

DIVERSIFIED ENVIRONMENTAL SERVICES

BOX 6263, FORT ST. JOHN, B.C. V1J 4H7 PHONE/FAX (250) 787-9101

SCIENCE AND COMMUNITY ENVIRONMENTAL KNOWLEDGE FUND BOREAL CARIBOU TELEMETRY PROGRAM

FIXED-WING TELEMETRY MONITORING FLIGHT – Dec 22-23, 2014

Date: Dec 24, 2014

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

Executive Summary

One hundred fifty-eight boreal caribou collar frequencies and 17 wolf collar frequencies were scanned during a monthly fixed-wing telemetry monitoring flight conducted on December 22-23, 2014. One hundred forty-five caribou collars were heard transmitting normal VHF signals and 5 caribou collars were transmitting VHF signal patterns indicating their release mechanisms had activated on low voltage conditions. No caribou collars were heard transmitting mortality signals. The remaining 8 caribou collars were not detected. These included 4 that are believed to have failed and 4 that could not be over-flown due to localized poor weather. No wolf mortality signals were detected, although several GPS wolf collars are presumed to have reached the end of their battery lives.

Background

Between December 17, 2012 and December 12, 2014, 217 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 December 22-23, 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 December 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.

Results

One hundred fifty-eight caribou collar frequencies were scanned during the December 2014 monitoring flight, including 152 SCEK collars (20 ATS Iridium, 46 Vectronic Vertex, 12 Lotek LifeCycle, and 74 Lotek VHF), 2 Alberta VHF collars, and 4 previously-deployed MFLNRO VHF collars. In addition, 17 wolf collar frequencies were scanned during the December flight (13 Lotek Iridium and 4 Lotek VHF).

Results of the December 22-23, 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 2,804 km. Of 158 caribou collar frequencies scanned, 145 normal VHF signals were detected and 5 ATS Iridium collars were transmitting VHF signal patterns indicating their release mechanisms had activated on low voltage conditions. In all 5 cases, diagnostic signal patterns suggested that the collars had failed to actually detach from the animal upon activation. The remaining 8 caribou collars were not detected during the December 2014 flight. These included 4 collars that are believed to have failed and are no longer trackable (Milligan ATS Iridium SCEK042 - failed in May 2013; Calendar ATS Iridium SCEK184 - no data received since September 2014; Calendar ATS Iridium SCEK114 - no data received since November 2014; and Parker MFLNRO VHF BC1001 - believed to have exceeded its normal battery life). The 4 remaining collars are assumed to be operational but could not be over-flown during the December flight due to unsuitable localized weather conditions.

Four ATS Iridium collars heard transmitting atypical VHF signal patterns in November were re-captured and replaced in December prior to the December fixed-wing monitoring flight (SCEK097b, SCEK100b, SCEK110b, SCEK146b).

Seventeen wolf collar frequencies were scanned during the December 2014 monitoring flight, including 13 Lotek Iridium and 4 Lotek VHF. Of the 13 GPS/satellite wolf collars scanned, 4 had normal VHF beacon function and the remaining 9 were not detected. Of these 9, two had previously dispersed to the Northwest Territories beyond VHF range; one stopped transmitting GPS data on August 15, 2014 (BW010; Snake Pack) and the other is believed to have died in early September (BW028; Snake Pack). The remaining 7 undetected GPS collars have ceased GPS data transmission and are nearing the end of their expected 2-year battery life.

Of the 4 VHF wolf collars scanned, 2 had normal VHF signals, a third is assumed to have failed or the wolf dispersed soon after deployment in 2013 (BW007; Snake Pack), and the fourth is assumed operational but could not be detected due to weather conditions (BW002; Big Arrow Pack).

