

KOOTENAY NATIONAL PARK

E L K . S T U D Y

1976 -- 1978

T. R. GIBBONS
PARK WARDEN

TABLE OF CONTENTS

1. INTRODUCTION
2. METHODS
3. IMMOBILIZATION
4. MONITORING
5. SUMMARY
6. RESULTS AND DISCUSSIONS
7. APPENDIX
 - "A" IMMOBILIZATION 1976-1977
 - "B" COLLAR CODES, OBSERVATIONS OF RADIO
COLLARED ELK, 1976-77
 - "C" IMMOBILIZATION 1977-1978
 - "D" COLLAR CODES, OBSERVATIONS OF RADIO
COLLARED ELK, 1977-78
 - "E" MAP OF WINTER RANGE

INTRODUCTION

In the spring of 1972, with the help of

John Stelfox, Canadian Wildlife Service
and Ian Jack, Chief Park Naturalist, K.N.P.,

plans were made to monitor elk movement from Kootenay National Park. At that time Park officials believed that the elk population was moving beyond the park boundary during the winter months.

The purpose of this study was to determine migration patterns of park elk and to locate their winter range.

For background and objectives refer to Elk Study, Kootenay National Park, 1976, by T. R. Gibbons and K. Baker.

METHODS

A total of 12 elk were fitted with radio collars between October 11, 1976 and December 10, 1976. Collars were assigned numbers from 166 - 181 and the telemetry equipment was fitted inside pieces of rubber-lined one and on half inch fire hose; each of the prepared collars was then color - coded for easy identification (Appendix B).

Fourteen additional elk were radio collared between October 20, 1977 and December 15, 1977. Collars were numbered from 213 - 227. Telemetry equipment was embedded between layers of industrial belting, which were then banded and sealed. Individual collars were then color coded. Refer to Appendix D.

IMMOBILIZATION

All radio collared elk were immobilized using Anectine (succinylcholine chloride) at a concentration of one hundred -(100) milligrams per cubic centimeter. The average dosage used on cow elk was 24 mg.; the average dosage on bull elk was slightly higher at 27.3 mg. Refer to Appendix A and C.

MONITORING

76-77

Twelve radio collars and a receiver were purchased from the Canadian Wildlife Service Bioelectronics Section (F. Anderka), Ottawa. These collars were designed to transmit in the 170-180 megahertz (MHZ) range. As of May 15, 1977 nine collars had been functioning for 24 weeks. Transmitter failure in collar #173 on November 11, 1976 reduced the number of collars functioning at that time to 11; collar #171 (which had not yet been placed on an animal) was fitted to the elk carrying #173 and the defective unit was removed on December 10, 1976. Data previously reported for collar #173 has been included in the records for #171. The telemetry equipment was accidentally stripped from collars #166 and #175 by the animals after March 28, 1977 and April 11, 1977, respectively. (Dates noted are the last recorded signals). Monitoring of radio collared elk was discontinued during the summer 1977. Refer to Appendix B.

77-78

Fourteen additional radio collars were purchased from the C. W. S

for the 77-78 season.

These collars also transmitted in the 170-180 megahertz range. Radio collared elk were monitored in conjunction with routine road patrols throughout the winter of 77-78. Aerial monitoring of radio collared elk was carried out during January, February, March. As of April 18, 1978, thirteen of the fourteen radio collars were functioning. Transmitter failure in #227 secured within 3 - 4 days after November 15, 1977.

(Refer to Appendix D).

SUMMARY

Between November, 1972, and October, 1974, forty-two elk were ear-tagged and banded with colour coded collars.

Ground and aerial observations were initiated in January, 1973, and were carried out until the spring of 1976. Aerial reconnaissance flights by park personnel and the British Columbia Wildlife Service failed to locate banded elk beyond the park boundary. (Refer to Elk Study, Kootenay National Park, Interim Report, 1976).

The winter of 1975/76 was considered a trial period for the use of radio telemetry equipment. Four elk were fitted with radio collars. Data received from the four collared animals indicated that radio telemetry could provide the necessary information on herd movement.

During the winter of 1976/77 twelve elk were radio collared. Fourteen additional animals were collared during the winter of 1977/78.

- Exchange between herds from the Bow valley and Upper Vermilion have been observed during this study. Since 1973, three colour coded bands and two radio collared animals have been sighted in the Bow valley. Reliable reports of a banded elk near Edgewater, B.C., in July of 1973, and another one west of Radium in 1976 indicate a minimal exchange between herds from the Columbia and Kootenay valleys.

RESULTS AND DISCUSSIONS

- Reports of a growing elk population within Kootenay National Park and suggestions that these elk are moving as far south as Canal Flats during the winter are unfounded;
- Yearly elk censuses show a gradual decrease in the elk population;
- Census counts in the 1960's ranged from a high of 484 in 1963 to a low of 353 in 1969. The gradual decrease in population has continued into the 70's. Census counts in the 1970's ranged from a high of 265 in 1973 to a low of 223 in 1978. The present population at this time is estimated at 250 animals.
- Reports of banded elk beyond the park's south boundary are rare. Ground and aerial surveys by park personnel and aerial census counts taken by the British Columbia Wildlife Service have failed to locate banded elk in the Canal Flats area. The 1976 interim elk report listed sightings of banded elk at Wasa Lake, Skookumchuk, Canal Flats, and Dutch creek areas. All of the above mentioned sightings were recorded by one individual. Information gathered throughout this study indicates reported sightings in these areas were false.
- Eight to ten reports of banded elk as far south as the Palliser river have been checked out and verified. Data collected from logging personnel and land owners indicate no more than 20 to 30 elk winter beyond the park's southern boundary.
- Results of this study indicate the park's elk population is a definable unit associated with the park. The majority of animals rut, calve, and winter within the park and thus can be considered a resident population and adjacent herds appear to be minimal.
- The use of radio telemetry equipment during the winters of 1976/77 & 1977/78 indicates that the majority of the park's elk winter within the boundaries of Kootenay National Park. With the exception of a small band of 12 to 14 animals that winter on Wardle Flats, in the Vermilion valley, the main body of elk winters in the northern section of the Kootenay valley.
- The winter range as determined by this study extends from the park's northern boundary on the Kootenay river south to approximately the junction of the Palliser and Kootenay rivers. Sightings and telemetry data received throughout the study show the heaviest concentrations occur along the river flats and terraces, from Nixon creek (mile 15 on highway #93) to the park's northern boundary on the Kootenay river.

APPENDIX A
INFORMATION ON IMMOBILIZATION
1976-77

DATE	LOCATION	AGE, SEX	DOSE	PLACEMENT	DEPARTED	DOWN	UP	COLLAR	TAGS	
Oct. 7	5 mi. N. Ver. Xing	A Female	24	hip	9:AM	(Animal not located)				
Oct. 7	Assiniboine Slides	A 5pt. Male	29	hip	6:PM	(Moved into heavy timber, not located)				
Oct. 8	Assiniboine Slides	A Female	24	hip	8:45AM	(Animal not located)				
Oct. 11	Paint Pots	A 5pt. Male	29	hip	8:47 AM	9:09 AM	9:33AM	#169	GR #10, #11	
Oct. 12	Hawk Creek	A Female	24	hip	10:11AM	10:21AM	10:47AM	#180	(No ear tags good recovery not located)	
Oct. 12	Hawk Creek	A Female	24	hip	5:25PM					
Oct. 19	Assiniboine Slides	A Female	24	hip	5:57PM	*6:12PM	6:45PM	#166	BR #13 #12	Good recovery
Oct. 20	5 mi. N. Numa Picnic Site	Spike	24	hip	8:57AM	*9:12AM	9:40AM	#181	GR #15 #14	Good recovery
Oct. 21	Paint Pots	A 5pt. Male	24	hip	9:26AM	9:36AM	10:07AM	#174	BR #16 #17	Good recovery
Oct. 22	Assiniboine View Point	A Female	22	hip	8:47AM	*9:09AM	9:30AM	#175	RD #10	(One red ear tag from year)
Oct. 25	Horse pasture K.C.	A Female	24	hip	8:55AM	9:10AM	9:25AM	#170	GR #18 #19	Good recovery
Nov. 4	1½ mi. S. Hawk Creek	A Female	24	hip	2:47PM	2:59PM	3:22PM	#167	GR	Good recovery
Nov. 5	5 mi. S. McLeod	Spike	24	hip	2:38PM	2:51PM	3:22PM	#173		Good recovery
Nov. 22	Wardle Picnic Site	A Female	24	hip	8:58AM	*9:15AM	9:38AM	#172	CR	Too active for ear tags
Nov. 29	Crooks Meadow	A Female	24	hip	9:48AM	9:55AM	10:50AM	#176	CR #19 #18	
Dec. 10	Kootenay Crossing	#173	25.5	hip	8:48AM					(Unapproachable)
Dec. 10	1.5 mi. N. McLeod	#173	26mg.	hip	3:09PM	3:20PM	4:22PM	(Collar #173 removed)		replaced with #171. Good recovery.

APPENDIX B

1976-77

OBSERVATIONS FROM RADIO COLLARED ELK
AND COLLAR CODES

COLLAR CODES

1976 - 77

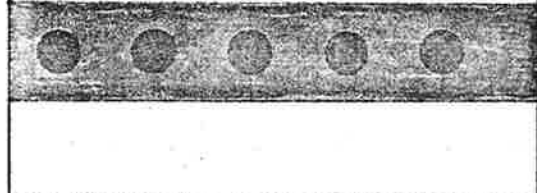
166



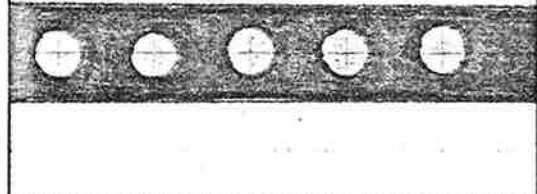
167



169



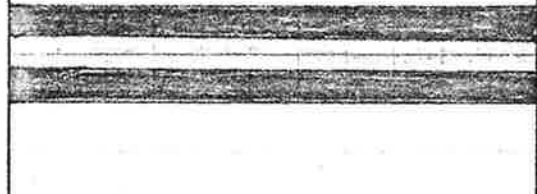
170



171



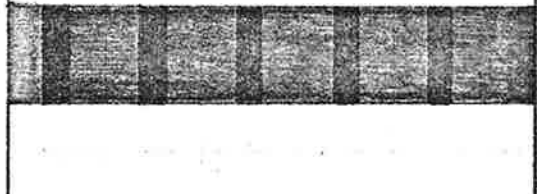
172



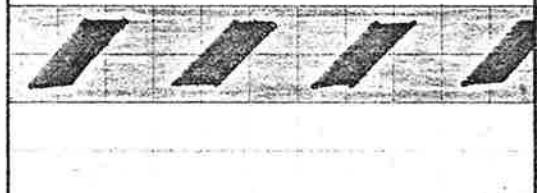
174



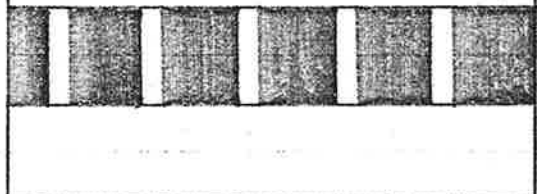
175



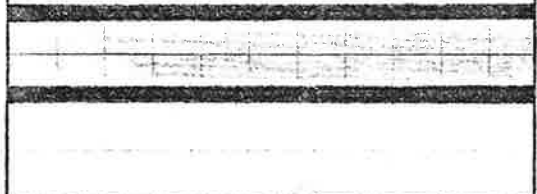
176



180



181



173



1" Bands

7

Radio Collar 166
Summary of Movements

This adult cow was banded October 19 at the Assiniboine Slide Area just south of Vermilion Crossing. It remained in the immediate area of Vermilion Crossing and the slide paths (within two miles of these areas) until November 30 when it began moving southward, reaching Wardle Picnic Site by December 1 and Kootenay Crossing by December 8. For the remainder of the winter this animal moved back and forth between Crooks meadows and McLeod meadows, moving as far north as the old air-field and as far south as the junction of Settlers Road.

Radio Collar #166
Frequency 171.808

Yellow Collar
Adult Cow

- 1976
- Oct. 19 Banded Assiniboine slide path #1 & 2
 - " 20 Opposite slide path #1 & 2
 - " 21 Opposite slide path #1 & 2
 - " 22 Opposite slide path #1 & 2
 - " 23 Opposite slide path #1 & 2 across river
 - " 24 Opposite slide path #1 & 2 across river
 - " 25 Sighted across river from Assiniboine slide #1 & 2
 - " 27 Sighted 0.75 mi. South of Vermilion Crossing
 - Nov. 1 Signal picked up 0.5 mi. North of Vermilion Crossing West of highway 93
 - " 2 Signal picked up 0.5 mi. North of Vermilion Crossing West of highway 93
 - " 3 Sighted 0.5 mi. South of Vermilion Crossing East of highway 93
 - " 5 Signal picked up at Assiniboine Viewpoint toward River Flats
 - " 6 Signal picked up at Assiniboine Viewpoint toward River Flats
 - " 8 Signal opposite slide path #1 & 2 River Flats
 - " 10 Located 1.9 mi, North of Shanks fire road
 - " 11 Located 1.9 mi. North of Shanks fire road
 - " 13 Signal East of Vermilion Crossing
 - " 14 Signal East of Vermilion Crossing
 - " 17 Signal picked up at Assiniboine Viewpoint toward River Flats
 - " 20 Signal picked up at Assiniboine Viewpoint toward River Flats
 - " 21 Located 0.5 mi. South of Vermilion Crossing West of highway 93
 - " 22 Signal East of Assiniboine Viewpoint toward River Flats

Radio Collar #166

1976

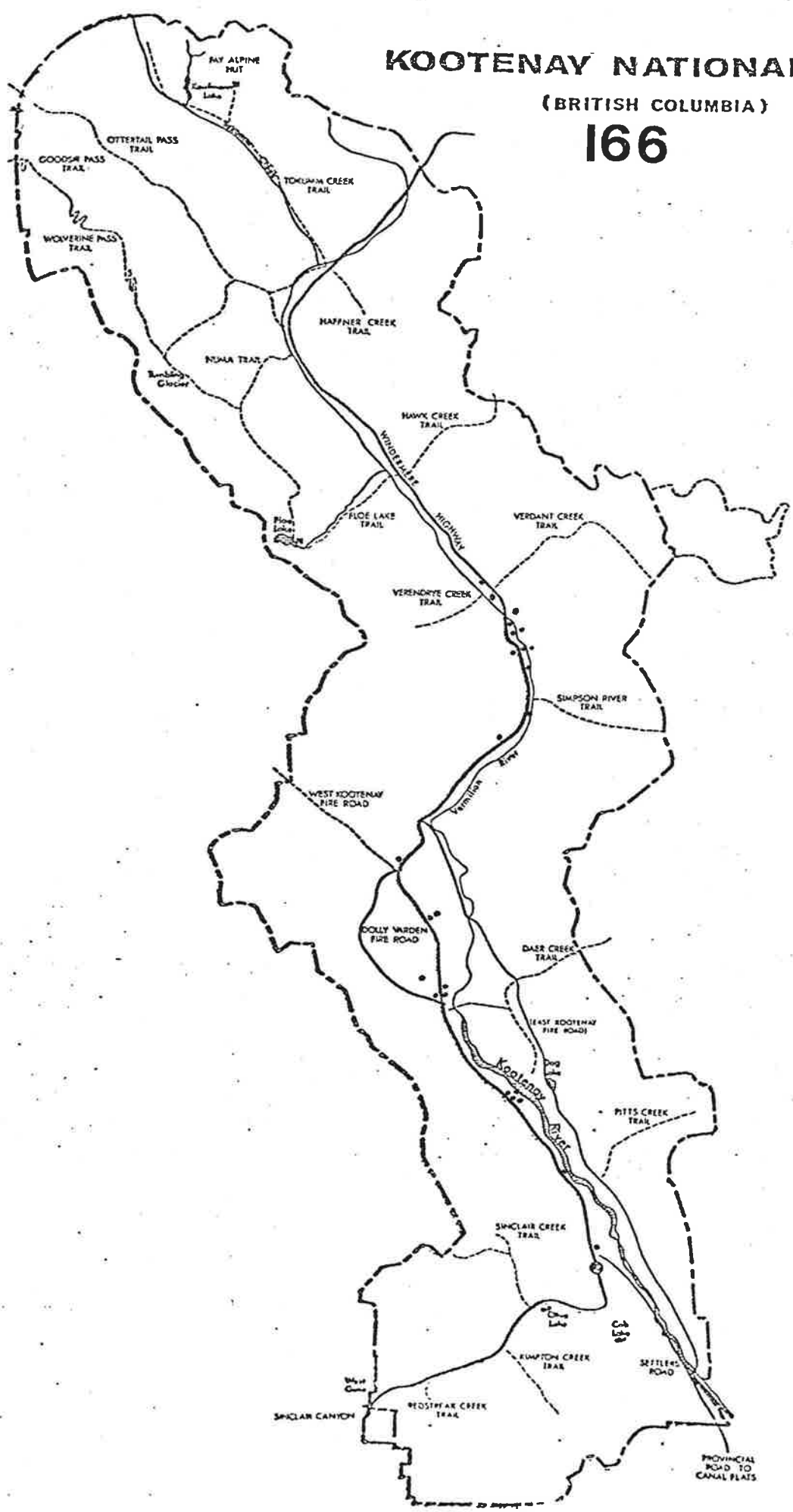
- Nov. 26 Signal 0.5 mi. South of Vermilion Crossing road side
- " 27 Located 1.5 mi. North of Vermilion Crossing
- " 30 Sighted at Simpsons Monument East side of highway 93
- Dec. 1 Sighted 0.5 mi. North of Wardle Picnic Site
- " 3 Sighted 0.5 mi. North of Wardle Picnic Site
- " 8 Sighted at Kootenay Crossing
- " 9 Sighted at Kootenay Crossing
- " 10 Signal near old airfield East of highway 93
- " 21 Located Crooks meadow
- " 22 Located Crooks meadow
- " 23 Signal 1.0 mi. North McLeod meadow
- " 24 Located old airfield, aerial patrol

