

DIVERSIFIED ENVIRONMENTAL SERVICES

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BC OIL AND GAS RESEARCH AND INNOVATION SOCIETY BOREAL CARIBOU TELEMTRY PROGRAM

FIXED-WING TELEMTRY MONITORING FLIGHT – May 31-June 1, 2016

Date: June 15, 2016

Attention: Brian Thomson
BC Oil and Gas Research and Innovation Society
Victoria, BC

Executive Summary

One hundred fifty boreal caribou collar frequencies and 22 wolf collar frequencies were scanned during a monthly fixed-wing telemetry monitoring flight conducted on May 31 and June 1, 2016. One hundred forty-two caribou collars were heard transmitting normal VHF signals and 1 mortality signal was detected. The VHF beacons of the remaining 7 caribou collars were not detected. These included 1 SCEK ATS Iridium collar that has ceased Iridium data transmission and is believed to have failed (Kotcho male SCEK173), 1 MFLNRO VHF collar that may be nearing the end of its battery life (Capot-Blanc BC1014), 1 SCEK VHF collar originally collared in the Kiwigana core and most recently heard in Tsea core (Kiwigana SCEK064), and 4 SCEK Vectronic GPS collars whose GPS data transmissions have ceased (Milligan SCEK034, SCEK055, Fortune SCEK085, SCEK236).

No wolf mortality indications were detected during the May-June flight.

Background

Between December 17, 2012 and March 31, 2016, 240 individual 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 May 31 and June 01, 2016, Diversified Environmental Services (DES) conducted a fixed-wing telemetry monitoring flight under contract to the BC Oil and Gas Research and Innovation Society (OGRIS; formerly 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, as well as to track potential long distance seasonal movements of VHF-collared caribou.

Objectives

The objective of the May 31-June 1, 2016 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 and wolf collars deployed on behalf of SCEK, caribou collars deployed on behalf of MFLNRO, wolf collars deployed for a research program funded by Nexen Inc., 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 700-1,200 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. 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 caribou collar frequencies were scanned during the May 31-June 1, 2016 monitoring flight, including 147 SCEK collars (1 ATS Iridium, 75 Vectronic Vertex, 10 Lotek LifeCycle, and 61 Lotek VHF), 2 previously-deployed MFLNRO VHF collars, and 1 VHF collar of unknown origin. In addition, 22 wolf collar frequencies were scanned during the flight, including 15 SCEK wolf collars (11 Lotek Iridium, 4 Lotek VHF) and 7 University of Alberta/Nexen collars (Lotek Iridium). Several SCEK Iridium wolf collars assumed to have exceeded their battery lives were not scanned.

Results of the May-June 2016 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 2,629 km. Of 150 caribou collar frequencies scanned, 142 normal VHF signals and 1 mortality signal were detected. The VHF beacons of the remaining 7 caribou collars were not detected. These included 1 SCEK ATS Iridium collar that has ceased Iridium data transmission and is believed to have failed (Kotcho male SCEK173), 1 MFLNRO VHF collar that may be nearing the end of its battery life (Capot-Blanc BC1014), 1 SCEK VHF collar originally collared in the Kiwigana core and most recently heard in Tsea

core (Kiwigana SCEK064), and 4 SCEK Vectronic GPS collars whose GPS data transmissions have ceased (Milligan SCEK034, SCEK055, Fortune SCEK085, SCEK236).

Calendar caribou mortality SCEK108 (Lotek VHF) was detected during the June 1 flight. This animal was last heard transmitting a normal VHF signal on April 17, 2016. As of May 1, 2016, mortality indications involving VHF collars will not be investigated at the time of detection; VHF collars will be recovered from the field opportunistically in conjunction with related fieldwork.

Of the 22 wolf collar frequencies scanned during the May-June 2016 monitoring flight, 10 normal VHF signals and no mortality signals were detected. The remaining 12 wolf collars were not detected. These included 4 VHF collars, 2 GPS/satellite collars transmitting data indicating normal activity, and 6 GPS/satellite collars whose GPS data transmission functions appear to have failed.

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', with a stylized flourish at the end.

