ANALYSIS OF FUR PRODUCTION RECORDS FOR REGISTERED TRAPLINES IN THE AOSERP STUDY AREA, 1970-75

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ABSTRACT

Between 1970 and 1975, the AOSERP study area contained up to 131 registered trapping areas (traplines). Traplines averaged 165.8 km^2 (64 mi^2) in area. For the four trapping seasons 1971-72 to 1974-75, affidavits reporting trapper harvests were available for an average of 75 percent of the traplines. An average of five percent of the traplines reported nil catches each year. The mean annual value of wild fur reported produced per trapline was calculated at $1,252.61, with beaver, lynx, and muskrat having the greatest economic importanance. Fur value produced per square kilometre averaged $7.58 ($19.64/mi^2) but ranged more than 500-fold, with much variation seeming attributable to trapper effort. Cash value per unit area was negatively correlated with trapline size; this relationship appeared to stem primarily from decreasing trapping intensity with increasing size of traplines. It is suggested that trapping areas could in all likelihood have produced, on a sustained yield basis, several times more fur than they had.

ACKNOWLEDGEMENTS

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1. INTRODUCTION

Furbearers collectively are a renewable resource of considerable economic and social importance throughout northern Alberta, yet there is a general lack of information on this group of mammals. This report presents results of analyses of trapping records of registered trapping areas in the Alberta Oil Sands Environmental Research Program (AOSERP) study area (Figure 1). The objectives were: (1) to estimate the economic value of fur trapping in the area between 1970 and 1975; and (2) to test whether analysis of trapping records could provide an indication of furbearer distribution and relative abundance within various sectors of the area. Several earlier reports have presented some trapline production statistics for northern Alberta (Intercontinental Engineering of Alberta Ltd. 1973; Renewable Resources Consulting Services Limited 1975), but none has examined the entire span of records now available (1970-75) for the AOSERP study area itself.

