

ALBERTA RECREATION, PARKS AND WILDLIFE

FISH AND WILDLIFE DIVISION

BLACK BEAR DAMAGES TO BEEYARDS IN THE PEACE RIVER AREA OF ALBERTA:

1972-76

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April 20, 1977

SUMMARY

Black bears (*Ursus americanus*) continue to damage beehives in the Peace River area of Alberta. The Alberta Fish and Wildlife Division initiated intensive bear control and studies of beeyard damages in 1972 and studies of bear biology, electric fence effectiveness, translocations and electro-shock conditioning since then. These programs have been summarized in earlier reports (Quaedvlieg, et. al. 1973, Gunson 1974, Denison and MacGougan 1975, Pecharsky 1975, Gunson 1975, Allen 1976, Dorrance and Gunson 1976, Gunson and Pipella 1977, Gunson and Cole 1977). This report summarizes data on damages and bear captures from 1972 to 1976, inclusive.

During the 5-year period, 1972 to 1976, 1110 bear-beeyard complaints have been investigated (Table 1 and Figures 1 to 5). During 1972, the first year of study, we worked only in the MD130. Numbers of complaints in that area declined from 106 in 1972 to 33 in 1975; then increased to 103 in 1976. A total of 554 bears have been captured at beeyards during the above period; 177 in MD130 (Table 1 and Figures 1 to 5). Within MD130 bear captures at beeyards declined from 48 in 1972 to 19 in 1975; then increased to 59 in 1976.

Proportion of damages occurring in respective months varied between years (Table 2). Bear damages begin in April, but are not common during that month. Although not recorded, damages were common in September, 1973. Numbers of bears captured during May and June, 1975 were in excess of captures during that period in 1974, but declined appreciably about mid-July, 1975 and remained low throughout the month of August. The sudden decline of damages in 1975 appeared to be correlated with the appearance of substantial wild berry production.

A mean of 4.2 hives were damaged per bear penetration (Table 3) during the 5-year period. Damages on individual complaints varied from one to 41 hives. In both 1973 and 1976 mean number of hives damaged was significantly ($P < 0.05$) greater than in 1972 or 1974.

Numbers of participating beekeepers varies from 13 in 1972 (MD130 only) to 43 in 1976 (Table 4). Calculated losses from records of bear control personnel (which include beekeepers' estimates) ranged from 20 (X1000) dollars in 1972 (MD130 only) to 133 (X1000) dollars in 1976. Actual losses throughout the Peace River control/study area between 1973 and 1976 would be about 1.5 times the recorded loss (Table 4) since all beekeepers have not participated in the program.

Multiple occurrences of damages at individual beeyards were recorded in all years (Table 5). The proportion of damaged beeyards with multiple occurrences of damage was 25.2 percent (58 of 230 yards in 1972 and 19.3 percent (47 of 244 yards) in 1976. Following the construction of 400 to 500 electric fences around beeyards in the area between 1974 and 1976 (unreported data) we might have expected a greater decline in the number of yards with more than one occurrence of damage. Damage prevention by electric fences appears to have been offset in part by continued choice of poor locations by new, inexperienced beekeepers.

Leg-snaring has been more effective than culvert-trapping (Table 6). Totals of 6603 snare-nights and 3507 trap-nights resulted in a mean of 59.2 bears captured per 1000 snare-nights and 31.1 bears captured per 1000 trap-nights. Success of snaring has increased from 51.8 to 66.7 bears per 1000 snare-nights between 1972 and 1976 from 42.8 to 23.1 captures per 1000 trap-nights.

The index of bears captured per damaged beeyard (Table 7) was significantly ($P < 0.01$) greater in 1973 than in all other years. The second highest index was recorded in 1976. This, along with the greater mean number of hives damaged per attack during 1973 and 1976 (Table 3) suggests that, at least on the average, more bears were involved in individual damages during those years.

The bulk of damages continue to occur at beeyards without an electric fence (Table 8). This suggests that damages have not been common at the yards recently (1974 to 1976) fenced under the electric-fence subsidy program. Mean number of hives damaged was not significantly greater at unfenced yards as opposed to fenced yards (Table 9). Unfenced yard locations with multiple occurrences of damage should be identified for electric fencing.