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 May 31-June 1, 2016 OGRIS fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK112	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	642477	6641036	normal
SCEK113	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	610846	6616379	normal
SCEK119	Caribou	Calendar	Calendar	Vectr-Vertex	42 ppm	1-Jun-16	10	614517	6641254	normal
SCEK120	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	612475	6627337	normal
SCEK122	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	618107	6667410	normal
SCEK123	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	606965	6623821	normal
SCEK125	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	652762	6680845	normal
SCEK134	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	621579	6662211	normal
SCEK135	Caribou	Calendar	Calendar	Vectr-Vertex	42 ppm	1-Jun-16	10	636683	6664117	normal
SCEK136b	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	1-Jun-16	10	606568	6607968	normal
SCEK137	Caribou	Calendar	Calendar	Lotek VHF	60 ppm	1-Jun-16	10	642477	6645036	normal
SCEK146b	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	1-Jun-16	10	607462	6638546	normal
SCEK180	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	1-Jun-16	10	604295	6664503	normal
SCEK181b	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	1-Jun-16	10	615483	6614420	normal
SCEK183	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	1-Jun-16	10	622126	6630295	normal
SCEK185	Caribou	Calendar	Calendar	Lotek-Lifecycle	50 ppm	1-Jun-16	10	584644	6637054	normal
SCEK234	Caribou	Calendar	Calendar	Vectr-VertexTD	42 ppm	1-Jun-16	10	647804	6649633	normal
SCEK126b	Caribou	Calendar	RRA-C	Vectr-VertexTD	42 ppm	1-Jun-16	10	592192	6653978	normal
SCEK107	Caribou	Calendar	RRA-D	Lotek VHF	60 ppm	1-Jun-16	10	620193	6642017	normal
SCEK108	Caribou	Calendar	RRA-D	Lotek VHF	60 ppm	1-Jun-16	10	659121	6652128	MORTALITY
SCEK040	Caribou	Chinchaga	Etthithun	Vectr-Vertex	42 ppm	31-May-16	10	646685	6406700	normal
SCEK195	Caribou	Chinchaga	Etthithun	Vectr-VertexTD	42 ppm	31-May-16	10	646829	6406828	normal
SCEK224	Caribou	Chinchaga	Etthithun	Vectr-VertexTD	42 ppm	31-May-16	10	640528	6412564	normal
SCEK026b	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	660798	6296400	normal
SCEK027	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	676987	6294051	normal
SCEK029	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	645572	6332655	normal
SCEK032	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	654696	6367621	normal
SCEK033b	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	633958	6345625	normal
SCEK034	Caribou	Chinchaga	Milligan	Vectr-Vertex	not heard	31-May-16	n/a	n/a	n/a	VHF signal not detected; last data Dec 7, 15
SCEK035	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	636756	6342047	normal
SCEK036b	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	611626	6369451	normal
SCEK038b	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	684185	6306171	normal
SCEK041	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	n/a	n/a	VHF signal heard but not located
SCEK053	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	620040	6349676	normal
SCEK054	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	645903	6359660	normal
SCEK055	Caribou	Chinchaga	Milligan	Vectr-Vertex	not heard	31-May-16	n/a	n/a	n/a	VHF signal not detected; last data Mar 16, 16
SCEK057	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	638084	6356855	normal
SCEK059	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	622694	6347733	normal
