

**BOREAL CARIBOU HABITAT  
STUDY IN  
NORTHEASTERN BRITISH COLUMBIA**

**ANNUAL PROGRESS REPORT – YEAR VI  
APRIL 1, 2004 - MARCH 31, 2005**

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## **INTRODUCTION**

In May 2002, the *Committee on the Status of Endangered Wildlife in Canada* re-examined the rank of the Boreal population of woodland caribou (*Rangifer tarandus caribou*) and confirmed the classification of "Threatened" (COSEWIC 2002). This designation is defined as "a species likely to become endangered if limiting factors are not reversed." Within British Columbia, the population is restricted to the northeastern corner of the province. On the provincial scale, woodland caribou are classified into 3 ecotypes based on characteristic ecology, with the "boreal ecotype" corresponding to the British Columbian segment of the national "Boreal population." Provincially, the boreal ecotype is blue-listed (CDC 2002).

In 1999, the *Boreal Caribou Habitat Study in Northeastern British Columbia* was initiated as a joint project between the British Columbia Ministry of Environment, Lands & Parks (MoELP)<sup>1</sup> and Slocan Forest Products Ltd. – Fort Nelson Division (Slocan), which has since been bought by Canadian Forest Products (Canfor). The primary objective of the project is to describe boreal caribou habitat use and population dynamics within the Snake and Sahtaneh watersheds and Kotcho Lake area, east of Fort Nelson. The study is a significant step in addressing information gaps on the ecology of boreal caribou in British Columbia and identifying key habitats and limiting factors critical to the long-term persistence of the species.

Since its inception, the project has collected information on caribou habitat use, seasonal movements, and population dynamics within the Snake/Sahtaneh study area. As preliminary results indicated low calf recruitment, the Year IV program was expanded to include an assessment of local predator populations.

This report summarizes Years I through V (April 1999 through March 2004) and describes activities conducted during Year VI (April 2004 to March 2005) of the project. Collection of GPS telemetry data for boreal caribou, grey wolves (*Canis lupus*), and black bears (*Ursus americanus*) was completed during Year VI, with active radio-collars retrieved during late fall of 2004.

## **SUMMARY OF YEAR I (1999/2000) TO YEAR V (2003/2004)**

### ***Year I (1999/2000)***

During Year I of the study, 12 GPS collars were purchased from Advanced Telemetry Systems (ATS; Isanti, Minnesota, USA). These collars were fitted on adult female caribou captured by MoELP staff in March 2000. Efforts were made to capture animals within the coverage area of recently completed Terrestrial Ecosystem Mapping (TEM) in the Snake/Sahtaneh study area (Shearwater Mapping Ltd. 1997). The life expectancy of the original 12 collars was approximately six months, at which time they were to be recovered, sent to the manufacturer for refurbishment, then fitted on a new sample of 12 caribou during the following winter (Year II).

### ***Year II (2000/2001)***

In Year II, 4 of the original 12 ATS collars were recovered between June and October and sent for refurbishment. A fifth collar was retrieved in November 2000. In January 2001, 4 of the 7 caribou still wearing functioning collars were recaptured and fitted with

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<sup>1</sup> Currently, the Ministry of Water, Land and Air Protection (MWLAP).

the 4 refurbished collars. Technological advances since the original purchase of the collars allowed the life expectancy of the refurbished units to be increased to approximately 1 year.

The project was expanded in Year II with the purchase of 13 Televilt POSREC® C900 GPS collars (Televilt Positioning, Lindsberg, Sweden). These collars, which had an estimated life span of 2.5 years, were fitted on 13 new adult female caribou captured in March 2001.

### ***Year III (2001/2002)***

Caribou GPS data collection and monthly fixed-wing monitoring of GPS collar status continued into Year III with 18 GPS collars active in April 2001. In early November 2001, 6 new caribou were captured and fitted with refurbished ATS collars. Later that month, problems with the 13 Televilt collars became evident, with some units transmitting premature low battery signals. The manufacturer acknowledged a software defect and agreed to supply 13 warranty collars, however, 4 of the original Televilt collars had stopped transmitting VHF signals and were lost before the replacement collars could be obtained.

### ***Year IV (2002/2003)***

Monthly fixed-wing monitoring of GPS collar status continued through Year IV of the project.

