COUGAR IN THE KOOTENAY REGION

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ABSTRACT

Cougar management has been hampered by the lack of cougar population information since 1966 when the animal was granted game species status.

In this report, cougar abundance was calculated in terms of a high and low population estimate for each management unit within the Kootenay Region.

Based on a 15 percent maximum harvest per year and the maximum estimated cougar population, quotas have been calculated for each management unit.

Analysis of the past harvests, and the newly calculated harvest quotas show that 11 management units have been over-harvested during at least one hunting season from 1975-78. Resident hunters accounted for 8 of these management units. Guided non-resident hunters combined with resident hunters accounted for 3 management units. Guided non-resident hunters did not harvest more than the newly proposed quotas for the management units they were guided in.

In an attempt to describe the cougar hunter's attitudes, a questionnaire was designed and administered to cougar hunters throughout the Kootenay Region.

The majority of resident cougar hunters feel that cougar are not being managed properly. They would like to see the hunting season extended into March, all guide outfitters put on quotas and the harvesting of female cougar with kittens made illegal.

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INTRODUCTION

Relatively little is known about the ecology of the secretive cougar, (Felis concolor).

British Columbia supports a large population of cougar, of which there are three subspecies.

Felis concolor vancouverensis Confined to Vancouver Island and some of the adjacent islands.

Felis concolor oregonensis Found throughout the Pacific Range of the southwest portion of the Interior Plateau known as the Thompson Plateau.

Felis concolor missoulensis Found throughout the Kitimat Range of the Coast Mountains, the Interior Plateau (with exception of the Thompson Plateau), the Columbia Mountains up to approximately 56' latitude.

The cougar subspecies distribution for B.C. is shown on Figure 1.

The Kootenay Region of the Fish and Wildlife Branch is in the process of developing a Cougar Management Plan for the Kootenays. This plan will discuss Resource Protection, Resource Management, Information and Education and Research Needs for the cougar resource.

Portions of this author's report may be used in the development of the management plan.

The objectives of this report are;

1) To compile existing information on the cougar resource.

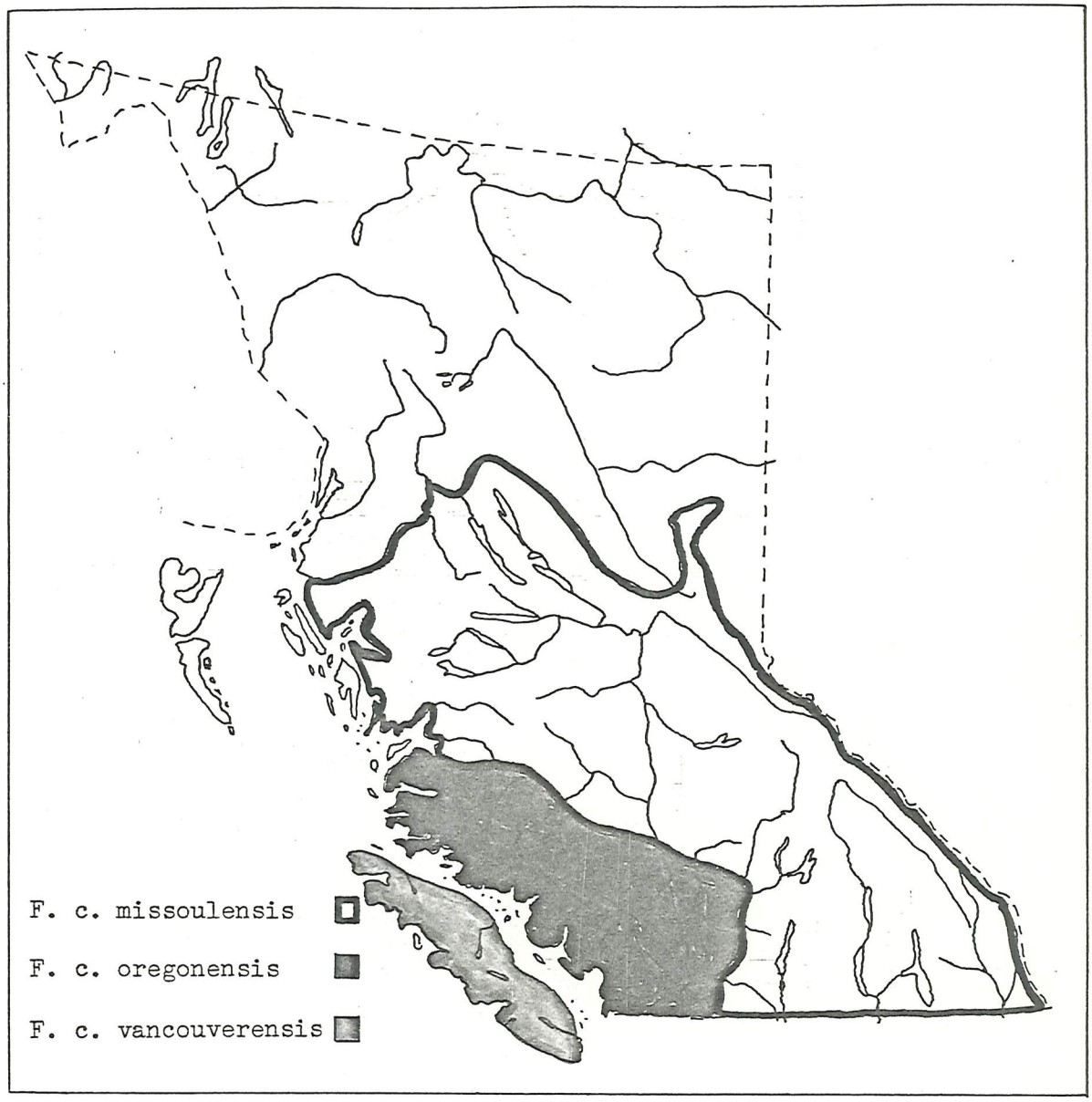


FIG. 1 Distribution of cougar in British Columbia

(after Cowan and Guiguet, 1960)

2) To survey the cougar hunters of the region in an attempt to describe their attitudes about the cougar resource.

3) To use the obtained information to suggest possible improvements for future cougar management in the region.

4) To determine what additional data, if any, may be required for future cougar management programs in the region.

THE COUGAR AS A PREDATOR

THE FUNCTIONS OF COUGAR PREDATION

The removal of animals by a population of cougar acts to lower the rate of prey increase before more drastic forces such as disease or starvation become dominant. Thus cougar predation dampens and protracts severe prey oscillations. The kind of animal removed is important, and has shown to be a function of different factors acting seperately or collectively to increase vulnerability. These include prey density, behaviour, age, health, inter- and perhaps intraspecific competition, and the cougar's predatory characteristica. Hornocker (1969).

It appears cougar select young elk, avoid prime bulls, and kill deer indiscriminately. In the Idaho Primative Area study, where prey populations were overabundant, cougar have killed a greater proportion of very young and very old animals and many were in poor condition. This pattern of predation appears universal where prey populations exceed the carrying capacity regardless of the type of predator operating. It also appears that predator populations preying on overabundant prey populations are self-limited. Hornocker (1969).

Where prey species occur within the carrying capacity of the environment, a different pattern of predation, with regard to the kind of prey animal killed, might be expected, i.e., more prime animals are killed. Under those conditions, however, the predator population may be limited by the food supply. Wright

(1960) found this to be the case in Africa. Hornocker (1969).

In an ecological sense, the influence of cougar predation on surviving prey animals may be more important than the actual killing of animals. Cougar have been shown to force the re-distribution of elk and deer on limited winter range. This is doubly important to ungulate species exhibiting weak or non-territorial behaviour which allows them to overpopulate an area and seriously damage the habitat. Mitchell et al (1965) recognized the importance of predation on such nonterritorial apedies in Africa, and Errington (1956) stated "The less that strong territoriality or other self-limitation enters population equations, the more something else must do the limiting.

Predation tends to maintain ecological stability in a wilderness environment. Hornocker (1969).

CHARACTERISTICS OF THE PREDATOR

The most detailed study of cougar is that of Hornocker (1969), made in a region of central Idaho where prey (elk and mule deer) was abundant and there was very little human interference. The investigation extended over four years and combined winter tracking with trapping and marking. The adult residents in the area numbered from five to nine in different years and in addition a number of transients passed through. The males occupied non-overlapping ranges of up to 25 square miles, female ranges were smaller, from 5 to 20 square miles and a male overlapped with two or three females. The size of the female's range changed from one winter to another in relation to how many young she had to provide for. The females appeared to make the necessary readjustments peacefully and female ranges sometimes showed some overlap. The animals seemed to avoid each other by mutual consent; although those whose ranges overlapped might use the same pathways, they refrained from doing so at the same time. Transients did not attempt to stay in the already occupied areas and were permitted to pass through without molestation. The frequency of fighting is rare.

Hornocker does not discuss what happens in the mating season, but clearly the pattern of mutual avoidance must be modified. According to Young and Goldman (1946), several males will follow a female who is in heat.