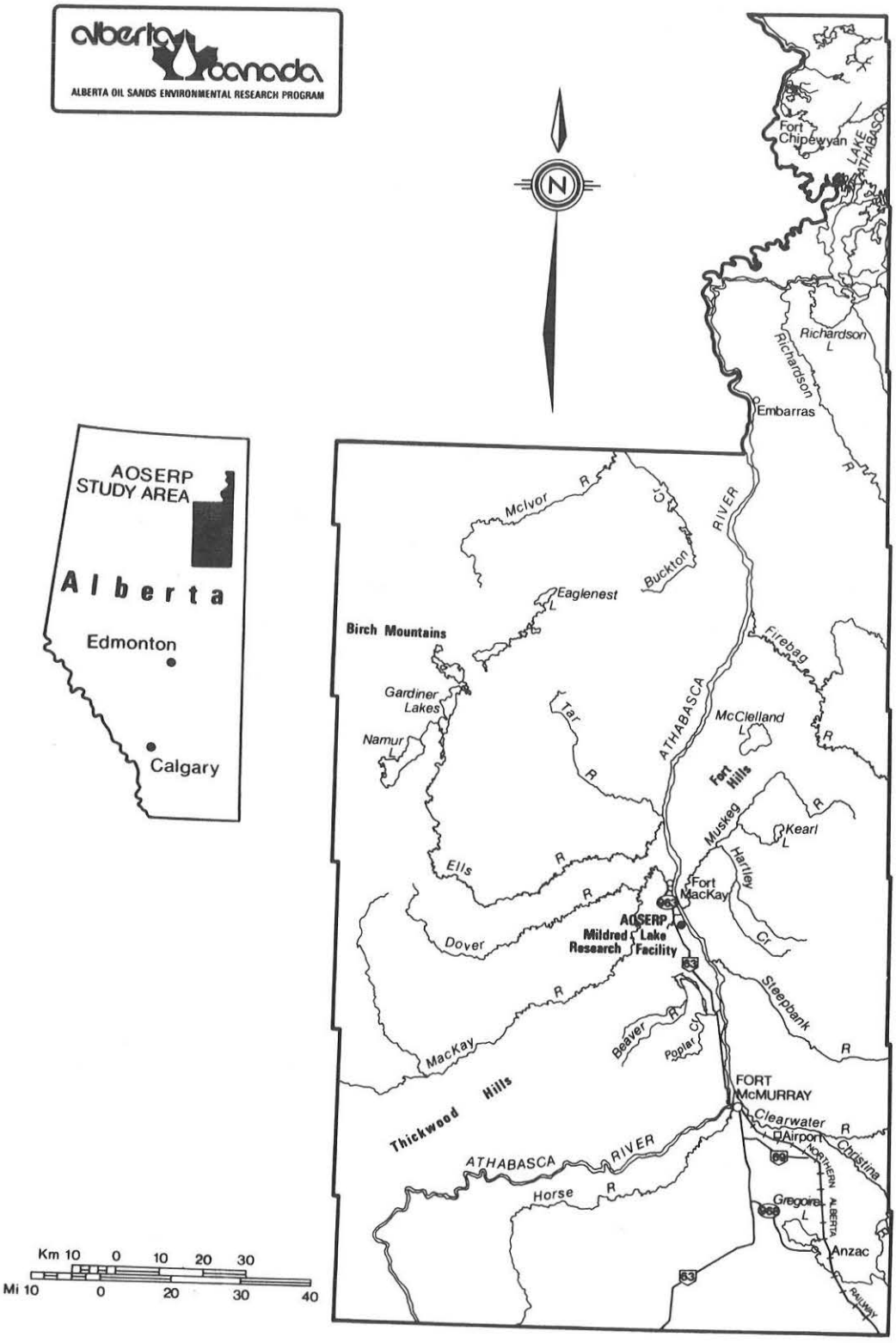

Figure 1. The AOSERP study area.

2. METHODS

Trapline fur production statistics were obtained from Department of Recreation, Parks and Wildlife affidavits, completed by trappers, listing the number of each species caught each year. The statistics compiled may be somewhat inaccurate due to: (1) apparent duplication in reporting by some trapping partners; (2) misreporting by trappers for personal reasons; and (3) recording errors. The magnitudes of these possible sources of error were not determined.

Fur value calculations were based on average yearly fur prices (Table 1). Average pelt prices are derived by averaging the highest and lowest prices paid by each of the five major fur buyers throughout the year. The fur prices received by individual trappers may vary substantially from the calculated averages due to variations in fur quality, pelt handling, fur buyer, and time of fur sale. Value calculations are thus somewhat hypothetical, but are standardized for purposes of productivity comparisons within the area and likely approximate prices received by the trappers under consideration.

Table 1. Average prices ($) of Alberta wild furs, 1970-75.

Species	Year				
	1970-71	1971-72	1972-73	1973-74	1974-75
Beaver	12.28	20.31	24.83	18.35	13.60
Coyote	13.53	17.90	29.18	35.55	30.65
Fisher	37.25	35.02	55.60	40.96	39.76
Fox, arctic	20.61	17.35	27.60	35.83	20.42
Fox, coloured	18.95	23.69	38.49	45.61	35.98
Hare	-[a]	-	-	-	-
Lynx	36.01	46.34	114.43	85.16	102.84
Marten	11.97	15.12	20.16	15.92	12.52
Mink	13.02	18.79	23.65	19.73	12.65
Muskrat	1.13	1.52	2.08	2.24	2.22
Otter	31.22	45.76	53.85	43.57	42.74
Skunk	0.75	0.45	2.46	1.15	1.50
Squirrel	0.38	0.68	1.26	0.97	0.78
Weasel	0.65	1.00	1.50	1.50	1.22
Wolf	42.47	56.96	97.79	70.05	49.75
Wolverine	52.65	75.96	120.67	77.20	95.34

[a]No economic value for pelts.

3. RESULTS

The AOSERP study area contained 131 registered trapping areas through the 1974-75 trapping season (Table 2). Trapping areas averaged 164.8 km^2 (63.6 mi^2) in size. The modal size class was 78 to 101 km^2 (30 to 39 mi^2) (Figure 2).