1977

- Jan. 7 Sighted McLeod meadows
- " 14 Sighted McLeod meadows West of highway 93
- " 18 Sighted McLeod meadows no signal
- " 21 Sighted 0.25 mi. North Settlers Road junction
West of highway 93 no signal
- Feb. 4 Signal to 4. North West of Dolly Varden (Beaver Ponds)
- Mar. 3 Possible signal East of old airfield
- " 15 Sighted at Mt. Harkin sign
- " 16 Sighted at McLeod meadow
- " 22 Signal to 4 at mile 16 East of highway 93, 0835 hours
- " 28 Sighted 0.25 mi. South of Dolly Varden East of highway
93, no signal
- April 11 Located McLeod meadow
- " 26 Located McLeod meadow
- May 1 Located Dolly Varden transmitter not working (sighted)
- " 9 Sighted Crooks meadow
- " 10 Located Crooks meadow
- " 12 Sighted Crooks meadow, 0910 hours

KOOTENAY NATIONAL PARK (BRITISH COLUMBIA)

166



Radio Collar #167
Summary of Movements

This animal, an adult cow, was banded November 4, 1.5 miles south of Hawk Creek. It moved slowly southward over the next three weeks, reaching Kootenay Crossing by November 25 and Crook meadows by November 30. It remained in the area between the old airfield and McLeod meadows until April 26 when it was located at Kootenay Crossing; by May 9 it had moved north to the Vermilion Crossing area.

	Radio Collar #167 Frequency 171.826	Yellow Collar with Red Stripe Adult Cow
1976		
Nov.	4	Banded 1.5 mi. South Hawk Creek
"	5	Located 1.5 mi. South of Hawk Creek West of highway 93
"	6	Located 2.3 mi. South Hawk Creek on River Flats
"	8	Located on River Flats opposite Hawk Creek
"	10	Signal 0.3 mi. South of Snow Creek West of highway 93
"	11	Located 0.3 mi. South of Snow Creek West side of river on flats
"	13	Located at Snow Creek
"	17	Sighted across from Hawk Creek
"	20	Located at Mt. Shanks sign
"	21	Located 0.4 mi. South Simpson Monument North side of highway 93
"	22	Sighted at Wardle Picnic Site
"	23	Sighted 0.5 mi. South Wardle Picnic Site
"	25	Signal Kootenay Crossing Pasture
"	27	Located South of Hector Gorge Viewpoint
"	28	Sighted at Crooks meadow
"	30	Sighted at old airfield East side of highway 93
Dec.	1	Sighted 1.5 mi. North Dolly Varden
"	3	Signal picked up East of Dolly Varden Picnic Site
"	6	Signal picked up at Kootenay Crossing
"	8	Sighted at Kootenay Crossing
"	10	Sighted at Kootenay Crossing
"	19	Sighted at old airfield
"	20	Located 0.25 mi. South of old airfield
"	21	Located at Crooks meadow
"	22	Located at Crooks meadow
"	23	Signal 1.0 mi. North McLeod meadow East of highway 93
"	24	Located signal at old airfield, aerial patrol
"	27	Signal 1.5 mi. North of McLeod meadow
"	31	Located at Dolly Varden

Radio Collar #167

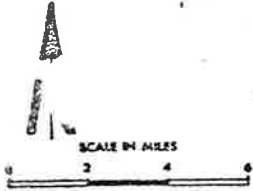
1977

Jan.	1	Sighted at Dolly Varden Picnic Site
"	7	0.25 mi. South of East Kootenay fire road, West of highway 93
"	11	Sighted at old airfield no signal from transmitter
"	18	Sighted Crooks meadow strong signal
"	28	Signal to 2 East of Crooks meadow River Flats
Feb.	4	Signal to 4 North East of Dolly Varden
"	6	Signal to 3 West of Dolly Varden
"	8	Located 0.5 mi. North of Crooks meadow West of highway 93
"	9	Sighted 0.5 mi. South of old airfield West of highway 93
Mar.	4	Signal to 2 South East of Dolly Varden, 0935 hours
"	10	Signal to 2 Dolly Varden Area, aerial patrol
"	16	Sighted at 0.75 mi. North of Mt. Harkin sign
April	26	Located at Kootenay Crossing
May	9	Located 0.5 mi. North of Vermilion Crossing
"	10	Sighted at Vermilion Crossing

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

167



Radio Collar #169
Summary of Movements

A five point bull was fitted with radio collar #169 at the Paint Pots on October 11. By October 16 it had reached the B.C. - Alberta boundary and by October 19 it had traveled further north to the Storm Mountain Lodge area. It remained in the area between Storm Mountain Lodge and Eisenhower Junction until at least November 17 when the transmitter ceased functioning. It probably remained in the Eisenhower Junction area for most of the winter as it was sighted near the junction, February 10. It appeared to move slowly eastward from the junction during the period March through May.

	Radio Collar #169 Frequency 171.865	Red Collar with Black Dots 5 Point Bull
1976		
Oct.	11	Banded at Paint Pots opposite parking lot
"	12	Signal picked up on slide path west of river west of Paint Pots
"	15	1 mi. North Marble Canyon Warden Station East side of highway 93
"	16	Located 0.25 mi. South of Great Divide West of highway 93
"	18	Located B.C. - Alberta boundary West of highway 93
"	19	Signal 0.5 mi. South of Storm Mountain Lodge West of highway 93
"	20	Signal back of Storm Mountain Lodge West of highway
"	21	Signal 1.5 mi. North of Storm Mountain Lodge East of highway 93
"	23	Signal 2½ mi. North Storm Mountain Lodge between TransCanada and highway 93
"	24	Located 1.2 mi. West of Eisenhower Junction South of TransCanada highway
"	26	Located West of Storm Mountain Lodge South of TransCanada highway
Nov.	1	Located 0.5 mi. North of Storm Mountain Lodge West of highway 93
"	5	Located 0.5 mi. North of Storm Mountain Lodge West of highway 93
"	6	Located 1 mi. South of Eisenhower Junction West of highway 93
"	8	1 mi. South of Eisenhower Junction West of highway 93
"	10	Located 1 mi. North of Storm Mountain Lodge East of highway 93
"	11	Sighted in Taylor Creek area, reported from Banff
"	12	Sighted 1 mi. North of Storm Mountain Lodge, reported from Banff
"	15	Sighted 100 yds, North of Storm Mountain Lodge along road side of highway 93
"	17	Signal South of Storm Mountain Lodge

Radio Collar #169

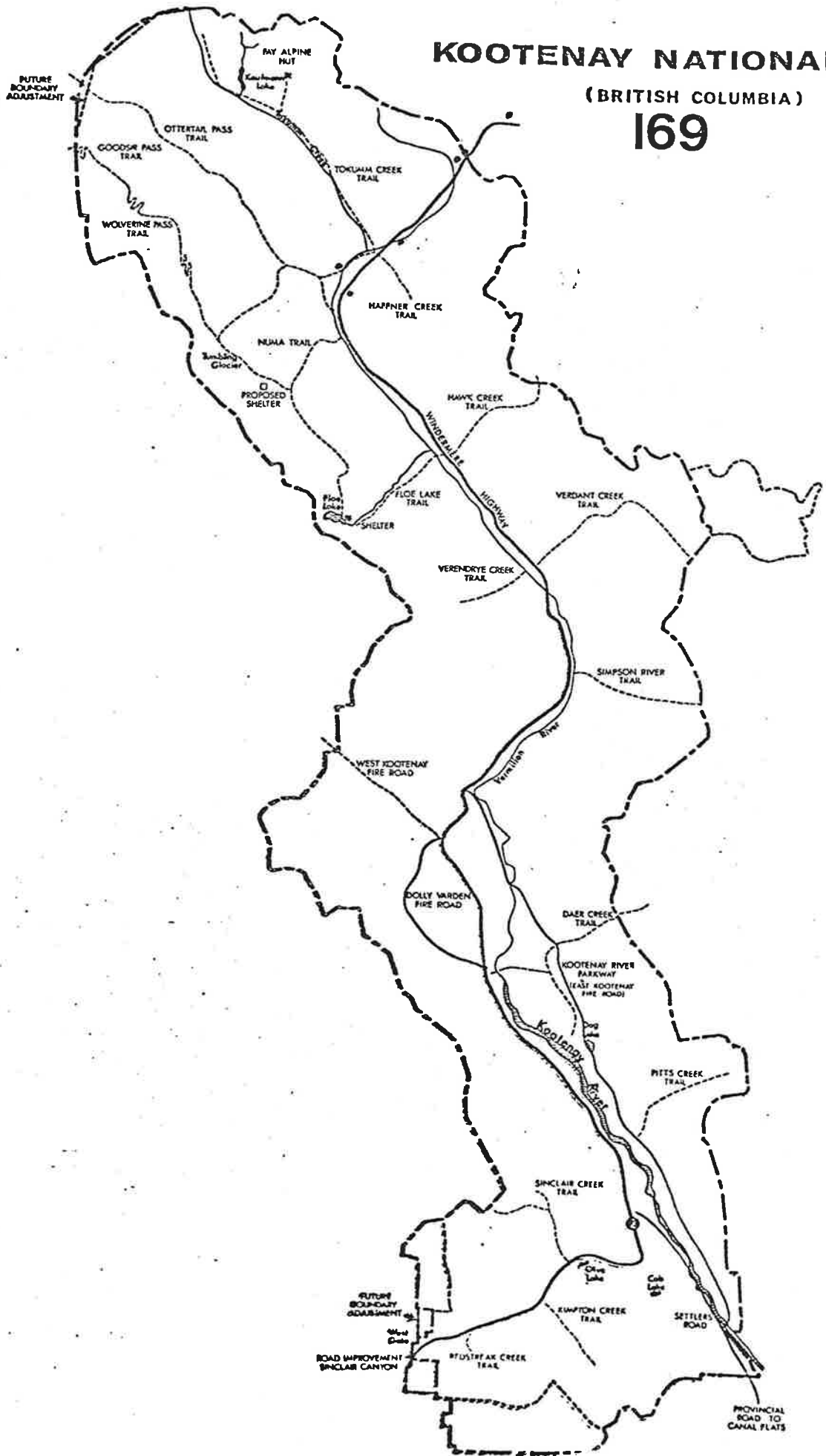
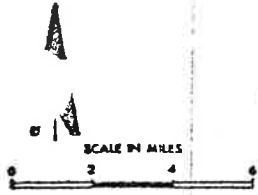
1977

- Feb. 10 Sighted by Banff Maintenance 200 yds. East of Eisenhower Junction
- May 7 Sighted at Red Earth Creek, Banff
- " 15 Sighted 4 mi. East of Eisenhower Junction, Banff
- " 17 Sighted 1 mi. North West of Hillside, Banff

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

169



Radio Collar #170
Summary of Movements

This adult cow was banded October 25 at Kootenay Crossing. It remained in the area until November 2 after which it moved north to Wardle Flats where it remained until November 28. It moved south again and reached McLeod meadows by December 31, remaining in the area between McLeod meadows and Kootenay Crossing for the winter. Last sighted at Dolly Varden Picnic Site April 27.

	Radio Collar #170 Frequency 171.886	Red Collar with Yellow Dots Adult Cow
1976		
Oct.	25	Banded Kootenay Crossing Pasture
"	26	Signal cow has moved Northward up Kootenay Valley toward boundary
"	27	Located on North end of Kootenay Pond
"	28	Sighted on North end of Kootenay Pond
Nov.	1	Signal pick up East of Kootenay Pond
"	2	Signal pick up West of Kootenay Pond
"	3	Signal 0.33 mi. North of 4 mi. Viewpoint West of highway
"	5	Signal 0.5 mi. North of 4 mi. Viewpoint
"	6	Signal 0.5 mi. North of 4 mi. Viewpoint
"	7	Sighted on River Flats opposite Goat Lick
"	8	Signal opposite Goat Lick
"	10	Signal East of Wardle Creek
"	14	Located 0.25 mi. South of Wardle Picnic Site River Flats
"	17	Located 0.5 mi. North of Wardle Picnic Site
"	18	Sighted at Wardle Picnic Site
"	20	Located 0.5 mi. South Wardle Picnic Site
"	21	Located 0.25 mi. South Wardle Picnic Site
"	22	Located at Wardle Picnic Site
"	23	Sighted 0.5 mi. South Wardle Picnic Site
"	24	Sighted 1 mi. North Wardle Picnic Site
"	27	Located 0.25 mi. South of Wardle Picnic Site
"	28	Sighted Wardle Flats
"	30	Sighted 0.3 mi. South of Kootenay Crossing West of highway 93
Dec.	1	Sighted 1.5 mi. North of Dolly Varden
"	6	Signal .5 mi. South of Crooks meadow
"	8	Sighted opposite Kootenay Crossing
"	10	Signal and Sighted at Kootenay Crossing
"	19	Sighted at Kootenay Crossing
"	22	Located at horse pasture Kootenay Crossing
"	23	Signal 1 mi. North of McLeod meadow East of highway 93
"	24	Located Kootenay Crossing area, aerial patrol
"	31	Signal 1 mi. North of McLeod meadow East of highway 93

Radio Collar #170

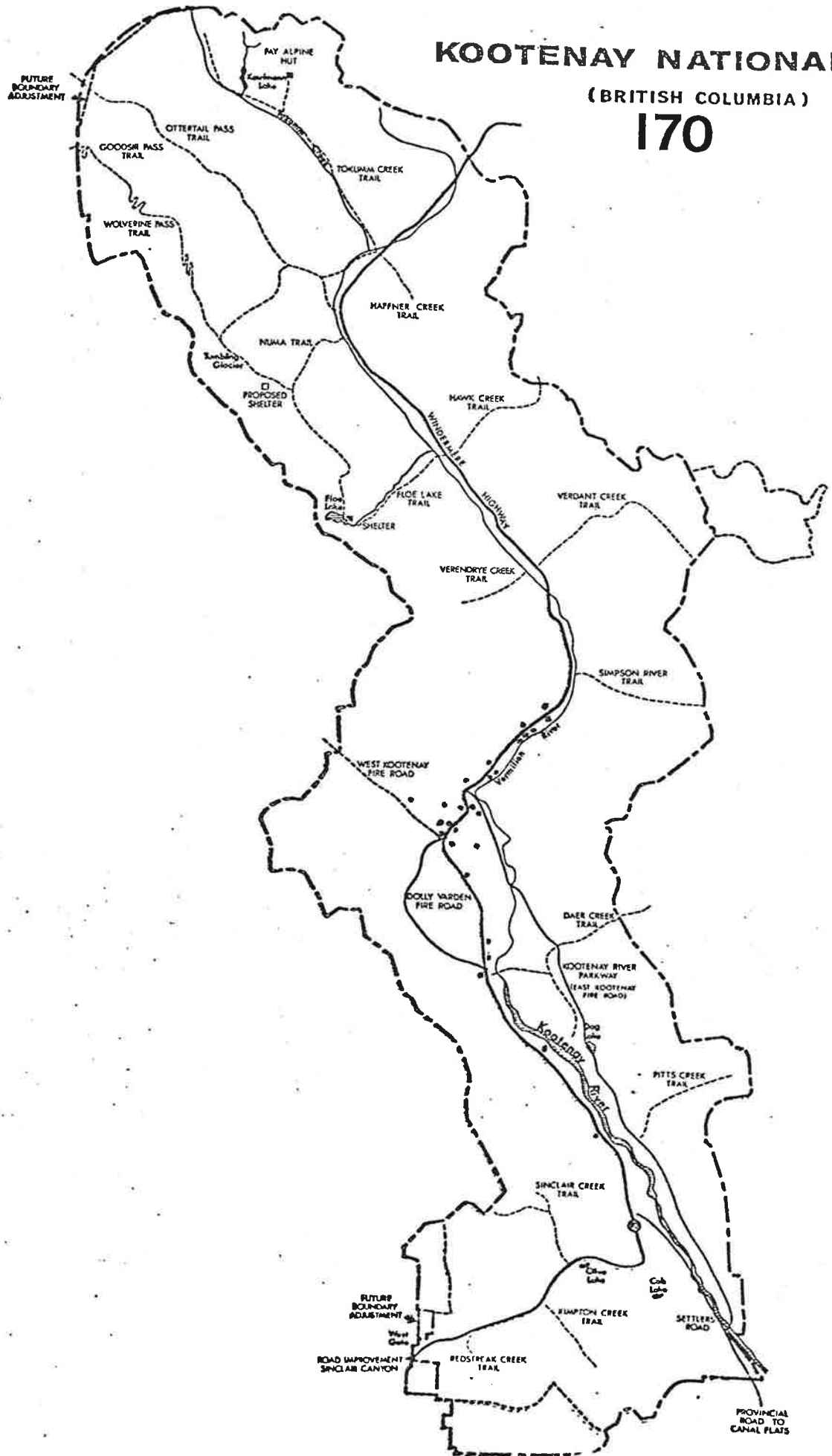
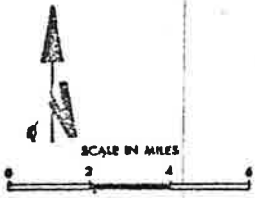
1977

Jan.	4	Sighted at Kootenay Pond Good signal above highway 93
"	25	Very weak signal South East of Kootenay Crossing
"	27	Sighted, no signal 0.5 mi. North of old airfield
Mar.	8	Signal to 2 Located at mile 16 East of highway 93
April	27	Sighted at Dolly Varden 0900 hours

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

170



Radio Collar #171
Summary of Movements

This animal, a spike bull, was banded November 5 just south of Crooks meadows. It remained in the area between McLeod meadows and Kootenay Crossing from November through until May. The most recent sighting was on August 29, 1977 at Wardle Flats.