Cougar establish scent stations. "On a number of occasions

an animal tracked to one of these sites abruptly changed course, sometimes retracing it's route for a considerable distance. Invariably it was found that another cougar or family of cougar was in the area." Hornocker (1969). In this way, scent would function importantly as a spacing mechanism, a conclusion also reached by Leyhausen and Wolff (1959) and Hornocker (1969).

Hornocker (1969) speculated that spacing of individuals may also afford greater success in securing large prey animals. Cougar must employ stealth to place themselves within striking distance. The chances of success in an area already hunted or being hunted by another individual are much less than in an area where prey animals are undisturbed.

In following up Hornocker's (1969) study, Seidensticker et al (1973) continued cougar work in the Idaho Primative Area. This investigation extended over three year and used Hornocker's (1969) data and study methods with additionsl summer work.

The adult residents in the area numbered from five to seven in different years and a number of transients palled about the areas of residents. This pattern was the same in summer. Transient females did not reproduce and transient males only rarely bred. Upon finding an area free of too many residents but not independent of other residents, the young cougar would restrict it's movements to this area. Reproduction was possible only when the cougar had established a home area.

Avoidance between adult males, males and females with kittens,

and females without kittens was total.

Resident male home areas showed little overlap while resident female areas often overlapped.

The use of this home area was influenced by the localizing effects of the large ungulate kills, and for the female, kitten mobility. (Mule deer and elk are the most important prey nine months of the year).

The resident male population remained stable over the seven winters (1965-1972). The resident female population was constant for three winters but later deaths were never quite compensated.

Land tenure was based on prior right but the system was not static. Home areas were altered in response to the death or movement of other residents. Young adults established residences only as vacancies became available.

The land tenure system maintains the density of the breeding adults below a level set by food supply in terms of absolute numbers of mule deer and elk.

THE COUGAR AS A NUISANCE ANIMAL

In British Columbia there has been 16 verified human attacks by cougar to date. Four of these attacks have resulted in human deaths.

In the Kootenay Region there has been 1 verified cougar attack and no human deaths attributed to cougar attacks.

The present Fish and Wildlife Branch practice is to tranquilize and move cougar that are too close to civilized areas and in good physical condition, and to destroy only those animals that are threatening humans or domestic stock.

Livestock owners receive no compensation for depredation actions by cougar in B.C.

The nuisance cougar discussed in this section are animals that have physically assaulted humans, livestock, or domestic pets. Lyn Hancock has summarized all such confrontations for B.C. from 1916 to 1976 for her masters thesis at Simon Fraser University (1978). Her data for the Kootenay Region, (Appendix B), has been graphically represented in Figure 2.

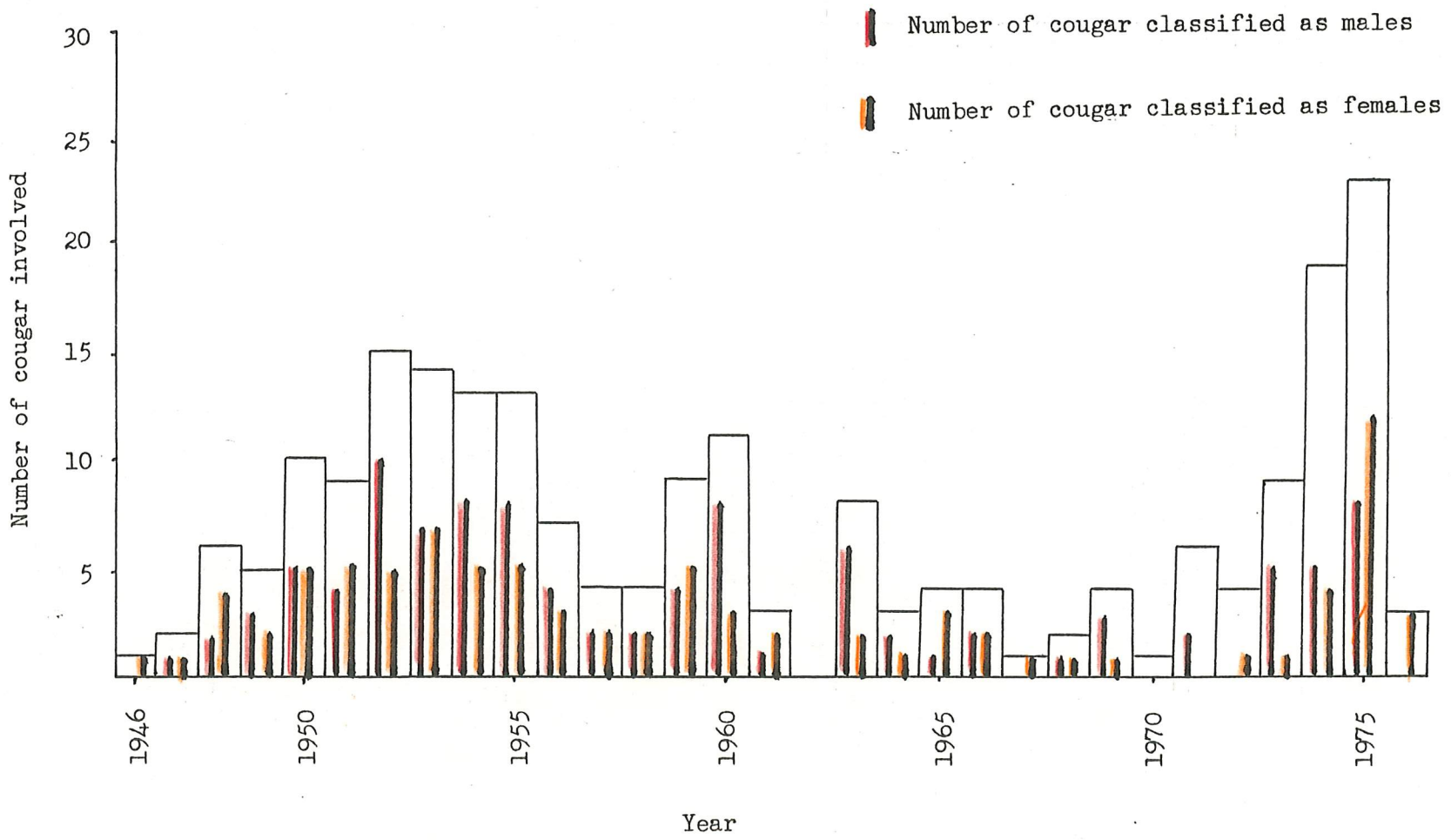
At a first glance of this graph, it looks like the number of males significantly out-numbers the number of females.

A chi-square test for significance was used to determine if this was true.

Not all nuisance cougar taken were classified as to sex. The probability of a male not being classified as to sex, and the probability of a female not being classified as to sex, is the

FIG. 2. COUGAR CONFRONTATIONS WITH HUMANS, LIVESTOCK, OR DOMESTIC PETS.

(1946 - 1976)



same, so it is felt that this will not bias the conclusions.

At a 95 percent confidence level with 1 degree of freedom, the calculated x^2 value was 0.600. The table x^2 value was 3.841.

There is no significant differance in the number of male to the number of female nuisance cougar in the Kootenay Region from 1945 to 1976.

The amount of cougar attacks seems to be on the increase throughout most of the province.

There is no simple explanation for these attacks. Jack Lay, provincial animal control officer in southwest British Columbia, states that, "Cougar are increasing, they are seeing more people and they definitely are losing their fear of men."

While this may be true in the southwest portion of the province, I do not feel it applys to the Kootenay Region.

Cougar are definitely losing habitat. Subdivisions are encroaching on natural range. The exploitation of the provinces natural resources is constantly reducing habitat. The crown land base is constantly being chopped up and redistributed by the Lands Branch causing a reduction in the land available for wildlife.

I feel that the increase in the number of cougar confrontations with man is a direct result of the decrease in available habitat. Cougar will not stockpile if their habitat decreases. Each resident cougar of the population occupies a definite range with

little overlap by males and some overlap by females. When the habitat is reduced, some members of the cougar population will have to move out of the area. It is these animals, (transients), causing the problems. When the habitat stabilizes, the cougar population will stabilize, and the confrontations of cougar with man will decrease.

THE COUGAR POPULATION IN THE KOOTENAY REGION

DISTRIBUTION AND ABUNDANCE

Early this year, 1978, the Fish and Wildlife Branch developed a Cougar Distribution Map for the province of B.C. (Map 1, appendix D). This map gives ranges of relative abundance as well as distribution information. These abundance ranges are based on branch staff evaluations throughout the province.

In determining the distribution and abundance of cougar in the Kootenay Region, the Cougar Distibution Map information was transferred to a map of southeastern B.C. having Management Unit boundaries on it. (Map 2, appendix D). A planimeter was then used to calculate the area of each cougar abundance range within each management unit. The calculated area was then multiplied by the relative abundance range figures for each management unit.

The result of this work is a high and low cougar population figure for each management unit within the Kootenay Region. These figures are graphed on Figs.4 to 9.

