

DIVERSIFIED ENVIRONMENTAL SERVICES

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SCIENCE AND COMMUNITY ENVIRONMENTAL KNOWLEDGE FUND BOREAL CARIBOU TELEMETRY PROGRAM

FIXED-WING TELEMETRY MONITORING FLIGHT – Aug 18-21, 2014

Date: August 22, 2014

Attention: Brian Thomson
Science and Community Environmental Knowledge Fund
Victoria, BC

Executive Summary

One hundred fifty-two boreal caribou collar frequencies and 20 wolf collar frequencies were scanned during a monthly fixed-wing telemetry monitoring flight conducted on August 18-21, 2014. One hundred forty-four caribou collars were heard transmitting normal VHF signals, 2 were transmitting mortality signals (SCEK074, SCEK147), and 6 were not detected. The majority of the undetected collars could not be approached due to inclement weather. One wolf collar mortality signal was also detected (BW016).

Background

During the winters of 2012-13 and 2013-14, 204 adult boreal caribou were radio-collared in British Columbia's boreal caribou ranges as part of the *British Columbia Boreal Caribou Implementation Plan* (BCIP). On August 18-21, 2014, Diversified Environmental Services (DES) conducted a fixed-wing monitoring flight under contract to the Science and Community Environmental Knowledge Fund (SCEK), on behalf of the Research and Effectiveness Monitoring Board (REMB). Fixed-wing monitoring flights are conducted at monthly intervals throughout the year in order to identify mortality events to be followed up by ground-based mortality investigations and collar recoveries and to track potential long distance seasonal movements of VHF-collared caribou.

Objectives

The objective of the August 2014 monitoring flight was to determine the approximate location and VHF beacon status of all boreal caribou and wolf collars believed to be active in the survey area. These included caribou collars deployed on behalf of SCEK, caribou and wolf collars deployed on behalf of the Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO), and pre-existing collars known to have entered BC's boreal caribou ranges from adjacent jurisdictions.

Methods

The monitoring flight was conducted using a Cessna 180 fixed-wing aircraft equipped with 1 outward-facing directional antenna affixed to each wing strut. Collar frequencies were scanned using Lotek™ STR 1000 and Lotek BioTracker telemetry receivers. The flight was conducted at 700-1,000 m above ground level at an average speed of 160 km/hr. The VHF beacon status of all detected collars was recorded on hard copy forms. In the case of VHF collars (Lotek LMRT4), status was recorded as either normal (60 pulses per minute (ppm)) or mortality mode (120 ppm) and a location (+/- 1 km) was recorded using a hand-held GPS unit. In the case of GPS/satellite collars (ATS Iridium, Vectronic Vertex, and Lotek LifeCycle), additional diagnostic VHF beacon patterns were recorded where applicable. As GPS/satellite collars are programmed to log multiple daily locations with high precision, additional effort to obtain collar locations after VHF signal detection is not necessary. Therefore, waypoints for GPS/satellite collars were typically recorded at the location from which the collar was heard, with

corrections for estimated bearing and distance, unless the VHF beacon status indicated a collar malfunction or mortality, in which case, more precise locations were obtained.

During Day 2 of the August 2014 fixed-wing flight, deteriorating weather conditions prevented access to the Calendar, Fortune, North Kotcho, and East Kotcho Cores. As incoming GPS/satellite data had previously indicated a caribou mortality in the Calendar Core, necessitating a helicopter recovery flight, fixed-wing monitoring was aborted on August 19. The remaining caribou and wolf collars were scanned in conjunction with helicopter mortality investigations conducted on August 21.

Results

One hundred fifty-two caribou collar frequencies were scanned during the August 18-21, 2014 monitoring flight, including 146 SCEK collars (27 ATS Iridium, 31 Vectronic Vertex, 11 Lotek LifeCycle, and 77 Lotek VHF), 2 Alberta VHF collars, and 4 previously-deployed MFLNRO VHF collars. In addition, 20 wolf collar frequencies were scanned during the August 2014 flight (14 Lotek Iridium, 1 Vectronic Vertex, and 5 Lotek VHF).

