

2013

BC Boreal Caribou Implementation Plan:

**Mortality Investigation Summary Report No. 1:
December 17, 2012 – April 06, 2013**

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 Community Environmental Knowledge Fund (SCEK).

The VHF signal status of each active collar is monitored monthly during regular fixed-wing telemetry monitoring flights and incidental associated surveys. In addition to the SCEK collars, active caribou and wolf collars from other programs, known to be present within each caribou range, 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 and to recover the collar for redeployment during the upcoming winter capture season. Adult mortality information is used in conjunction with juvenile recruitment data to estimate population trend.

This summary report pertains to mortality signals detected between the commencement of SCEK collar deployment on December 17, 2012 and completion of late winter recruitment surveys on April 04, 2013, as well as incidental observations made during unrelated work to April 06, 2013.

METHODS

Mortality sites of previously-collared caribou were detected by telemetry during the course of SCEK caribou collar deployment and late winter recruitment surveys, as well as during associated activities within the boreal caribou ranges. Mortality sites of unmarked animals were found incidentally during the course of winter field activities.

Mortality investigations were typically conducted at the time of detection. Information recorded for each radio-collared caribou mortality site included: animal ID, collar frequency, collar condition, GPS coordinates, photodocumentation, condition of remains, and other evidence relevant to suspected cause of death. Where available, biological samples were collected, including long bones (femur or humerus), lower jaw, tissue samples, and internal organs. In the case of incidental observations of uncollared caribou kills, GPS coordinates, photodocumentation, condition of remains, and other evidence relevant to suspected cause of death were documented, and any available biological samples were collected.

RESULTS

Eighteen boreal caribou mortalities were detected between December 17, 2012 and April 06, 2013, including 2 SCEK Iridium collars, 1 SCEK Vectronic collar, and 3 SCEK VHF collars. As well, 3 previously-deployed MFLNRO collars were recovered from caribou BC1064, BC1006, and BC 1003. An additional 9 uncollared caribou mortalities were incidentally found during the course of field activities (Table 1).

Table 1. Summary of boreal caribou mortality investigations by range and core, between December 17, 2012 and April 06, 2013, northeastern British Columbia (n=18).

Range	Core	Collar Type				Total
		Iridium	Vertex	VHF	Unmarked	
Chinchaga	Milligan	1				1
Snake-Sahtaneh	Clarke				1	1
	Paradise				2	2
	North Kotcho - Outside				1	1
	Tsea				1	1
Calendar	Calendar				1	1
Maxhamish	Kiwigana	1		1		2
	Fortune		1	1	1	3
	Capot-Blanc			1		1
Parker	Parker			1		1
Fort Nelson	Fort Nelson	1		1	2	4
		3	1	5	9	18

With the exception of 3 caribou, mortality site investigations were conducted at the time of detection, during boreal caribou capture and collaring activities, recruitment surveys, and associated field work. The 3 deferred investigations included an unmarked yearling male (UNCOLL-545M) and 2 previously-collared MFLNRO caribou (BC1006 and BC1003). The intact carcass of UNCOLL-545M was first observed in the Clarke Core during the March 30, 2013 recruitment survey. As it appeared that death was not the result of predation, plans were made to recover the carcass whole for a lab necropsy. Upon returning to the site on April 02, the carcass was found to have been partially scavenged; therefore a field necropsy was performed. The VHF beacons of previously-collared MFLNRO caribou BC1006 and BC1003 did not

transmit mortality signals upon death and an unknown number of months elapsed prior to detection of the stationary collars during the 2013 late winter recruitment surveys. Recovery of these collars was deferred until after snow-melt due to the large amount of snow cover that had accumulated at the sites during the winter.

Eight of the 9 mortalities of collared caribou were attributed to wolf predation (Table 2; Appendix I). The body of the ninth collared animal (BC1064) was found intact on December 18, 2012. Death was attributed to non-predation natural causes. The carcass was slung out by helicopter and transported to Fort St. John, where the Provincial Wildlife Veterinarian subsequently performed a formal necropsy; cause of death was attributed to poor condition (Appendix II).

Eight of the 9 mortalities of uncollared caribou investigated were caused by wolf predation (Table 3; Appendix I). Poor body condition appeared to be a contributing factor in the ninth case (UNCOLL-545M); organ and tissue samples were collected for analysis by the Provincial Wildlife Veterinarian.

