FUR PRODUCTION OF THE BOREAL FOREST REGION OF BRITISH COLUMBIA

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source: The Journal of Wildlife Management, Volume 21, Number 3, July 1957

(The authors express appreciation to F.R. Butler, Game Commissioner, B.C. Game Department, for permission to use data and for assistance in compiling them.)

Since earliest historical times, fur-bearing animals have constituted an important part of the natural resources of Canada. Eighty percent of Canadian territory is still in the phase of land use where primary resources are of first importance. This it is that the fur harvest remains a vital source of income to about 47,000 trappers, native and white. The fur yield varies across Canada, but in 1950-51 it averaged $13 per square mile in Manitoba and Ontario, and at this level was the most important source of wealth on much of the wild lands of these provinces (Cowan, 1955).

Despite the importance of the fur resource there is, with few exceptions, almost no information on the ecological requirements of fur species, on the densities the species achieve, or on the yield they can supply in the different ecological regions that they inhabit.

The registered trap-line (= trapping area) system was developed in British Columbia and has been in full operation here since 1929 (Eklund, 1946). In brief the system consists of allocating to each trapper the sole right to trap on a defined area. Trappers, Indians excepted, are required to submit annually a statement of the animals taken from their lines. These accumulated reports now constitute a unique body of data on fur animals in western Canada. This paper is the first of a proposed series using these data to study fur production and fur management in the various and diversified ecological regions of British Columbia.

The present study deals with fur production in the boreal forest region of northern British Columbia as delineated by Halliday (1937). Fig. 1 outlines the region, which comprises 67,200 square miles on which 310 trappers hold registered trap lines. The 164 trap lines selected for detailed study have a mean area of 144 square miles each. They were selected solely on the basis of continuity of record, but even on these, changes in ownership and in methods of record-keeping provide continuous comparable records for only an average period of 10.8 years.

This is a spatial rather than a temporal study, with production for different subregions calculated for the same span of years. Thus temporal influences on trapping effort, such a changing prices of fur, are not of importance in influencing the relative productions from the seven forest subregions studied. The same many probably be said for cycles. In production figures calculated for any period of years, variations in the population density of the important species will influence the average annual production levels, but in examining relative differences in production between adjacent areas of limited size cyclic changes in abundance are of less importance.

In this study, cycles have been largely ignored expect for our having established that each of the species most subject to violent fluctuations increased and declined more of less synchronously throughout the boreal forest.

The few other studies of fur production on designated ecological regions are, for one reason or another, not comparable to the present one. Quick (1953) studied some trap lines about Fort Nelson; these lines are included in our data. Hess (1946) reported on the catch from one Ontario clay belt trap line over 14 years. In both instances, the areas studied were so small that human activity on surrounding areas could exert a powerful influence. Peterson and Crichton (1949) studied fur production on a small part of central Ontario but it is difficult to compare their data with ours.

Fig. 1: Extent of the boreal forest in British Columbia. Numbered subregions are: 1 - Yukon; 2 - Stikine; 3 - Liard; 4 - Nelson; 5 - Northern Peace; 6 - Peace Parkland; 7 - Southern Peace (after Halliday, 1937).

Study Methods

The annual catch reports from 1929 to 1948 inclusive constitute the basic data for this study. As part of its trap-line control system, the Provincial Game Commission maintains maps of all lines, and it is these that have permitted our calculations of trap-line areas and corresponding yield.

We have calculated productivity for each species in the form of average number of square miles that produced one pelt per annum.

In this way, yield on the seven different areas included in the boreal forest region of British Columbia can be compared. There is unfortunately no way as yet to relate such productivity figures to theoretical maximum yield or directly to the size of the population being exploited.

The boreal forest region of British Columbia is not uniform in its ecological characteristics and can be divided into seven areas differing in vegetation, altitude, drainage characteristics, proximity to alpine or grassland conditions, the extent of burned areas, the abundance of man and his works, and other factors.

