VANCOUVER ISLAND MARMOT INVENTORY

1983

Completed by: V. Heinsalu
G. W. Smith

Fish and Wildlife, Nanaimo

October 1983

TABLE OF CONTENTS

Purpose

The purpose of the 1983 Fish and Wildlife survey was to continue with a field inventory of Vancouver Island marmot colonies. Emphasis of this survey was on the monitoring of active marmot areas located in 1982 as well as investigating new areas of potential use. All areas visited were recorded and marked on maps and aerial photos for management purposes and future investigation.

Method

Sites found to exhibit active marmot usage during the 1982 Fish and Wildlife inventory were visited in 1983 in order to determine their current activity status. The major emphasis of these visits was to observe a known colony and report on whether reproduction was occurring. The overall condition of the colony was noted. Marmot sightings and the presence of active burrows gave an indication of the productivity of the colony. Active burrows were those burrows showing definite signs of this year's use i.e., trampled vegetation, fresh diggings, fresh scats. The total number of active burrows was assumed to reflect the degree of use of that area by marmots, whereas the marmot sightings and whistles provided minimum population (size) estimates for that area. Sightings of young indicated that a viable population of marmots existed in that area.

The investigation of new areas followed a standard procedure of being thoroughly searched for the presence or absence of active burrows. Active burrows reflected use of

the area by marmots and the number of active burrows indicated the degree of use. Marmot sightings and whistles provided minimum population (size) estimates for that area. Sightings of young confirmed the presence of a productive colony. For each newly discovered area, altitude (m above sea level), aspect (azimuths) and slope (%) were recorded. General notes on the area (topography, plant species, etc.) were also made. Access to the area was noted, for later transfer to maps (Figure 3 - 14). Every new marmot colony and area of marmot activity was marked on existing aerial photos for future reference.

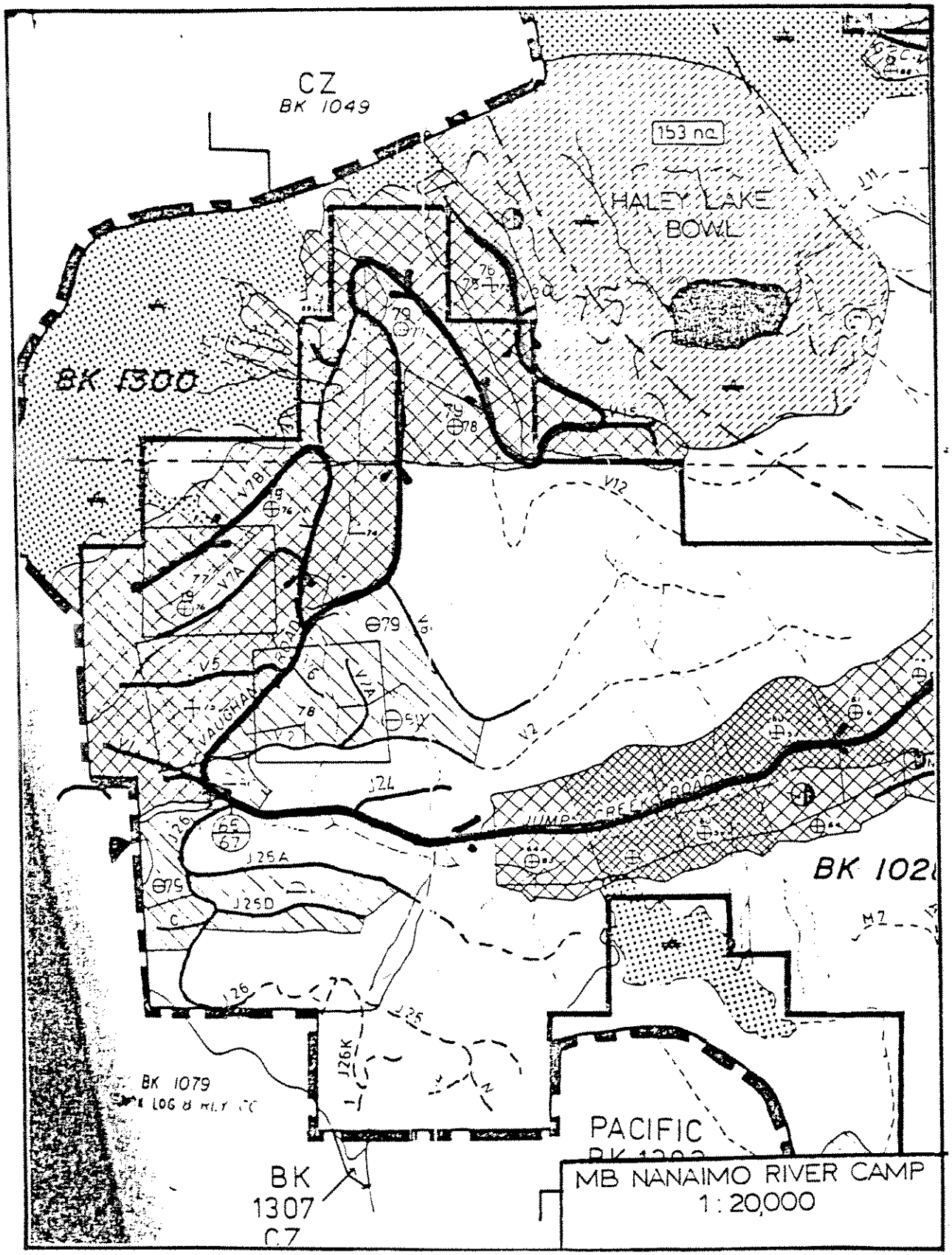


Figure 3. ACCESS ROUTES TO BUTLER PEAK & HALEY LAKE BOWL.

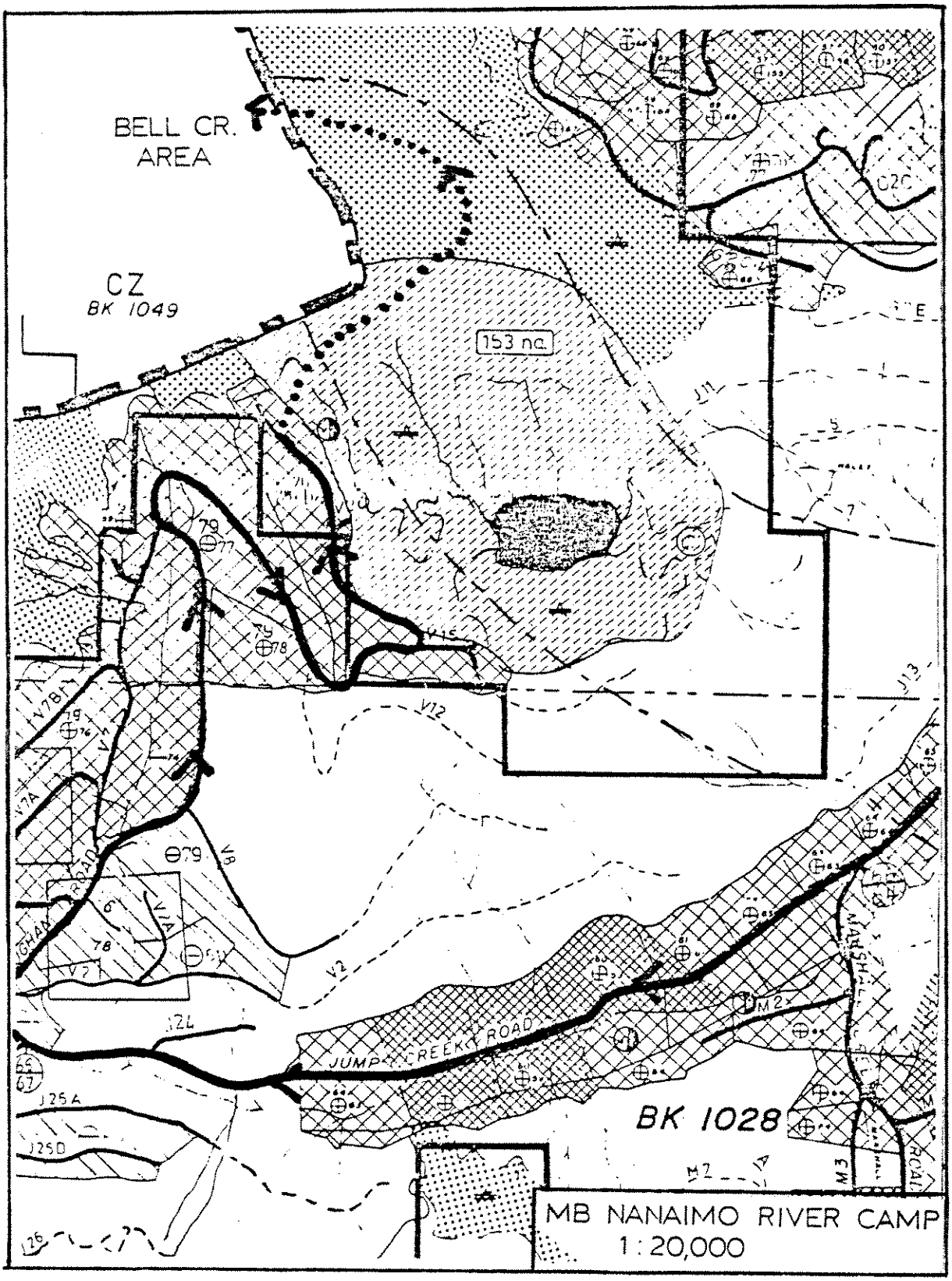


Figure 4. ACCESS ROUTE TO BELL CREEK AREA.