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Table 1. Numbers of black bear complaints¹⁾ and bears removed at beeyards in the Peace River area of Alberta: 1972-76.

Year	Complaints		Bears Removed	
	Control Area (MD130)		Control Area (MD 130)	
1972 ²⁾	106	(106)	48	(48)
1973	337	(89)	182	(39)
1974	223	(35)	86	(12)
1975	134	(33)	68	(19)
1976	310	(103)	170	(59)
1972-76	1110	(366)	554	(177)

1) complaints handled in control/survey work only; and do not represent all bear/beeyard penetrations

2) MD130 only in 1972

Table 2. Temporal distribution of black bear complaints at beeyards in the Peace River area of Alberta: 1972-76.

Month	Proportion (%)				
	1972 (106) ¹⁾	1973 (337)	1974 (223)	1975 (134)	1976 (310)
April	2)	2)	0	0.7	2.3
May	2)	22.0	9.5	11.9	8.4
June	37.8	30.6	25.7	60.0	20.6
July	41.5	24.0	33.3	22.2	31.6
August	18.9	23.4	30.6	5.2	32.3
September	1.9	2)	0.9	0	4.8
Total	100.0	100.0	100.0	100.0	100.0

1) number of complaints

2) unknown since control program not in progress

Table 3. Mean number of beehives damaged per bear complaint in the Peace River area of Alberta: 1972-76.

Year	Number Complaints ¹⁾	Number Hives Damaged ²⁾	HD/C
1972	97	327	3.4
1973	310	1493	4.8
1974	216	792	3.7
1975	115	479	4.2
1976	253	1115	4.4
Total/Mean	991	4206	4.2

1) complaints where damage was recorded

2) number of hives damaged regardless of extent of damage
Student's "t" distribution

1973 \bar{vs} . 1972 $P < 0.01$

1973 \bar{vs} . 1974 $P < 0.01$

1976 \bar{vs} . 1972 $P < 0.05$

1976 \bar{vs} . 1974 $P < 0.05$

Table 4. Calculated losses from bear damages to beeyards in the Peace River area of Alberta: 1972-76.

Year	Participating Beekeepers	Recorded \$ Loss		Calculated Loss ¹⁾	
		Complaints	\$\$	Complaints	\$\$ (x1000)
1972	13				20 ²⁾
1973	42				111 ²⁾
1974	36	208	46,437	223	50
1975	32	108	37,516	134	47
1976	43	253	108,149	310	133

1) for survey complaints only; which represent an estimated 60 to 70 percent of all damages between 1973 and 1976. Total losses in the control/study area would be that much higher. In 1972 losses are for MD130 only.

2) \$\$ losses for 1972 and 1973 were calculated using a mean of \$60.00/hive (Gunson 1975).

Table 5. Frequency of occurrence of bear damages at individual beeyards in the Peace River area of Alberta: 1972-76.

Damage Occurrences Per Yard	Number of Beeyards				
	1972 (78) ¹⁾	1973 (230)	1974 (148)	1975 (104)	1976 (244)
1	60	172	113	84	197
2	11	39	22	13	36
3	5	9	6	6	7
4	1	6	3	1	3
5	1	2			
6		1	2		1
7			1		
8					
9		1			
10			1		

¹⁾ number of beeyards with bear damage

Table 6. Frequency of capture of black bears at beeyards in the Peace River area of Alberta: 1972-76.

Year	Bears Captured/1000 Nights		
	Leg-snares	Culvert-traps	Both
1972	51.8(521) ¹⁾	42.8(374)	48.0(895)
1973	55.5(2287)	30.5(1212)	46.9(3499)
1974	55.1(1035)	35.8(670)	47.5(1705)
1975	61.6(795)	29.6(473)	49.7(1268)
1976	66.7(1965)	23.1(778)	54.3(2743)
Mean(Total)	59.2(6603)	31.1(3507)	49.5(10,110)

¹⁾ number of snare- or trap-nights

Table 7. Relationship between numbers of beeyards damaged and bear captures in the Peace River area of Alberta: 1972-76.