When one considers these factors over so large an area, it is the broad picture that is most important. Localized personal experience can be misleading, as exemplified in certain conclusions reached by Quick (*op. cit.*) that are at variance with the over-all situation. Most of our data on ecological conditions have been drawn from the physiographic surveys of Bostock (1948), various geological surveys (Camsell, 1936; Dawson, 1881, 1898; Johnston, 1926; McConnell [in Dawson, 1898]; and Watson and Mathews, 1944), the forest classification of Halliday (1937), and unpublished forest surveys undertaken by the British Columbia Forest Service, particularly those of A.E. Collins; and the 1941 census of Canada undertaken by the Dominion Bureau of Statistics (Anon., 1944).

Description of the Area

For the boreal forest region of British Columbia the characteristic vegetation occurs from river bottom to timberline. In its climax form, trees are mainly white spruce *(Picea glauca),* black spruce *(P. mariana),* and balsam fir *(Abies balsamea).* Periodic fires, often extensive, appear to be natural phenomena, and result in seral forest areas as a normal feature of most parts of the region. Seral stages feature aspen *(Populus tremuloides)* and white birch *(Betula papyrifera)* with lodgepole pine *(Pinus contorta)* replacing the jack pine *(P. banksiana)* that is found throughout this forest elsewhere in Canada.

Five major river systems drain this part of the province, the Yukon and its tributaries, the Stikine and Taku, the Liard, and the Peace.

Physiographically the region falls into two main systems, the Cordilleran and the Great Plains (Moore, 1944). In the former the boreal forest is confined to the lowest elevations of three plateaux. The Yukon and Stikine plateaux, both of high elevation, and the Liard Plain, of lower elevation, lie west of the Rocky Mountains. East of these the forested extension northward of the Great Plains covers the entire area.

Within the boreal forest seven subregions can be recognized on the basis of physiography and vegetation (Fig. 1); these are as follows.

The Yukon forest subregion, restricted in size and confined to the lowest elevations of valleys, drains the Yukon plateau. This plateau is a much-eroded and treeless tableland, with an elevation of about 5,000 feet. Tree line is at approximately 3,800 feet. Numerous lakes characterize the area, some of them large. The weather is dry in the rain shadow of the Coast Mountains, records from Atlin indicating an average annual precipitation of only 11 inches. Generally speaking, the forest is stunted and open, with extensive burns forming seral forests of aspen with abundant grasses.

The Stikine forest is similar and confined to valleys in the extensive, treeless Stikine plateau with an elevation of about 4,000 feet. Burns are large and numerous, particularly in the west. This plateau is less eroded than the Yukon plateau, its valleys are narrower and lakes less numerous except for a restricted area to the northeast near Dease Lake. The top of the plateau itself, above tree line, is boggier than the more eroded plateau to the north.

The Liard forest covers the intermountain Liard plain, an area with little relief, and with all elevations lying below 3,000 feet. Large poorly drained areas have bogs and muskegs, while drier sites, particularly to the west and near the Cassiar Mountains, are frequently burned and support grasslands or aspen forests as a result.

The Nelson forest covers the Liard drainage on the Great Plains. This forest is little influenced by alpine conditions, a feature variously characterizing the boreal forest within the Cordillera. Since the mountains to the west of this forest are relatively low, this is the most humid of the seven forests. Drainage is poor, with muskeg extensive and lakes abundant. Drier sites are frequently burned.

The Northern Peace forest resembles the Nelson forest, except that it is better drained; a relatively larger area is subject to foothill topography. Southern portions are influenced vegetationally by the Peace parkland to the south.

The Peace parkland is the most isolated from alpine and subalpine conditions bo the seven forests. It is characterized by grassy aspen parklands, pockets of rich agricultural soil, and elevations ranging from 1,800 to 2,400 feet. Logging has removed much of the original coniferous forests, and large areas of burn are common.

The Southern Peace forest resembles the coniferous forests to the north, except that from its smaller size it is most influenced by foothill topography, is better drained, and includes a more influential intrusion of the grassland conditions that reach fullest expression in the parklands.

