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Subject: East Kootenay Forage Use Report

Dear Sirs:

At a meeting of the Ministries of Forests and Environment held in Cranbrook on September 26, 1989, we were directed to prepare a report to provide baseline data for the East Kootenay range resource and outline a framework for forage allocation in the East Kootenay. This report has now been completed and is attached for your review.

The introduction describes joint presentation of the report's contents to livestock and wildlife interest groups and the recommendations include actions which would involve our Regional and District offices. After you have had an opportunity to review the report, we would suggest a meeting between our two Ministries to discuss the report's contents and agree on the direction we should take.

Yours truly,

D E Phelps

Dave Phelps
Land Management Specialist
Ministry of Environment
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:0453A

FORAGE USE ON CROWN RANGELAND

IN THE EAST KOOTENAY

A JOINT REPORT OF THE
MINISTRY OF FORESTS, CRANBROOK
& INVERMERE DISTRICTS AND THE
MINISTRY OF ENVIRONMENT, EAST
KOOTENAY SUB REGION

December, 1990

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INTRODUCTION

Over the past 15 years, a substantial amount of range improvement has been done in the East Kootenay, primarily funded by ARDA and ARDSA* under Coordinated Resource Management Plans. However, two critical elements were missing from the planning process since its beginning. The first was an overall land use plan and the second, a system to allocate forage between livestock and wildlife. The Trench Integrated Renewable Resource Management Plan (TIRRMP) addresses the first short-coming, but the forage allocation question remains unanswered. Several attempts at forage allocation have been made by the Ministries of Forests and Environment but no conclusions have been reached. Without a forage allocation system, resource managers in the two Ministries were unsure of each other's aims and objectives and mistrust developed.

At a meeting of the Ministry of Forests and the Ministry of Environment in September, 1989 it was agreed that to alleviate these problems, several things needed to be done:

1. Improve trust and cooperation between the two Ministries. As a first step, baseline data would be agreed to regarding the current and past utilization of the range resource.

2. Make a joint presentation by the two Ministries of this data to livestock and wildlife interest groups in the East Kootenay to help dispel misconceptions which have grown up around the issue.

3. Determine the actions needed to develop a forage allocation process for the East Kootenay.

This report presents the baseline data agreed to by the two Ministries and provides the framework for a forage allocation plan and vegetation management strategy.

*Between 1975 and 1982, approximately $3.1 million was expended by ARDA (the joint Canada-British Columbia Agriculture and Rural Development Agreement) and by ARDSA (the Agriculture and Rural Development Subsidiary Agreement) on range improvement projects on Crown land in the Cranbrook and Invermere Forest Districts.

1. CROWN RANGE INFLUENCES

The Oxford Dictionary defines "encroachment" as the intrusion on an other's territory, rights etc. It also suggests a change over time. Much of the difference of opinion in forest encroachment stems from the lack of a common time frame. For this exercise, the time frame will be from approximately 1850 to the present.

The nineteenth century explorers described a mature, well spaced climax forest, with very little regeneration or forest litter and few shrubs. Frequent fires played an important role in the development and maintenance of this forest ecosystem. Repeated fires killed juvenile conifers and shrubs and kept forest debris to a minimum.

The expansion of the national railroad system during the late 1800's and early 1900's created an increased demand for railroad ties. The virgin, mature forests of the East Kootenay, particularly those in the trench, were logged to meet this demand. East Kootenay tie logging peaked about 1920. Quality and quantity of wood, technology of the day, and an exploitation philosophy led to extremely high slash accumulations. Some slash was deliberately set on fire for disposal and other slash burned as a result of lightning strikes or wildfires. When fires started under these circumstances, almost everything, including conifer seedlings, immature and mature stands, burned.

As a result of these fires, a seral grass/shrub-land was produced in this ecosystem. Subsequently, opportunities for livestock and wildlife emerged.

Since most of the East Kootenay is naturally a forested area, conifers started to re-occupy the logged and burned sites, slowly at first, but accelerating over time, to the point where open grass/shrub-lands started to diminish. At the same time, with the use of aircraft, beginning in the late 1940's and early 1950's, the Ministry of Forests became much more efficient at wildfire control. Efficiency was so high, in fact, that virtually all fires were suppressed. Because almost all conifer regeneration survived, dense over-stocked stands of yellow pine, Douglas-fir and lodgepole pine developed. Many of these stands were so dense that conifers competed with one another for moisture, nutrients and sunlight, and became stagnated.

Quantification of the foregoing encroachment events has not occurred to the knowledge of this committee. It was therefore thought that a review of historical Forest Service Inventory data might be helpful.

Forest Inventory personnel indicated that the information was not in a form that could readily be used and analysed for this exercise. It was estimated that reclaiming this information could cost $25,000 - $50,000 — far beyond the capabilities of this committee. The following air photos are included to illustrate the magnitude of forest encroachment in three selected areas (Figures 1, 2, and 3). Each pair was selected to be representative of vegetation when the first air photos were taken in the late 1940's and early 1950's and in more recent times, 1979 and 1988.

A review of the information at hand indicates that the Rocky Mountain Trench is a forested ecosystem. The first information describes the system in a climax stage with well spaced, mature trees in a park-like state. Man altered this by logging and burning, and hence a seral grass/shrub-land emerged. As regeneration occurred, man again intervened and suppressed all wildfires. This action produced stagnated, overstocked conifer stands which do not benefit forage, timber or wildlife production. The question is where, how and to what extent should man intervene to bring the system back into an acceptable balance between forest and grassland communities.