Year	Number Beeyards Damaged	Number Bear Captures	BC/ByD
1972	78	48	0.62
1973	230	182	0.79
1974	148	86	0.58
1975	104	68	0.65
1976	244	170	0.70
Total/Mean	804	554	0.69

2x2 Chi-square

1973 vs. 72 P<0.01
 73 vs. 74 P<0.01
 73 vs. 75 P<0.01
 73 vs. 76 P<0.01
 76 vs. 72 P<0.20
 76 vs. 74 P<0.01
 76 vs. 75 P<0.30

Table 8. Electric fence status at beeyards damaged by black bears: Peace River area of Alberta: 1972-76.

Year	n ¹⁾	Proportion (%)		
		No Fence	Operable Fence	Inoperable Fence
1972	105	67.6	18.4	14.3
1973	337	84.6	10.7	4.7
1974	218	78.0	15.1	6.9
1975	133	69.2	19.5	11.3
1976	294	71.1	22.1	6.8
1972-76	1087	76.1	16.5	7.5

¹⁾ number of complaints with known fencing status

Table 9. Mean number of beehives damaged by black bears at unfenced and fenced beeyards; Peace River area of Alberta: 1974-76.

Year	Mean Number of Hives Damaged (n)		
	No Fence	Operable Fence	Inoperable Fence
1974	3.8(164)	3.3(31)	4.4(15)
1975	3.9(77)	4.7(26)	4.5(12)
1976	4.2(181)	4.6(52)	6.6(14)
1974-76	4.0(422)	4.3(109)	5.2(41)