Excluding the 1970-71 trapping season when trapline records were very incomplete (Table 2), affidavits reporting fur-bearer harvests (including nil catches) were, on the average, available for 75 percent of the traplines. Reports of nil catches (doubtless reflecting no trapping effort) were made for an average of five percent of the trapping areas each year.

Trapping activity apparently declined somewhat from 1972-73 to 1974-75, as evidenced by increases in both numbers of traplines vacant and reports of nil catches (Table 2). This same trend generally appeared to have occurred in the rest of the province and seemed attributable to a declining interest in trapping due to cyclic declines in numbers of some carnivores. This was coupled with disappointingly low prices for beaver (Table 1) which is one of the staple species for Alberta trappers.

The mean annual value of wild fur reported produced per trapline (including those lines which were untrapped) in the AOSERP study area during 1970-75 was calculated at $1,252.61 (Table 3). Beaver, lynx, and muskrat collectively contributed over 80 percent of the annual fur value; all other species were relatively unimportant. Note that overall averages for the area may be somewhat misleading because 17 traplines in the Peace-Athabasca Delta produced approximately 75 percent of the total muskrats (43,000)[1] reported caught between 1970 and 1975. Value of muskrat fur produced was insignificant on the vast majority of the remaining traplines. Muskrats are often trapped heavily only where they occur in notable concentrations. Furthermore, suitable muskrat habitat is largely lacking in the southern two-thirds of the study area.

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[1]Animals trapped in Wood Buffalo National Park or Indian reservations would not be included in this figure.

Table 2. General statistics on traplines in the AOSERP study area, 1970-75.

Number of Traplines	Trapping Season				
	1970-71	1971-72	1972-73	1973-74	1974-75
Not reporting	116	39	25	25	24
Reporting successful catches	13	85	104	96	78
Reporting nil catches	0	6	2	7	13
Vacant	0	0	0	3	13
Total	129	130	131	131	131