It is assumed that the true cougar population for each management unit is somewhere within the high and low population figures calculated for that management unit.

MORTALITY - MAN CAUSED

Hunting is by far the largest contributing factor to cougar mortality.

Hunting is a legitimate recreational activity whose effects on a cougar population can be minimized through proper management.

Trappers inadvertently catch a few cougar every year in their lynx sets. In the Kootenay Region from 1975 - 78, trapping has accounted for approximately 6 cougar.

The destruction of nuisance cougar must also be considered a mortality caused by man. This has accounted for a substantial percentage of cougar in relation to the harvest figures. Table 1.

COUGAR HUNTER HARVEST			
1975-76	1976-77	1977-78	
59	45	50	No. OF COUGAR HUNTER HARVESTED
15	7	2	No. OF COUGAR DESTROYED AS NUISANCE ANIMALS
25 %	16 %	4 %	PERCENTAGES INDICATE THE EQUIVALENT IN RELATION TO THE HUNTER HARVEST

Table 1

MORTALITY - NATURAL

The first 6 months of life for a cougar is probably quite critical, particularly after the kittens are taken from the den where they are born. The female must leave them unattended while she hunts, and there is evidence that they may be left alone for as long as 2 days. (Hornocker 1969). Under these circumstances they are quite vulnerable to predation as well as accidents.

Another critical period is the first few weeks after the young cougar become self-sufficient. They may not be a successful hunter and may starve.

The only serious disease known to affect cougar is Rabies, (Young and Goldman 1946), though there is evidence that arthritis occurs in old males.

Some male cougar have been known to exibit cannibalism. Young and Goldman (1946) stated that the male will devour it's own young, but how prevalent this may be is not known. Hornocker (1969) also noted this occurance by a male cougar.

Old animals are unable to kill effectively, and probably starve. Young and Goldman (1946).

Hornocker (1969) believed that young cougar, particularly when attacking elk, may be injured more frequently than has been believed. A cougar was severely injured while attacking an elk in the Idaho Primative Area. The ailing cougar was destroyed by Hornocker.

PRODUCTIVITY

Social tolerance between adult males and females is exibited only during the breeding season, a period of a few weeks usually in winter or early spring. Cougar conception may occur in any month (Young and Goldman 1946) and with a gestation of 96 days (Young and Goldman 1946) the birth dates are variable throughout the year. Hornocker's (1969) studies in the Idaho Primative Area indicate that 90% of the cougar births occur between mid - March and mid - May, or April 15 plus or minus one month.

Zoo records (Rabb 1959) indicate that female cougar first come into heat and produce kittens at 2.5 years of age. A normal litter size is 2 or 3 kittens. Kitten independance occured just under 2 years of age in the Idaho Primative Area. Hornocker (1969).

Females normally mate with one male during the breeding period but may mate with several males during their lifetime.

HABITAT PREFERENCES

During non-winter months cougar tended to use the edges of openings, such as new logging slash, rather than the actual openings. Dewars(1975). This was also reported in Seidensticker et al. (1973) where the conclusion was made that although cougar demonstrated a wide habitat tolerance, cover was an important component of the habitat.

During the winter, the cougar's ranges were largely restricted to areas of mature timber. Dewars (1975). Again this was reported by Seidensticker et al. (1973).

Cougar predation tends to occur around the rougher peripheries of the wintering deer herds.

Dens may be in any concealed sheltered location.

In general, cougar habitat is the same as their major prey species, mule deer. The mule deer prefers open coniferous forests, aspen parkland, steep broken terrain and shuns open prairie and thick dark coniferous forests.

FOOD HABITS

In the Idaho Primative Area, analysis of cougar scats has shown that mule deer and elk make up 70 percent of the prey, snowshoe hares about 5.5 percent and small mammals and grass making up the remaining 24.5 percent. Occasional kills of coyotes, bighorn sheep, and mountain goats were documented.

Fifty three elk and 46 deer were reported as definitely killed by cougar during the 4 year period. There were only 2 kills of bighorn sheep found. Hornocker believed that predation of bighorn sheep by cougar was insignificant. Seventy five percent of the elk and 62 percent of the deer killed by cougar were less than 1.5 years old or more than 9.5 years old. More young than old animals were killed. Hornocker (1969).

It appears cougar select young elk, avoid prime bulls, and kill deer indiscriminately. Hornocker (1969).

An analysis of cougar stomach contents showed that in the Okanagan, 74 percent of the winter diet of cougar was mule deer. Spalding and Lesowski (1970). Porcupine, beaver and snowshoe hare were of decreasing importance.

The amount of deer killed by a cougar is not really known. Robinette et al (1959) speculated that a cougar killed 1 deer weekly during winter in Utah. This estimate is based on a daily consumption rate of 7 to 8 pounds. Young and Goldman (1949) indicated that fewer deer were killed in summer.

VALUE OF COUGAR

NON-CONSUMPTIVE USE

The non-hunting public rarely observe a cougar in the wild. Though their attitudes toward cougar have not been surveyed in this report, it is my opinion that they generally want cougar to always be an intergral part of our wildlife even though they rarely see them.

Of the cougar hunters surveyed in this report, 6.5 percent were non-consumptive hunters and 61.3 percent were a combination of both consumptive and non-consumptive hunters.

The non-consumptive hunters generally hunt and tree cougar, then take a picture, and leave.

Since the questionnaire was only administered to cougar hunters who had harvested a cougar during the 1975-77 hunting seasons, there is a large number of non-consumptive hunters who have not been surveyed by this report.

The hunters that are a combination of both consumptive and non-consumptive generally hunt and tree cougar, and if the animal is of trophy size they will harvest it, if it isn't a trophy animal they will let it go.

From conversations with some of the local cougar hunters, they stated that they had treed several cougar in the season but rarely harvested one due to it's small size.

It appears that most non-consumptive hunting of cougar is a result of the decrease in the number of trophy sized cougar bringing about conservation practices and concerns by some of the local cougar hunters.

CONSUMPTIVE USE

Of the cougar hunters surveyed in this report, 29.0% were consumptive hunters and 61.3% were a combination of both consumptive and non-consumptive hunters.

In general, the consumptive hunters harvest all the cougar they tree within the legal bag limit.

The hunters that are a combination of both consumptive and non-consumptive hunters generally harvest only trophy sized animals and let the others go.

The amount of cougar hunters that are just consumptive are decreasing as a result of the decreased number of trophy animals.

It is my opinion that this trend will continue.

HISTORY OF COUGAR MANAGEMENT

Cougar were taken for bounty from at least 1910 to 1957. (Fig.3). The price paid per cat ranged from $10 to $40. In addition, the Fish and Wildlife Branch personnel destroyed cougar whenever possible.

The bounty system was removed in 1957.

In 1966, the cougar received recognition as a game animal. There were no restrictions placed on hunting: no harvest limits, no closed seasons, no tag licensd (although a hunting license was required), and non-residents could hunt cougar without a guide.

The Fish ahd Wildlife Branch incorporated a cougar questionnaire into their general hunter questionnaire program, with the hoped goal of determining hunting pressure and harvest. The data obtained was regarded as unreliable.

The first attempt to control cougar hunting was made during the 1968-69 hunting season. The Kootenays and part of the Interior South imposed a 5.5 month closed season on cougar. There was still no bag limits.

Further reductions in open seasons and bag limits followed. (Tables 2 and 3).

Other regions throughout the province also followed with reduced seasons and bag limits.

In 1970, harvest control was intensified. A $60 trophy fee for cougar taken by non-residents was initiated. Non-residents were required to hunt cougar with a guide and all cougar hunters were required to purchase a $5 tag license.

Fig.3 BOUNTIES PAID ON COUGAR IN B.C.