Two collars were destroyed by wolves, including SCEK (SCEK065) and MFLNRO (BC1006). Iridium collar was recovered from SCEK028 during the March 25 Chinchaga recruitment survey. The collar was returned to the office for testing prior to being redeployed on caribou SCEK161 to replace MFLNRO Iridium collar (BC1059) during the April 1, 2013 Prophet Range recruitment survey. Vectronic GPS collar was recovered from the mortality of caribou SCEK077 during the April 1, 2013 Maxhamish recruitment survey and redeployed on a new caribou in the Fortune Core (SCEK163) on the same day. VHF collar (SCEK084) was also retrieved during the 01 April 2013 recruitment survey and redeployed on SCEK164 the same day. The remaining 2 SCEK collars retrieved are both in good condition and suitable for redeployment during the winter 2013-2014 capture season.

First Nation Contractors

William Irvine and Kathie Needlay of the Fort Nelson First Nation and Maxine Davis of Doig River First Nation participated in mortality site investigations conducted in conjunction with capture and recruitment survey field work.

Table 2. Summary of mortality investigations for SCEK and MFLNRO radio-collared boreal caribou, December 17, 2012 to April 06, 2013, northeastern British Columbia ($n=9$).

Mort Invest #	Caribou ID	Range ¹	Collar Type	Freq	Date Collared	Core ² Collared	Core Died	Date of Death	Date Last Known Alive	Date Investigated	Cause of Death	Comments
001	BC1064	MAX	IRID		NRO data	KWG	KWG	27-Nov-12	27-Nov-12	18-Dec-12	Poor condition	"Sleeping caribou # 1"; lab necropsy by Provincial Wildl. Vet
004	SCEK028	CHIN	IRID			MLL	MLL	20-Mar-13	20-Mar-13	25-Mar-13	Wolf kill	Collar redeployed on Caribou SCEK161/BC1059
007	SCEK065	MAX	VHF		02-Feb-13	CPB	CPB	Unknown	02-Feb-13	31-Mar-13	Wolf kill	
008	BC1006	MAX	VHF		NRO data	KWG	KWG	Unknown	Unknown	31-Mar-13 & 25-May-13	Wolf kill	Returned in snow-free period
009	BC1003	PRK	VHF		NRO data	PRK	PRK	Unknown	Unknown	01-Apr-13 & 14-Sept-13	Wolf kill	Returned in snow-free period
010	SCEK077	MAX			04-Feb-13	FRT	FRT	23-Mar-13	23-Mar-13	01-Apr-13	Wolf kill	Collar retrieved/ redeployed on SCEK163 same day during LW survey
011	SCEK084	MAX	VHF		05-Feb-13	FRT	FRT	Unknown	05-Feb-13	01-Apr-13	Wolf kill	Collar retrieved/ redeployed on SCEK164 same day during LW survey
015	SCEK008	FN	VHF		18-Dec-12	FN	FN	05-Apr-13	01-Apr-13	06-Apr-13	Wolf kill	Tsimeh pack tracked to scene of 4 caribou mortalities from group of 10 (Grp #2 LW survey), including SCEK008, SCEK 162, and 2 uncollared
016	SCEK162	FN	IRID		01-Apr-13	FN	FN	05-Apr-13	05-Apr-13	06-Apr-13	Wolf kill	As above

¹ CHIN – Chinchaga MAX – Maxhamish PRK – Parker FN – Fort Nelson

² MLL – Milligan KWG – Kiwigana FRT – Fortune CPB – Capot Blanc FN – Fort Nelson

Table 3. Summary of mortality investigations of uncollared boreal caribou, December 17, 2012 to May 16, 2013, northeastern British Columbia ($n=9$).

Mort Invest #	Caribou ID	Range ¹	Core ²	Date Investigated	Cause of Death	Comments
002	UNCOLL-198M	SNS	NK-OS ¹	25-Feb-13	Wolf kill	Incidental observation of unmarked caribou kill
003	UNCOLL-229M	CAL	CAL	26-Feb-13	Wolf kill	Incidental observation of unmarked caribou kill on unploughed cutline
005	UNCOLL-545M	SNS	CLR	02-Apr-13	Undetermined; suspected poor condition	Uncollared yearling male; first observed during March 30 LW recruitment survey, body intact at that time (possibly not yet dead); returned April 02 to sling whole carcass out for formal necropsy but body partially scavenged by lynx, ravens and golden eagle; collected samples for Provincial Wildlife Veterinarian
006	UNCOLL-574M	SNS	TSE	31-Mar-13	Wolf kill	Old caribou kill in vicinity of group of 37 caribou at Tsea Lakes
012	UNCOLL-622M	MAX	FRT	01-Apr-13	Wolf kill	Young male; discovered during LW recruitment survey on lake in Fortune Core where caribou concentrated; used helicopter to follow wolf tracks several km along ploughed roads onto snowmobile track
013	UNCOLL-624M	SNS	PRD	02-Apr-13	Wolf kill	First of 2 unmarked caribou killed approx. 300 m apart
014	UNCOLL-625M	SNS	PRD	02-Apr-13	Wolf Kill	Second of 2 unmarked caribou killed approx. 300 m apart
017	UNCOLL-FN4a	FN	FN	06-Apr-13	Wolf kill	Tsimeh pack tracked to scene of 4 caribou mortalities from group of 10 (Grp #2 LW survey), including SCEK008, SCEK 162, and 2 uncollared animals
018	UNCOLL-FN4b	FN	FN	06-Apr-13	Wolf kill	As above