The influence of humans throughout the boreal forest has not been uniform. Agricultural soils in the Peace parklands have attracted the densest human population in northern British Columbia. Here agriculture and logging have changed the natural vegetation; similar influences are penetrating both the North and South Peace forests, particularly the latter. Human influence has been unimportant in the Cordilleran areas except for the highway along the Liard valley, and mining activity near Atlin. However, mineral exploration is intensifying, and major discoveries may further affect the area.

Fur Production

For the purpose of discussion of fur yields, we assume that the economic motive to trap has been equally operative throughout the region and therefore that yield figures from one subregion to another reflect to some close degree the population of fur bearers available.

The yields of each of the twelve species of fur-bearing mammals occurring as regular inhabitants are shown in Fig. 2. Each graph compares one species through the seven subregions. In interpreting the graphs, it must be remembered that the shortest columns represent the highest yields.

Several species are not included in the graphic treatment. Striped skunk *(Mephitis mephitis),* raccoon *(Procyon lotor),* and cougar *(Felis concolor)* are occasionally taken adjacent to the Peace River, but are beyond their normal range. The otter *(Lutra canadensis)* occurs regularly but in small numbers in 6 of the 7 subregions. The average number of square miles per otter pelt is subregional order 1 to 7 is 1,783; 1,298; 1,334; 1,526; 4,385; nil; 3,029. It is the rarest of the indigenous fur bearers throughout northwestern North America.

The yield densities illustrated show consideration variation from species to species, and from area to area, but despite this there are manifest tendencies for groups of species to be associated in yield. Thus, areas with a high muskrat *(Ondatra zibethica)* yield also have a high weasel *(Mustela* spp.) yield; red squirrel *(Tamiasciurus hudsonicus)* also falls into this association with the exception of the Stikine forest. The figures for coyote *(Canis latrans)* and wolf *(C. lupus)* are somewhat alike in trend and conform to the pattern of weasel and muskrat. There are notable differences, however, such as the low yield of coyote in the Nelson forest.

The remaining seven species, plus the otter, differ in trend from the five already mentioned. The relatively poor production in the Peace parklands of otter, beaver *(Castor canadensis),* mink *(Mustela vison),* marten *(Martes americana),* lynx *(Lynx canadensis),* and wolverine *(Gulo luscus)* is marked. Similarly the highest production of beaver, marten, lynx, and fox *(Vulpes fulva)* is reached in the Nelson forest.

Another observation is that yield in the mountain areas is markedly lower than it is in the forested plains.

In two species there are almost "clinal" trends in yield. Wolverine show an almost constant decrease from northwest to southeast. Fisher *(Martes pennanti)* appears to be absent from the Yukon and Stikine forests and becomes progressively more abundant from north to south on the plains.

Fig. 2: Yields of 12 species of fur-bearing mammals in seven subregions of the boreal forest.

Analysis and Discussion

Several factors influence the fur yield taken from any region. Of first importance is the stock available to the trapper and it is this that is of the most interest to us in the present study. Another highly important factor is the incentive to trap. This can be applied either as a high price for the catch or as reduced alternative methods of obtaining financial return for labour.

Innis (1927), in his study of the economics of the fur trade in Canada, suggests that fur species may be divided into two categories, fine fur and coarse fur. According to him, fine fur, such as fox or marten, has high value and fluctuating supply and is sought up to the limits of availability. Coarse fur, such a muskrat and wolf, has low value per pelt and consequently is neglected where fine fur is abundant. It should be pointed out also that the majority of the so-called coarse fur species are either of high ecological tolerance, or are associated with disturbed or seral stages of the forest, or with rich-land environments such as marshes.

Fine Fur Species

Innis (*ibid.)* recognizes as a characteristic of fine fur that production is proportional to the abundance of the species concerned, and is not appreciably affected by changing economic conditions. This appears to have been true for a long period in the trapping history of Canada, and is accepted as true by the many authors who have contributed to the extensive literature concerning cycles in fur-bearing mammals.