Results of the August 18-21, 2014 monitoring flight are presented in Table 1. Flight paths searched within and adjacent to each core habitat area are shown in Figure 1. Total flight line distance was 2,927 km (2,247 km by fixed-wing and 680 km by helicopter). Of 152 caribou collar frequencies scanned, 144 normal VHF signals and 2 mortality signals were detected. The remaining 6 caribou collars were not detected. These included one believed to have failed shortly after deployment in May 2013 (SCEK042, Milligan, Iridium), 2 Vertex collars that couldn't be approached due to cloud conditions but whose transmitted GPS data indicated normal activity (SCEK005b; Fortune and SCEK180; Calendar), 2 VHF collars well north of the Northwest Territories border that couldn't be approached due to cloud conditions (SCEK122; Calendar and SCEK125; Calendar), and one Iridium collar that was transmitting normal GPS data but appeared not to be transmitting a VHF signal at the time of the flight (SCEK097; North Kotcho).

August 2014 caribou mortality indications included SCEK147 (Calendar, Vectronic Vertex), which was detected by GPS/satellite data on August 15, and SCEK074 (North Kotcho, Lotek VHF), which was detected by VHF signal on August 21.

At the time of the August 2014 monitoring flight, 4 Calendar caribou were located or assumed present north of the BC/NT border (SCEK122, SCEK125, SCEK126, and SCEK180).

Twenty wolf collar frequencies were scanned during the August 18-21, 2014 monitoring flight, including 14 Lotek Iridium, 1 Vectronic Vertex, and 5 Lotek VHF. Of the 15 GPS/satellite wolf collars scanned, 8 had normal VHF beacon function and an additional 2 had current Iridium data function but had moved north into the Northwest Territories, beyond VHF reception range (BW010 and BW028; Snake Pack). Of the 5 undetected GPS/satellite wolf collars, 1 is suspected to have failed in June 2013 (BW012; Big Arrow Pack), 1 is suspected to have failed in November 2013 (BW017; Elleh Pack) and 3 had not transmitted GPS data since prior to the August flight.

Of the 5 VHF wolf collars scanned, 3 had normal VHF signals, 1 was transmitting in mortality mode (BW016; Snake Pack), and 1 collar, which was assumed to have failed or dispersed soon after deployment in 2013, was not detected (BW007; Snake Pack).

At the time of the August 2014 flight, 2 of 3 GPS-collared wolves from the Snake Pack that had separately dispersed well into the Northwest Territories were still NT residents (BW010, BW02). The third (BW027) was located on the outskirts of Fort Nelson in its original pack territory.

There were no opportunities for First Nations field assistance on this monitoring flight.

Cordially,

A handwritten signature in black ink, appearing to read 'Brad Culling'.