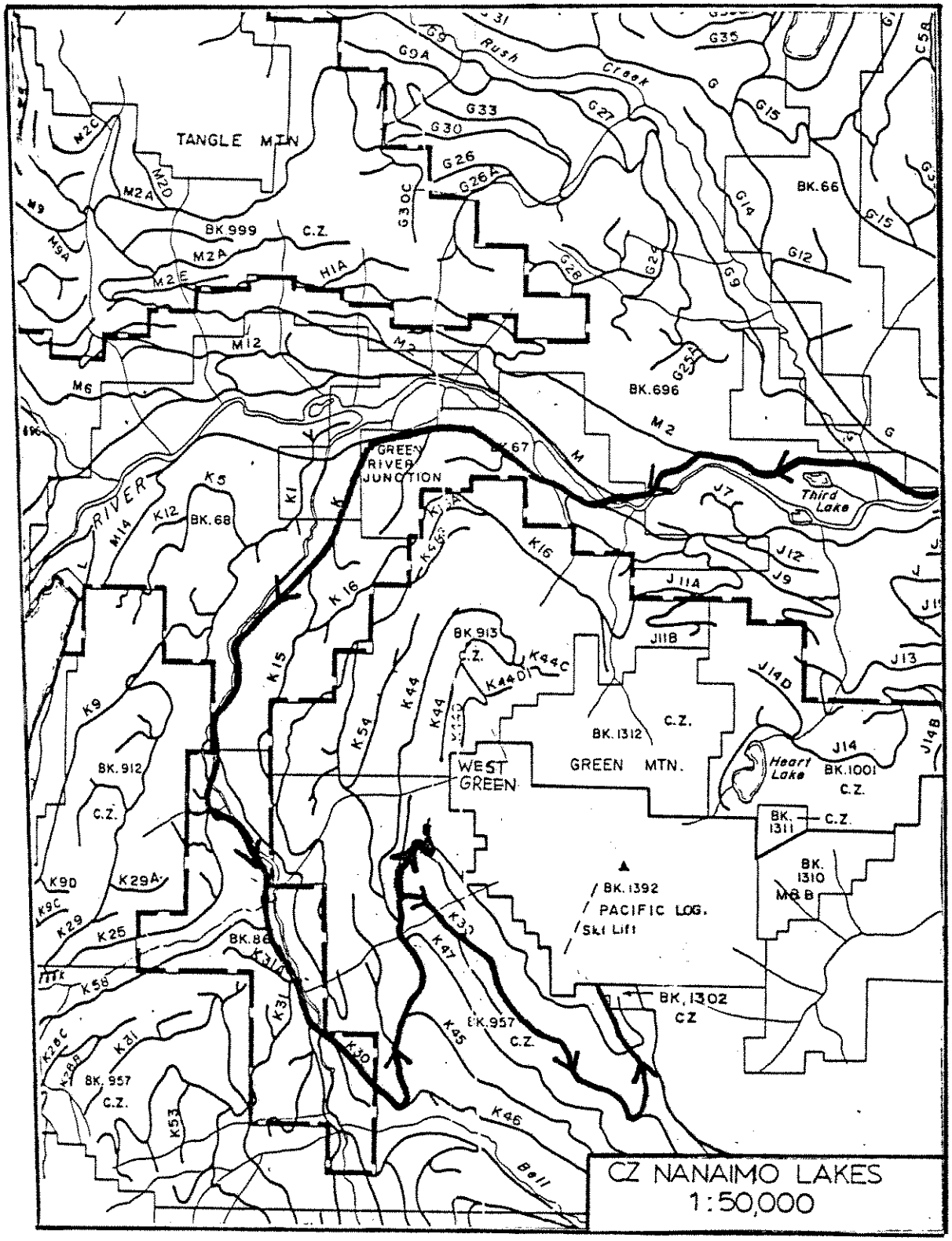


Figure 5. ACCESS ROUTES TO GREEN MOUNTAIN & WEST GREEN.

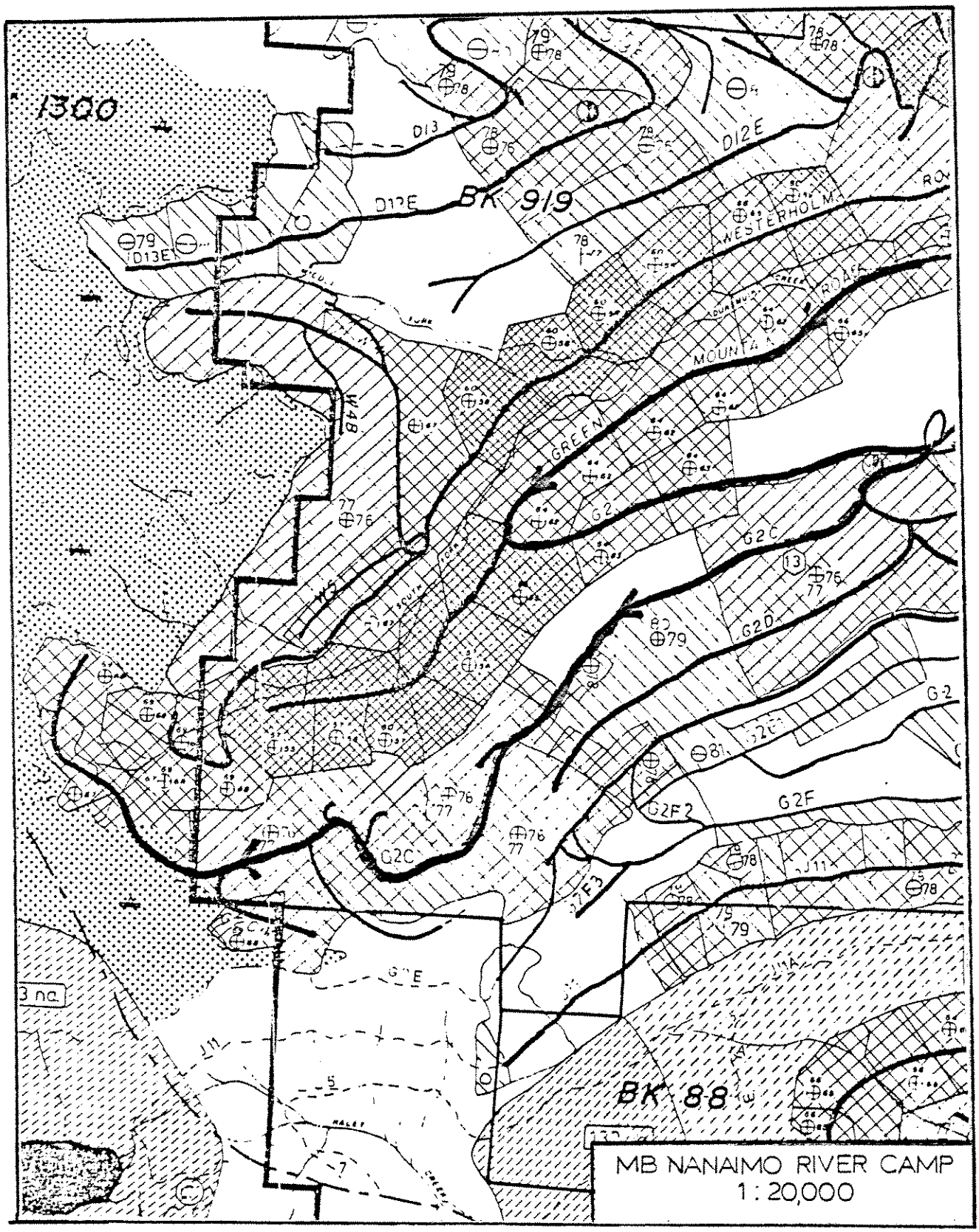


Figure 6. ACCESS ROUTE TO WESTERHOLM BASIN.