HA HA LAKE

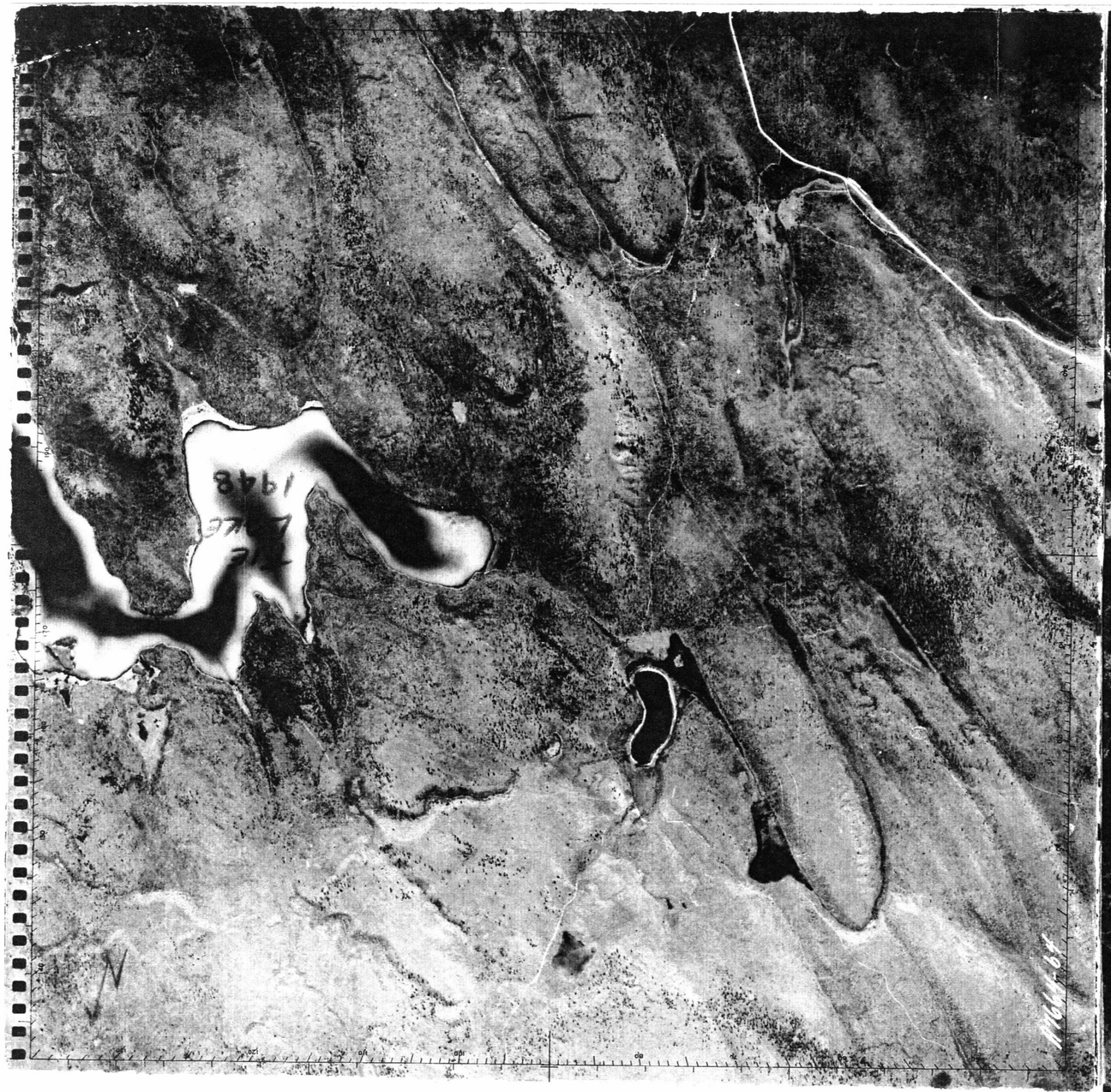
1948 and 1979

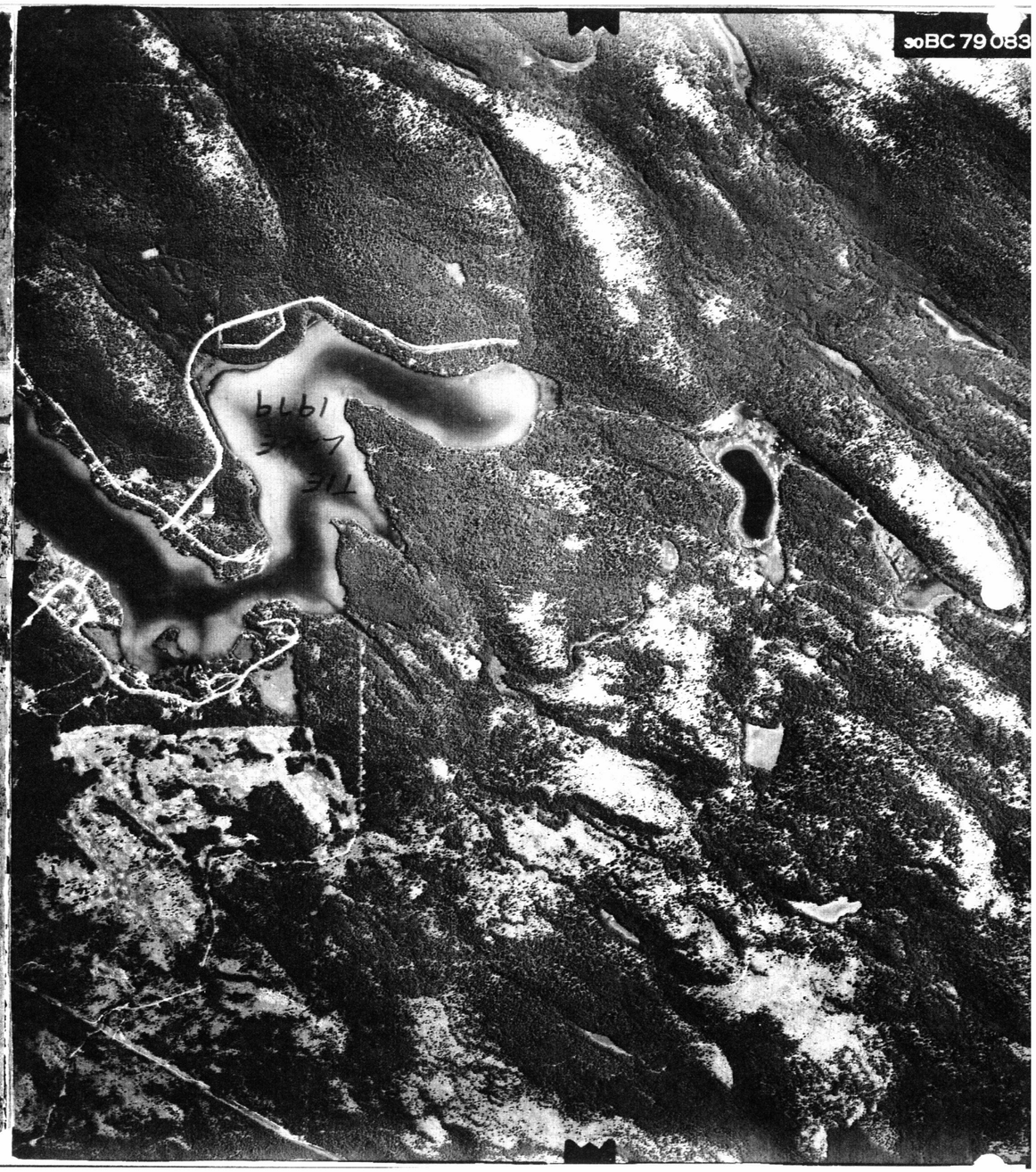
Figure 1: Aerial photographic pairs of Ha Ha Lake area taken in 1948 and 1979.

TIE LAKE

1948 and 1979

Figure 2: Aerial photographic pairs of Tie Lake area taken in 1948 and 1979.


1948
N

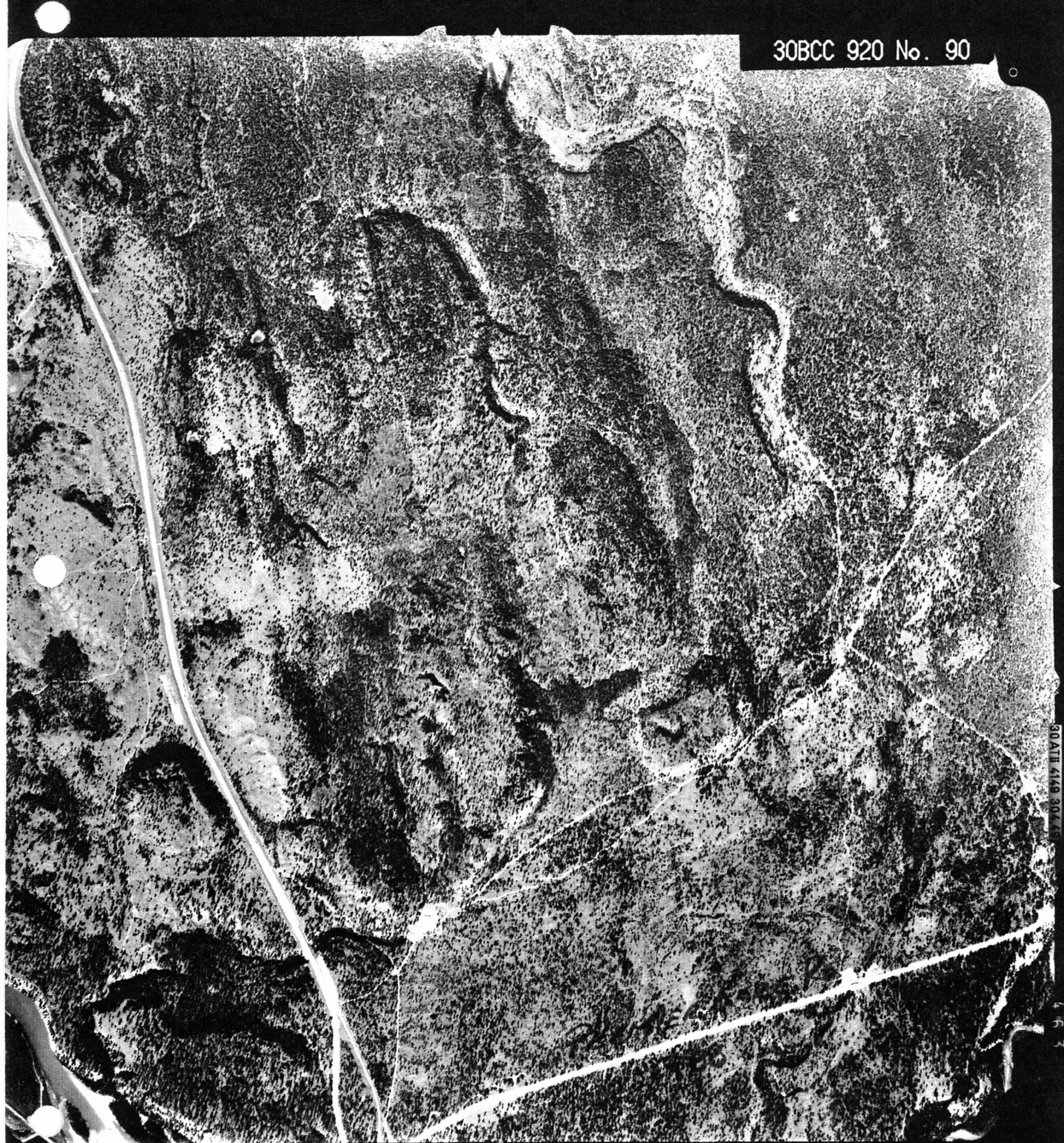

30BC 79 083
1948

PREMIER LAKE ROAD

1952 and 1988

Figure 3: Aerial photographic pairs of Premier Lake Road taken in 1952 and 1988.

30BCC 920 No. 90



2. LAND ALIENATIONS

Land alienation data from 1980 to 1989 provided by the B.C. Ministry of Crown Lands was reviewed. In this period, the large majority of East Kootenay Crown land alienations involved small areas of a few hectares or less, many of which did not impact the range resource. However, increased alienations for commercial recreational facilities have adversely impacted range and other resource values in the back country.

Two large scale alienations did reduce the amount of Crown range. These involved Crown lands alienated as compensation for private land lost to the Libby Dam (Lake Koocanusa) and the Cranbrook sewage effluent disposal area.

A more severe impact on the range resource has resulted from subdivision and development of already existing private land. Fencing and other developments on these lands have resulted in considerable losses of rangeland. Associated increases in population and activity levels have displaced livestock and wildlife from areas which they previously utilized. To mitigate these negative impacts, the subdivision approval process must fully take into account natural resource issues.

3. CLIMATE

As the majority of Crown range shared by livestock and wildlife is found within the Interior Douglas-fir biogeoclimatic zone, annual fluctuations in precipitation and temperature, particularly during the growing season, have a significant influence on forage production and use. The Cranbrook Airport, which is situated near the geographic centre of the East Kootenay, has been taken as representative of environmental conditions in area.

Weather information for the Cranbrook Airport* was obtained from the Atmospheric Environment Service and graphed in order to depict any apparent trends. As shown in figures 4, 5 and 6 there has been a change from the long-term average (1951 - 88):

Figure 4 average total precipitation is down for the period 1981 - 88 although the usual peak in June is much above average,

Figure 5 average total snowfall is down for the period 1981 -88. This is particularly pronounced in January,

Figure 6 average daily temperatures are somewhat higher for the period 1981 - 88, although they approach the long-term average for the months September through December.

No attempt has been made to determine whether these differences are statistically significant, or what their effect on the range resource was.

* Information for the period 1951 - 68 was from the old Cranbrook Airport in Cranbrook; information from 1968 onward is from the new airport site approximately 10 km north of and 21 m higher than Cranbrook. These differences are not considered to be significant.