		Radio Collar #171 Frequency 171.905	Red with Black Zig Zag Spike Bull
1976			
Nov.	5	Banded 0.5 mi. South of Crooks meadow	
"	8	Located 1 mi. South of Crooks meadow	
"	10	Located South of Crooks meadow	
"	11	Sighted at Crooks meadow East of highway	
"	13	Sighted 0.4 mi. South of Dolly Varden Picnic Site	
"	17	Located at Crooks meadow	
"	24	Sighted at Dolly Varden Picnic Site	
"	28	Sighted at Crooks meadow	
Dec.	6	Sighted at Kootenay Pond	
"	7	Sighted 1 mi. South of Crooks meadow	
"	8	Sighted 1.5 mi. North of McLeod meadow	
"	9	Sighted .5 mi. North of McLeod meadow	
"	10	Located 1.5 mi. North of McLeod meadow	
"	19	Sighted at old airfield	
"	21	Located at old airfield	
"	22	Located at old airfield	
"	23	Signal 1 mi. North of McLeod meadow East of highway 93	
"	24	Signal old airfield area, aerial patrol	
"	27	Signal 0.25 mi. North of Dolly Varden	
"	31	Signal at Dolly Varden	
1977			
Jan.	2	Location 1 mi. North of Harkin sign signal East of highway 93	
"	7	Signal at East Kootenay fire road West of highway 93	
"	14	Signal West of Dolly Varden (near beaver ponds)	
"	18	Signal West of Dolly Varden (near beaver ponds)	
"	21	Signal West of Dolly Varden (near beaver ponds)	
"	25	Signal West of Dolly Varden (near beaver ponds)	
"	26	Signal to 3 West of Dolly Varden	
"	27	Signal to 3 West of Dolly Varden	
"	28	Signal to 2 West of Dolly Varden	
Feb.	2	Signal to 2 West of Dolly Varden	
"	3	Signal to 4 West of Dolly Varden	
"	4	Signal to 4 West of Dolly Varden	
"	8	Signal to 2 West of Dolly Varden	
"	9	Sighted 0.5 mi. South of old airfield West of highway 93	

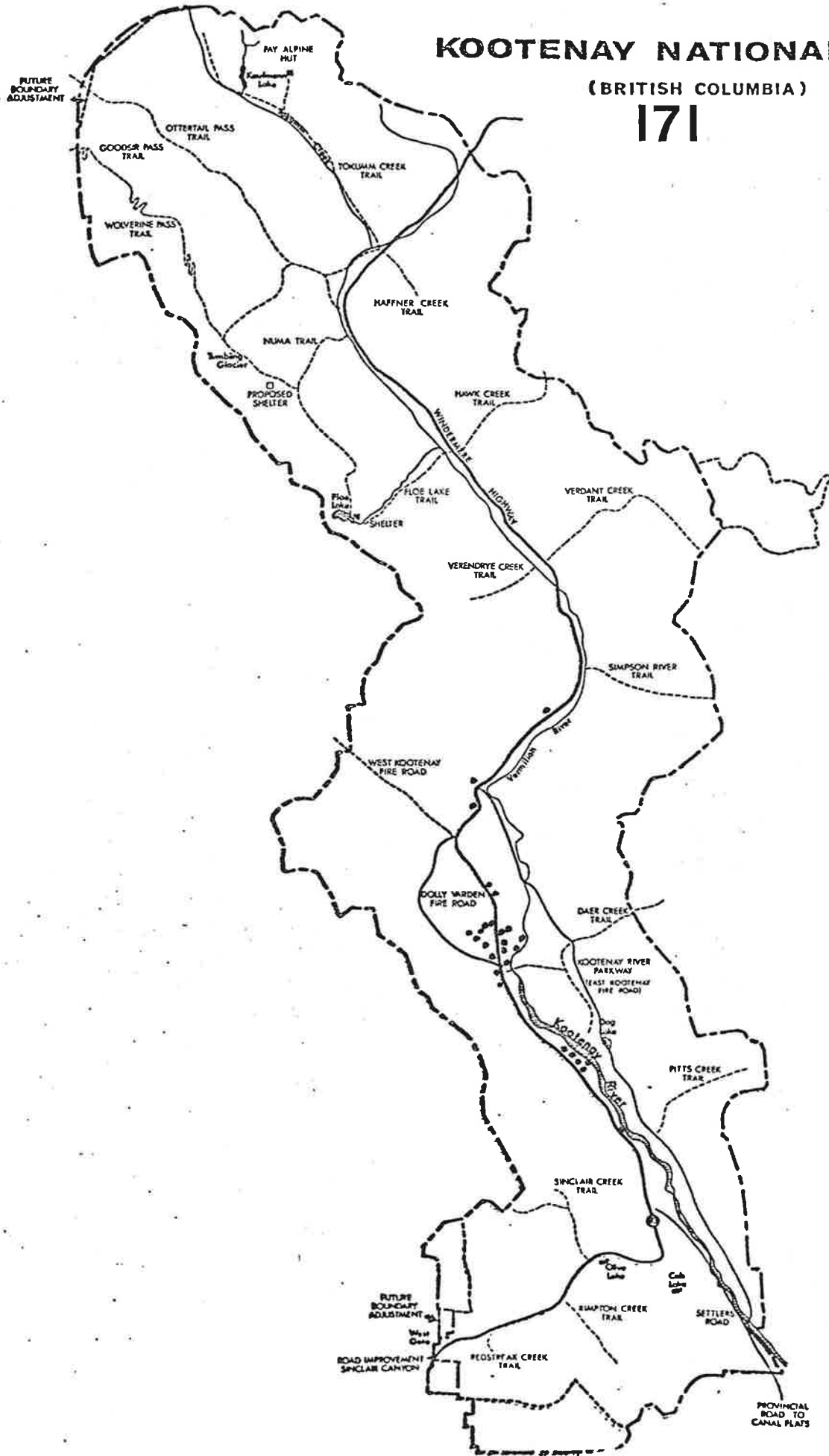
Radio Collar #171

1977
Feb. 11 Located West of Dolly Varden
" 14 Located North of Dolly Varden West of highway 93
" 16 Located 0.5 mi. North of Dolly Varden East of
highway 93
" 21 Signal to 2 East of Dolly Varden
" 22 Located 1 mi. North of Dolly Varden East of highway 93
Mar. 3 Located 0.5 mi. North of East Kootenay fire road West of
highway 93
" 4 Signal to 4 East of Dolly Varden 0940 hours
" 8 Signal to 2 at mile 16 East of highway 93
" 10 Located McLeod meadow area, aerial patrol
" 16 Sighted at McLeod meadow
April 15 Signal to 2 East of Crooks meadow 0945 hours
" 25 Located at 4 mi. Gravel pit
" 26 Located at 4 mi.
May 12 Sighted at Dolly Varden 0900 hours
Aug. 29 Sighted at Wardle Flats near river

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

171



SCALE IN MILES



Radio Collar #172
Summary of Movements

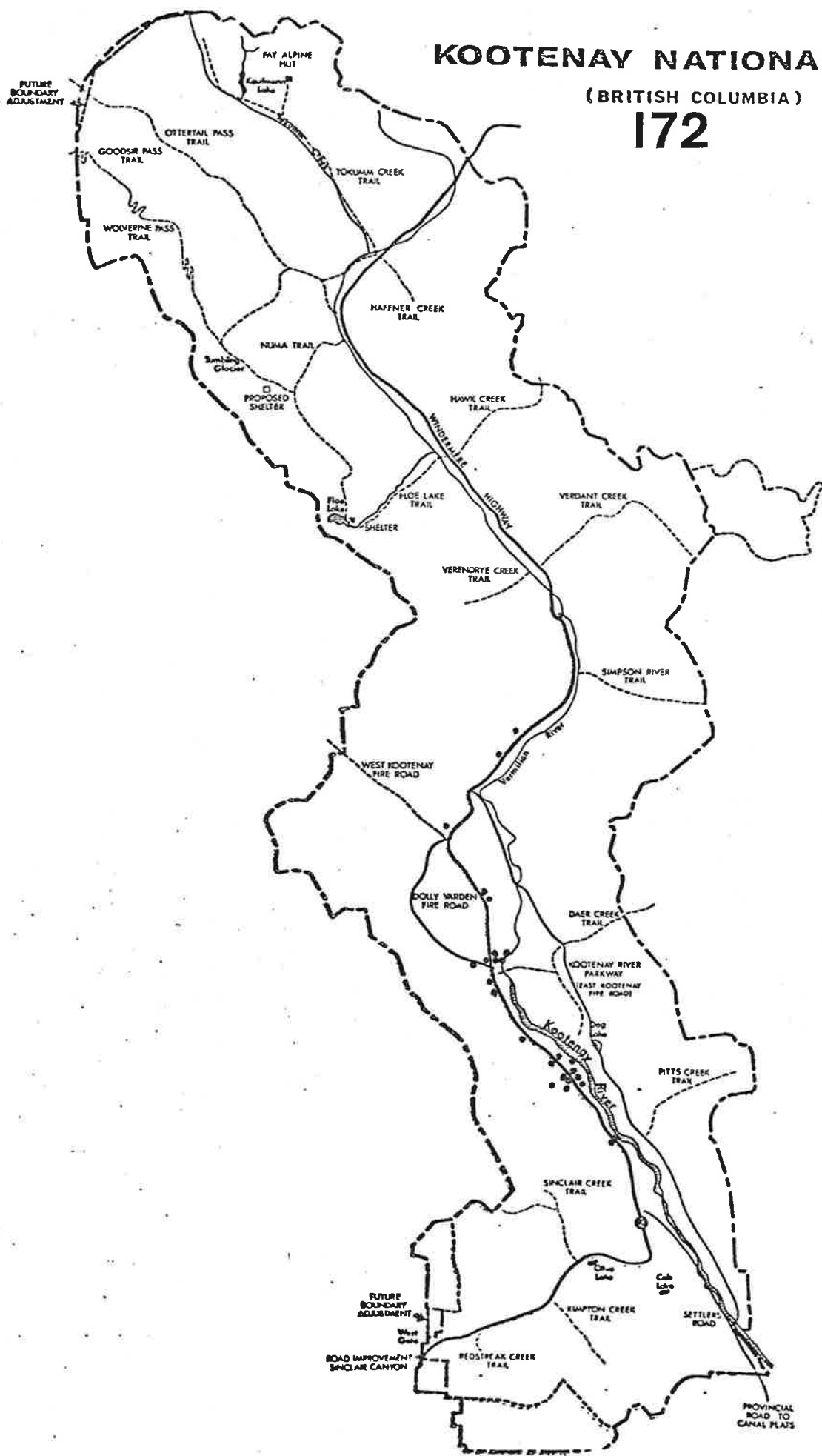
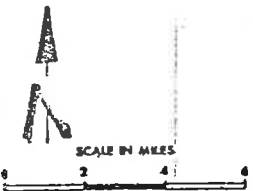
An adult cow was fitted with radio collar #172 at Wardle Picnic Site on November 22. The animal moved south and reached McLeod meadows by December 3. It remained in the McLeod meadows area until April 15; after that date it moved north and a signal was picked up May 6 and 9 near Assiniboine slidepaths.

	Radio Collar #172 Frequency 171.917	Red Collar with Yellow Stripe Adult Cow
1976		
Nov.	22	Banded at Wardle Picnic Site
"	24	Sighted Hector Gorge
"	25	Signal at Kootenay Crossing pasture
"	30	Signal and sighted 0.5 mi. South of Crooks meadow
Dec.	3	Signal 0.5 mi. North of McLeod meadow East of highway 93
"	6	Located 0.5 mi. North of McLeod meadow West of highway 93
"	20	Sighted 0.25 mi. South of old airfield
"	21	Located at Crooks meadow
"	22	Located at Crooks meadow
"	23	Signal 1 mi. South of Crooks meadow
"	24	Located at old airfield, aerial patrol
"	27	Located 0.25 mi. South of McLeod meadow
"	31	Located 0.25 mi. South of McLeod meadow
Jan.	2	Signal opposite McLeod meadow
"	3	Sighted and signal McLeod meadow
"	7	Located 0.25 mi. North of McLeod meadow West of highway 93
"	14	Sighted and good signal 0.25 mi. South Dolly Varden Picnic Site
"	18	Sighted Crooks meadow good signal
"	19	Sighted 0.75 mi. South of Crooks meadow
"	25	Signal to 4, 0.25 mi. South of old airfield East of highway 93
"	27	Signal to 4 South East of Crooks meadow (River Flats)
Feb.	4	Signal to 2, East of Dolly Varden
"	6	Signal to 5, 1.0 mi. North of Mt. Harkin sign West of highway 93
"	11	Located West of Dolly Varden
"	21	Sighted 1.0 mi. North of Mt. Harkin sign
Mar.	3	Signal weak West of highway 93 Crooks meadow
"	4	Signal to 2 East of Mt. Harkin sign 0910 hours
"	7	Signal South East of Dolly Varden
"	8	Signal to 4 at mile 16
"	15	Sighted at mile 16
"	16	Sighted at McLeod meadow 1930 hours
"	22	Signal to 4 mi. 16 East of highway 93 0835 hours
April	15	Signal to 6, 0.5 mi. South of 21 mile West of highway 93
May	6	Located at Assiniboine Viewpoint Good signal
"	9	Located at Assiniboine Viewpoint

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

172



Radio Collar # 174
Summary of Movements

A radio collar was fitted to a 5-point bull at the Paint Pots on October 21. It remained in the Paint Pots area until November 2, after which it moved slowly south reaching Kootenay Crossing by December 8. Remained in the area between McLeod meadows and Kootenay Crossing until March 28 when a signal was received between mile 6 and 7 on Settlers Road. It then moved back north; on May 9 it was sighted on a slide path southwest of Numa Picnic Site.