In early April 2002, the 13 warranty replacement Televilt GPS collars were received. On April 11, an attempt was made to locate and re-capture caribou fitted with the failing units. Seven animals were found to be still transmitting VHF signals and were re-captured for collar replacement. The remaining 6 warranty collars were fitted on new caribou. An eighth original collar was located, in low-battery mode, later in the year and replaced with a refurbished ATS collar. Four remaining original Televilt collars are assumed to be non-functional.

During Year IV, calf survival surveys were conducted in June and October 2002 and March 2003. Radio-collared females were relocated and the presence or absence of a calf recorded. Calf numbers declined over the course of the year from 20 calves:100 cows in late June, to 12 calves:100 cows at approximately 5 months post-calving, to 5.4 calves:100 cows in late winter. As populations with approximately 30 calves:100 cows through fall are considered stable (Thomas and Gray 2002), low calf survival in the Snake-Sahtaneh caribou herd was a concern.

Two collared caribou died during Year IV, bringing mortalities to 4 over the course of the project. Mortality site investigations conducted during May 2002 and August 2002 indicated wolf predation and an undetermined non-predatory cause, respectively.

To assess predation pressure on the Snake-Sahtaneh caribou herd, 9 Televilt POSREC® C600 GPS collars were purchased in November 2002 for deployment on wolves within the study area. Three wolves from each of 3 packs were radio-collared in mid-winter. Wolf collars were programmed to log positions every 3 hrs through the following 8 months to track movements during the wolf denning and rearing period and the caribou calving and neonatal period. An additional 6 Lotek VHF collars were provided by the Ministry of Water, Land and Air Protection (MWLAP) - Fort St. John and

fitted on 2 wolves in each of the 3 packs containing GPS-collared wolves as a means of locating the packs after the scheduled release of the GPS units.

During Year IV, the initial 12 caribou data sets were mapped as a preliminary GIS coverage and appeared to indicate 3 areas of high year-round caribou use within the study area. A copy of this draft map was provided to habitat protection staff at the British Columbia Oil & Gas Commission, Fort St. John, as supplementary information for considering development applications.

#### ***Year V (2003/2004)***

GPS data collection and monthly fixed-wing monitoring of GPS collar status continued through Year V of the project. Seasonal movements and habitat use of predators in relation to calving caribou were further investigated with the collaring of both wolves and black bears.

Five black bears were captured by aerial darting in May 2003, following emergence from winter dens. Bears were fitted with Televilt POSREC® C600 GPS collars. The VHF beacon on 1 of the 5 collars failed during the summer and the bear could not be located for collar recovery during the fall. Three of the remaining 4 collars were located and successfully recovered during October. The fifth collar detached after the bear had entered its den and was retrieved the following spring.

The 9 GPS collars fitted on wolves in late winter of Year IV were recovered between late summer and fall of Year V (August to November 2003). Only 4 of the 9 collars collected data through the caribou calving and neonatal period. The collection of data for the remaining 5 collared wolves was interrupted by bite damage to the GPS antennae inflicted by other pack members.

Recovered black bear and wolf collars were returned to the manufacturer for refurbishment in preparation for re-deployment. The 9 wolf collars were upgraded with heavy-duty GPS antennae housings to reduce potential for wolf-bite damage. Two additional GPS wolf collars were provided by the manufacturer in settlement of outstanding warranty issues, making a total of 11 available for re-deployment.

In addition to the 3 wolf packs collared during Year IV (Snake, Kotcho and Kyklo packs), 2 new packs (Clarke and Gunnel packs) were identified in Year V through the establishment of 2 bait stations situated between the apparent territories of the previously collared packs. Eleven new wolves from these 5 packs were fitted with upgraded GPS collars during late winter of Year V (February and March 2004).

During Year V, calf survival surveys were conducted on June 28 and October 29, 2003 and on March 24, 2004. Once again, calf numbers declined throughout the year from 20 calves:100 cows in June, to 13 calves:100 cows in late October, to 8.9 calves:100 cows by March (10 months post-calving). No collared caribou died during Year V.

A total of 17 Televilt and ATS caribou collars were deployed during the winter of Year V as part of the recovery and re-deployment cycle focused on maintaining a sample size of 20 adult female caribou. During late March 2004, 4 previously used Lotek VHF collars contributed by MWLAP-Fort St. John were fitted on female caribou in order to maximize the sample size for proposed calf survival surveys in the final year of field data collection (Year VI).

## SUMMARY OF YEAR VI (2004/2005)

Year VI represented the final year of data collection for the project. As of April 2004, 24 caribou collars were active in the study area (20 GPS and 4 VHF), with the status of 2 additional GPS collars unknown. Eleven GPS wolf collars were active within 5 wolf packs. Scheduled fixed-wing monitoring flights continued from April through December, at which time all active GPS collars were recovered.