SCEK060	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	575289	6368531	normal
SCEK061	Caribou	Chinchaga	Milligan	Lotek VHF	60 ppm	31-May-16	10	654582	6365282	normal
SCEK196	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	632245	6364711	normal
SCEK197	Caribou	Chinchaga	Milligan	Lotek-Lifecycle	50 ppm	31-May-16	10	625105	6381608	normal
SCEK198	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	654247	6310397	normal
SCEK201	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	662807	6287883	normal
SCEK223	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	640468	6329857	normal
SCEK226	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	666394	6303024	normal
SCEK227	Caribou	Chinchaga	Milligan	Vectr-VertexTD	42 ppm	31-May-16	10	635052	6353618	normal
SCEK048	Caribou	Chinchaga	RRA-A	Lotek VHF	60 ppm	31-May-16	10	604237	6417727	normal
SCEK142	Caribou	Chinchaga	RRA-A	Vectr-Vertex	42 ppm	31-May-16	10	621078	6448386	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the May 31-June 1, 2016 OGRIS fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK170b	Caribou	Chinchaga	RRA-A	Vectr-Vertex	42 ppm	31-May-16	10	644043	6471110	normal
SCEK172	Caribou	Chinchaga	RRA-A	Lotek-Lifecycle	50 ppm	31-May-16	10	591829	6445181	normal
SCEK189	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	31-May-16	10	614123	6445848	normal
SCEK213	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	31-May-16	10	610621	6449119	normal
SCEK214	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	31-May-16	10	608025	6434583	normal
SCEK215	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	31-May-16	10	644004	6441230	normal
SCEK216	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	not heard	31-May-16	10	614629	6443189	VHF not heard since Apr 2015; GPS activity normal
SCEK235	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	42 ppm	31-May-16	10	623485	6462353	normal
SCEK236	Caribou	Chinchaga	RRA-A	Vectr-VertexTD	not heard	31-May-16	10	n/a	n/a	VHF signal not detected; last data Apr 15, 2016
SCEK009b	Caribou	Fort Nelson	Fort Nelson	Vectr-VertexTD	42 ppm	31-May-16	10	519110	6552449	normal
SCEK166	Caribou	Fort Nelson	Fort Nelson	Vectr-VertexTD	42 ppm	31-May-16	10	518947	6546034	normal
SCEK167	Caribou	Fort Nelson	Fort Nelson	Lotek-Lifecycle	50 ppm	31-May-16	10	521065	6540689	normal
BC1014	Caribou	Maxhamish	Capot-Blanc	Lotek VHF	not heard	31-May-16	n/a	n/a	n/a	VHF signal not detected
SCEK007b	Caribou	Maxhamish	Capot-Blanc	Vectr-VertexTD	42 ppm	31-May-16	10	455314	6581725	normal
SCEK066b	Caribou	Maxhamish	Capot-Blanc	Vectr-VertexTD	42 ppm	31-May-16	10	455864	6553625	normal
SCEK076	Caribou	Maxhamish	Capot-Blanc	Lotek VHF	60 ppm	31-May-16	10	454418	6582623	normal
SCEK225	Caribou	Maxhamish	Capot-Blanc	Vectr-VertexTD	42 ppm	31-May-16	10	473217	6583721	normal
BC1033	Caribou	Maxhamish	Fortune	Lotek VHF	60 ppm	31-May-16	10	507652	6625382	normal
SCEK085	Caribou	Maxhamish	Fortune	Vectr-Vertex	not heard	31-May-16	n/a	n/a	n/a	VHF signal not detected; last data Feb 27, 16
SCEK086	Caribou	Maxhamish	Fortune	Lotek VHF	60 ppm	31-May-16	10	n/a	n/a	VHF signal heard but not located
SCEK128	Caribou	Maxhamish	Fortune	Lotek VHF	60 ppm	31-May-16	10	525740	6631766	normal
SCEK129	Caribou	Maxhamish	Fortune	Lotek VHF	60 ppm	31-May-16	10	538135	6630329	normal
SCEK164	Caribou	Maxhamish	Fortune	Lotek VHF	60 ppm	31-May-16	10	541401	6626659	normal
SCEK175	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	31-May-16	10	497532	6630345	normal
