RECONNAISSANCE

of

AREA WEST OF THE PACIFIC GREAT

EASTERN RAILWAY

(CHILCOTIN)

1923

W.W. Stevens.

Reconn. File 611A.
Corres. " 045685.

Key: 1.75 miles = 1 inch. Scale

With reports.
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Key Map.
P. C. E. RECONNAISSANCE.

The area covered and reported on consists of the watersheds of the Bridge, Chilcotin and Blackwater rivers, and the headwaters of the coast streams, Homathko, Klinitklini, Bella-Coola and Dean Rivers; and covers the territory extending from the right-of-way of the Pacific Great Eastern railway Westward as far as the rugged and snow-capped Cascade Mountains; extending through the Interior or Fraser Plateau from a point fifty miles north of the town of Quesnel south to Lillooet, in close proximity to the mouth of the Bridge River, and Westward to Anahim.

DESCRIPTION OF THE COUNTRY BETWEEN CLINTON AND THE FRASER RIVER.

Lake. The reconnaissance was undertaken in order to determine the amount, species and quality of the timber,
its availability and commercial value. The area is segregated into site classes, dependent upon the timber species and the quality and composition of the soil, by broad divisional lines.

Transitory stands were disregarded in this divisional map, which shows the ultimate or determinative stand which has occupied the area in the past and will ultimately form the forest stand.

Descriptions of the stand dominant at present, are included in the report and also a map showing the location of the timber types.

The condition of the forage and main forage types were noted.

RESUME' OF ROUTE.

The party consisting of three men with pack and saddle horses, left Clinton on May 21st, 1923, and proceeded south through a long narrow valley, traversed by the P.C.E. railway, to Kelly Lake. Then westward toward the Fraser through a land of low broken hills covered with scrubby Douglas Fir and Lodgepole Pine. The thick matted grasses of the previous year covered the ground but many bands of beef cattle were feeding on the green spring forage.

The average elevation of this plateau land of low hills broken by numerous ravines, is approximately 3600 feet. The soil consists of a light clay loam, usually of small depth.
Mt. Bowman is located to the North-west of Clinton and rises to an elevation of 7500 feet.

Approximately 14 miles west of Kelly Lake the party took the Highbar road which descends to the Fraser River 5 miles of the Highbar ferry. This branch road winds up and down, in and out of shallow ravines and is bordered by a thick stand of scrubby timber which renders it impossible to obtain a clear and relative view of the plateau.

Suddenly rounding a sharp corner the Fraser River can be distinguished 3000 feet below. The river flows Southward between banks of alluvial clay, precipitous and from 100 to 300 feet in height. The bare mountains, sparsely clad with bunch grass and a few clumps of trees, so stunted that they might be termed shrubs, rise in steep slopes 3000 feet and more to an upper rolling plateau. Slopes of alluvial clay retain the same unwavering, sage-like colour, broken infrequently at the highest altitude by
outcrops of rock formations radiating colour. A magnificent scene, but even in the brightest sunlight, barren, grey and dull: unvaried save by the shadows of the mountains cast across the valley.

At McCuen's ranch, one mile above the Highbar ferry, the road ends and a trail switchbacks steeply up the slope to Donaldson's ranch, four miles above the mouth of Ward Creek. Here we are 3000 feet above the river and on the Fraser Plateau. Over 50% of the area is reproducing in Lodgepole pine after numerous and recent fires. The trail continues up Ward Creek, past Connor Lake and over a low divide to French Bar Creek.

LOOKING DOWN FRENCH-BAR CREEK.

Following up French Bar Creek in a westerly direction, we rode through a narrow valley bordered by low burned hills. Lodgepole pine reproduction was frequently encountered. The soil is sandy and pine grass of poor
quality and quantity was the only horse feed available.

French Bar Creek heads 2-1/2 miles east of Beaver Meadows on the Yalahom River. A blazed and marked tree gave the distance from Lillooet, up the Bridge and Yalahom rivers, to Beaver Meadows at 50 miles.

Continuing down the Yalahom river, the trail climbs steeply to a height of from 800 to 1000 feet above the stream, on a very steep slope of a gravelly character. Forage was in good condition (June 3rd) and consisted of pine grass. A scant stand of thrifty Fir of small size and slow growth was found on the steep slopes. Frequent rock slides broke the continuity of the trail. The width of the timbered valley did not exceed one mile until we reached a point twelve miles above the Moha post-office. Here the valley is 1-1/2 miles in width and Yalahom Creek flows through a deep canyon. The timber is located on low broken knolls which rise to the high mountains on either side of the stream.

Looking west across the Yalahom 30 miles from Lillooet.
At this point the timber stand is more uniform in character and consists of fir, jackpine and yellow pine. Three miles below Moha post office the Yalahom enters Bridge River.

The hills extending down to Lillooett are sparsely covered with a very scrubby, scattered stand which will never result in merchantable timber. The old Lillooett trail crosses the Yalahom river 100 yards above its mouth and cuts its way through Bridge River canyon to join the highway at the Government Bridge, ten miles below the Rexmouth post-office.

Bridge River, between its mouth and the confluence
of the Yalaloh or North Fork - a distance of 16 miles - has alluvial benches on either side and lies in a narrow valley between steep mountain slopes. The canyon is located above the confluence of the North Fork. It is 12 miles long and very rugged, with precipitous rock slopes. Above the canyon the valley varies in width, exceeding one mile only near the confluence and lower portion of Tyaughton Creek.

The country drained by the Bridge river and its branches is very mountainous above the confluence of Tyaughton creek. The valleys of the streams are very narrow, between steep mountains, and the upper reaches of the streams and the high peaks are snow-clad throughout the greater portion of the year.

BRIDGE RIVER, NEAR REXMOUNT P.O.

After crossing Tyaughton Creek the party left the highway and followed the trail up Sun Creek and over Taylor Pass
to Whitewater or Taseko Lake.

SPRUCE MEADOWS - GUN CREEK.