In May 2004, 4 new black bears were captured by aerial darting and fitted with refurbished Televilt POSREC® C600 GPS collars, bringing the total number of bears collared to 9. Efforts were made to select bears within or adjacent to areas of moderate to high caribou use. Programmed release mechanisms on these collars were set to activate on October 1, 2004, prior to bears entering their winter dens. Also during May 2004, a female bear wearing the failed GPS collar deployed in Year V was incidentally spotted during a caribou calf-survival survey. The bear was captured and the collar was successfully recovered and downloaded.

In order to gather more detailed information on caribou neonatal mortality and survival, the number of spring calf survival surveys was increased from 1 to 4 flights in Year VI. GPS data from Years I through V were analyzed to determine a mean calving date of May 15. Commencing at 10 days after the estimated peak, a series of 4 neo-natal calf-survival surveys were conducted throughout late May and June. Spring surveys were conducted on May 25, June 4, June 12, and June 30, with a final fall calf-survival survey conducted on October 24, 2004. Results suggested that approximately 80% of female caribou gave birth to healthy calves in 2004. While calf survival declined steadily throughout the 4 spring surveys, the June 30 cow:calf ratio was slightly higher than in Years IV and V (Table 1). Results of the October survey found calf-survival to 5 months post-calving consistent with previous years.

Table 1. Summary of preliminary results of calf survival surveys conducted 2002-2004.\*

Survey Date	Cows	Calves	Calves:100 cows
Jun 26 2002	20	4	20.0
Oct 27 2002	67	8	11.9
Mar 27 2003	74	4	5.4
Jun 28 2003	25	3	20.0
Oct 29 2003	60	8	13.3
Mar 24 2004	123	11	8.9
Jun 30 2004	21	6	28.6
Oct 24 2004	72	10	13.9

\*For comparative purposes, only the final June 2004 survey results are presented.

Wolf collars were equipped with programmed release mechanisms scheduled to activate on November 15, 2004. Following this date, collars that successfully released were located by VHF beacon and retrieved using a Bell 206B helicopter. Two wolves whose GPS collars did not release successfully were recaptured by aerial darting on December 2, 2004. One GPS wolf collar was returned by a trapper who had caught the animal in a snare. As of March 31, 2005, 2 GPS wolf collars remain un-recovered. Collared wolves were known to make significant movements outside their "normal" territories during Year

VI. A VHF-collared wolf from the Kyklo Pack was killed by a hunter near High Level, Alberta in November 2004 and a GPS-collared wolf from the Snake pack ranged as far north as Fort Liard, NWT. As a result of the more durable GPS antennae housing on the upgraded wolf collars, the collar failure rate was much reduced in Year VI.

GPS caribou collars equipped with programmable release mechanisms were also scheduled to activate on November 15, 2004. Collars that had successfully released were retrieved between late November and early December 2004. It was necessary to retrieve a number of collars by aerial net-gunning, including 1 caribou collar whose release mechanism failed to activate, and several collars that were not equipped with programmable release mechanisms.

Only one adult caribou mortality occurred during Year VI; a GPS-collared caribou was killed by wolves on a seismic line on October 20, 2004.

Locational data from all ATS and Televilt GPS collars recovered during the course of the project were downloaded and converted to standardized datum, projection, and time zone as of March 31, 2005. Initial visual screening and systematic censoring of individual caribou data sets was completed. Preliminary analysis was commenced and will be completed during Year VII.

Digital habitat attribute layers, derived from Ducks Unlimited Earth Cover mapping (DU 2003), Topographic Resource Inventory Mapping (TRIM), and NTS hydrology mapping have been assembled in a GIS platform (ArcView 3.2). These layers will support the analysis of home range, seasonal movements, and habitat use of caribou, wolves, and black bears based on the GPS data.

Preliminary analysis of caribou home range and movement data collected during Years I to V was completed early in Year VI, to aid in the identification of core habitat areas and the development of interim guidelines to mitigate impacts of accelerating oil & gas development on boreal caribou range. Preliminary analysis of GPS data also provided baseline information on caribou distribution to aid in the development of the *British Columbia Boreal Caribou Recovery Strategy* by the Boreal Caribou Technical Advisory Committee (BCTAC).

Final data compilation and analysis and report preparation will be completed during Year VII with funding provided by the British Columbia Oil and Gas Commission's Science and Community Knowledge Fund.