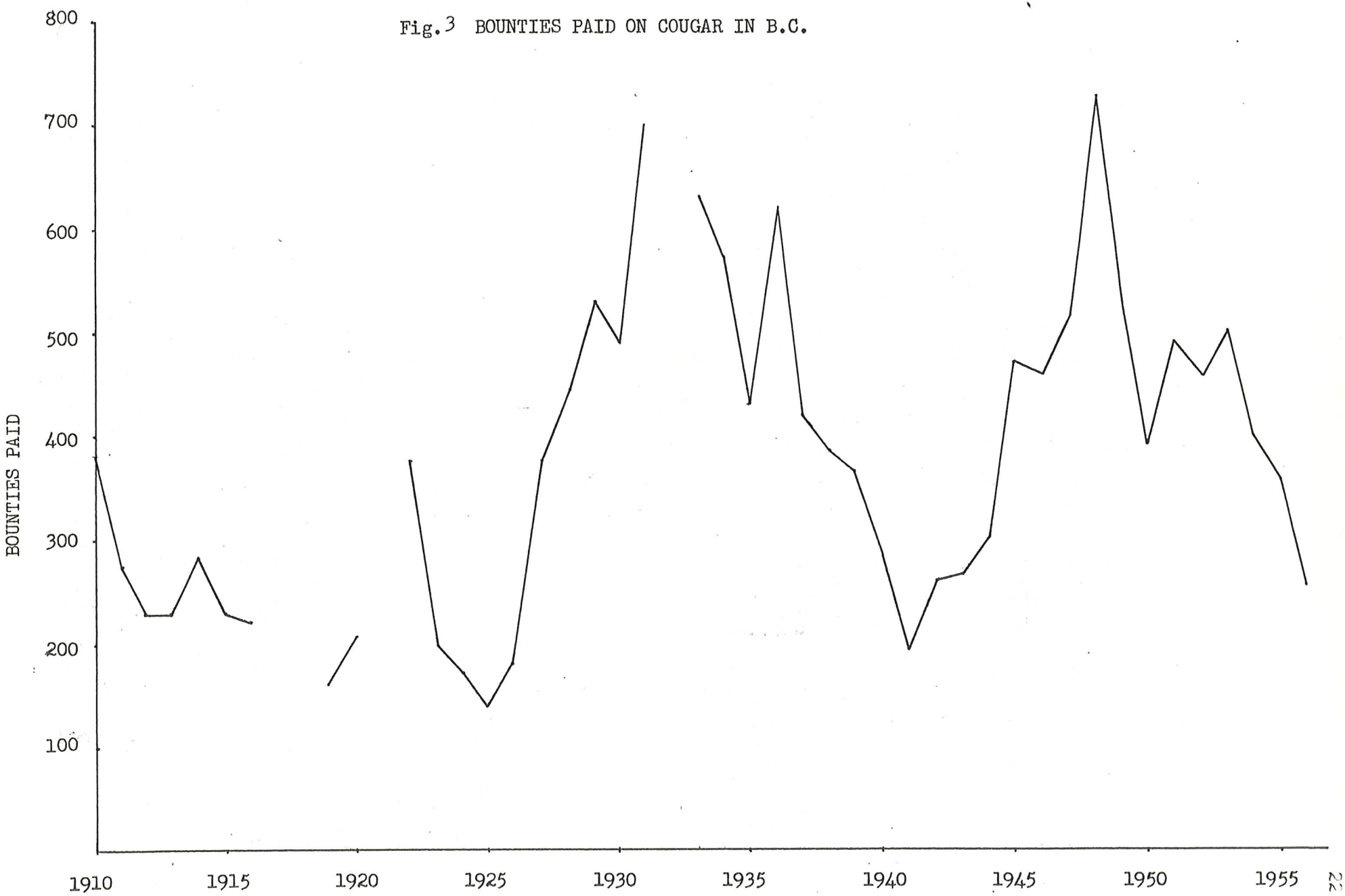


Table 2. COUGAR HUNTING SEASONS FOR THE KOOTENAY REGION

(1968 - 1978)

MANAGEMENT AREA	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
8	APR 1 – MAR 31	APR 1 – MAR 31	APR 1 – MAR 31	APR 1 – MAR 31	APR 1 – MAR 31	APR 1 – MAR 31	APR 1 – MAR 31			
9	SEP 15 – MAR 31	OCT 1 – MAR 31	OCT 1 – MAR 31	OCT 1 – FEB 28	DEC 1 – FEB 28	DEC 1 – FEB 28	DEC 1 – FEB 28			
10	SEP 15 – MAR 31	OCT 1 – MAR 31	OCT 1 – MAR 31	OCT 1 – FEB 28	DEC 1 – FEB 28	DEC 1 – FEB 28	DEC 1 – FEB 28			
11	SEP 15 – MAR 31	OCT 1 – MAR 31	OCT 1 – MAR 31	OCT 1 – FEB 28	DEC 1 – FEB 28	DEC 1 – FEB 28	DEC 1 – FEB 28			
MANAGEMENT UNITS										
4-10, 4-11, 4-12										APR 1 – MAR 31
4-13										NOV 29 – FEB 29
REMAINDER OF REGION 4										DEC 1 – FEB 29
ALL REGION 4									DEC 1 – FEB 28	DEC 1 – FEB 28

Table 3. COUGAR BAG LIMITS FOR THE KOOTENAY REGION

(1968 - 1978)

		1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
MANAGEMENT AREA											
8		NBL	5	3	2	1	1				
9		NBL	2	2	1	1	1				
10		NBL	2	2	1	1	1				
11		NBL	2	2	1	1	1				
MANAGEMENT UNITS											
REGION 4								1	1	1	1

NBL - NO BAG LIMIT

In 1971, the cougar population of south central and south-eastern portions of the province were said to contain declining cougar populations attributable in part to heavy hunting pressure.

In an attempt to obtain harvest data, the Fish and Wildlife Branch required hunters to report all the cougar they harvest. The compulsory reporting program was initiated in 1975 and has collected 3 years of data to date.

PAST HARVESTS

The harvest data from 1975-78 has been graphed for each management unit in the Kootenay Region. (Figures 4 to 9). The first two columns of each graph show the high and low population estimates previously discussed in the Distribution and Abundance section of this report. The remaining columns show the number and sex of the harvested cougar for each year.

The graphs in Figures 4 to 9 showing a decreased harvest each year may indicate a decrease in the cougar population for that management unit. This trend is noted in management units; 4-11, 4-17 and 4-19.

The graphs in Figures 4 to 9 showing an increased harvest each year may indicate an increase in the cougar population for that management unit. This trend is noted in management unit 4-4.

At the Nevada Mountain Lion Workshop, (1976), it was determined that cougar could be harvested at 10 to 15 percent. If only males were harvested then it is likely that the harvest could go to about 20 percent.

Based on this information, population estimates (from the Distribution and Abundance section of this report), and past harvests, the proposed maximum harvest figures have been calculated for the maximum estimated cougar population within each management unit in the Kootenay Region. (Tables 4 to 6).