The trail, from the Government highway on Bridge river, up Gun Creek to Humming-bird Lake was constructed graded and traversed by the Provincial Government.

This trail traverses a barren country, denuded of timber by successive burns. The valley of Gun Creek is barely 1/4 mile in width; successive and higher ranges rise from the valley. At Spruce Meadows four miles below Humming-bird Lake, a low hill thickly covered with forage extends to Spruce Lake. There is no merchantable timber but some scrubby balsam and a very few spruce were found on a strip extending 1/16 of a mile back from the stream. Above Humming-bird Lake the trail is faint and climbs, past the glacier to the south of Taylor Pass, over the divide to the headwaters of the East Branch of the Taseko.
LOOKING DOWN EAST TASEKO RIVER FROM

TAYLOR PASS.

From Taylor Pass to Taseko Lake the country is covered with a very small stand of Lodgepole Pine of no commercial value.

Battlement of Iron Creek was the scene of a gold rush in 1922 where a strike was made by a prospector, named Taylor, on Iron Creek.

On June 9th the water was high and it was necessary to raft narrows between North and South Taseko Lake.

RAFTING THE NARROWS - WHITESTWATER.
Some difficulty was experienced because of a high wind in conjunction with the, then rapid current.

The entire country in the vicinity of Taseko Lake is burned or covered with a stand of jackpine which cannot be considered merchantable from any standpoint. Pine grass is abundant, particularly in the valley to the west of North Taseko Lake.

The trail crosses the Taseko River at the outlet of North Taseko Lake and follows down the east side of the stream for 16 miles, then turns North-east in a fairly straight line for the town of Hancockville on the Chilcotin River. Mt. Tatlow, elevation 10,100 feet, rises in a snow-capped peak to the west of Taseko Lake.

Used as a triangulation point by the Geological Survey, its height affords a magnificent view out over the Interior Plateau. North-westward the mountains of the Cascade Range recede in a succession of snow-capped peaks North and West stretches the Fraser plateau.

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CASCADE RANGE FROM MT. TATLOW.
Innumerable small lakes relieve the monotonous colour of the jackpine stand—a colour deepening with the distance. Long low hills rise toward the Fraser, broken only occasionally by the drainage system. In this dry belt the flow of water is very small. A large part of the rain-fall is rapidly absorbed by the soil or evaporated in the sunlight, leaving a very small run-off. From Taseko River to the Chilcotin the low ridges of the plateau, which has an average elevation of 3600 feet are covered with Lodgepole Pine.

Numerous small burned-over areas were encountered, but 80% of the area is forested with a stand of jackpine, closely spaced and of small size. Only occasionally do we find a tree twelve inches in diameter and over. Pine grass is abundant under the timber stand. The soil is light and sandy verging on a sandy loam in places, and is known as a hungry soil because of its capacity for water absorption.
Numerous stagnant ponds were encountered but in no wise was the water of alkaline quality. The shores of these ponds are usually bog-like; the slum covered with a moss-like growth. This water can be used by cattle without ill effect, and is the residue of the melted snow water caught in depressions and held from percolating away by the slum which has formed in the ponds during countless ages.

During June, at which time we passed through, the pine grass was in very good condition and numerous cattle were feeding on the range.

The Lodgepole stand averages 2200 bd. ft. per acre, closely spaced and of small size. This timber can only be utilized locally for saw-timber and is described as prop or mining timber. Located at an average elevation of 3200 ft on soil of small forest value, the growth is slow and a tree 12 inches in diameter is close to maturity. It may be possible to develop the turpentine industry at some future date.
The jackpines, found throughout the Interior plateau, is extremely pitchy or resinous in character; far more so than stands of the same species in any other part of the Province and, I believe, in any portion of the Dominion of Canada.

CHILCOTIN VALLEY - NEAR AMANIM RESERVE:

The Chilcotin River is about 145 miles long and drains an area of about 7000 square miles of the westerly section of the great Interior plateau. Chilko Lake is about 48 miles long from 3 to 4 miles wide, about 97 sq. miles in area and lies partly surrounded by high mountains of the Cascade Range, many of which are snow covered all year. It is about 3900 feet above sea level and is one of the scenic beauties of the Province.

At the confluence of the Chilko and Chilcotin the river lies about 200 feet below the general surface of the country. Downstream the valley gradually widens and deepens until, at Hanceville 25 miles below, it is 400 feet below the plains.
At its confluence with the Fraser, 28 miles below Hanceville, the floor of the valley has dropped until the river is no less than 1800 feet below the general level of the Interior.

Except at one or two points, where there are short canôns, the river flows between banks composed chiefly of sand and gravel, with occasional slides. Fir is confined to the Chilcotin valley, circumscribed within narrow limits, and is not found west of the junction of the Chilanko and Chisko rivers.
A wagon road follows up the Chilanko River and along the southern shore of Tatla Lake. Then continues in a Northwesterly direction, past the headwaters of the Homathko, Klimlini and Bella Coola Rivers, to Anahim Lake; down the Upper Dean River, cutting across the Eliguk Lake and then following down Ulgako River.

From Hanceville to Redstone or Chilanko Forks, several Indian reserves are located along the road. The Indians, who subsist mainly on proceeds from furs and what meat they can kill, are dying out. Game is gradually becoming extinct or moving northward. Many of the Indians make their way to Bella Coola for the salmon fishing season. Wealth is rated upon the number of horses an individual owns. Cayuses of small size and no valid value, owned by the Indians, form a wild horse problem to the owners of better stock throughout the Chilecotin district.

From Chilanko Forks to Tatla Lake, Lodgepole Pine is found growing on a light sandy soil. Gravel mixtures and
beds of gravel are frequent. The timber stand is of small size and the forest floor is covered with pine grass. Tatla Lake is located in the shadow of the Cascades, close to the headwaters of the Homathko and Kliniklini rivers.