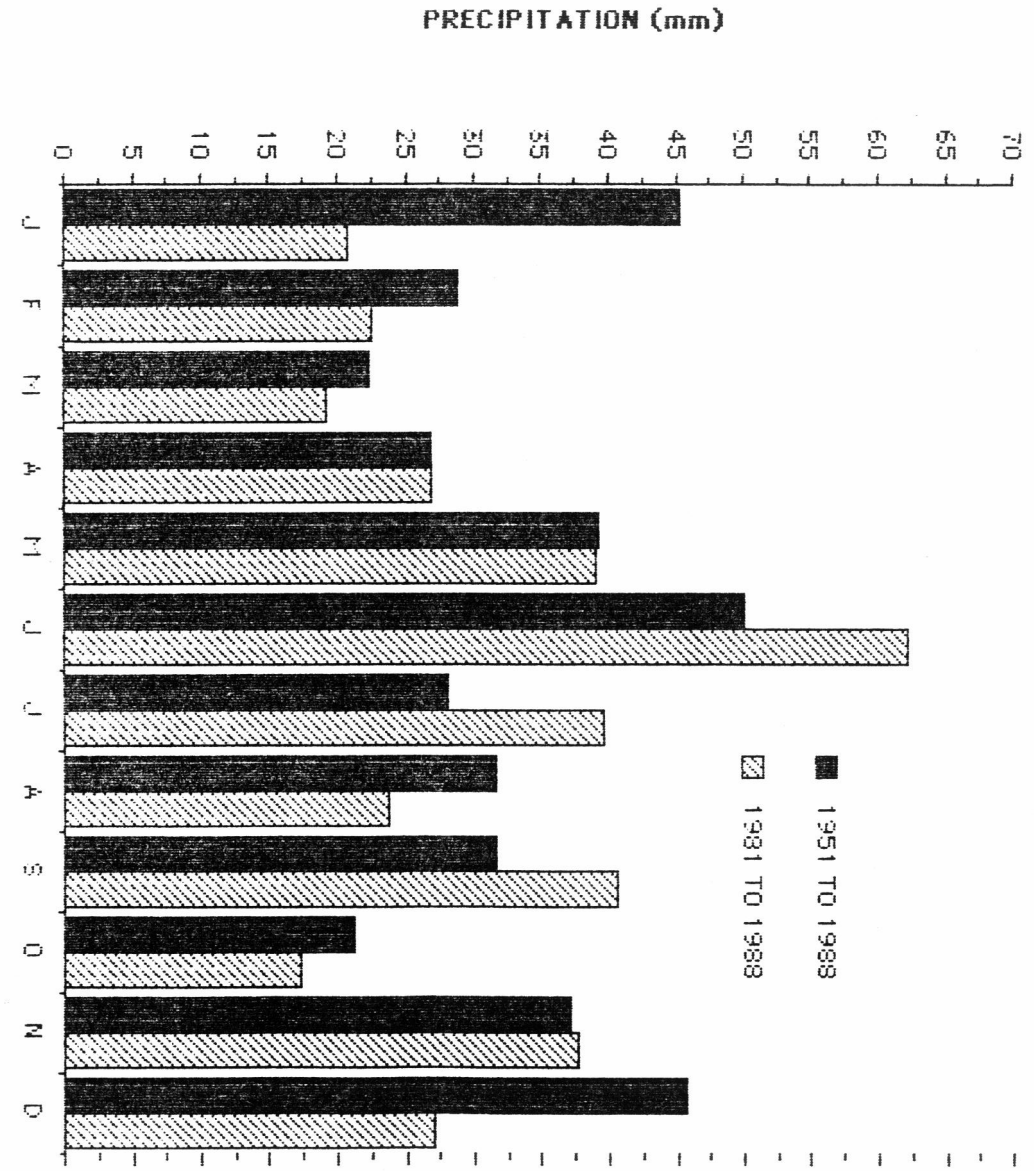

AVERAGE TOTAL PRECIPITATION by MONTH
Cranbrook Airport
PRECIPITATION (mm)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
J
F
M
A
M
J
J
A
S
O
N
D
MONTH
1951 TO 1988
1981 TO 1988

FIGURE 4

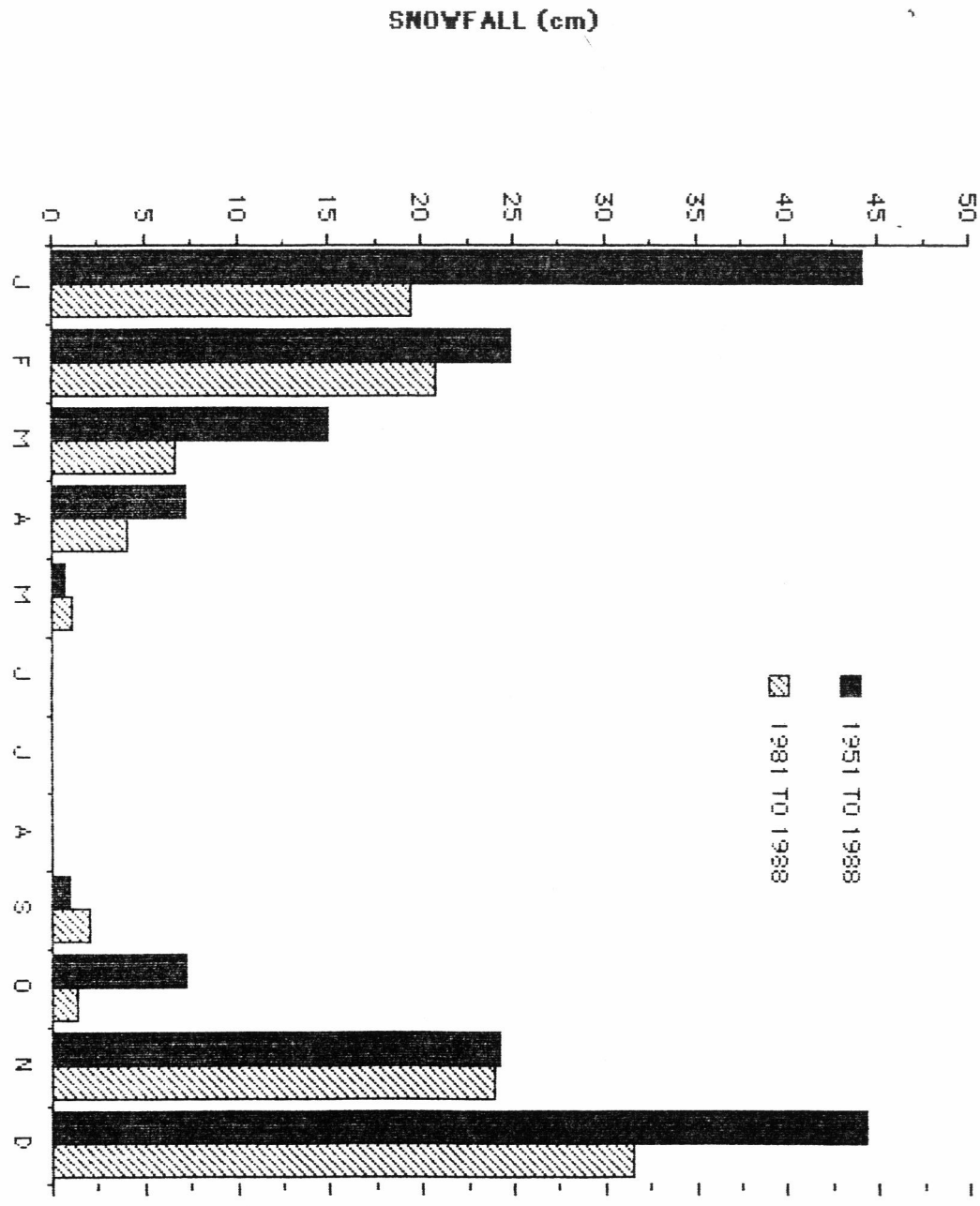

AVERAGE TOTAL SNOWFALL by MONTH
Cranbrook Airport
SNOWFALL (cm)
0
5
10
15
20
25
30
35
40
45
50
J
F
M
A
M
J
J
A
S
O
N
D
MONTH
1951 TO 1988
1981 TO 1988

FIGURE 5

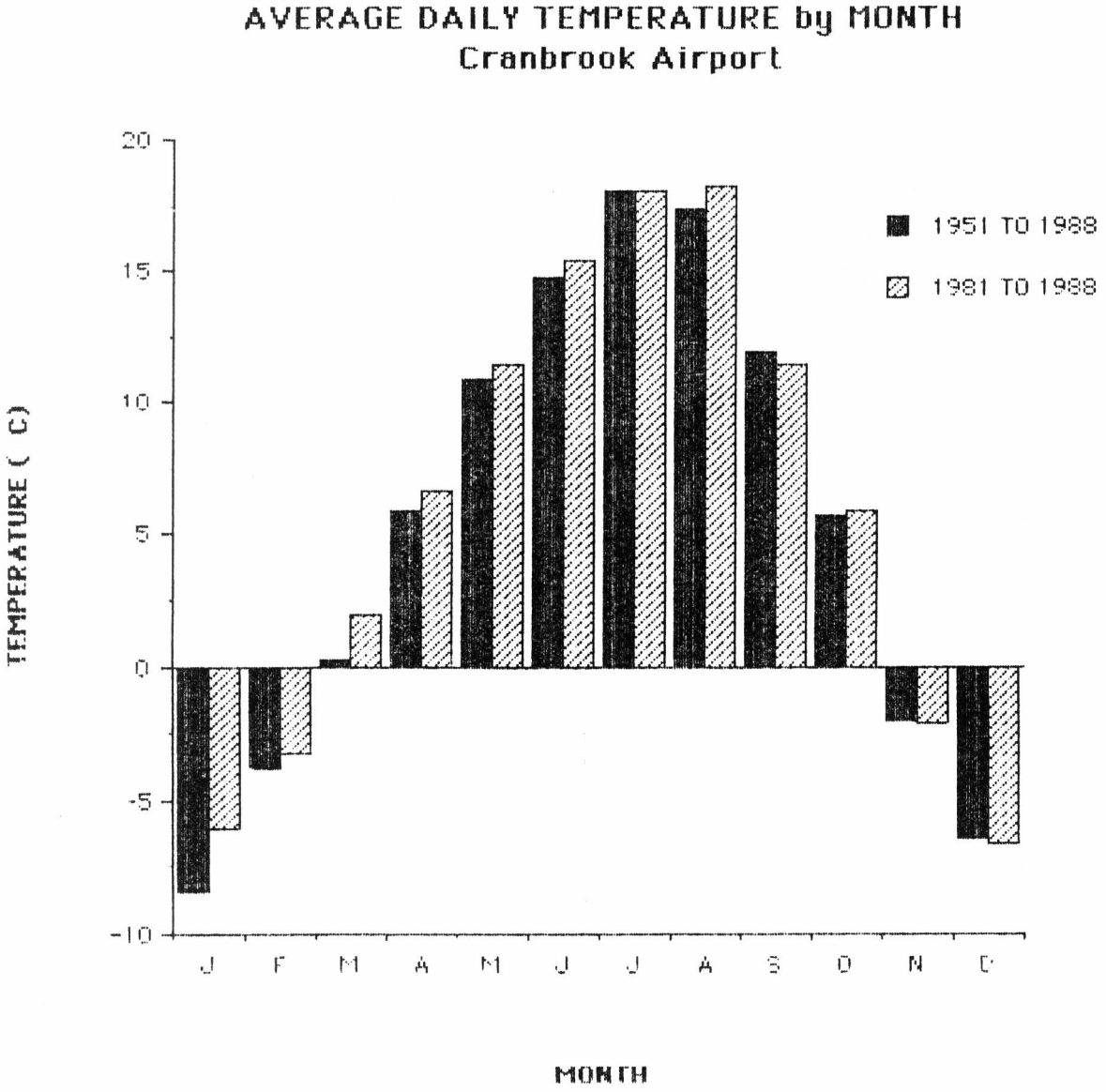

AVERAGE DAILY TEMPERATURE by MONTH
Cranbrook Airport
1951 TO 1988
1981 TO 1988
TEMPERATURE (C)
20
15
10
5
0
-5
-10
J
F
M
A
M
J
J
A
S
O
N
D
MONTH

FIGURE 6

4. LIVESTOCK NUMBERS

The following two tables provide a summary of livestock utilization on Crown range in 1975, '80, '85 and '89 for the Invermere and Cranbrook Forest Districts.