SCEK176	Caribou	Maxhamish	Fortune	Lotek-Lifecycle	50 ppm	31-May-16	10	480248	6632262	normal
SCEK177	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	31-May-16	10	529778	6630699	normal
SCEK178	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	31-May-16	10	544722	6622841	normal
SCEK205	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	31-May-16	10	541120	6629007	normal
SCEK206	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	31-May-16	10	535694	6624008	normal
SCEK208	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	31-May-16	10	481363	6630263	normal
SCEK221	Caribou	Maxhamish	Fortune	Vectr-VertexTD	42 ppm	31-May-16	10	543396	6625164	normal
SCEK004	Caribou	Maxhamish	Kiwigana	Lotek VHF	60 ppm	31-May-16	10	466502	6646449	normal
SCEK062	Caribou	Maxhamish	Kiwigana	Lotek VHF	60 ppm	31-May-16	10	513018	6574914	normal
SCEK064	Caribou	Maxhamish	Kiwigana	Lotek VHF	not heard	31-May-16	n/a	n/a	n/a	VHF signal not detected
SCEK168	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	31-May-16	10	545995	6561838	normal
SCEK169b	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	31-May-16	10	501470	6587634	normal
SCEK211	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	31-May-16	10	537355	6564717	normal
SCEK231	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	31-May-16	10	515946	6573445	normal
SCEK232	Caribou	Maxhamish	Kiwigana	Vectr-VertexTD	42 ppm	31-May-16	10	530664	6559814	normal
SCEK010	Caribou	Parker	Parker	Lotek VHF	60 ppm	31-May-16	10	489839	6504887	normal
SCEK012	Caribou	Parker	Parker	Lotek VHF	60 ppm	31-May-16	10	496665	6512582	normal
SCEK015	Caribou	Parker	Parker	Lotek VHF	60 ppm	31-May-16	10	484818	6522967	normal
SCEK016b	Caribou	Parker	Parker	Vectr-VertexTD	42 ppm	31-May-16	10	479148	6514769	normal
SCEK194	Caribou	Parker	Parker	Vectr-VertexTD	42 ppm	31-May-16	10	487450	6521622	normal
SCEK237	Caribou	Parker	Parker	Vectr-VertexTD	42 ppm	31-May-16	10	457990	6538589	normal
SCEK238	Caribou	Parker	Parker	Vectr-VertexTD	42 ppm	31-May-16	10	498032	6516805	normal
SCEK045	Caribou	Prophet	Prophet	Lotek VHF	60 ppm	31-May-16	10	n/a	n/a	VHF signal heard but not located
SCEK049	Caribou	Prophet	Prophet	Lotek VHF	60 ppm	31-May-16	10	554013	6446020	normal
SCEK051	Caribou	Prophet	Prophet	Lotek VHF	60 ppm	31-May-16	10	538718	6486335	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the May 31-June 1, 2016 OGRIS fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK161b	Caribou	Prophet	Prophet	Vectr-VertexTD	42 ppm	31-May-16	10	579493	6445196	normal
SCEK217	Caribou	Prophet	Prophet	Vectr-VertexTD	42 ppm	31-May-16	10	555767	6451108	normal
SCEK019	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	571728	6505920	normal
SCEK020b	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	31-May-16	10	573510	6465357	normal
SCEK024	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	1-Jun-16	10	568008	6500172	normal
SCEK025	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	1-Jun-16	10	570175	6485323	normal
SCEK068	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	1-Jun-16	10	564160	6529511	normal
SCEK070	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	569281	6503406	normal
SCEK145	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	1-Jun-16	10	587838	6547204	normal
SCEK148	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	610617	6453798	normal
SCEK149	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	578852	6499192	normal
SCEK150	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	603344	6488541	normal