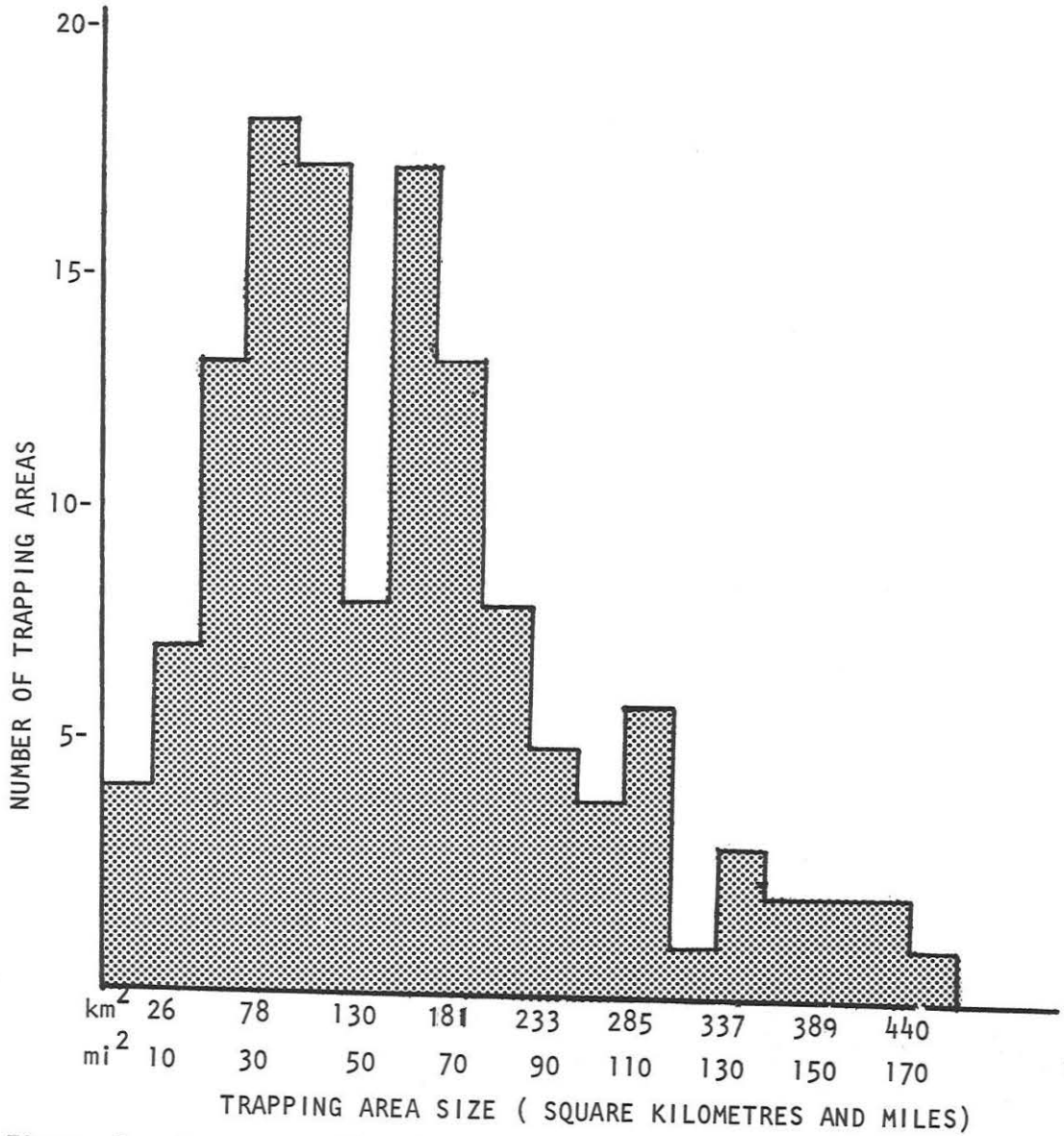

Figure 2. Frequency distribution of 1974-75 sizes of 131 trapping areas in the AOSERP study area.

Table 3. Mean annual number and value of furbearing species reported harvested per trapping area in the AOSERP study area, 1970-75 (nil yearly catches are exluded).[a,b]

Species	Number	Value ($)
Beaver	21.9	416.38
Coyote	0.8	22.52
Fisher	0.6	25.50
Fox, arctic	tr[c]	1.34
Fox, coloured	0.7	25.88
Hare	13.8	-
Lynx	4.7	360.10
Marten	0.1	2.35
Mink	4.1	75.11
Muskrat	115.8	236.47
Otter	0.2	7.96
Skunk	0.3	0.48
Squirrel	63.6	55.20
Weasel	5.6	7.27
Wolf	0.2	13.43
Wolverine	tr	2.62
Total		1,252.61

[a] Average size of trapping areas was 164.8 km^2 (63.6 mi^2).

[b] Number of traplines reporting catches was 13, 85, 104, 96, and 78 in 1970-71, 1971-72, 1972-73, 1973-74, and 1974-75, respectively.

[c] tr = trace = < 0.05.

The 5-year period under consideration may not be representative of a longer time span. For instances, due to greatly elevated prices, lynx have had much greater economic importance in Alberta in recent years than during any other period in the 20th Century. Beaver, muskrat, and squirrel have traditionally been the staple furbearers in Alberta. It is also important to realize that potential value and importance ranking of the various species (under optimum sustained yield harvests) might differ from those realized in the current period. For instance, the author believes that the red squirrel is greatly underharvested compared with several other furbearers. In recent years the Alberta squirrel harvest has averaged about one-fifth of the harvest 20 to 30 years earlier. This long-term trend seems at least in part attributable to increased reliance on beaver, as well as long-haired furs (especially lynx and coyotes) in recent years.

For further analysis, average annual fur value figures were divided by trapline sizes to compare cash yields per square unit and thus eliminate variations in trapline size. Value of fur taken averaged \$7.58/km^2 (\$19.64/mi^2) of trapline. The cash yield per unit area (excluding nil catches) ranged from a low of \$0.27 per km^2 (\$0.69 per mi^2) to more than \$135.00/km^2 (\$350.00/mi^2). Traplines producing wild fur valued at more than \$19.30/km^2 (\$50.00/mi^2) of trapline were arbitrarily considered outstanding (Figure 3). Fifty percent of these 16 traplines were located in the Peace-Athabasca Delta area and owed their high returns primarily to muskrat catches. The average cash yield per unit area fur traplines in that area (27.85/km^2 or \$72.14/mi^2), was significantly higher ($p < 0.05$) than that for traplines in the remainder of the AOSERP study area. This was the only significant difference found between areas.