Brad Culling, R.P.Bio
Diversified Environmental Services
Fort St. John, BC

Table 1. VHF signal status and location of boreal caribou and wolf collars detected during the Aug 18-21, 2014 SCEK fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK114	Caribou	Calendar	Calendar	ATS-Irid	50 ppm; no double 6th	21-Aug-14	10	636999	6650008	normal
SCEK184	Caribou	Calendar	Calendar	ATS-Irid	50 ppm; no double 6th	21-Aug-14	10	597509	6620176	normal
SCEK185	Caribou	Calendar	Calendar	Lotek-Lifecycle	50 ppm	21-Aug-14	10	581649	6637850	normal
SCEK183	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	21-Aug-14	10	582408	6624378	normal
SCEK180	Caribou	Calendar	Calendar	Vectr-VertexTD	not located or heard	21-Aug-14	10	610617	6668635	GPS data normal
SCEK136	Caribou	Calendar	Calendar	ATS-Irid	50 ppm; double 6th	21-Aug-14	10	609876	6608064	normal
SCEK181	Caribou	Calendar	Calendar	ATS-Irid	50 ppm; double 6th	21-Aug-14	10	611100	6608645	normal
SCEK135	Caribou	Calendar	Calendar	Vectr-Vertex	50 ppm	21-Aug-14	10	635260	6641731	normal
SCEK119	Caribou	Calendar	Calendar	Vectr-Vertex	50 ppm	21-Aug-14	10	615050	6642817	normal
SCEK123	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	21-Aug-14	10	599491	6625718	normal
SCEK122	Caribou	Calendar	Calendar	Lotek-VHF	not located or heard	21-Aug-14	n/a	n/a	n/a	NWT; not searched
SCEK138	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	21-Aug-14	10	626805	6622402	normal
SCEK137	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	21-Aug-14	10	648540	6620957	normal
SCEK120	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	21-Aug-14	10	609001	6636537	normal
SCEK134	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	21-Aug-14	10	612979	6633355	normal
SCEK112	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	21-Aug-14	10	633684	6638167	normal
SCEK113	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	21-Aug-14	10	611788	6613243	normal
SCEK125	Caribou	Calendar	Calendar	Lotek-VHF	not located or heard	21-Aug-14	n/a	n/a	n/a	NWT; not searched
SCEK126	Caribou	Calendar	RRA-C	ATS-Irid	50 ppm; no double 6th	21-Aug-14	10	595913	6658667	normal
SCEK146	Caribou	Calendar	RRA-D	ATS-Irid	50 ppm; double 6th	21-Aug-14	10	612979	6635355	normal VHF; no sat comm
SCEK147	Caribou	Calendar	RRA-D	Vectr-Vertex	100 ppm	21-Aug-14	10	627137	6653067	MORTALITY
SCEK108	Caribou	Calendar	RRA-D	Lotek-VHF	60 ppm	21-Aug-14	10	629428	6638380	normal
SCEK107	Caribou	Calendar	RRA-D	Lotek-VHF	60 ppm	21-Aug-14	10	612577	6637316	normal
SCEK195	Caribou	Chinchaga	Etthithun	Vectr-VertexTD	42 ppm	18-Aug-14	10	642576	6409442	normal
SCEK036	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; no double 6th	18-Aug-14	10	615699	6366320	normal
SCEK038	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; double 6th	18-Aug-14	11	319864	6304248	normal
SCEK026	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	675810	6295803	normal
SCEK033	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	624784	6344221	normal
SCEK199	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	18-Aug-14	10	666154	6326882	normal
SCEK198	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	18-Aug-14	10	646500	6302022	normal
SCEK196	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	18-Aug-14	10	632838	6361304	normal
SCEK042	Caribou	Chinchaga	Milligan	ATS-Irid	missing; not heard		n/a	n/a	n/a	Failed Iridium and VHF functions
SCEK201	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	18-Aug-14	10	662382	6288469	normal
SCEK197	Caribou	Chinchaga	Milligan	Lotek-Lifecycle	50 ppm	18-Aug-14	10	652730	6368718	normal
AB149.391	Caribou	Chinchaga	Milligan	unknown	60 ppm	18-Aug-14	10	674436	6367358	normal
SCEK040	Caribou	Chinchaga	Milligan	Vectr-Vertex	50 ppm	18-Aug-14	10	637109	6410702	normal
SCEK034	Caribou	Chinchaga	Milligan	Vectr-Vertex	50 ppm	18-Aug-14	10	630410	6366655	normal
SCEK055	Caribou	Chinchaga	Milligan	Vectr-Vertex	50 ppm	18-Aug-14	10	648217	6345122	normal
AB150.470	Caribou	Chinchaga	Milligan	unknown	60 ppm	18-Aug-14	10	664619	6368711	normal
SCEK035	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	629100	6363690	normal
SCEK041	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	647220	6362768	normal
SCEK027	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	674064	6296180	normal