Table 1: SUMMARY OF LIVESTOCK UTILIZATION ON CROWN RANGE

Invermere Forest District 1975-1989

1989	Totals
AUM's	13,396
Animals	3,616
Permittees	38

1985	Totals
AUM's	13,328
Animals	3,623
Permittees	38

1980	Totals
AUM's	11,411
Animals	3,439
Permittees	39

1975	Totals
AUM's	13,632
Animals	3,975
Permittees	58

Notes:

1. AUM's and animal numbers include ranchers' cattle and horses and guide outfitters' horses.

2. The majority of the horses are located in the back country and belong to guide outfitters.

Table 2: SUMMARY OF LIVESTOCK UTILIZATION ON CROWN RANGE

Cranbrook Forest District 1975-1989

1989	Totals
AUM's	33,237
Animals	8,197
Permittees	116

1985	Totals
AUM's	30,565
Animals	7,911
Permittees	126

1980	Totals
AUM's	30,536
Animals	7,772
Permittees	140

1975	Totals
AUM's	34,212
Animals	8,463
Permittees	144

Notes:

1. Permittee and livestock numbers may be duplicated because some graze more than one Range Unit.

2. AUM's and animal numbers include ranchers' cattle and horses and guide outfitters' horses.

3. The majority of the horses are located in the back country and belong to guide outfitters.

5. LIVESTOCK WEIGHTS

Average cattle weights and forage requirements have increased during the past 20 years. To accurately determine the magnitude and effect of these increases would be very costly. The important question is the effect of today's cattle on Crown range. To properly answer this question, it should be included in the proposed East Kootenay Forage Use Study.

6. FARMLAND DEVELOPMENT

Several key indicators were selected from Statistics Canada's 1961, 1971, 1981 and 1986 censuses to determine trends in agricultural development, primarily cattle ranching on private lands in the East Kootenay (Table 3). All key indicators were either stable or increased during the periods 1961 to 1971 and 1971 to 1981 despite the removal of the Golden District from the East Kootenay census in 1971. For example, the number of farms and the amount of improved (cleared/cultivated) land remained relatively stable while the amount of irrigated cropland doubled between 1961 and 1981. The statistics indicated improvement in both the quantity and quality of forage crop and beef production on private land. For example, cow numbers increased by 50 percent while calf numbers doubled between 1961 and 1981. Between 1981 and 1986 the indicators reveal slight declines or a levelling off of production of both forage and cattle.

Table 3: B.C. Census of Agriculture in the East Kootenay 1961 to 1986 (Source: Statistics Canada, Agriculture Division, Ottawa, Ontario)

	1961	1971	1981	1986
Number of farms	397	342	402	387
Land area (ac) total	10,229,760	7,004,160	7,004,160	7,004,160
Farmland area	159,229	190,408	155,887	183,567
Improved land-total	40,524	34,802	49,019	40,833
Improved land-crops	19,273	23,364	25,954	24,718
Irrigated land	8,804	12,349	17,701	17,294
Number of cattle-total	16,538	25,145	28,100	25,975
Cows	7,679	11,666	11,810	11,637
Calves	5,334	8,834	10,519	10,506
Heifers	2,030	2,736	3,355	2,064
Bulls	367	591	763	669
Steers	1,128	1,309	1,653	1,099

7. WILD UNGULATES

The wildlife section of this report is in keeping with the primary goals stated in the introduction. To achieve that objective, several facets of the wildlife management program and techniques will be briefly described. Much of the conflict revolves around elk and subsequently the most emphasis will be placed on that species. However, the Ministeries have agreed that the species involved in the wildlife-agriculture conflict, and in determining a forage allocation policy will be elk, mule deer, whitetail deer and bighorn sheep.

A. Process for Determining Populations

Much of the mistrust and many of the misconceptions are due to a lack of understanding of how wildlife population numbers are estimated. The following briefly describes the process. Figure 7 diagramatically outlines the various information inputs to determine the population for any given species. The population estimates in this report are the same as those used in establishing the annual hunting regulations.

1. Population Inventory

Population inventory consists of annual classification surveys conducted by jet helicopter during February and March. The objectives of these surveys are to obtain bull: cow:calf ratios and detailed age composition of bulls, based on antler characteristics. Flight routes are designed to cover open or semi-open winter ranges where animals are most visible and concentrated. It is well known that these areas are frequently used by yearling bull:cow:calf groups with mature bulls occupying more remote high elevation areas. Although the annual surveys probably provide unbiased calf:cow ratios, the differential distribution of bulls and cows suggests that bull:cow ratios are not representative (see also Peek and Lovaas, 1968). Without information on animal numbers, it is not possible to sample population ratios in an unbiased manner.

2. Harvest Inventory

Harvest estimates are based on the hunter sample, and limited entry for cows and calves. Harvest age structure is provided by voluntary tooth returns through the Harvest Card Tooth Return Program. These samples are adequate to estimate the mean age of the harvest to within $\pm$ 10% with 90% confidence limits (Hatter and Thornton, 1986). Hunter bias in submitting teeth for different sex and age classes is not known. The bull age structure, however, is suggestive of a stable age distribution which implies no major biases are

present for bulls 2.5 years of age or older. The cow age structure is not stable, but it is unlikely that hunters are selective in harvesting cows. Hunter effort and success data, measured in terms of catch per unit effort, are available but of limited use due to changing regulations which may influence kill/hunter day (eg. antler point restrictions, increases in calf and cow permits).

3. Present Method of Estimating Population Size

Animal numbers are estimated from population and harvest inventory data through simulation modeling. This method requires several years of data to align simulated and observed population parameters (calf:cow ratio, bull:cow ratio, mean age of bull harvest, mean age of cow harvest).

Presently, there are no standard statistical procedures for measuring the reliability of population estimates from simulation models. However, model precision can be evaluated by the strength of the correlation coefficiency between the observed and simulated population parameters (Williams 1977). Accuracy can be evaluated in an intuitive manner by examining the mathematical impossibility of certain reported data combinations. The East Kootenay model is shown in Figure 7.

REFERENCES FOR POPULATION INVENTORY

Hatter, I. and J. Thornton. 1986. The Provincial Tooth Return Program - An Evaluation. Unpub. Rep., Wildlife Branch, B.C. Ministry of Environment, Victoria. 20 pp.

Peek, J.M. and A.L. Lovaas. 1968. Differential distribution of elk by sex and age on the Gallatin winter range, Montana. J. Wildl. Manage. 32:553-557.

Williams, G.L. 1977. Simulation modeling of big game at Wichita Mountains Wildlife Refuge. Phd. Thesis. Colorada State Univ., Fort Collins, Colorado. 242 pp.