¹ SNS - Snake-Sahtaneh CAL - Calendar MAX - Maxhamish FN - Fort Nelson

² CLR - Clarke PRD - Paradise NRK - North Kotcho TSE - Tsea CAL - Calendar FRT - Fortune FN - Fort Nelson OS - Outside Core

APPENDIX I: Mortality Investigation Reports

Mortality Investigation #001, BC1064, December 18, 2012, report and photos.

Mortality Investigation #	001
Caribou ID	BC1064
Range	Maxhamish
Date Detected	18-Dec-12
Date Investigated	18-Dec-12
Collar Type	Iridium
Frequency	
Date Collared	NRO data
Core Collared	Kiwigana
Capture Site UTM (Zn 10)	NRO data
Core Died	Kiwigana
Date of Death	27-Nov-12
Date Last Known Alive	27-Nov-12
Mortality Site UTM	10.523249.6574077
Cause of Death	Poor condition
Samples	Whole body
Collar Condition	Good
Photos	1051-1054
Investigators	Brad Culling, Ted Euchner
Site Investigation Comments	"Sleeping caribou # 1"; lab necropsy by H. Schwantje, DVM (Appendix II)



Plate 1. Mortality Site Investigation #001: BC1064 (Iridium 149.333), Maxhamish Range, Kiwigana Core (UTM 10.523249.6574077), December 18, 2012. (1/2)



Plate 2. Mortality Site Investigation #001: BC1064 (Iridium 149.333), Maxhamish Range, Kiwigana Core (UTM 10.523249.6574077), December 18, 2012. (2/2)

Mortality Investigation #002, UNCOLL-198M, February 25, 2013, report.

Mortality Investigation #	002
Caribou ID	UNCOLL-198M
Range	Snake-Sahtaneh
Date Detected	25-Feb-13
Date Investigated	25-Feb-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	North Kotcho (outside core)
Date of Death	Unknown
Date Last Known Alive	n/a
Mortality Site UTM	10.607417.6578505
Cause of Death	Wolf kill
Samples	Tissue sample
Collar Condition	n/a
Photos	None
Investigators	Brad Culling, Diane Culling, William Irving (FNFN)
Site Investigation Comments	Incidental observation of unmarked caribou kill

Mortality Investigation #003, UNCOLL-229M, February 26, 2013, report and photos.

Mortality Investigation #	003
Caribou ID	UNCOLL-229M
Range	Calendar
Date Detected	26-Feb-13
Date Investigated	26-Feb-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Calendar
Date of Death	Unknown
Date Last Known Alive	n/a
Mortality Site UTM	10.641057.6632659
Cause of Death	Wolf kill
Samples	Devoured; no samples available
Collar Condition	n/a
Photos	1567-1568
Investigators	Brad Culling, Diane Culling, William Irving (FNFN)
Site Investigation Comments	Incidental observation of unmarked caribou kill; few pieces of hide left; kill site on unploughed cutline



Plate 3. Mortality Site Investigation #003: UNCOLL-229M, Snake-Sahtaneh Range, Clarke Core (UTM 10.), February 26, 2013. (1/1)

Mortality Investigation #004, SCEK028, March 25, 2013, report and photos.

Mortality Investigation #	004
Caribou ID	SCEK028
Range	Chinchaga
Date Detected	25-Mar-13
Date Investigated	25-Mar-13
Collar Type	Iridium
Frequency	
Date Collared	17/01/2013
Core Collared	Milligan
Capture Site UTM	10.652508.6356719
Core Died	Milligan
Date of Death	20-Mar-13
Date Last Known Alive	20-Mar-13
Mortality Site UTM	10.656442.6355327
Cause of Death	Wolf kill
Samples	Devoured; no samples available
Collar Condition	OK; returned to office to check prior to redeployment
Photos	1902-1911
Investigators	Brad Culling, Diane Culling, Maxine Davis (DRFN)
Site Investigation Comments	Collar redeployed on Caribou SCEK161/BC1059 to replace Demars' Iridium collar on April 1, 2013 (Prophet Range).



