

APPENDIX C

CANADIAN FORESTRY SURVEY 1/

Part 1 - FOREST RESOURCES OF NORTHWESTERN ALBERTA

The provincial Government of Alberta prepared a statement of the forest resources of the Northwestern part of the Province, pointing out that very little information is available from Government surveys, and reports respecting certain portions were gathered from trappers, traders and Indians, and are, therefore, of doubtful dependability. Nevertheless, it is roughly estimated that there is somewhat over 5,000,000,000 ft. B.M. of merchantable pine and spruce. In this area, with a few exceptions, this timber is in small blocks. This estimate does not take into consideration the coniferous forest along the Northern Boundary of the Province, as there are no data available concerning this area.

It is reported that there is far more poplar and birch than pine and spruce, but no estimate has been formed of what is available as the market for this species is limited as yet. However, with the development of different classes of building materials, such as plywood, pressed wood, etc., there is no doubt that a great deal of these woods will be utilized in the not distant future. Furthermore, the poplar areas have a large potential value as pulpwood and for manufacture as matches, spools and other articles.

The immature or young growth spruce and pine in this section of the Province is tremendous and has great potential value.

Part 2 - FOREST RESOURCES OF COAST AND CENTRAL BRITISH COLUMBIA

During the summer the Forest Service of British Columbia prepared a report supplementing the forest information already published. This report covers that part of the Province included in the North Pacific Planning Project. Some of the main points are as follows:

Commercial Forests of the Coast - The Coast growing stock could sustain an annual yield of 340 million board feet, 224 million feet being from accessible areas. During the period since war was declared, production, particularly on the Queen Charlotte Islands, has been stepped up so that the average annual cut for 1940-42, inclusive, has been about 204 million, or approaching equality with the estimated sustained annual yield. This war time increase is due mainly on account of the urgent demand for Sitka spruce, which is used extensively in the production of all-wood aeroplanes.

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The greater part of the Sitka spruce forests of the Province are located here, thereby concentrating the source of supply from which this special demand can be met. In ordinary times, the main use of the forests was for pulp-wood with the high-grade spruce logs being sold to sawmills, where they were utilized for specialty products such as ladder stock, interior finish, furniture and veneer. Today, the forests are being selectively logged for high-grade spruce, but some hemlock and cedar are also being taken out at the same time. The coast forests are normally utilized to about two-thirds their capacity, and an increase in yield of 80 million feet is available in normal times from accessible areas.

Commercial Forests of the Interior - The total yield of the interior forests is estimated to be about 1,250 million board feet per annum, of which 256 million board feet are considered accessible under present market conditions. North of Prince George and along the Parsnip River to Finlay Forks, there are extensive stands of white spruce of good merchantable quality suitable for manufacture of export lumber. At present, these forests are completely inaccessible and no prediction can be made of their future utilization.

The sustained annual yield from accessible forests is estimated to be 256 million board feet. The annual war time cut is over 131 million board feet. To this utilization should be added annual fire loss of over 127 million board feet, making a war time drain of over 258 million board feet, or approximately equal to the sustained yield capacity. In other words, the accessible areas are now fully utilized and any further expansion should come only as a result in reduction of fire losses.

The sawmills of the region have always been so far from their highly competitive markets that they are perpetually struggling against the handicap of long rail haul and correspondingly high freight rates. Once the stimulus of war orders has been removed it is to be expected that the annual cut will revert to the pre-war figure of about 71 million feet a year. However, water power is available and when the world pulp market creates the demand it will be possible to construct a pulp mill to utilize the spruce and balsam. Such an industry has been needed for years, and there is every reason to expect the development will take place ultimately.

In 1942 the total production for the four basic industries, mining, fishing, agriculture and forestry was estimated to be 286 million dollars, of which the forest industries were credited with 124 million dollars. In other words, at least forty cents in every dollar in circulation in this Province has its origin in the forests.

Part 3 - THE LIARD WATERSHED IN NORTHERN BRITISH COLUMBIA

Our knowledge of timber conditions in that part of the Liard watershed which lies within the Province of British Columbia was obtained from a brief reconnaissance along the Alaskan Highway during the summer of 1943, plus such information as could be obtained from those who had travelled in different parts of the area. The information is not, therefore, very comprehensive nor necessarily very accurate.

