

2014

**BC Boreal Caribou Implementation Plan:
Mortality Investigation Summary Report No. 11:
May 2014**

EXECUTIVE SUMMARY

A total of 204 boreal caribou were radio-collared between December 2012 and March 2014 in British Columbia's boreal caribou ranges as part of the *British Columbia Boreal Caribou Implementation Plan* (BCIP). The fate of these animals, as well as all boreal caribou previously collared by the Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO), was monitored to track adult survival and calf recruitment. A total of 58 boreal caribou (51 SCEK, 7 MFLNRO) died from natural causes between the commencement of BCIP monitoring in December 2012 and May 30, 2014. The majority of cases (34) were confirmed wolf kills, with an additional 7 cases of suspected wolf predation. The cause of death in the remainder of cases was undetermined; poor condition was a likely factor in the death of several caribou following a particularly severe winter in 2012-13.

A total of 5 SCEK-collared caribou deaths were investigated during the May 2014 monitoring period. One was detected through examination of transmitted GPS data (SCEK104), one was detected during the May 10-11 fixed-wing monitoring flight (SCEK056), 2 were detected while enroute to other May ground investigation sites (SCEK046 and SCEK047), and the fifth was a follow-up investigation of a mortality detected in April but deferred due to fresh bear activity (SCEK190). Cause of death included 4 confirmed wolf kills and one suspected wolf kill.

BACKGROUND

During the winter of 2012-13, 164 adult female caribou were radio-collared in British Columbia's boreal caribou ranges as part of the *British Columbia Boreal Caribou Implementation Plan* (BCIP). An additional 41 caribou (40F, 1M¹) were collared between February 28 and March 31, 2014. Caribou collaring activities were administered and funded through the Science and Community Environmental Knowledge Fund (SCEK). The fate of SCEK-collared caribou, as well as boreal caribou previously collared by MFLNRO, was monitored to track adult survival and calf recruitment. Forty-seven SCEK caribou and 7 MFLNRO caribou died from natural causes between the commencement of the study through April 30, 2014.

The VHF signal status of each active radio-collar is monitored monthly during regular fixed-wing telemetry flights, as well as during associated incidental surveys and field activities. In addition to the SCEK collars, active caribou and wolf collars from other programs, known to be present within BC boreal caribou ranges, are also monitored for approximate location and mortality status. These include caribou and wolf collars deployed by MFLNRO, as well as collared caribou that have entered BC's boreal caribou ranges from adjacent jurisdictions.

Upon detection of a suspected mortality event, through VHF signal status or transmitted GPS/satellite data, a ground-based mortality investigation is conducted to determine the cause and approximate date of

¹ SCEK173/BC1037 was collared as a yearling by MFLNRO in March 2010. It was recaptured and fitted with a larger SCEK collar in February 2014.

death, collect biological samples, and recover the collar. Adult mortality information is used in conjunction with juvenile recruitment data to estimate population trend.

This summary report pertains to mortality signals investigated during May 2014.

METHODS

Mortality sites are typically accessed by helicopter from the Fort St. John airport, in the case of the Milligan and Etthithun cores of the Chinchaga Range, and from the Fort Nelson airport in the case of the Chinchaga RRA and all other ranges and cores.

Information recorded for each confirmed mortality site includes: animal ID, collar frequency, collar condition, GPS coordinates, photodocumentation, condition of remains, habitat, and other evidence relevant to suspected cause of death. Where available, and when the stage of decomposition allows, biological samples are collected (e.g., long bones, lower jaw, tissue samples, and internal organs). Samples of predator scat from the mortality site are collected when available. Mortality investigation numbers are assigned based on the date of detection, not the date of the ground investigation.

RESULTS

A total of 5 SCEK-collared caribou deaths were investigated during the May 2014 monitoring period (Table 1), including 4 newly detected mortalities and a return trip to Mortality Site #061 (SCEK190). Chinchaga RRA caribou SCEK190 was first incidentally detected as a mortality while enroute to another site on April 27, 2014 (Summary Report #10, April 2014). A low-level, aerial inspection of the mortality site revealed fresh bear tracks in newly-fallen snow and a ground investigation was deferred until May. The 4 new mortalities included 1 detected during the May 10-11 fixed-wing monitoring flight (SCEK056), 1 suspected mortality identified through examination of transmitted GPS data and confirmed during the May telemetry flight (SCEK104), and 2 detected while enroute to the May ground investigation of the SCEK190 mortality site.

The cause of death was confirmed to be wolf kill for 4 of 5 caribou. The fifth case (SCEK190) appeared to be a wolf kill, with subsequent scavenging of the carcass by a bear. SCEK104 and SCEK056 were killed by wolves in areas of relatively intact habitat. SCEK190 was killed within 25 m of an active winter road. Although no predator scat was found at the kill site, both wolf and bear scat were collected on the adjacent winter road RoW. The remaining 2 caribou (SCEK104, SCEK046) were both killed along pipeline ROWs.