Since the data is based on maximum estimated cougar populations,

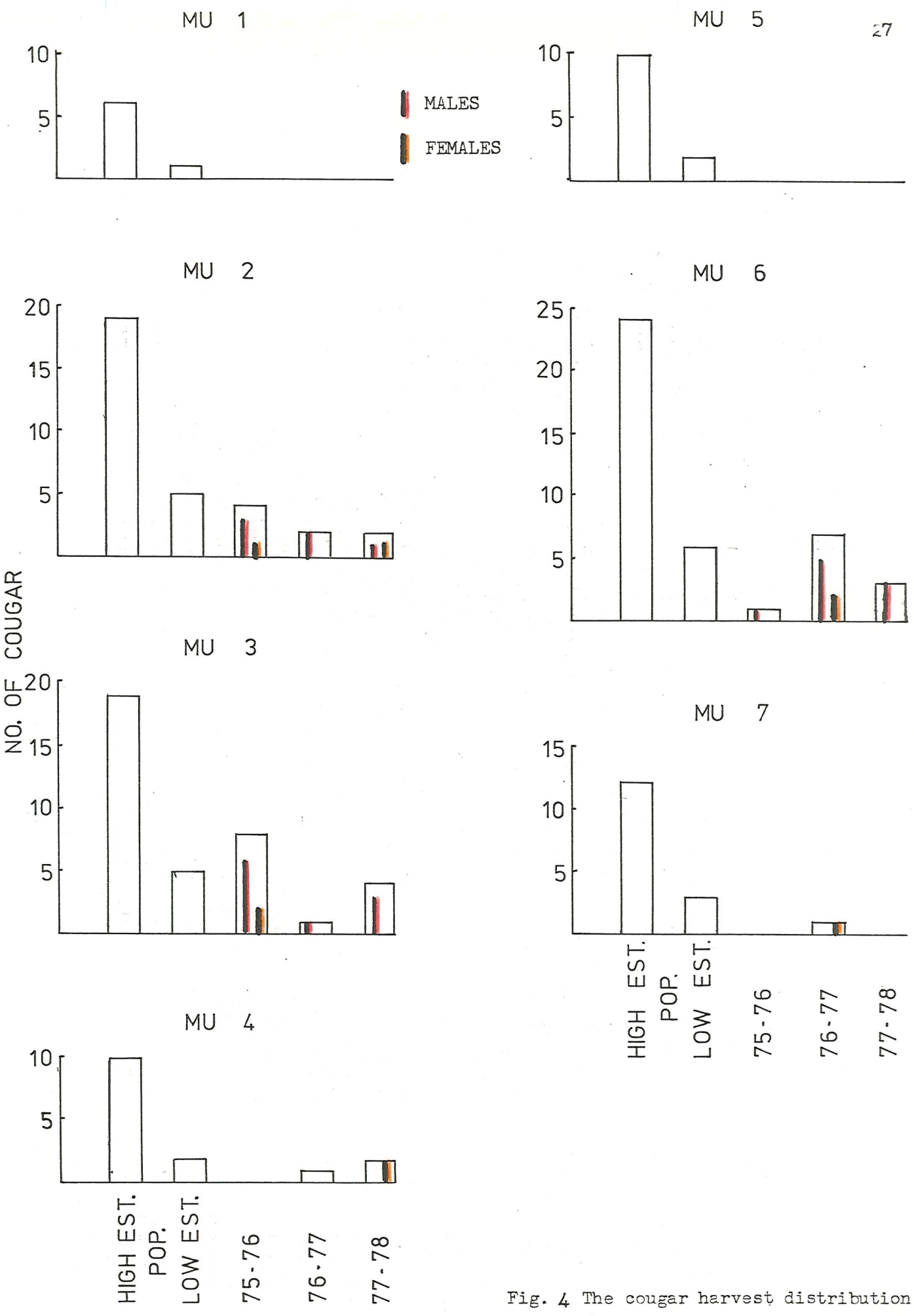


Fig. 4 The cougar harvest distribution by Management Unit 1975-78

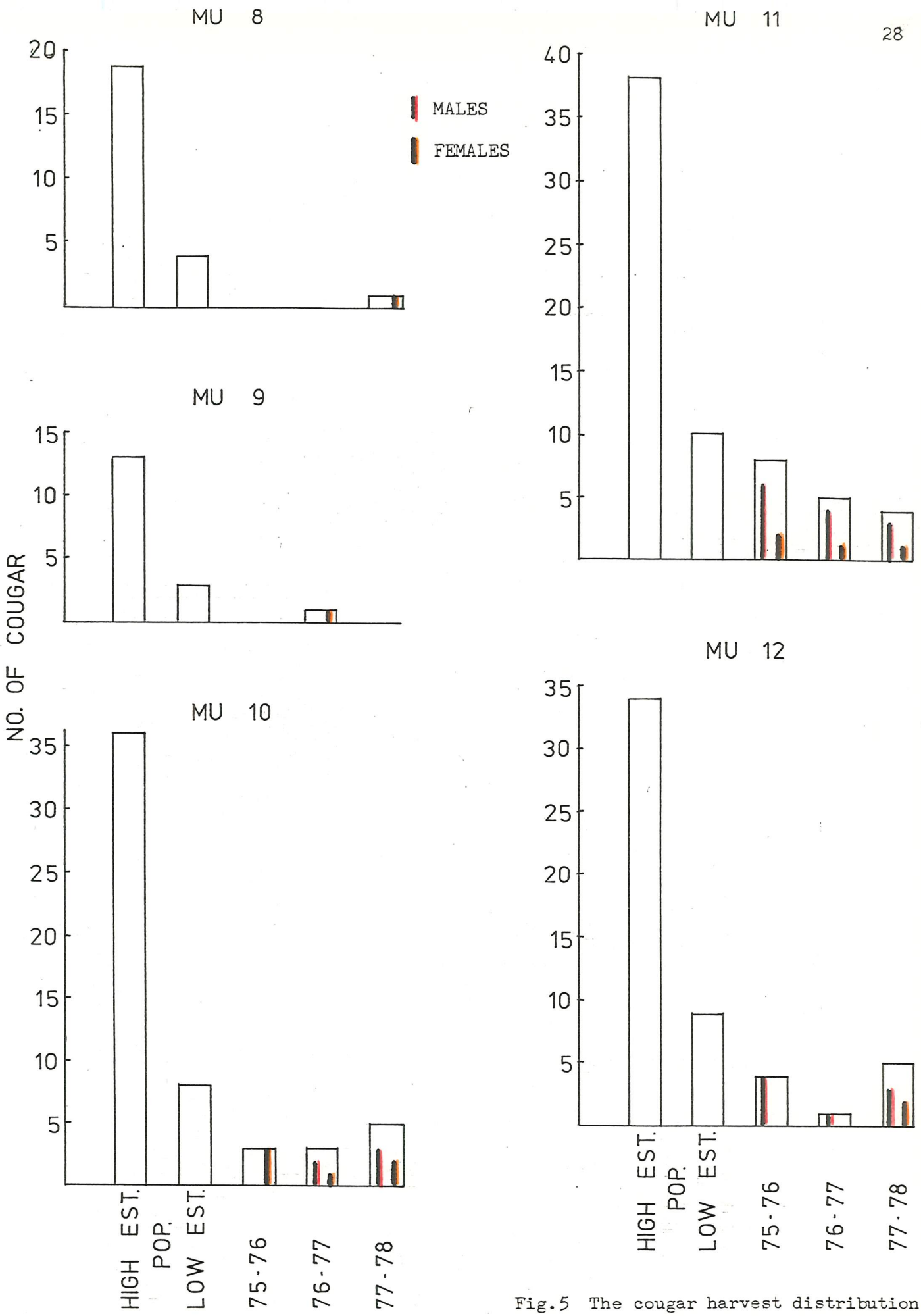


Fig.5 The cougar harvest distribution by Management Unit 1975-78

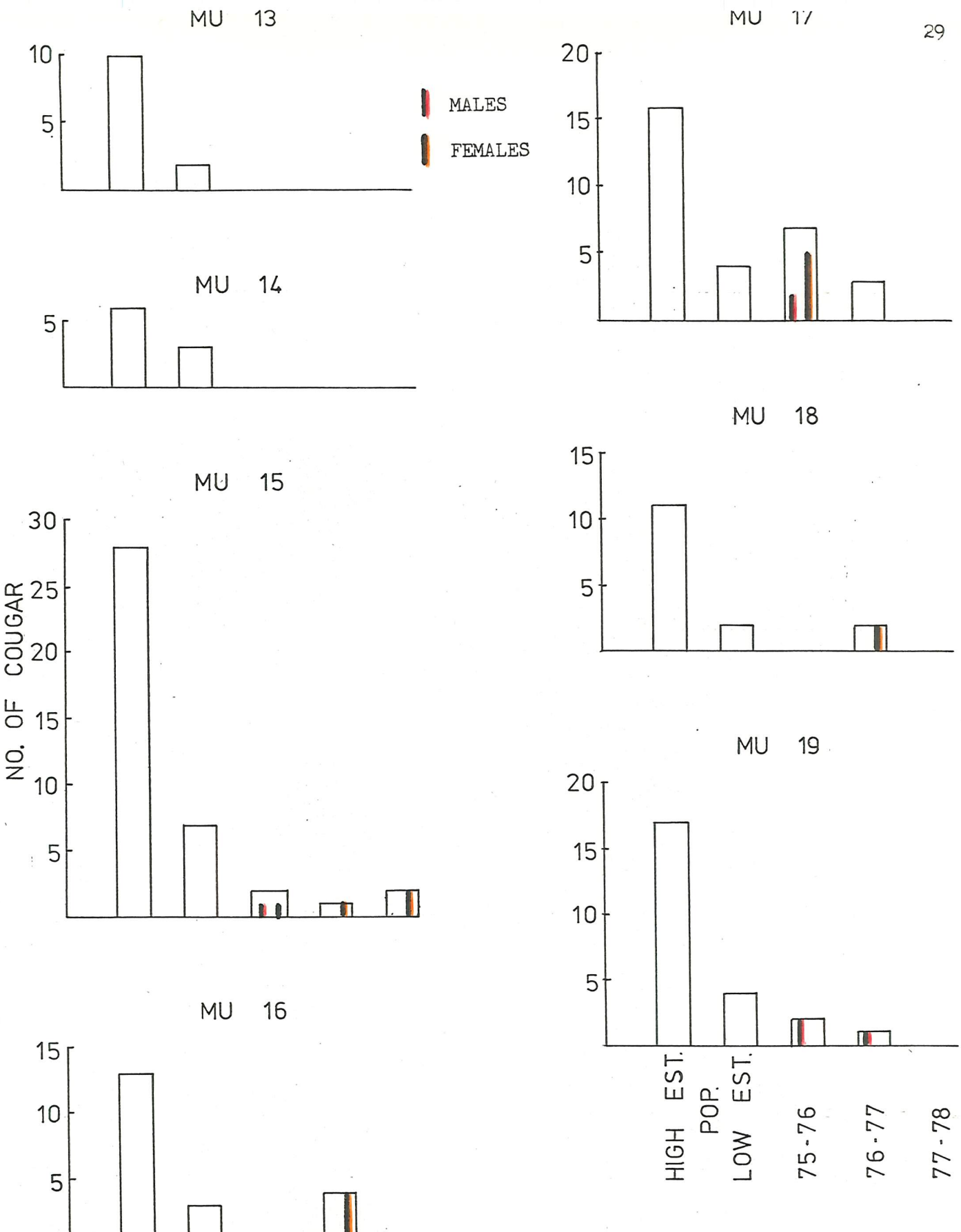


Fig. 6 The cougar harvest distribution by Management Unit 1975-78

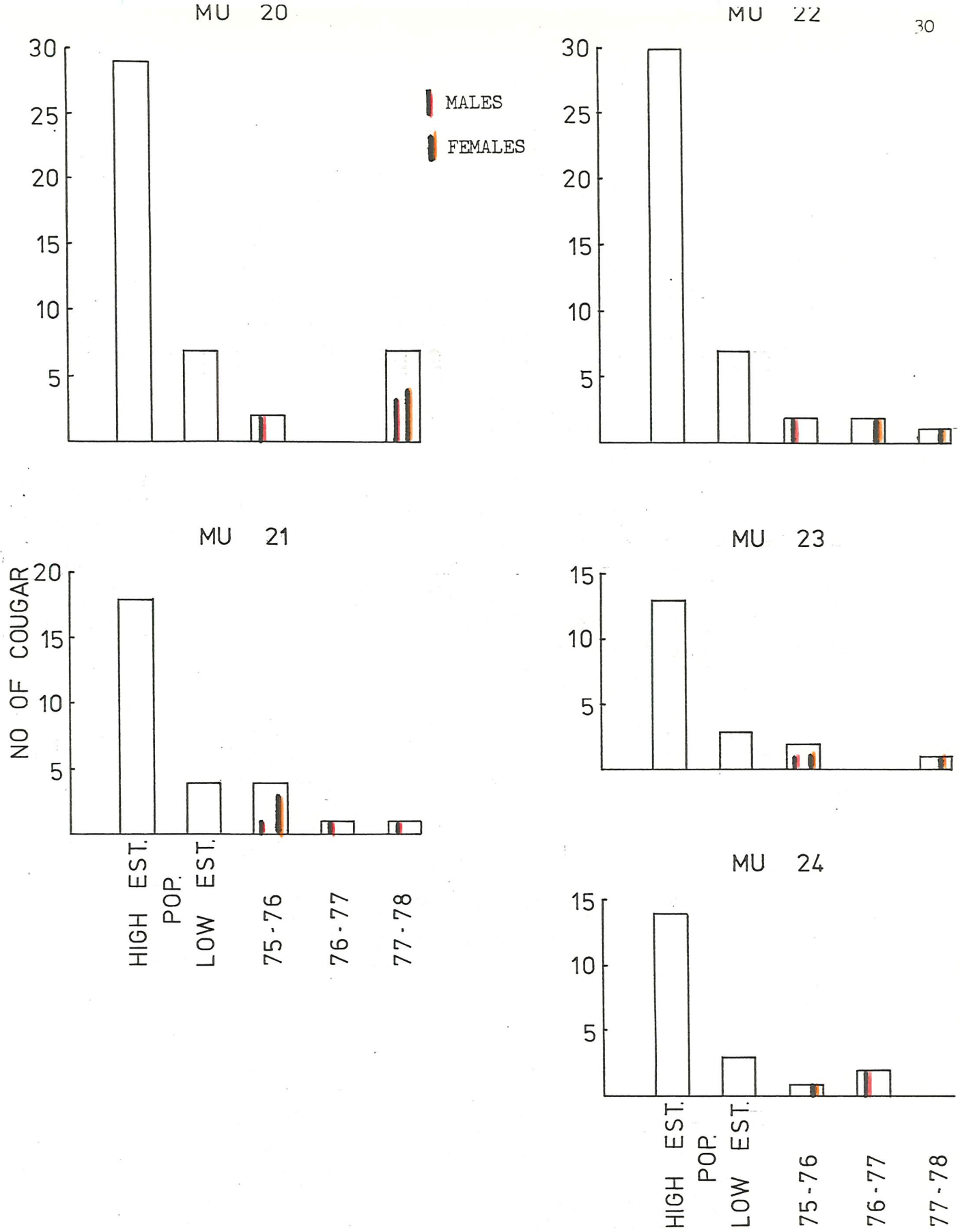


Fig.7 The cougar harvest distribution by Management Unit 1975-78

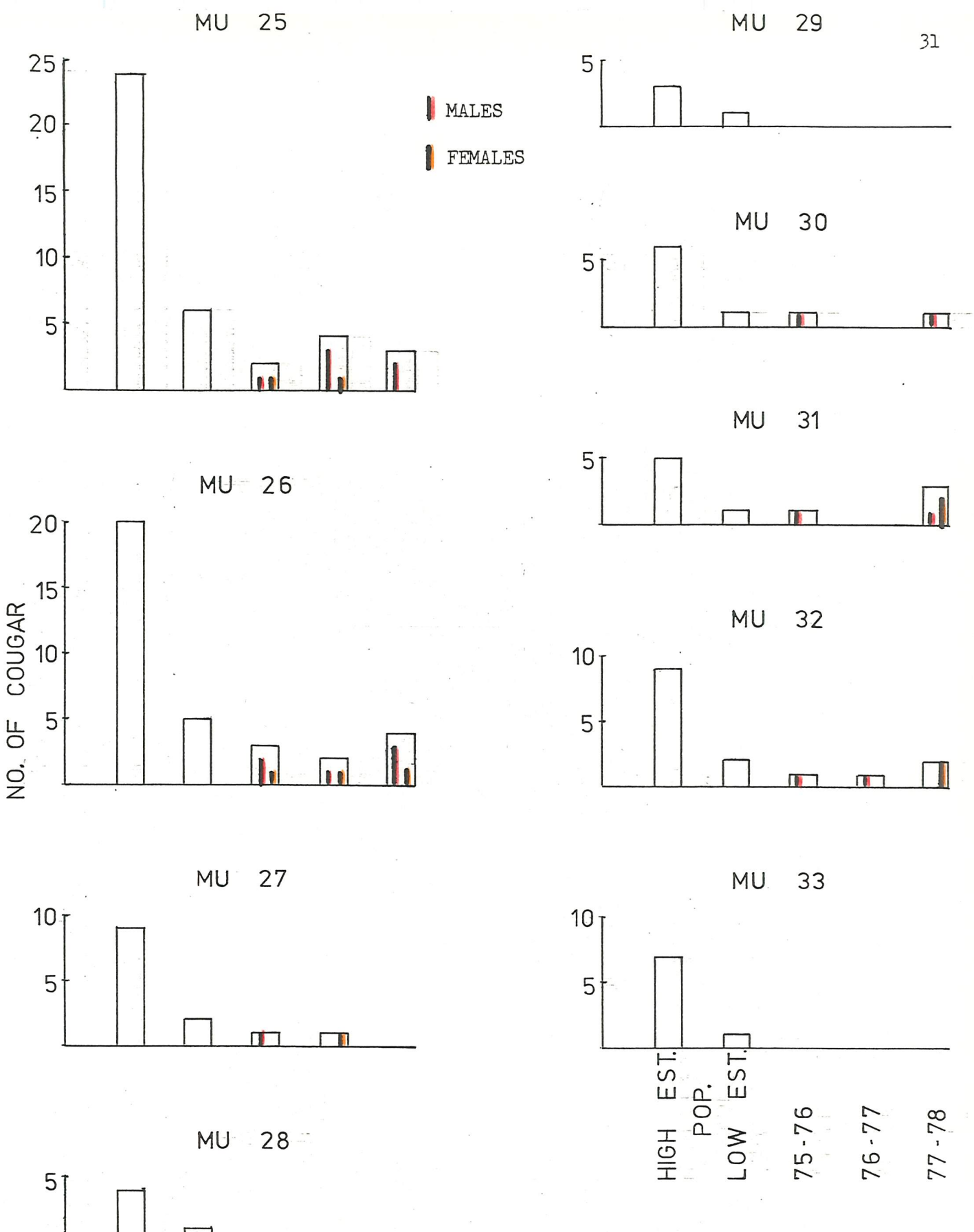


Fig.8 The cougar harvest distribution by Management Unit 1975-78

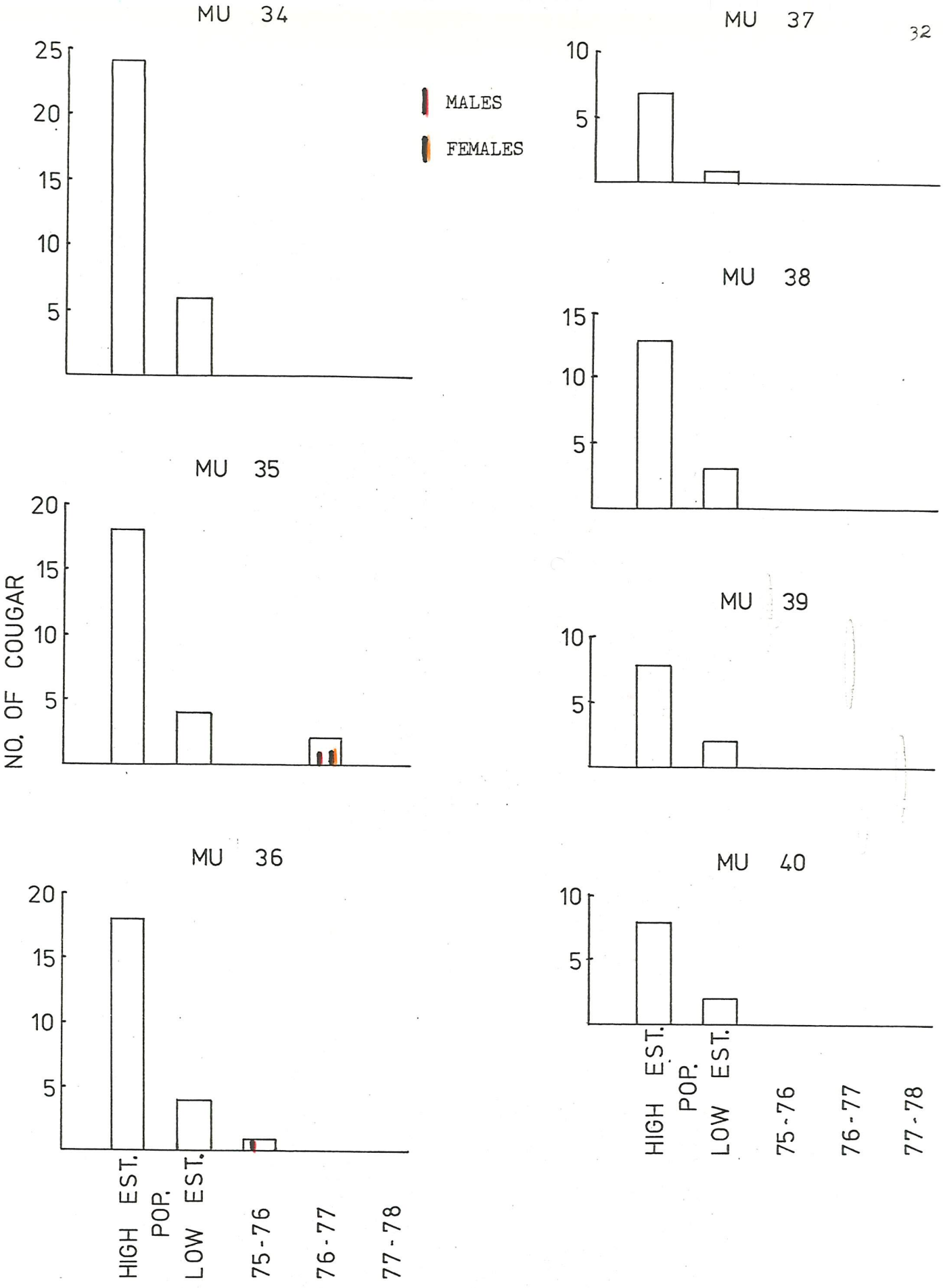


Fig. 9 The cougar harvest distribution by Management Unit 1975-78

a maximum proposed harvest percentage and actual harvests from 1975-78, any management unit whose actual harvest figures are larger than the proposed harvest figures can be stated as over-harvested.

In the 1975-76 hunting season, 5 management units were over-harvested; 4-2, 4-3, 4-11, 4-17 and 4-21.

In the 1976-77 hunting season, 3 management units were over-harvested; 4-6, 4-16 and 4-17.

In the 1977-78 hunting season, 5 management units were over-harvested; 4-3, 4-20, 4-26, 4-31 and 4-32.

The extent of overharvesting can be seen on Tables 4 to 6.

Consideration must be given to the source of the overharvesting, resident hunters or guided hunters.

Analysis of the compulsory reports show that 8 management units were overharvested by resident hunters within the time period of 1975-78. Three management units were overharvested by a combination of resident hunters and guided hunters during the same time period. Guided hunters have not harvested more than the newly proposed harvest limits shown on Tables 4 to 6.

The extent of overharvesting can be seen on Tables 4 to 6.

Since the cougar population in any management unit is probably not as high as the estimated maximum, there are likely to be more management units overharvested than indicated in this report.