SCEK032	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	664580	6362391	normal
SCEK029	Caribou	Chinchaga	Milligan	Lotek-VHF	61 ppm	18-Aug-14	10	645288	6337078	normal
SCEK052	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	656013	6305024	normal
SCEK053	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	623882	6343315	normal
SCEK030	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	672551	6345006	normal
SCEK058	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	663211	6365906	normal
SCEK054	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	647274	6359403	normal
SCEK057	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	641798	6333700	normal
SCEK059	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	616711	6338541	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the Aug 18-21, 2014 SCEK fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK061	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	661292	6340635	normal
SCEK060	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	18-Aug-14	10	578091	6366991	normal
SCEK171	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	18-Aug-14	10	593588	6419322	normal
SCEK142	Caribou	Chinchaga	RRA-A	Vectr-Vertex	50 ppm	18-Aug-14	10	611633	6454332	normal
SCEK189	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	18-Aug-14	10	607673	6450400	normal
SCEK170	Caribou	Chinchaga	RRA-A	ATS-Irid	50 ppm; no double 6th	18-Aug-14	10	648791	6439597	normal
SCEK048	Caribou	Chinchaga	RRA-A	Lotek-VHF	60 ppm	18-Aug-14	10	601461	6402038	normal
SCEK172	Caribou	Chinchaga	RRA-A	Lotek-Lifecycle	50 ppm	18-Aug-14	10	597655	6437234	normal
SCEK009	Caribou	Fort Nelson	Fort Nelson	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	518289	6550008	normal
SCEK166	Caribou	Fort Nelson	Fort Nelson	Vectr-VertexTD	42 ppm	18-Aug-14	10	516216	6546066	normal
SCEK167	Caribou	Fort Nelson	Fort Nelson	Lotek-Lifecycle	50 ppm	18-Aug-14	10	509484	6553012	normal
BC1014	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	19-Aug-14	10	470426	6589255	normal
SCEK002	Caribou	Maxhamish	Capot-Blanc	ATS-Irid	50 ppm; no double 6th	19-Aug-14	10	474488	6583196	normal
SCEK007	Caribou	Maxhamish	Capot-Blanc	ATS-Irid	50 ppm; double 6th	19-Aug-14	10	441527	6567028	normal
SCEK001	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	19-Aug-14	10	468213	6579256	normal
SCEK076	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	19-Aug-14	10	457635	6576399	normal
SCEK066	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	19-Aug-14	10	441893	6569814	normal
BC1033	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	21-Aug-14	10	510196	6621958	normal
SCEK178	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	21-Aug-14	10	541633	6623728	normal
SCEK085	Caribou	Maxhamish	Fortune	Vectr-Vertex	50 ppm	21-Aug-14	10	530033	6624287	normal
SCEK005b	Caribou	Maxhamish	Fortune	Vectr-VertexTD	not located or heard	21-Aug-14	10	485770	6612299	GPS data normal
SCEK177	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	21-Aug-14	10	535488	6631323	normal
SCEK175	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	21-Aug-14	10	497500	6631447	normal
SCEK179	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	21-Aug-14	10	529196	6637174	normal
SCEK176	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	21-Aug-14	10	483982	6627841	normal
SCEK164	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	21-Aug-14	10	534954	6620825	normal
SCEK078	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	21-Aug-14	n/a	n/a	n/a	normal - heard but not located
SCEK128	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	21-Aug-14	10	521611	6633781	normal
SCEK086	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	21-Aug-14	10	528319	6635128	normal
SCEK129	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	21-Aug-14	10	544067	6631097	normal
SCEK087	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	21-Aug-14	10	539635	6624230	normal
SCEK168	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	18-Aug-14	10	551026	6566678	normal
SCEK003	Caribou	Maxhamish	Kiwigana	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	530875	6569255	normal
SCEK169	Caribou	Maxhamish	Kiwigana	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	499056	6583661	normal