	Radio Collar # 174 Frequency 171.957	Yellow Collar with Black Marks 5 Point Bull
1976		
Oct.	21 Banded 0.5 mi. South of Paint Pots	
"	22 0.5 mi. South of Paint Pots	
"	23 0.5 mi. South of Paint Pots	
"	24 Sighted 0.25 mi. North of Numa picnic site	
"	25 Sighted 0.25 mi. South of Numa picnic site	
"	26 Located on old roadbed above Numa picnic site	
"	27 Sighted 1.3 mi. North of Numa picnic site West of highway 93	
Nov.	1 Signal picked up East of Vermilion Peak sign at Numa Flats	
"	2 Sighted East of highway opposite Numa picnic site	
"	3 Sighted on River Flats 0.5 mi. North of Hawk creek	
"	4 Sighted Numa picnic site West of highway	
"	5 Located 0.5 mi. South of Hawk creek West of highway 93	
"	6 Sighted 2.5 mi. South of Hawk creek	
"	8 Located 1.5 mi. South of Hawk creek	
"	10 Located 1.5 mi. South of Hawk creek West of highway 93	
"	11 Sighted 3 mi. South of Hawk creek (Intermediate hill)	
"	13 Located 0.8 mi. North of Hawk creek on River Flats	
"	14 Located 0.8 mi. North of Snow creek on River Flats	
"	17 Located 1 mi. North of Snow creek Sighted on slide slope West side	
"	20 Located 0.75 mi. North of Hawk creek	
"	21 Located 0.5 mi. North of Hawk creek	
"	22 Located at Snow creek	
"	23 Located 0.75 mi. North of Hawk creek, River Flats	
"	24 Sighted 1 mi. South of Snow creek	
"	25 Located 0.5 mi. North of Hawk creek	
"	26 Located 1 mi. South of Hawk creek East of highway 93	
"	27 Located 2.5 mi. North of Vermilion Crossing	
"	28 Sighted at Vermilion Crossing	
"	30 Signal picked up at Assiniboine slides 1 & 2	
Dec.	3 Sighted Wardle picnic site 0.5 mi. North of highway 93	
"	8 Sighted at Kootenay Crossing	
"	10 Sighted at Kootenay Crossing	
"	19 Sighted at old airport	

Radio Collar #174

1976

- Dec. 20 Located 0.25 mi. South of old airfield sighted
- " 21 Located old airfield
- " 22 Located old airfield
- " 23 Signal 1 mi. North of McLeod East of highway 93
- " 24 Located at old airfield, aerial patrol
- " 31 Located at old airfield

1977

- Jan. 2 Signal to 4 opposite Dolly Varden
- " 3 Signal to 3, 0.25 mi. North of McLeod meadow
- " 5 Sighted at McLeod meadow
- " 7 Opposite Dolly Varden West of highway 93, located
- " 11 Opposite Dolly Varden West of highway 93, located
- " 14 Located near Dolly Varden weak signal
- " 19 Located South of Dolly Varden weak signal
- " 21 Signal East of 21 mi. River Flats
- " 25 Signal to 4, 0.5 mi. South of old airfield East of highway 93
- " 26 Signal to 3, East of 21 mile across river
- " 27 Signal to 3, East of 21 mile across river
- " 28 Signal to 3, East of Dolly Varden
- Feb. 2 Signal to 4 Southeast of Crooks meadow, River Flats
- " 4 Signal to 2 East of Dolly Varden
- " 6 Faint signal West of Mt. Harkin sign
- Mar. 8 Signal to 2, at mile 16 East of highway 93 0900 hours
- " 28 Possible signal between mile 6 & 7 on Settlers Road, east of road
- May 9 Located 0.5 mi. South of Numa West of Vermilion river, on slide path

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

174



SCALE IN MILES



Radio Collar #175
Summary of Movements

An adult cow was banded two miles south of Vermilion Crossing on October 21. It remained in the immediate area until November 2 when it began moving south. By November 10 it had reached Crooks meadows and remained in this area until December 27. It then moved to McLeod meadows and remained in that immediate area for the rest of the winter.

	Radio Collar #175 Frequency 171.985	Red Collar with Black Marks Adult Cow
1976		
Oct.	21	Banded at Assiniboine Viewpoint
"	22	Located 0.5 mi. South of Assiniboine Viewpoint East side of highway 93
"	23	Located at Assiniboine slide path #1 & 2
"	24	Located at Assiniboine slide path #1 & 2
"	25	Located at Assiniboine slide path #1 & 2
"	26	East of highway across from Assiniboine slide path #1 & 2
"	27	Assiniboine slide between highway and river
Nov.	1	Sighted East side of highway opposite slide path #1 & 2
"	2	Located East of Animal Lick
"	3	Located 0.5 mi. North of Wardle picnic site East of highway 93
"	4	Signal picked up by Animal Lick East of highway 93
"	5	Signal picked up. opposite Hector Gorge
"	6	Signal South of old airport East of highway 93
"	10	Sighted 0.3 mi. South of Crooks meadow
"	11	Located 0.2 mi. South of Crooks meadow
"	13	Located at Crooks meadow
"	14	Sighted 0.75 mi. North of Crooks meadow
"	17	Sighted and signal at Crooks meadow
"	19	Located 1.0 mi. South of Crooks meadow, sighted and signal
"	20	Sighted 1.75 mi. South of Crooks meadow
"	21	Located 0.75 mi. North of Crooks meadow
"	22	Sighted at Crooks meadow
"	23	Sighted at Dolly Varden, West side of highway 93
"	24	Located 0.2 mi. South of Dolly Varden
"	25	Sighted at Dolly Varden
"	26	Located at Crooks meadow
"	27	Signal picked up at Crooks meadow
"	30	Signal at McLeod meadow East of highway 93
Dec.	3	Sighted at McLeod meadow, 0900 hours
"	6	Sighted at McLeod meadow
"	8	Sighted 1.5 mi. North of McLeod meadow
"	21	Located at Crooks meadow
"	22	Located at Crooks meadow
"	24	Sighted and signal McLeod meadow, aerial patrol
"	31	Signal at Mt. Harkin sign, East of highway 93

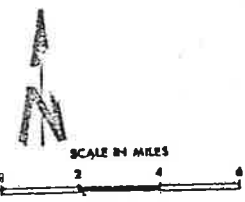
Radio Collar #175

1977

Jan.	7	Signal at mile 16 East of Kootenay River
"	11	Located at McLeod meadow
"	14	Signal at Kootenay River picnic site from East side of river
"	18	Located near McLeod meadow, East side of river, faint signal
"	21	Faint signal, to East side of river at mile 21
"	26	Signal to 2, East of McLeod meadow
"	27	Signal to, 2, East of McLeod meadow
"	28	Signal to, 2, East of old airfield
Mar.	3	Signal to 2, at horse pasture Kootenay Crossing
"	4	Signal to 3, East of McLeod meadow 0905 hours
"	10	Signal to 3, North of McLeod meadow area, aerial patrol
"	13	Sighted 0.75 mi. North of mile 16
"	16	Sighted at mile 16
"	22	Signal to 2, 0.25 mi. South of Kootenay Crossing West of highway, 1020 hours
April	11	Located McLeod meadow
"	21	Sighted at mile 16, 1915 hours
"	26	Located at McLeod meadow
"	28	Sighted at McLeod meadows, no signal, battery pack hanging down from collar approximately 3".
May	1	Sighted Mt. Harkin sign , transmitter not working
"	6	Sighted at mile 16
"	9	Located at mile 16, feeding along the road
"	10	Located at McLeod meadow

KOOTENAY NATIONAL PARK (BRITISH COLUMBIA)

175



FUTURE BOUNDARY ADJUSTMENT
ROAD IMPROVEMENT
SINCLAIR CANTON

PROVINCIAL ROAD TO
CANAL PLATS

Radio Collar #176
Summary of Movements

This adult cow was banded November 29 at Crooks meadows. It moved to Kootenay Crossing and remained in the area from December 6 to December 31. By January 4 it had moved to the Wardle picnic site area and remained in this area until January 19 when it again moved southward. By February 11 the animal had moved as far south as mile 2 on Settlers road. By March 3, the elk had moved back to Kootenay Crossing where it remained for the rest of the winter.

	Radio Collar #176 Frequency 172.013	Yellow Collar with Red Slashes Adult Cow
1976		
Nov.	29	Banded at Crooks meadow
Dec.	6	Signal at Kootenay Crossing West of highway 93
"	10	Sighted in front yard of bunkhouse at Kootenay Crossing
"	19	Sighted at Kootenay Crossing
"	21	Located at Crooks meadow
"	22	Located at Crooks meadow
"	24	Located Kootenay Crossing area, aerial patrol
"	27	Signal Kootenay Crossing
"	31	Signal Kootenay Crossing
1977		
Jan.	4	Sighted 0.5 mi. North of Wardle picnic site
"	11	Sighted at old goat trap
"	14	Sighted 0.5 mi. North of Wardle picnic site
"	19	Signal to 4, sighted at Wardle Flats
"	26	Faint signal, South East Hector Gorge Viewpoint
"	28	Signal to 6, sighted at old airfield
Feb.	11	Weak signal to south of Kootenay Valley Viewpoint gravel pit area Settlers road
Mar.	3	Signal to 2, at horse pasture Kootenay Crossing
"	10	Signal to 2, South of old airfield, aerial patrol
April	11	Sighted at Kootenay Crossing Warden Station
"	21	Sighted in bunkhouse yard at Kootenay Crossing

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

176



SCALE IN MILES



Radio Collar #180
Summary of Movements

An adult cow was banded at Hawk creek on October 12. The animal remained in the Hawk creek area until December 30 at which time it had moved as far south as McLeod meadows. It stayed in the area between Crooks meadows and McLeod meadows (and slightly North and South of these areas) for much of the winter and early spring, but moved rapidly northward after 21 April; by April 26 it had reached Shanks Bridge Crossing (near Simpson Monument). By May 6 however, it had moved back South again to mile 21 (approximately 2 miles North of McLeod meadows).

	Radio Collar #180 Frequency 172.086	Red Collar with White Bars Adult Cow
1976		
Oct.	12	Banded at Hawk creek
"	13	Located 0.5 mi. North of Hawk creek
"	14	Located 1.0 mi. North of Hawk creek, West of highway 93 River Flats
"	15	Located 2.0 mi. North of Hawk creek, West of highway 93 River Flats
"	18	Located 2.0 mi. North of Hawk creek, West of highway 93 River Flats
"	20	Located 2.0 mi. North of Hawk creek, West of highway 93
"	21	Located 2.0 mi. North of Hawk creek, West of highway 93
"	22	Located 2.0 mi. North of Hawk creek, West of highway 93
"	23	Located West of Mt. Haffner sign River Flats
"	24	Located 0.5 mi. North of Mt. Haffner sign West of highway 93
"	26	Signal 0.5 mi. North of Hawk creek River Flats
"	27	Sighted at Hawk creek old maintenance camp East side of highway 93
Nov.	1	Signal 0.5 mi. North of Hawk creek West of highway 93
"	2	Sighted 0.25 mi. North of Hawk creek East of highway 93 Road side
"	3	Sighted at old maintenance camp Hawk creek
"	4	Signal 1.5 mi. South of Hawk creek West of highway 93
"	5	Signal 1.5 mi. South of Hawk creek West of highway 93
"	6	Signal 2 mi. South of Hawk creek West of highway 93
"	8	Located 1.0 mi. South of Hawk creek West of highway 93
"	10	Signal 2.3 mi. South of Hawk creek West of highway 93
"	11	Sighted 3.0 mi. South of Hawk creek
"	13	Located 1.3 mi. North of Hawk creek River Flats
"	14	Located 1.0 mi. North of Snow creek
"	17	Located 0.5 mi. South of Snow creek
"	20	Located at Hawk creek
"	21	Located 0.7 mi. South of Snow creek
"	22	Located at Snow creek

Radio Collar #180

1976

Nov. 23 Signal 0.75 mi. North of Hawk creek River Flats
 " 25 Signal 0.3 mi. South of Snow creek East of highway 93
 " 26 1 mi. South of Snow creek
 " 27 Located 0.25 mi. of Hawk creek
 " 30 Sighted opposite Assiniboine slide path 1 & 2
 Dec. 3 Sighted opposite animal lick
 " 8 Sighted at old airfield
 " 19 Sighted at old airfield
 " 20 Sighted 0.25 mi. South of old airfield
 " 21 Located at Crooks meadow
 " 22 Located at Crooks meadow
 " 23 Signal and sighted 1 mi. North of McLeod meadow
 " 24 Located at old airfield area, aerial patrol
 " 27 Sighted 0.25 mi. South of old airfield

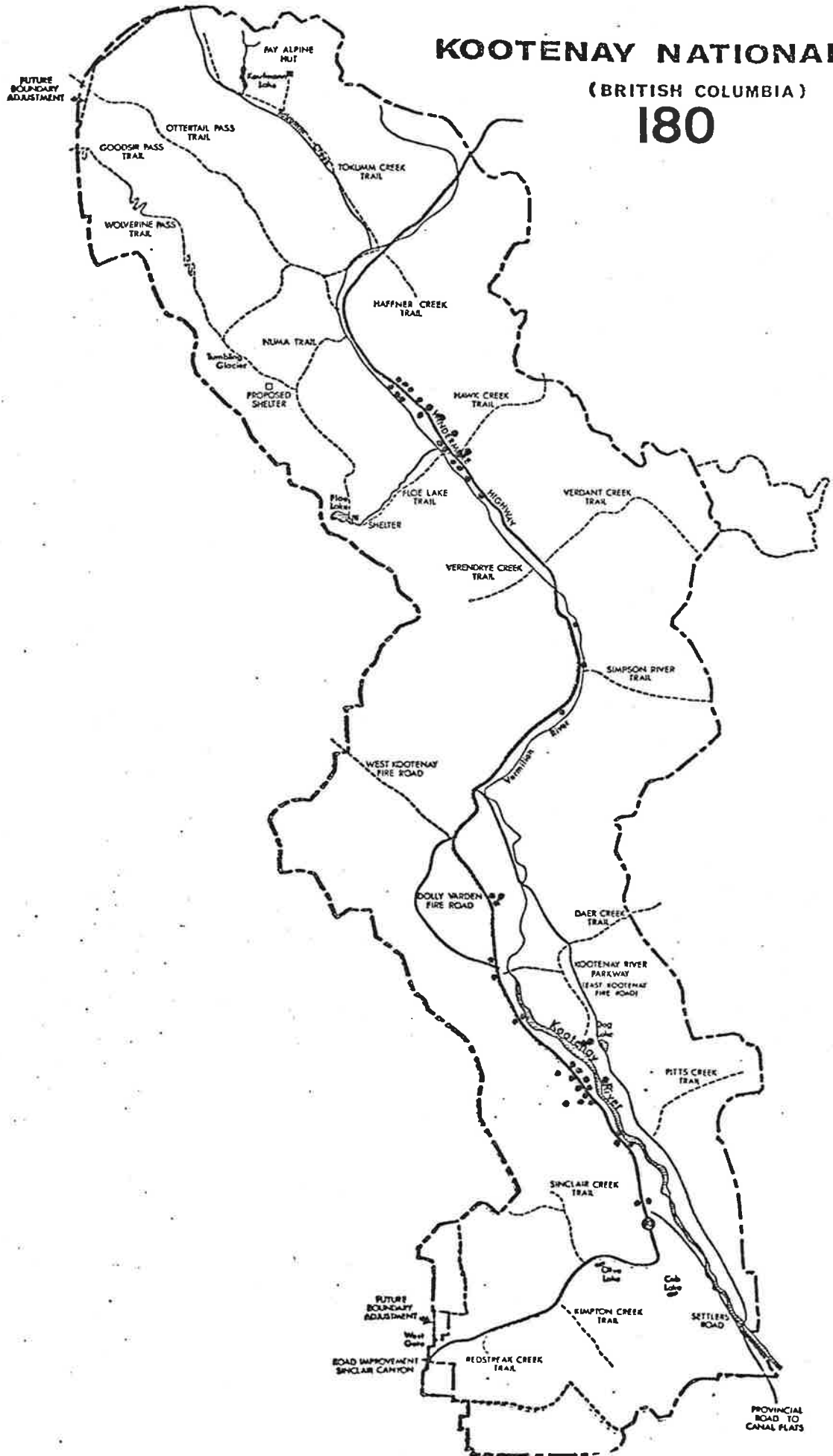
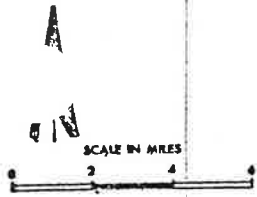
1977

Jan. 2 Sighted at McLeod meadow
 " 3 Sighted at McLeod meadow
 " 7 Located at McLeod meadow
 " 11 Located at McLeod meadow
 " 18 Signal to 6, sighted at McLeod meadow
 " 21 Signal to 6, sighted at 0.25 mi. North of Settlers Junction
 West of highway 93
 " 26 Signal to 5, 0.5 mi. South of McLeod meadow East side
 of Kootenay River
 " 27 Signal to 2, West of McLeod meadow
 " 28 Signal to 7, Sighted at mile 16 (Road side)
 Feb. 1 Signal to 2, East of Mt. Harkin sign
 " 2 Signal to 3, East of Mt. Harkin sign
 " 3 Signal to 4, 0.25 mi. South of McLeod meadow West of highway 93
 " 8 Located 1.0 mi. South of McLeod West of highway 93
 " 11 Located 1.0 mi. South of McLeod West of highway 93
 " 14 Located 0.5 mi. South of McLeod East of highway 93
 " 22 Sighted 0.5 mi. North of McLeod meadow
 " 24 Located at mile 16
 Mar. 3 Signal to 5, and sighted 0.5 mi. North of Mt. Harkin sign
 " 4 Signal to 4, 0.5 mi. North of Mt. Harkin sign West of
 highway 93
 " 10 Signal to 2 in McLeod meadow area, aerial patrol
 " 13 Sighted at Mt. Harkin sign
 " 15 Sighted at McLeod meadow
 April 13 Located at Kootenay River picnic site
 " 21 Sighted 0.5 mi. South of Crooks meadow
 " 26 Located at Shanks Bridge Crossing Vermilion River
 May 6 Located at mile 21
 " 8 Sighted at Crooks meadow
 " 10 Located at mile 21

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

180



Radio Collar #181
Summary of Movements

A spike bull elk was fitted with radio collar #181 on 20 October near Numa Picnic Site. It did not leave the area between the Paint Pots and Snow creek until November 20 when it started to move slowly south. By December 3, this animal was in the area of the old airfield; it remained in the area between Crooks meadow and the Kootenay River picnic area for the rest of the winter (except for one sighting above Kootenay Pond January 14).