Plate 4. Mortality Site Investigation #004: SCEK028 (Iridium 148.575), Chinchaga Range, Milligan Core (UTM 10.656442.6355327), March 25, 2013. (1/2)



Plate 5. Mortality Site Investigation #004: SCEK028 (Iridium 148.575), Chinchaga Range, Milligan Core (UTM 10.656442.6355327), March 25, 2013. (1/2)

Mortality Investigation #005, UNCOLL-545M, detected March 30, investigated April 02, 2013, report and photos.

Mortality Investigation #	005
Caribou ID	UNCOLL-545M
Range	Snake-Sahtaneh
Date Detected	30-Mar-13
Date Investigated	02-Apr-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Clarke
Date of Death	Unknown
Date Last Known Alive	n/a
Mortality Site UTM	10.558628.6504070
Cause of Death	Suspected poor condition
Samples	Lower jaw, heart, lungs, liver, tissue sample, femur, parasites
Collar Condition	n/a
Photos	1933-1935, 1985-2004
Investigators	Brad Culling, Diane Culling
Site Investigation Comments	Uncollared yearling male; first observed during March 30 LW recruitment survey, body intact at that time; returned on April 02 to sling whole carcass out for formal necropsy but body partially scavenged - collected samples for Provincial Wildlife Veterinarian; comparison of March 30 aerial photos and April 02 site investigation suggests caribou may have been dying but not yet dead at the first observation. On April 02 the vegetation was disturbed at the site but no evidence of direct predation (e.g., large volume of blood, wounds) was found, there were no wolf tracks at site but lynx tracks were observed; it appears caribou had thrashed around prior to death. The right hind leg was missing on April 02 (suspect lynx dragged it away); multiple ravens and 1 golden eagle were also present.



Plate 6. Mortality Site Investigation #005: UNCOLL-545M, Snake-Sahtaneh Range, Clarke Core (UTM 10.558628.6504070), first observation, March 30, 2013. (1/2)



Plate 7. Mortality Site Investigation #005: UNCOLL-545M, Snake-Sahtaneh Range, Clarke Core (UTM 10.558628.6504070), site investigation April 02, 2013, showing scavenged hind leg. (2/2)

Mortality Investigation #006, UNCOLL-574M, March 31, 2013, report.

Mortality Investigation #	006
Caribou ID	UNCOLL-574M
Range	Snake-Sahtaneh
Date Detected	31-Mar-13
Date Investigated	31-Mar-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Tsea
Date of Death	Unknown
Date Last Known Alive	n/a
Mortality Site UTM	10.555113.6584515
Cause of Death	Wolf kill
Samples	Devoured; no samples available
Collar Condition	n/a
Photos	None
Investigators	Brad Culling, Diane Culling, Kathy Needlay (FNFN)
Site Investigation Comments	Old caribou kill in vicinity of group of 37 caribou at Tsea Lakes; no tissue sample available

Mortality Investigation #007, SCEK065, March 31, 2013, report and photos.

Mortality Investigation #	007
Caribou ID	SCEK065
Range	Maxhamish
Date Detected	31-Mar-13
Date Investigated	31-Mar-13
Collar Type	VHF
Frequency	
Date Collared	02-Feb-13
Core Collared	Capot-Blanc
Capture Site UTM	10.476713.6594623
Core Died	Capot-Blanc
Date of Death	Unknown
Date Last Known Alive	02-Feb-13
Mortality Site UTM	10.472736.6585942
Cause of Death	Wolf kill
Samples	Hoof (x1)
Collar Condition	Destroyed
Photos	1936-1943
Investigators	Brad Culling, Diane Culling, Kathy Needlay (FNFN)
Site Investigation Comments	Collar destroyed by wolves; spruce forest



Plate 8. Mortality Site Investigation #007: SCEK065 (VHF150.270), Maxhamish Range, Capot Blanc Core (UTM 10.472736.6585942), March 31, 2013. (1/2)



Plate 9. Mortality Site Investigation #007: SCEK065 (VHF150.270), Maxhamish Range, Capot Blanc Core (UTM 10.472736.6585942), March 31, 2013. (2/2)

Mortality Investigation #008, BC1006, detected/investigated March 31 and investigated May 25, 2013, report (2 site visits).