Leaving Tatla Lake we crossed the headwaters of the Homathko river, then the Klinilini. The latter had overflowed its banks and the trail was covered with water from one to three feet in depth. Passing One Eye Lake the road crosses the Kliniklini, makes a half circle and then crosses McCluncheey Creek to continue up the eastern bank of the latter in a north-westerly direction. Thence over a low divide to the headwaters of Dean River near Towdistan Lake.

ANAHIM RESERVE INDIANS.

West of the road from Tatla Lake to Towdistan Lake the Cascade range rises in an unvarying succession of snow-clad peaks. The slopes leading up to the
rugged mountain crests are timbered with Lodgepole Pine of small size, thickly spaced and with pine grass covering the forest floor. Eastward of the road stretches the Fraser Plateau — a succession of low rolling hills typical Jackpine country with its sandy soil and close stand of small sized timber. An old trading post is located.
At Anahim Lake, North-eastward the Itcha Mts. rise in long sharp ridges, bare of timber and with long slopes, timber clad, leading up to the unforested slopes of shallow soils which rise steeply upward to the crests. At Abuntlet Lake, on the Dean River, a bare isolated peak, known as Anahim Peak stands out as a landmark for the surrounding country.

At Eliku Lake we have passed out of the northern limit of the sand belt. North of the line (see soil map) drawn eastward to Quesnel the percentage of clay in the soil is greater.

Lodgepole pine is a temporary type, the result of repeated and sweeping fires.

A winter road follows down the Ulgako River, past the shores of Tzidzi Lake and south of Tsacha Lake to Kluskus Lake.
Large meadows border the Ulgako River. Northward are low, broken, and timber clad hills. To the South the forest clad slopes rise to the low barren crests of the Itcha Mountains. Lodgepole pine of a fair quality and small size, suitable for ties, cover the entire area. Frost occurs during the Summer months and three feet of snow covers the ground during the Winter.

The Blackwater River discharges into the Fraser from the West about 35 miles above Quesnel. It drains 5000 sq. miles of the Interior or Fraser Plateau and is about 150 miles long. East of the Telegraph range it flows through a deeply eroded channel about 200 feet below the level of the plateau. The Blackwater River rises on the slopes of the Itcha and Ilgachuz Mountains, isolated ranges rising to an elevation of from 2000 to 3000 feet above the plateau. The watershed lies entirely within the dry belt.

SMOKING UP - KLUKUS VILLAGE.

An estimate would indicate an annual precipitation of
from 10 to 15 inches. The timber is mainly jackpine with small patches of spruce, balsam and fir in places. Much of the wooded country is of an open park-like character. Considerable areas have been devastated by repeated fires and only a few remnants of the old stand, consisting of spruce, balsam and fir, remain on the Blackwater watershed.

On the plateau above the depressions of the Coglistiko valley and Buchiniko Lakes, we find large muskegs separated by low ridges covered with jackpine of fair size and stand per acre. The Coglistiko, Baczacko and Nazko valleys with the country intervening are forested with an open, park-like stand of jackpine. Forage, mainly pine grass, is abundant.

Ten miles west of the Telegraph Station at Blackwater Bridge, an old stand is located north of the stream on the slopes of a long hill. This particular area has been entered by successive fires and is the remnant of a fine stand which once covered the Blackwater drainage basin.

From Blackwater Bridge to the town of Quesnel, a distance of 46 miles along the old Prince George, Quesnel road, indications of the old stand are found in scattered patches. The greater portion of the country is barren after frequent fires or reproducing in Jackpine. Under the Lodgepole stands, temporary in this district, fir, spruce and balsam are springing up.

 Freed from the fire hazard, Jack Pine, now the dominant stand would be eventually followed and superseded by fir, spruce and balsam. 
CLASSIFICATION OF LANDS WITH AMOUNT OF TIMBER WEST OF THE PACIFIC GREAT EASTERN RAILWAY.

Classes of Land.

<table>
<thead>
<tr>
<th>Land Description</th>
<th>Area</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above merchantable timber line</td>
<td>2305</td>
<td>264000</td>
</tr>
<tr>
<td>Below</td>
<td></td>
<td>13,262,480</td>
</tr>
<tr>
<td>Area carrying 5000 to 10000 B.M. per Acre</td>
<td>55</td>
<td>264000</td>
</tr>
<tr>
<td>&quot; 1000 to 5000 B.M. &quot;</td>
<td>10020</td>
<td>13,262,480</td>
</tr>
<tr>
<td>Area carrying young growth</td>
<td>8570</td>
<td></td>
</tr>
<tr>
<td>Incapable of carrying timber</td>
<td>2280</td>
<td></td>
</tr>
<tr>
<td>Area grass or very open forest</td>
<td>1010</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>24,240</strong></td>
<td><strong>13,520,480</strong></td>
</tr>
</tbody>
</table>

The merchantable timber, by species, is as follows:

<table>
<thead>
<tr>
<th>Species</th>
<th>Area (M.B.F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow Pine</td>
<td>262,415</td>
</tr>
<tr>
<td>Douglas Fir</td>
<td>1,558,320</td>
</tr>
<tr>
<td>Spruce</td>
<td>490,800</td>
</tr>
<tr>
<td>Balsam</td>
<td>349,200</td>
</tr>
<tr>
<td>Jack Pine</td>
<td>10,865,745</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>13,520,480</strong></td>
</tr>
</tbody>
</table>
PART II.

REPORT ON TIMBER RESOURCES.

2. Bridge River.
4. Between the Fraser River and the Pacific Great Eastern Railway.
SOUTHERN INTERIOR PLATEAU.

JACKPINE AREA.
The lands of the Interior plateau, designated as the lodgepole or jackpine area, are of vast extent and cover the watershed of the Chilcotin River, tributaries of the Blackwater to the south and the headwaters of the Homathko, Klinaklini and Dean rivers east of the Cascade Range.