DIAGRAMATIC SUMMARY OF POPULATION CALCULATION

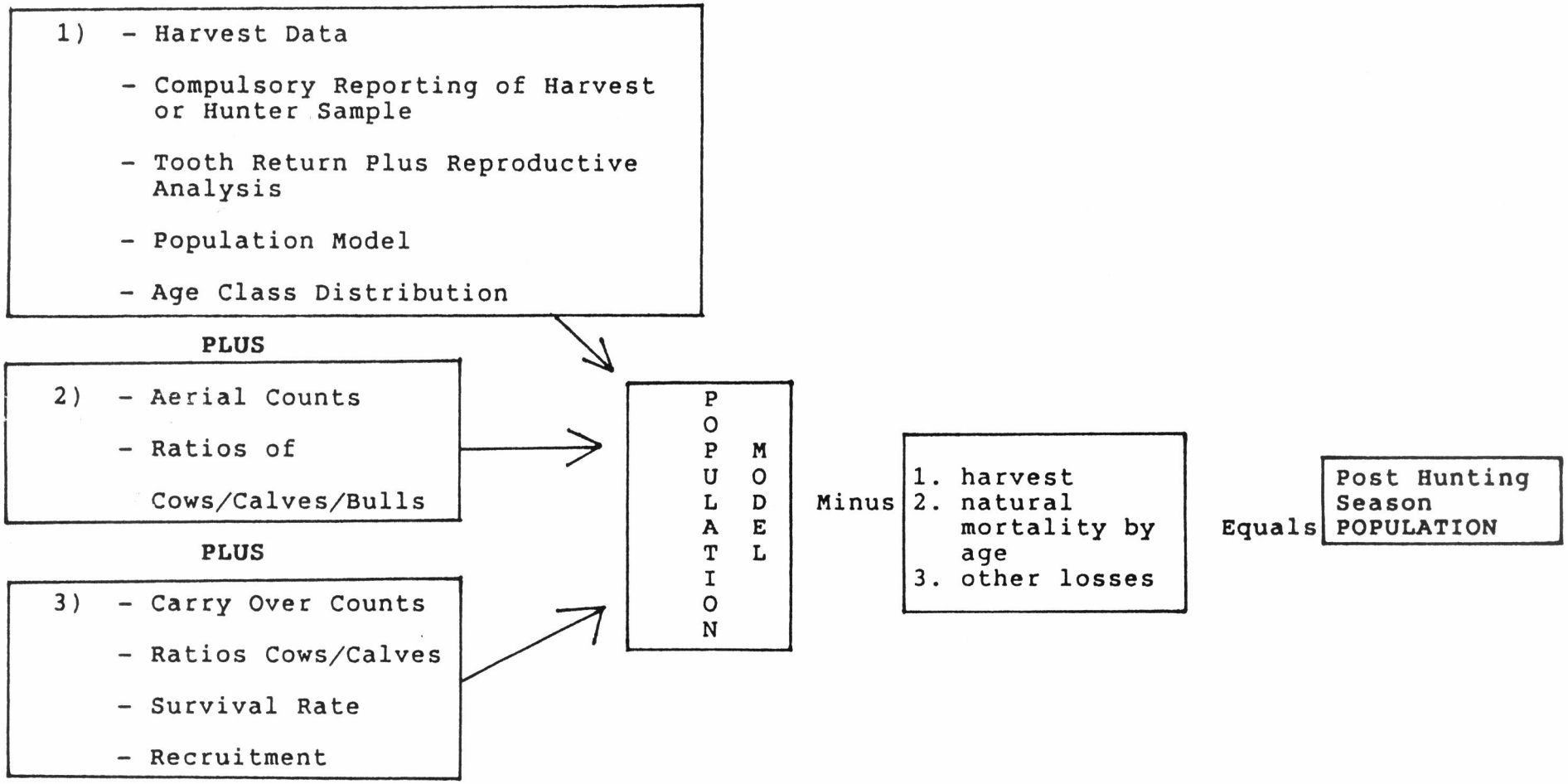
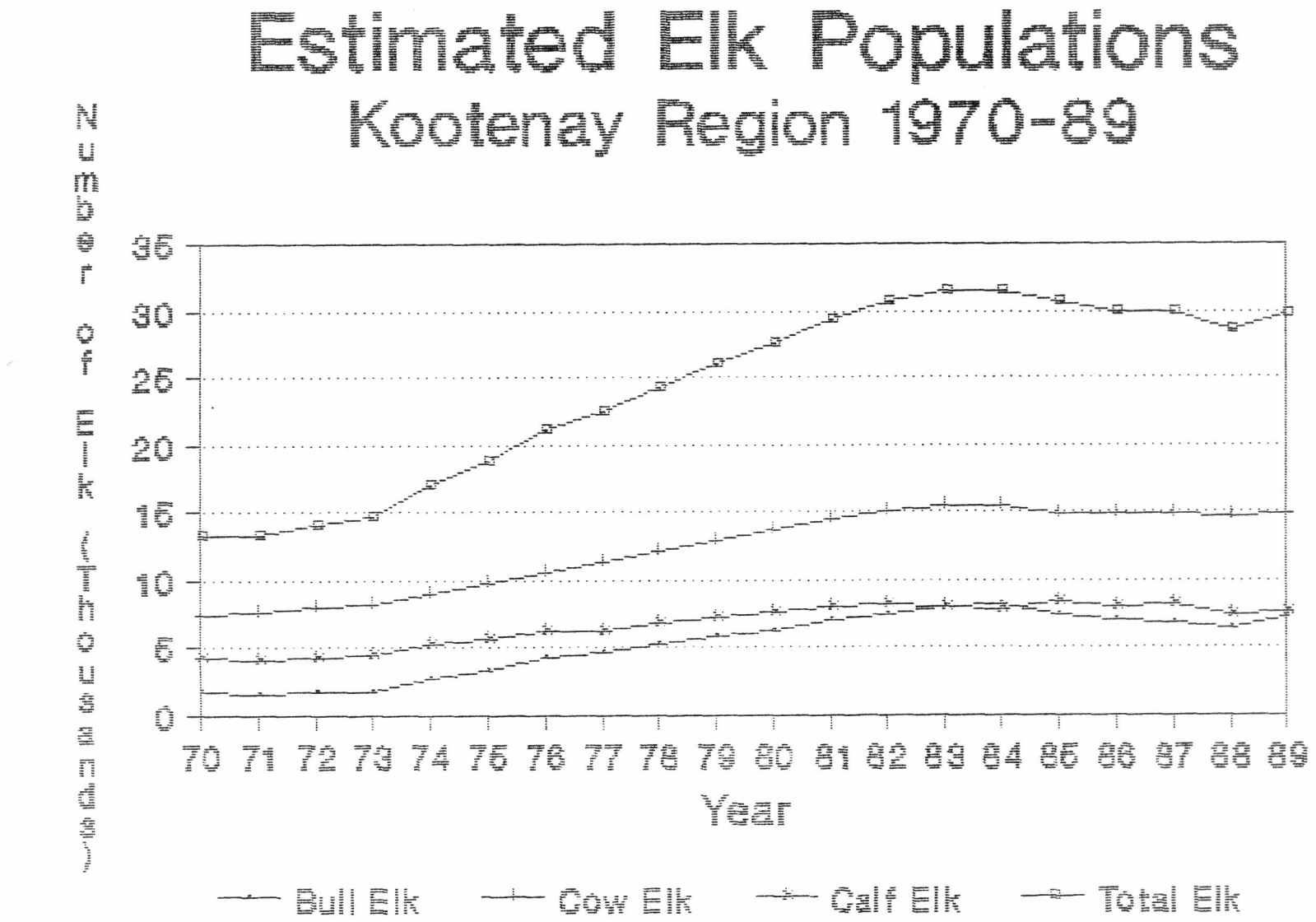


FIGURE 7

B. Distribution of Regional Wildlife Populations

Rocky Mountain elk are distributed throughout the Kootenay Region although the densities vary considerably. The Ministeries have agreed that in order to resolve some of the conflict and for purposes of management planning, the populations should be defined by geographical areas and in constant terms. All population data presented in this report are for **post hunting season**; that is, the number of animals that require winter forage. The second requirement in arriving at a forage allocation policy, and for management purposes is to further break down the population by geographical area to show where overlaps occur.

Figure 8 shows the total Kootenay Region elk populations from 1970 to 1989, by age class and sex. Figure 9 identifies the geographical distribution of the Regional elk population, and the map in Figure 10 depicts the overlap or conflict area. Table 4 shows the population numbers for the four species by Forest District. These population estimates are further broken down to the overlap areas. This data, presented by range units, is provided in Appendix 4.



Post-Season

FIGURE 8

DISTRIBUTION OF KOOTENAY REGION POST SEASON ELK POPULATION (1986 - 1990)