Fort Nelson River Area - This is really the south fork of the Liard River and includes not only the Fort Nelson River but also its tributaries, the Sikanni Chief; the Fontas, the Prophet and the Muskwa, all rivers of considerable size. The Highway traverses the area on a high ridge which runs parallel to the Prophet River, crosses the Muskwa near Fort Nelson and then turns west along the Muskwa to cross a high divide into the Toad, which empties directly into the Liard itself. From the top of the high ridge near the Prophet River, a good view is obtained of all the intervening country between the Prophet and the foothills of the Rockies as well as much of the country to the east between the Prophet and the Fontas.

Much of this country is very poorly drained and there occur extensive muskegs between the rivers which support no timber of any commercial value. Interspersed between the muskeg are narrow pine ridges which, even if they do at times attain merchantable size, are so isolated and inaccessible as to be valueless. Where good drainage is obtained along the streams and rivers there are many thrifty stands of white spruce, lodgepole pine and poplar and merchantable patches are not infrequent in such areas. Spruce stands were examined on the Miniker, the Prophet and the Muskwa Rivers, some of which ran as high as 25,000 board feet to an acre with some trees attaining a height of more than 100 feet and a diameter of more than 20 inches. A stand of balsam poplar near the Muskwa Bridge on a flood plane of the river; had 104 mainstand trees to the acre with an average diameter of 23 inches at breast height and an average height of 124 feet. None of the mainstand trees had any branches below the 55 foot level. The largest tree was 42 inches in diameter at breast height and was 127 feet high. The timber appeared to be sound.

Excellent spruce stands were also observed along the Sikanni Chief, where the road crosses it, and others have been reported along the Fontas and its tributaries. It seems reasonable, therefore, to draw the conclusion that merchantable stands of spruce occur at frequent intervals along the valleys of all these rivers and that, considering the hundreds of miles of river valley involved, there is a tremendous reserve of timber here which is of good quality and easily accessible. It would be folly to hazard a guess as to how much merchantable timber there might be in the watershed, without a far more intensive examination, but it is certain that conditions along the road do not give a correct impression of the timber resources of the area as a whole.

A fire started during the road building operations in 1942 is still burning in the Fontas River area and it is reported to have covered a tremendous area in this valley. It is visible from the air but looks rather insignificant from the road.

The West Liard Area - Included in this area would be that part of the Liard watershed of Nelson Forks, which lies within the Province of British Columbia.

Our knowledge of this area is admittedly sketchy, being gleaned mostly from observations along the Highway. The Highway, on leaving the Muskwa

Valley, cuts across the headwaters of the Toad through mountainous and rather poorly timbered country, until it again hits the main Liard at what is known as the "Lower Crossing". At this point it crosses the river and runs along river benches as far as Lower Post, where it enters the Yukon Territory.

While the valley of the Toad may contain merchantable stands of spruce and lodgepole pine for some distance up from the Liard (as one would expect it to have) such stands do not appear in the upper reaches of the river where it is traversed by the Highway. The river rises in the Rocky Mountains and runs through mountainous country most of its length. The valleys appear to be lightly timbered with lodgepole pine but many of these stands are not of merchantable size and the timber values of the area appear to be negligible.

Between Lower Crossing and Lower Post, a distance of over 100 miles, the Highway follows the main Liard River on the north, or left, side keeping to the river benches for the most part. The forest along the route is by no means uniform. On the river bottoms and lower benches, as well as in all valleys, it is often exceptionally heavy, almost rank and luxuriant in some places, and many good stands of merchantable spruce can be found in such locations. On the other hand, there are long stretches, usually on the higher benches, where the soil appears to be dry and sandy and where the forest is poor. Usually pine occurs on these locations but it is seldom of merchantable size. Good poplar-birch mixtures occur on the upper benches and also a peculiar mixture of spruce, pine, poplar and tamarack. The latter species seldom occurs on dry benches in other parts of Canada, but here it seems to develop well on such sites. There are not many muskeg areas along the route and those that occur are small in extent.

The bulk of the merchantable timber reserves in this area will be found on islands and bends in the larger rivers and in the smaller side valleys. One stand measured at Contact Creek, ran 12,000 feet per acre with dominants 115 feet high and 15 inches in diameter at breast height. Many such stands occur along all water courses and better stands should be found closer to the Liard though none were examined by us.