Fur production on individual traplines may of course be influenced by a number of factors, which include habitat quality and furbearer abundance, as well as trapper effort and skill.

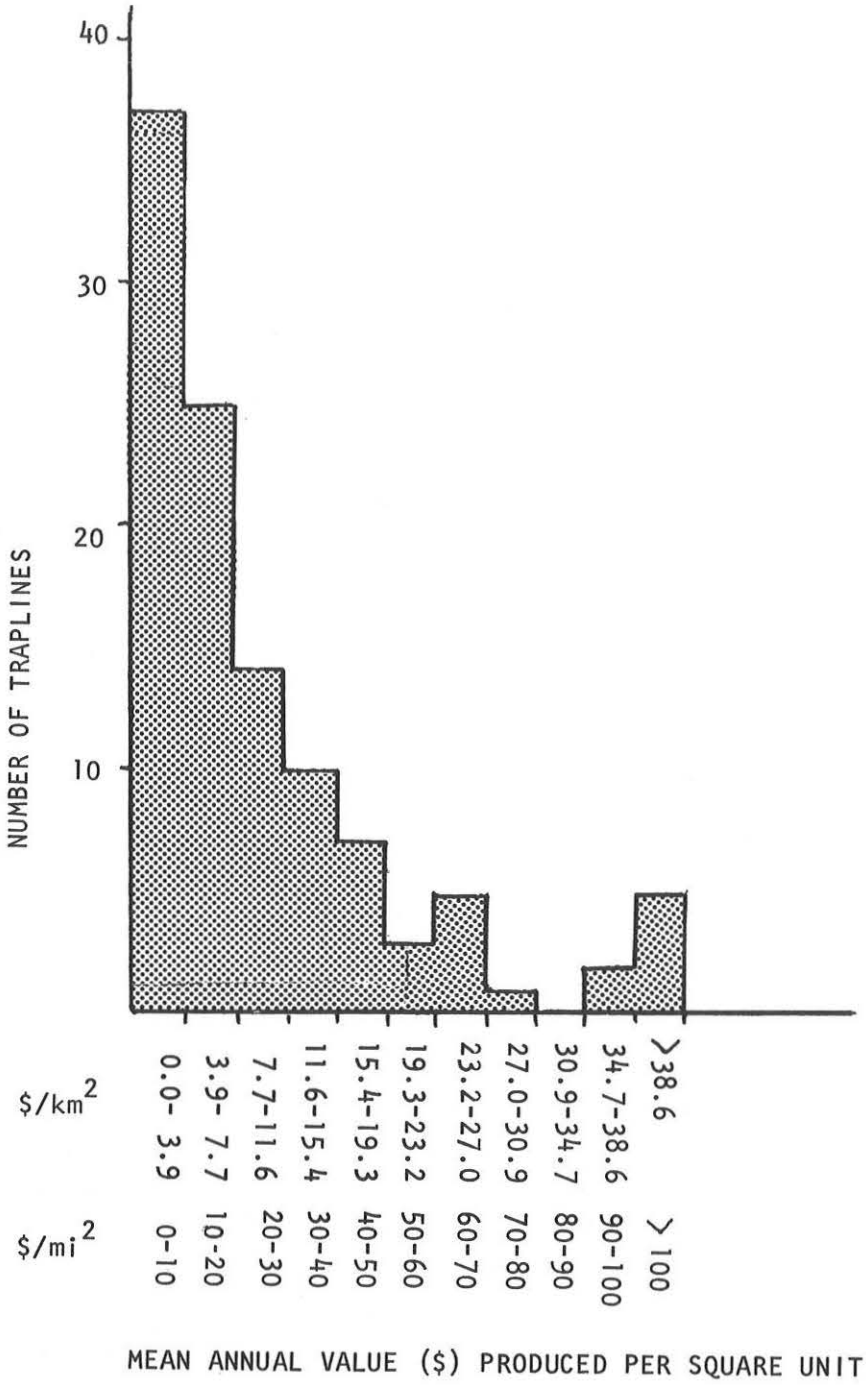

Figure 3. Frequency distribution of mean annual value of fur produced per square unit of trapping area, AOSERP study area, 1970-75 (trapping areas with less than two years reported catches excluded).