Table 2 summarizes activities completed to the end of Year VI (2004/2005) of the *Boreal Caribou Habitat Study in Northeastern British Columbia* for the caribou, wolf and black bear components of the project. The status and history of all GPS and VHF collars as of March 31, 2005 is provided in Appendix I.

Table 2. Summary of annual activities completed for the *Boreal Caribou Habitat Study in Northeastern British Columbia* to March 31, 2005.

Year	Activities Completed
<b>YEAR I</b> (1999/2000)	<ul style="list-style-type: none"> <li>• purchase 12 Advanced Telemetry Solutions (ATS) GPS/VHF collars,</li> <li>• capture and collar 12 adult female caribou in and adjacent to the TEM mapping coverage area (March 2000).</li> </ul>
<b>YEAR II</b> (2000/2001)	<ul style="list-style-type: none"> <li>• monthly monitoring of radio-collared caribou by Piper PA12 fixed-wing aircraft,</li> <li>• recover active ATS collars as batteries expire and ship for refurbishment,</li> <li>• 1 caribou mortality investigation (June 2000),</li> <li>• purchase 13 Televilt POSREC® C900 GPS/VHF collars (December 2000),</li> <li>• re-deploy 5 refurbished ATS collars – January to March 2001 (4 re-collared caribou &amp; 1 new),</li> <li>• collar 13 new adult female caribou in and adjacent to the TEM mapping coverage area using new Televilt collars (March 2001),</li> <li>• locate winter habitat sites, record snow depth.</li> </ul>
<b>YEAR III</b> (2001/2002)	<ul style="list-style-type: none"> <li>• monthly monitoring of radio-collared caribou by Piper PA12 fixed-wing aircraft,</li> <li>• spring calf-survival survey (June 2001),</li> <li>• fall calf-survival survey (October 2001),</li> <li>• 1 caribou mortality investigation (October 2001),</li> <li>• re-deploy 6 refurbished ATS collars on new caribou (November 2001).</li> </ul>
<b>YEAR IV</b> (2002/2003)	<ul style="list-style-type: none"> <li>• deploy 13 warranty replacement Televilt collars (7 re-collared caribou, 6 new; April 2002),</li> <li>• continue monthly telemetry monitoring by Piper PA12 fixed-wing aircraft,</li> <li>• spring calf-survival survey (June 2002),</li> <li>• 2 caribou mortality investigations (May &amp; August 2002),</li> <li>• fall calf-survival survey (October 2002),</li> <li>• loan of 8 salvaged VHF wolf collars from MWLAP - Fort St. John (November 2002),</li> <li>• purchase 9 Televilt POSREC® C600 GPS collars to be fitted on wolves (December 2002),</li> <li>• collect road-killed moose and deer to establish and maintain 3 wolf bait-stations (November 2002 through March 2003),</li> <li>• capture and radio-collar 16 wolves using GPS and VHF collars (November 2002 through March 2003),</li> <li>• re-deploy 8 refurbished ATS collars and 1 warranty Televilt collar (5 re-collared caribou &amp; 1 new ) to maintain target sample of approx. 20 caribou (Nov. 2002-Mar. 2003),</li> <li>• late-winter composition and calf-survival survey (March 2003).</li> </ul>

Table 2 cont.. Summary of annual activities completed for the *Boreal Caribou Habitat Study in Northeastern British Columbia* to March 31, 2005.