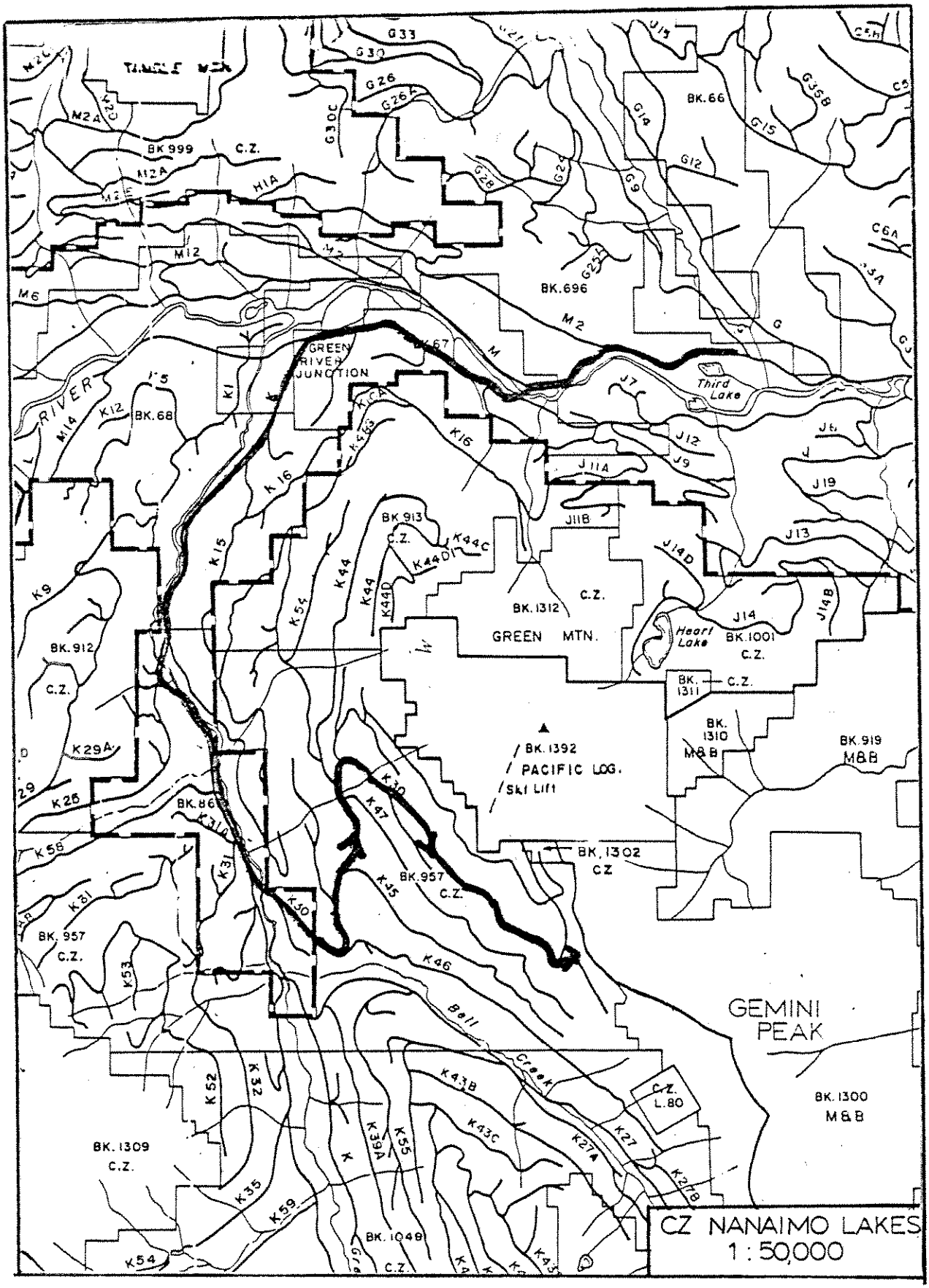


Figure 7. ACCESS ROUTE TO GEMINI PEAK.

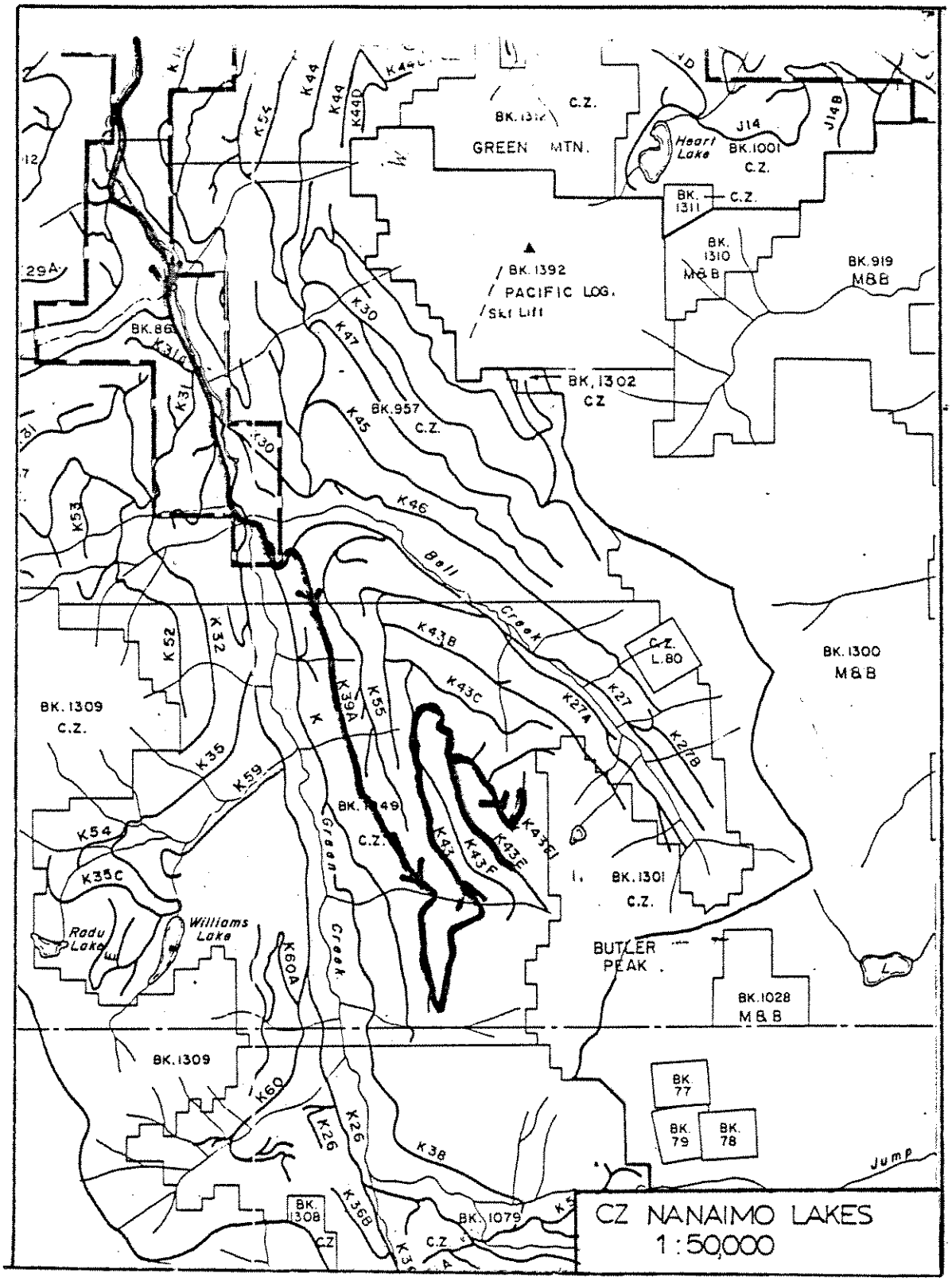


Figure 8. ACCESS ROUTE TO BUTLER PEAK.

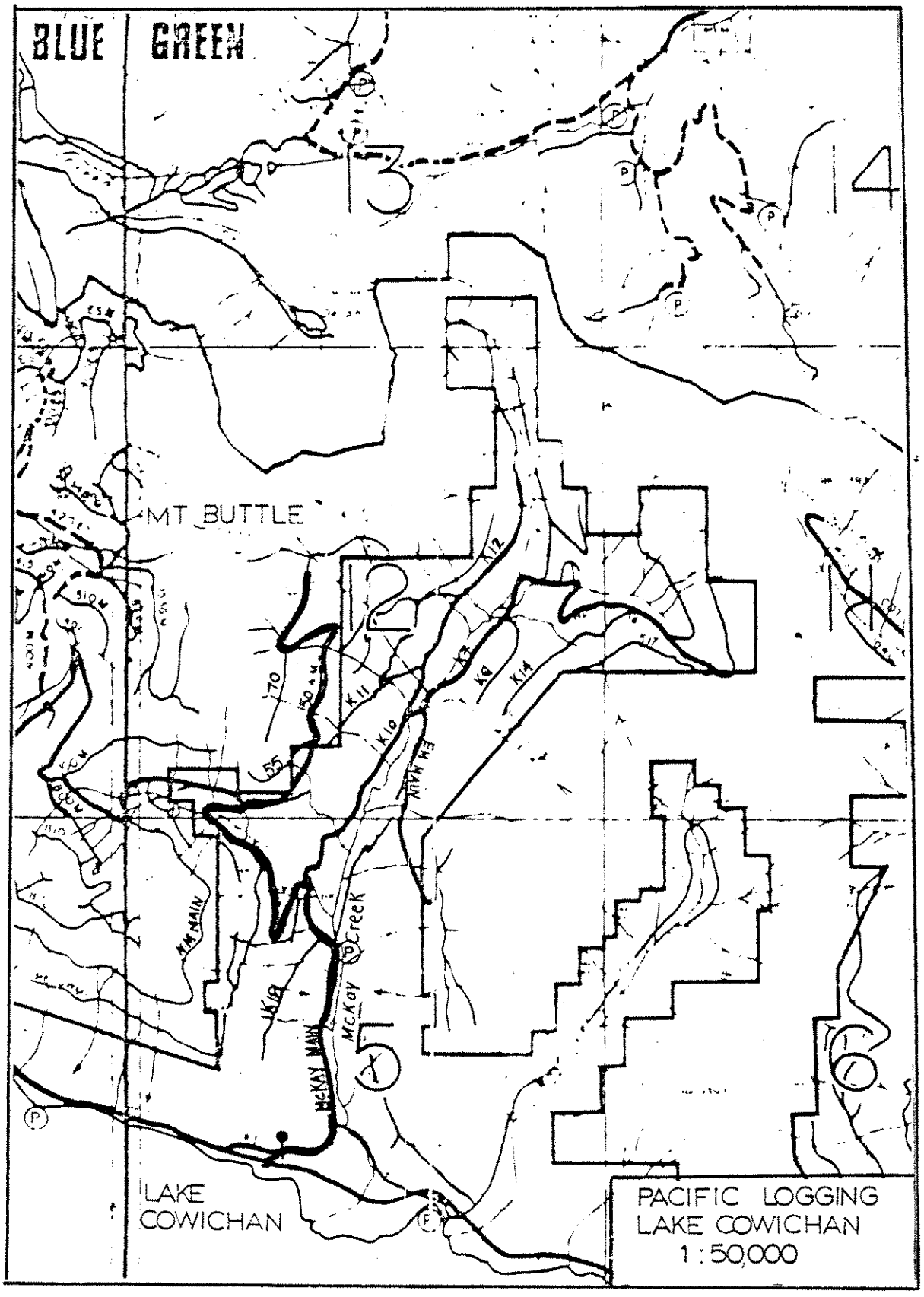


Figure 9. ACCESS ROUTE TO MT. BUTTLE.

