

2014

**BC Boreal Caribou Implementation Plan:
Mortality Investigation Summary Report No. 10:
April 2014**

**Diversified Environmental Services
Fort St. John, BC**

BACKGROUND

During the winter of 2012-13, 164 adult female boreal caribou were radio-collared in British Columbia's boreal caribou ranges as part of the *British Columbia Boreal Caribou Implementation Plan* (BCIP). Caribou collaring activities were administered and funded through the Science and Community Environmental Knowledge Fund (SCEK).

Forty-seven SCEK-collared boreal caribou died from natural causes between the commencement of the study, in December 2012, through March 2014. An additional 7 caribou, which were previously collared by the Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO), also died during that period. To maintain the target sample size, 40 new GPS collars were deployed on 41 individual caribou between February 28 and March 31, 2014, including 1 collar re-deployed following the predation death of a newly collared animal.

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 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 detected during April 2014, including mortalities detected during wolf collar deployment, fixed-wing telemetry monitoring, examination of incoming GPS/satellite data, and new VHF mortality signals detected while enroute to mortality site investigations.

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

Seven caribou mortalities were investigated in the April 2014 monitoring period, including 2 detected during wolf collar deployment on April 01, one detected during the April 02 fixed-wing monitoring flight, 3 detected through examination of transmitted GPS data, and 1 detected while enroute to investigating other mortality sites (Table 1).

Wolf predation was confirmed as the cause of death for 5 of the 7 caribou, with an additional suspected but unconfirmed case (SCEK165). The cause of death for the seventh caribou (SCEK190) is pending. The site was initially investigated from the air on April 27 following a snowstorm on April 24 that deposited approximately 20 cm of new snow. Fresh bear tracks were observed at the site, which was located in dense cover, therefore, no ground investigation was attempted. The site will be revisited in May 2014.

Although no carcass or remains could be located in the vicinity of collar SCEK202, the cause of death was attributed to wolves due to the following characteristic conditions: the collar belting was ripped in half (not typical of other predators), the animal made a sudden 5 km movement immediately prior to death, and the collar had been removed from the site of the remains.

The SCEK165 case represented the first instance of a radio-collared caribou moving outside the Fort Nelson Core. This animal was first collared in the Fort Nelson Core on February 24, 2010 (BC1023; ATS Iridium). It was recaptured and recollared in the Fort Nelson Core on February 28, 2014, where it was subsequently located during the March 17 late winter recruitment survey. GPS data indicate that SCEK165 left the Fort Nelson Core suddenly on April 13 in the company of SCEK166. Both caribou travelled south approximately 25 km, then spent the following 4 days approximately 1 km north of the Fort Nelson airport. SCEK166 then retraced her route back to the Fort Nelson Core while SCEK165 crossed the Fort Nelson River valley and continued southeast. It was killed on April 18, 4.5 km short of the Clarke Core, 38 km south of its starting point. Although the heavily damaged collar belting was characteristic of wolf predation, aspects of the mortality site were atypical and the cause of death could not be confirmed.

SCEK037 was killed approximately 30 m from a packed snowmobile trail on a cutline through black spruce forest in the Milligan Core of the Chinchaga Range. SCEK190 was killed in a mature mixedwood stand within approximately 25 m of a ploughed winter road in the Chinchaga RRA. SCEK165 was killed on the edge of a newly constructed lease just outside the Clarke Core of the Snake-Sahtaneh Range. Four of the 7 mortality sites were in areas of relatively intact habitat. Late winter snow conditions and temperature fluctuations that resulted in the formation of a very hard crust likely played a role in the predation of several caribou by wolves.

No wolf mortalities were detected in April 2014.

First Nation Contractors

Short-term timing uncertainty associated with weather prevented coordination of First Nations participation in caribou mortality site investigations in April 2014.

Table 1. Summary of SCEK and MFLNRO radio-collared boreal caribou mortality investigations conducted in April 2014, northeastern British Columbia ($n=7$).