SCEK152	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	591888	6485466	normal
SCEK156	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	549105	6497134	normal
SCEK157	Caribou	Snake-Sahtaneh	Clarke	Lotek VHF	60 ppm	31-May-16	10	562759	6501939	normal
SCEK191	Caribou	Snake-Sahtaneh	Clarke	Lotek-Lifecycle	50 ppm	31-May-16	10	602309	6488380	normal
SCEK192	Caribou	Snake-Sahtaneh	Clarke	Lotek-Lifecycle	50 ppm	31-May-16	10	607477	6489228	normal
SCEK193	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	31-May-16	10	547194	6495670	normal
SCEK218	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	1-Jun-16	10	555120	6545102	normal
SCEK220	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	31-May-16	10	605899	6484889	normal
SCEK239	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	31-May-16	10	542277	6492638	normal
SCEK240	Caribou	Snake-Sahtaneh	Clarke	Vectr-VertexTD	42 ppm	31-May-16	10	575279	6477619	normal
SCEK103	Caribou	Snake-Sahtaneh	East Kotcho	Lotek VHF	60 ppm	1-Jun-16	10	634208	6561560	normal
SCEK105	Caribou	Snake-Sahtaneh	East Kotcho	Lotek VHF	60 ppm	1-Jun-16	10	633606	6576530	normal
SCEK088	Caribou	Snake-Sahtaneh	North Kotcho	Lotek VHF	60 ppm	1-Jun-16	10	634728	6558950	normal
SCEK089	Caribou	Snake-Sahtaneh	North Kotcho	Lotek VHF	60 ppm	1-Jun-16	10	603682	6582685	normal
SCEK090	Caribou	Snake-Sahtaneh	North Kotcho	Lotek VHF	60 ppm	1-Jun-16	10	596712	6583781	normal
SCEK092	Caribou	Snake-Sahtaneh	North Kotcho	Lotek VHF	60 ppm	1-Jun-16	10	611089	6597965	normal
SCEK097b	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	1-Jun-16	10	606724	6583647	normal
SCEK100b	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	1-Jun-16	10	619543	6570653	normal
SCEK111	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-Vertex	84 ppm	1-Jun-16	10	605841	6583361	normal
SCEK182	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	1-Jun-16	10	598672	6584144	normal
SCEK186	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	1-Jun-16	10	590819	6572382	normal
SCEK187	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-Lifecycle	50 ppm	1-Jun-16	10	606374	6572299	normal
SCEK204	Caribou	Snake-Sahtaneh	North Kotcho	Lotek-Lifecycle	50 ppm	1-Jun-16	10	623249	6562879	normal
SCEK228	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	1-Jun-16	10	633704	6550848	normal
SCEK229	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	1-Jun-16	10	591777	6579252	normal
SCEK230	Caribou	Snake-Sahtaneh	North Kotcho	Vectr-VertexTD	42 ppm	1-Jun-16	10	585326	6594324	normal
SCEK096	Caribou	Snake-Sahtaneh	Paradise	Lotek VHF	60 ppm	1-Jun-16	10	558231	6532675	normal
SCEK079b	Caribou	Snake-Sahtaneh	Tsea	Vectr-VertexTD	42 ppm	31-May-16	10	531071	6597929	normal
SCEK081	Caribou	Snake-Sahtaneh	Tsea	Lotek VHF	60 ppm	31-May-16	10	553735	6607197	normal
SCEK082	Caribou	Snake-Sahtaneh	Tsea	Lotek VHF	60 ppm	31-May-16	10	556010	6601548	normal
SCEK127	Caribou	Snake-Sahtaneh	Tsea	Lotek VHF	60 ppm	31-May-16	10	564069	6604546	normal
SCEK131	Caribou	Snake-Sahtaneh	Tsea	Lotek VHF	60 ppm	31-May-16	10	554009	6599505	normal
SCEK132	Caribou	Snake-Sahtaneh	Tsea	Lotek VHF	60 ppm	31-May-16	10	552967	6600469	normal
SCEK233	Caribou	Snake-Sahtaneh	Tsea	Vectr-VertexTD	42 ppm	31-May-16	10	554491	6594722	normal
UNKN	Caribou	Snake-Sahtaneh	Tsea	Lotek VHF	60 ppm	31-May-16	10	565477	6595064	normal; unknown collared caribou
SCEK071	Caribou	Snake-Sahtaneh	West Kotcho	Vectr-Vertex	42 ppm	1-Jun-16	10	584118	6548393	normal
SCEK091	Caribou	Snake-Sahtaneh	West Kotcho	Lotek VHF	60 ppm	1-Jun-16	10	609332	6583715	normal