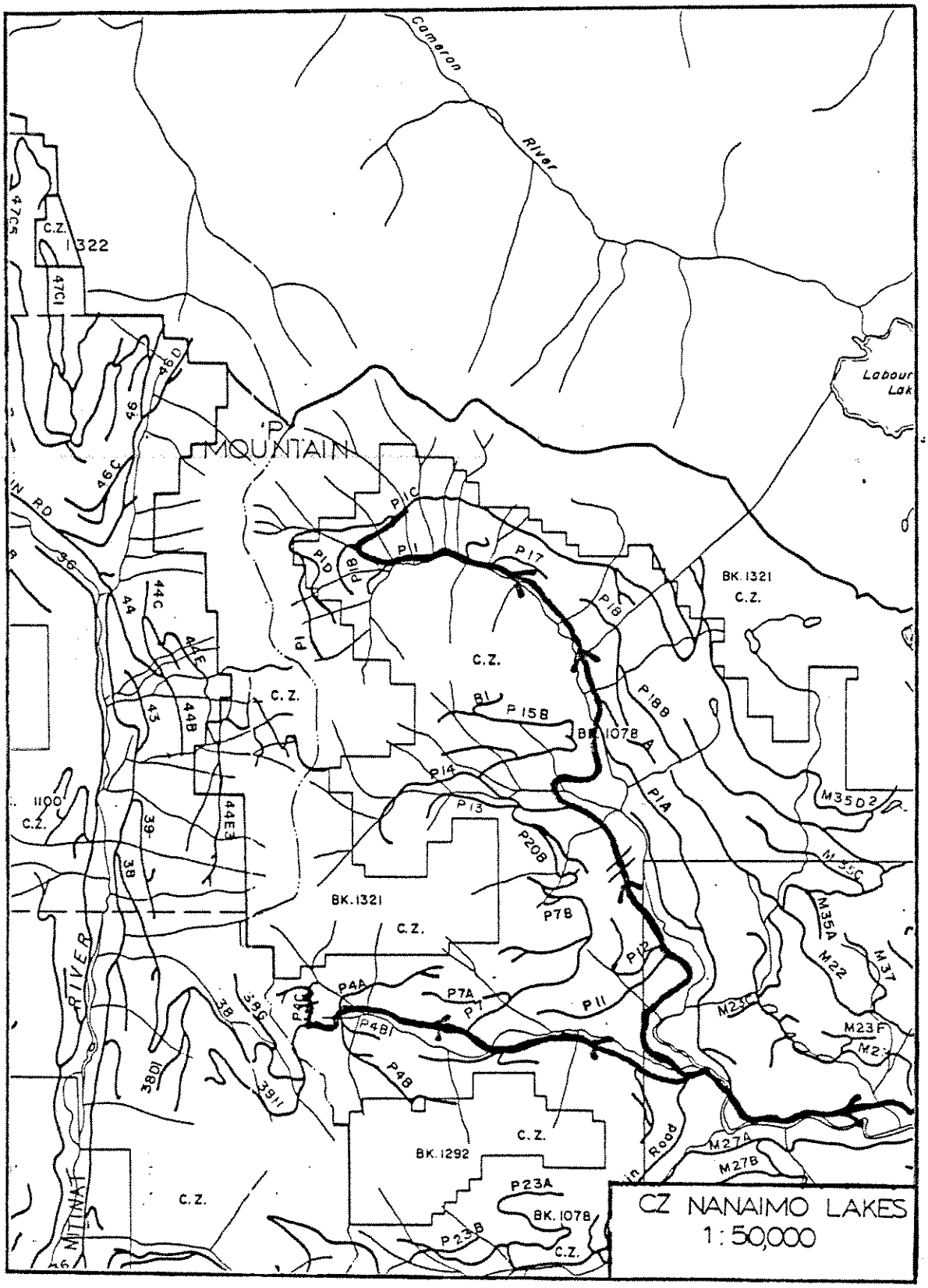


Figure 10. ACCESS ROUTE TO 'P' MOUNTAIN AREA.

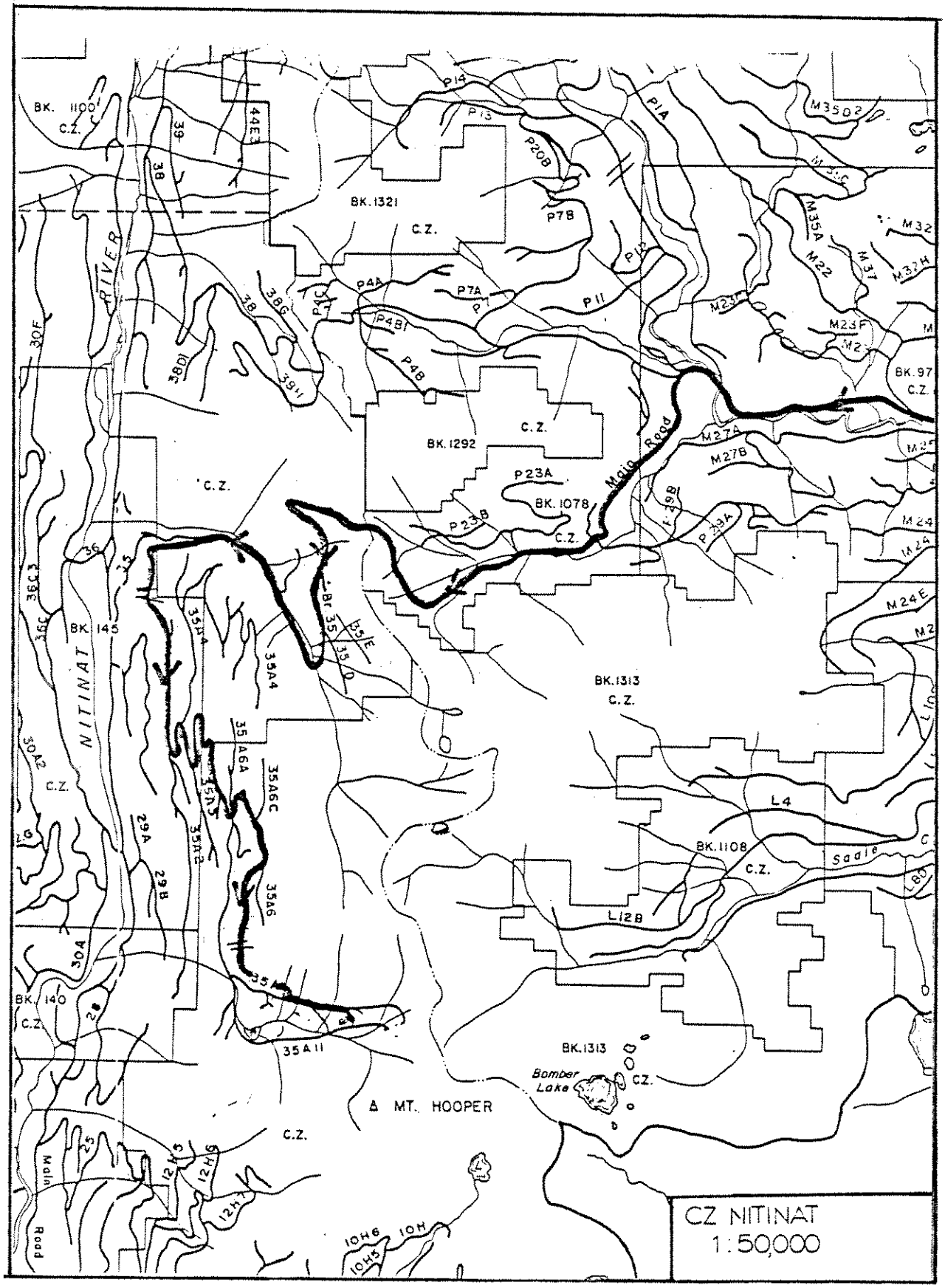


Figure 11. ACCESS ROUTE TO MT. HOOPER AND HOOPER NORTH.

