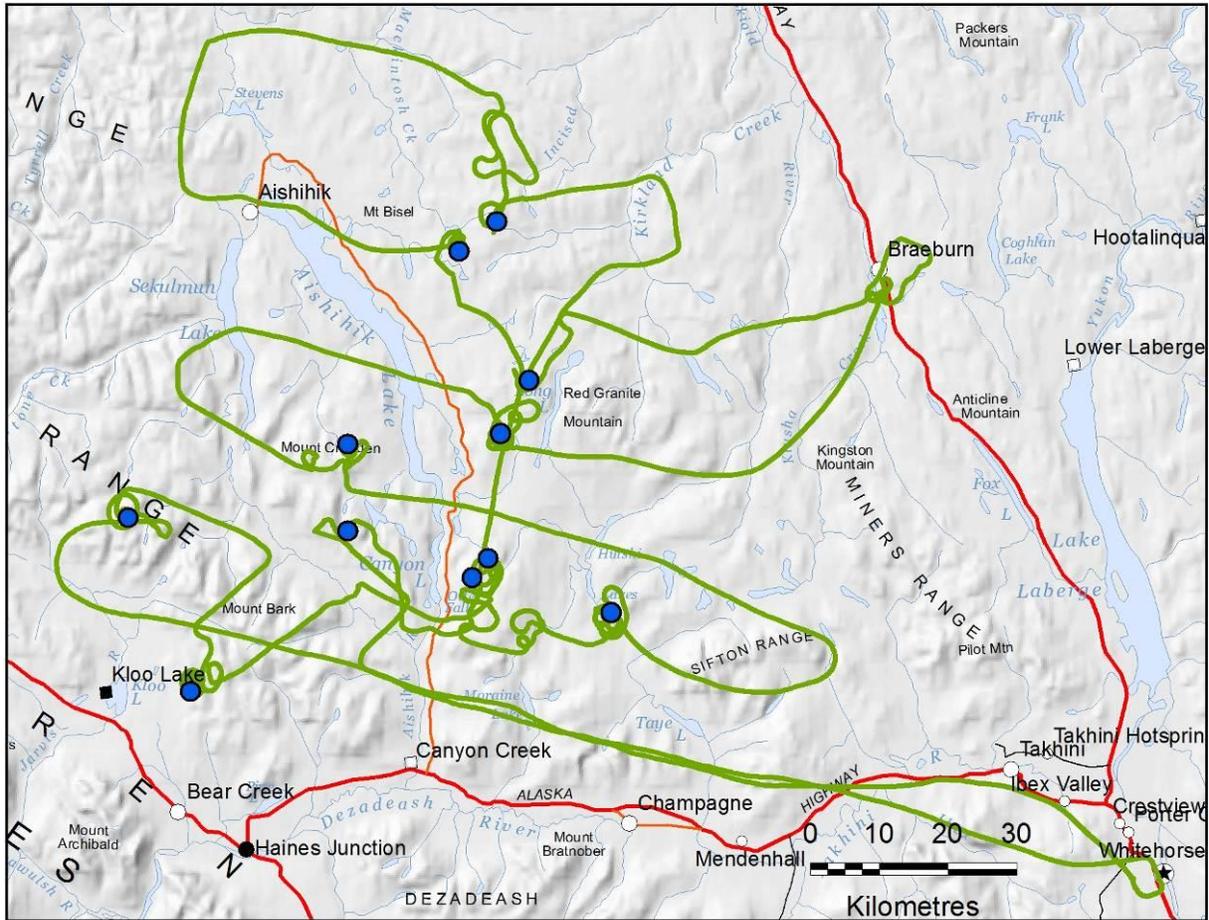


Figure 2. Bison telemetry flight flown on 16 July 2013. Blue circles are locations where radio-collared bison were found. Green line is the flight line flown.