Mort Invest #	Caribou ID	Range ¹	Collar Type	Date Collared	Core Collared ²	Core Died	Date of Death	Date Last Known Alive	Date Investigated	Cause of Death ³	Site Investigation Comments
057	SCEK018/ BC1062	SNS	Lotek VHF	08-Jan-13	CLK	CLK	Unknown	17-Mar-14	01-Apr-14	Wolf kill	First collared in Clarke Core on March 02, 2011 (BC1062; ATS Iridium). Kill site in black spruce bog-fen complex. Mean snow depth 54 cm with very hard crust (can support person's weight).
058	SCEK154	SNS	Lotek VHF	03-Mar-13	CLK	CLK	Unknown	17-Mar-14	01-Apr-14	Wolf kill	Kill site in black spruce bog. Mean snow depth 50 cm with hard crust that supports person's weight.
059	SCEK037	CHIN	Lotek VHF	21-Jan-13	MLL	MLL	Unknown	22-Mar-14	02-Apr-14	Wolf kill	Kill site approximately 30 m from packed snowmobile trail on cutline through black spruce forest.
060	SCEK202	CHIN	Vectronic Vertex GPS	19-Mar-14	CHIN RRA	CHIN RRA	08-Apr-14	07-Apr-14	27-Apr-14	Wolf kill	Ground investigation delayed due to snow storm. Collar not at kill site, carcass not located due to approx. 20 cm fresh snow. Collar found in black spruce forest adjacent to fen.

¹ SNS - Snake-Sahtaneh, CHIN - Chinchaga

² CLK - Clarke, MLL - Milligan, CHIN RRA - Chinchaga RRA

Table 1 cont. Summary of SCEK and MFLNRO radio-collared boreal caribou mortality investigations conducted in April 2014, northeastern British Columbia ($n=7$).

Mort Invest #	Caribou ID	Range ¹	Collar Type	Date Collared	Core Collared ²	Core Died	Date of Death	Date Last Known Alive	Date Investigated	Cause of Death ³	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	Pending	Caribou collared on March 05, 2014; suspected GPS mortality event confirmed during SCEK202 mortality investigation on Apr 27, 2014 when site investigated from air. Black bear tracks and excavating in fresh snow around kill site, did not attempt to recover collar; will return to check site in May 2014.
062	SCEK151	SNS	Lotek VHF	02-Mar-13	CLK	CLK	Unknown	01-Apr-14	27-Apr-14	Wolf kill	Kill site in black spruce forest.
063	SCEK165/ BC1023	FN	Vectronic Vertex GPS	28-Feb-14	FN	CLK	19-Apr-14	18-Apr-14	27-Apr-14	Suspected wolf kill	Collared in FN Core in February 2010 (BC1023), recollared in FN Core in February 2014, located in FN Core on March 17, 2014 late winter recruitment survey; left FN Core and moved 38 km south, to within 4.5 km of Clarke Core, between April 13-18 (date of death); kill site in stand of mature black spruce at edge of beaver pond complex and recently constructed well site.

¹ CHIN - Chinchaga, SNS - Snake-Sahtaneh, FN- Fort Nelson

² CHIN RRA - Chinchaga RRA, CLK - Clarke, FN- Fort Nelson

APPENDIX I: Caribou Mortality Investigation Reports

Mortality Investigation #057: SCEK018/BC1062, April 01, 2014, report and photos.

Mortality Investigation #	057
Caribou ID	SCEK018/BC1062
Range	Snake-Sahtaneh
Date Detected	01-Apr-14
Date Investigated	01-Apr-14
Collar Type	Lotek VHF
Capture Site UTM	10.546957.6504656
Date Collared	08-Jan-13
Core Collared	Clarke
Capture Site UTM	10.546957.6504656
Core Died	Clarke
Date of Death	Unknown
Date Last Known Alive	17-Mar-14
Mortality Site UTM	10.538403.6501720
Cause of Death	Wolf kill
Samples	Lower jaw, long bone, skull, wolf scat
Collar Condition	Good - can be re-used; still attached to carcass
Photos	3580-3586
Investigators	Brad Culling, Ted Euchner
Site Investigation Comments	First collared in Clarke Core on March 02, 2011 (BC1062; ATS Iridium); caribou located with calf at heel during March 17, 2014 recruitment survey; mortality detected during wolf collar deployment; collar still attached to partially consumed carcass - remains include hide and portion of skeleton; kill site in black spruce bog-fen complex; mean snow depth 54 cm with very hard crust (can support a person's weight).



Plate 1. Mortality Site Investigation #057: SCEK018/BC1062 (Lotek VHF), Snake-Sahtaneh Range (UTM 10.538403.6501720), April 01, 2014. (1/2)



Plate 2. Mortality Site Investigation #057: SCEK018/BC1062 (Lotek VHF), Snake-Sahtaneh Range (UTM 10.538403.6501720), April 01, 2014. (2/2)

Mortality Investigation #058: SCEK154, April 01, 2014, report and photos.