No information of any value was obtained regarding that stretch of the main Liard between Lower Crossing and Nelson Forks but we have no reason for believing that it is very different from the part described above.

Part 4 - TIMBER CONDITIONS IN THE YUKON TERRITORY

The following is a brief summary of what has been learned regarding forest conditions in the Yukon Territory, as a result of a forest reconnaissance survey undertaken during the summer of 1943 along the Alaskan Highway and also along the river route between Whitehorse and Dawson.

The Territory as a whole, although forested in greater or less degree over practically its whole area, is not rich in timber values. The effect

of latitude is such as to limit tree growth to comparatively low elevations and, since most of the Yukon is mountainous or plateau-like, there are large areas of tundra above timber line as well as other large areas supporting a growth so stunted that it has no value whatever except as cover for fur and game animals. Merchantable stands, except in the extreme south, are for the most part confined to the river and stream valleys where the combination of good soils, sheltered conditions and low elevation make possible the development of the stand to a size suitable for saw timber or other commercial use.

Such areas are not widespread, in spite of the fact that timber conditions along the immediate vicinity of the Highway might lead one to that conclusion. It must be pointed out in this connection that the Highway is not only located in the most southerly part of the Territory over the greater part of its length, but also follows the low elevation and easy terrain of the river and stream valleys. As a consequence, it traverses the very locations where the best of the forest may be expected to be found. Especially is this true of that section of the road east of Whitehorse, through the Liard watershed and the lake country.

Between latitude 60 degrees (the southern boundary) and latitude 61 degrees there is a strip of country extending from the St. Elias Mountains in the west to the eastern boundary of the Territory in the east, which may be considered to be fairly heavily and satisfactorily timbered. Within this area occurs the larger portion of the timber reserves of the Yukon Territory and from it must come the bulk of the forest products which may be required in connection with development projects undertaken in the less favoured northern parts of the Territory. It alone, of the whole area, can furnish an exportable surplus of products for use elsewhere.

North of latitude 61 degrees merchantable stands are for the most part confined to the immediate valleys of the larger rivers such as the Lewes, Yukon, Pelly and the Stewart. Such timber as occurs within this area is barely sufficient to supply local need under present conditions, and would be quickly depleted were the present demand increased to any appreciable extent. It is doubtful if much merchantable timber occurs north of latitude 64 degrees because of the generally high elevations which obtain, but stands suitable for fuelwood might be found on good sites at low elevations on the river bottoms. This area was not examined during the summer.

The Liard Watershed - As might be expected, due to its generally low elevation and southerly location, the Liard watershed contains by far the best timber to be found in the Yukon. Speaking generally, this part of the Territory is as heavily forested as any part of Alberta or British Columbia east of the mountains and the growth rate is equally as good. The best stands are, of course, to be found in the immediate valleys of the larger rivers but merchantable stands are by no means confined to such locations. The uplands also support timber of very good quality up to an elevation of, roughly, 3500 feet above sea level and much of the country, in the southern portion of the watershed at least, lies well below the 3500 foot contour. Our knowledge of the upper, or northern end of the watershed is rather meagre but is probable that it is rather more lightly timbered. Some of it

must be above timber line which, in this latitude, is around 5000 feet above sea level. However, one would expect good stands of spruce to extend up the larger rivers well to their source and this seems to be confirmed by information obtained locally.

Along the river flats and benches of the Liard and its larger tributaries occur some quite remarkable spruce and cottonwood stands. A stand of spruce was measured on the Liard River just west of Watson Lake which was found to be between 125 and 135 years old. It ran better than 30,000 board feet per acre, with the majority of the trees between 110 and 120 feet in height and between 18 and 28 inches in diameter at breast height. Such stands of spruce occur quite frequently along the larger rivers and, while most of them would cover no more than a few hundred acres of river bottom land, the sum of them all must constitute quite a considerable and valuable reserve of saw timber.