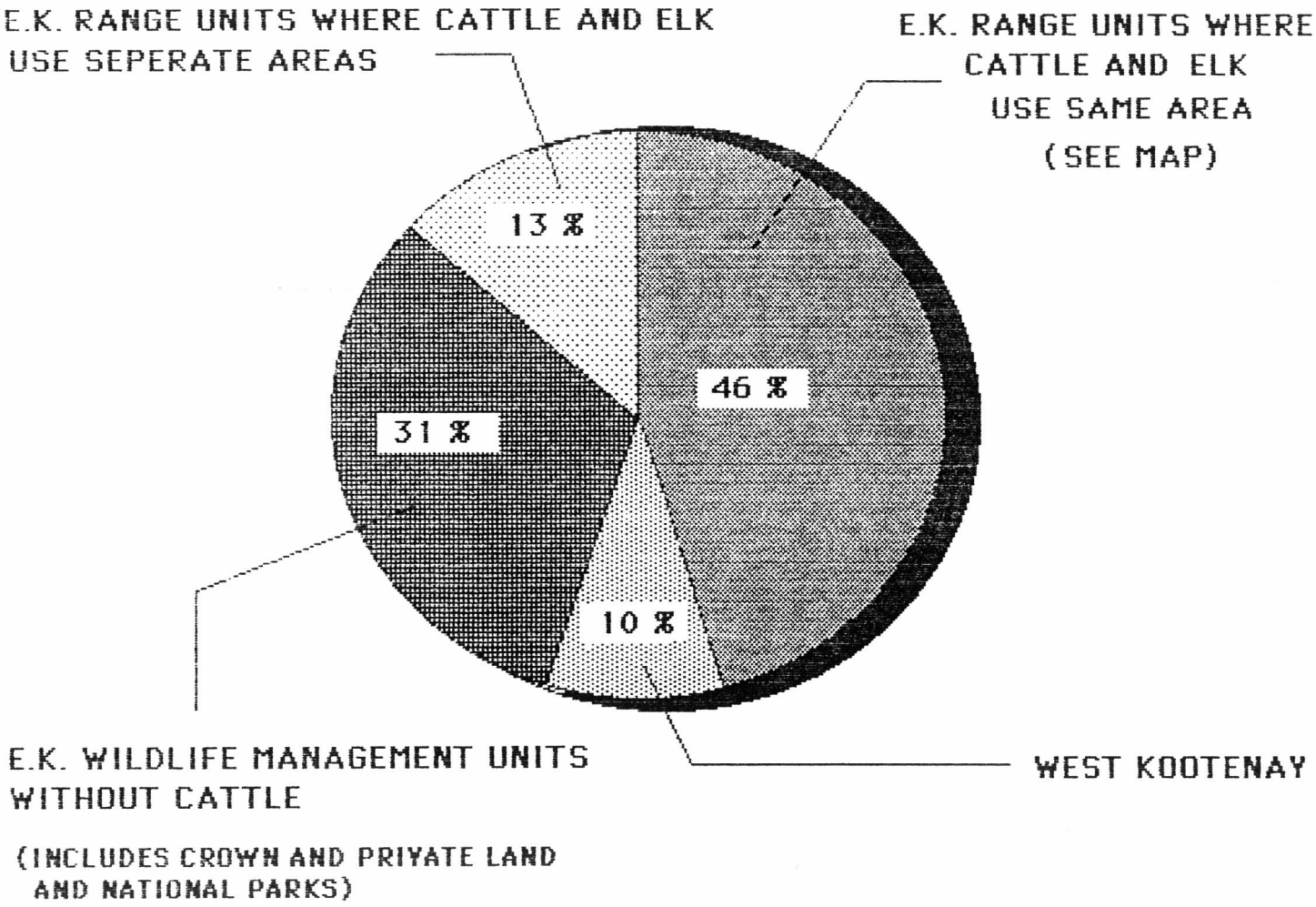


FIGURE 9

EAST KOOTENAY RANGE UNITS WHERE CATTLE AND ELK USE SAME AREAS

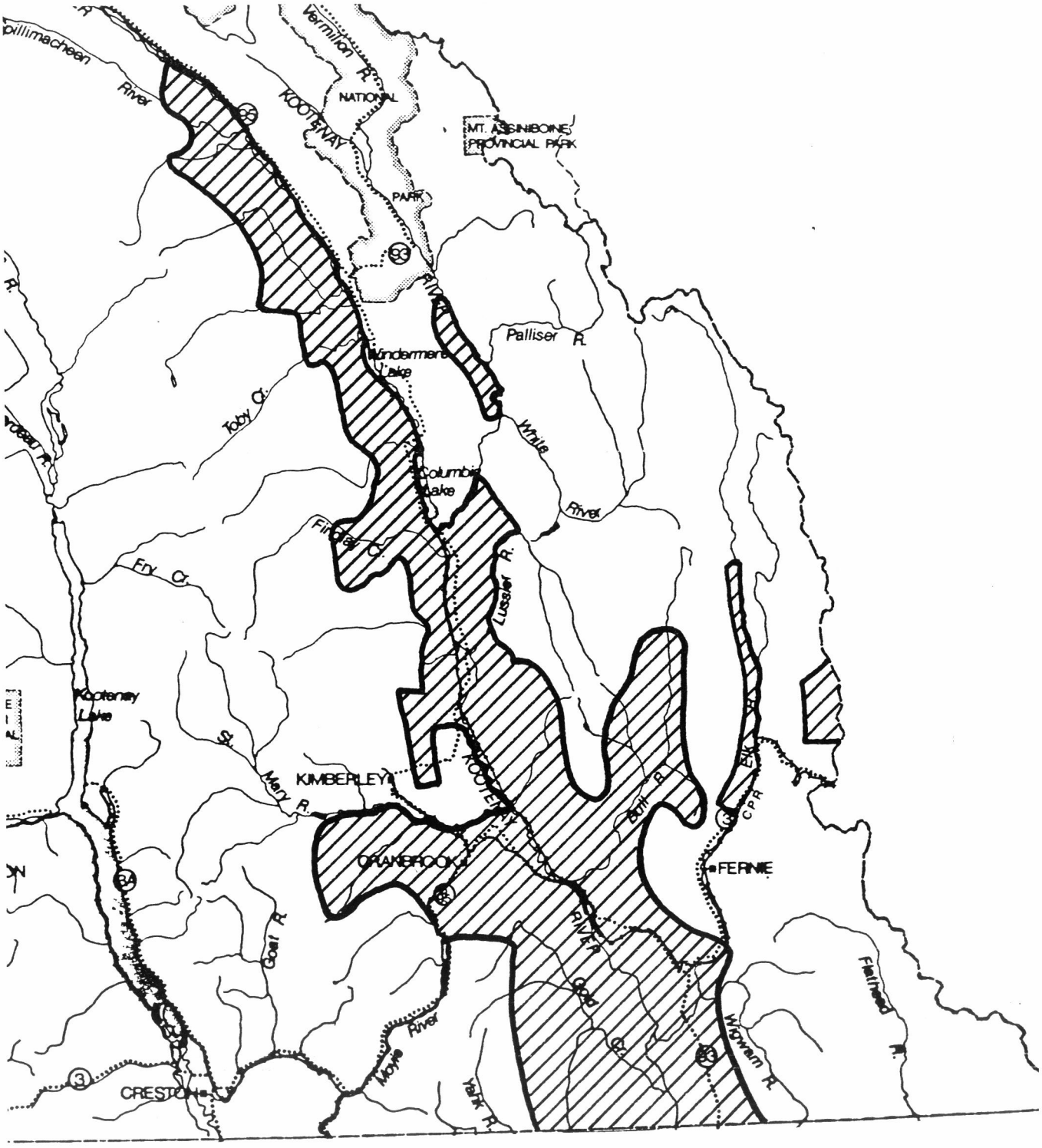


FIGURE 10

Table 4

East Kootenay Post Season Wild Ungulate Populations

ESTIMATES BY FOREST DISTRICT 1975, 1980, 1985 and 1989

YEAR	ROCKY MTN. ELK			MULE DEER		
	CBK.	INV.	GDN.	CBK.	INV.	GDN.
1975	10066	7248	486	6400	3248	352
1980	14760	10628	712	8205	4164	451
1985	16258	11707	785	12160	6171	669
1989	15127	10893	730	14707	7464	809

YEAR	WHITETAIL DEER			BIGHORN SHEEP		
	CBK.	INV.	GDN.	CBK.	INV.	GDN.
1975	6103	3801	96	1100	800	0
1980	7830	4877	123	1450	900	0
1985	9917	6177	156	1250	850	0
1989	11443	7127	180	1400	875	0

CBK = Cranbrook Forest District
INV = Invermere Forest District
GDN = Golden Forest District

C. Elk Harvest and Hunter Activity

Figure 11 shows the elk harvest, by sex and age class from 1970 to 1989. As the elk populations increased so did harvests via more liberal opportunities, and more limited entry hunting authorizations for harvesting cows and calves. During the 1980's annual harvests were double or more the annual harvests during the 1970's. A significant component of the harvest has been calf elk, thereby controlling recruitment into the population.

Figure 12 shows the amount of hunting activity in hunter days from 1976 to 1988. The increased activity, (not demand) is a direct result of more liberal opportunities. This data is presented to show the comparison between population, harvest and hunter activity.

D. Comparability and Wildlife Food Habits

The dietary overlap figures presented here are average and on an annual basis. Variations would occur, especially during transition periods in April-May and prehaps in some localities during late fall.

To establish a common basis for comparability the Ministries have agreed that one domestic cow-calf unit is equivalent to three elk or five mule deer, or five whitetail deer or six bighorn sheep. The accuracy of these ratios must be determined by the proposed East Kootenay Forage Use Study. Within the overlap area the average use of the winter range is for a five month period except for whitetail deer which are more valley oriented. A large percentage of whitetail deer use the overlap area year round.

Dietary overlap for all the species is not a direct one to one ratio. Food habit studies in the Kootenays and other locations in the Pacific Northwest indicate that where the area of overlap (area used by cattle and wildlife) is 100% the dietary overlap (use of the same forage species) is approximately:

for elk 80%
for sheep 80%
for mule deer 30%
for whitetail deer 20%

It is strongly recommended that research be done on dietary preferences of wildlife and cattle. This research should be specific to the East Kootenay, cover the necessary time frames, and provide the data needed to make rational forage allocation decisions.

Kootenay Elk Harvest
1970-89
Number of Animals Harvested
0
1000
2000
3000
4000
5000
Years
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89
Bulls
Cows
Calves

FIGURE 11

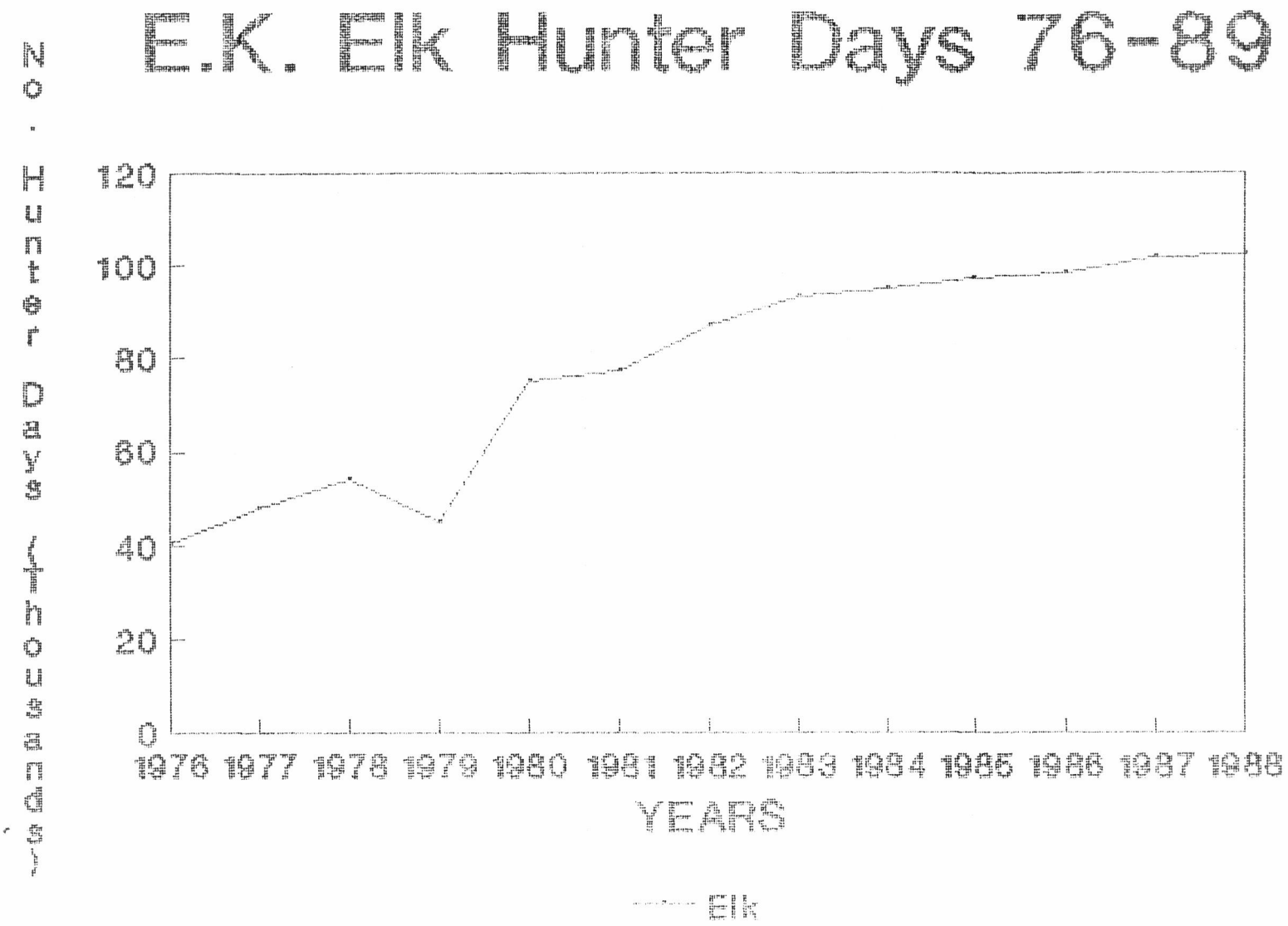

E.K. Elk Hunter Days 76-89
No. Hunter Days (thousands)
120
100
80
60
40
20
0
1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
YEARS
Elk

FIGURE 12

E. Other Wildlife

Due to dietary preference, small populations, or lack of overlap in use areas, it was agreed that other wildlife species, specifically mountain goats, moose, bears, and caribou would not be included in this report or be of issue for forage allocation.