The eastern limit of the sandy plateau follows the western bank of the Fraser (see map on following page). This large area is contained wholly within the Dry Belt and the annual precipitation ranges from 10 to 15 inches. The soil throughout is sandy verging on a sandy loam in which the sand invariably forms the greater percentage of the constituents of the soil. Soil of the Interior plateau is well fitted for the growth of jackpine. For some reason, which I was unable to determine, the timber has a very slow growth and reaches maturity while still short and of small diameter. The hungry or avid nature of the soil may account for this slow growth by absorbing the rainfall rapidly and leaving the soil dry during the growing season.

The area covered in this portion of the report aggregates 13,500 square miles or 8,640,000 acres, over 95 per cent vacant Crown Land.
CLASSIFICATION OF LANDS.

<table>
<thead>
<tr>
<th>Classes of Land</th>
<th>Area square miles</th>
<th>Percent of Total</th>
<th>M Ed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above merchantable timber line</td>
<td>135</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Below &quot; &quot; &quot; &quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area carrying 5,000 bd. ft. per acre</td>
<td>378</td>
<td>2.8</td>
<td>1,209,600</td>
</tr>
<tr>
<td>Area carrying 1,000 to 5,000 bd. ft.</td>
<td>1,040</td>
<td>7.7</td>
<td>2,296,800</td>
</tr>
<tr>
<td>per acre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area carrying 1,000 bd. ft. per acre</td>
<td>4,117</td>
<td>30.5</td>
<td>2,634,880</td>
</tr>
<tr>
<td>Area carrying young growth</td>
<td>5,670</td>
<td>42.0</td>
<td>-</td>
</tr>
<tr>
<td>Incapable of carrying timber</td>
<td>1,350</td>
<td>10.0</td>
<td>-</td>
</tr>
<tr>
<td>Area grass or very open forest</td>
<td>810</td>
<td>6.0</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>13,500</strong></td>
<td><strong>6,141,280.</strong></td>
<td></td>
</tr>
</tbody>
</table>

The merchantable timber, by species, is as follows:-

- Douglas Fir 420,000 m.b.f.
- Spruce 30,000 m.b.f.
- Balsam 42,000 m.b.f.
- Jackpine 5,649,280 m.b.f.

The timber found consisted largely of jackpine from 2 to 12 inches diameter breast high. Estimate includes trees 8 inches D.B.H. and over. Fir is found in close proximity to the streams. A pure stand of jackpine occupies the Interior plateau proper.

The Chilcotin watershed comprises 7,000 square miles or nearly 50 per cent of the jackpine area of the Interior plateau (13,500 square miles). Of the remaining area 35 per cent drains directly into the Fraser River, 25 per cent into the Coast.
streams Homathko, Klinaklini, Bella Coola and Dean, and the remaining 40 per cent is tributary to the Blackwater River.

That is, 12,815 square miles of typical pine land, in which lodgepole is the permanent stand, or 85 per cent of the timber (5,220,000 m.b.f.) is tributary to the Fraser River.

The altitude of the plateau ranges from 3,000 to 4,000 feet, averaging 3,500 feet.

The valley of the Chilcotin is U shaped in form, flanked on either side by well defined benches. Tatla Lake, the headwaters of the Chilanko branch of the Chilcotin, has an altitude of 2,980 feet - practically on the general level of the plateau.

At the confluence of the Chilko and Chilcotin the river lies about 200 feet below the general level of the country. Down stream the valley deepens and widens until, at Hanceville, 25 miles below, it is 400 feet below the plains. At its confluence with the Fraser, 28 miles below Hanceville the floor of the valley has dropped until the river is no less than 1800 feet below the general level of the Interior plateau. The Interior plateau west of the Fraser consists of low, long hills of gradual slopes.

The headwater of the Homathko, Klinaklini, Bella Coola and Dean rivers range from 2800 to 3200 feet in elevation.
The whole region of 13,500 square miles lies within the dry belt. The precipitation is low, ranging from 10 to 20 inches per year with an average of about 12 inches. Snowfall is apparently very uniform and the ground is covered with snow to a depth of from 18 to 36 inches during the winter season - 4 to 5 months in length.

The jackpine timber is from 2 to 12 inches D.B.H. The stands are open and park like. Little or no underbrush is present under the stand. Numerous small lakes and swamps occupy slight depressions and the meadow lands surrounding the small lakes is cut by the ranches for winter forage.

The soil is sandy, in places verging on a sandy loam. Pine grass is almost invariably found under the timber stands. Humus is absent from the soil by reason of repeated fires which have burned off this protective covering to expose the mineral soil.

The stands are thinned naturally and no reproduction, other than jackpine, is discoverable on the plateau.

The jackpine of the Interior plateau contains a high percentage of resin and pitch. It may be possible to develop the turpentine and allied industries for, in this district, the proportion of resin found in the pine is higher than in any other portion of British Columbia and, I believe, in any part of Canada.

On account of the SMALL AVERAGE SIZE OF THE TIMBER (9 INCHES D.B.H.) - TREES EIGHT INCHES AND OVER COMPOSE
ESTIMATE, ITS RESINOUS CHARACTER, AND SHORT CLEAR LENGTH it is of value only for domestic use; as squared timber and fence posts, corrals, fence panels, etc.

On the 13,500 square miles covered by this report, the average stand per acre is approximately 650 board feet.

The heavier stands are of small area and scattered, located in the midst of burned over lands or areas of much smaller timber content. The greater portion of the timber would require LONG HAULS to drivable streams.

Roads can be readily constructed at small cost (maximum $600 per mile, no grading) through the open park-like stands.

It may be possible, in the future, by developing logging railroads and cutting clean, to utilize the method of destructive distillation, on an economic scale for the extraction of turpentine and its by-products from the jack pines.

Reproduction could be secured by a broadcast burn after logging.

A certain amount of the timber area, that in close proximity to drivable streams, will eventually be taken up under small timber sale contracts and utilized for domestic supply and hewn railroad ties.