Much of the variation in fur production per unit area seemed attributable to differences in trapping intensity. Adjoining traplines comprised of similar habitats often differed more than two- to four-fold in average cash yields per square unit.

The author hypothesized that trapping intensity was inversely related to trapline size and, therefore, tested the relationship between cash yields per square kilometre and trapline size (Figure 4), excluding some small, very productive trapping areas on the Peace-Athabasca Delta. As expected, cash yields per unit area decreased significantly with increasing trapline size ($r = 0.432$, $p < 0.001$). While this relationship might reflect trapping intensity, it could simply arise if traplines were originally made larger in less productive areas. For further analysis, the mean cash value per unit area for directional traplines was tested against the mean for block-shaped areas. The trapping areas of directional lines consists of a strip 0.8 km (0.5 mi) on either side of the blazed line which described the trapline. Hence, by definition, a directional line is apt to be trapped more intensively than a block of similar size. The mean cash yield on 23 directional lines was double that on 79 block-shaped areas, \$14.33/km^2 (\$37.12/mi^2) vs. \$6.96/km^2 (\$18.05/mi^2) ($p < 0.005$). Note that the mean size of the block-shaped area was considerably larger than the mean for directional traplines (189 km^2 [73 mi^2] vs. 104 km^2 [40 mi^2]) but this mean size difference only accounts for a 25 percent difference in the expected cash value of fur produced per square unit on traplines of these sizes (Figure 4). Hence, trapping intensity would appear to be the major variable.

The total number of active beaver colonies believed sustainable was estimated for all trapping areas within planimetric mapsheet 74D (about 40 percent within the AOSERP study area) using data from the Alberta Land Inventory--Furbearers (Todd, unpublished data, collected for Alberta Fish and Wildlife Division). Upper and lower limits of estimated total active