It is apparent from field experience with large trap lines in several parts of British Columbia that, prior to about 1950, this was an acceptable rule in most cases. Fine fur was taken as available if there was any trapping at all. Since that date the price of fur has been exceptionally low, so low in fact that it appears to have created a situation unique in Canada's history of fur production. In the past few years many trappers have not trapped at all. The low financial return from tapping is not enough to justify the effort. A general condition of poverty has spread across many parts of Canada where fur was formerly a major product with no other important means of income available. No such period of low fur demand has influenced the period under study.

The distinction between coarse and fine fur species is a most important one because from it follows the inference that the yield of fine fur will closely parallel availability, whereas this will only be true of the species of low value where more valuable species are scarce or absent.

From Fig. 2 it can be seen that those species falling into the coarse fur category, wolf, coyote, weasel, red squirrel, and muskrat, show high yields in the Peace River forests where mink, marten, beaver, and lynx are low. They are high also in those plateau forests of the northwest where production of fox, lynx, marten, and fisher is low. Conversely, areas with high yields of fine fur usually have low coarse fur yields.

Fig. 3: Average size in square miles of trapping areas in seven subregions of the boreal forest.

However, another factor enters. Fig. 3 shows the average trap "line" area for each of the seven forest subregions. There is strong negative correlation between the yields of the five coarse fur species and trapline size. That is, coarse fur production is high where trapline size is small. The coefficients of correlation (using "sq. miles per pelt" , hence positive correlations) and probabilities resulting from "t" tests (Goulden, 1939) are: muskrat r = 0.987 with P less than 0.01; weasel r = 0.821, P = 0.02; red squirrel (omitting Stikine forest) r = 0.864, P less than 0.01; coyote r = 0.701, P = 0.05; and wolf r = 0.754, P = 0.02.

These figures strongly suggest that trapline size has a major influence upon the production of coarse furs. Small traplines produce a higher yield per unit area, while large traplines are low producers.

The influences affecting trapline area are several but the most important appears to be that of demand for space in which to trap. In northern British Columbia the smallest trapping areas are found in and about the regions containing the most people. A system of registering the boundaries will tend to oppose this trend toward smaller lines with an increase of human population. However, in British Columbia most lines were registered after supply and demand had already established a pattern of trapping area size.

The pattern of fur yield on the areas producing primarily coarse furs is the result of influences that may be summarized as follows. Agriculture and lumbering may have altered the area so as to render it unsuitable for the fine fur species; at the same time intensive trapping upon the smaller traplines may have depleted those species with an inherently low density.

If this interpretation is correct, it follows that coarse fur species are more or less ignored on the larger trapping areas where fine fur is available. The continuance of high per-unit-area yields of coarse fur even on the smallest areas also implies that these fur species are inherently highly productive and that trapping is unlikely to reduce productivity over a period of years. This is to say that careful management is less important for these species than it is for the species of lower density that have proven vulnerable to reduction through human influence.

We have observed that the first of these implications is correct. Where marten, lynx, and fisher are available in numbers, trappers may not bother with lower-priced species. However, it is worth remarking that elsewhere in Canada there are areas of especially high muskrat production where this species is preferred over all other because ease of capture and abundance make it profitable to concentrate on it even when fine fur is present.

Thus, in northern British Columbia the factors influencing coarse fur production seem to be those affecting the efficiency with which an area is harvested. In a sense, these are often more economic that biological.

It is self evident that while the factors described above may set the stage for high coarse fur production, if a species is scarce its production will be low. This is believed to be the situation with respect to the squirrel yield in the Stikine forest where several other species, including lynx, fox, and marten, are also scarce.

Some significant facts on relative densities can be derived from comparison of the yields of the different fine fur species on the seven forest areas.

Wolverine: Innis (*op.cit.)* considers this to be a coarse fur species. However, in northern British Columbia its production is more like that of the fine furs. Its fur is in high demand for trimming outdoor clothing and this, along with the wolverine's reputation for destructiveness on traplines, leads to intensive trapping effort. Its fur yield is probably a close reflection of population density.