Student "t" distribution

1974-76 No Fence vs. Operable Fence P<0.5

No Fence vs. Inoperable Fence P<0.2

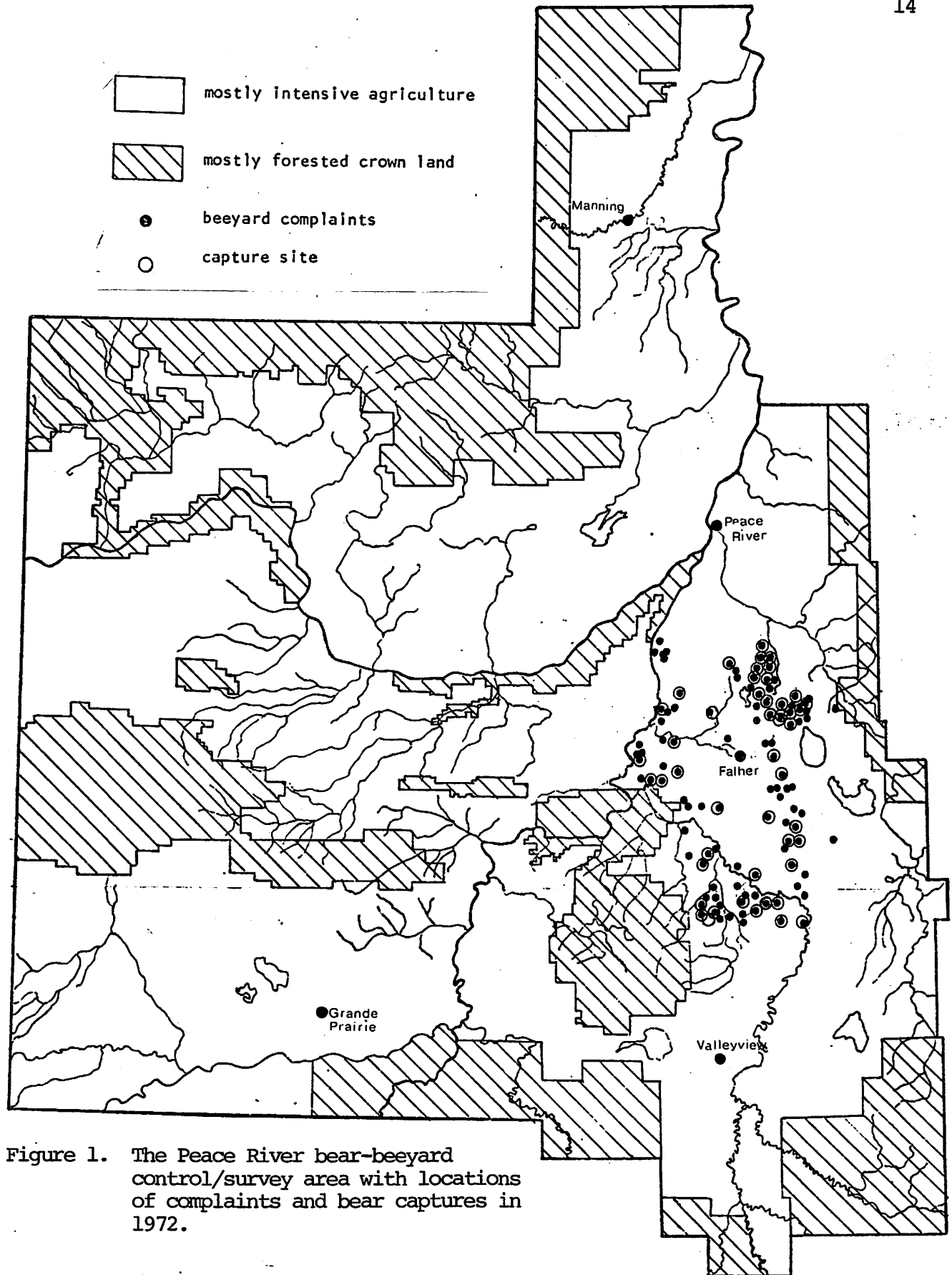
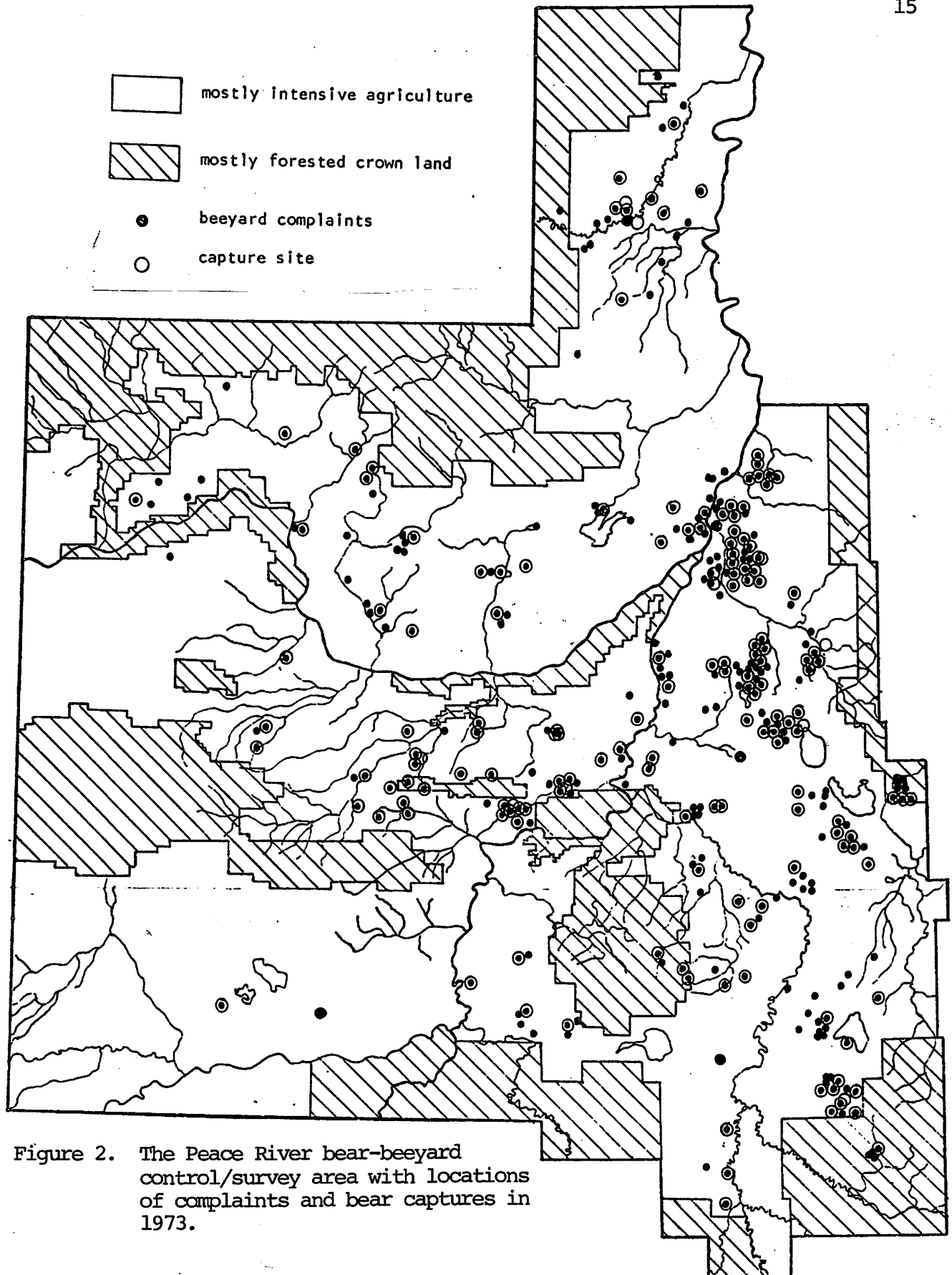