Table 4 AN ANALYSIS OF PAST YEARS HUNTER HARVESTS

MANAGEMENT UNIT	POPULATION ESTIMATES		PAST HARVEST						PROPOSED FUTURE HARVEST	
			1975-76		1976-77		1977-78		MALES AND FEMALES	MALES ONLY
	MAX.	MIN.	M	F	M	F	M	F	15 % OF MAXIMUM POP. EST.	20 % OF MAXIMUM POP. EST
4-1	6	1	0	0	0	0	0	0	1	1
4-2	19	5	3	1	2	0	1	1	3	4
4-3	19	5	6	2	1	0	3	1 0	3	4
4-4	10	2	0	0	0	1 0	0	2	2	2
4-5	10	2	0	0	0	0	0	0	2	2
4-6	24	6	1	0	5	2	3	0	4	5
4-7	12	3	0	0	0	1	0	0	2	2
4-8	19	4	0	0	0	0	0	1	3	4
4-9	13	3	0	0	0	1	0	0	2	3
4-10	36	8	0	3	2	1	3	2	5	7
4-11	38	10	6	2	4	1	3	1	6	8
4-12	34	9	4	0	1	0	3	2	5	7
4-13	10	2	0	0	0	0	0	0	2	2
4-14	6	3	0	0	0	0	0	0	1	1
4-15	28	7	1	1	0	1	0	2	4	6
4-16	13	3	0	0	0	4	0	0	2	3
4-17	16	4	2	5	0	3	0	0	2	3
4-18	11	2	0	0	0	2	0	0	2	2

——— OVERHARVESTED

Table 5 AN ANALYSIS OF PAST YEARS HUNTER HARVESTS

MANAGEMENT UNIT	POPULATION ESTIMATES		PAST HARVEST						PROPOSED FUTURE HARVEST	
			1975-76		1976-77		1977-78		MALES AND FEMALES	MALES ONLY
	MAX.	MIN.	M	F	M	F	M	F	15 % OF MAXIMUM POP. EST.	20 % OF MAXIMUM POP.EST.
4-19	17	4	2	0	1	0	0	0	3	3
4-20	29	7	2	0	0	0	3	4	4	6
4-21	18	4	1	3	1	0	1	0	3	4
4-22	30	7	2	0	0	2	0	1	5	6
4-23	13	3	1	1	0	0	0	1	2	3
4-24	14	3	0	1	2	0	0	0	2	3
4-25	24	6	1	1	3	1	2	1 0	4	5
4-26	20	5	2	1	1	1	3	1	3	4
4-27	9	2	1	0	0	1	0	0	1	2
4-28	4	1	0	0	0	0	0	0	1	1
4-29	3	1	0	0	0	0	0	0	0	1
4-30	6	1	1	0	0	0	1	0	1	1
4-31	5	1	1	0	0	0	1	2	1	1
4-32	9	2	1	0	1	0	0	2	1	2
4-33	7	1	0	0	0	0	0	0	1	1
4-34	24	6	0	0	0	0	0	0	4	5
4-35	18	4	0	0	1	1	0	0	3	4
4-36	18	4	1	0	0	0	0	0	3	4

—— OVERHARVESTED

Table 6 AN ANALYSIS OF PAST YEARS HUNTER HARVESTS

MANAGEMENT UNIT	POPULATION ESTIMATES		PAST HARVEST						PROPOSED FUTURE HARVEST	
			1975-76		1976-77		1977-78		MALES AND FEMALES	MALES ONLY
	MAX.	MIN.	M	F	M	F	M	F	15 % OF MAXIMUM POP. EST.	20 % OF MAXIMUM POP.EST.
4-37	7	1	0	0	0	0	0	0	1	1
4-38	13	3	0	0	0	0	0	0	2	3
4-39	8	2	0	0	0	0	0	0	1	2