SCEK064	Caribou	Maxhamish	Kiwigana	Lotek-VHF	60 ppm	18-Aug-14	10	500550	6583225	normal
SCEK062	Caribou	Maxhamish	Kiwigana	Lotek-VHF	60 ppm	18-Aug-14	10	525016	6572102	normal
SCEK004	Caribou	Maxhamish	Kiwigana	Lotek-VHF	60 ppm	21-Aug-14	10	511146	6615884	normal
BC1009	Caribou	Maxhamish	Kiwigana	Lotek-VHF	60 ppm	18-Aug-14	10	522554	6571975	normal; old wolf collar
SCEK016	Caribou	Parker	Parker	ATS-Irid	50 ppm; no double 6th	18-Aug-14	10	476753	6517133	normal
SCEK014	Caribou	Parker	Parker	ATS-Irid	50 ppm; no double 6th	18-Aug-14	10	480095	6508056	normal
SCEK194	Caribou	Parker	Parker	Vectr-VertexTD	42 ppm	18-Aug-14	10	487214	6524683	normal
SCEK013	Caribou	Parker	Parker	Lotek-VHF	60 ppm	18-Aug-14	10	490959	6514136	normal
SCEK010	Caribou	Parker	Parker	Lotek-VHF	60 ppm	18-Aug-14	10	486651	6499414	normal
SCEK012	Caribou	Parker	Parker	Lotek-VHF	60 ppm	18-Aug-14	10	489222	6509938	normal
SCEK015	Caribou	Parker	Parker	Lotek-VHF	60 ppm	18-Aug-14	10	485803	6522331	normal
BC1001	Caribou	Parker	Parker	Lotek-VHF	60 ppm	18-Aug-14	10	493093	6509497	normal
SCEK044	Caribou	Prophet	Prophet	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	570253	6449208	normal
SCEK161	Caribou	Prophet	Prophet	ATS-Irid	50 ppm; no double 6th	18-Aug-14	10	554387	6449984	normal
SCEK143	Caribou	Prophet	Prophet	Vectr-Vertex	50 ppm	18-Aug-14	10	554400	6451164	normal
SCEK144	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	18-Aug-14	10	570259	6443267	normal
SCEK051	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	18-Aug-14	10	544089	6481256	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the Aug 18-21, 2014 SCEK fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK049	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	18-Aug-14	10	554463	6447474	normal
SCEK045	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	18-Aug-14	10	536167	6460957	normal
SCEK020	Caribou	Snake-Sahtaneh	Clarke	ATS-Irid	50 ppm; no double 6th	18-Aug-14	10	585787	6468239	normal
SCEK193	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	18-Aug-14	10	563705	6500750	normal
SCEK192	Caribou	Snake-Sahtaneh	Clarke	Lotek-Lifecycle	50 ppm	18-Aug-14	10	608001	6489258	normal
SCEK191	Caribou	Snake-Sahtaneh	Clarke	Lotek-Lifecycle	50 ppm	18-Aug-14	10	600409	6487128	normal
SCEK145	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	21-Aug-14	10	591077	6543877	normal
SCEK068	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	19-Aug-14	10	565626	6529306	normal
SCEK150	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	609650	6491854	normal
SCEK148	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	613087	6485197	normal
SCEK153	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	565035	6475704	normal
SCEK152	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	559374	6499075	normal
SCEK019	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	568182	6510693	normal
SCEK021	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	554895	6503740	normal
SCEK025	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	548323	6494176	normal
SCEK024	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	570827	6500410	normal
SCEK149	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	576316	6501566	normal
SCEK156	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	540234	6499076	normal
SCEK157	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	561862	6497367	normal
SCEK070	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	18-Aug-14	10	566994	6500014	normal
SCEK100	Caribou	Snake-Sahtaneh	East Kotcho	ATS-Irid	50 ppm; double 6th	21-Aug-14	10	638518	6565022	normal
SCEK103	Caribou	Snake-Sahtaneh	East Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	630618	6557315	normal
SCEK102	Caribou	Snake-Sahtaneh	East Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	624517	6555071	normal
SCEK105	Caribou	Snake-Sahtaneh	East Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	636069	6569324	normal
SCEK182	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	21-Aug-14	10	598397	6587720	normal
SCEK188	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	21-Aug-14	10	604535	6570648	normal
SCEK186	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	21-Aug-14	10	603424	6572328	normal