Fig. 2 illustrates a decreased density from northwest to southeast with near absence from the Peace parklands. Several authors describe the wolverine as being most abundant in alpine and subalpine areas (Dixon, 1938; Grinnell, *et al.,* 1937), and Clarke (1940) records it far out on the Arctic barrens. Unpublished studies in Wells Gray Park, British Columbia, reveal it as a timberline species in summer but frequently encountered in adjacent forested valleys in winter. This habitat preference agrees well with its fur production. It has highest production on the high, cold plateaux in the northwest (236 and 352 square miles per pelt), lower production in the mountain-encircled Liard forest (426 square miles), and still lower production on the forested plains east of the mountains (697 to 9,232 square miles). Proximity to mountains seems to increase production, a point on which we disagree with Quick (1953). This was further tested by calculating production for the four areas bounded by meridians of longitude on the forested plains and north of the Peace River. The numbers of square miles required to produce one pelt were from west to east: 741; 932; 1,003; and 4,244. This shows that, while wolverine production upon the forested plains is relatively low, it is highest in the west next to the mountains and becomes progressively lower with increased distance from them.

Marten: Lowest yields, approximately 450 square miles per pelt, are found in the Yukon forest and Peace parkland (Fig. 2), the two forests most influenced by human activity. It is unlikely that the Peace parklands ever had a high population of marten, as it was ecologically unsuitable even when first entered by whites. Since then agriculture, fire, and logging have further altered the environment.

Of the better areas, Nelson forest has the highest yield with 12.9 square miles per pelt per annum, and Stikine forest the lowest with 80.3 square miles per pelt.

In this species, as with the wolverine, production east of the Rockies decreases in direct relation to distance from the mountains. Calculations of yield in four regions progressively removed from the mountains are 16, 16, 45, and 124 square miles per pelt. No habitat factor of probable significance included in this study appears to follow a similar pattern, and no explanation can be offered for this trend in marten population.

Fox: Fox production by forest section falls into two distinct groups (Fig. 2), the low-producing Cordilleran forests with production as low as a pelt per 432.6 square miles, and the high-producing forests on the plains, east of the Rocky Mountains, with production as high as a pelt per 15.7 square miles. Production from the Liard plain is of special interest. Geologically this plain is part of the Cordillera, but it is topographically and vegetationally similar to the Nelson forest to the east with which it is continuous through the low and forested Liard Gap. Despite this similarity Liard plain production is one-tenth that of the Nelson forest.

Throughout most of the mountainous west in Canada the red fox is generally distributed, but never reaches the spectacular abundances periodically experienced in the rest of forested Canada. Low production in the mountains may be due in part to an absence of such periodic abundance.

The influence of mountainous terrain was tested further by calculating production for the four areas on the plains, north of the Peace River and bounded by meridians of longitude. Production was found to be, from west at the foot of the mountains to east next to the Alberta border: 45, 17, 13, and 16.5 square miles required to produce one pelt per year. The foothills area here has relatively poor production.

Especially low fox production form the Stikine, and similarly low production there of several other terrestrial fur species, has been noted in discussing squirrel. This low production does not appear to result from any lack of trapping effort, since wolverine, coyote, and wolf are taken there in relatively high numbers.

Beaver: Beaver is perhaps the North American fur species most susceptible to over-trapping. Its workings are obvious, its wanderings are restricted and somewhat predictable, and it is easy to trap as a result. In the Peace parklands, low beaver production (Fig. 2) appears to be a result of heavy trapping in the past, a factor perhaps made more effective by the region's paucity of lakes. In the Yukon forest where human activity has also been relatively intensive, abundant lakes affording better habitat over larger areas may have partially offset heavy trapping pressures. In the remaining five forests, production appears to depend largely upon drainage characteristics. The well-drained foothills south of the Peace and the young drainage systems of the Stikine forest provide less habitat than do the well-watered and poorly drained areas in the Liard, Nelson, and North Peace forests. The Nelson forest especially has poor drainage, which is reflected in high production, one pelt being produced from each 6 square miles.