Table 1 cont. VHF signal status and location of boreal caribou and wolf collars detected during the May 31-June 1, 2016 OGRIS fixed-wing telemetry monitoring flight.

ID	Species	Range	Core	Collar Type	Status	Date	Zone	East	North	Comments
SCEK173	Caribou	Snake-Sahtaneh	West Kotcho	ATS-Irid	not heard	1-Jun-16	n/a	n/a	n/a	VHF not detected; no data since July 28, 15
SCEK209	Caribou	Snake-Sahtaneh	West Kotcho	Vectr-VertexTD	42 ppm	31-May-16	10	508915	6573667	normal
SCEK219	Caribou	Snake-Sahtaneh	West Kotcho	Vectr-VertexTD	42 ppm	31-May-16	10	546992	6620021	normal
BW034	Wolf	Calendar	July	Lotek VHF	not heard	1-Jun-16	n/a	n/a	n/a	VHF not detected
BW042nex	Wolf	Calendar	July	Lotek Iridium	50 ppm	1-Jun-16	10	639333	6615152	VHF normal; GPS data normal
BW043nex	Wolf	Calendar	July	Lotek Iridium	50 ppm	1-Jun-16	10	623984	6633959	VHF normal; GPS data normal
BW044nex	Wolf	Calendar	July	Lotek Iridium	50 ppm	1-Jun-16	10	623984	6633959	VHF normal; last data Apr 10, 16
BW045nex	Wolf	Calendar	July	Lotek Iridium	not heard	1-Jun-16	n/a	n/a	n/a	VHF not detected; GPS data normal
BW046nex	Wolf	Calendar	July	Lotek Iridium	not heard	1-Jun-16	n/a	n/a	n/a	VHF not detected; GPS data ceased Dec 21, 15
BW002	Wolf	Chinchaga	Big Arrow	Lotek VHF	not heard	31-May-16	n/a	n/a	n/a	VHF not detected
BW053	Wolf	Chinchaga	Kahntah	Lotek Iridium	50 ppm	31-May-16	10	563146	6406168	normal
BW038	Wolf	Clarke	Elleh	Lotek Iridium	50 ppm	31-May-16	10	580154	6483064	VHF normal; GPS data normal
BW039	Wolf	Clarke	Elleh	Lotek Iridium	50 ppm	31-May-16	10	572658	6502650	VHF normal; GPS data normal
BW040	Wolf	Clarke	Elleh	Lotek Iridium	50 ppm	31-May-16	10	576115	6501695	VHF normal; GPS data normal
BW051	Wolf	Fort Nelson	Tsimeh	Lotek Iridium	not heard	31-May-16	n/a	n/a	n/a	VHF not detected; last data Oct 14, 15
BW032	Wolf	Fortune/Tsea	Petitot	Lotek VHF	not heard	31-May-16	n/a	n/a	n/a	VHF not detected
BW033	Wolf	Fortune/Tsea	Petitot	Lotek Iridium	50 ppm	31-May-16	10	n/a	n/a	VHF normal, heard not located; last data Nov 23, 15
BW047nex	Wolf	Fortune/Tsea	Petitot	Lotek Iridium	50 ppm	31-May-16	10	566257	6607056	VHF normal; last data Oct 30, 15
BW049nex	Wolf	Fortune/Tsea	Petitot	Lotek Iridium	50 ppm	31-May-16	10	564016	6601709	VHF normal; GPS data normal
BW050	Wolf	Fortune/Tsea	Petitot	Lotek Iridium	not heard	31-May-16	n/a	n/a	n/a	VHF not detected; last data Nov 06, 15
BW035	Wolf	Maxhamish	Fortune	Lotek Iridium	not heard	31-May-16	n/a	n/a	n/a	VHF not detected; Last GPS data Nov 22, 15
BW036	Wolf	Maxhamish	Fortune	Lotek Iridium	not heard	31-May-16	n/a	n/a	n/a	VHF not detected; last GPS data Jan 20, 16
BW024	Wolf	Snake-Sahtaneh	Kwokullie	Lotek Iridium	50 ppm	1-Jun-16	10	627353	6574720	VHF normal; GPS data normal
BW026	Wolf	Snake-Sahtaneh	Kwokullie	Lotek VHF	not heard	1-Jun-16	n/a	n/a	n/a	VHF not detected
BW052	Wolf	Snake-Sahtaneh	Kwokullie	Lotek Iridium	not heard	1-Jun-16	n/a	n/a	n/a	VHF not detected; GPS data normal