4-40	8	2	0	0	0	0	0	0	1	2

——— OVERHARVESTED

The sex classification of the harvested cougar is shown on Table 7.

The percentage of female cougar in the harvest has been increasing each year.

Harvesting in this manor will reduce the cougar productivety and probably result in a declining cougar population.

In the 1977-78 hunting season, the non-resident hunters accounted for 40 percent of the seasons harvest while the resident hunters accounted for 60 percent. (Table 7).

I feel that the increasing percentage of cougar taken by non-resident hunters does not indicate a decrease in resident hunter effort. The resident hunter still goes out and runs cougar, but most of these hunters are waiting for a trophy size cougar before they harvest it. The non-resident hunters are paying for a guide and his time, so they may have to take whatever they can get.

The distribution of the cougar harvest over the hunting seasons from 1975-78 is shown on Figure 10.

The month of December accounted for 16 percent of the harvest in the 1975-76 hunting season, 21 percent of the harvest in the 1976-77 hunting season and 16 percent of the harvest in the 1977-78 hunting season.

The month of January accounted for 32 percent , 46 percent and 52 percent of the harvest in the 1975-76, 1976-77 and 1977-

Table 7 SUMMARY OF COMPULSORY REPORTS

(1975 - 1978)

SEASON	NO. OF COUGAR HARVESTED	RESIDENT HUNTERS	NON-RESIDENT HUNTERS	MALE COUGAR	FEMALE COUGAR
1975-76	60	45 (75%)	15 (25%)	39 (65%)	21 (35%)
1976-77	45	36 (80%)	9 (20%)	27 (61%)	17 (39%)
1977-78	50	30 (60%)	20 (40%)	27 (56%)	21 (44%)

78 hunting seasons respectively.

The month of February accounted for 53 percent, 34 percent and 32 percent of the harvest in the 1975-76, 1976-77 and 1977-78 hunting seasons respectively.

All cougar harvested in March were illegal kills.

The majority of the cougar harvested from 1975-78 were taken in the months of January and February.