GRIZZLING. By far the greater portion of the forage in this large district consists of pine grass. The ranchers rate this as poor quality for summer forage and maintain
that the cattle will not use this grass and wander far in
search of better forage. The Grazing Commissioner advocates
herding the cattle and maintaining salt licks at some
distance from the watering places, thus compelling the herds
to wander from salt to water and graze the country between.
This necessitates herding. Fine grass is not first class
feed but the cattle to be sold in the fall can be fattened
before sale in the home ranch or better feeding grounds.

Agricultural land is confined to the river valleys,
and, in this dry belt, irrigation is required.

CONCLUSIONS:

1. The Interior Plateau consists of an area of 13,500
square miles covered with jackpine stands of various ages
and size and of no commercial value to the lumber industry.

2. The stands are open and park-like. Grass covers
the forest floor.

3. The ranchers advocate wide burning and believe that
the grass is improved thereby and that after repeated fires,
the pine grass will be superseded by forage of greater value.
They also claim that water storage and run-off would not
be affected by widespread burning.

Mr. McKenzie, Grazing Commissioner, considers it
unwise to undertake severe burning for the purpose of
removing the timber and says "Intelligent burning will
assist in a more vigorous growth of pine grass through the
ash deposit and the removal of the humus with its humic acid
deposit."
-30-

From a range point of view it destroys the small seedlings which restrict grazing. All burning should be light, that is, sufficient only to destroy the old grass without injuring its root system and to destroy the small seedlings only".

The subject of grazing in the Cariboo is fully treated in Mr. McKenzie's report (Annual Report of the Minister of Lands 1918).

4. The timber is scattered, of small size, low stand per acre, and far from available transportation facilities and consists largely of a species, jack pine, which is of small commercial value.

The timber, jackpine, can only be logged in close proximity to the streams. The character, species and location of the timber is such that the greater portion of the stands cannot be regarded as merchantable in a marketable sense until jackpine becomes a valuable timber species capable of sustaining a logging cost of from $20 to $25 delivered at the mill (costs based on average wage of $4 per day).

If utilized for pulp there is no holding ground nor water power available bearer than Seton Lake near Lillooet. The average length of log haul to drivable streams, which furnish the only means of cheap transportation is long.
The log run, in 16 foot logs, would run from 20 to 30 per thousand B.M. The cost of logging would be exorbitant when we consider the quality of the extremely pitchy species.

Any development of water powers at Seton Lake, obtainable from the Bridge River, would require an enormous initial expenditure.

5. The jackpine throughout the Interior is very resinous. There may be a possibility of developing a large and paying industry by the manufacture of turpentine and allied products by the destructive distillation of the jackpine. The estimates given in this report only include trees 8 inches D.B.H. and over. In destructive distillation entire sections could be clear cut. It would be possible to obtain approximately 30 million cords for the purpose of distillation. Reproduction in jackpine could be readily secured, if required, by a broad cast burn after logging.

DESCRIPTION OF INTERIOR PLATEAU BY SECTIONS.

Nazko Valley:

The Nazko Valley is 60 miles long, located between low hills covered with jackpine. Pine grass covers the forest floor. The valley itself, from one to four miles in width, has been burned frequently and is reproducing in poplar and an excellent crop of forage, not pine grass, is found in the open spaces.
At present there are ten settlers and about 700 head of cattle in the valley. The Nazko Valley can sustain 4000 head of cattle, if fully opened up. In July the feed was thick and heavy, not even trampled. Many meadows are located in the low hills of the plateau. The soil of the meadows is capable of drainage and of good quality clay loam. Only a few of the meadows have been improved and cut for winter feed by the ranchers. The balance of the land is sandy and stony with a light growth of jackpine and poplar. Some spruce and fir are also found. The valley is well adapted for dairying and mixed farming. Hardy grains and vegetables grow well. General altitude 3,500 feet above sea level.

From the Nazko River westward to the Dean River and the Cascade range beyond the country is covered with a jackpine stand of the prevailing type. Numerous small meadows are located in the midst of the timber. Average elevation of the plateau is 3,500 feet; low, rolling hills covered with a park like timber stand. The soil is sandy. On the burned over land reproduction is heavy and, with the exception of the meadows, forage is scant. The Itcha Mountains rise from 1500 to 3000 feet above the plateau and are located to the north of the area described.

**BIG CREEK AND GASPARD CREEK:**

Twenty five miles up Gaspard Creek, on the Interior plateau, the land is high rolling, timbered with jack pine and a few scrub spruce. The soil is sandy with boulders
covering a great part. Summer frosts are frequent.

The plateau at Big Creek lies at an altitude of 5100 feet, is rolling and timbered with jack pine and some fir. In places the soil is a good, sandy loam and boulders occur here and there. Irrigation has to be resorted to. Big Creek is a mountain stream, fed by snow-capped hills to the south and gives ample water when required.

From Fletcher Lake an extensive tract of pine grass grazing land reaches out to the Whitewater or Tesoko River and beyond.

CHILANKO AND CHILKO RIVERS, CHILKO LAKE.

Between the outlet of Chilko Lake and the Chilanko River the country is rolling. The timber is very open and has been burned over frequently. The average elevation of the plateau is about 4,000 feet. Pine is the main species. An occasional spruce or fir is found in the river valleys.

Between the Tsuniah and Nemiah valleys the shores of Chilko Lake rise rapidly to the foot of the mountains and support a growth of fir which has been badly burned in places. The growth is nowhere heavy. Jackpine attains a remarkable size, for the Interior plateau, near the outlet of Chilko Lake; small poplar is plentiful and fir begins to make its appearance.

From Chilko Lake eastward toward the Fraser River, including the headwaters of Big Creek, Cappard Creek and Churn Creek the elevation varies from 3,000 to 4,000 feet
above sea level. The soil is sandy. Swamp-like meadows and muddy lakes are numerous. The jackpine is of small size and short height and the stands are frequently isolated by large burns in various ages and degrees of reproduction.