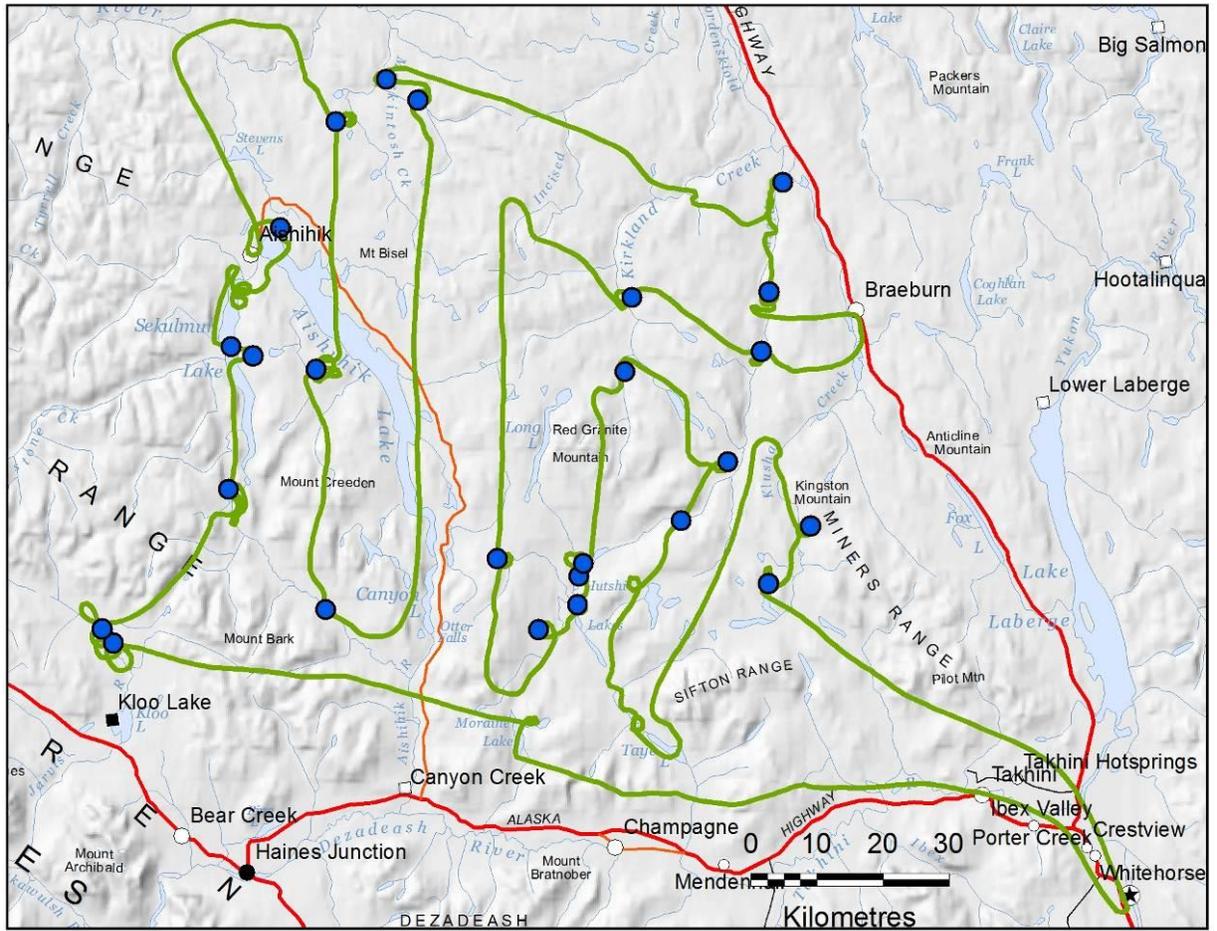


Figure 3. Bison telemetry flight flow on 31 October 2013. Blue circles are locations where radio-collared bison were found. Green line is the flight line flown.