The higher land away from the rivers is fairly well drained for the most part and supports a good, rapidly-growing and healthy forest. Forest fires have not been extensive nor frequent in this area for more than 70 years. The last wide-spread fire occurred between 1870 and 1873 and the area covered by it is now covered with a thrifty 75 year old stand which on the better sites is already approaching merchantable size. There are also remnants of an older stand, about 125 to 130 years, which is of merchantable size on good sites. Some stands of spruce were measured, on upland, near the Rancheria River, which went better than 15,000 board feet per acre with dominants up to 84 feet in height and diameters up to 17 inches at breast height. Most of the upland area, however, supports the 75 year old pole-sized stand. As its rate of growth is generally fairly good, it may be expected that a large proportion of this stand will reach saw timber size in from 40 to 50 years.

To sum up, it may be said that the Liard watershed contains sufficient reserves of timber to furnish an exportable surplus to northern areas in the event that transportation facilities are improved to the point where this becomes feasible. Further, the general growth rate throughout the area is such that, taken into consideration with its present rather considerable reserves, it will not easily be depleted as the result of cutting.

This area is well worth the expense of a stock-taking survey and the inauguration of a fire protection organization.

Teslin Lake and Nisutlin River Watershed - From observations made from the road and information gathered from other sources, it appears that there are fairly large stocks of merchantable spruce timber in the vicinity of Teslin Lake and along the Nisutlin and Teslin River valleys. These extend well up the Nisutlin toward its source and down the Teslin to where it is joined by the Boswell River. Near Teslin Lake the merchantable forest is found not only close to the lake itself but also on the uplands to elevations of 3500 feet or more above sea level and this is true generally of the strip of country between latitudes 60 and 61 degrees.

Although the bottomland stands of spruce in the Teslin Lake area and along the Nisutlin River cannot approach in quality similarly located stands in the Liard watershed, they are, nevertheless, of very good quality. Yields up to 15,000 feet per acre on river bottom land are not unusual. One stand which was measured near the mouth of the Nisutlin River ran 16,000 board feet per acre with dominant trees reaching a height of 90 feet and a diameter of 20 inches at breast height. Upland timber is of course not so good but even on these sites many stands run up to 10,000 board feet per acre with dominants ranging between 70 and 80 feet in height and up to 14 inches in diameter at breast height.

Because its climate is drier, this has suffered more from fire than the Liard watershed. The fire of 1870-73 burned even more territory within this watershed than it did on the Liard and in addition a fire in 1917 took a heavy toll of timber stocks. Of the forested land below an elevation of 3500 feet, which would include all stands of merchantable quality, it is estimated that approximately 25 per cent bears timber 25 years old, sixty per cent bears timber 75 years old and 15 per cent bears timber of older age classes, the most important of which would be the 125 to 130 year class. About half of the latter class is of saw timber quality.

Lodgepole pine in pure, or nearly pure, stands occur quite extensively throughout this watershed and there is much of it of a suitable size for the manufacture of railroad ties - a fact which is worth noting in view of projected plans for a railroad through the area.

The Lewes - Takhini Watershed - This unit is bounded on the east by Teslin Lake and River, on the south by the southern boundary of the Territory, on the west by Kusawa Lake and on the north by the Takhini Valley. Its general appearance is strikingly like that of the east-slope country of southern and central Alberta. They have much in common - both are dry as to climate; both have warm "chinook" winds; they have the same species of trees and, to a surprising degree, the same kind of ground vegetation; and, finally, both have been badly ravaged by forest fire and therefore present the same variety or multiplicity of age groups.

The river bottoms and low-lying lands around the Lake shores support some very good spruce stands but none of them are very extensive as to area and they have been, or are being, heavily drawn upon for lumber and other products to be used in connection with present local development. This is especially true of the valley of the Takhini in the vicinity of Whitehorse. Upland timber is mostly lodgepole pine although there are also some very good spruce-pine mixtures in sheltered locations. A few of these stands are of tie size and it is quite possible that quite a large cut of ties could be made in this area although most of the stands from which they would come are very small in area and rather patchy.

The rate of growth in this area is only fair, so far as anything but river bottomland is concerned, and reserves are being heavily drawn upon at present. Moreover, there is the ever present danger of forest fire which unless some action is taken in connection with it; is likely to further deplete the reserve supply of timber in this area. In the vicinity of

Whitehorse and Carcross there is a local scarcity which does not greatly effect the general picture which is that of a fairly well timbered country which could under normal conditions take care of local demand with ease.