EAST OF NAZKO:

The jackpine area of the Interior plateau east of the Nazko River and Alexis Creek, as designated on the timber map, is described in the same terms as the area to the west.
(2)

TIMBER REPORT

ON

BRIDGE RIVER.
Bridge River rises on the eastern slope of the Cascade Mountains and flows in an easterly direction, emptying into the Fraser River five miles north of the town of Lillooet. The Lower Bridge River, between the junction of the North Fork, or Yalahlom River, and the mouth of the Bridge River, has a length of about 16 miles, and is confined in a narrow valley with precipitous mountains on either side.

Narrow alluvial benches lie on each side of the river nearly the whole of its length, at altitudes varying from 100 to 400 feet above the river. The mountains on the south side are heavily timbered with scrub fir and are generally less precipitous than the mountains on the north, which are sparsely covered with a stunted growth of Yellow Pine, and present a very arid appearance.

The North Fork, or Yalahlom River, for a distance of 12 miles from the mouth, flows in a deep ravine worn down through alluvial deposits; the banks of the river are precipitous in the extreme, and the river, in many places, may be said to be a canon. The timber is dense on the west side of the river and composed of Fir and Yellow Pine suitable for tie timber.

The mountains in the immediate vicinity are wooded and have a well rounded appearance. The main mountain, approaching the river on the east side, six miles from the mouth, is quite devoid of water during the summer, and
its sides are sparsely covered with a thin growth of stunted Yellow Pine. Above the 12 mile point, the mountains descend to the river, particularly on the east side of the stream. Slopes are uniformly steep. An open growth of small Fir and Jack Pine of small size covers the hillsides, which are frequently broken by rock and gravel slides. Poplar and a thrifty growth of small Spruce is found on the narrow valley bottom. Where the soil is of sufficient depth on the sidehills, Fir is the predominant species. The stand is quite open, and the forest floor covered with pine grass.

Above the mouth of the Yalahoma, the Bridge River runs through a rock canyon of an extremely precipitous nature for 12 miles. On the east side of the river huge precipices rise abruptly to a height of about 2,000 feet, and are almost perpendicular. The mountains on the west side are not so rugged, and are more or less wooded with a poor quality of Fir, but are, nevertheless, very broken up with rock slides and bluffs.

The Bridge River, for the next 30 miles above the canyon, is a comparatively sluggish stream, flowing between low banks, which overflows in the flood season. The width of this valley is at no point more than a mile, and it is bounded by mountains, more or less thickly wooded, which rise abruptly from the valley.

The mountain-side all along the southern side of the Upper Bridge River valley, east of Tyaughton Creek, is more
or less densely covered with Yellow Pine and Fir.

The best timber east of Tyaughton Creek lies on a bench about 1/2 mile to the north of Lot 1139 and consists of 300 acres, containing 2,500 M.B.F. of Yellow Pine and Fir. Good timber is also located between Truax and Bobb Creek and at Tommy Creek. A timbered area is located south of Tyaughton Lake, between Gun Creek and Tyaughton Creek. This stand consists of Yellow Pine and Fir, covers an area of 7,400 acres, and aggregates 55,000 M.B.F. Another timbered area of 5,650 acres is found between Gun Lake and the Bridge River and contains 41,375 M.B.F. Along the west side of the Yalashom River above "Four mile creek", a stand of Yellow Pine and Fir of the size covers about 4,000 acres - estimated at 20,000 M.B.F.

The best timber on Hurley Creek is located near the headwaters and consists of a well timbered area of 2,500 acres, containing about 17,500 M.B.F. in Yellow Pine and Fir.
Classification of Lands with Amount of Timber.

<table>
<thead>
<tr>
<th>Classes of Land</th>
<th>Area (sq.mi.)</th>
<th>% of Total</th>
<th>M. bd.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above merchantable timber line</td>
<td>1,800</td>
<td>70.8</td>
<td>-</td>
</tr>
<tr>
<td>Below merchantable timber line</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Area carrying 5,000 to 10,000 per acre</td>
<td>30</td>
<td>1.2</td>
<td>144,000</td>
</tr>
<tr>
<td>Area carrying 1,000 to 5,000 per acre</td>
<td>460</td>
<td>18.1</td>
<td>737,200</td>
</tr>
<tr>
<td>Area carrying young growth</td>
<td>100</td>
<td>3.9</td>
<td>-</td>
</tr>
<tr>
<td>Incapable of carrying timber</td>
<td>80</td>
<td>3.1</td>
<td>-</td>
</tr>
<tr>
<td>Area grass or very open forest</td>
<td>70</td>
<td>2.9</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,540</strong></td>
<td></td>
<td><strong>937,200</strong></td>
</tr>
</tbody>
</table>

The merchantable timber by species is as follows:

- Douglas Fir: 562,320 B.F.
- Lodgepole Pine: 112,465 "
- Yellow Pine: 262,415 "

**Total**: 937,200 B.F.

(Estimate includes trees 8 inches D.B.H. and over)

The report of the Commission of Conservation mentions that a tunnel of 2-1/2 miles cut through the mountain from the head of Bridge River Canon to Seton Lake would give a fall of 1,150 feet and a development of 68,000 horsepower. Development of storage reservoirs reported on upper waters may permit the ultimate installation of 100,000 to 200,000 h.p.
It may be possible to electrify the Pacific Great Eastern at some future date. A sale for the unlimited power could, doubtless, be developed in Vancouver and vicinity. With the development of Vancouver as a port and manufacturing centre, demand for electric power will increase.

Utilization of the timber on Bridge River has been confined to domestic and local consumption. The best timber, the location of which is previously designated, is found in isolated stands in close proximity to the main stream and branches. Bridge River presents no great difficulty in stream driving.

Because of the scattered stand, low content per acre, low average diameter of trees and quality of the lumber (Fir is second class), the difficulty and cost of transportation down the branches of the main streams, the steep hillsides on which the greater portion of the timber is located, the same can only be transported to roads or streams by costly chute, or road construction which is not warranted by the size, quality, value and stand of the timber.

Because of all these difficulties, which increase logging costs considerably, the greater portion of the timber, particularly up the small streams, will not be utilized for many years.