Figure 1. The Peace River bear-beeyard control/survey area with locations of complaints and bear captures in 1972.



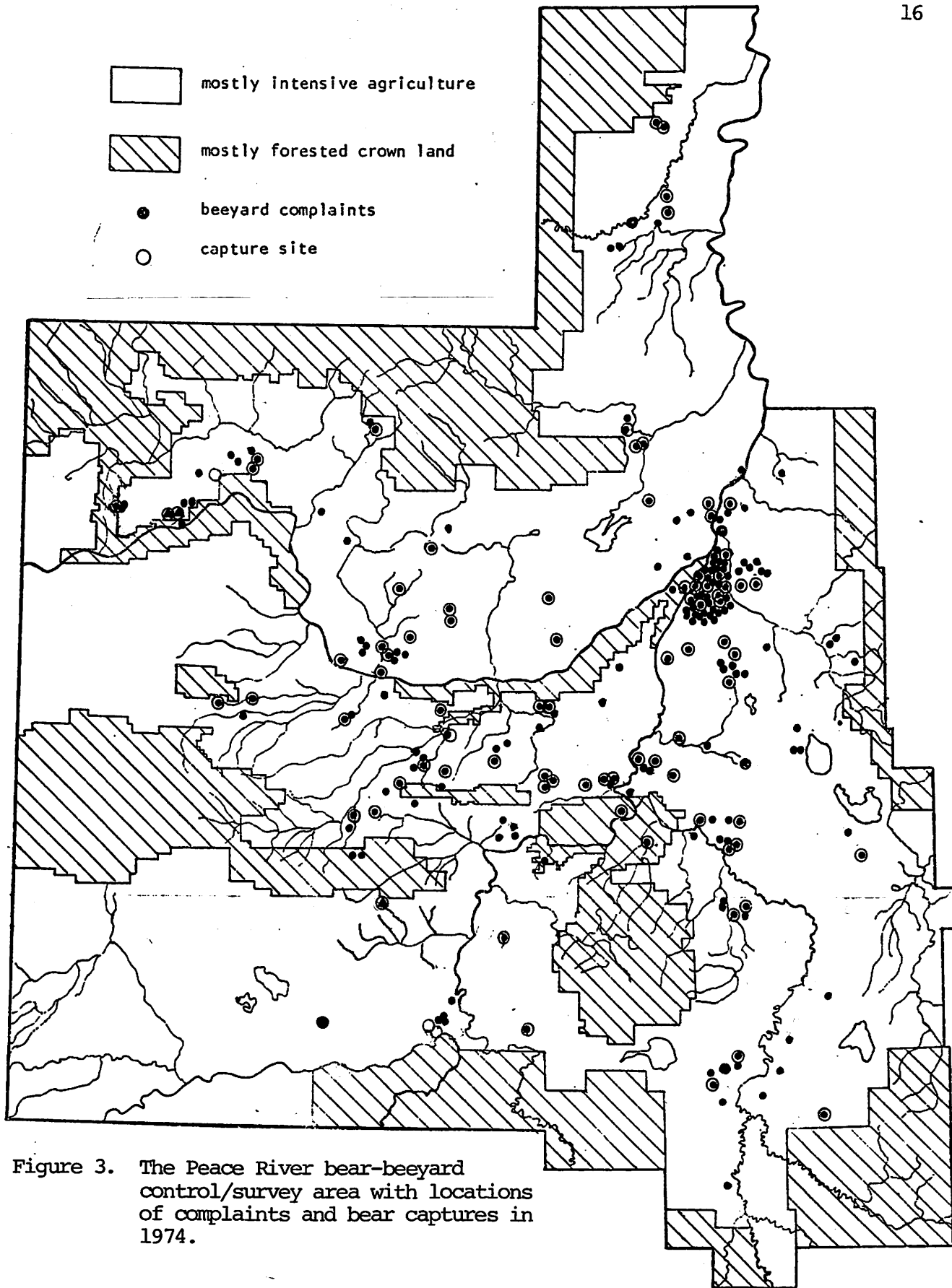