The influence of drainage on the forested plains was tested further. In four successive areas at progressively greater distance from the mountains (as calculated for wolverine and others), production from west to east was: 19, 9, 8, and 8 square miles necessary to produce one pelt per year. The well-developed and rapid drainage of the foothills provided poor beaver habitat.

Fisher: This species is absent from the Yukon and Stikine plateaux, although it occurs on the coast to the west (Anderson, 1946), on the Skeena drainage to the south (Stanwell-Fletcher and Stanwell-Fletcher, 1943), and on the Liard plain to the east. Fisher do not occur at high elevations or high latitudes; indeed, in northern British Columbia the species is at the northern edge of its range. Rand (1945) had no records for Yukon Territory adjacent to British Columbia on the north. The forests in order of fisher abundance are: South Peace - 175 square miles per pelt; Liard plain - 260 square miles per pelt; Peace parklands - 330 square miles; North Peace - 450 square miles; and Nelson forest - 664 square miles per pelt (Fig. 2). The last, despite Quick's (1953) designation of it as an area of fisher abundance, is the least productive of the five eastern forests. The maximum annual yield of fisher, as estimated on six traplines of high productivity over periods of from 14 to 20 years, is one per 136 square miles.

On the forested plains east of the Rocky Mountains there is a declining trend in yield eastward. The four zones compared yielded 395 square miles per pelt in the foothills and 325, 1033, and 1890 square miles per pelt in order eastward away from mountain influence. These findings support observations made elsewhere that fisher favour areas of relatively dry, well-drained, semi-open mixed forest. These conditions predominate in the areas of greatest fisher abundance in the boreal forest.

The fisher, usually considered a rare and intolerant species, has maintained itself in the Peace parkland, while mink, lynx, marten, beaver, and otter seem severely depleted. This may result from especially suitable habitat or from great mobility that leads to continued invasion from adjacent regions of lesser exploitation.

Mink: Mink production (Fig. 2) shows no regular trends. There is low yield in the Peace parklands and, like most other fine fur species, it appears to have been reduced by trapping in that area. A clue to its general ecological requirement is provided by its production on the forested plains with progressive distance from the mountains (as calculated for wolverine). These are, from west to east, 118, 77, 45, and 46 square miles per pelt. Poor drainage with abundant lakes and more sluggish rivers at some distance from the mountains appear to favour this species.

Continued high production in the heavily trapped Yukon forest may be a result of superior habitat resulting from many lakes. The same reasoning has been applied in the case of beaver. In the Stikine forest, 69 percent of the production has come from a small area with numerous lakes, in a region that elsewhere has few lakes and good drainage.

Lynx: Lynx production (Fig. 2) suggests low populations in the Peace parklands, as noted for most fine fur species, and low numbers in the Stikine forest. This last is true also of red squirrel, fox, and marten. Poor production is evident also in the restricted and heavily trapped Yukon forests, and in forests adjacent to the heavily trapped Peace parklands. The poorly drained Liard and Nelson forests are highest producers (34.5 and 24.8 square miles respectively to produce one pelt).

Production figures on the Plains, from west to east (as calculated for wolverine) show 58, 44, 38, and 53 square miles necessary to produce a pelt and thus indicate a fairly uniform distribution.

We have no explanation to offer for the low production of lynx and several other forest mammals in the Stikine forest. There are few biological data for these northwestern plateaux, and what few are known suggest that these areas are ecologically unique. Forests follow narrow valleys through extensive tablelands that are dry and cold. Bunch grasses cover large areas, and snow depths are relatively shallow. This is the Cassiar country of big-game hunting fame, where a large form of caribou *(Rangifer arcticus)* occurs and thin-horned mountain sheep *(Ovis dalli)* may be found in some abundance. Apparently those forests that do occur do not provide adequate habitat for a number of species typical of the boreal forest elsewhere.

Coarse Fur Species

It was pointed out earlier that, with respect to squirrel, weasel, muskrat, coyote, and wolf on the areas in and west of the Rocky Mountains, there may be poor correlation between yields and the population available. However, on forest areas 1, 5, 6, and 7, catch probably does represent population. Here maximum yields are: weasel - 1.4 square miles per pelt; muskrat - 2.0 square miles per pelt; coyote - 11.6 square miles per pelt; while squirrel production reached one per 0.1 square miles. The highest wolf yield has been one animal per 92 square miles.