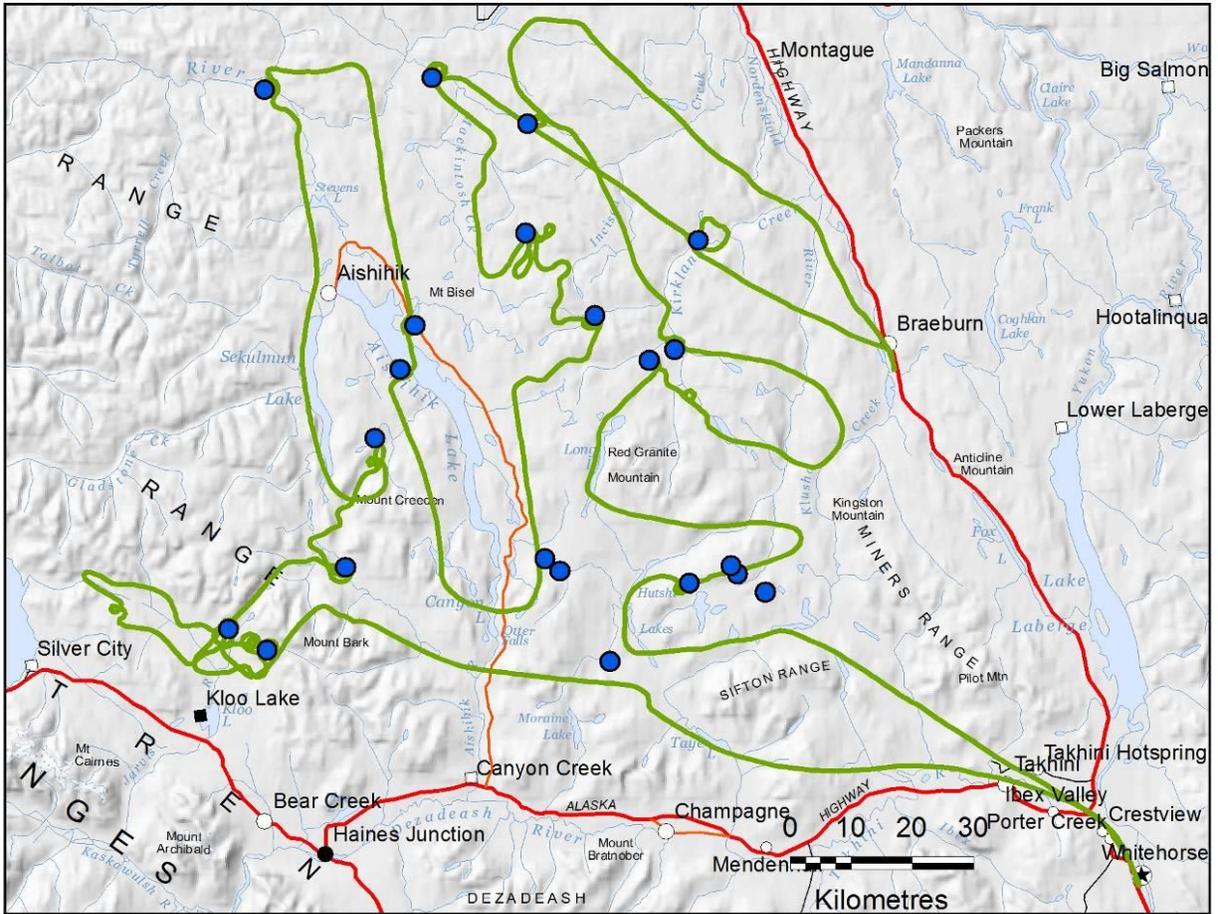


Figure 4. Bison telemetry flight flown on 10, 17 and 19 February 2014. Blue circles are locations where radio-collared bison were located. Green line is the flight line flown.