Mortality Investigation #	008 (also presented in summary report #2)
Caribou ID	BC1006
Range	Maxhamish
Date Detected	31-Mar-13
Date Investigated	31-Mar-13 and 25-May-13
Collar Type	VHF
Frequency	
Date Collared	
Core Collared	Kiwigana
Capture Site UTM	NRO data
Core Died	Kiwigana
Date of Death	Unknown; prior to March 2013 recruitment survey
Date Last Known Alive	Unknown
Mortality Site UTM	10.527628.6571495
Cause of Death	Wolf kill
Samples	Devoured; no samples available
Collar Condition	Destroyed
Photos	None
Investigators	Brad Culling, Diane Culling, Kathy Needlay (FNFN) (March 31) and Brad Culling, Craig DeMars, Kathy Needlay (May 25)
Site Investigation Comments	Old Lotek VHF wolf collar deployed on caribou BC1006 by Thiessen; mortality detected/first attempt to retrieve collar on March 31 LW recruitment survey, collar on ground under > 1 m deep, crusted snow with no tracks or disturbance (i.e., long dead), collar not transmitting on mortality mode therefore not able to locate under snow; returned to site on May 25 2013, retrieved remnants of collar (destroyed by wolves)

Mortality Investigation #009, BC1003, detected April 01, 2013, investigated September 14, 2013, report and photos.

Mortality Investigation #	009 (also presented in summary report #5)
Caribou ID	BC1003
Range	Parker
Date Detected	01-Apr-13
Date Investigated	01-Apr-13 (aerial) and 14-Sept-13
Collar Type	VHF
Frequency	
Date Collared	NRO data
Core Collared	Parker
Capture Site UTM	NRO data
Core Died	Parker
Date of Death	Unknown
Date Last Known Alive	Unknown
Mortality Site UTM	10.496193.6520206
Cause of Death	Undetermined
Samples	No samples available
Collar Condition	Good
Photos	2734-2737
Investigators	Brad Culling, Diane Culling, Kathy Needlay (FNFN) (March 31) and Brad Culling, Diane Culling (September 14)
Site Investigation Comments	Detected during LW recruitment survey - collar on ground but access restricted (small openings); returned to retrieve during snow-free months; caribou long dead - moss growing over collar; no skeleton/remains at collar location; open black spruce forest



Plate 10. Mortality Site Investigation #009: BC1003 (VHF151.880), Parker Range, (UTM 10.496193.6520206), September 14, 2013. (1/2)



Plate 11. Mortality Site Investigation #009: BC1003 (VHF151.880), Parker Range, (UTM 10.496193.6520206), September 14, 2013. (2/2)

Mortality Investigation #010, SCEK077, April 01, 2013, report and photos.

Mortality Investigation #	010
Caribou ID	SCEK077
Range	Maxhamish
Date Detected	01-Apr-13
Date Investigated	01-Apr-13
Collar Type	Vertex
Frequency	
Date Collared	04-Feb-13
Core Collared	Fortune
Capture Site UTM	10.476225.6632488
Core Died	Fortune
Date of Death	23-Mar-13
Date Last Known Alive	23-Mar-13
Mortality Site UTM	10.478879.6632000
Cause of Death	Wolf kill
Samples	Carcass devoured; jaw collected
Collar Condition	Good - redeployed
Photos	1952-1954
Investigators	Brad Culling, Diane Culling, Kathy Needley (FNFN)
Site Investigation Comments	Devoured, jaw and bone shards remaining; wolf scat and tracks; black spruce forest; collar retrieved and redeployed on SCEK163 same day (April 1, 2013) during LW recruitment survey; mean snow depth at mortality site 104 cm



Plate 12. Mortality Site Investigation #010: SCEK077 (Vertex 149.990), Maxhamish Range, Fortune Core (UTM 10.478879.6632000), April 01, 2013. (1/2)



Plate 13. Mortality Site Investigation #010: SCEK077 (Vertex 149.990), Maxhamish Range, Fortune Core (UTM 10.478879.6632000.), April 01, 2013. (2/2)

Mortality Investigation #011, SCEK084, April 01, 2013, report and photos.