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

Cordially,



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 Dec 22-23, 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	not heard	23-Dec-14	n/a	n/a	n/a	No VHF; last data Nov 27 14
SCEK184	Caribou	Calendar	Calendar	ATS-Irid	not heard	23-Dec-14	n/a	n/a	n/a	No VHF; last data Sep 23 14
SCEK185	Caribou	Calendar	Calendar	Lotek-Lifecycle	50 ppm	23-Dec-14	10	591830	6635731	normal
SCEK183	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	23-Dec-14	10	642734	6605236	normal
SCEK180	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	23-Dec-14	10	635963	6612564	normal
SCEK136	Caribou	Calendar	Calendar	ATS-Irid	50 ppm; no double 6th	23-Dec-14	10	618564	6614238	normal
SCEK181	Caribou	Calendar	Calendar	ATS-Irid	50 ppm; double 6th	23-Dec-14	10	644013	6607291	normal
SCEK135	Caribou	Calendar	Calendar	Vectr-Vertex	50 ppm	23-Dec-14	10	614555	6577383	normal
SCEK119	Caribou	Calendar	Calendar	Vectr-Vertex	50 ppm	23-Dec-14	10	613496	6635755	normal
SCEK146b	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	23-Dec-14	10	647920	6628513	normal
SCEK123	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	23-Dec-14	10	n/a	n/a	normal; heard but not located - weather
SCEK122	Caribou	Calendar	Calendar	Lotek-VHF	not heard	23-Dec-14	n/a	n/a	n/a	not heard - weather
SCEK138	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	23-Dec-14	10	n/a	n/a	normal; heard but not located - weather
SCEK137	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	23-Dec-14	10	628667	6625311	normal
SCEK120	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	23-Dec-14	10	622876	6617614	normal
SCEK134	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	23-Dec-14	10	n/a	n/a	normal; heard but not located - weather
SCEK112	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	23-Dec-14	10	n/a	n/a	normal; heard but not located - weather
SCEK113	Caribou	Calendar	Calendar	Lotek-VHF	60 ppm	23-Dec-14	10	n/a	n/a	normal; heard but not located - weather
SCEK125	Caribou	Calendar	Calendar	Lotek-VHF	not heard	23-Dec-14	n/a	n/a	n/a	not heard - weather
SCEK126	Caribou	Calendar	RRA-C	ATS-Irid	50 ppm; no double 6th	23-Dec-14	10	587183	6618012	normal
SCEK108	Caribou	Calendar	RRA-D	Lotek-VHF	60 ppm	23-Dec-14	10	n/a	n/a	normal; heard but not located - weather
SCEK107	Caribou	Calendar	RRA-D	Lotek-VHF	60 ppm	23-Dec-14	10	626739	6647440	normal
SCEK195	Caribou	Chinchaga	Etthithun	Vectr-VertexTD	42 ppm	22-Dec-14	10	649607	6408001	normal
SCEK036	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; no double 6th	22-Dec-14	10	615212	6360843	normal
SCEK038	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; double 6th	22-Dec-14	10	668826	6297418	normal
SCEK026	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; double 6th	22-Dec-14	10	662541	6303327	normal
SCEK033	Caribou	Chinchaga	Milligan	ATS-Irid	50 ppm; no double 6th	22-Dec-14	10	656931	6317855	normal
SCEK199	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	22-Dec-14	10	666820	6363612	normal
SCEK198	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	22-Dec-14	10	635407	6330841	normal
SCEK196	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	22-Dec-14	10	627460	6349273	normal
SCEK042	Caribou	Chinchaga	Milligan	ATS-Irid	missing; not heard	22-Dec-14	n/a	n/a	n/a	Failed Iridium and VHF functions
SCEK201	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	22-Dec-14	10	657741	6293343	normal
SCEK197	Caribou	Chinchaga	Milligan	Lotek-Lifecycle	50 ppm	22-Dec-14	10	642529	6331005	normal
AB149.391	Caribou	Chinchaga	Milligan	unknown	not heard	22-Dec-14	n/a	n/a	n/a	VHF not detected
SCEK040	Caribou	Chinchaga	Milligan	Vectr-Vertex	50 ppm	22-Dec-14	10	649212	6401113	normal
SCEK034	Caribou	Chinchaga	Milligan	Vectr-Vertex	50 ppm	22-Dec-14	10	637384	6335115	normal
SCEK055	Caribou	Chinchaga	Milligan	Vectr-Vertex	50 ppm	22-Dec-14	10	658120	6341897	normal
AB150.470	Caribou	Chinchaga	Milligan	unknown	60 ppm	22-Dec-14	10	668604	6333424	normal
SCEK035	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	618238	6358069	normal
SCEK041	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	652671	6337294	normal
SCEK027	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	660507	6301330	normal
SCEK032	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	667317	6358414	normal