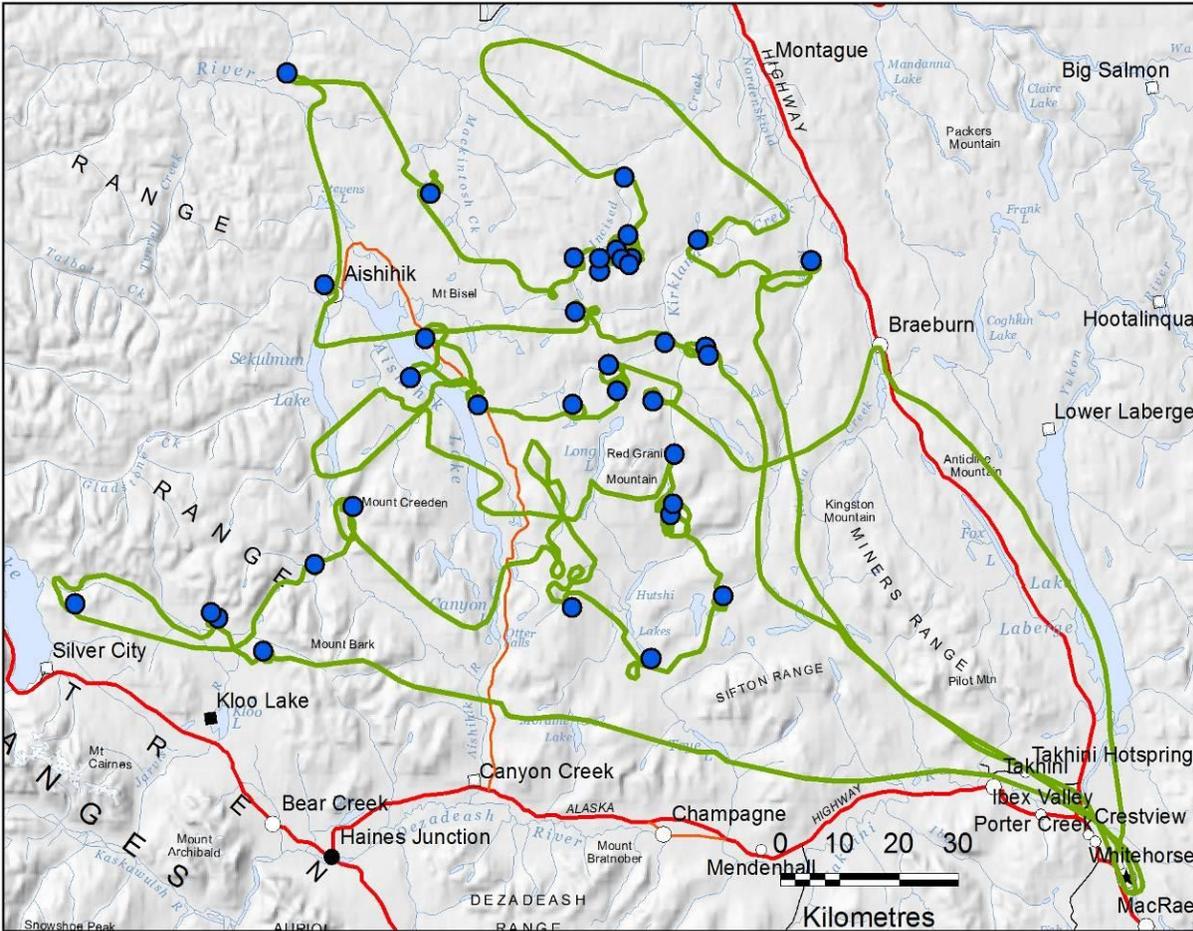


Figure 5. Bison telemetry flight flown on 12 and 13 March 2014. Blue circles are where radio-collared bison were located. Green line is the flight track.

Live Capture and Radio-collaring

Radio-collared bison facilitate population surveys—e.g. composition counts and censuses—and provide important information on the distribution and habitat use of the population. A small number of bison are live-captured and radio-collared each year in order to maintain working radio-collars on bison (Government of Yukon 2012). During 2013–2014, our goal for the collaring project was to place 12 to 14 VHF collars on adult female bison. This radio-collaring aspect of our monitoring program focused on

obtaining data on bison survival and general spatial distribution. VHF collars are well suited to collecting data on survival and spatial distribution, and are more cost effective than GPS collars because they require less frequent live-capture events due to their reliability and battery longevity.

During 4 to 6 March 2014, 13 adult female bison were captured by chemically immobilizing them, via a dart fired from a helicopter. A medetomidine-telazol-ketamine combination was used to immobilize 9 bison. This immobilization was later reversed using tolazollne and

atipamazole. Another 4 bison were immobilized with carfentanyl as part of an alternative immobilization drug trail. A Eurocopter A-Star helicopter was used.