Further details are presented graphically in Fig. 2

Comparison of Maximum Yields

Even though the relationship between harvest and population remains unknown, it can be safely concluded that the maximum yields from the best area over several years probably correspond rather closely to the mean annual crop that could be removed. Comparison of maximum yields for each species provides an indication of relative densities reached.

To facilitate this comparison and also to permit comparison with figures presented by Peterson and Crichton (1949) for the Chapleau forest of Ontario, we have prepared Table 1. This shows the production of fur from part of the Chapleau forest in square miles per pelt averaged over a six year period. It also gives yield figures for the boreal forest of British Columbia. The latter are not strictly comparable to the Ontario data for they are not mean figures for the entire region, which would be relatively meaningless. For each species the highest yield figure for any of the seven forest subregions is used. Thus the beaver figure is from Nelson forest, the muskrat from Peace parklands, etc.

Comparing the maximum yield figures as derived from the boreal forest of British Columbia, it is evident that the otter is the rarest fur bearer, followed by wolverine and fisher. Wolf and squirrel do not appear in Table 1. Neither involves a yield produced through the full 20 years. Best production for wolf is 92 square miles per pelt (19 year average) and for squirrel 0.1 square mile per pelt (13 year average).

Comparisons between two such widely separated areas as Ontario and British Columbia must be undertaken with caution. Only as production figures are the values in Table 1 directly comparable. From this aspect it is evident that per square mile the country south of the Chapleau Game Preserve produced more otter, fisher, mink, fox, beaver, and muskrat. Since figures for northern British Columbia are in each case from the best-producing areas, the Chapleau region is by comparison an area of considerably higher fur production.

Table 1 emphasizes the lower production of fine fur in two widely separated areas. Although there may be exceptions depending upon the area concerned, fine fur species appear to give low fur production primarily because of inherently low population density. Also, as a group, they appear to be particularly sensitive to habitat modification by man. These two characteristics combine to make fine fur a resource that is especially liable to deterioration when under inadequate management.

Table 1: Fur yields in square miles per pelt in northern British Columbia and Ontario

	Boreal Forest of B.C. average of 20 years	Chapleau District, Ontario average of 6 years
Otter	1,298	50
Wolverine	236	--
Fisher	159	104
Lynx	25	317
Mink	19	7
Fox	16	13
Marten	13	35
Coyote	12	--
Beaver	6	4
Muskrat	2	1
Weasel	1	9

In much of the boreal forest, fur is a major resource with human populations dependent upon it for a large part of their livelihood. The boreal forest is also a major producer of fine fur for the fur industry. If this fur resource is to maintain its importance in supporting human populations, fur management should concentrate its efforts upon fine fur, for coarse fur production can be maintained, and even increased, under heavy exploitation accompanied by little organized management effort.

Summary

The boreal forest in northern British Columbia is divisible into seven subregions differing in topography, vegetation, the extent of burns, proximity to alpine or grassland conditions, the abundance of man and his works, and other factors. Data from annual reports of white trappers enable calculation of the average annual production of fur, by species, for these seven subregions. The years involved are from 1929 to 1948 inclusive. The production of 12 fur-bearing species is shown graphically, and figures for another (otter) are given in the text. For most species, it is possible to offer explanations for differences in production shown in the graphs.

It is also noted that the fur bearers fall into two groups, those with fine fur, and those with coarse fur. The factors influencing the production of these two groups are quite different. Fine fur tends to be taken in proportion to the size of the fur bearer population concerned, while coarse fur production is the result of several factors influencing the intensity of effort that trappers direct toward harvesting the species with coarse fur.

A major conclusion is that careful management is less important for coarse furred species than it is for species with fine fur. The latter are usually present in lower densities, and have proven more vulnerable to reduction by human influence.

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Received for publication November 13, 1956.