SCEK029	Caribou	Chinchaga	Milligan	Lotek-VHF	61 ppm	22-Dec-14	10	646628	6331295	normal
SCEK052	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	655900	6316414	normal
SCEK053	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	644582	6346532	normal
SCEK030	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	657675	6354059	normal
SCEK058	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	665300	6340551	normal
SCEK054	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	650902	6334340	normal
SCEK057	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	669441	6361958	normal
SCEK059	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	659948	6342561	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the Dec 22-23, 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	22-Dec-14	10	662532	6340251	normal
SCEK060	Caribou	Chinchaga	Milligan	Lotek-VHF	60 ppm	22-Dec-14	10	616040	6363807	normal
SCEK171	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	22-Dec-14	10	630475	6435187	normal
SCEK142	Caribou	Chinchaga	RRA-A	Vectr-Vertex	50 ppm	22-Dec-14	10	630107	6453647	normal
SCEK189	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	22-Dec-14	10	619769	6453222	normal
SCEK170	Caribou	Chinchaga	RRA-A	ATS-Irid	50 ppm; double 6th	22-Dec-14	10	621205	6462789	normal
SCEK213	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	22-Dec-14	10	642735	6439404	normal
SCEK215	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	22-Dec-14	10	594295	6453403	normal
SCEK048	Caribou	Chinchaga	RRA-A	Lotek-VHF	60 ppm	22-Dec-14	10	598295	6451333	normal
SCEK216	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	22-Dec-14	10	626335	6451989	normal
SCEK172	Caribou	Chinchaga	RRA-A	Lotek-Lifecycle	50 ppm	22-Dec-14	10	640334	6466299	normal
SCEK214	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	22-Dec-14	10	630534	6435189	normal
SCEK009	Caribou	Fort Nelson	Fort Nelson	ATS-Irid	27 ppm; double 3rd	23-Dec-14	10	502002	6556083	release activated but collar moving
SCEK166	Caribou	Fort Nelson	Fort Nelson	Vectr-VertexTD	42 ppm	23-Dec-14	10	499828	6554750	normal
SCEK167	Caribou	Fort Nelson	Fort Nelson	Lotek-Lifecycle	50 ppm	23-Dec-14	10	513370	6553482	normal
BC1014	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	23-Dec-14	10	467415	6579519	normal
SCEK007	Caribou	Maxhamish	Capot-Blanc	ATS-Irid	27 ppm; double 3rd	23-Dec-14	10	474235	6577194	release activated but collar moving
SCEK001	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	23-Dec-14	10	467671	6574766	normal
SCEK076	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	23-Dec-14	10	469791	6576477	normal
SCEK066	Caribou	Maxhamish	Capot-Blanc	Lotek-VHF	60 ppm	23-Dec-14	10	470631	6577420	normal
BC1033	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	23-Dec-14	10	535198	6622012	normal
SCEK178	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	23-Dec-14	10	562007	6604055	normal
SCEK085	Caribou	Maxhamish	Fortune	Vectr-Vertex	50 ppm	23-Dec-14	10	549684	6607115	normal
SCEK005b	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	23-Dec-14	10	533909	6619335	normal
SCEK177	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	23-Dec-14	10	529957	6630989	normal
SCEK208	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	23-Dec-14	10	482874	6623946	normal
SCEK175	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	23-Dec-14	10	550484	6606939	normal
SCEK205	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	23-Dec-14	10	539196	6617607	normal
SCEK207	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	23-Dec-14	10	535213	6628290	normal
SCEK179	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	23-Dec-14	10	555007	6605935	normal
SCEK176	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	23-Dec-14	10	481830	6623899	normal
SCEK164	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	23-Dec-14	10	529159	6629531	normal
SCEK078	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	23-Dec-14	10	472252	6620067	normal
SCEK128	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	23-Dec-14	10	528010	6628848	normal
SCEK086	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	23-Dec-14	10	552388	6606523	normal
SCEK206	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	23-Dec-14	10	535083	6621024	normal
SCEK129	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	23-Dec-14	10	534573	6629227	normal