	Radio Collar #181 Frequency 172.107	Yellow Collar with Black Edges Spike Bull
1976		
Oct.	20	Banded 0.5 mi. North Numa picnic site
"	21	Sighted 0.75 mi. North of Numa picnic site on old road bed
"	22	Sighted 0.75 mi. North of Numa picnic site on old road bed
"	23	Located 1.0 mi. North of Numa picnic site
"	24	Located 1.0 mi. North of Numa picnic site
"	25	Located 0.5 mi. South of Numa picnic site East of highway 93
"	26	Located above Numa picnic site on old road bed
"	27	Located 1.6 mi. North of Snow creek, between highway 93 and Vermilion River
Nov.	1	Signal East of Vermilion Peak sign
"	2	Sighted 1.0 mi. South of Paint Pots East side of highway 93
"	3	Sighted at Vermilion sign East of highway 93
"	5	Located on old highway above Numa picnic site
"	6	Located 0.5 mi. North of Numa picnic site East of highway 93
"	8	Located 0.5 mi. North of Numa picnic site East of highway 93
"	10	Located 1.7 mi. North of Numa picnic site West of highway 93
"	11	Located on Vermilion Peak slide path above old highway
"	13	Located 0.8 mi. North Numa picnic site
"	14	Located 0.9 mi. North of Numa picnic site
"	17	Located 0.25 mi. South Numa picnic site old road bed
"	20	Located 1.3 mi. North of Numa picnic site
"	21	Located 0.5 mi. South of Snow creek
"	22	Located at Snow creek
"	23	Located at Hawk creek opposite old maintenance yard
"	24	Sighted 1.0 mi. North of Hawk creek
"	25	Located 0.3 mi. South of Snow creek East of highway 93
"	26	Located 1.0 mi. North of Hawk creek
"	27	Located 2.0 mi. South of Hawk creek
"	30	Sighted opposite Assiniboine slides #1 & 2
Dec.	1	Sighted at animal lick
"	3	Sighted 0.5 mi. North of old airfield
"	6	Sighted at old airfield

Radio Collar #181

1976

Dec. 8 Sighted 0.5 mi. North of Crooks meadow
" 9 Located 0.5 mi. North of McLeod meadow
" 19 Sighted at old airport
" 20 Sighted 0.25 mi. South of old airfield
" 21 Located at Crooks meadow
" 22 Located at Crooks meadow
" 23 Signal 1.0 mi. North of McLeod meadow East of highway 93
" 24 Located in old airfield area, aerial patrol
" 27 Located 1.5 mi. North of McLeod meadow West of highway 93
" 31 Signal opposite old airfield

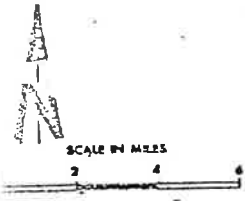
1977

Jan. 2 Signal opposite Dolly Varden
" 3 Signal opposite Dolly Varden
" 7 Located, old airfield East of highway 93
" 14 Sighted and good signal above highway 93 at Kootenay Pond
" 19 Signal to 4, 0.5 mi. South of Dolly Varden
" 26 Weak signal 0.5 mi. South of McLeod meadow East of highway 93
" 27 Located across river from Kootenay River picnic site,
signal to 3
Feb. 2 Sighted 0.5 mi. North of old airfield West side of road
Mar. 3 Signal to 4, 0.5 mi. North of Mt. Harkin sign east of
highway 93

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

181



APPENDIX C
INFORMATION ON IMMOBILIZATION
1977-78

DATE	LOCATION	AGE	SEX	DOSE	PLACEMENT	DARTED	DOWN	UP	COLLAR	TAGS	
Oct. 20	Hawk Creek	A		24 mg.	hip	6:23 p.m.	6:32 p.m.	6:50 p.m.	#213		Old radio #180
Oct. 21	Marble Canyon W. S.	A		24 mg.	hip	5:38 p.m.	5:45 p.m.	6:09 p.m.	#214		
Nov. 6	Hawk Creek	A		24 mg.	hip	8:40 a.m.	---	---	---	---	Unable to locate
Nov. 7	McLeod Meadows	A		24 mg.	hip	8:05 a.m.	Located 8:30 a.m.	8:44 a.m.	#215		Old radio #175
Nov. 8	Crooks Meadow	A		24 mg.	hip	8:35 a.m.	Located 8:50 a.m.	9:20 a.m.	#216	L R 29 30	
Nov. 8	Crooks Meadow	Spike		24 mg.	hip	10:20 a.m.	---	---	---	---	No reaction from animal
Nov. 8	Mt. Harkin	Spike		24 mg.	hip	5:10 p.m.	---	---	---	---	No reaction from animal
Nov. 9	Crooks Meadow	A		24 mg.	hip	7:50 a.m.	Located 8:10 a.m.	8:58 a.m.	#217	L R 10 9	Good recovery
Nov. 10	Kootenay Pond	A		25 mg.	hip	9:10 a.m.	---	---	---	---	No reaction from animal
Nov. 14	Mt. Harkin	4 pt.		25 mg.	hip	4:03 p.m.	4:16 p.m.	5 p.m.	#219		Good recovery
Nov. 18	Mt. 16	A		25 mg.	hip	8:10 a.m.	---	---	---	---	No reaction from animal
Nov. 18	Crooks Meadow	Spike		25 mg.	hip	2:10 p.m.	2:24 p.m.	3:09 p.m.	#224		Good recovery
Nov. 18	Airfield	A		25 mg.	hip	3:50 p.m.	4:04 p.m.	5 p.m.	#223		Good recovery
Nov. 29	McLeod Meadows	A		25 mg.	hip	8:24 a.m.	---	---	---	---	No reaction
Nov. 29	K. R. Picnic Site	A		25 mg.	hip	4:34 p.m.	4:51 p.m.	5:08 p.m.	#222		Good recovery
Nov. 30	Crook Meadow	Spike		25 mg.	hip	8:22 a.m.	---	---	---	---	Unable to locate
Nov. 30	Mt. Harkin	A		25 mg.	hip	11:05 am.	11:18 a.m.	11:46 a.m.	#221	---	Good recovery
Nov. 30	Mt. Harkin	A		25 mg.	hip	3:54 p.m.	Located 4:20 p.m.	5 p.m.	#226		Good recovery

APPENDIX D

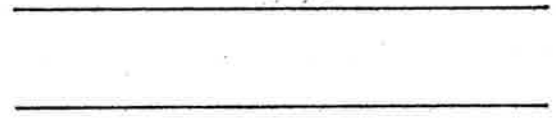
1977-78

OBSERVATIONS FROM RADIO COLLARED ELK
AND COLLAR CODES

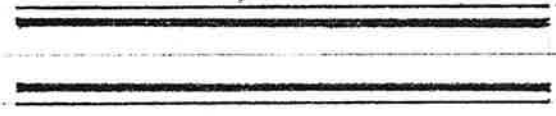
Good

1977-78

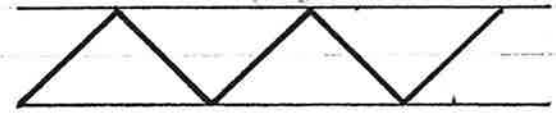
213



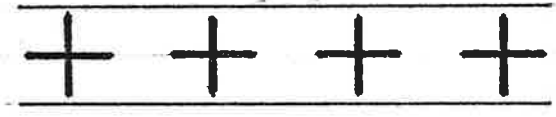
214



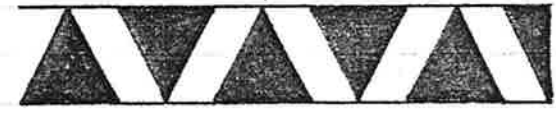
215



216



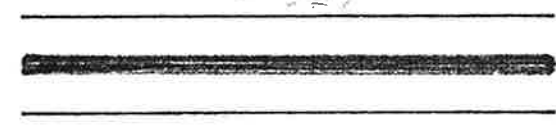
217



219



221



222



227



220



224



223



226



225



Radio Collar #213
Summary Of Movements

Radio Collar #213
Frequency 172.170

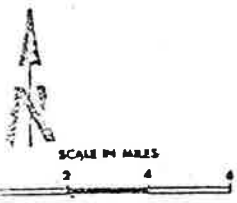
White Collar
Adult Cow

1977		
Oct.	20	Radio Collared Cow, #180, banded at Hawk Creek
"	22	Signal W. Of Hawk Creek
"	28	Signal W. of Hawk Creek
Nov.	1	Signal 1 mi. N of Hawk Creek, W. of Hwy.
"	3	Sighted Vermilion Xing
"	10	Sighted on Wardle Flats
"	14	Sighted at Crooks Meadow
"	15	Signal W. of Crooks Meadow
"	22	Sighted ml. 21, Signal to 7
"	30	Signal S. E. Mt. Kindersley post
Dec.	6	Sighted McLeod Meadows
"	10	Sighted McLeod Meadows
"	27	Signal W. of McLeod Meadows
"	30	Signal E. of McLeod Meadows
1978		
Jan.	5	Sighted ml. 16
"	99	Signal N. E. mile 16
"	19	Sighted Harkin Sign Post
"	20	Sighted at mile 21
"	24	Sighted at mile 21
"	27	Sighted at mile 21
"	30	Sighted at mile 21
Feb.	1	Sighted at McLeod Meadows
"	2	Sighted at McLeod Meadows
"	3	Sighted at mile 21
"	13	Sighted at mile 16
"	20	Signal S. W. McLeod Meadows
"	21	Signal W of Nixon Creek
"	22	Sighted Nixon Creek
"	27	Signal E McLeod
"	28	Signal E McLeod
Mar	6	Signal E McLeod
"	10	Sighted McLeod Meadows
"	14	Sighted Harkin Sign Post
April	10	Signal E. of McLeod
"	17	Signal E. of McLeod

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

213



RADIO COLLAR #214
Summary of Movements

Radio Collar #214
Frequency 172.207

Adult Cow

1977

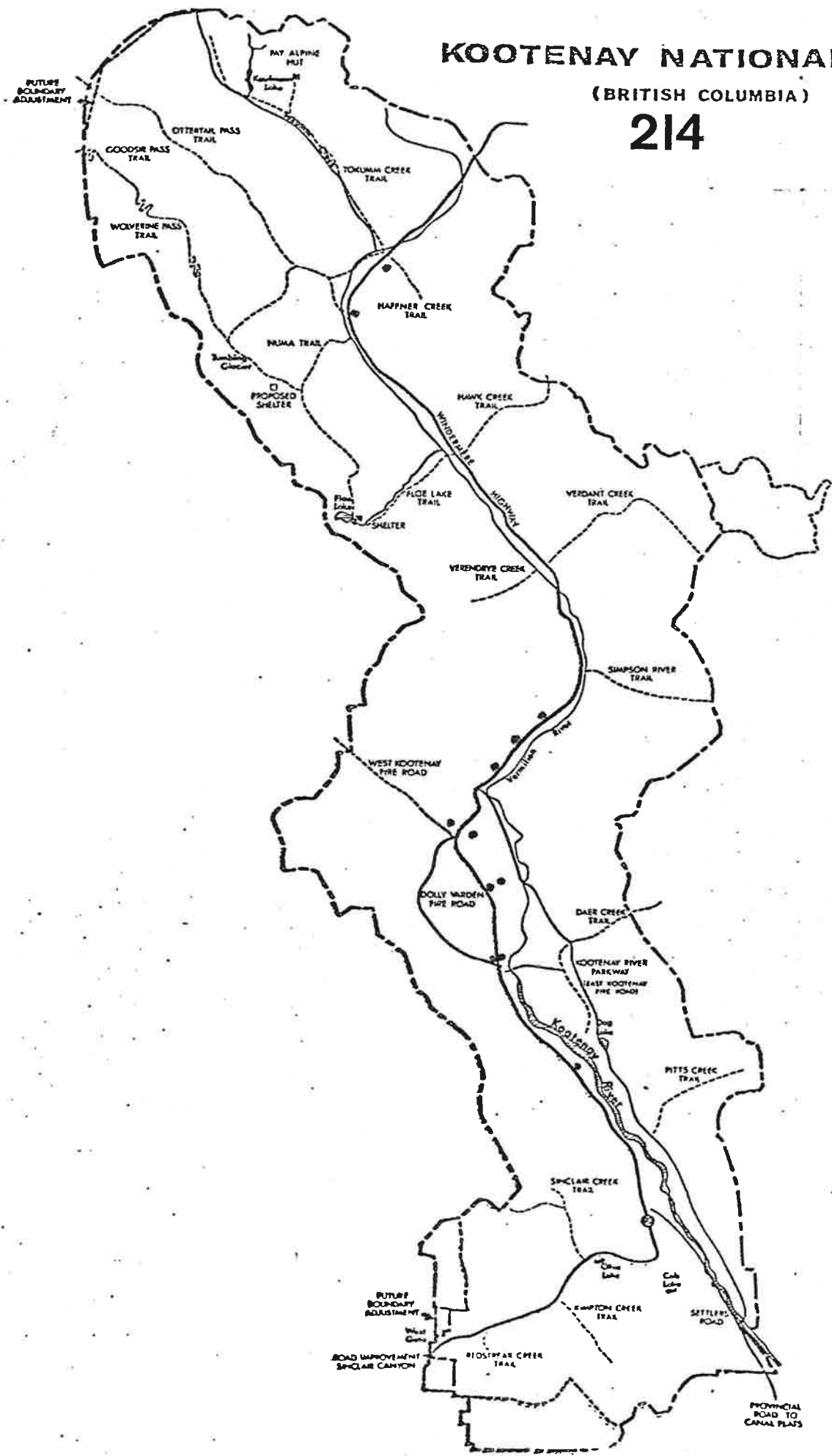
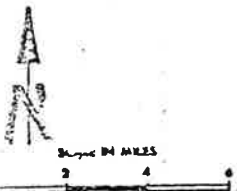
Oct.	21	#214 Placed on cow near Paint Pots
Nov.	1	Signal picked up S. E. of Marble Warden Station
"	8	Sighted at Wardle Creek
"	9	Sighted on Wardle Flats
"	10	Sighted at Hector Gorge View Point
"	15	Signal E of K. C. Warden Station
"	16	Sighted in pasture at K. C.
Dec.	6	Sighted at Airfield
"	10	Sighted at Airfield
"	12	Sighted at Airfield
"	14	Sighted at Airfield
"	16	Sighted at Airfield
"	27	Strong Signal E of Airfield

1978

Jan.	5	Sighted at Airfield
"	9	Signal E of Airfield
"	19	Sighted at Airfield
"	20	Sighted at Airfield
"	24	Sighted at Airfield
"	27	Sighted at Airfield
Feb.	1	Sighted at Airfield
"	13	Signal E of Airfield
"	20	Signal E of Airfield
"	21	Signal E of Airfield
"	27	Sighted at Airfield
"	28	Sighted at Airfield
Mar	6	Sighted at Airfield
"	8	Signal at Airfield
"	10	Signal at Airfield
"	14	Signal at Airfield
"	16	Signal at Airfield
April	10	Sighted Dolly Varden Picnic Site
"	13	Sighted Crooks Meadow
"	18	Sighted Harkin Sign Post

KOOTENAY NATIONAL PARK (BRITISH COLUMBIA)