Two caribou made significant movements immediately prior to being killed by wolves along pipeline ROWs, including SCEK104 (11.3 km) and SCEK046 (19.9 km). While woodland caribou often make atypically large and rapid movements immediately prior to being killed by predators (Culling and Culling, pers. obs.), the timing of these events also coincides with the period when pregnant females commonly make pre-calving movements.

The collars of SCEK046 and SCEK047 were damaged by wolves, with their GPS antenna wires chewed off. The VHF beacon of both collars was not heard during the high-altitude May 10 telemetry flight, however, faint mortality signals were detected from the helicopter while enroute to the ground investigation of the SCEK190 kill site on May 17. SCEK047 last transmitted GPS data on May 07, 2014. A gap in the data occurred between March 26, when the caribou was 10 km from the kill site, and the last fix on May 07, which was 700 m from the kill site, therefore the exact date of death is unconfirmed.

A total of 58 boreal caribou (51 SCEK, 7 MFLNRO) have died from natural causes between the commencement of BCIP monitoring in December 2012 and May 30, 2014. The majority of cases (34) were confirmed wolf kills, with an additional 7 cases of suspected wolf predation. The cause of death in the remainder of cases was undetermined; poor condition was a likely factor in the death of several caribou following a particularly severe late winter in 2012-13.

Twenty-five wolf collar frequencies were scanned during the May 10-11, 2014 fixed-wing telemetry monitoring flight, including 16 Lotek Iridium, 1 Vectronic Vertex, and 8 Lotek VHF. No wolf mortalities were detected in May.

First Nation Sub-contractors

Eva Needlay, of the Fort Nelson First Nation, assisted with caribou mortality site investigations during May 2014.

Table 1. Summary of SCEK and MFLNRO radio-collared boreal caribou mortality investigations conducted in May 2014, northeastern British Columbia ($n=5$).

Mort Invest #	Caribou ID	Range ¹	Collar Type	Date Collared	Core Collared ²	Core Died ²	Date of Death	Date Last Known Alive	Date Investigated	Cause of Death	Site Investigation Comments
061	SCEK190	CHIN	Lotek Lifecycle GPS	05-Mar-14	CHIN RRA	CHIN RRA	22-Apr-14	21-Apr-14	27-Apr-14 and 17-May-14	UND Pred (suspect wolf kill)	Collared March 05, 2014. Aerial site inspection on Apr 27 revealed fresh bear sign; ground investigation deferred to 17 May. Not characteristic of bear predation; suspect wolf kill with a bear later scavenging. Mature mixedwood stand within approx. 25 m of winter road.
064	SCEK046	CHIN	ATS Iridium GPS	26-Jan-14	CHIN RRA	CHIN RRA	05-Apr-14	04-Apr-14	17-May-14	Wolf kill	Detected faint VHF mortality signal while enroute to other site investigation on May 17. Collar damaged/ GPS antenna wire snapped (last data transmitted April 05; VHF not heard on May 10 flight). Caribou made 19.9 km movement immediately prior to death. Collar found on pipeline with kill site approx. 30 m from RoW through black spruce forest.

¹ CHIN - Chinchaga

² CHIN RRA - Chinchaga RRA

³ UND Pred - - Undetermined predation

Table 1 cont. Summary of SCEK and MFLNRO radio-collared boreal caribou mortality investigations conducted in May 2014, northeastern British Columbia ($n=5$).

Mort Invest #	Caribou ID	Range ¹	Collar Type	Date Collared	Core Collared ²	Core Died ²	Date of Death	Date Last Known Alive	Date Investigated	Cause of Death	Site Investigation Comments
065	SCEK047	CHIN	ATS Iridium GPS	26-Jan-13	CHIN RRA	CHIN RRA	Unknown	26-Mar-14	17-May-14	Wolf kill	Detected VHF mortality signal May 17 enroute to Mort Site #061. Collar destroyed (last data transmitted May 07, VHF not heard on May 10 flight). Data gap between Mar 26 and last fix on May 07; date of death unclear. Mature mixedwood patch in bog-fen complex, with adjacent beaver impoundment (habitat relatively intact).
066	SCEK104	SNS	Vectronic Vertex GPS	24-Feb-13	ESK	Outside NRK	20-Apr-14	20-Apr-14	17-May-14	Wolf kill	Possibly mortality identified from GPS data May 05, 2014; confirmed during May 11 telemetry flight. Kill site on pipeline RoW, collar found in adjacent Sb forest approx. 50 m from remains; caribou made 11.3 km movement immediately prior to death on April 20.