Mortality Investigation #	011
Caribou ID	SCEK084
Range	Maxhamish
Date Detected	01-Apr-13
Date Investigated	01-Apr-13
Collar Type	VHF
Frequency	
Date Collared	05-Feb-13
Core Collared	Fortune
Capture Site UTM	10.539583.6634937
Core Died	Fortune
Date of Death	Unknown
Date Last Known Alive	05-Feb-13
Mortality Site UTM	10.540000.6635061
Cause of Death	Wolf kill
Samples	Devoured; no samples available
Collar Condition	Good - redeployed
Photos	1957-1959
Investigators	Brad Culling, Diane Culling, Kathy Needley (FNFN)
Site Investigation Comments	Collar retrieved and redeployed on SCEK164 same day (April 1, 2013) during LW recruitment survey



Plate 14. Mortality Site Investigation #011: SCEK084 (VHF 151.490), Maxhamish Range, Fortune Core (UTM 10.540000.6635061), April 01, 2013. (1/2)



Plate 15. Mortality Site Investigation #011: SCEK084 (VHF 151.490), Maxhamish Range, Fortune Core (UTM 10.10.540000.6635061), April 01, 2013. (2/2)

Mortality Investigation #012, UNCOLL-622M, April 01, 2013, report and photos.

Mortality Investigation #	012
Caribou ID	UNCOLL-622M
Range	Maxhamish
Date Detected	01-Apr-13
Date Investigated	01-Apr-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Fortune
Date of Death	Unknown
Date Last Known Alive	n/a
Mortality Site UTM	10.540320.6633369
Cause of Death	Wolf kill
Samples	None
Collar Condition	n/a
Photos	1967-1984
Investigators	Brad Culling, Diane Culling, Kathy Needley (FNFN)
Site Investigation Comments	Young male; discovered during LW recruitment survey on lake in Fortune Core where caribou concentrated; used helicopter to follow wolf tracks several km along ploughed roads onto snowmobile track to kill site



Plate 16. Mortality Site Investigation #012: UNCOLL-622M, Maxhamish Range, Fortune Core (UTM 10.540320.6633369), April 01, 2013. (1/4)



Plate 17. Mortality Site Investigation #012: UNCOLL-622M, Maxhamish Range, Fortune Core (UTM 10.540320.6633369), April 01, 2013. (2/4)



Plate 18. Mortality Site Investigation #012: UNCOLL-622M, Maxhamish Range, Fortune Core (UTM 10.540320.6633369), wolf tracks from ploughed RoW to snowmobile trail on lake, April 01, 2013. (3/4)



Plate 19. Mortality Site Investigation #012: UNCOLL-622M, Maxhamish Range, Fortune Core (UTM 10.540320.6633369), wolf tracks on snowmobile trail across lake to caribou kill, April 01, 2013. (4/4)

Mortality Investigation #013, UNCOLL-624M, April 02, 2013, report and photos.

Mortality Investigation #	013
Caribou ID	UNCOLL-624M
Range	Snake-Sahtaneh
Date Detected	02-Apr-13
Date Investigated	02-Apr-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Paradise
Date of Death	Unknown
Date Last Known Alive	n/a
Mortality Site UTM	10.560206.6540903
Cause of Death	Wolf kill
Samples	Devoured; no samples available
Collar Condition	n/a
Photos	2005-2009, 2012-20013
Investigators	Brad Culling, Diane Culling
Site Investigation Comments	Two unmarked caribou killed approx. 300 m apart; hide remaining; wolf tracks/sign observed



Plate 20. Mortality Site Investigation #013: UNCOLL-624M, Snake-Sahtaneh Range, Paradise Core (UTM 10.560206.6540903), April 02, 2013. (1/2)



Plate 21. Mortality Site Investigation #013: UNCOLL-624M, Snake-Sahtaneh Range, Paradise Core (UTM 10.560206.6540903), April 02, 2013. (2/2)

Mortality Investigation #014, UNCOLL-625M, April 02, 2013, report and photos.

Mortality Investigation #	014
Caribou ID	UNCOLL-625M
Range	Snake-Sahtaneh
Date Detected	02-Apr-13
Date Investigated	02-Apr-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Paradise
Date of Death	Unknown
Date Last Known Alive	n/a
Mortality Site UTM	10.560508.6540923
Cause of Death	Wolf Kill
Samples	Devoured; no samples available
Collar Condition	n/a
Photos	2007-2013
Investigators	Brad Culling, Diane Culling
Site Investigation Comments	Second of 2 unmarked caribou killed approx. 300 m apart



Plate 22. Mortality Site Investigation #014: UNCOLL-625M, Snake-Sahtaneh Range, Paradise Core (UTM 10.560508.6540923), April 02, 2013. (1/2)



Plate 23. Mortality Site Investigation #014: UNCOLL-625M, Snake-Sahtaneh Range, Paradise Core (UTM 10.560508.6540923), April 02, 2013. (2/2)

Mortality Investigations #015 to #018, SCEK008, SCEK162, UNCOLL-FN4a, and UNCOLL-FN4b, April 06, 2013, report and photos.