Year	Activities Completed
<p><b>Year V</b> (2003/2004)</p>	<ul style="list-style-type: none"> <li>• continue recovery and redeployment of collars to maintain a minimum sample of 20 collared caribou,</li> <li>• continue monthly telemetry monitoring by Piper PA12 fixed-wing aircraft,</li> <li>• capture and collar 5 black bears (May 2003),</li> <li>• spring calf-survival survey (June 2003),</li> <li>• conduct wolf den inspections and scat collection (fall 2003),</li> <li>• recover GPS wolf collars and ship for upgrading and refurbishment (August through October 2003),</li> <li>• fall calf-survival survey (October 2003),</li> <li>• recover 4 of 5 black bear collars and ship for refurbishment (October 2003),</li> <li>• establish wolf bait sites and capture and radio-collar 15 wolves (11 GPS collars and 4 VHF collars) (January-March 2004),</li> <li>• late-winter composition and calf-survival survey (March 2004),</li> <li>• deploy 4 re-cycled VHF caribou collars to maintain sample size for Year VI spring and fall surveys.</li> </ul>
<p><b>Year VI</b> (2004/2005)</p>	<ul style="list-style-type: none"> <li>• continue monthly telemetry monitoring by Piper PA12 fixed-wing aircraft,</li> <li>• recover failed collar from Year V black bear; capture and collar 4 new black bears (May 2004),</li> <li>• spring calf-survival surveys (May 25, June 12, June 25, and June 30 2004),</li> <li>• recover remaining 4 black bear collars (Oct 2004),</li> <li>• fall calf-survival survey (October 2004),</li> <li>• conduct 1 caribou mortality investigation (October 2004),</li> <li>• recover 9 of 11 outstanding GPS wolf collars (November-December 2004),</li> <li>• recover all remaining active GPS caribou collars (November-December 2004),</li> <li>• download all recovered caribou, wolf and black bear GPS data,</li> <li>• complete GPS data projection conversion, formatting, and standardization,</li> <li>• commence locational data screening and systematic censoring process,</li> <li>• begin assembly of available GIS data coverages in preparation for merging of biophysical habitat attributes with GPS locational data,</li> <li>• begin compilation of caribou survival and mortality data.</li> </ul>

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## **APPENDIX I**

### **STATUS/HISTORY OF GPS AND VHF COLLARS TO MARCH 31, 2005**

**SNAKE/SAHTANEH BOREAL CARIBOU: Updated March 31, 2005**

ID	Status	First collared	Orig freq-ser#	Re-collar Date	Re-coll freq-ser#	Current Freq	Comments
S1	retired	March 2000	a150.600-250	n/a	n/a	n/a	retrieved Oct 31, 2000
S2	retired	March 2000	a150.660-251	Jan 2001	n/a	n/a	recollared Jan 18 2001 as 150.450; retrieved Oct 05 01
S3	retired	March 2000	a150.560-248	Jan 2001 Oct 2002 Dec 2003	a150.468-10055 a150.450-12209 t152.191-069	n/a	recollared Jan 18 2001 with refurb ATS 150.468; re-collared Oct 27 2002 with refurb ATS 150.450; re-collared Dec 12 2003 with refurb Televilt 152.191; collar picked up Nov 23 2004
S4	mort	March 2000	a150.710-252	n/a		n/a	retrieved June 24 2000
S5	retired	March 2000	a150.540-253	Jan 2001 Feb 2003 Mar 2004	a150.709-10057 a150.658-12085 a150.430-12119	n/a	recollared Jan 18 2001 with ATS 150.709; recov Jul 02; recollared Feb 06 03 with ATS 150.658; recap/recollared Mar 27 2004 with ATS 150.430; recapture/recover Nov 23 2004
S6	retired	March 2000	a150.580-249	Jan 2001 Nov 2002	a150.597-10056 t150.770-184	n/a	recollared Jan 18 2001 with refurb ATS 150.597; replaced Nov 24 2002 with collar from S15 mort; recovered Sep 24, 2003
S7	retired	March 2000	a150.456-281	n/a	n/a	n/a	retrieved Aug 27, 2000
S8	retired	March 2000	a150.490-285	n/a	n/a	n/a	retrieved Feb 01 2001
S9	retired	March 2000	a150.481-279	n/a	n/a	n/a	retrieved Mar 31, 2001
S10	retired	March 2000	a150.469-278	n/a	n/a	n/a	retrieved Aug 27, 2001
S11	retired	March 2000	a150.440-286	n/a	n/a	n/a	retrieved Oct 31, 2000
S12	retired	March 2000	a150.430-287	n/a	n/a	n/a	retrieved Nov 22, 2000
S13	lost	March 2001	t150.500-021	n/a	n/a	t150.500	missing since Dec 23 2001
S14	retired	March 2001	t150.510-022	Apr 2002	t150.742-022	n/a	re-collared with warranty replacement, recaptured/retrieved Dec 18 03 (failed transmitter; failed drop-off)
S15	mort	March 2001	t150.520-023	Apr 2002	t150.770-184	n/a	re-collared with warranty replacement; mort retrieved August 2002 - collar re-deployed on S6 Nov 24, 2002
S16	retired	March 2001	t150.531-024	Apr 2002 Dec 2003	t150.780-185 t152.141-064	n/a	re-collared with warranty replacement; recaptured - dead collar replaced with Televilt refurb Dec 12 03; collar picked up Nov 23 2004
S17	retired	March 2001	t150.609-025	Feb 2003	a150.467-12323	n/a	not found Apr 2002; retrieved and replaced with ATS 150.467 Feb 06 2003; picked up Dec 02 2004
S18	missing	March 2001	t150.620-026	Apr 2002	t150.720	t150.720	re-collared with warranty replacement; not recovered