Mortality Investigation #	058
Caribou ID	SCEK154
Range	Snake-Sahtaneh
Date Detected	01-Apr-14
Date Investigated	01-Apr-14
Collar Type	Lotek VHF
Date Collared	03-Mar-13
Core Collared	Clarke
Capture Site UTM	10.558758.6503920
Core Died	Clarke
Date of Death	Unknown
Date Last Known Alive	17-Mar-14
Mortality Site UTM	10.559371.6498418
Cause of Death	Wolf kill
Samples	Lower jaw, pelvis, wolf scat
Collar Condition	Destroyed
Photos	3587-3591
Investigators	Brad Culling, Ted Euchner
Site Investigation Comments	Caribou located during March 17, 2014 recruitment survey; mortality detected during wolf collar deployment; carcass mostly consumed (lower jaw, partial skull, segment of spine and piece of hide remaining); wolf tracks of varying age observed; kill site in black spruce bog; mean snow depth 50 cm with hard crust that supports person's weight.



Plate 3. Mortality Site Investigation #058: SCEK154 (LoteK VHF), Snake-Sahtaneh Range (UTM 10.559371.6498418), April 01, 2014. (1/2)



Plate 4. Mortality Site Investigation #058: SCEK154 (LoteK VHF), Snake-Sahtaneh Range (UTM 10.559371.6498418), April 01, 2014. (2/2)

Mortality Investigation #059: SCEK037, April 02, 2014, report and photos.

Mortality Investigation #	059
Caribou ID	SCEK037
Range	Chinchaga
Date Detected	02-Apr-14
Date Investigated	02-Apr-14
Collar Type	Lotek VHF
Date Collared	21-Jan-13
Core Collared	Milligan
Capture Site UTM	10.668109.6287157
Core Died	Milligan
Date of Death	Unknown
Date Last Known Alive	22-Mar-14
Mortality Site UTM	10.665395.6290731
Cause of Death	Wolf kill
Samples	Lower jaw, long bones , skull, wolf scat (2)
Collar Condition	Destroyed
Photos	3604-3611
Investigators	Brad Culling, Diane Culling
Site Investigation Comments	Caribou located during March 22, 2014 recruitment survey; mortality detected during April 02 fixed-wing telemetry flight; kill site found approx. 40 m from collar; carcass mainly consumed except for legs, spine, pelvis, scapula; kill site in black spruce forest; packed snowmobile trail on cutline approx. 30 m from kill site, wolf tracks and scat on trail; mean snow depth 80 cm.



Plate 5. Mortality Site Investigation #059: SCEK037 (Lotek VHF), Chinchaga Range (UTM 10.665395.6290731), April 02, 2014. (1/2)



Plate 6. Mortality Site Investigation #059: SCEK037 (Lotek VHF), Chinchaga Range (UTM 10.665395.6290731), April 02, 2014. (2/2)

Mortality Investigation #060: SCEK202, April 27, 2014, report and photos.

Mortality Investigation #	060
Caribou ID	SCEK202
Range	Chinchaga RRA
Date Detected	18-Apr-14
Date Investigated	27-Apr-14
Collar Type	Vectronic Vertex (GPS)
Date Collared	19-Mar-14
Core Collared	Chinchaga RRA
Capture Site UTM	10.602465.6443394
Core Died	Chinchaga RRA
Date of Death	08-Apr-14
Date Last Known Alive	07-Apr-14
Mortality Site UTM	10.615379.6443786
Cause of Death	Wolf kill
Samples	None available (carcass not found)
Collar Condition	Destroyed
Photos	7518-7527
Investigators	Ted Euchner, Rob Woods
Site Investigation Comments	Caribou collared during March 19, 2014 recruitment survey; mortality detected from GPS data on 18 April 2014; ground investigation delayed due to snow storm; caribou moved 5 km immediately prior to death; carcass not located due to approx. 20 cm fresh snow; collar webbing ripped in half and removed from kill site consistent with wolf predation; estimate that ground was 60-70% bare prior to late April storm; at time of March capture mean snow depth was 32 cm with a very hard crust; collar found in black spruce forest adjacent to fen.