SCEK110	Caribou	Snake-Sahtaneh	North Kotcho	ATS-Irid	50 ppm; double 6th	21-Aug-14	10	605875	6566440	normal
SCEK204	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-Lifecycle	50 ppm	21-Aug-14	10	612610	6562447	normal
SCEK187	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-Lifecycle	50 ppm	21-Aug-14	10	606741	6561831	normal
SCEK111	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-Vertex	50 ppm	21-Aug-14	10	592354	6575158	normal
SCEK074	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	120 ppm	21-Aug-14	10	610269	6574469	MORTALITY
SCEK089	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	599133	6554718	normal
SCEK088	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	630434	6559440	normal
SCEK090	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	603243	6583276	normal
SCEK092	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	607335	6580804	normal
SCEK096	Caribou	Snake-Sahtaneh	Paradise	Lotek-VHF	60 ppm	21-Aug-14	10	606498	6563959	normal
SCEK203	Caribou	Snake-Sahtaneh	Tsea	Vectr-VertexTD	42 ppm	18-Aug-14	10	556858	6606531	normal
SCEK079	Caribou	Snake-Sahtaneh	Tsea	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	524947	6603437	normal
SCEK131	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	18-Aug-14	10	553152	6597461	normal
SCEK081	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	18-Aug-14	10	555480	6604150	normal
SCEK132	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	18-Aug-14	10	550292	6595996	normal
SCEK082	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	18-Aug-14	10	558314	6592607	normal
SCEK127	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	18-Aug-14	10	555921	6596388	normal
SCEK173	Caribou	Snake-Sahtaneh	West Kotcho	ATS-Irid	50 ppm; double 6th	18-Aug-14	10	583050	6520672	normal
SCEK071	Caribou	Snake-Sahtaneh	West Kotcho	Vectr-Vertex	50 ppm	21-Aug-14	10	590992	6547605	normal
SCEK097	Caribou	Snake-Sahtaneh	West Kotcho	ATS-Irid	no VHF signal	21-Aug-14	10	623280	6580232	GPS data active
SCEK091	Caribou	Snake-Sahtaneh	West Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	610701	6565473	normal
SCEK094	Caribou	Snake-Sahtaneh	West Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	579095	6531764	normal
SCEK073	Caribou	Snake-Sahtaneh	West Kotcho	Lotek-VHF	60 ppm	21-Aug-14	10	593255	6544977	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the Aug 18-21, 2014 SCEK fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
BW002	Wolf	Chinchaga	Big Arrow	Lotek-VHF	60 ppm	18-Aug-14	10	611309	6334128	normal
BW011	Wolf	Chinchaga	Big Arrow	Lotek-Irid	40 ppm	18-Aug-14	10	611309	6334128	normal
BW012	Wolf	Chinchaga	Big Arrow	Lotek-Irid	not heard		n/a	n/a	n/a	VHF failed; no data since Jun 30, 13
BW008	Wolf	Fort Nelson	Tsimeh	Lotek-Irid	not heard	19-Aug-14	n/a	n/a	n/a	VHF not detected
BW001	Wolf	Fort Nelson	Tsimeh	Lotek-VHF	60 ppm	19-Aug-14	10	496173	6548021	normal
BW009	Wolf	Fort Nelson	Tsimeh	Lotek-Irid	50 ppm	19-Aug-14	10	496173	6548021	normal
BW014	Wolf	Fort Nelson	Tsimeh	Lotek-Irid	50 ppm	19-Aug-14	10	496173	6548021	normal
BW019	Wolf	Parker	Parker	Lotek-Irid	not heard		n/a	n/a	n/a	VHF not detected; last data Jun 25, 14.
BW021	Wolf	Snake-Sahtaneh	Clarke	Lotek-Irid	not heard		10	n/a	n/a	VHF not detected; last data Jun 30, 14.
BW031	Wolf	Snake-Sahtaneh	Clarke	Lotek-Irid	50 ppm	18-Aug-14	10	548653	6504820	normal
BW030	Wolf	Snake-Sahtaneh	Clarke	Lotek-Irid	50 ppm	18-Aug-14	10	541400	6503604	normal
BW017	Wolf	Snake-Sahtaneh	Elleh	Lotek-Irid	not heard		10	n/a	n/a	VHF not detected; last data Oct 17, 13.
BW024	Wolf	Snake-Sahtaneh	Kwokullie	Lotek-Irid	50 ppm	21-Aug-14	10	618476	6597745	normal
BW025	Wolf	Snake-Sahtaneh	Kwokullie	Vectronic	50 ppm	21-Aug-14	10	622475	6587120	normal
BW026	Wolf	Snake-Sahtaneh	Kwokullie	Lotek-VHF	60 ppm	21-Aug-14	10	618476	6597745	normal
BW007	Wolf	Snake-Sahtaneh	Snake	Lotek-VHF	not heard		n/a	n/a	n/a	not detected; missing since deployment
BW010	Wolf	Snake-Sahtaneh	Snake	Lotek-Irid	not heard		n/a	n/a	n/a	dispersal to NWT; Irid data current
BW027	Wolf	Snake-Sahtaneh	Snake	Lotek-Irid	50 ppm	19-Aug-14	10	519802	6516844	normal
BW028	Wolf	Snake-Sahtaneh	Snake	Lotek-Irid	not heard		n/a	n/a	n/a	dispersal to NWT; Irid data current
BW016	Wolf	Snake-Sahtaneh	Snake	Lotek-VHF	120 ppm	21-Aug-14	10	544850	6532034	MORTALITY