¹ CHIN - Chinchaga, SNS - Snake-Sahtaneh

² CHIN RRA - Chinchaga RRA, ESK - East Kotcho, Outside NRK - Outside North Kotcho

Table 1 cont. Summary of SCEK and MFLNRO radio-collared boreal caribou mortality investigations conducted in May 2014, northeastern British Columbia ($n=5$).

Mort Invest #	Caribou ID	Range ¹	Collar Type	Date Collared	Core Collared ²	Core Died ²	Date of Death	Date Last Known Alive	Date Investigated	Cause of Death	Site Investigation Comments
067	SCEK056	CHIN	Lotek VHF	31-Jan-13	MLL	MLL	Unknown	02-Apr-14	25-May-14	Wolf kill	Detected during May 10 fixed-wing telemetry flight. Kill site in patch of black spruce/lodgepole pine in beaver impounded fen (habitat relatively intact).

¹ CHIN - Chinchaga

² MLL - Milligan

APPENDIX I: Caribou Mortality Investigation Reports

Mortality Investigation #061: SCEK190, April 27 and May 17, 2014, report and photos.

Mortality Investigation #	061 (Initially reported in April 2014 Summary Report #10)
Caribou ID	SCEK190
Range	Chinchaga RRA
Date Detected	26-Apr-14
Date Investigated	27-Apr-14 (aerial) and 17-May-14 (ground)
Collar Type	Lotek Lifecycle GPS
Date Collared	05-Mar-14
Core Collared	Chinchaga RRA
Capture Site UTM	10.615100.6461336
Core Died	Chinchaga RRA
Date of Death	22-Apr-14
Date Last Known Alive	21-Apr-14
Mortality Site UTM	10.619015.6438369
Cause of Death	Undetermined predation (suspected wolf kill)
Samples	Ear, wolf scat (2), bear scat (1)
Collar Condition	Good
Photos	0219-0227
Investigators	Ted Euchner, Rob Woods (April 27) and Brad Culling, Diane Culling, Eva Needlay (May 17)
Site Investigation Comments	Caribou collared on March 05, 2014; suspected GPS mortality event confirmed during SCEK202 mortality investigation on Apr 27, 2014. Site initially investigated from air on Apr 27 following approx. 20 cm fresh snow; fresh bear tracks in new snow around kill site therefore did not attempt to recover collar. Site revisited on 17 May, 2014 - carcass completely consumed with only hair patch, 1 ear, a few small bone shards, and an orange ear tag remaining; no sign of wolf or bear scat at kill site but samples found on adjacent winter road. Kill site not characteristic of bear predation - suspect wolf kill with bear later scavenging. Kill site in mature mixedwood stand within approx. 25 m of winter road.



Plate 1. Mortality Site Investigation #061: SCEK190 (Lotek Lifecycle GPS), Chinchaga RRA, (UTM 10.619015.6438369), May 17, 2014. (1/2)



Plate 2. Mortality Site Investigation #061: SCEK190 (Lotek Lifecycle GPS), Chinchaga RRA, (UTM 10.619015.6438369.), May 17, 2014. (2/2)

Mortality Investigation #064: SCEK046, May 17, 2014, report and photos.

Mortality Investigation #	064
Caribou ID	SCEK046
Range	Chinchaga
Date Detected	17-May-14
Date Investigated	17-May-14
Collar Type	ATS Iridium GPS
Date Collared	26-Jan-13
Core Collared	Chinchaga RRA
Capture Site UTM	10.581719.6455276
Core Died	Chinchaga RRA
Date of Death	05-Apr-14
Date Last Known Alive	04-Apr-14
Mortality Site UTM	10.609586.6443631
Cause of Death	Wolf kill
Samples	None available
Collar Condition	Destroyed
Photos	0212-0218
Investigators	Brad Culling, Diane Culling, Eva Needlay
Site Investigation Comments	<p>Detected VHF mortality signal while enroute to Mort #061 investigation on May 17. Collar chewed in half and GPS antenna wire snipped off - last data transmitted on April 05, 2014, VHF not heard on May 10 telemetry flight.</p> <p>Caribou made 19.9 km movement immediately prior to death. Collar found on pipeline with kill site approx. 30 m from RoW. Carcass consumed (only hair remaining). Site in black spruce forest in vicinity of lake cluster with abundant standing water. Collared on same day from same group as SCEK047 in January 2013.</p>



Plate 3. Mortality Site Investigation #064: SCEK046 (ATS Iridium GPS), Chinchaga RRA, (UTM 10.609586.6443631), May 17, 2014. (1/2)



Plate 4. Mortality Site Investigation #064: SCEK046 (ATS Iridium GPS), Chinchaga RRA, (UTM 10.609586.6443631), May 17, 2014. (2/2)

Mortality Investigation #065: SCEK047, May 17, 2014, report and photos.