214



Radio Collar #215

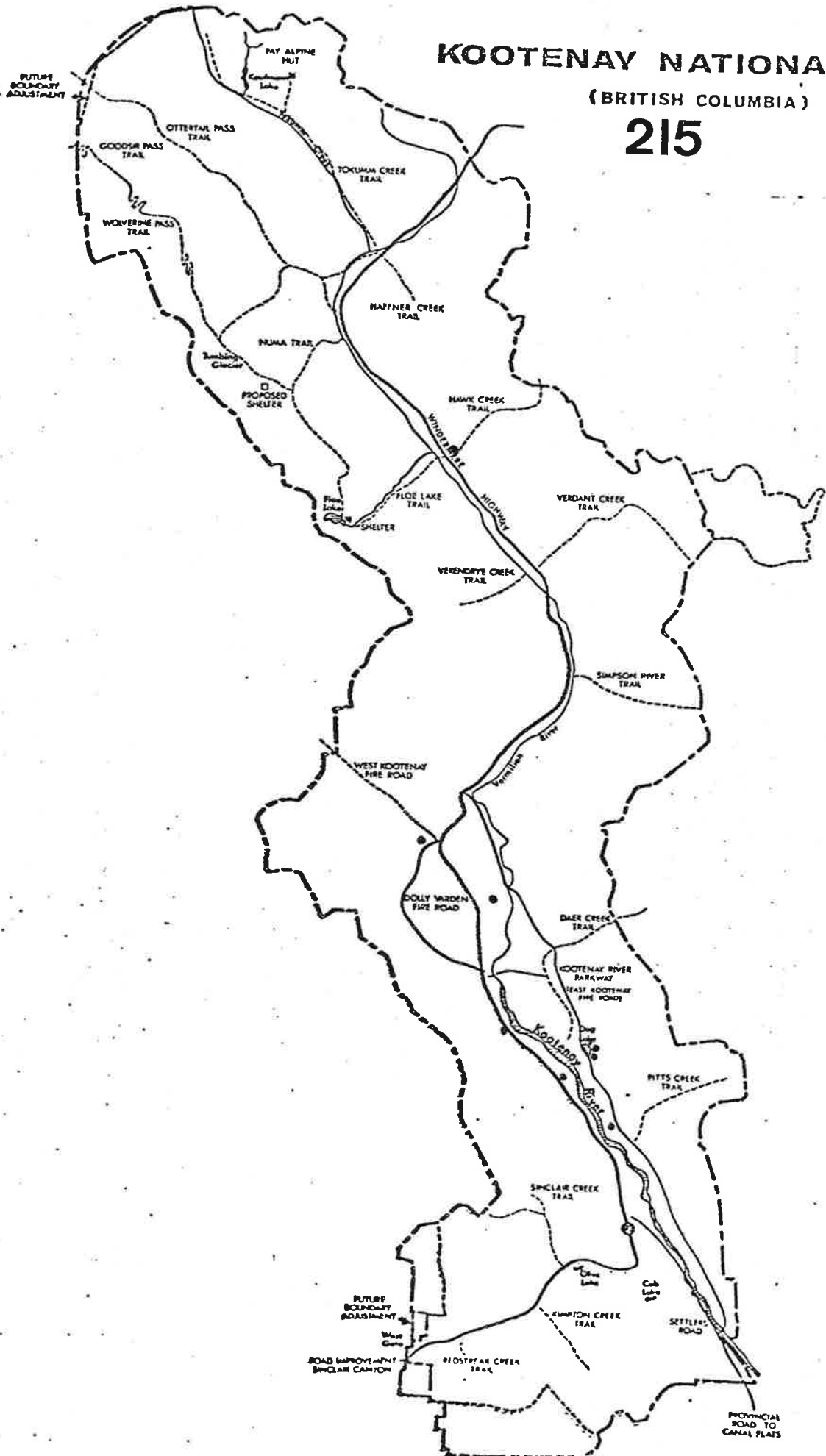
Radio Collar #215
Frequency 172.270

Adult Cow

1977		
Nov.	7	#215 Placed on #175, Adult cow at Hawk Creek
"	15	Signal W of K. C. H. Q.
"	30	Sighted at 21 mi.
Dec.	6	Sighted at Harkin Sign Post
"	12	Signal E of Harkin Sign Post
"	16	Signal E of Harkin Sign Post
"	28	Signal S. E. of Airfield
1978		
Jan.	6	Signal N. E. of mi 16 (Dog Lake Area)
"	19	Signal S. E. Harkin (Dog Lake Area)
"	27	Signal S. E. Harkin (Dog Lake Area)
Feb.	3	Signal S. E. Harkin (Dog Lake Area)
"	13	Signal S. E. Harkin (Dog Lake Area)
"	20	Signal S. E. Harkin (Dog Lake Area)
"	27	Signal S. E. Harkin (Dog Lake Area)
"	28	Signal S. E. Harkin (Dog Lake Area)
Mar	6	Signal S. E. Harkin (Dog Lake Area)
April	10	Signal S. E. Harkin (Dog Lake Area)

KOOTENAY NATIONAL PARK (BRITISH COLUMBIA)

215



FUTURE BOUNDARY ADJUSTMENT
Map Camp
ROAD IMPROVEMENT
SINCLAIR CANYON

PROVINCIAL ROAD TO CANAL FLATS

Radio Collar #216
Summary of Movements

Radio Collar #216
FREQUENCY 172.316

ADULT COW

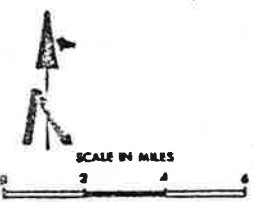
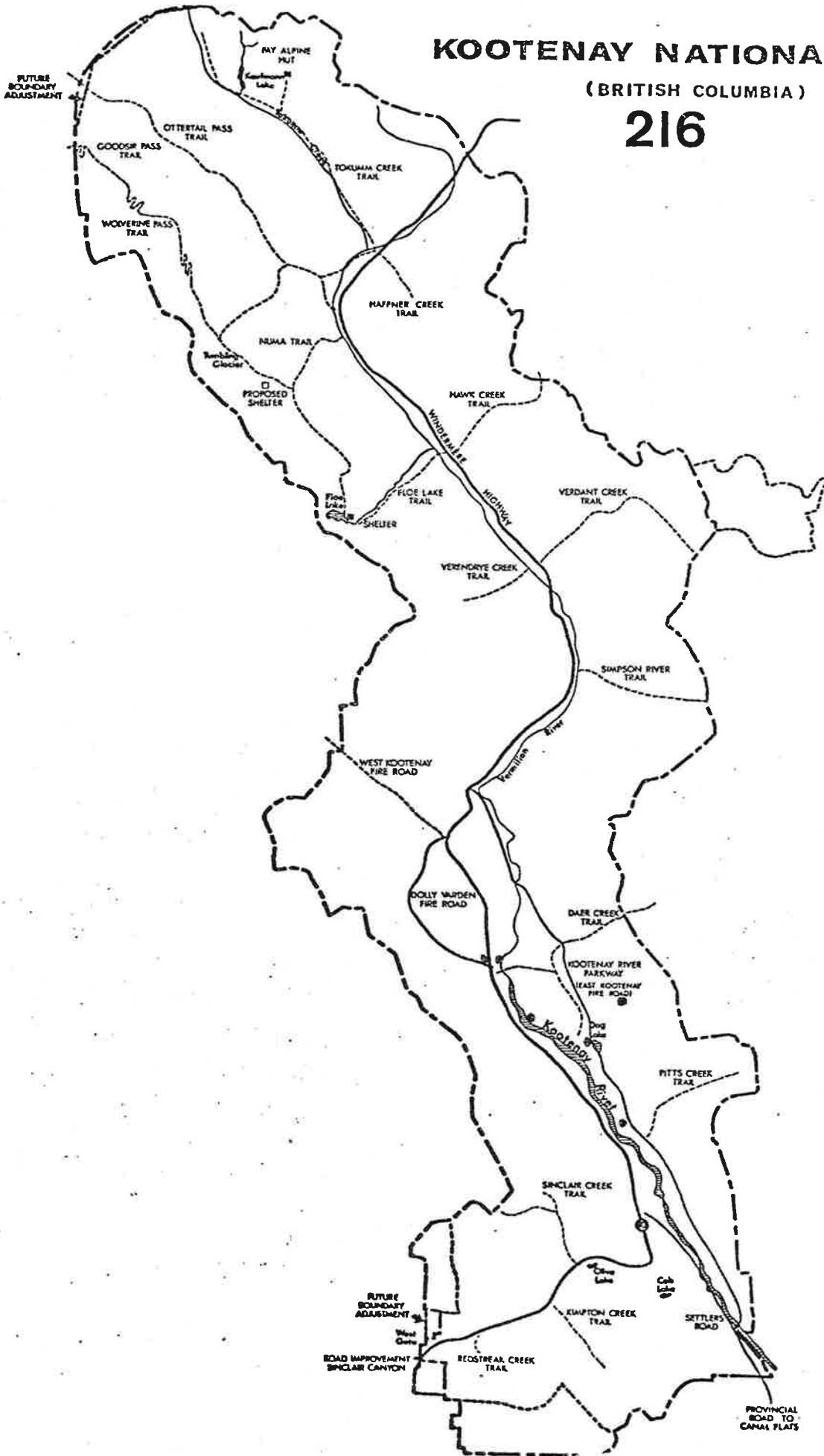
1977

Nov.	8	Adult cow banded at Crook Meadow
"	15	Signal picked up E of Crooks Meadow
"	22	Signal N. E. of Daer Tower
Dec.	6	Signal Dog Lake Area
"	10	Signal Dog Lake Area
Jan.	5	Signal N. E. of mi 16
"	19	Signal N. E. of mi 16
"	30	Signal N. E. of mi 16
Feb.	3	Signal N. E. of mi 16
"	20	Signal N. E. of mi 16
"	24	Signal N. E. of mi 16
Mar.	6	Signal E mi 21
"	28	Signal E mi 21

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

216



FUTURE BOUNDARY ADJUSTMENT
ROAD IMPROVEMENT
SINCLAIR CANTON

PROVINCIAL ROAD TO
CANAL FLATS

Radio Collar #217
Summary of Movement

Radio Collar #217
FREQUENCY 172.413

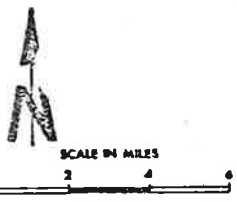
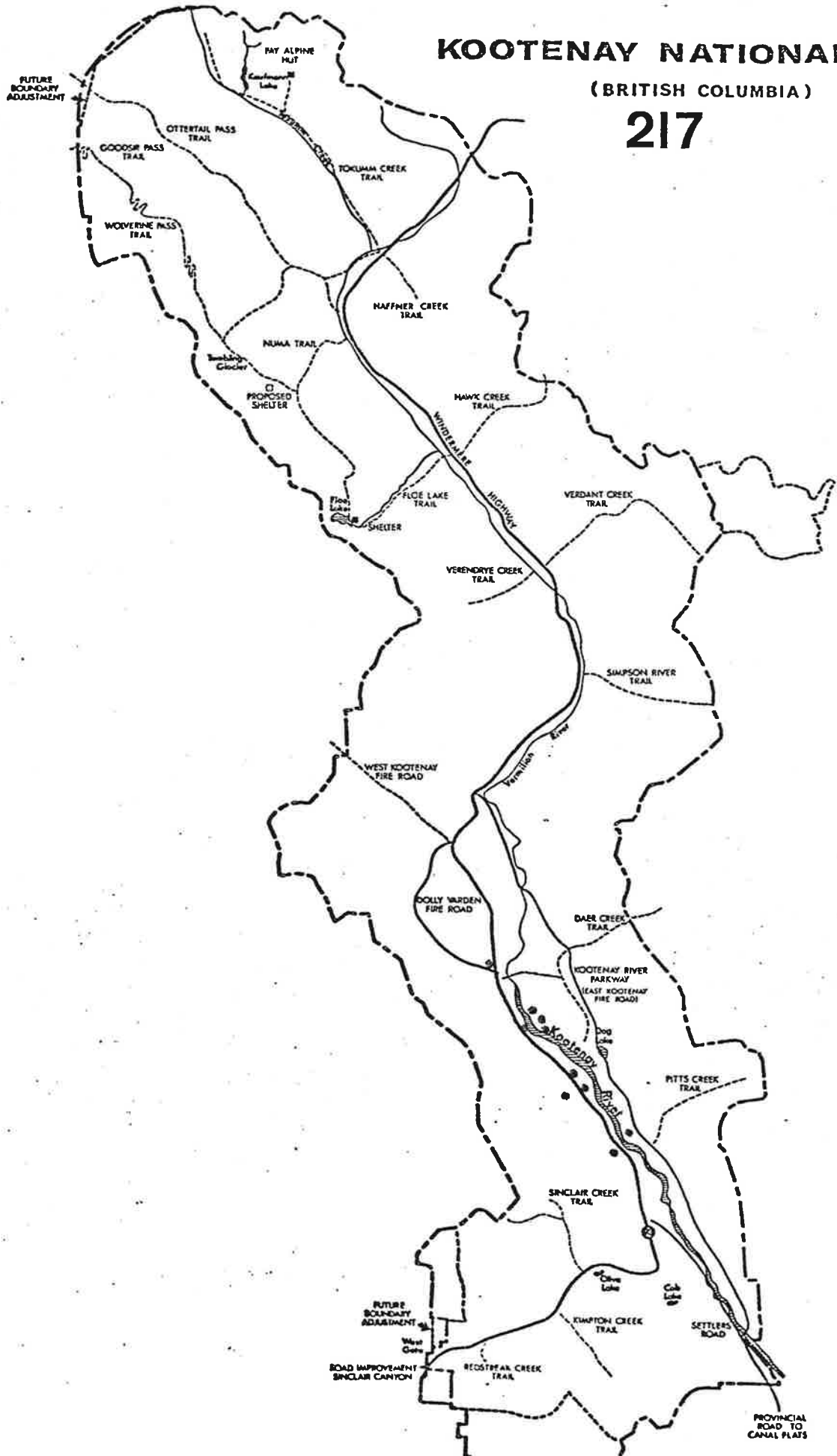
ADULT COW

1977

Nov.	9	Adult Cow banded at Crook Meadow
"	14	Sighted at Crooks Meadows
"	15	Sighted at Crooks Meadows
"	30	Sighted at Crooks Meadows
Dec.	3	Sighted at 21 mi
"	6	Sighted at McLeod Meadows
"	10	Signal W. of McLeod Meadows
Jan.	5	Sighted at mile 16
"	9	Signal N. E. mile 16
"	19	Signal E of 21 mile
"	24	Signal E of 21 mile
"	27	Signal E of 21 mile
"	30	Signal E of 21 mile
Feb.	1	Signal E of 21 mile
"	3	Signal E of 21 mile
"	13	Signal S. E. of mile 21
"	18	Signal S. E. of mile 21
"	20	Signal N. E. of mile 21
"	21	Signal N. E. of mile 21
"	27	Signal N. E. of mile 21
"	28	Signal E of mile 21
Mar.	6	Signal E of mile 21
"	10	Signal E of mile 21
"	14	Signal E of mile 21
Apr.	10	Signal Crooks Meadows
"	12	Sighted 21 mile
"	14	Sighted 21 mile
"	18	Sighted Harkin Sign Post

KOOTENAY NATIONAL PARK (BRITISH COLUMBIA)

217



FUTURE BOUNDARY ADJUSTMENT

PROVINCIAL ROAD TO CANAL FLATS

Radio Collar #219
Summary of Movement

Radio Collar #219
FREQUENCY 171.941

4 Pt. BULL

1977

Nov.	14	4 Pt. Bull banded near Mt. Harkin #219
"	15	Signal picked up E mile 21
"	22	Signal N. E. of Crooks Meadow
"	30	Signal N. E. of Crooks Meadow
Dec.	6	Sighted at Crooks Meadow
"	10	Sighted at Mile 21
"	12	Signal E mile 21
"	16	Signal N. E. mile 21
"	27	Signal E mile 21