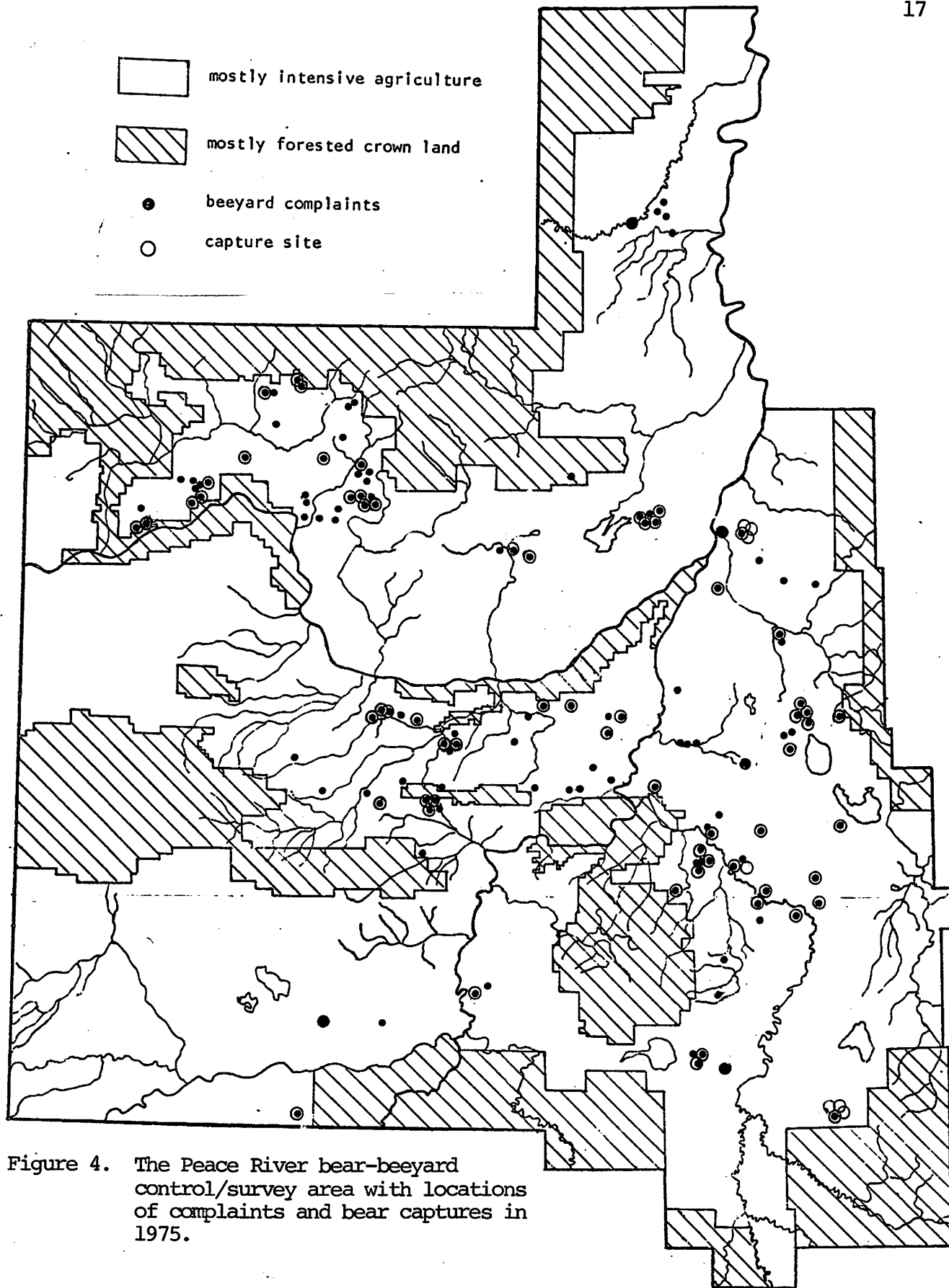


Figure 3. The Peace River bear-beeyard control/survey area with locations of complaints and bear captures in 1974.