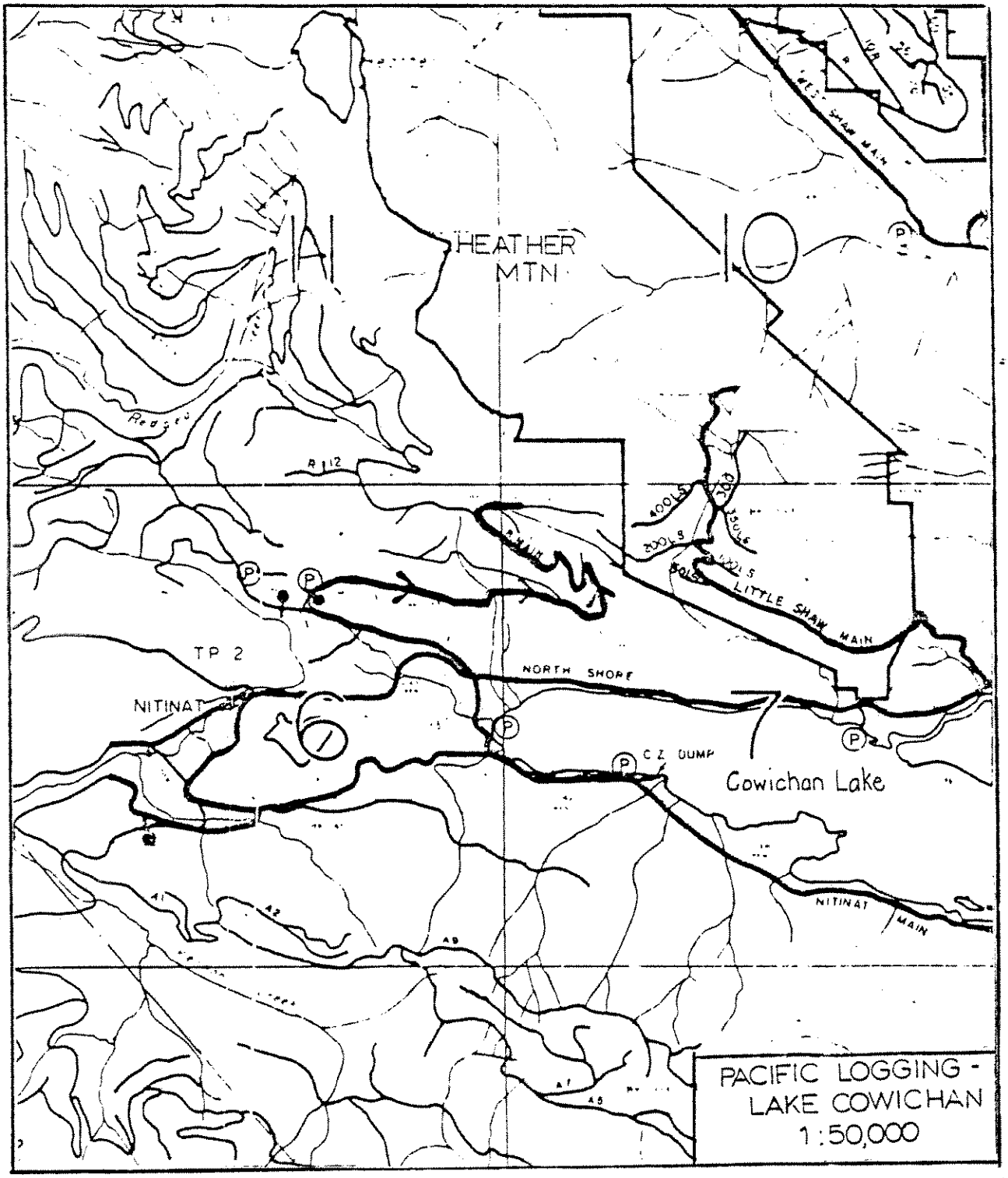


Figure 12. ACCESS ROUTE TO HEATHER MOUNTAIN.

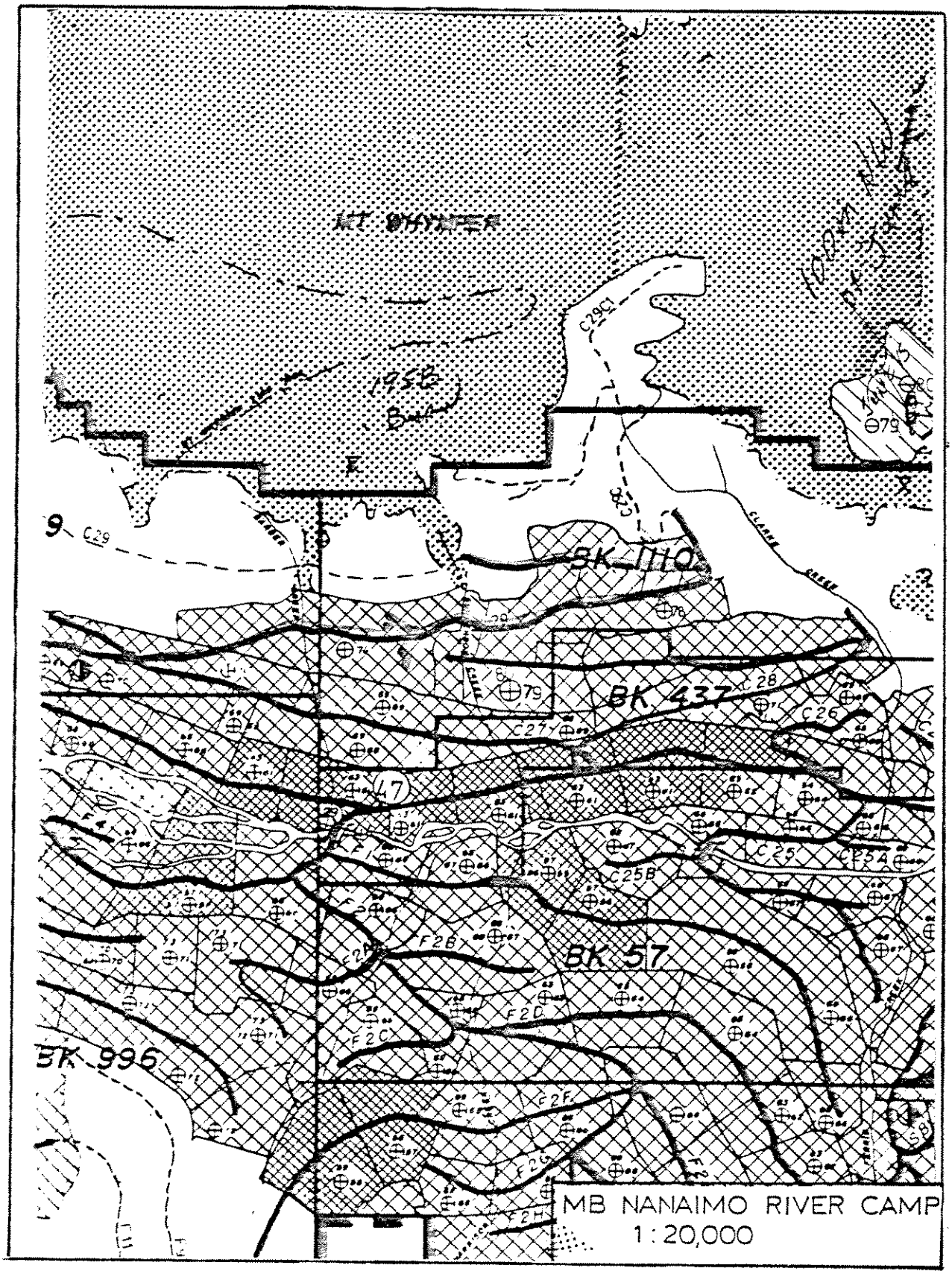


Figure 13. ACCESS ROUTE TO MT. WHYMPER.