**SNAKE/SAHTANEH BOREAL CARIBOU: Updated March 31, 2005**

ID	Status	First collared	Orig freq-ser#	Re-collar Date	Re-coll freq-ser#	Current Freq	Comments
S19	missing	March 2001	t150.629-027	Apr 2002	t150.670	t150.670	re-collared with warranty replacement; heard intermittently at Kotcho Dec 11 2003; not recovered
S20	lost	March 2001	t150.640-028	n/a	n/a	t150.640	missing since Nov 19 2001 (recovery beacon); not recovered
S21	retired	March 2001	t150.650-029	Apr 2002 Dec 2003	t150.760 t150.810	n/a	re-collared with warranty replacement, released and recovered Sep 24, 2003; recollared Dec 11 2003; picked up Nov 23 2004
S22	mort	March 2001	t150.670-030	n/a	n/a	n/a	mort retrieved Oct 13 2001
S23	lost	March 2001	t150.679-031	n/a	n/a	t150.679	missing since Mar 06 2002 (weak signal); not recovered
S24	lost	March 2001	t150.690-032	Apr 2002	t150.820	t150.820	warranty replacement - last heard found Dec 19 2002 - intermittent signal; not recovered
S25	lost	March 2001	t150.700-033	n/a	n/a	t150.700	not found Apr 2002; last heard Jul 10 2002 (weak signal); not recovered
S26	retired	March 2001	a150.440-10053	n/a	n/a	n/a	retrieved May 2002
S28	retired	Nov 2001	a150.489-12081	n/a	n/a	n/a	retrieved June 26 2002
S29	retired	Nov 2001	a150.658-12085	Oct 2002 Nov 2003	a150.430 a150.539	n/a	recollared Oct 27 2002 with ATS refurb; recollared Nov 12, 2003 with ATS refurb; recapture/recover Nov 23 2004
S30	retired	Nov 2001	a150.579-12086	n/a	n/a	n/a	retrieved Feb 06 2003
S31	retired	Nov 2001	a150.479-12083	n/a	n/a	n/a	retrieved Oct 03 2002
S32	mort	Nov 2001	a150.559-12084	n/a	n/a	n/a	retrieved May 2002
S33	retired	Nov 2001	a150.539-12082	n/a	n/a	n/a	Low battery - last heard Nov 2002; signal stopped before collar detached; recovered April 17, 2003 - VHF started up again
S34	retired	02-Dec-03	a150.597-12365	n/a	n/a	n/a	refurb ATS collar on new caribou; recapt/recoverd Oct 24, 2004; low batt
S35	retired	11-Dec-03	a150.479-12083	n/a	n/a	n/a	refurb ATS collar on new caribou; recapture/recover Dec 02 2004
S36	retired	11-Dec-03	t152.151-065	n/a	n/a	n/a	refurb Televilt collar on new caribou; picked up Nov 23 2004
S37	retired	11-Dec-03	t150.800-186	n/a	n/a	n/a	refurb Televilt collar on new caribou; picked up Dec 02 2004