Other wildlife species dependent on grass-seral shrub ranges, such as ground nesting birds, waterfowl, badgers, etc. must be accommodated in range management and forage allocation. This will be accommodated not by population numbers but by range condition and habitat requirements.

RECOMMENDATIONS

This analysis has examined the past and current state of the East Kootenay range resource. After the introduction of Coordinated Resource Management Plans (CRMP's) in the mid 1970's, range condition improved substantially because of fencing, other range improvements, and the initiation of controlled grazing systems.

On many Range Units this improvement has reached a plateau and, in some cases, begun to decline. There is now a clear question facing East Kootenay resource managers: now that structural range improvements and controlled grazing systems are in place, will the next steps be taken to develop the forage allocation system and vegetation management strategy needed to ensure the range can be managed in a productive and sustainable manner? If this is to be done, the following steps must be taken:

1. Formal approval of the Trench Integrated Renewable Resource Management Plan (TIRRMP) by the Ministries of Forests and Environment. The TIRRMP provides the overall land use plan required to focus vegetation management activities.

2. Completion of the proposed East Kootenay Forage Use Study. This study is vitally needed to determine the overlap in habitat and food requirements of livestock and wildlife species. Without this information, a rational forage allocation will not be possible.

3. Determination of critical wildlife areas on a species basis and pasture basis.

4. Determination of each Range Unit's carrying capacity.

5. Using the results of the East Kootenay Forage Use Study, determine forage allocation for: cattle, horses, elk, whitetail deer, mule deer and bighorn sheep. These numbers should be determined for the entire East Kootenay, each Forest District, each Wildlife Management Unit and each Range Unit.

6. Determination and implementation of a vegetation management strategy to manage the range in a productive and sustainable manner. This should be carried out on Range Units used exclusively by wildlife as well as those shared by livestock and wildlife.

7. Agreement on a monitoring system to evaluate forage and shrub utilization by livestock and wildlife.

8. The Ministry of Forests and the Ministry of Environment review with the Ministry of Transportation and Highways the subdivision approval process so it effectively takes into account natural resource issues.

9. The Ministry of Crown Lands must fully take into account the impacts of land alienations on range and wildlife resources and their associated industries such as ranching, hunting, guiding and tourism.

10. At present, there are several different interpretations of Section 4 of the Ministry of Forests Act. The Act should be clarified to affirm the Forest Ministry's requirement to provide wildlife forage and habitat.

CONCLUSION

It is imperative that a workable forage allocation policy and vegetation management strategy be agreed upon. Failure to do so will result in increasing conflict and deterioration of the range resource, consequences which neither the Ministry of Forests nor the Ministry of Environment can condone.

APPENDICES

1. Livestock numbers by range unit - Invermere Forest District
2. Livestock numbers by range unit - Cranbrook Forest District
3. Wildlife numbers by range unit - Invermere Forest District
4. Wildlife numbers by range unit - Cranbrook Forest District

APPENDIX 1

LIVESTOCK NUMBERS BY RANGE UNIT - INVERMERE FOREST DISTRICT

1975, 1980, 1985, 1989

RANGE UNIT	CATEGORY	DOMESTIC LIVESTOCK 1975	1980	1985	1989
Spillimacheen North	AUM's	210	273	d) 150	387
	Animals	60	78	40	103
	Permittees	2	2	1	2
Bugaboo - Spillimacheen	AUM's	75	126	126	189
	Animals	25	28	28	42
	Permittees	1	1	1	1
Bryanton Creek	AUM's	135	135	75	e) 0
	Animals	30	30	30	0
	Permittees	1	1	1	0
Sunny Bench - Fish Lakes	AUM's	496	d)270	609	808
	Animals	90	60	116	154
	Permittees	1	1	1	1
Steamboat	AUM's	385	275	177	319
	Animals	70	48	9	62
	Permittees	3	2	1	1
Frances Creek	AUM's	1911	1331	1763	1908
	Animals	446	280	333	373
	Permittees	4	3	2	2
Forster - Horsethief	AUM's	378	641	529	511
	Animals	a)172	106	133	155
	Permittees	1	1	1	1

LIVESTOCK NUMBERS BY RANGE UNIT - INVERMERE FOREST DISTRICT

1975, 1980, 1985, 1989

RANGE UNIT	CATEGORY	DOMESTIC LIVESTOCK 1975	1980	1985	1989
Toby - Horsethief	AUM's	1707	1264	1297	1373
	Animals	296	228	250	286
	Permittees	6	3	3	4
Luxor	AUM's	113	56	97	147
	Animals	25	22	26	30
	Permitttees	1	1	1	b) 0
Westside	AUM's	145	256	451	494
	Animals	c)543	c)513	c)706	c)678
	Permittees	9	7	8	8
Dutch - Findlay	AUM's	859	901	907	912
	Animals	250	350	259	260
	Permittees	1	1	1	1
Findlay Basin	AUM's	1464	1338	1339	1339
	Animals	650	330	315	315
	Permittees	2	1	1	1
Torrent	AUM's	126	540	536	596
	Animals	59	108	108	114
	Permittees	1	1	b) 0	b) 0
Ta Ta - Skookumchuck	AUM's	1264	d)785	1393	e) 0
	Animals	275	157	309	0
	Permittees	4	1	1	0

LIVESTOCK NUMBERS BY RANGE UNIT - INVERMERE FOREST DISTRICT

1975, 1980, 1985, 1989

RANGE UNIT	CATEGORY	DOMESTIC LIVESTOCK 1975	1980	1985	1989
Camp 6 North	AUM's	400	400	481	495
	Animals	100	200	120	124
	Permittees	1	1	1	1
Watson	AUM's	428	617	900	1000
	Animals	138	140	200	200
	Permittees	1	1	1	1
Sheep Creek North	AUM's	1682	d)742	d)983	1187
	Animals	347	171	253	326
	Permittees	4	1	2	2
Wolf - Sheep Creek	AUM's	352	619	439	500
	Animals	68	320	188	96
	Permittees	1	1	1	1
Windermere - Fairmont	AUM's	310	80	e) 0	160
	Animals	100	80	0	40
	Permittees	b) 0	b) 0	0	b) 0
Guides' Territories & Sloughlands	AUM's	1192	762	1076	1071
	Animals	231	190	200	258
	Permittees	14	9	10	11
DISTRICT TOTALS	**Animals**	**3975**	**3439**	**3623**	**3616**
	Permittees	**58**	**39**	**38**	**38**
	AUM's utilized	**13632**	**11411**	**13328**	**13396**
	Authorized Non-Use	**0**	**900**	**200**	**1475**
	TOTAL	**13632**	**12311**	**13528**	**14871**

Notes:

a) A large portion of the AUM's are on private land.

b) Counted as zero so the same permittee is not counted twice.

c) The majority of the AUM's are on private land.

d) Partial authorized non-use.

e) Total authorized non-use.

SUMMARY OF CATTLE AND HORSES ON CROWN RANGE

INVERMERE FOREST DISTRICT

1989	Cattle	Horses	Totals
AUM's	11,969	1,427	13,396
Animals	3,269	347	3,616
Permittees	25	13	38

1985	Cattle	Horses	Totals
AUM's	12,030	1,298	13,328
Animals	3,373	250	3,623
Permittees	25	13	38

1980	Cattle	Horses	Totals
AUM's	10,443	968	11,411
Animals	3,222	217	3,439
Permittees	28	11	39

1975	Cattle	Horses	Totals
AUM's	12,097	1,535	13,632
Animals	3,695	280	3,975
Permittees	42	16	58

NOTE:

1. The majority of the horses are guide outfitters' in the back country.

APPENDIX 2

LIVESTOCK NUMBERS - CRANBROOK FOREST DISTRICT (May 1990)

RANGE UNIT	CATEGORY	1975	1980	1985	1989
Alexander Creek	AUM's	350	280	287	294
	Animals	100	80	82	84
	Permittees	2	2	2	2
Alkali Lakes	AUM's	60	132	46	164
	Animals	60	203	203	205
	Permittees	1	1	1	1
Upper Joseph	AUM's	530	240	336	200
	Animals	160	225	225	205
	Permittees	4	2	2	1
Baker	AUM's	518	395	667	671
	Animals	142	95	145	138
	Permittees	2	2	2	2
Bull River	AUM's	1009	1049	971	1182
	Animals	275	278	338	385
	Permittees	5	5	6	7
Burton Lake	AUM's	287	425	363	383
	Animals	102	98	103	109
	Permittees	1	1	1	1
Upper Sand	AUM's	306	180	261	244
	Animals	102	92	103	109
	Permittees	1	1	1	1
Cherry-TaTa	AUM's	3031	2925	1776	2507
	Animals	644	585	367	547
	Permittees	6	4	3	4
Chipka-Rocky	AUM's	1076	318	342	290
	Animals	167	99	99	86
	Permittees	3	2	2	1
Colvalli	AUM's	1033	788	847	847
	Animals	199	160	166	166
	Permittees	3	3	3	3

RANGE UNIT	CATEGORY	1975	1980	1985	1989
Cranbrook-Ft. Steele	AUM's	1747	1348	1458	1431
	Animals	429	304	391	485
	Permittees	2	3	3	3
Flathead	AUM's	135	84	62	0
	Animals	36	26	26	0
	Permittees	3	2	2	0
Gold Creek/ Plumbob	AUM's	3522	3537	4392	4320
	Animals	712	746	735	731
	Permittees	10	10	8	7
Grasmere	AUM's	3749	2491	2825	3935
	Animals	752	482	757	766
	Permittees	12	12	12	12
Ha Ha Creek	AUM's	228	251	59	62
	Animals	78	67	21	21
	Permittees	2	3	2	2
Lewis/Wolf	AUM's	800	458	0	500
	Animals	198	125	0	100
	Permittees	4	3	0	1
Newgate	AUM's	1088	590	927	805
	Animals	283	106	140	153
	Permittees	5	3	3	3
Patton's Lake	AUM's	374	0	0	0
	Animals	269	0	0	0
	Permittees	2	0	0	0
Peavine/Pulp	AUM's	462	222	525	522
	Animals	155	139	175	155
	Permittees	4	3	3	2
Peckham's Lake	AUM's	1831	1760	1807	1818
	Animals	547	561	590	496
	Permittees	6	6	6	6
Perry/Booth	AUM's	1122	992	366	296
	Animals	301	228	86	84
	Permittees	2	2	2	2