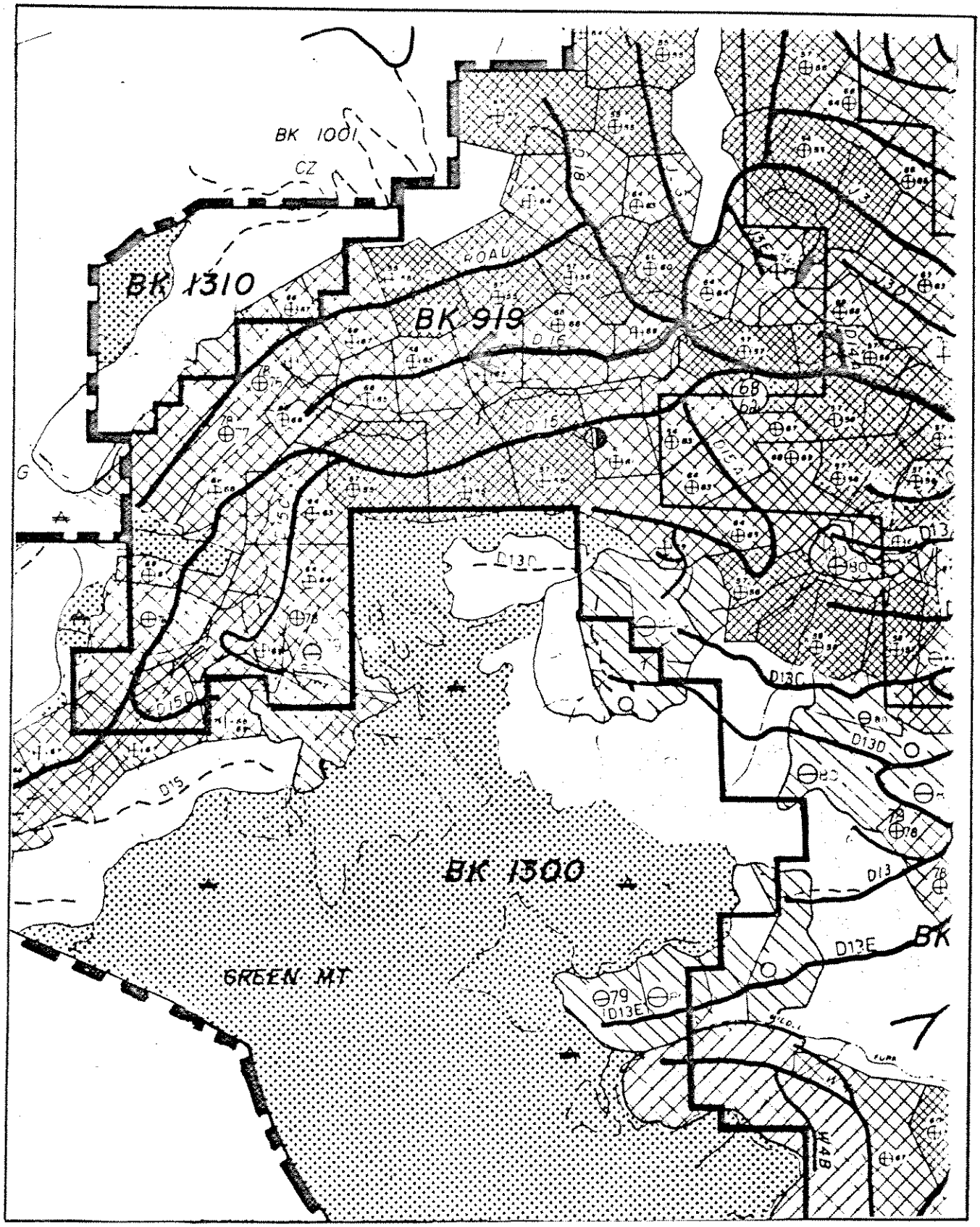


Figure 14. ACCESS ROUTE TO MBD16.

Results

The 1983 Vancouver Island marmot survey was conducted from May 27, 1983 to August 19, 1983, with sporadic searches made thereafter. The inventory was primarily concentrated within the Nanaimo River drainage area although Mt. Washington was also visited (Figure 1 and 2). A total of 17 areas were investigated for active marmot use.

The areas found to support marmots generally occurred between 975 metres (3,200 feet) and 1,433 meters (4,700 feet) above sea level. The slope varied from 35% - 95%, with the aspect usually southern, though north and west aspects did occur. Active marmot areas contained an assortment of plants and forbs (Indian Hellebore, Lupine, Tiger Lily, Indian Paintbrush). The soil was of sufficient depth and structure to permit digging and tunneling. Natural objects such as stumps and rocks provided sunning and look-out spots.

The results of the 1983 Fish and Wildlife survey showed a favourable distribution of marmot activity throughout areas of Central Vancouver Island (Table 1). Most of the 1982 active areas investigated in 1983 demonstrated increased activity, and young were recorded in areas where none were observed in 1982 (Table 2). The sighting of young indicates the presence of a successful breeding population leading to a viable marmot colony. Young were sighted in the Heather, Bell Creek, Buttle, and Whymper colonies, and a higher number of young were sighted in the Haley Lake Bowl as well. Sightings of young in the remaining colonies was thwarted by obscuring weather, visiting the colony prior to the emergence of young and in one case, disruption of the colony by the entrance of a bear.

Although increased marmot activity was generally noted, two colony sites were found to be vacant in 1983. These were

Figure 1. AREAS SEARCHED FOR MARMOT ACTIVITY - 1983

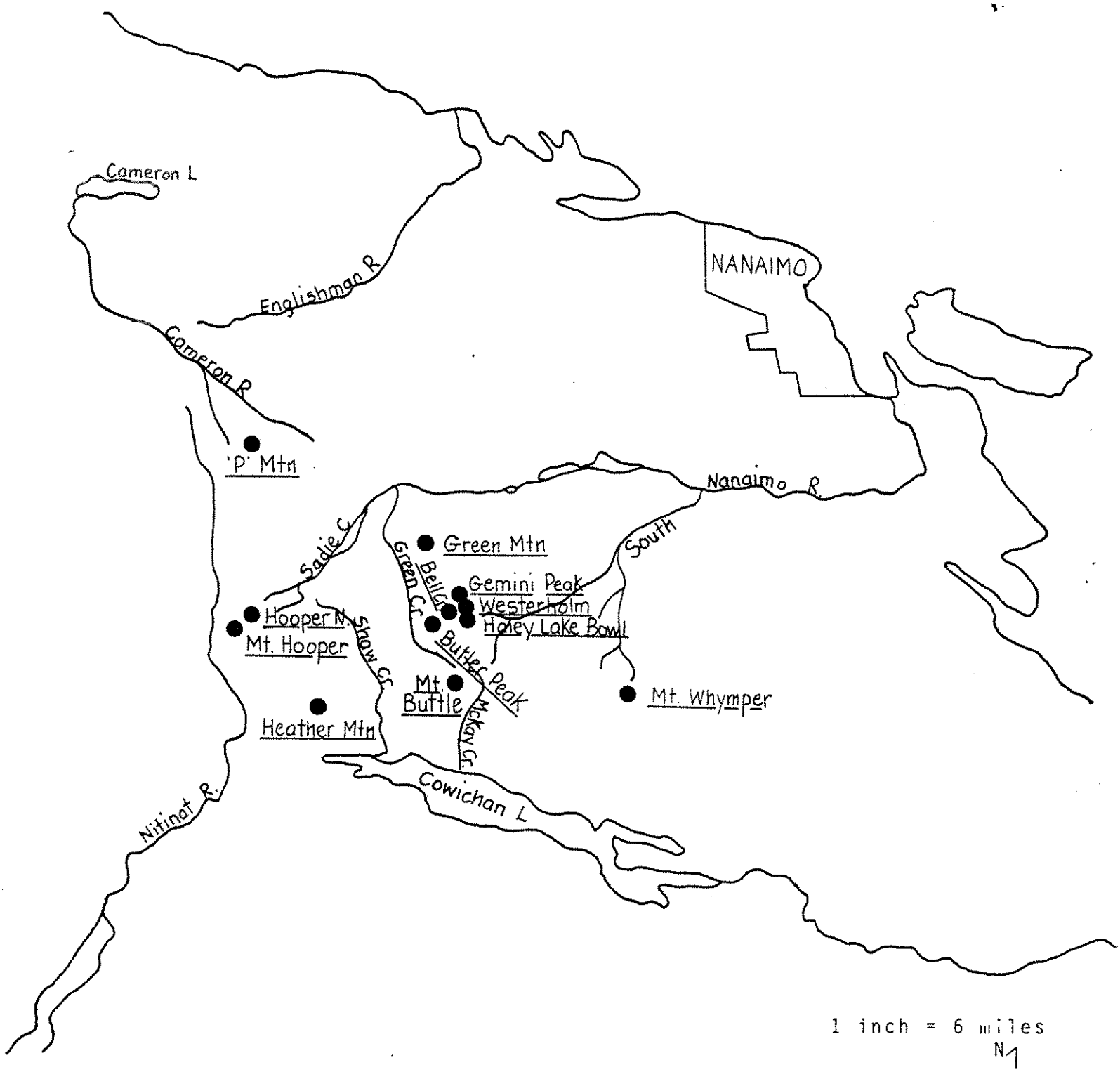
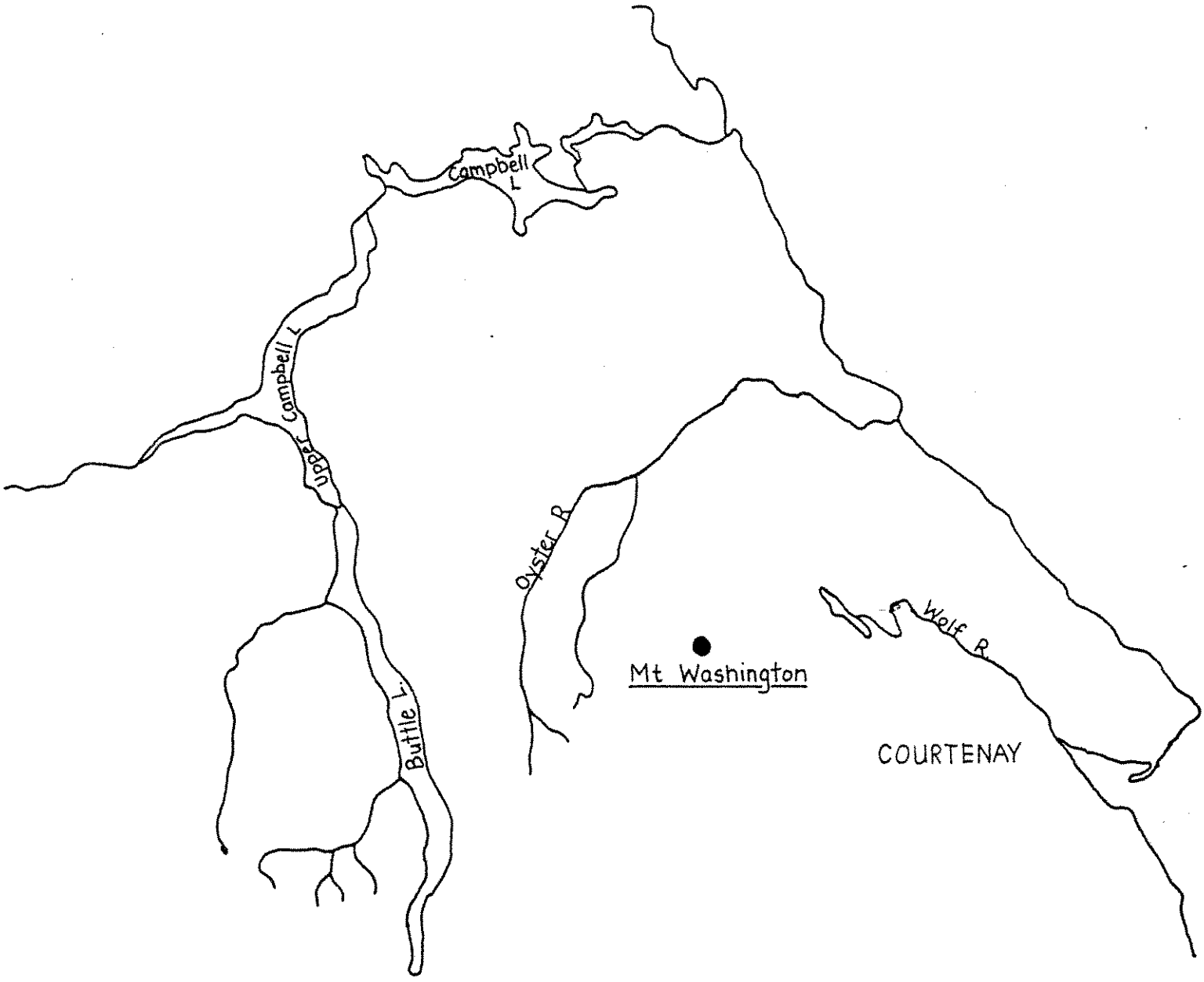