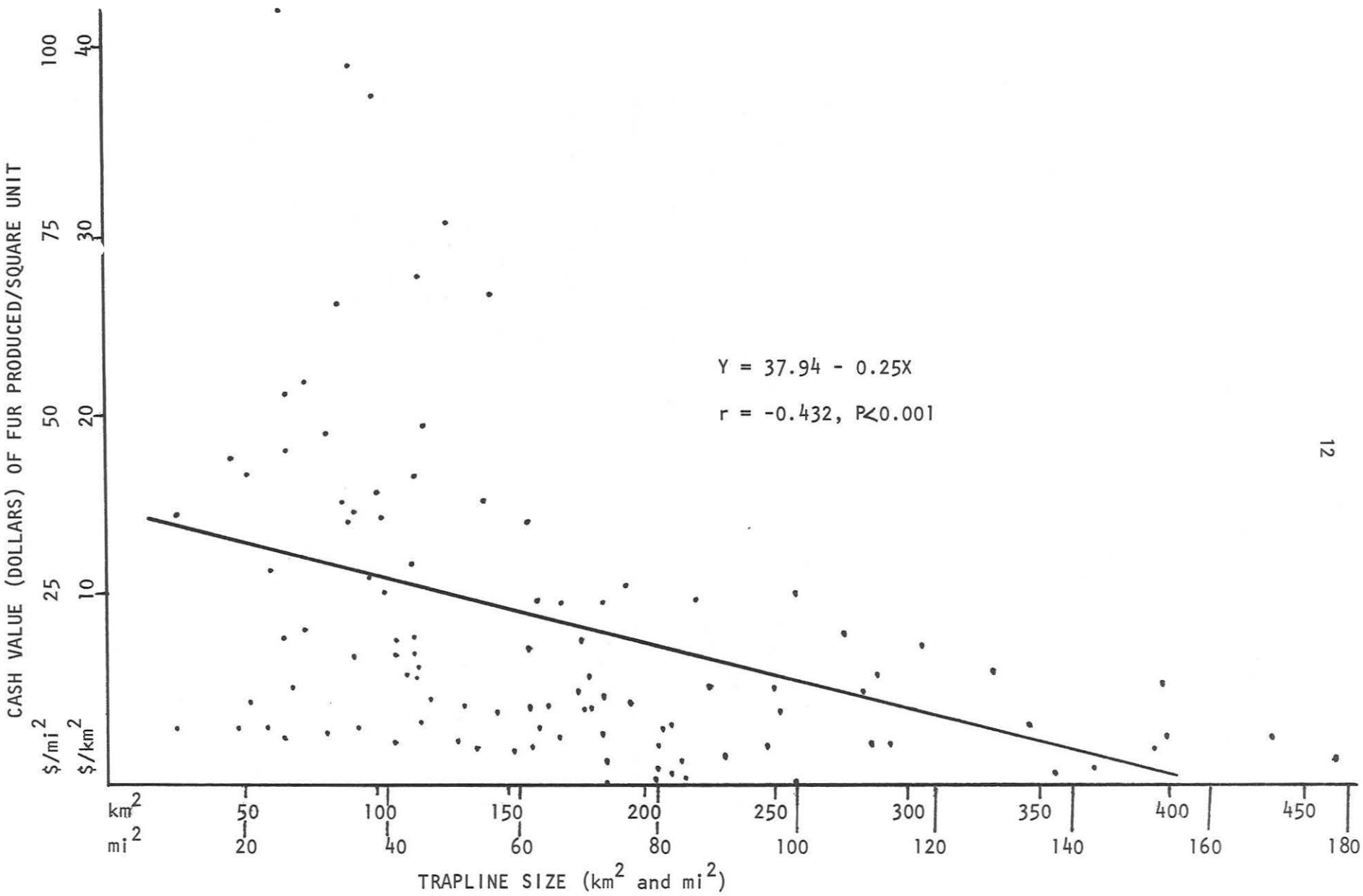

Figure 4. Relationship between trapline size and average value of wild fur harvested per square unit.

beaver colonies were then compared to recent beaver harvests reported for 22 traplines. The average number of beaver reported harvested ranged from 0.5 to 0.9 per active colony, using minimum and maximum colony estimates, respectively. Since quotas for beaver have traditionally been based on 1 beaver per colony (and this figure appears to be generally conservative if appropriate harvest rotation methods are used), it follows that beaver harvests on mapsheet 74D could, on the average, be increased several fold on a sustained yield basis. Additional information on colony sizes and limiting factors is, of course, required to accurately set quotas on the basis of active colonies, but it seems reasonable to assume harvest levels equivalent to two beaver per active colony could be sustained in intermediate quality habitats by use of rotating trapping methods (see also Gunson 1970).

It should be noted that, although colony estimates pertain to capability and hence may seem hypothetical, 1975 densities observed were almost invariably within capability estimates. In light of the relative year-to-year stability of beaver populations compared to most other furbearers, the above comparison of 1975 populations with 1973 or 1974 harvests may not be as ludicrous as it might seem.

Note that mean reported beaver harvests on the 22 traplines above were not correlated with estimated numbers of beaver colonies ($r = +0.089$). This finding supports earlier indications that habitat quality and furbearer abundance are not the chief variables affecting fur production on individual traplines. It follows that detailed analysis of trapline records cannot be used to secure information on local furbearers abundance, although comparisons of regional trapline averages may be worthwhile.

4. DISCUSSION

This report presents statistics on trapline harvests and estimates the average annual value of fur produced on traplines in the AOSERP study area between 1970 and 1975. Considerable evidence is presented to show that many traplines were greatly under-utilized; thus, the potential economic value of the wild fur resources in the area were several-fold that realized during 1970-75. Anyone judging the significance of the wild fur industry should keep this fact in mind. However, cultural and recreational aspects of trapping which are ignored in this report should also properly be considered in judging the significance of trapping.