There is no possibility of competition with the Coast, very little local demand or market in the
Cariboo, while transportation charges to the normal market for interior British Columbia lumber would be very high. With wages rated at $4.00 per day, the cost of logs delivered at Lillooet will range from $15.00 to $24.00 per thousand.
(3)

TIMBER RESOURCES

ON THE

BLACKWATER RIVER.
TIMBER RESOURCES OF BLACKWATER RIVER.

The Blackwater River rises on the slopes of the Itcha and Ilgatchuz Mountains, bare ranges rising from 2,000 to 3,000 feet above the level of the plateau. West of Tsacha Lake and north of the Itcha Mountains, the country is extremely broken and covered with a dense growth of jackpine and spruce. The general elevation varies from 3,500 to 3,800 feet. The Ulgako River is bordered by poplar and willow stands. The soil is good clay loam on the flats but the winter season is long and summer frosts are frequent. The stream slowly flows past low banks; good hay meadows fringe the shores. Belts of poplar occur on the southern slopes and spruce of fair size is plentiful in places.

The predominant growth, however, is jackpine, generally of sufficient size to make it serviceable for tie timber. It may, at some future date, be used as pulp. Many extensive fire devastated areas were encountered but, in the portion of the watershed, the fires have been less extensive than farther east. There is no remnant and few indications of the old stand of spruce, balsam and fir which once covered the entire watershed; that ancient forest was utterly destroyed long before Alexander McKenzie made his celebrated journey to the Pacific.

Reproduction almost invariably consists of spruce, balsam and fir and is particularly noticeable within the jackpine stands.
The jackpine is tall and fairly clean and the pitchy content is far less than in the same species grown on the sandy soil of the southern Interior plateau.

The shores of Tsachla Lake are fairly steep, rising from 100 to 200 feet to a broken plateau land. Tsachla Lake drains into Euchinoko Lakes, which are an enlargement of the Blackwater River. The plateau to the north of Euchinoko Lake is broken; the timber consists of jackpine stands. Burned areas of considerable size are numerous.

On the plateau lying south-east of the Euchinoko Lakes and Kluskus Lake, including part of the Coglistikko River, large windfall areas were encountered. The small streams flow through scattered, wet meadows and muskegs of large size occur at intervals. Where the windfall has been burned away, poplar was observed in places. Outside of the muskegs and wet meadows there is practically no forage. Stands of jackpine of fair size, suitable for hewn ties, occupy the low broad knolls between the muskegs. A scant reproduction in spruce, balsam and fir is found under the jackpine stand. Surface outcrop of rock and gravel is frequent and, as a general rule, the soil is shallow on the jackpine knolls.

Sixteen miles above the mouth of the Nasko River, on the Blackwater, the University of British Columbia hold a number of hay meadows near a small hill, covered with excellent forage, which is locally known as "Poplar Mountain". Where this portion of the Blackwater has been burned and the soil is even of moderate depth, a good crop
of excellent forage covers the ground.

A fair stand of timber is located between the mouth of the Nasko River and Blackwater Bridge (Blackwater Bridge is at the Telegraph Station on the old Prince George Quesnel road and is 46 miles north of Quesnel)

Classification of Lands, with Timber Estimate.

Blackwater Watershed.

<table>
<thead>
<tr>
<th>Classes of Land</th>
<th>Area (sq. mi.)</th>
<th>% of total</th>
<th>M.B.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above merchantable timber line</td>
<td>250</td>
<td>5.0</td>
<td>-</td>
</tr>
<tr>
<td>Below merchantable timber line</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Area carrying 5,000 to 10,000 per acre</td>
<td>25</td>
<td>0.5</td>
<td>120,000</td>
</tr>
<tr>
<td>Area carrying 1,000 to 5,000 per acre</td>
<td>325</td>
<td>46.5</td>
<td>3,720,000</td>
</tr>
<tr>
<td>Area carrying young growth</td>
<td>2,000</td>
<td>40.0</td>
<td>-</td>
</tr>
<tr>
<td>Area incapable of carrying timber</td>
<td>400</td>
<td>8.0</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>5,000</td>
<td>-</td>
<td>3,840,000</td>
</tr>
</tbody>
</table>

The merchantable timber, by species, is as follows:—
Jackpine, 2,456,000 M.B.F., Douglas Fir, 576,000 M.B.F.
Spruce 450,800 M.B.F., Balsam 307,200 M.B.F. Total,
3,840,000 M.B.F.

The watershed of the Blackwater lies entirely within the dry belt. There is no precipitation data nor station within its borders. An estimate, based on the nearest stations and on reports from various sources, would indicate
an annual precipitation of from ten to fifteen inches. During the winter season, snow covers the ground to a depth never exceeding 36 inches. The summer season is short and nights are cool. Frosts may occur in any month.

In spite of the large drainage area, the run-off is low. A reading taken the first of September, near the Blackwater Bridge, showed the quantity flowing as 350 cubic feet per second (c.f.s.)

Driving is possible only for three to four weeks during the spring freshet. Logging can be carried on throughout the year. The plateau of the Blackwater is irregular and broken but could be constructed on a fairly even grade and at low cost. The soil is firm and logging roads could be utilized during summer and winter.

A spruce and balsam stand, thrifty and of small size, occupies small osilated areas; particularly areas where the soil is of fair depth and the ground water table is high. The stand is dense; reproduction is abundant in spruce and balsam and the dominant trees have a good height growth.

Where poplar is found, reproduction is most frequently in spruce, balsam and fir.

Stands of lodgepole or jackpine cover the greater portion of the timbered area. Where the soil is shallow and rocky (usually sandy) the reproduction consists of jackpine.

Reproduction in spruce, balsam and fir is found under the greater portion of the pure jackpine stand. The older
Jackpine stands are thrifty, usually of the size, and of good height growth (carry their height well).

After numerous fires there is little humus or none at all and the underbrush is very light. No disease nor insect depredations were found in any part of the stand.