SCEK087	Caribou	Maxhamish	Fortune	Lotek-VHF	60 ppm	23-Dec-14	10	553476	6607284	normal
SCEK168	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	23-Dec-14	10	531096	6561580	normal
SCEK169	Caribou	Maxhamish	Kiwigana	ATS-Irid	50 ppm; double 6th	23-Dec-14	10	516901	6572951	normal
SCEK211	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	23-Dec-14	10	522094	6569310	normal
SCEK064	Caribou	Maxhamish	Kiwigana	Lotek-VHF	60 ppm	23-Dec-14	10	523925	6569438	normal
SCEK062	Caribou	Maxhamish	Kiwigana	Lotek-VHF	60 ppm	23-Dec-14	10	527895	6566577	normal
SCEK210	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	23-Dec-14	10	524398	6574409	normal
SCEK004	Caribou	Maxhamish	Kiwigana	Lotek-VHF	60 ppm	23-Dec-14	10	473696	6618309	normal
BC1009	Caribou	Maxhamish	Kiwigana	Lotek-VHF	not heard	23-Dec-14	n/a	n/a	n/a	VHF not detected
SCEK016	Caribou	Parker	Parker	ATS-Irid	27 ppm; double 3rd	22-Dec-14	10	490798	6519715	release activated but collar moving
SCEK014	Caribou	Parker	Parker	ATS-Irid	27 ppm; double	22-Dec-14	10	498612	6519880	release activated but failed
SCEK194	Caribou	Parker	Parker	Vectr-VertexTD	42 ppm	22-Dec-14	10	489233	6522318	normal
SCEK010	Caribou	Parker	Parker	Lotek-VHF	60 ppm	22-Dec-14	10	489115	6521478	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the Dec 22-23, 2014 SCEK fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK012	Caribou	Parker	Parker	Lotek-VHF	60 ppm	22-Dec-14	10	489215	6521578	normal
SCEK015	Caribou	Parker	Parker	Lotek-VHF	60 ppm	22-Dec-14	10	490865	6522879	normal
BC1001	Caribou	Parker	Parker	Lotek-VHF	not heard	22-Dec-14	n/a	n/a	n/a	VHF not detected, assumed failed
SCEK161	Caribou	Prophet	Prophet	ATS-Irid	50 ppm; no double 6th	22-Dec-14	10	559040	6459545	normal
SCEK143	Caribou	Prophet	Prophet	Vectr-Vertex	50 ppm	22-Dec-14	10	555248	6448332	normal
SCEK144	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	22-Dec-14	10	569429	6444666	normal
SCEK217	Caribou	Prophet	Prophet	Vectr-VertexTD	42 ppm	22-Dec-14	10	556832	6465103	normal
SCEK051	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	22-Dec-14	10	556030	6461246	normal
SCEK049	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	22-Dec-14	10	574328	6421385	normal
SCEK045	Caribou	Prophet	Prophet	Lotek-VHF	60 ppm	22-Dec-14	10	554623	6444290	normal
SCEK020	Caribou	Snake-Sahtaneh	Clarke	ATS-Irid	50 ppm; no double 6th	22-Dec-14	10	585837	6485041	normal
SCEK193	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	22-Dec-14	10	559460	6503093	normal
SCEK212	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	22-Dec-14	10	557569	6513199	normal
SCEK192	Caribou	Snake-Sahtaneh	Clarke	Lotek-Lifecycle	50 ppm	22-Dec-14	10	613821	6489217	normal
SCEK191	Caribou	Snake-Sahtaneh	Clarke	Lotek-Lifecycle	50 ppm	22-Dec-14	10	607511	6485199	normal
SCEK145	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	557152	6505419	normal
SCEK068	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	567992	6497765	normal
SCEK150	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	611758	6482469	normal
SCEK148	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	596674	6479936	normal
SCEK153	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	542600	6502536	normal
SCEK152	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	584429	6484730	normal
SCEK019	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	560912	6504481	normal
SCEK021	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	550341	6503925	normal
SCEK025	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	559740	6502370	normal
SCEK024	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	561872	6502571	normal
SCEK149	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	578251	6487306	normal
SCEK156	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	576661	6498828	normal
SCEK157	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	564433	6502815	normal
SCEK070	Caribou	Snake-Sahtaneh	Clarke	Lotek-VHF	60 ppm	22-Dec-14	10	567386	6504149	normal
SCEK110b	Caribou	Snake-Sahtaneh	East Kotcho	Lotek-Lifecycle	50 ppm	23-Dec-14	10	611369	6558157	normal
SCEK103	Caribou	Snake-Sahtaneh	East Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	635047	6560041	normal
SCEK102	Caribou	Snake-Sahtaneh	East Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	622758	6562545	normal