RANGE UNIT	CATEGORY	1975	1980	1985	1989
Pickering Hills	AUM's	2138	2222	2415	2430
	Animals	493	458	559	549
	Permittees	7	7	7	7
Power Plant	AUM's	461	480	493	418
	Animals	125	130	131	103
	Permittees	3	3	3	3
Rampart	AUM's	781	1021	1045	1053
	Animals	158	197	209	200
	Permittees	3	4	4	4
Rosen Lake	AUM's	174	171	174	257
	Animals	61	57	47	68
	Permittees	3	3	3	3
Spruce/Olsen	AUM's	417	313	327	355
	Animals	119	89	93	106
	Permittees	3	3	3	4
St. Mary's Prairie	AUM's	1762	2075	1608	1540
	Animals	420	504	520	388
	Permittees	8	8	6	4
Tokay Hills	AUM's	417	672	650	516
	Animals	150	141	144	106
	Permittees	4	4	4	4
Tokay Reforestation	AUM's	28	138	135	135
	Animals	28	138	135	135
	Permittees	1	1	1	1
Upper Elk	AUM's	53	90	41	118
	Animals	12	16	15	25
	Permittees	1	1	1	1
Waldo	AUM's	2802	3189	3316	4214
	Animals	642	649	696	874
	Permittees	15	15	13	10
Wigwam	AUM's	45	171	137	178
	Animals	12	28	24	36
	Permittees	1	2	2	2

RANGE UNIT	CATEGORY	1975	1980	1985	1989
Wildhorse/	AUM's	1014	420	1120	908
Lewis	Animals	249	120	300	320
	Permittees	2	1	1	1
Miscellaneous	AUM's	862	1109	787	644
Cranbrook/Fernie	Animals	283	546	286	262
	Permittees	13	18	14	11
TOTALS FOR					
CRANBROOK	**Animals**	**8463**	**7772**	**7911**	**8197**
DISTRICT	**Permittees**	**144**	**140**	**126**	**116**
	AUM's Utilized	**34212**	**30536**	**30565**	**33237**
	Authorized				
	Non-Use	**0**	**0**	**1016**	**1195**
	TOTAL AUTHORIZED	**34212**	**30536**	**31581**	**34432**

Notes:

1. Permittee and Livestock numbers may be duplicated because some graze more than one Range Unit.

2. AUM's and animal numbers include ranchers' cattle and horses and guide outfitters' horses.

3. The majority of the horses are guide outfitters' in the back country

APPENDIX 3

POST SEASON EAST KOOTENAY ELK POPULATION

BY RANGE UNIT. INVERMERE FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-20	Ta Ta-Skookumchuck	1344	1480	1377
4-21	Torrent	576	634	590
	Wolf - Sheep	671	740	688
	Sheep N.	671	740	688
4-24	Watson	483	532	495
4-25	Camp 6 North	247	272	253
4-26	Findlay Basin	156	172	160
	Dutch - Findlay	1402	1545	1437
	Westside	779	858	799
	Toby Horsethief	467	515	479
	Forster - Horsethief	156	172	160
4-34	Columbia Slough	84	93	86
	Francis Creek	126	140	129
	Sunny Bench-Fish Lakes	84	93	86
	Steamboat & Bryanton	126	140	129
	Bugaboo S.	42	46	44
	Spillimacheen N.	126	140	129
	TOTAL	7540	8312	7729
	All other lands	3088	3395	3164
	TOTAL ELK	10628	11707	10893

APPENDIX 3

POST SEASON EAST KOOTENAY WHITETAILED DEER POPULATION

BY RANGE UNIT. INVERMERE FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-20	Ta Ta-Skookumchuck	508	644	742
4-21	Torrent	127	161	186
	Wolf - Sheep	823	1043	1203
	Sheep N.	309	391	451
4-24	Watson	447	567	652
4-25	Camp 6 North	N E G L I G I B L E		
4-26	Findlay Basin	N E G L I G I B L E		
	Dutch - Findlay	288	365	421
	Westside	384	486	561
	Toby Horsethief	192	243	281
	Forster - Horsethief	166	211	243
4-34	Columbia Slough	30	37	43
	Francis Creek	118	150	173
	Sunny Bench-Fish Lakes	59	75	86
	Steamboat & Bryanton	118	150	173
	Bugaboo S.	30	37	43
	Spillimacheen N.	89	112	130
	TOTAL	3688	4672	5388
	All other land	1189	1505	1739
	TOTAL WHITETAILED DEER	4877	6177	7127

APPENDIX 3

POST SEASON EAST KOOTENAY MULE DEER POPULATION

BY RANGE UNIT. INVERMERE FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-20	Ta Ta-Skookumchuck	214	317	383
4-21	Torrent	128	190	230
	Wolf - Sheep	628	931	1126
	Sheep N.	188	279	338
4-24	Watson	139	206	250
4-25	Camp 6 North	N E G L I G I B L E		
4-26	Findlay Basin	54	80	97
	Dutch - Findlay	379	562	680
	Westside	379	562	680
	Toby Horsethief	162	241	291
	Forster - Horsethief	158	235	285
4-34	Columbia Slough	35	52	63
	Francis Creek	175	259	313
	Sunny Bench-Fish Lakes	70	104	125
	Steamboat & Bryanton	140	207	250
	Bugaboo S.	35	52	63
	Spillimacheen North	105	155	188
	TOTAL	2989	4432	5362
	All other lands	1175	1739	2102
	TOTAL MULE DEER	4164	6171	7464

APPENDIX 3

POST SEASON EAST KOOTENAY BIGHORN SHEEP POPULATION
BY RANGE UNIT. INVERMERE FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-20	Ta Ta-Skookumchuck			
4-21	Torrent			
	Wolf - Sheep	117	107	188
	Sheep N.	?	?	24
4-24	Watson			
4-25	Camp 6 North			
4-26	Findlay Basin			
	Dutch - Findlay			
	Westside			
	Toby Horsethief			
	Forster - Horsethief			
4-34	Columbia Slough			
	Francis Creek			
	Sunny Bench-Fish Lakes			
	Steamboat & Bryanton			
	Bugaboo S.			
	Spillimacheen N.			
	TOTAL	117	107	212
	All other lands	783	743	663
	TOTAL BIGHORN SHEEP	900	850	875

APPENDIX 4

POST SEASON EAST KOOTENAY ELK POPULATION
BY RANGE UNIT. CRANBROOK FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-02	Grasmere	237	261	243
4-03	Newgate	89	98	91
	Gold Creek/Plumbob			
	Chipka Rock			
	Ha Ha Creek	1244	1371	1275
	Tokay Hills			
	Baker			
	Rampart			
	Cranbrook-Fort Steele	445	490	455
	Alkali Lakes			
	Upper Joseph			
4-20	Perry/Booth	192	212	197
	Cherry - Ta Ta	768	846	787
	St. Mary's Prairie	192	212	197
4-21	Wildhorse Lewis	192	211	197
	Lewis/Wolf	96	106	98
4-22	Burton Lake	165	181	169
	Pickering Hills			
	Rosen Lake	1152	1269	1181
	Power Plant	165	181	169
	Peckhams Lake	494	544	506
	Colvalli	329	363	337
	Waldo	494	544	506
	TOTAL	6254	6889	6408
	All other lands	8506	9369	8719
	TOTAL ELK	14760	16258	15127

APPENDIX 4

POST SEASON WHITETAILED DEER POPULATION
BY RANGE UNIT. CRANBROOK FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-02	Grasmere	619	786	906
4-03	Newgate	260	329	379
	Gold Creek/Plumbob	779	986	1138
	Chipka Rock Ha Ha Creek Tokay Hills Baker	173	219	253
	Rampart Cranbrook-Fort Steele Alkali Lakes	522	660	762
	Upper Joseph	N E G L I G I B L E		
4-20	Perry/Booth	127	80	93
	Cherry - Ta Ta St. Mary's Prairie	508	644	742
4-21	Wildhorse Lewis	309	391	451
	Lewis/Wolf	309	391	451
4-22	Burton Lake	154	195	225
	Pickering Hills Rosen Lake	614	778	898
	Power Plant	154	195	225
	Peckhams Lake	768	973	1122
	Colvalli	307	389	449
	Waldo	1075	1362	1571
	TOTAL	6678	8378	9665
	All other lands	1152	1539	1778
	TOTAL WHITETAILED DEER	7830	9917	11443

APPENDIX 4

POST SEASON MULE DEER POPULATION
BY RANGE UNIT. CRANBROOK FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-02	Grasmere	187	277	334
4-03	Newgate	321	475	575
	Gold Creek/Plumbob Chipka Rock	802	1188	1437
	Ha Ha Creek Tokay Hills Baker Rampart	240	357	432
	Cranbrook-Fort Steele	187	277	334
	Alkali Lakes	80	119	144
	Upper Joseph	N E G L I G I B L E		
4-20	Perry/Booth	43	63	77
	Cherry - Ta Ta	128	190	230
	St. Mary's Prairie	N E G L I G I B L E		
4-21	Wildhorse Lewis	126	186	225
	Lewis/Wolf	126	186	225
4-22	Burton Lake	119	176	213
	Pickering Hills Rosen Lake	831	1231	1489
	Power Plant	237	352	425
	Peckhams Lake	593	879	1064
	Colvalli	119	176	213
	Waldo	356	528	638
	TOTAL	4495	6660	8055
	All other lands	3710	5500	6652
	TOTAL MULE DEER	8205	12160	14707

APPENDIX 4

POST SEASON BIGHORN SHEEP POPULATION

BY RANGE UNIT. CRANBROOK FOREST DISTRICT

Wildlife M.U.	Range Unit	1980	1985	1989
4-02	Grasmere	46	20	32
4-03	Newgate			
	Gold Creek/Plumbob			
	Chipka Rock			
	Ha Ha Creek			
	Tokay Hills			
	Baker			
	Rampart			
	Cranbrook-Fort Steele			
	Alkali Lakes			
	Upper Joseph			
4-20	Perry/Booth			
	Cherry - Ta Ta			
	St. Mary's Prairie			
4-21	Wildhorse Lewis	45	41	24
	Lewis/Wolf			
4-22	Burton Lake			
	Rosen Lake			
	Pickering Hills			
	Power Plant	40	63	173
	Peckhams Lake	20	31	57
	Colvalli			
	Waldo			
	TOTAL	105	135	254
	All other lands	1345	1115	1146
	TOTAL BIGHORN SHEEP	1450	1250	1400