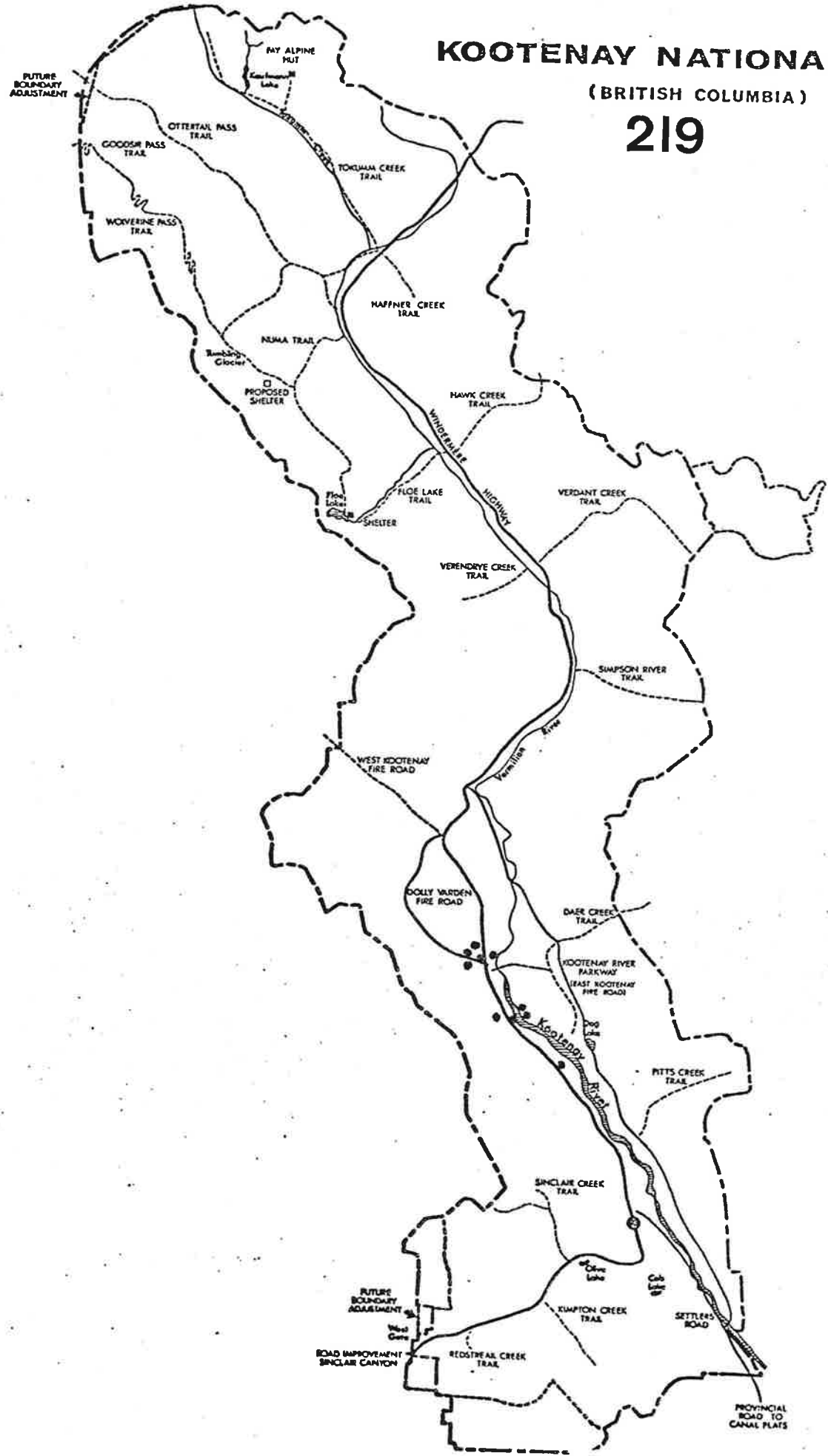
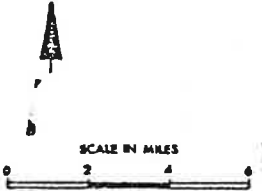
1978

Jan.	6	Signal N. W. mile 21
"	9	Signal N. W. mile 21
"	19	Signal N. W. Crooks Meadow
"	24	Signal W of Dolly Varden (Beaver Dams)
"	27	Signal W of Dolly Varden (Beaver Dams)
"	29	Signal W of Dolly Varden (Beaver Dams)
Feb.	1	Signal W of Dolly Varden (Beaver Dams)
"	13	Signal W of Dolly Varden (Beaver Dams)
"	18	Signal W of Dolly Varden (Beaver Dams)
"	20	Signal W of Dolly Varden (Beaver Dams)
"	21	Signal W of Dolly Varden (Beaver Dams)
"	27	Signal W of Dolly Varden (Beaver Dams)
"	28	Signal W of Dolly Varden (Beaver Dams)
Mar.	6	Signal W of Dolly Varden (Beaver Dams)
"	10	Signal W of Dolly Varden (Beaver Dams)
"	14	Signal W of Dolly Varden (Beaver Dams)
"	16	Signal W of Dolly Varden (Beaver Dams)
Apr.	10	Signal W of Crooks Meadow
"	13	Signal W of Crooks Meadow
"	18	Signal W of Crooks Meadow

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

219



Radio Collar #220
Summary of Movement

Radio Collar #220
FREQUENCY 171.925

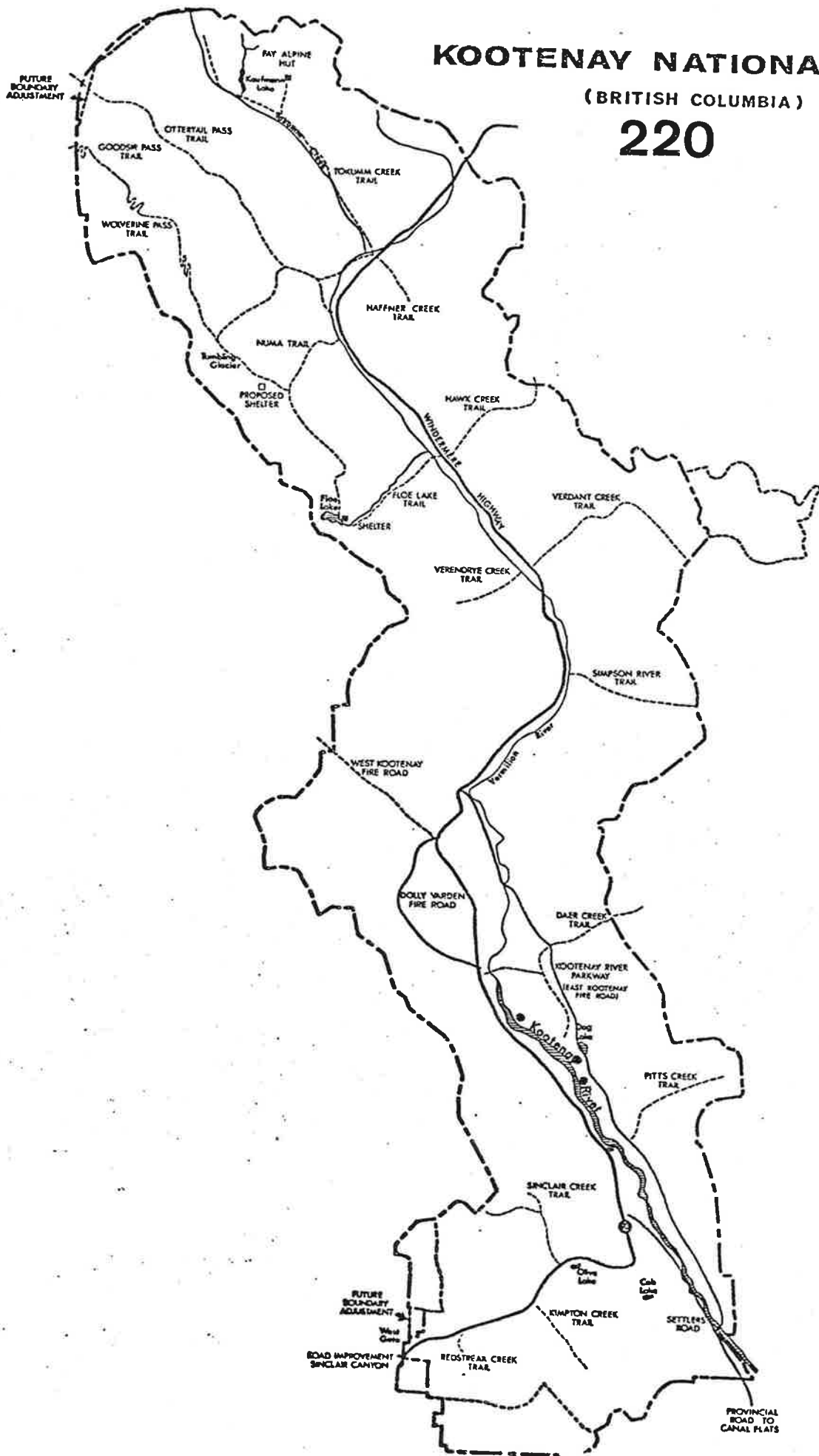
5 Pt. BULL

1977
Dec. 14 14 Banded at K. R. picnic site
" 27 Signal E of McLeod Meadows
1978
Jan. 5 Signal N. E. McLeod Meadows
" 9 Signal N. E. McLeod Meadows
" 19 Signal E of mile 21
" 24 Signal E of mile 21
" 27 Signal E of mile 21
Feb. 1 Signal E of mile 21
" 13 Signal E of mile 21
" 20 Signal E of mile 21
" 21 Signal E of mile 21
" 27 Signal E of mile 21
" 28 Signal E of mile 21
Mar. 6 Signal E of 21 mile
" 10 Signal E of 21 mile
" 14 Signal E of 21 mile
Apr. 10 Signal E of 21 mile

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

220



Radio Collar #221
Summary of Movement

Radio Collar #221
FREQUENCY 171.901

ADULT COW

1977

Nov.	30	Adult cow banded at Mt. Harkin, #221
Dec.	6	Signal E of McLeod Meadows
"	10	Signal E of McLeod Meadows
"	14	Signal E of McLeod Meadows
"	16	Signal E of McLeod Meadows

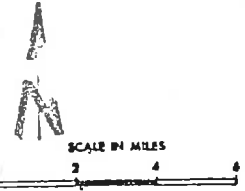
1978

Jan.	5	Sighted at McLeod Meadows
"	9	Signal S. W. McLeod Meadows
"	19	Signal W mile 21
"	24	Signal E mile 21
"	27	Signal E mile 21
"	30	Signal E mile 21
Feb.	1	Sighted at 21 mile
"	13	Signal S. E. of Dolly Varden
"	20	Signal S. E. of Dolly Varden
"	21	Signal E of Dolly Varden
"	22	Signal E of Dolly Varden
"	27	Signal E of Dolly Varden
"	28	Signal E of Dolly Varden
Mar.	6	Signal E of E Kootenay Fire Road
"	10	Signal E of Dolly Varden
"	14	Signal E of Dolly Varden
Apr.	10	Signal E of mile 21

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

221



ROAD IMPROVEMENT
SINCLAIR CANYON

PROVINCIAL
ROAD TO
CANAL FLATS

Radio Collar #222
Summary of Movement

Radio Collar #222
FREQUENCY 171.883

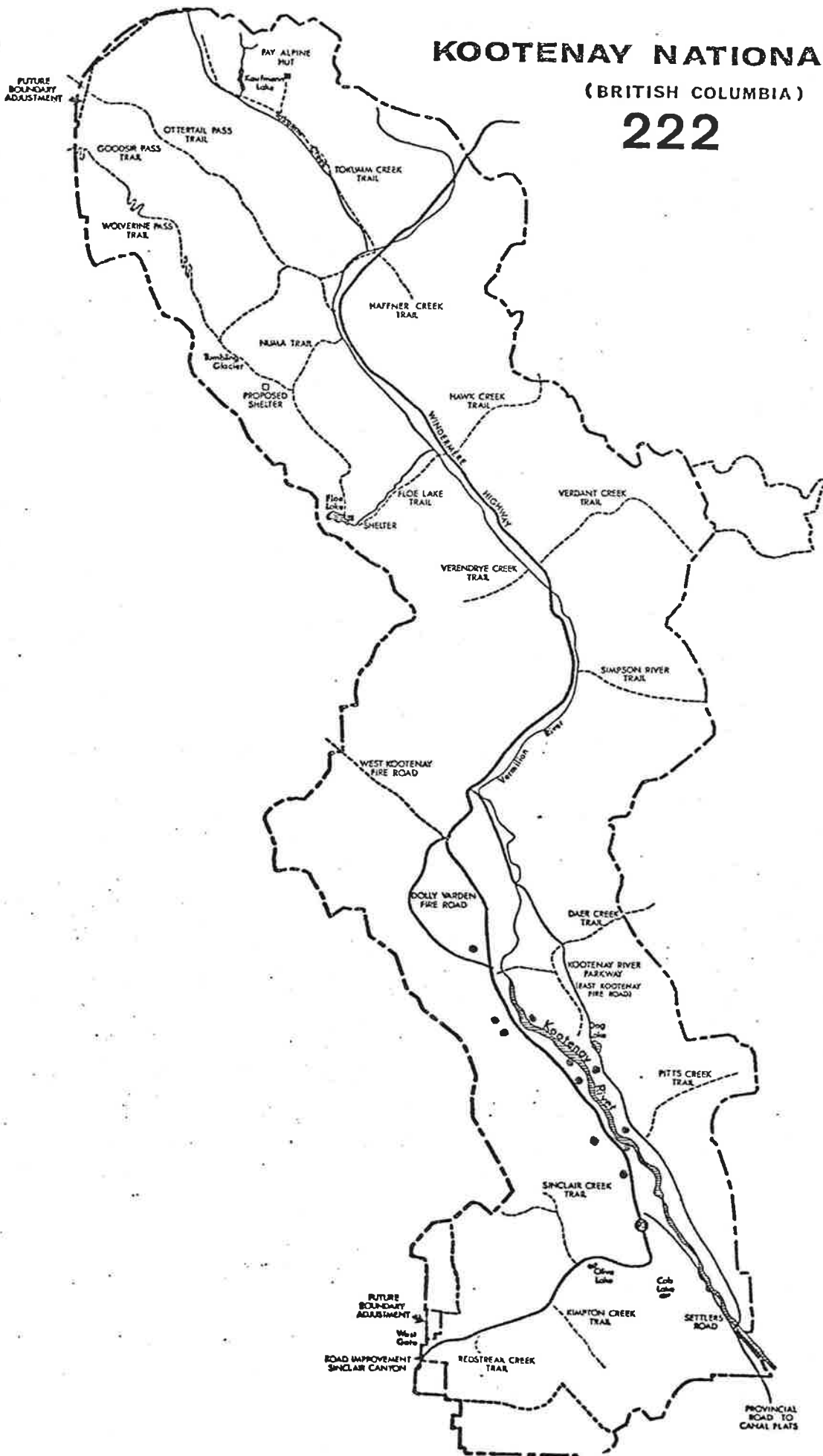
ADULT COW

1977		
Nov.	29	Adult cow banded at Kootenay River picnic site
Dec.	6	Sighted at McLeod Meadow
"	10	Sighted At McLeod Meadow
1978		
Jan.	5	Signal N. W. mile 16
"	9	Signal N. W. mile 16
"	19	Signal W of 21 mile
"	24	Signal N. W. of 21 mile
"	26	Signal N. W. of 21 mile
"	27	Signal N. W. of 21 mile
"	30	Signal W. of Dolly Varden
Feb.	1	Signal N. W. of mile 21
"	13	Signal N. W. of mile 21
"	21	Signal W of Dolly Varden
"	22	Signal W of Dolly Varden
"	27	Signal W. of Dolly Varden
"	28	Signal W. of Dolly Varden
Mar.	6	Signal W of Dolly Varden
"	8	Signal E of 21 mile
"	10	Signal E of Harkin Sign
"	14	Signal E of McLeod Meadows
Apr.	10	Signal E of mile 16
"	12	Sighted mile 16
"	17	Sighted Nixon Creek
"	18	Sighted Nixon Creek

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

222



ROAD IMPROVEMENT
SINCLAIR CANYON

PROVINCIAL
ROAD TO
CANAL FLATS

Radio Collar #223
Summary of Movement

Radio Collar #223
FREQUENCY 171.862

ADULT COW

1977

Nov.	18	Adult cow banded at Airfield #223
"	22	Signal E of Dolly Varden picnic site
"	30	Signal E of mile 21
Dec.	6	Signal E of McLeod Meadows
"	10	Signal E of McLeod Meadows
"	14	Signal N. E. mile 21
"	16	Signal N. E. mile 21