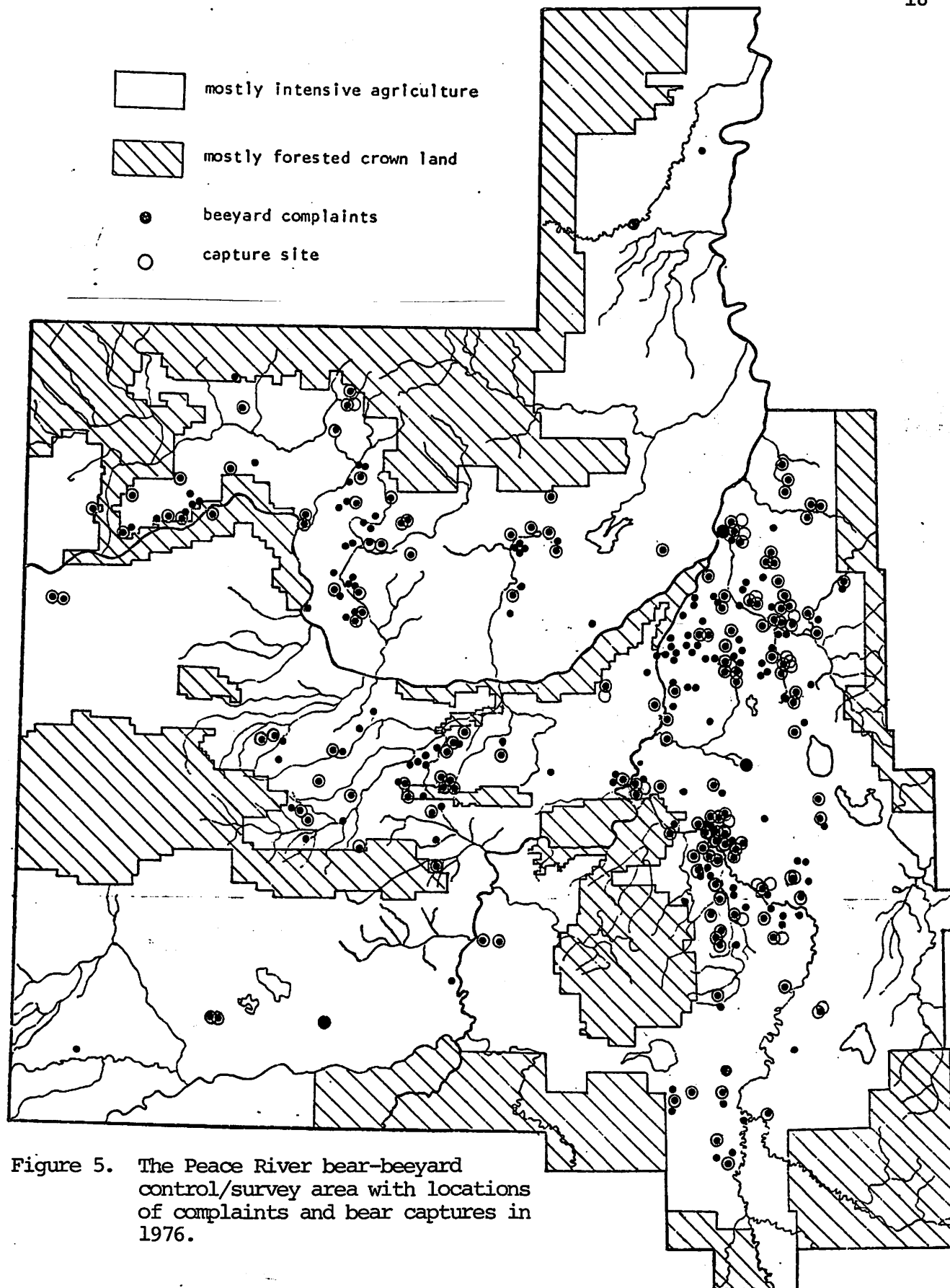


Figure 5. The Peace River bear-beeyard control/survey area with locations of complaints and bear captures in 1976.