5. LITERATURE CITED

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6. AOSERP RESEARCH REPORTS

1.		AOSERP First Annual Report, 1975
2.	AF 4.1.1	Walleye and Goldeye Fisheries Investigations in the Peace-Athabasca Delta--1975
3.	HE 1.1.1	Structure of a Traditional Baseline Data System
4.	VE 2.2	A Preliminary Vegetation Survey of the Alberta Oil Sands Environmental Research Program Study Area
5.	HY 3.1	The Evaluation of Wastewaters from an Oil Sand Extraction Plant
6.		Housing for the North--The Stackwall System
7.	AF 3.1.1	A Synopsis of the Physical and Biological Limnology and Fisheries Programs within the Alberta Oil Sands Area
8.	AF 1.2.1	The Impact of Saline Waters upon Freshwater Biota (A Literature Review and Bibliography)
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11.	AF 2.2.1	Life Cycles of Some Common Aquatic Insects of the Athabasca River, Alberta
12.	ME 1.7	Very High Resolution Meteorological Satellite Study of Oil Sands Weather: "a Feasibility Study"
13.	ME 2.3.1	Plume Dispersion Measurements from an Oil Sands Extraction Plant, March 1976
14.	HE 2.4	Athabasca Oil Sands Historical Research Design (3 Volumes)
15.	ME 3.4	A Climatology of Low Level Air Trajectories in the Alberta Oil Sands Area
16.	ME 1.6	The Feasibility of a Weather Radar near Fort McMurray, Alberta
17.	AF 2.1.1	A Survey of Baseline Levels of Contaminants in Aquatic Biota of the AOSERP Study Area
18.	HY 1.1	Interim Compilation of Stream Gauging Data to December 1976 for the Alberta Oil Sands Environmental Research Program
19.	ME 4.1	Calculations of Annual Averaged Sulphur Dioxide Concentrations at Ground Level in the AOSERP Study Area
20.	HY 3.1.1	Characterization of Organic Constituents in Waters and Wastewaters of the Athabasca Oil Sands Mining Area

21.		AOSERP Second Annual Report, 1976-77
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23.	AF 1.1.2	Acute Lethality of Mine Depressurization Water on Trout Perch and Rainbow Trout
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26.	AF 4.5.1	Interim Report on an Intensive Study of the Fish Fauna of the Muskeg River Watershed of Northeastern Alberta
27.	ME 1.5.1	Meteorology and Air Quality Winter Field Study in the AOSERP Study Area, March 1976
28.	VE 2.1	Interim Report on a Soils Inventory in the Athabasca Oil Sands Area
29.	ME 2.2	An Inventory System for Atmospheric Emissions in the AOSERP Study Area
30.	ME 2.1	Ambient Air Quality in the AOSERP Study Area, 1977
31.	VE 2.3	Ecological Habitat Mapping of the AOSERP Study Area: Phase I
32.		AOSERP Third Annual Report, 1977-78
33.	TF 1.2	Relationships Between Habitats, Forages, and Carrying Capacity of Moose Range in northern Alberta. Part I: Moose Preferences for Habitat Strata and Forages.
34.	HY 2.4	Heavy Metals in Bottom Sediments of the Mainstem Athabasca River System in the AOSERP Study Area
35.	AF 4.9.1	The Effects of Sedimentation on the Aquatic Biota
36.	AF 4.8.1	Fall Fisheries Investigations in the Athabasca and Clearwater Rivers Upstream of Fort McMurray: Volume I
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38.	VE 7.1.1	Techniques for the Control of Small Mammals: A Review
39.	ME 1.0	The Climatology of the Alberta Oil Sands Environmental Research Program Study Area
40.	VE 7.1	Interim Report on Reclamation for Afforestation by Suitable Native and Introduced Tree and Shrub Species
41.	AF 3.5.1	Acute and Chronic Toxicity of Vanadium to Fish
42.	TF 1.1.4	Analysis of Fur Production Records for Registered Traplines in the AOSERP Study Area, 1970-75.

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