To make the collars more visible to hunters, a bright yellow sleeve of fire hose was fitted over the collar (Figure 6). To facilitate identification, immobilized bison were given an individually numbered, plastic

livestock eartag (Allflex Canada, St-Hyacinthe, Quebec) in one ear and an individually numbered aluminum eartag (Kurl-lock #3, Ketchum, Brockville, Ontario) in the other ear. Female bison were checked for pregnancy status via palpation. Select biological samples were collected (e.g. blood, feces, and a DNA sample). Locations where bison were captured are provided in Figure 7.



Figure 6. An immobilized bison wearing a radio-collar with yellow fire hose to improve visibility and a yellow livestock eartag to aid in identification of individuals.

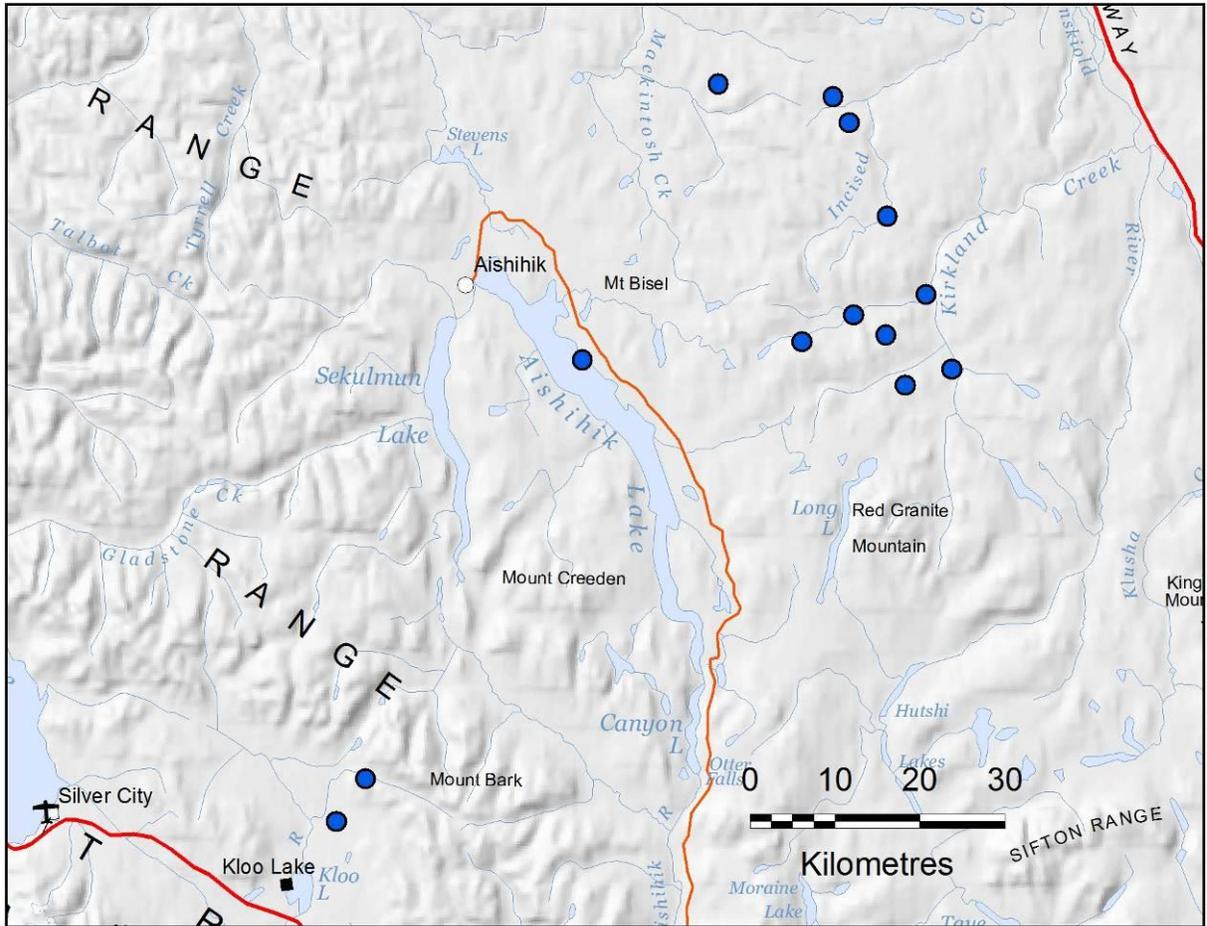


Figure 7. Location of the 13 bison captured and radio-collared between 4 and 6 March 2014.