Mortality Investigation #	065
Caribou ID	SCEK047
Range	Chinchaga
Date Detected	17-May-14
Date Investigated	17-May-14
Collar Type	ATS Iridium GPS
Date Collared	26-Jan-13
Core Collared	Chinchaga RRA
Capture Site UTM	10.581100.6454453
Core Died	Chinchaga RRA
Date of Death	Unknown
Date Last Known Alive	26-Mar-14
Mortality Site UTM	10.599510.6456585
Cause of Death	Wolf kill
Samples	Caribou hair; wolf scat
Collar Condition	Destroyed
Photos	0228-0244
Investigators	Brad Culling, Diane Culling, Eva Needlay
Site Investigation Comments	<p>Detected VHF mortality signal while enroute to Mort #061 ground investigation. Carcass consumed, only scattered hair and wolf scat at kill site; collar 50 m away. Collar destroyed by wolves; GPS antenna wire chewed off - last data transmitted on May 07, VHF not heard on May 10 telemetry flight. Data gap between Mar 26 (10 km from kill) and last fix on May 07 (700 m from kill); date of death unclear. Mature mixedwood strip (spruce/paper birch) in bog-fen complex, with adjacent beaver impoundment (habitat relatively intact). Collared in same group as SCEK046 in January 2013.</p>



Plate 5. Mortality Site Investigation #065: SCEK047 (ATS Iridium GPS), Chinchaga RRA, (UTM 10.599510.6456585), May 17, 2014. (1/2)



Plate 6. Mortality Site Investigation #065: SCEK047 (ATS Iridium GPS), Chinchaga RRA, (UTM 10.599510.6456585), May 17, 2014. (2/2)

Mortality Investigation #066: SCEK104, May 17, 2014, report and photos.

Mortality Investigation #	066
Caribou ID	SCEK104
Range	Snake-Sahtaneh
Date Detected	05-May-14
Date Investigated	17-May-14
Collar Type	Vectronic Vertex GPS
Date Collared	24-Feb-13
Core Collared	East Kotcho
Capture Site UTM	10.631305.6560043
Core Died	North Kotcho-OS
Date of Death	20-Apr-14
Date Last Known Alive	20-Apr-14
Mortality Site UTM	10.583968.6570975
Cause of Death	Wolf kill
Samples	Lower jaw (2), bone shard with marrow, ear (with yellow eartag), caribou hair, wolf scat (2)
Collar Condition	Good
Photos	0245-0257
Investigators	Brad Culling, Diane Culling, Eva Needlay
Site Investigation Comments	Possibly mortality identified from GPS data May 05, 2014; confirmed during May 11 telemetry flight. Kill site on pipeline RoW, collar found in adjacent Sb forest approx. 50 m from remains; caribou made 11.3 km movement immediately prior to death on April 20.



Plate 7. Mortality Site Investigation #066: SCEK104 (Vectronic Vertex GPS), Snake-Sahtaneh Range, (UTM 10.583968.6570975), May 17, 2014. (1/2)



Plate 8. Mortality Site Investigation #066: SCEK104 (Vectronic Vertex GPS), Snake-Sahtaneh Range, (UTM 10.583968.6570975), May 17, 2014. (2/2)

Mortality Investigation #067: SCEK056, May 25, 2014, report and photos.

Mortality Investigation #	067
Caribou ID	SCEK056
Range	Chinchaga
Date Detected	11-May-14
Date Investigated	25-May-14
Collar Type	Lotek VHF
Date Collared	31-Jan-13
Core Collared	Milligan
Capture Site UTM	10.614125.6347325
Core Died	Milligan
Date of Death	Unknown
Date Last Known Alive	02-Apr-14
Mortality Site UTM	10.668069.6324728
Cause of Death	Wolf kill
Samples	Bone shards, scapula, caribou hair, wolf scat
Collar Condition	Destroyed
Photos	0267-0273
Investigators	Brad Culling, Diane Culling
Site Investigation Comments	Detected during May 10 fixed-wing telemetry flight. Carcass consumed. Kill site in patch of black spruce/lodgepole pine in beaver impounded fen (habitat relatively intact). Collar found approx. 50 m from kill site.



Plate 9. Mortality Site Investigation #067: SCEK056 (Lotek VHF), Chinchaga Range, (UTM 10.668069.6324728), May 25, 2014. (1/2)



Plate 10. Mortality Site Investigation #067: SCEK056 (Lotek VHF), Chinchaga Range, (UTM 10.668069.6324728), May 25, 2014. (2/2)