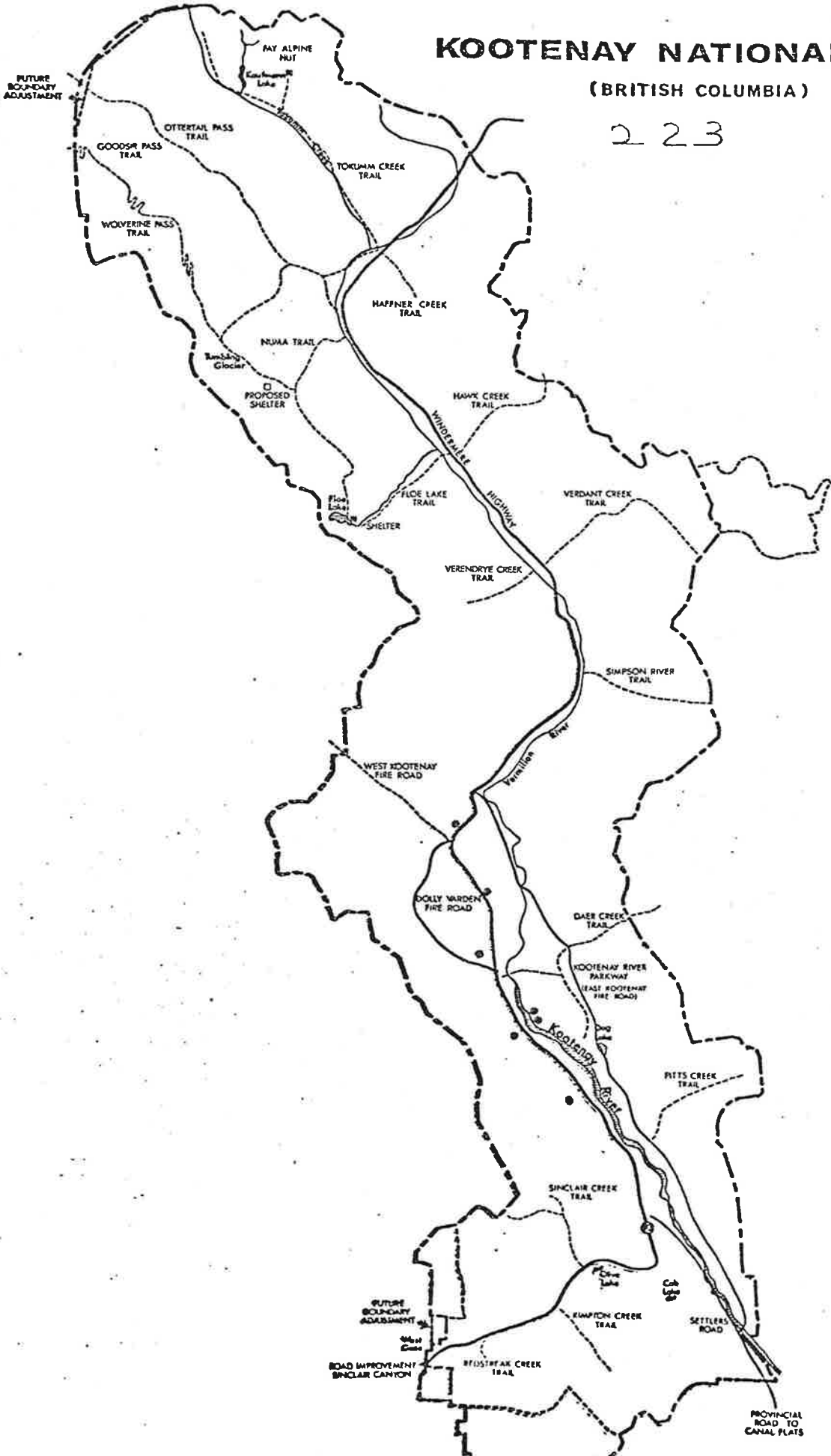
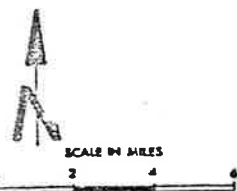
1978

Jan.	5	Signal N. E. of mile 21
"	9	Signal N. E. of mile 21
"	13	Signal N. E. of mile 21
"	20	Signal N. E. of mile 21
"	27	Signal N. E. of mile 21
"	28	Signal N. E. of mile 21
Feb.	1	Signal N. W. of mile 21
"	13	Signal N. W. of mile 21
"	20	Signal N. W. of mile 21
"	22	Signal N. W. of mile 21
Mar.	6	Signal N. W. of mile 21
April	24	Sighted at Kootenay Pond

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

2 2 3



Radio Collar #224
Summary of Movements

Radio Collar #224
FREQUENCY 171.825

SPIKE BULL

1977

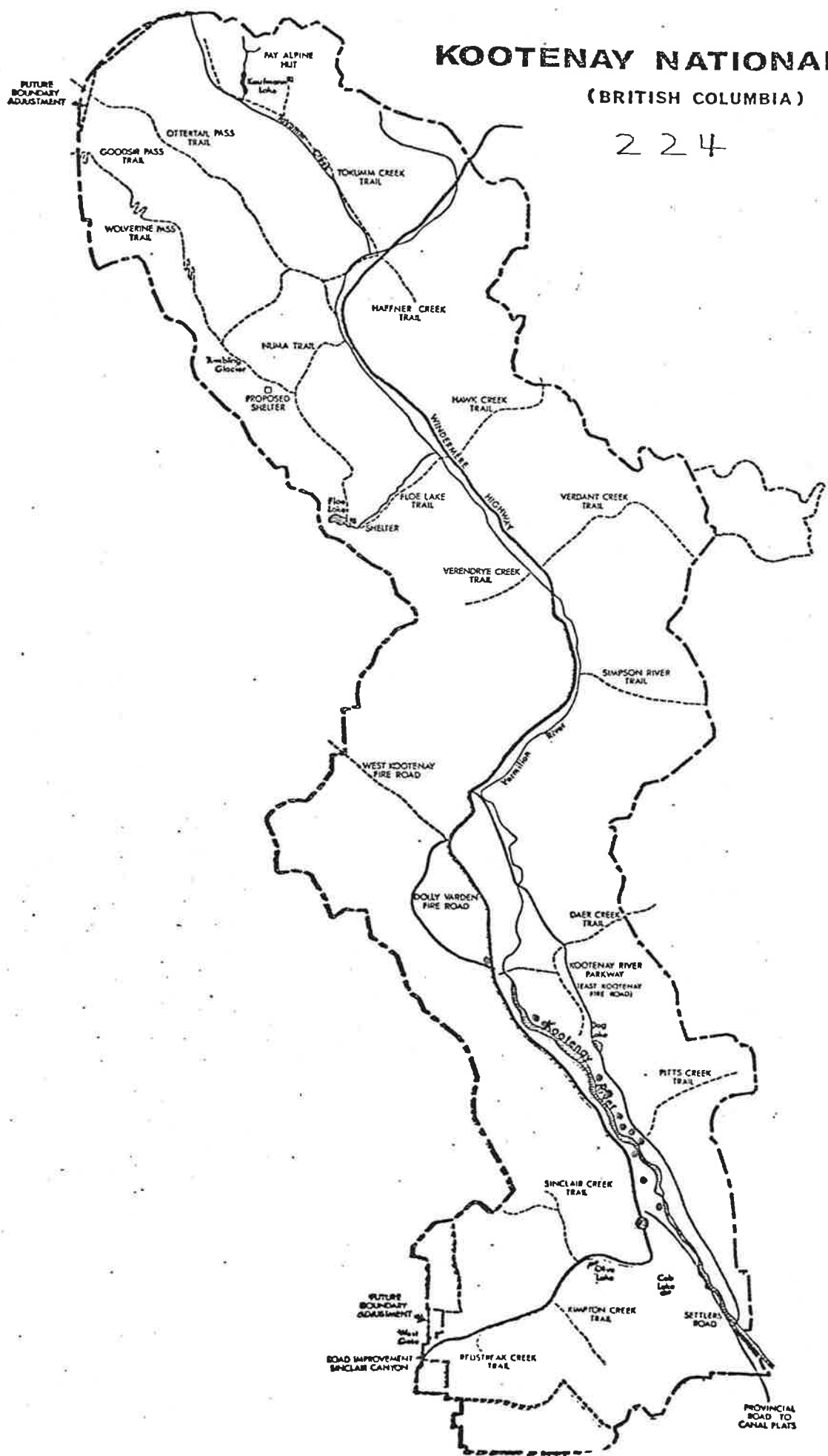
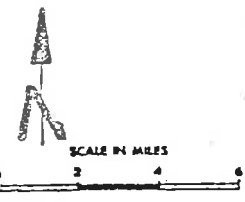
Nov.	18	Spike Bull banded at Crooks Meadow
"	22	Signal E of mile 21
"	30	Signal S. E. of mile 21
Dec.	6	Signal E of McLeod Meadows
"	10	Signal E of McLeod Meadows
"	14	Signal E of mile 16
"	16	Signal E of mile 16

1978

Jan.	5	Signal E of mile 16
"	9	Signal E of K. R. Picnic Site
"	19	Signal E of mile 21
"	20	Signal E of mile 21
"	24	Signal E of mile 21
"	27	Signal E of mile 21
Feb.	1	Signal E of mile 21
"	13	Signal S. E. of McLeod Meadow
"	20	Signal N. E. of K. R. picnic site
"	21	Signal S. E. of McLeod Meadows
"	27	Signal E of K. R. picnic site
"	28	Signal E of K. R. Picnic site
Mar.	6	Signal N. E. of Kootenay Viewpoint
"	9	Signal S. E. of K. R. picnic site (Beaver Dams)
"	10	Signal S. E. of K. R. Picnic Site (Beaver Dams)
"	14	Signal S. E. of K. R. Picnic Site (Beaver Dams)
April	10	Signal S. E. of K. R. Picnic Site

KOOTENAY NATIONAL PARK (BRITISH COLUMBIA)

224



ROAD IMPROVEMENT
SINCLAIR CANYON

PROVINCIAL
ROAD TO
CANAL PLATS

Radio Collar #225
Summary of Movement

Radio Collar #225
FREQUENCY 171.803

ADULT COW

1977

Dec.	1	Adult cow banded near Nixon Creek #225
"	6	Sighted near McLeod Meadows
"	10	Sighted near McLeod Meadows
"	14	Sighted near McLeod Meadows
"	16	Sighted near McLeod Meadows
"	21	Sighted near McLeod Meadows

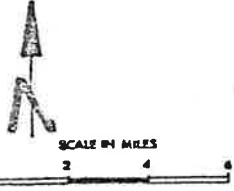
1978

Jan.	5	Sighted N. E. of mile 16
"	9	Signal N. E. of mile 16
"	18	Sighted Harkin Sign Post
"	19	Sighted Harkin Sign Post
"	20	Sighted 21 mile
"	24	Signal E of 21 mile
"	28	Sighted 21 mile
"	30	Sighted 21 mile
Feb.	1	Sighted McLeod Meadows
"	2	Sighted McLeod Meadows
"	3	Sighted McLeod Meadows
"	13	Sighted mile 16
"	20	Signal E of McLeod Meadows
"	21	Signal E of McLeod Meadows
"	22	Sighted Harkin Sign
"	27	Sighted Harkin Sign
Mar.	6	Signal E Harkin sign
"	10	Signal E Harkin sign
"	14	Signal E Harkin sign
April	10	Signal E of 21 mile
"	12	Sighted at 21 mile
"	17	Sighted McLeod Meadows
"	18	Sighted McLeod Meadows

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

225



FUTURE BOUNDARY ADJUSTMENT
ROAD IMPROVEMENT
SINCLAIR CANYON

PROVINCIAL ROAD TO CANAL FLATS

Radio Collar #226
Summary of Movement

Radio Collar #216
FREQUENCY 171.782

ADULT COW

1977

Nov.	30	Adult cow darted near Mt. Harkin
Dec.	6	Signal E of Mt. Daer
"	10	Sighted 21 mile
"	12	Signal E of 21 mile
"	14	Signal E of 21 mile
"	16	Signal E of 21 mile

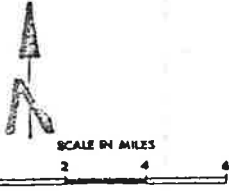
1978

Jan.	5	Signal W of Crooks Meadow
"	9	Signal W of Dolly Varden
"	18	Sighted at Crooks Meadow
"	19	Sighted at Crooks Meadow
"	24	Sighted at 21 mile
"	27	Sightee at 21 mile
"	30	Sighted at 21 mile
Feb.	1	Sighted McLeod Meadows
"	3	Sighted McLeod Meadows
"	13	Signal S. E. McLeod Meadows
"	18	Signal E of McLeod Meadows
"	20	Signal E of Harkin Sign
"	21	Signal N. E. of K. R. Viewpoint
"	27	Signal N. E. of K. R. Viewpoint
Mar.	6	Signal E of Harkin Sign
"	10	Signal E of Harkin Sign
"	14	Signal E of Harkin Sign
April	10	Signal E of 21 mile
"	12	Signal E of 21 mile
"	13	Signal E of 21 mile

KOOTENAY NATIONAL PARK

(BRITISH COLUMBIA)

226



Radio Collar #227
Summary of Movement

Radio Collar #227
FREQUENCY 171.765

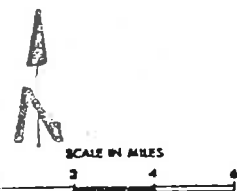
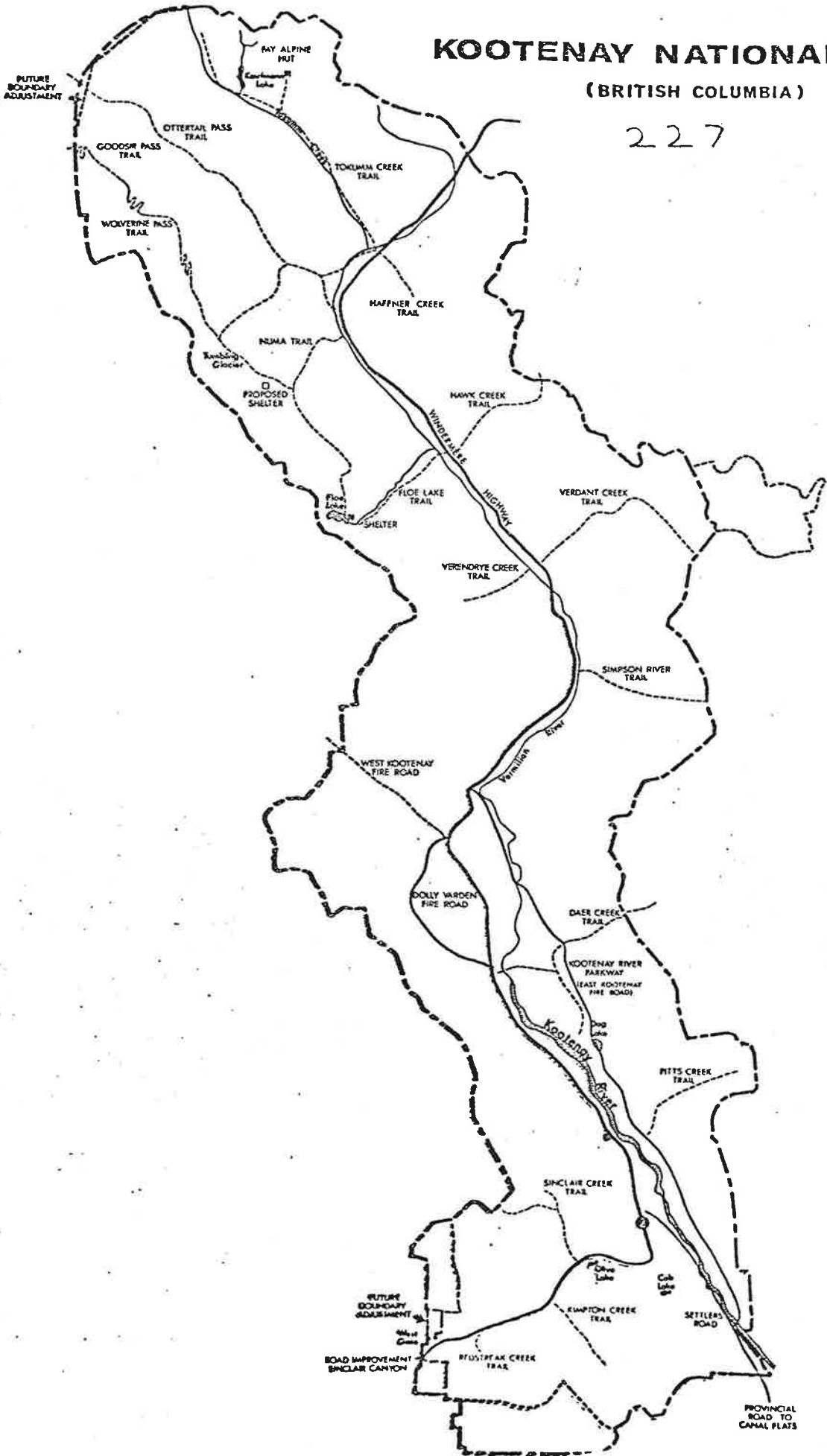
SPIKE BULL

1977

Nov. 15 Spike bull banded mile 16
Transmitter failure occurred within two to three days
after placing collar on animal.

KOOTENAY NATIONAL PARK (BRITISH COLUMBIA)

227



FUTURE BOUNDARY ADJUSTMENT
ROAD IMPROVEMENT
SINCLAIR CANYON

PROVINCIAL ROAD TO CANAL FLATS



Verenory
10125

Wardle
9218

Shanks

Wardle

Simpson

Split
9601

Gorge
Hector
Gorge

Kootenay
Crossing

Dolly
Varden

Daer
8603

Chanon
Brisco Range

COLOMBIE

Harkin
9788

Pre
McLeod
Meadow

Dog

Kinkersley

Meadow

95

Edgewater

Col
Kinkersley
Pass

Col
Sinclair
4375
Pass

Golden 67 m

Radium
Jct.

Radium
Hot Springs

Redstreak
7075

Redstreak

Cranbrook 87 m

95

Sinclair

Oliver

Sinclair
8734

Cobb

Chemin
Settlers
Road