SCEK105	Caribou	Snake-Sahtaneh	East Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	636334	6570079	normal
SCEK182	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	23-Dec-14	10	624797	6580163	normal
SCEK188	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	23-Dec-14	10	614646	6576639	normal
SCEK186	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	23-Dec-14	10	609154	6565558	normal
SCEK204	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-Lifecycle	50 ppm	23-Dec-14	10	640953	6568503	normal
SCEK097b	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	23-Dec-14	10	616940	6574278	normal
SCEK187	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-Lifecycle	50 ppm	23-Dec-14	10	627701	6542176	normal
SCEK111	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-Vertex	50 ppm	23-Dec-14	10	605018	6568750	normal
SCEK100b	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	23-Dec-14	10	612021	6558715	normal
SCEK089	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	n/a	n/a	normal; heard but not located - weather
SCEK088	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	622350	6563243	normal
SCEK090	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	616986	6564395	normal
SCEK092	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	623264	6578592	normal
SCEK096	Caribou	Snake-Sahtaneh	Paradise	Lotek-VHF	60 ppm	23-Dec-14	10	631095	6557396	normal
SCEK203	Caribou	Snake-Sahtaneh	Tsea	Vectr-VertexTD	42 ppm	23-Dec-14	10	565207	6603590	normal
SCEK079	Caribou	Snake-Sahtaneh	Tsea	ATS-Irid	27 ppm; double 3rd	23-Dec-14	10	558071	6591790	release activated but collar moving
SCEK131	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	23-Dec-14	10	557955	6601135	normal
SCEK081	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	23-Dec-14	10	558101	6599121	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the Dec 22-23, 2014 SCEK fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK132	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	23-Dec-14	10	557383	6595217	normal
SCEK082	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	23-Dec-14	10	566643	6595895	normal
SCEK127	Caribou	Snake-Sahtaneh	Tsea	Lotek-VHF	60 ppm	23-Dec-14	10	567703	6599058	normal
SCEK173	Caribou	Snake-Sahtaneh	West Kotcho	ATS-Irid	50 ppm; no double 6th	23-Dec-14	10	630050	6571535	normal
SCEK071	Caribou	Snake-Sahtaneh	West Kotcho	Vectr-Vertex	50 ppm	23-Dec-14	10	607667	6557494	normal
SCEK209	Caribou	Snake-Sahtaneh	West Kotcho	Vectr-VertexTD	42 ppm	23-Dec-14	10	590311	6553074	normal
SCEK091	Caribou	Snake-Sahtaneh	West Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	606962	6570492	normal
SCEK073	Caribou	Snake-Sahtaneh	West Kotcho	Lotek-VHF	60 ppm	23-Dec-14	10	598067	6553919	normal
BW002	Wolf	Chinchaga	Big Arrow	Lotek-VHF	not heard	23-Dec-14	n/a	n/a	n/a	VHF not detected
BW011	Wolf	Chinchaga	Big Arrow	Lotek-Irid	not heard	23-Dec-14	n/a	n/a	n/a	VHF not detected; no data since deployment
BW012	Wolf	Chinchaga	Big Arrow	Lotek-Irid	not heard	23-Dec-14	10	n/a	n/a	VHF failed; last data Nov 21, 14
BW008	Wolf	Fort Nelson	Tsimeh	Lotek-Irid	not heard	23-Dec-14	n/a	n/a	n/a	VHF not detected; last data Aug 07 14
BW001	Wolf	Fort Nelson	Tsimeh	Lotek-VHF	60 ppm	23-Dec-14	10	508552	6558132	normal
BW009	Wolf	Fort Nelson	Tsimeh	Lotek-Irid	not heard	23-Dec-14	n/a	n/a	n/a	VHF not detected; last data Sep 27 14
BW014	Wolf	Fort Nelson	Tsimeh	Lotek-Irid	50 ppm	23-Dec-14	10	508552	6558132	normal
BW019	Wolf	Parker	Parker	Lotek-Irid	not heard	22-Dec-14	n/a	n/a	n/a	VHF not detected; last data Jun 25 14.
BW021	Wolf	Snake-Sahtaneh	Clarke	Lotek-Irid	not heard	22-Dec-14	n/a	n/a	n/a	VHF not detected; last data Jun 30 14.
BW030	Wolf	Snake-Sahtaneh	Clarke	Lotek-Irid	50 ppm	23-Dec-14	10	522938	6521892	normal
BW017	Wolf	Snake-Sahtaneh	Elleh	Lotek-Irid	not heard	22-Dec-14	10	n/a	n/a	VHF not detected; last data Oct 17, 13.
BW024	Wolf	Snake-Sahtaneh	Kwokullie	Lotek-Irid	50 ppm	23-Dec-14	10	628294	6574936	normal
BW026	Wolf	Snake-Sahtaneh	Kwokullie	Lotek-VHF	60 ppm	23-Dec-14	10	628294	6574936	normal
BW007	Wolf	Snake-Sahtaneh	Snake	Lotek-VHF	not heard	22-Dec-14	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; last data Aug 15 14
BW027	Wolf	Snake-Sahtaneh	Snake	Lotek-Irid	50 ppm	23-Dec-14	10	526829	6524676	normal
BW028	Wolf	Snake-Sahtaneh	Snake	Lotek-Irid	not heard		n/a	n/a	n/a	dispersal to NT; no movement since Sep 06 14