The timber on the Blackwater is of small size, suitable for ties. Although the country is broken and irregular, the slopes are not very steep. The ground is quite firm with very little underbrush and snowfall is light; therefore, the hauling roads can be used throughout the year. The cost of logging road construction would be small, not more than a maximum of $800 per mile. Swamps and muskegs could be utilized to advantage by hauling off the surrounding timber during the winter season when the bottom is firm and hard. Streams are small and probably frozen during the winter. It will be necessary in some cases to dig wells to maintain a supply of good drinking water.

Railroad logging and the construction of any expensive improvements is not feasible, because of the low stand per acre and the scattered character of that stand.

The Blackwater River widens out into long lakes such as Tsacha and Euchiniko Lakes, which would require rafting. As booming ground the lakes are ideal. Three to four weeks would complete the stream driving period and to lengthen that period would require expensive dam construction. Logs delivered at the mouth of the Blackwater would entail an outlay of from $12 to $30 per M. with an average cost of about $20 (when labour
is paid $4.00 per day)

THE QUALITY, SIZE, SPECIES AND LOCATION OF THE
TIMBER IS SUCH THAT THE GREATER PORTION OF THE STAND
CANNOT BE CONSIDERED MERCHANTABLE IN A MARKETABLE SENSE
UNTIL JACKPINE BECOMES A VALUABLE TIMBER SPECIES, AND CAN
bear the costs of logging, milling and transportation to
market in competition with timber which has increased in
value and decreased in quality. That situation is far in
the future.

Management.

The Blackwater watershed has been devastated time after
time by fire. At one period in the past a good stand, con-
sisting of spruce, balsam and fir, covered the drainage basin
of the stream. At present they are making a valiant attempt
to regain ground and will eventually succeed if fires are
kept to a minimum.

Now jackpine is the dominant species, but under the
jackpine stands, which succeed after a fire, a fine repro-
duction in spruce, fir and balsam is springing up to compete
with and finally overtop the temporary jackpine.

If fires are kept out.

It will be far in the future, a century and more, before
the more valuable species forge ahead and regain the ground
lost in the fires of the past. The timber in the Blackwater
is not available at present nor for many years to come.
Protected from fire and treated as a forest reserve, it will
eventually become a timber country. As true forestry practice becomes better known and its necessity receives recognition with the depletion of our timber supply, we may find the Blackwater watershed with a commercial stand and in line to help supply the requirements of the future.
ESTIMATE OF TIMBER

between

FERASER RIVER

and the

PACIFIC GREAT EASTERN RAILWAY.
The district included in this report extends from Quesnel to Williams Lake along the west side of the Fraser River, then south to Glen Fraser, including the land between the right-of-way of the Pacific Great Eastern Railway and a line to the west and parallel to the Fraser River (see map). This tract contains an area of 3,200 square miles.

This area, included in the Cariboo District, is comparatively thickly settled. The precipitation varies from 10 to 18 inches per year. This country is well known, and very little time was spent on an examination. The Pacific Great Eastern Railway practically parallels the old trunk road, known as the "Cariboo Road".

In this report I shall treat only of the timber conditions.

Note. Very little of this area was covered by the reconnaissance, and this report can be regarded only as a fair estimate based on the timber in the region actually covered by the party. However, I consider the country actually covered as representative of the entire area.
### Classification of Lands, with Amount of Timber

<table>
<thead>
<tr>
<th>Classes of Lands</th>
<th>Area (sq. mi.)</th>
<th>% of Total</th>
<th>M. bd. M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above merchantable timber line</td>
<td>120</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Below merchantable timber line</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Area carrying 2,000-5,000 B.F.</td>
<td>450</td>
<td>14</td>
<td>1,008,000</td>
</tr>
<tr>
<td>per ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area carrying 1,000-2,000 B.F.</td>
<td>1,250</td>
<td>40</td>
<td>1,600,000</td>
</tr>
<tr>
<td>per ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area carrying young growth</td>
<td>800</td>
<td>24</td>
<td>-</td>
</tr>
<tr>
<td>In incapable of carrying timber</td>
<td>450</td>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>Open grass or very open forest</td>
<td>150</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,200</strong></td>
<td></td>
<td><strong>2,608,000</strong></td>
</tr>
</tbody>
</table>

The merchantable timber by species is as follows:

- **Douglas Fir** .................................................. 1,564,800 B.F.
- **Jackpine** .................................................... 912,800 " "
- Other Species, (Spruce, Balsam and Yellow Pine, etc) 130,400 " "

**Total** .... 2,608,000 B.F.

The estimate includes only trees 8 inches D.B.H. and over. At one time a stand of large fir trees covered this area. Old stumps and fragments of trees up to 6 feet in diameter are the only indication of the ancient stand. The present stand contains few trees over 16 inches in diameter, and Jackpine
seldom attains a diameter of 1/4 inches, breast high. The growth is very slow, probably due to the light rainfall. The soil varies from a light sandy loam to a light clay loam. The latter soil produces the more thrifty growth.

As a general rule, both Lodgepole Pine and Fir have a rapid taper. Frequently heavy branches begin half way up the tree in the Douglas Fir. The stands present an open appearance and forage frequently covers the forest floor.

Logging Conditions.

Small timber sales have been granted for the purpose of cutting Ties, Cordwood, and some Sawlogs for local consumption. The Pacific Great Eastern accept very few Jack Pine Ties. Douglas Fir in this locality is almost invariably second-class timber. The heavier timber stands are of small area, and scattered, and are located in the midst of burned-over land or areas of much smaller timber content.

None of the timber is of sufficient size, quality and value to bear the costs of logging, milling and transportation to market, in competition with the output of the present day logging concerns on the coast and in the interior of British Columbia.

When timber has decreased in quality and increased in value, this stand may become a valuable asset.
RECONNAISSANCE MAP
OF AREA
WEST OF THE PGE RAILWAY
SHOWING
PRESENT TIMBER STAND