**SNAKE/SAHTANEH BOREAL CARIBOU: Updated March 31, 2005**

ID	Status	First collared	Orig freq-ser#	Re-collar Date	Re-coll freq-ser#	Current Freq	Comments
S37	retired	11-Dec-03	t150.800-186	n/a	n/a	n/a	refurb Televilt collar on new caribou; picked up Dec 02 2004
S38	retired	12-Dec-03	t152.159-066	n/a	n/a	n/a	refurb Televilt collar on new caribou; picked up Nov 23 2004
S39	retired	11-Dec-03	t150.770-184	n/a	n/a	n/a	refurb Televilt collar on new caribou; picked up Dec 02 2004
S40	retired	11-Apr-2002	t150.810-187	n/a	n/a	n/a	warranty Televilt collar; new caribou; recovered Sep 24, 03
S41	retired	11-Apr-2002	t150.800-186	n/a	n/a	n/a	warranty Televilt collar; new caribou; recovered Sep 24, 03
S42	retired	11-Apr-2002	t150.710-178	Oct 2003	a150.489-12081	n/a	warranty Televilt collar - new caribou; last heard Aug 31 2002 - recaptured Jan 06 2003 - no VHF not re-collared; re-collared with ATS refurb Oct 30 2003; recaptured Dec 02 2004
S43	retired	11-Apr-2002	t150.751-182	n/a	n/a	n/a	warranty Televilt collar; new caribou; recovered Sep 24, 03
S44	retired	11-Apr-2002	t150.830-189	n/a	n/a	n/a	warranty Televilt collar; new caribou; recovered Sep 24, 03
S45	retired	11-Apr-2002	t150.729	n/a	n/a	n/a	warranty Televilt collar on new caribou; release failed Aug 2003; recap/recovery Jan 29 2004 on low batt.
S46	retired	05-Feb-2003	a150.440-12324	Mar 2004	a150.450-12209	n/a	refurb ATS on new caribou; recapt/recovered Oct 24, 2004
S47	retired	05-Feb-2003	a150.690-12322	n/a	n/a	n/a	refurb ATS on new caribou; collar recapture/recover Mar 29 2004
S48	active	Feb 06 2003	a150.559-12084	Mar 2004	L150.246	L150.246	refurb ATS on new caribou; recollared Mar 27 2004 with Lotek VHF
S49	retired	12-Mar-03	t150.710-178	n/a	n/a	n/a	warranty Televilt on new caribou, recapt/recovered Oct 24, 2004; low batt
S50	retired	12-Nov-03	a150.579	n/a	n/a	n/a	ATS refurb on new caribou; recapture/recover Nov 23 2004
S51	retired	12-Dec-03	t152.181-068	n/a	n/a	n/a	refurb Televilt on new caribou; picked up Nov 23 2004

**SNAKE/SAHTANEH BOREAL CARIBOU: Updated March 31, 2005**

<b>ID</b>	<b>Status</b>	<b>First collared</b>	<b>Orig freq-ser#</b>	<b>Re-collar Date</b>	<b>Re-coll freq-ser#</b>	<b>Current Freq</b>	<b>Comments</b>
S51	retired	12-Dec-03	t152.181-068	n/a	n/a	n/a	refurb Televilt on new caribou; picked up Nov 23 2004
S52	retired	12-Dec-03	t152.080-008	n/a	n/a	n/a	refurb Televilt on new caribou; picked up Nov 23 2004
S53	retired	12-Dec-03	t150.830-189	n/a	n/a	n/a	refurb Televilt on new caribou; recapture/recover Nov 23 2004
S54	mort	12-Dec-03	t150.760-183	n/a	n/a	n/a	refurb Televilt on new caribou; wolf kill - recovered Oct 24, 2004
S55	active	29-Mar-04	150.261	n/a	n/a	L150.261	VHF collar on new caribou
S56	active	29-Mar-04	151.580	n/a	n/a	L151.580	VHF collar on new caribou
S57	active	29-Mar-04	150.681	n/a	n/a	L150.681	VHF collar on new caribou

**SNAKE/SAHTANEH WOLVES (W): Updated March 31, 2005**

ID	Status	First collared	Original freq	Re-collar Date	Re-collar Freq	Current Freq	Comments
W1	unknown	24-Nov-02	153.911	n/a	n/a	L153.911	Kyklo Pack - gray female
W2	mort	24-Nov-02	152.831	n/a	n/a	L152.831	Kyklo Pack - gray female; shot High Level Alberta
W3	retired	18-Dec-02	150.620	n/a	n/a	n/a	Kyklo Pack - gray male; recovered August 2003 (drop-off)
W4	retired	18-Dec-02	150.629	n/a	n/a	n/a	Kyklo Pack - gray female; recovered August 2003 (drop-off)
W5	retired	18-Dec-02	150.460	n/a	n/a	n/a	Kyklo Pack - gray/brown male; recovered August 2003 (drop-off)
W6	retired	06-Jan-03	150.532	n/a	n/a	n/a	Kotcho Pack - gray female; recovered Sep 24 03 (drop-off)
W7	unknown	06-Jan-03	150.521	Mar 12 2003	152.961	L152.961	Kotcho Pack - white male; failed Televilt GPS collar replaced with Lotek VHF
W8	retired	06-Jan-03	150.570	n/a	n/a	n/a	Kotcho Pack - yellow male; recovered Sep 24, 03 (drop-off)
W9	retired	09-Jan-03	150.511	n/a	n/a	n/a	Snake pack - gray female; recovered Oct 29, 2003 (re-capt)
W10	unknown	09-Jan-03	150.551	Feb 06 2003	153.210	L153.210	Snake pack - gray male; failed Televilt GPS collar replaced with Lotek VHF
W11	retired	09-Jan-03	150.591	n/a	n/a	n/a	Snake pack - gray female; recovered Oct 29, 2003 (drop-off)
W12	unknown	09-Jan-03	150.136	n/a	n/a	L150.136	Komie pack
W13	unknown	09-Jan-03	153.230	n/a	n/a	L153.230	Komie pack
W14	unknown	05-Feb-03	152.880	n/a	n/a	L152.88	Kotcho Pack - black male
W15	unknown	06-Feb-03	153.542	n/a	n/a	L153.542	Snake pack - gray male
W16	retired	12-Mar-03	150.649	n/a	n/a		Snake Pack - gray female; retrieved Nov 12 2003 (re-capt)
W17	missing	11-Feb-04	150.624	n/a	n/a	T150.624	Snake pack - gray male; not recovered
W18	mort	11-Feb-04	150.521	n/a	n/a	n/a	Snake pack - gray female; recovered from trapper snare