Table 2. Summary of the number and percent of wood bison harvested in southwestern Yukon during the 2013–2014 season. Harvest was closed from 1 January to 14 February 2014.

Month	Bull	Cow	Total
September 2013	3	0	3 (2%)
October 2013	5	1	6 (5%)
November 2013	18	7	25 (19%)
December 2013	4	5	9 (7%)
January 2014	-	-	-
February 2014	9	11	20 (15%)
March 2014	42	25	67 (52%)
Totals	81 (62%)	49 (38%)	130 (100%)

Population Monitoring

On 24 July 2013, a composition count was undertaken. The composition count was done as an aerial survey—flown in a Bell Jet-Ranger helicopter—using 5.9 hours of flight time. Bison groups were located and the age and sex composition was determined using the following age-

sex categories: calves, mature bulls and unclassified adults. Unfortunately, it is difficult to classify adults by sex from a moving helicopter; it is only possible to identify the mature bulls. A total of 616 bison, from 29 groups (Figure 8), were counted. Calf composition was 13.5% of the sample population, which is about 5% lower than the average for previous years.

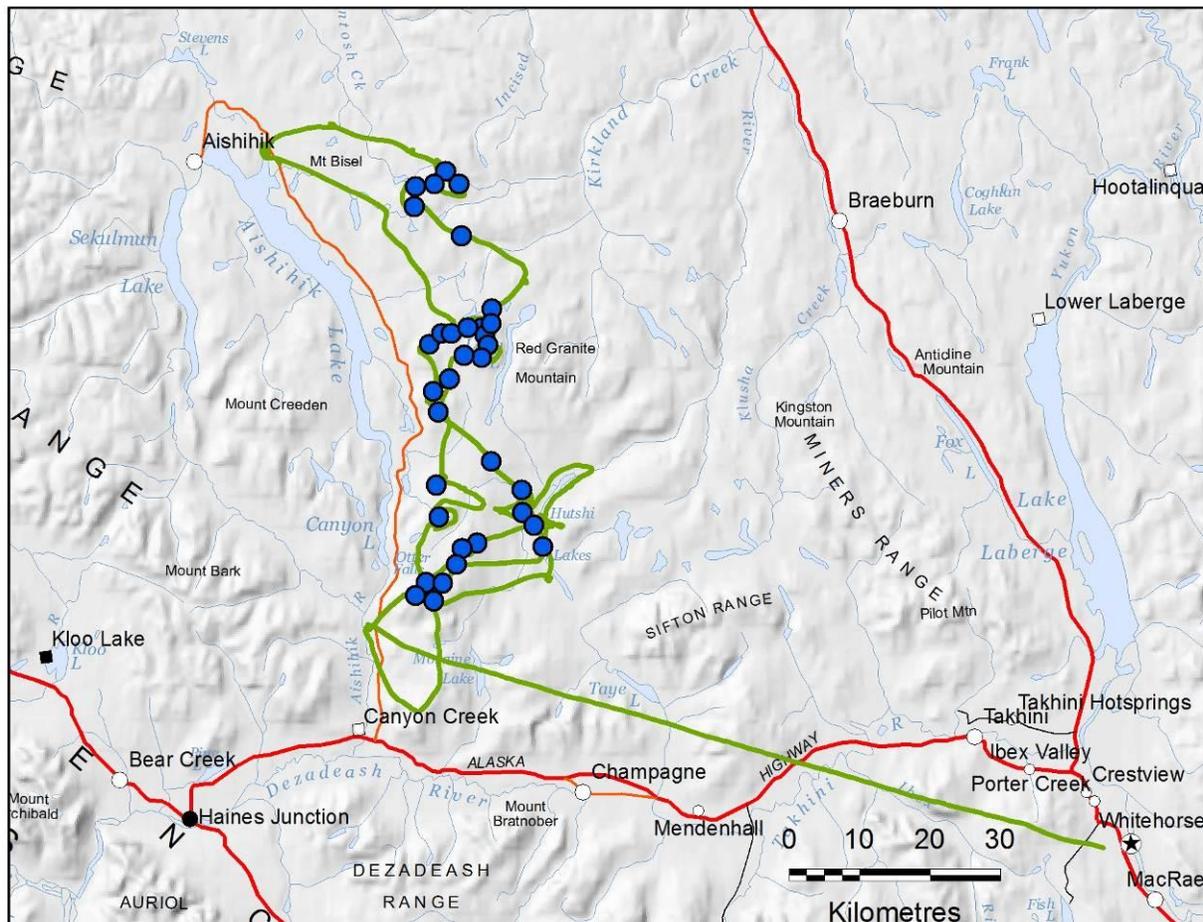


Figure 8. Locations of bison groups that were used in the 24 July 2013 composition count. Blue circles are locations of bison. Green line is the survey's flight track.

Biological Sample Collection

We collected biological samples from two sources: hunter-submitted incisor bars, and during live-capture

of individuals for the purposes of radio-collaring.

From the hunter-submitted incisor bars, we obtained an incisiform tooth, and a small piece of tissue (meat). Teeth were sectioned at the root and

the animal's age was determined via cementum analysis. The tissue provides a DNA sample that can be contributed to larger-scale studies (e.g., national) of the genetics of bison.

During live-capture and radio-collaring operations we collected blood, DNA, and feces from captured bison. These samples provide a basis of assessing the health status of the population, and are intended to be archived until larger-scale (e.g. national) studies seeking samples from the population are in place.

In early 2013, we contributed frozen fecal samples from 31 live-captured bison to a research project done at the University of Calgary looking at the presence of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) in reintroduced bison across Canada. That study (Forde et al. 2013) found that all nine populations tested were positive for MAP, including the Aishihik Herd. Results were presented to the Yukon Wood Bison Technical Team.