Mortality Investigation #	015
Caribou ID	SCEK008
Range	Fort Nelson
Date Detected	06-Apr-13
Date Investigated	06-Apr-13
Collar Type	VHF
Frequency	
Date Collared	18-Dec-12
Core Collared	Fort Nelson
Capture Site UTM	10.499524.6559036
Core Died	Fort Nelson
Date of Death	05/04/2013 (assumed)
Date Last Known Alive	01-Apr-13
Mortality Site UTM	10.512040.6551578
Cause of Death	Wolf kill
Samples	None
Collar Condition	Good
Photos	2052-2062
Investigators	Brad Culling, Zonk Dancevik
Site Investigation Comments	On April 06, 2013, the Tsimeh pack was tracked to the scene of 4 caribou mortalities from the group of 10 observed in the LW recruitment survey (Grp #2) , including SCEK008 and SCEK162; the 4 caribou killed by the Tsimeh pack were either partially consumed or killed and left uneaten; Iridium data for SCEK162 indicates death on 05 April 2013 (assumed for all 4 caribou)

Mortality Investigation #	016
Caribou ID	SCEK162
Range	Fort Nelson
Date Detected	06-Apr-13
Date Investigated	06-Apr-13
Collar Type	Iridium
Frequency	
Date Collared	01-Apr-13
Core Collared	Fort Nelson
Capture Site UTM	10.511177.6552035
Core Died	Fort Nelson
Date of Death	05-Apr-13
Date Last Known Alive	05-Apr-13
Mortality Site UTM	10.512040.6551578
Cause of Death	Wolf kill
Samples	None
Collar Condition	Good
Photos	2052-2062
Investigators	Brad Culling, Zonk Dancevik
Site Investigation Comments	On April 06, 2013, the Tsimeh pack was tracked to the scene of 4 caribou mortalities from the group of 10 observed in the LW recruitment survey (Grp #2) , including SCEK008 and SCEK162; the 4 caribou killed by the Tsimeh pack were either partially consumed or killed and left uneaten; Iridium data for SCEK162 indicates death on 05 April 2013 (assumed for all 4 caribou)

Mortality Investigation #	017
Caribou ID	UNCOLL-FN4a
Range	Fort Nelson
Date Detected	06-Apr-13
Date Investigated	06-Apr-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Fort Nelson
Date of Death	05/04/2013 (assumed)
Date Last Known Alive	n/a
Mortality Site UTM	10.512040.6551578
Cause of Death	Wolf kill
Samples	None
Collar Condition	n/a
Photos	2052-2062
Investigators	Brad Culling, Zonk Dancevik
Site Investigation Comments	On April 06, 2013, the Tsimeh pack was tracked to the scene of 4 caribou mortalities from the group of 10 observed in the LW recruitment survey (Grp #2) , including SCEK008 and SCEK162; the 4 caribou killed by the Tsimeh pack were either partially consumed or killed and left uneaten; Iridium data for SCEK162 indicates death on 05 April 2013 (assumed for all 4 caribou)

Mortality Investigation #	018
Caribou ID	UNCOLL-FN4b
Range	Fort Nelson
Date Detected	06-Apr-13
Date Investigated	06-Apr-13
Collar Type	n/a
Frequency	n/a
Date Collared	n/a
Core Collared	n/a
Capture Site UTM	n/a
Core Died	Fort Nelson
Date of Death	05/04/2013 (assumed)
Date Last Known Alive	n/a
Mortality Site UTM	10.512040.6551578
Cause of Death	Wolf kill
Samples	None
Collar Condition	n/a
Photos	2052-2062
Investigators	Brad Culling, Zonk Dancevik
Site Investigation Comments	On April 06, 2013, the Tsimeh pack was tracked to the scene of 4 caribou mortalities from the group of 10 observed in the LW recruitment survey (Grp #2) , including SCEK008 and SCEK162; the 4 caribou killed by the Tsimeh pack were either partially consumed or killed and left uneaten; Iridium data for SCEK162 indicates death on 05 April 2013 (assumed for all 4 caribou)



Plate 24. Mortality Site Investigations #015 to #018: SCEK008, SCEK162, UNCOLL-FN4a, and UNCOLL-FN4b; "Fort Nelson Core" (UTM 10.512040.6551578), April 06, 2013. (1/4)