**SNAKE/SAHTANEH WOLVES (W): Updated March 31, 2005**

ID	Status	First collared	Original freq	Re-collar Date	Re-collar Freq	Current Freq	Comments
W19	mort	11-Feb-04	150.792	n/a	n/a	n/a	Kotcho pack - gray/white female; picked up Dec 02 2004
W20	retired	11-Feb-04	150.620	n/a	n/a	n/a	Kotcho pack - black female; picked up Jan 11 2005
W21	missing	12-Feb-04	150.570	n/a	n/a	T150.570	Kyklo pack - gray male; not recovered
W22	retired	12-Feb-04	150.460-318	n/a	n/a	n/a	Kyklo pack - gray male; picked up Nov 23 2004
W23	unknown	16-Feb-04	150.921	n/a	n/a	L150.921	Clarke pack - black male
W24	unknown	24-Mar-04	150.101	n/a	n/a	L150.101	Gunnel pack - old gray male
W25	retired	24-Mar-04	150.532	n/a	n/a	n/a	Gunnel pack - gray female; recapture/recover Dec 02 2004
W26	retired	27-Mar-04	150.589	n/a	n/a	n/a	Clarke pack - gray female; picked up Nov 23 2004
W27	mort	27-Mar-04	150.511	n/a	n/a	n/a	Clarke pack - black male; picked up Nov 24 2004
W28	unknown	27-Mar-04	151.411	n/a	n/a	L151.411	Clarke pack - gray male
W29	retired	27-Mar-04	150.832	n/a	n/a	n/a	Gunnel pack - gray/white female; recapture/recover Dec 02 2004
W30	retired	29-Mar-04	150.649-441	n/a	n/a	n/a	Gunnel pack - gray/white female; released - picked-up
W31	unknown	29-Mar-04	150.607	n/a	n/a	L150.607	Gunnel pack - gray female

**SNAKE/SAHTANEH BLACK BEARS (SB): Updated March 31, 2005**

<b>ID</b>	<b>Status</b>	<b>First collared</b>	<b>Original freq</b>	<b>Re-collar Date</b>	<b>Re-collar Freq</b>	<b>Current Freq</b>	<b>Comments</b>
SB1	retired	13-May-03	150.550	n/a	n/a	n/a	M - Clarke Lake, retrieved from den Apr 10, 2004
SB2	retired	13-May-03	150.850-463	n/a	n/a	n/a	F - Sierra, recovered May 25 2004; recapture
SB3	retired	22-May-03	150.650-460	n/a	n/a	n/a	F - Kotcho Lake; retrieved Oct 30, 2003 (re-capt)
SB4	retired	22-May-03	150.792	n/a	n/a	n/a	M - Sextet; retrieved Jun 28, 2003 (slipped)
SB5	retired	22-May-03	150.832	n/a	n/a	n/a	F - Hoffard Creek; retrieved Oct 30, 2003 (re-capt)
SB6	retired	21-May-04	150.650-460	n/a	n/a	n/a	M - south of Sierra; picked up Oct 13 2004
SB7	retired	24-May-04	150.851-682	n/a	n/a	n/a	M - north of Clarke Lake; picked up Oct 13 2004
SB8	retired	24-May-04	150.860-677	n/a	n/a	n/a	F - SE of Clarke Lake; picked up Oct 13 2004
SB9	retired	25-May-04	150.871-678	n/a	n/a	n/a	F - East of Clarke Lake; picked up Oct 13 2004