Studies on the Ecological Impacts of Bison

An assessment of the potential for competition between reintroduced bison and resident ungulates was completed in August 2013 and a separate report was completed (Jung and Czetwertynski 2013). The report may be found on the Environment Yukon website (<http://www.env.gov.yk.ca/publications-maps/documents/BisonCompetitionReportTR-13-15.pdf>).

Harvest Monitoring

The harvest for the 2013–2014 bison hunting season was 130 bison—81 bulls (62%) and 49 (38%) cows (Table 2).

As in most years, the majority of bison (67%) were harvested in March (Table 2). March is generally the preferred month for hunting bison due to the warm weather and the long daylight hours. Nine bison (7%) were harvested during the extended season (September and October).

Bison were harvested from 18 different game management subzones. The majority of the 2013–2014 bison harvest was from game management subzone 542.

Outreach and Deliverables

The Bison Banter—newsletter of the Yukon Wood Bison Technical Team—was posted on the Environment Yukon website and 500 hard copies were distributed to select agencies and organizations in November and December 2011. It can be found at: http://www.env.gov.yk.ca/hunting-fishing-trapping/documents/bisonbanter_13-14.pdf.

A Hunt Wisely brochure for bison was reviewed and reproduced by the Conservation Officers Services Branch in preparation for the 2013–2014 bison hunting season, and a HEED course on bison hunting was delivered on 23 October 2013 in Whitehorse. The current version of the Hunt Wisely brochure can be found online at: http://www.env.gov.yk.ca/publications-maps/documents/HuntWiselyBison_2014-15_web.pdf.

Maps showing areas of potential bison concentrations, based on aerial telemetry surveys, were posted on the Environment Yukon website for the early-winter and late-winter seasons (3 maps in total; Figure 9). The intent of the maps was to provide a tool for hunters to better plan their bison hunt.

Media interviews were given with Yukon media outlets (e.g. CBC radio, CKRW radio, Yukon News, and Whitehorse Star) throughout the year

on various bison topics, including a review of the 2012–2013 harvest.

A presentation on the ecological impact work (Jung and Czetwerynski 2013) was made to the Yukon Fish and Wildlife Management Board on 10 October 2013. A presentation on bison biology and history in the Yukon was made at the Bison HEED Workshop on 23 October 2013. There were no presentations on Yukon bison made at scientific conferences in 2013–2014.