The Alsek - Dezadeash Watershed - This area lies just to the east of the St. Elias Range and is drained to the Pacific Ocean by means of the Alsek River. It is generally rough and mountainous to the west with many of the hills rising above timber line. In this part of the area there is little or no merchantable timber. To the east, however, along the Dezadeash River there are quite large areas which are at a much lower elevation and some of this area supports merchantable spruce stands, of rather inferior quality but of sufficiently large size to make saw logs. South of the Dezadeash there is an insect infestation which is causing quite serious damage to a merchantable spruce stand and which has spread over several square miles. No pine occurs in this area.

Kluane Lake - White River Watershed - While a few pockets of merchantable spruce may be found in this area on the best and most sheltered sites, they are very small in extent and of inferior quality. The larger part of this watershed is mountainous and is above timber line. Much of the balance is scrubby growth of widely spaced trees, both white and black spruce. No lodgepole occurs and there are few poplar or other broad-leaved trees. Much of the ground is permanently frozen.

Central Yukon - That part of the Yukon Territory lying south of the 64th parallel of latitude, which has not already been described is being called the Central Yukon for present purposes. It is largely forested but with a short, shrubby growth of spruce, pine and poplar which has little, if any, merchantable value except for fuelwood. The only merchantable timber which occurs is found in the valleys of the large rivers. This is spruce of rather inferior quality in most instances but there are no doubt many stands along the rivers which are capable of being manufactured into lumber of fair quality. At any rate there are two mills on the Stewart River, one or two on the Pelly and at least one on the Lewes, all manufacturing for local consumption.

Stands of spruce along the larger rivers are important as a source of fuelwood for the river steamers. These use quite large quantities during the season of navigation but there appears to be a fairly adequate supply provided such traffic is not greatly increased. The growth rate is very slow throughout the whole area with the exception of that portion of the valley of the Yukon River between Dawson and the Alaska boundary.

There was a great drain upon local timber supplies during the early 1900's in the vicinity of Dawson and all reserves in this area have completely disappeared. Dawson now draws its supply of fuelwood and lumber from the Stewart River.

Northern Yukon - For present purposes it is considered that the Northern Yukon consists of all that part of the Territory north of latitude 64 degrees.

This area is for the most part barren or supports growth of such stunted character that it has no merchantable value except as fuelwood for local supply and, fortunately, very little is required for this purpose. There is permanent frost under practically the whole area.

Part 5 - TIMBER CONDITIONS IN THE MACKENZIE DISTRICT, N.W.T.

The following information regarding timber conditions in the Mackenzie District was obtained from a single flight over the area and must be considered simply as a recording of my impressions rather than a report.

While patches of what appears to be merchantable spruce occur generally along all the larger rivers in this area, there are only two locations where they occur with sufficient frequency to constitute any considerable reserve. One of these is that stretch of the Mackenzie River between Fort Smith and Great Slave Lake. The other is on the Liard River between Fort Simpson and Nelson Forks.

In both these locations the merchantable patches occur between the bends and on islands in the river. Seldom do they cover very large areas although there is one block on the Mackenzie north of Fort Smith that must contain about a thousand acres and which extends back about one-half to three-quarters of a mile from the river. The Liard timber occurs in smaller patches as a rule, at least so far as the river bottom timber is concerned. As the Liard valley between the Nahanni and Nelson Forks is broken, hilly country, it is possible that some of the timber observed in draws and ravines is also merchantable, since the drainage is good, but this cannot be determined without an examination on the ground. The Mackenzie country is wet and poorly drained almost to the river's edge, in most locations, so it is probable that it does not support timber of high merchantability.

No other timbered area of any great promise was noted on the trip, although, of course, the merchantable spruce and poplar is not by any means confined to the two locations mentioned. Small patches of timber do occur along practically all the rivers but scarcely in sufficient quantity to be worthy of mention. To be quite frank, my impression of the vast hinterland was that it was mostly muskeg and scrub timber of no value except to campers and game and fur animals.

There is reported to be some good timber on the lower South Nahanni River and also on the upper reaches of the Hay River but the flight did not cover these two valleys.

Fairly good timber stocks appear to occur along the Peace River in Northern Alberta, especially between Carcajou and Fort Vermilion. Also the Wabiscaw River appears to be fairly heavily timbered.