Plate 7. Mortality Site Investigation #060: SCEK202 (Vectronic Vertex GPS), Chinchaga RRA (UTM 10.615379.6443786), April 27, 2014. (1/2)



Plate 8. Mortality Site Investigation #060: SCEK202 (Vectronic Vertex GPS), Chinchaga RRA (UTM 10.615379.6443786), April 27, 2014. (2/2)

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

Mortality Investigation #	061 (Aerial Investigation)
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	Pending
Samples	n/a
Collar Condition	Pending
Photos	n/a
Investigators	Ted Euchner, Rob Woods
Site Investigation Comments	Caribou collared on March 05, 2014; suspected GPS mortality event confirmed during SCEK202 mortality investigation on April 27, 2014; site investigated from air on April 27 following approx. 20 cm fresh snow; fresh bear tracks observed in new snow around kill site therefore did not attempt to recover collar; site to be revisited in May 2014; mature mixedwood stand within approx. 25 m of winter road.

Mortality Investigation #062: SCEK151, April 27, 2014, report and photos.

Mortality Investigation #	062
Caribou ID	SCEK151
Range	Snake-Sahtaneh
Date Detected	27-Apr-14
Date Investigated	27-Apr-14
Collar Type	Lotek VHF
Date Collared	02-Mar-13
Core Collared	Clarke
Capture Site UTM	10.583385.6489077
Core Died	Clarke
Date of Death	Unknown
Date Last Known Alive	01-Apr-14
Mortality Site UTM	10.547267.6492693
Cause of Death	Wolf kill
Samples	Wolf scat (1)
Collar Condition	Destroyed
Photos	7528-7535
Investigators	Ted Euchner, Rob Woods
Site Investigation Comments	Detected VHF mortality signal enroute to investigating SCEK190 mortality site; majority of carcass consumed with only portion of hide and rumen, hair patch, and bone shards remaining; kill site in black spruce forest; approx. 80% snow cover remaining including residual snow patches 25-30 cm deep with fresh snow on top (mean snow depth 28 cm).



Plate 9. Mortality Site Investigation #062: SCEK151 (Lotek VHF), Snake-Sahtaneh Range (UTM 10.547267.6492693), April 27, 2014. (1/2)



Plate 10. Mortality Site Investigation #062: SCEK151 (Lotek VHF), Snake-Sahtaneh Range (UTM 10.547267.6492693), April 27, 2014. (2/2)

Mortality Investigation #063: SCEK165/BC1023, April 27, 2014, report and photos.

Mortality Investigation #	063
Caribou ID	SCEK165/BC1023
Range	Snake-Sahtaneh
Date Detected	22-Apr-14
Date Investigated	27-Apr-14
Collar Type	Vectronic Vertex GPS
Date Collared	28-Feb-14
Core Collared	Fort Nelson
Capture Site UTM	10.511999.6551172
Core Died	Clarke
Date of Death	19-Apr-14
Date Last Known Alive	18-Apr-14
Mortality Site UTM	10.528269.6512146
Cause of Death	Undetermined (suspected wolf kill)
Samples	Lower jaw (2), skull, scapula
Collar Condition	Destroyed
Photos	7539-7550
Investigators	Ted Euchner, Rob Woods
Site Investigation Comments	<p>First collared in FN Core on February 24, 2010 (BC1023), recaptured and recollared in FN Core in February 2014, located in FN Core on March 17 late winter recruitment survey; left FN Core and moved 38 km south, to within 4.5 km of Clarke Core, between April 13-18 (date of death); mortality detected from GPS data; site investigation delayed due to mid-April snow storm; cause of death suspected wolf kill due to torn collar webbing, however, site was somewhat atypical; no wolf scat or tracks observed; coyote tracks observed; kill site in stand of mature black spruce at edge of beaver pond complex and recently constructed well site; approx. 20 cm new snow on April 24, 2014.</p>



Plate 11. Mortality Site Investigation #063: SCEK165/BC1023 (Vectronic Vertex GPS), Snake-Sahtaneh Range (UTM 10.528269.6512146.), April 27, 2014. (1/4)



Plate 12. Mortality Site Investigation #063: SCEK165/BC1023 (Vectronic Vertex GPS), Snake-Sahtaneh Range (UTM 10.528269.6512146.), April 27, 2014. (2/4)



Plate 13. Mortality Site Investigation #063: SCEK165/BC1023 (Vectronic Vertex GPS), Snake-Sahtaneh Range (UTM 10.528269.6512146.), April 27, 2014. (3/4)



Plate 14. Mortality Site Investigation #063: SCEK165/BC1023 (Vectronic Vertex GPS), Snake-Sahtaneh Range (UTM 10.528269.6512146), April 27, 2014. (4/4)