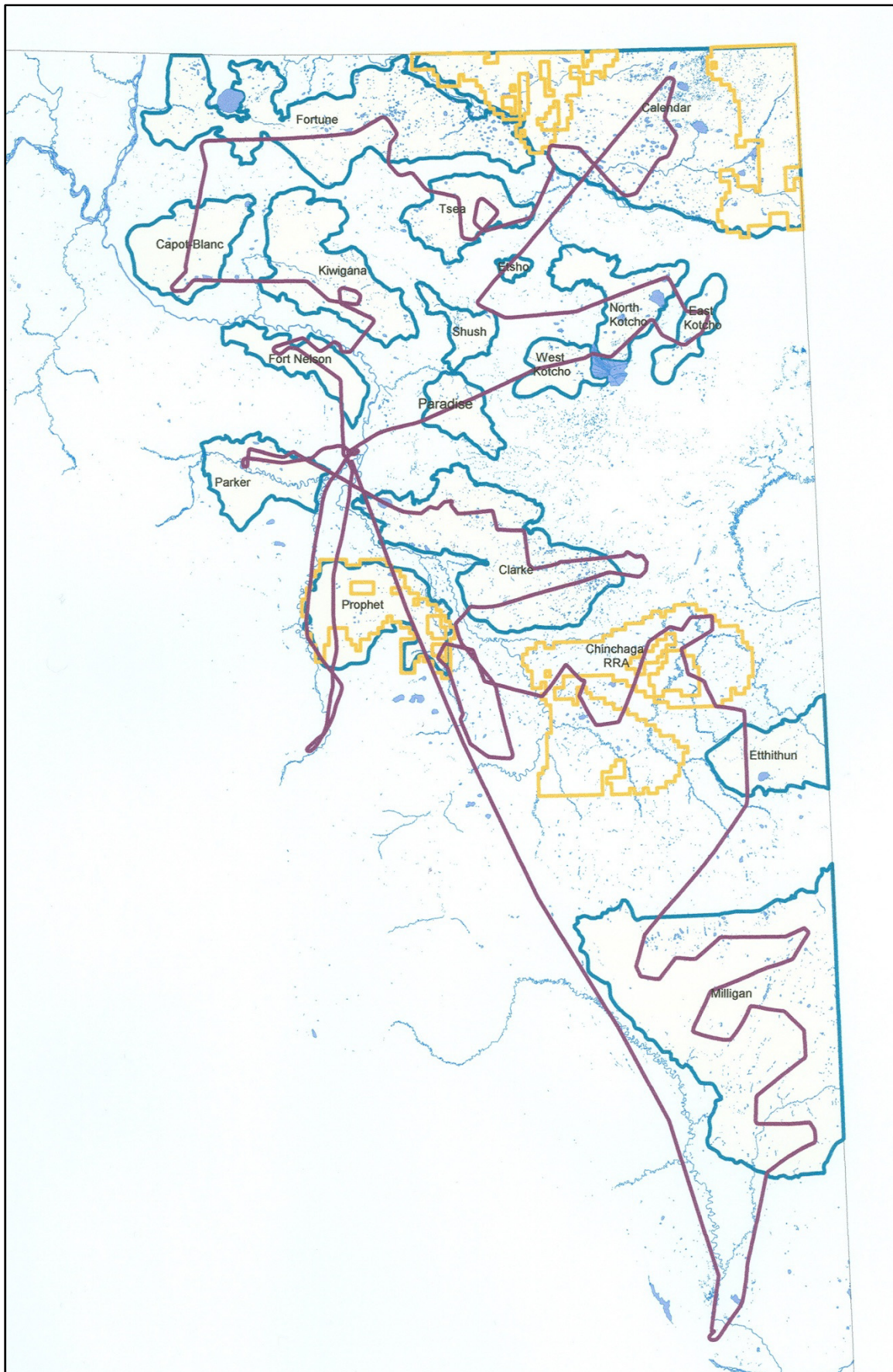


Figure 1. Flight paths flown during the December 22-23, 2014 SCEK boreal caribou and wolf telemetry monitoring flight.