Figure 2. AREAS SEARCHED FOR MARMOT ACTIVITY - 1983.



1 inch = 6 miles

N

VHJH

Table 1. Marmot Survey Results - 1983

AREA	SITE MEASUREMENTS altitude, aspect, slope			MARMOTS PRESENT (B = burrows)	TOTAL MARMOTS
GREEN MOUNTAIN					
- SE basin	---	---	---	5	
- ski area	---	---	---	4	
- N.W. arm	---	---	---	3	
- Elk meadow	---	---	---	1 (5+)	36 - 41
- ridge (west face)	---	---	---	1	plus 5 young
- West Green E (basin)	---	---	---	3 (22B)	from D. Lickley
- West Green W	---	---	---	2 (6+B)	
- South Green basin	---	---	---	1	
- South Green meadow	---	215°	90	6 (4+B)	
- K44 road	3,700	---	---	3	
- K44 slash	3,500	---	90	7	
BELL CREEK					
- cliffs	---	---	---	3 + 1 young	13 (4 young)
- meadow	4,090	225	70-85	6 + 3 young	
BELL CREEK NORTH	4,400	260	70-80	1 (9B)	1
WESTERHOLM					
- slash	3,220	120	50-70	1	
- basin	3,800	160	85	9 (39+B)	14
- meadow #1	4,000	180	65-70	2 (9B)	
- meadow #2	4,100	170	85-90	2 (9B)	
MT. HOOPER					
- basin	4,600	260	80-90	4	4
HEATHER MOUNTAIN					
- alder side	4,000	140	80	2 + 1 young (2B)	3 (1 young)
- upper meadow					
MTN N. of HOOPER	4,500	140	70	0	0
GEMINI PEAK					
- lower saddle	---	---	---	4	
- side saddle	---	---	---	2 (10+B)	20
- south slope-main	---	---	---	8	
- bluffs	4,400 - 4,500	95	100 +	4 (5+B)	
- 1st opening to slash	---	---	---	1 (1B)	
- 2nd opening - above	3,900	240	50	1	

Table 1. Marmot Survey Results - 1983 (con't)

AREA	SITE MEASUREMENTS altitude, aspect, slope			MARMOTS PRESENT (B = burrows)	TOTAL MARMOTS
'P' MOUNTAIN					
- basin	4,400	SSE	95	3 (21+B)	
- MB side	3,900	270	80+	1 (12+B)	
- NW colony	4,000	320	35	snow	8
- cliff	---	---	---	2 (4B)	
- CWS area				(11B+)	
- W opening to N.				2	
MT. BUTTLE					
- S. side - lower	4,300	120	80-100	3 + 1 young	4 (1 young)
- upper	---	---	---	(3B)	
BUTLER PEAK					
- meadow below cliff	3,700	110	80	1	
- W. slope	4,500	280	85-95	2 + 3 young	
	---	---	---		20 (3 young)
- snow slide	4,200	120	80-90	3	
- NW F + B K43E1C	3,500	240	50-60	2	
- K43E	3,400	220-250	45-50	9	
MT. WASHINGTON	---	---	---	0	0
HALEY LAKE BOWL					
- main area	4,350	163	85-90	17 + 7 young	
- Vaugh Rd slash	3,700	250	70	1	27 (7 young)
- parking lot - N	3,800	120	90	1 (5+B)	
- rim South	---	---	---	1	
MT. WHYMPER					
- bluff	4,300	120-130	70	1 (5+B)	
- stump	4,000	180	80	3 + 2 young	9 (2 young)
				(22+B)	
- West, under repeater	4,300	220-240	80	3	
MBD16	---	---	---	1	1
TOTAL					165 (23 young)

Table 2. MARMOT SURVEY RESULTS 1980 - 1983.

	1980		1981		1982 Routledge		1982 F & W		1983 F & W
	rec	bur	rec	bur	rec	bur	rec	bur	Marmots recorded
Haley Lake Bowl	15	(35)	14	(32)	12	(34)	24	(30)	24 (7 young)
Bell Creek	3	(16)	9	(18)	7	(21)	10	(33)	13 (4 young)
Bell Creek N	---		---		---		6	(20)	1
Green Mtn-Ski area	20	(16)	9	(15)	8	(26)	10	(N-C)	14 (5 young)
Green N.W	7	(7)	8	(8)	1	(6)	7	(N-C)	3
Westerholm	2	(8)	4	(6)	7	(14)	19	(82)	14
West Green	5	(20)	8	(18)	4	(19)	7	(2+)	5
Green South	5	(18)	3	(13)	7	(21)	5	(8)	7
Gemini Peak	17	(42)	14	(40)	13	(29)	16	(36+)	20
Butler East	1	(3)	0	(4)	0	(3)	5	(9)	4
Butler F & B	---		---		---		2	(6)	2
Butler West	6	(20)	6	(23)	6	(22)	7	(N-C)	5 (3 young)
'P' NNW	1	(8)	3	(7)	8	(11)	7	(36)	3
'P' SSE	5	(9)	0	(14)	0	(17)	4	(13)	5
Mt. Hooper	4	(11)	3	(11)	4	(10)	7	(26)	4
N. Hooper	---		---		---		8	(47)	0
Heather Mtn	0	0	0	0	---		1	(22)	3 (1 young)
Mt. Buttle	0	0	1	0	---		3	(20)	4 (1 young)
Mt. Washington	---		2	(4)	1	(8)	0	(19)	0
Totals	92	(213)	84	(213)	78	(241)	148	(409)	131
New Areas									
Green - Elk meadow	---		---		---		---		1 (7 bur)
Butler - K43E1C	---		---		---		---		9 (bur N-C)
Mt. Whymper	---		---		---		---		9 (2 young) (27 bur)
Haley-Vaughn Road	---		---		---		---		2 (5 + bur)
Haley-N Parking lot	---		---		---		---		1 (5 + bur)
Green - West Face	---		---		---		---		1 (1B)
D16	---		---		---		---		1
Green - K44	---		---		---		---		10 (bur N-C)
							TOTAL		165

* rec = marmots recorded
* bur = burrows counted
* N-C = not counted

the Hooper North and Mt. Washington colonies. Mt. Washington is a developed area, whereas Hooper N is an area undisturbed by human activity. In both cases, there was no sign of marmots having utilized these areas at any time during the season. Burrows and surrounding vegetation had not been disturbed. There was no smell of decay coming from the burrows nor was there sign of predator disturbance. A possible persisting snow level in the spring may have forced an exodus of marmots to areas of greener pasture. Hooper North and Mt. Washington are expansive mountains, providing ample opportunity for marmot colony relocation without initial discovery. Until the areas are more thoroughly searched, it would be pre-mature to state that these colonies are no longer in existance.