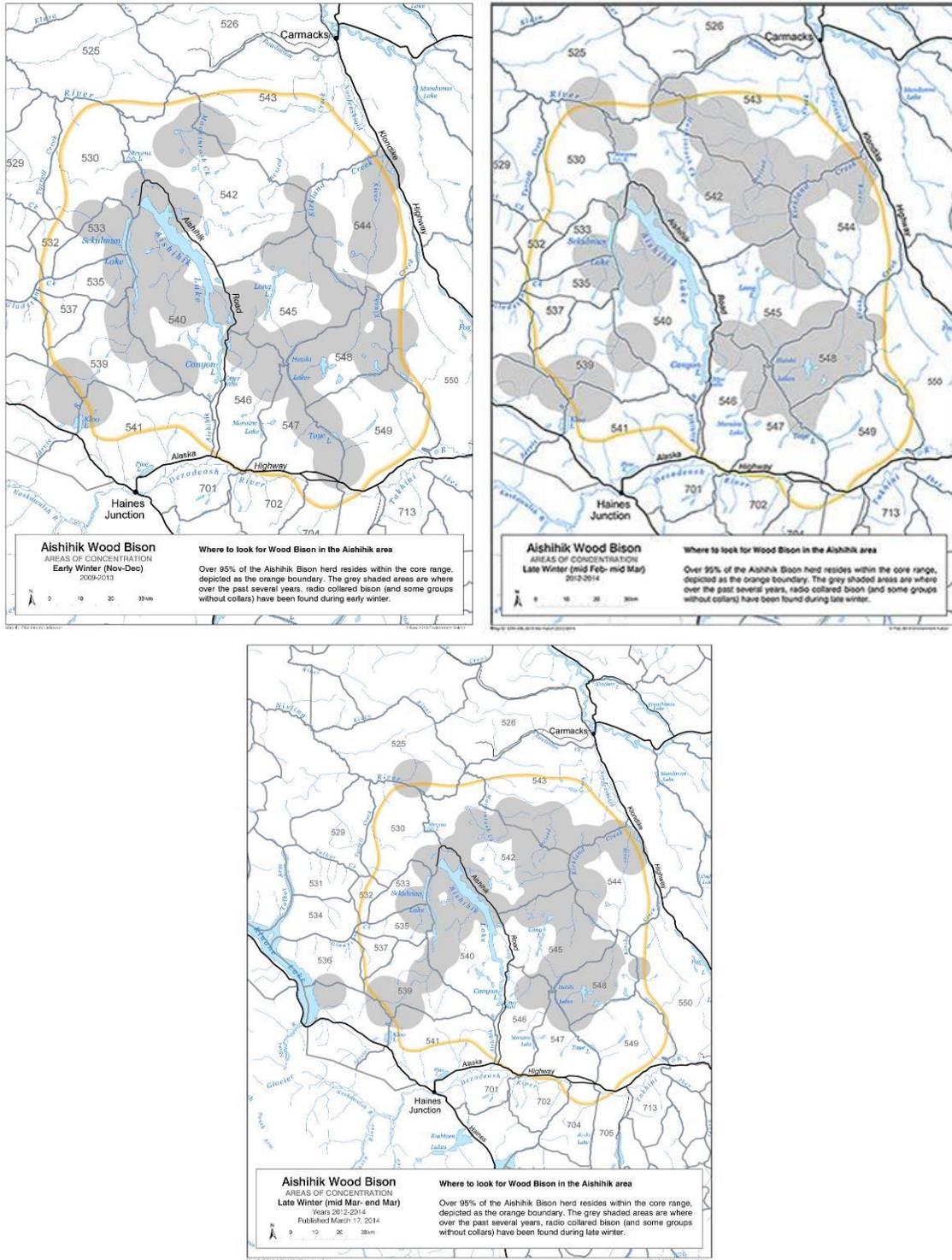


Figure 9. Maps produced to aid hunters in determining where to hunt bison during the 2013–2014 bison hunting season. These were posted on the Environment Yukon website and are based on aerial surveys of radio-collared bison.

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