Plate 25. Mortality Site Investigations #015 to #018: SCEK008, SCEK162, UNCOLL-FN4a, and UNCOLL-FN4b; "Fort Nelson Core" (UTM 10.512040.6551578), April 06, 2013. (2/4)



Plate 26. Mortality Site Investigations #015 to #018: SCEK008, SCEK162, UNCOLL-FN4a, and UNCOLL-FN4b; "Fort Nelson Core" (UTM 10.512040.6551578), April 06, 2013. (3/4)



Plate 27. Mortality Site Investigations #015 to #018: SCEK008, SCEK162, UNCOLL-FN4a, and UNCOLL-FN4b; "Fort Nelson Core" (UTM 10.512040.6551578), April 06, 2013. (4/4)

Appendix II: Caribou BC1064 Necropsy Report, May 05, 2013

15/05/2013 Wed 09:31

BC Animal Health Centre Case Number: 13-1862

ID: #24438 Page 1 of 3



Ministry of
Agriculture

Animal Health Centre

AAVLD - Accredited Laboratory

Ministry of Agriculture
1767 Angus Campbell Road
Abbotsford BC V3G 2M3
Telephone : (800) 556-3003
Facsimile : (800) 556-3010
Toll-Free : 1-800-661-6003

Final Report AHC Case: 13-1862

Last Updated: 05/14/13 3:39 PM

Pathologist: Ann Britton, DVM, MSc, PhD

Received Date: 05/09/13

Collected Date:

Client Ref No: 13-4027

Veterinarian: Dr. Helen Schwantje

Clinic: Ministry of Environment

Phone: (250) 953-4285

Fax: (250) 356-9145

Submitter: Helen Schwantje

Phone:

Fax:

Owner: Ministry of Environment

Phone:

Fax: (250) 356-9145

Animal Data

Species: Caribou

Breed:

Sex: F

Age: Adult

Premise ID:

Case History

Submitted fresh and formalized Boreal Caribou tissue for diagnostic evaluation. Cause of death.

Gross PM findings: thin, dehydrated, blood from nares. No internal fats, serous atrophy including bone marrow. Subcutaneous hemorrhage/edema of ventral head and brisket and hind quarters, muscles and coxofemoral joints. Several liters of sanguineous fluid in thorax and abdomen and pericardial sac. Moderate congestion/edema of lungs, mostly R. Heart flaccid and congested. GIT empty. Pregnant.

Nutritional condition: Poor; Date Specimen Reported: March 18, 2013; Location: Fort Nelson BC, adult, F, portions, 1 found dead.

Final Diagnosis

Final Diagnosis:

Hepatic atrophy with hemosiderosis

Comment:

The hepatic atrophy could represent starvation and reduced trophic stimulation to the liver. Hemosiderosis could then represent increased cell turnover in a cachexic state. Alternatively, the liver lesions could represent right sided heart failure. The mineralization/siderocalcinosis in the kidney most likely represents an incidental lesion associated with age and/or cachexia.

Histopathology

All tissues exhibit autolysis.

Skeletal muscle, heart, spleen: No significant lesions.

Kidney: There is moderate generalized tubular mineralization/siderocalcinosis.

Liver: There is moderate periacinar hepatocellular atrophy. Marked hemosiderin is deposited in periportal to midacinar zones.

Parasitology

Fecal Flotation Resulted by: Fiona Downer Verified by: Ann Britton on 05/13/13 @ 3:56 PM

Specimen	ID	Isolate	Result	Level
Feces			Negative	

Bacteriology

Aerobic Culture - Prod Resulted by: Erin Zabek Verified by: Sean Byrne on 05/13/13 @ 11:20 AM

Specimen	ID	Isolate	Result	Level
Liver		Streptococcus sp (non-haemolyt	Positive	Few
Liver		Pantoea sp.	Positive	Few
Feces		E.coli (non-haemolytic)	Positive	2+

Culture - Salmonella Resulted by: Jaime Osei-Appiah Verified by: Sean Byrne on 05/13/13 @ 11:19 AM

Specimen	ID	Isolate	Result	Level
Feces			No Salmonella sp. Isolated	


Molecular Diagnostics

Johne's PCR Resulted by: A Scouras Verified by: Sean Byrne on 05/13/13 @ 1:34 PM

Specimen	ID	Test	Result
Feces		Mycobacterium paratubercu	Negative

History of Communication

Date	To	Description
05/15/13 9:31 AM	Dr. Helen Schwantje - e-mail	bc report sent



Ann Britton, DVM, MSc, PhD
Ann.P.Britton@gov.bc.ca

These results relate only to the animals or items tested.

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END OF REPORT