The habitat types found to support Vancouver Island marmots in 1983 consisted of sub-alpine meadows, ski runs, building foundations rock cliff bases, rock slides, alder slides, standing timber, logging slashes, and felled and bucked areas. After completing the 1983 survey, it is apparent that Vancouver Island marmots are adaptable to a number of conditions, providing that these sites offer shelter and food. Success in locating marmots and burrows this year was by concentrating not only on open meadow habitats but also in the "marginal" habitat types. It was in the rocks, the alder slides, the timber edges and the slashes that marmot activity was found. Activity was often restricted to these habitats, despite the occurance of expansive meadow areas nearby - i.e., Heather, West Green, South Green.

It has been presumed by some observers that Vancouver Island marmots and logging are incompatable. Various reasons, such as logging noise and habitat destruction, have been proposed as being detrimental to the existance of

marmots. During the 1983 Fish and Wildlife Inventory, more Vancouver Island marmots were found to be successfully inhabiting logging areas then previously recorded in past surveys. A minimum of two marmots again were occupying the F & B area on Butler Peak. This year, 1983 sign was found beyond the original area occupied in 1982.

In addition to the carry-over occupation of the Butler F & B area, three more logging areas were found to contain Vancouver Island marmots. Two of these areas were brought to the attention of Fish and Wildlife by Crown Forest (formerly Crown Zellerbach), the third was found by MacMillan Bloedel. The most interesting of these areas was Crown Forest K43E. Crown Forest, concerned over the presence of marmots directly within an active logging area, called in Fish and Wildlife for advice on a possible course of action. The K43E area was currently in three stages of logging - active yarding, F & B and slash. Vancouver Island marmots were visible in all three areas, despite the constant activity of machines, vehicles and humans. The only 1982 marmot sign was found to be concentrated within a small area surrounding a large boulder by the roadside. Therefore, it appears that the marmots had moved into the surrounding area in spite of or because of the logging. At least 10 marmots were sighted in the area by loggers, Fish and Wildlife recorded nine. Marmots were actively utilizing the cut banks for burrows. Logging debris and stumps received heavy usage as look-out and sunning spots. A case of Vancouver Island marmots vs. logging was illustrated when after a yarder had been actively in place for at least two weeks, a marmot excavated an expansive burrow under one of the guy lines of the yarder. Upon completion of the yarding activities and removal of all machines and logging activity in the area, marmots were still inhabiting the area.

The second area, compliments again of Crown Forest, is the K44 area, located below the Green Mountain Ski Lodge. At least 10 marmots have taken up residence in the logging slash and roadside debris. Numerous marmot look-out spots and pathways line the roadside. Active logging is occurring a short distance down the road, and again the marmots appear unaffected.

At least one marmot was reported by MacMillan Bloedel personnel to be living in the Vaughn Road slash. Fish and Wildlife confirmed this marmot, as well as an area of intensive use. In addition to this report, Mr. R. J. Milko, Department of Biology, University of Victoria reported sighting three marmots in the logging slash near the approach road to the Haley Lake colony site. Mr. Milko's 1983 sightings were in two locations separated by approximately 500 m and were over 1 km from the slash site investigated by Fish and Wildlife. The existance of marmots in this slash may indicate that the Haley Lake Bowl is under expansion pressure, and that more marmots may be found in the same area. It is interesting to note that these marmots chose to reside in the slash, while a nearby sub-alpine meadow stands unused.

Of the 165 marmots recorded in the 1983 Fish and Wildlife inventory, at least 25 (15%) were successfully inhabiting a logging slash environment.

In addition to locating new areas of marmot activity within logging areas, several other new locations were found to support marmots. Mt. Whymper was brought to the attention of Fish and Wildlife by a veteran hunter, who had noted marmots during his hunting trips. Upon Fish and Wildlife investigation, at least two areas of the mountain were found to be inhabited by Vancouver Island marmots. Observations of these areas revealed a minimum of nine marmots, two of which were young of the year. Not all the areas on Whymper

previously noted for marmot sightings were included in the 1983 inventory, therefore the likelihood of more marmots being found on Mt. Whymper in future inventories is excellent.

New areas of marmot use were also found close to areas known to be inhabited by Vancouver Island marmots. These were the Green Mtn elk meadow, Green Mountain ridge and a timber corner in Haley Lake Bowl. The Green Mountain elk meadow and the Green Mountain ridge have been surveyed in the past. The timber corner in Haley Bowl has not been previously surveyed by Fish and Wildlife, however there are no past records of marmot or active marmot burrows from this location. The discovery of new areas within the proximity of such heavily used colony sites possibly demonstrates an increase in occupied marmot habitat and a subsequent increase in marmot population.

Expanded marmot use was found in the Bell Creek, 'P' Mountain, Gemini Peak, and S. Green colony areas. Within each area, both marmots and burrows were found beyond the original areas of habitation.

Conclusions

Time restrictions and the difficulties in overcoming the rugged topography of Vancouver Island did not permit all of the suspected and potential marmot area to be searched. As well, in 1983 Fish and Wildlife staff were faced with government restraint measures, creating increased workloads. Within the limited time available, the data base of Vancouver Island marmot information was again increased. Although we have only conducted systematic surveys for the past two field seasons, our knowledge on habitat use, colony locations, numbers, and influence of man's activities has increased

greatly. It is very likely that there remain many Vancouver Island marmots still undetected in unsearched patches of habitat. Research of various aspects of habitat use and dispersal will increase our knowledge, however, the top management priority, at this time, is the continuance of our inventory activities.

APPENDIX 1

Tabulation of field data

Date	Area Investigated	Active burrows present	Marmots/seen heard
May 26	Westerholm - slash	X fresh	1
	- basin	X	6
	- meadow 1	--	1
	- meadow 2	--	1
May 27	Green Mountain - ski area	X 1	1
	- old Faithful	X	1
	- SE slope	X	5
	- bluffs	--	1
	- NW arm	--	3
	- anchor block	X 2	1
	- snow slide	X 2	--
	West Green - SE	--	2
	- SW	--	1
June 7	West Green - West face	X	2
	- SE side	X 16 bur/comp	3
	Green Mtn - NW	--	1
	- elk meadow	X	1
June 10	Green Mtn with Pete McMartin		
	- men's outhouse	X	1
	- anchor block	X	1
June 13	Haley Lake Bowl	X	10
	Bell Creek - meadows	X	9
June 21	Gemini Peak - motherload	--	10
June 20	Butler Peak - K43E1C	X 4+	1
June 22	Green Mtn	--	3
	South Green - basin	--	0
	- lunch spot	--	1
	- meadow	--	5
	Green - elk meadow	X 4+	0
June 27	'P' Mtn - main area (gully)	X 15	3
	- cliff edge	X 4	2
	- MB side	--	1
	- CWS	X 11+	--
	- N West chute	X 4	2
	- snow slide	X 6	--
June 28	Butler Peak - K43B to end	0	0

APPENDIX 1 (con't)

Tabulation of field data

Date	Area Investigated	Active burrows present	Marmots/seen heard
June 30	Westerholm - main area (with Myke Chutter)	X 39	8
	- Bell Creek side	X 9	1
	- South	X	1
	- meadow #1	X 9	2
	- meadow #2	X 9	2
	- slash	X	1
July 5	Gemini - main (with Karen Jacobs)	X	3
	- lower saddle	X	4
	- side saddle	X (10+ B)	2
	- bluffs	X (5)	4
	- 1st opening	X	1
	- 2nd opening	X	1
July 8	Haley Lake Bowl	X	16
	Bell Creek	X	7
	Haley - new corner	X 5+	1
July 15	Green Mtn - elk meadow	X 4+	1
	West Green - SE side	X 3	--
	- bowl	X 13B4 com.	--
	Green Mtn - ridge	X	1
	- snow slide area	--	1
	- snow slide	X	2
	- Old Faithful	X	1
	- outhouse	--	1
	- lodge	--	1
July 18	Mt. Whymper	X	6 (2 young)
July 19	South Green - ski area	--	2
	- SE alder slide	--	2
July 20	Mt. Whymper	--	4 (1 young)
July 22	Butler Peak - rock bluffs	--	1
	SE alder slide	--	3
July 26	Butler Peak - K43E	X	9
	- MB D15	0	0
July 28	Mt. Whymper - C19F	0	0
	- MB D15 C	0	0

Appendix 1 (con't)

Tabulation of field data

July 29	Mt. Hooper	X	4
Aug 4	Heather Mtn - upper meadow	X (2)	--
	- alder slide	X	3 (1 young)
Aug 5	Hooper North	0	0
Aug 8	Mt. Whymper - 1st stump	X (22)	--
	- west	--	3
Aug 9	Mt. Buttle - lower	X	3 (1 young)
	- upper	X	--
Aug 10	Butler - K43E	X	1
	- K43E1	--	1
	- K43E1C	X	2
Aug 17	Mt. Washington	0	0
Aug 18	Haley Lake Bowl	X	18 (7 young)
	Bell Creek - cliff	--	3 (1 young)
	- meadow		6 (3 young)
	Haley Lake slash	X	1
	Haley Lake rim	--	1
Sept 8	Butler Peak - K43E	--	0
	- K43E1C	--	0
Sept 14	Green Mtn - ski area	X	0
	- road	X	2
Sept 15	Green Mtn - K44 road	X	3
	- K44 slash	X	7
Sept 17	Butler Peak - K43E1	X	5
Sept 27	K44 with Gord Prouse, Doug Janz	X	9