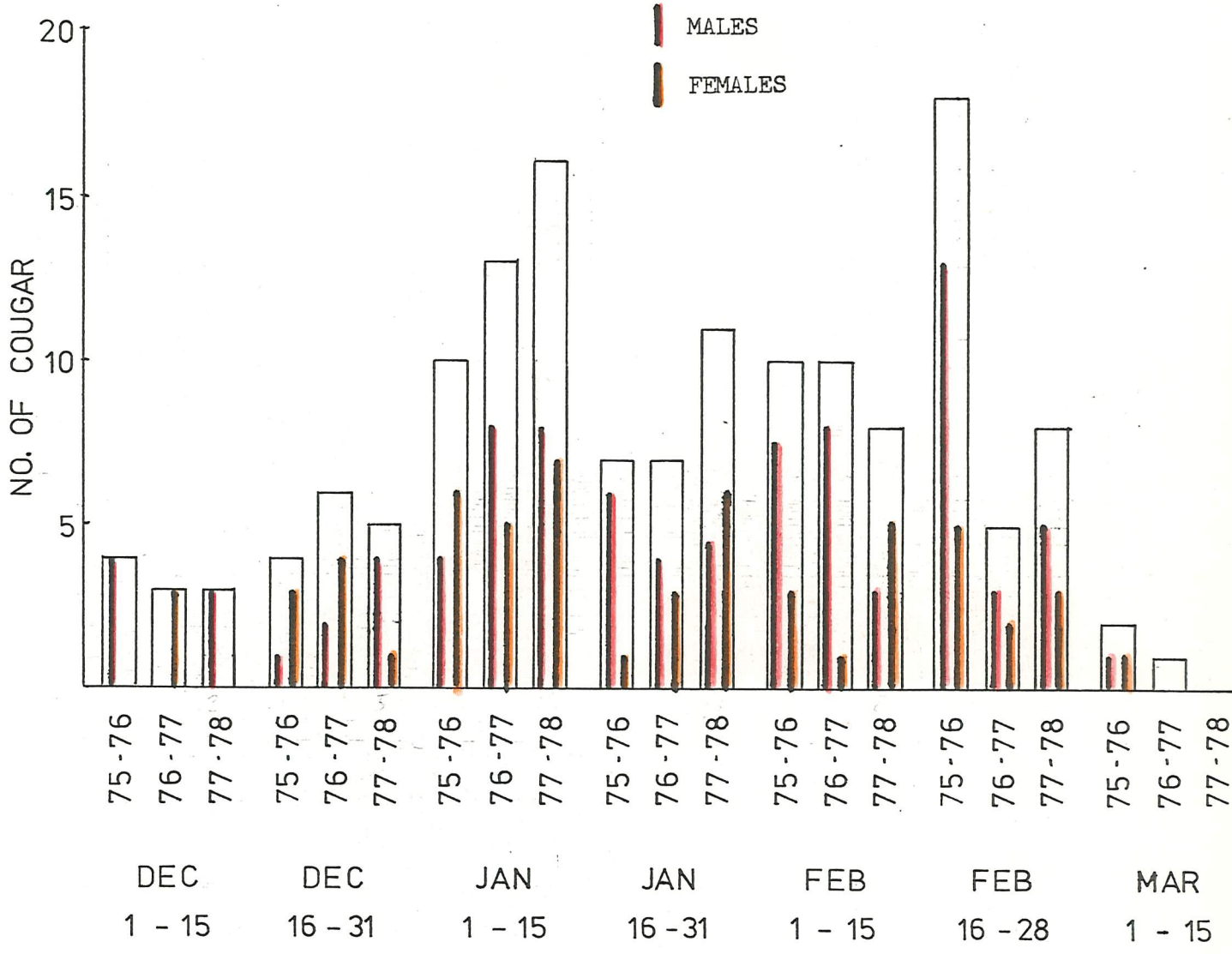


Fig. 10 The cougar harvest distribution over the hunting season 1975-78

THE COUGAR HUNTER

A questionnaire was designed to determine the cougar hunter's attitudes. (Appendix C).

All resident cougar hunters that harvested a cougar, and guide outfitters who guide for cougar, in the Kootenay Region during the 1975-77 hunting seasons were sent a questionnaire. The hunters or guides that have a check mark (✓) beside their name on the compulsory report forms in appendix A were sent the questionnaire. There were 62 of these questionnaires sent out.

The Fish and Wildlife Branch is also interested in the status of the snowshoe hare population and the amount of lynx and bobcat harvested tn management units 4-10, 4-11 and 4-12. This additional request for information was added to the last page of the questionnaire and sent to the cougar hunters and guides in those management units. The hunters or guides that have a (X) beside their name on the compulsory report forms in appendix A were sent the questionnaire asking for this additional information. There were 8 of these questionnaires sent out.

Of the returned questionnaires, 2 were trappers who don't hunt cougar, 1 was not a cougar hunter, and 3 were returned too late to be included in the survey. After removing the trappers and non-cougar hunter's returns, the surveyed sample size was 31. There was a 49 percent return.

The following is a generalized summary of the returns.

The majority of cougar hunters feel that training and hunting

with their hounds is the most enjoyable part of cougar hunting.

Most of them go hunting with others as well as by themselves.

They are generally trophy hunters and may run and tree several cougar before harvesting one.

Most cougar hunters feel cougar are supposed to have a benificial effect on ungulate populations of killing only the weak or sick members of the herds, but they have expressed concerns that this is not the case. They have stated that many prime deer are killed by cougar.

Any information and education program resulting from a Cougar Management Plan must try to clarify the make-up of the cougar's diet to the cougar hunter.

Cougar kill deer indiscriminately, select young elk and avoid prime bulls. Hornocker (1969).

In a wintering deer herd, the bucks are generally around the outer edges of the herd.

This could be one reason why there are so many prime bucks killed. I feel that this is what most cougar hunters are noticing when they are hunting. Spalding and Lewoski (1970) noticed a preponderance of bucks in their samples of cougar-killed mule deer.

Most cougar hunters think cougar could deplete a low ungulate population.

There opinions with regard to the present stability of the

cougar population in the areas they hunt is shown on Table 8.

I can not draw any conclusions from this data at this time.

Most cougar hunters feel that the cougar resource is not being managed properly. They would like to see guide outfitters put on quotas, no harvesting of females with kittens, and the hunting season extended into March.

The actual questionnaire return results are in Appendix C.

This questionnaire only deals with cougar hunters who have harvested a cougar within the 1975-77 hunting seasons. There is a large number of avid cougar hunters who did not harvest a cougar during this time period, so their opinions would not be reflected in this survey.

Table 8 The cougar hunter's opinion of the present status of the cougar populations in the Kootenay Region.

MANAGEMENT UNIT	INCREASING POPULATION	DECREASING POPULATION	STABLE POPULATION
4-1			
4-2		2	2
4-3			2
4-4			1
4-5			
4-6	3	1	1
4-7	1	1	
4-8	1		
4-9			1
4-10	1		2
4-11			2
4-12			2
4-13			
4-14			1
4-15	2		1
4-16		1	
4-17	1		
4-18			
4-19	1		
4-20		1	3
4-21		2	4
4-22		2	2
4-23		1	1
4-24		2	2
4-25		2	1
4-26	1	2	4
4-27			
4-28			
4-29			
4-30			
4-31	2		
4-32	2		
4-33			
4-34			1
4-35			
4-36			
4-37			
4-38			
4-39			
4-40			

The numbers indicate the number of times that management unit was chosen to that particular status by the hunters.

PROPOSED FUTURE REGULATIONS

1) The Proposed Future Harvest figures on Tables 4 to 6 of this report should be adopted as the cougar harvest quotas for each management unit within the Kootenay Region. Hunters should be limited to harvesting a maximum of 1 cougar every 2 years. This would lessen the number of overharvested management units previously discussed in this report.

2) The non-resident trophy fee should be increased to $150. In the 1977-78 hunting season, the non-resident hunters accounted for 40 percent of the total seasons harvest. This is the largest harvest percentage by non-resident hunters to date. This percentage is too high and should be lowered to approximately 25 percent. The higher non-resident trophy fee may accomplish this.

3) There should be a closure on the harvesting of female cougar with a kitten or kittens. This would aid in the cougar recruitment and productivity. The majority of the cougar hunters surveyed in this report call for this.

4) Several hunters are calling for an extension of the cougar hunting season into March. With evidence of overharvesting occuring in 11 management units within the period of the 1975-78 hunting seasons, an extension is not warrented. March is also a time when cougar are often born.

REQUIREMENTS FOR COUGAR MANAGEMENT

Population status of cougar should be ascertained in areas of high annual harvest to adjust harvest quotas.

A standard cougar aging technique should be employed by all Fish and Wildlife Branch District offices. All cougar harvested should be aged. A system of canine eruption, staining and wear seems to be the best. Such a system is used in Nevada.

A study should be initiated to determine the effect of hunting and treeing the same cougar several times within one season. This may be increasingly important as non-consumptive hunting increases.

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