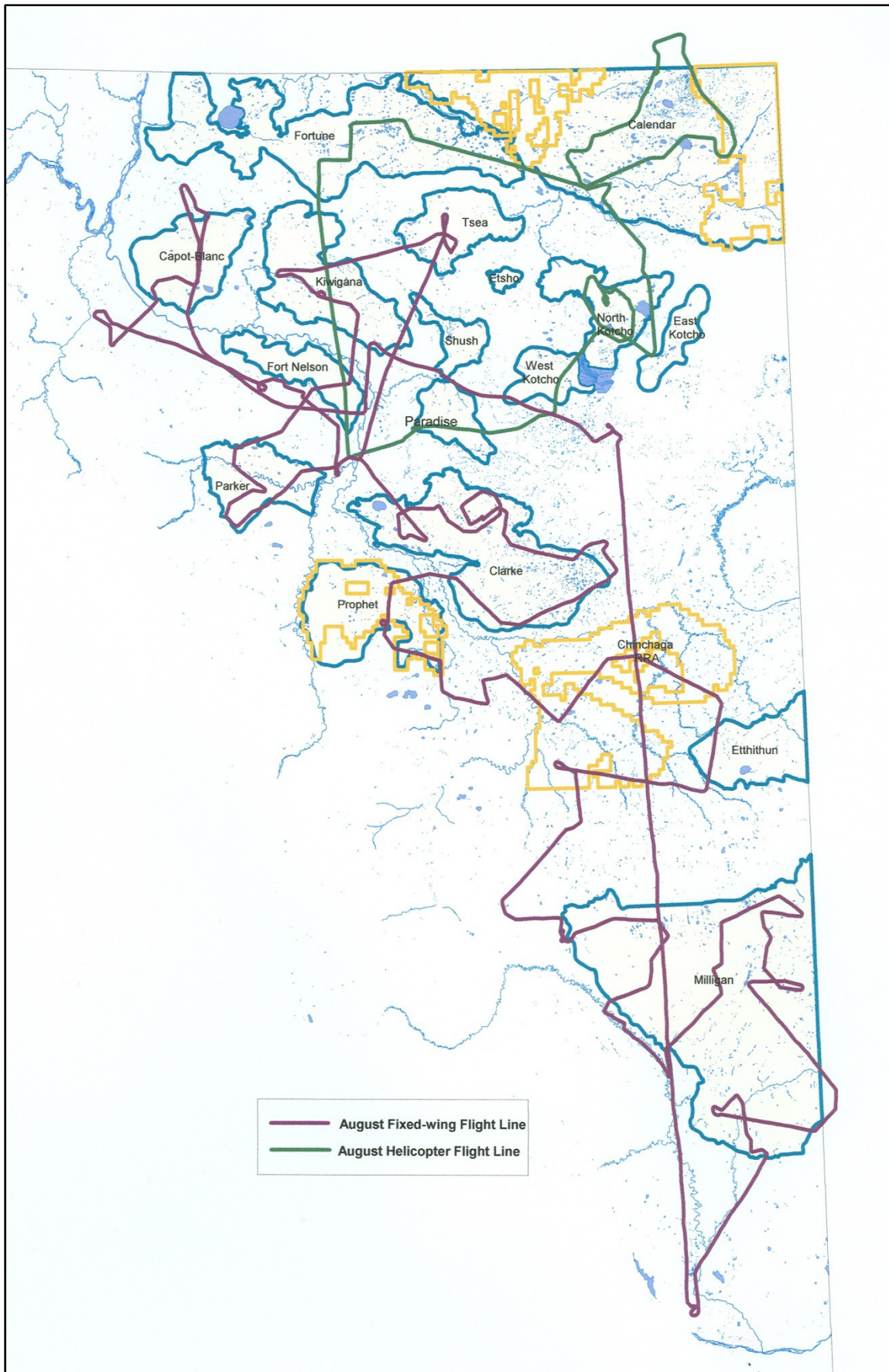


Figure 1. Flight paths flown during the August 18-21, 2014 SCEK boreal caribou and wolf telemetry monitoring flight.