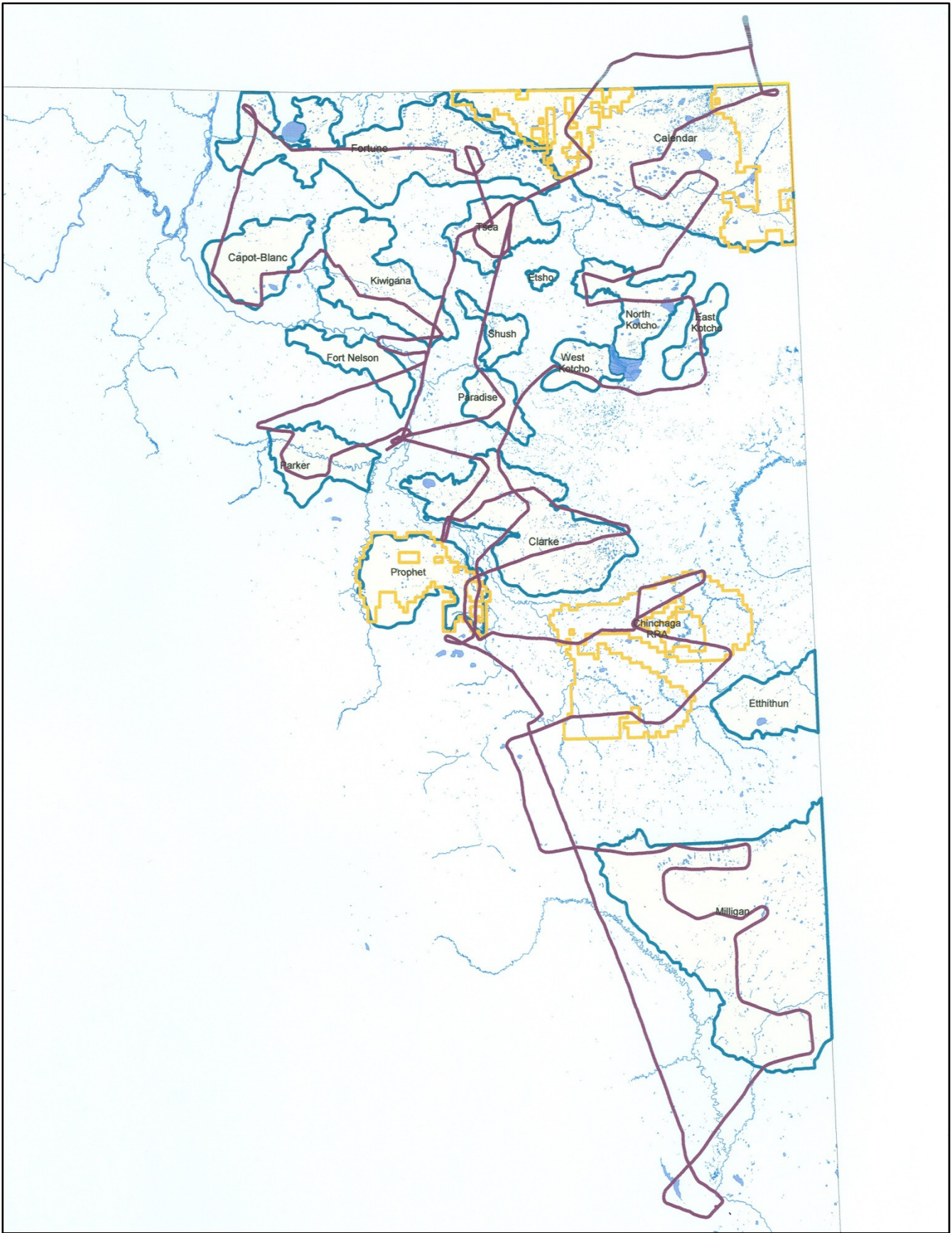


Figure 1. Flight paths flown during the May 31-June 1, 2016 OGRIS boreal caribou and wolf fixed-wing telemetry monitoring flight.