Reconnaissance

Upper Kootenay Valley

1914.

H. B. Murray.

Reconnaissance
File No. 104.

Maps - Topog. & Type Map.
- 80 chs. to 1 Inch.
(1.) - Forest Survey Office.
CONTENTS.

Introduction .................. 1.
Description of Area .......... 2.
Methods employed ............. 2.
Topography ................... 3.
Climate ....................... 4.
Conditions of Settlement ..... 5.
Forest Description .......... 6.
Quantity of Timber .......... 10.
Agricultural Lands .......... 14.
Costs of Cruise .............. 17.
REPORT ON RECONNAISSANCE OF THE
UPPER KOOTENAY VALLEY.

The Chief Forester,
Forest Branch,
Victoria, B.C.

Dear Sir:

The following is a brief report of conditions as were found to exist in the Upper Kootenay Valley. Our work which was to look over a large number of Applications to Purchase in this section of the valley, took us over an immense stretch of country and as a reconnaissance of the entire upper end of the Valley could be made by very little extra time and expense we thought it advisable to make this reconnaissance, as the topographical map and other data in connection with this section of the country will, no doubt, in a short time be of service to the Forest Branch.
Area and Country Covered.

The country covered by this reconnaissance includes that section of the Valley lying between the railway belt and a point about six miles south of the mouth of Vermillion Creek, an area about twenty-two miles long and between six and seven miles wide making an area of about 140 square miles or 89,600 acres. This area is made up as follows:

Statutory Timber Lands 2,240 acres
Timber Lands 3-5 17,580 "
Second growth on old burn 54,780 "
Barren and water 15,000 "

Methods Employed.

The usual method, that of compass triangulation was used throughout the work. This was much simplified by the fact that the entire bottom land country along the Kootenay, within the bounds of our work, is well surveyed thus enabling the triangulation to be tied in at frequent intervals. Compass lines were paced back into the hills on either side of the Valley every two miles as a general rule.
(3)

A contour interval of 100 feet was used wherever practicable but in the rough barren country back from the main valley a much larger interval, sometimes as high as 1000 feet was used.

**Topography.**

The Kootenay River has its origin at the summit of the divide near the headwaters of the Beaverfoot River. This divide is about twelve miles north of the railway belt. From this point the Kootenay flows in a general southerly direction swinging more to the west as it reaches the vicinity of Canal Flats.

The main valley on the section worked over by us has an elevation at the lower end of about 4000 feet and in the twenty-two odd miles north to the Railway Belt raises less than 100 feet. The valley bottom varies in width from one to four miles and on either side of this bottom land steep hills, often with a slope of over 30 degrees, ascend into the rough barren country which hems in the Kootenay Valley both east and west.
The Vermillion River, which enters the Kootenay, about eighteen miles below the Railway Belt, is the largest tributary of the Upper Kootenay. This river flows in a south-westerly direction almost paralleling the Kootenay for several miles near the junction of the two rivers. The Vermillion has a very narrow gorge-like valley with barren rough country on either side which has an elevation of between 8,000 and 9,000 feet.

Above the Vermillion on the Kootenay we find numerous small tributary streams entering the main stream on both sides. These smaller streams have not such defined valleys as the Vermillion, as they originate in the high mountains a few miles from their junction with the main stream.

Climate.

This section of the Kootenay Valley seems to be in a fairly wet zone. It receives a fairly regular rainfall the year round and the total precipitation would amount, roughly, to about twenty-five inches per annum. Snowfall in winter very seldom exceeds two feet on the bottoms but in the higher localities six or eight feet is very common.
No extremes in temperature occur in this section of the valley. The lowest temperature experienced during the last few years at the coldest period in winter was about 20 degrees below zero. The average winter temperature, however, runs above freezing point. The highest temperature in summer would run as high as 70-85 degrees above in the shade.

**Conditions of Settlement.**

The greater portion of the good agricultural land in this section is taken up by Applications to Purchase. There are, however, several pre-emptions taken up here and there and altogether there are at present about twenty pre-emptors on the land. Several good areas of agricultural land are still open for settlement and they, no doubt, will be taken up in the very near future.

**Soil.**

Soil conditions vary considerably over the area but on the bottom lands the soil, most generally encountered, is of a sandy nature in which is mixed a certain amount of loam. The subsoil is of a gravelly clay nature. Further back from the river on the lower benches the soil is of a better nature than that on the flat, there being a fairly heavy layer of humus
underlying which is a well mixed loam with a small percent. of sand.

In certain localities near the bottom of old slides can be found numerous large boulders which have come down from the higher mountain slopes.

Forest Species.

The following species were found to occur:

Douglas Fir       Pseudotsuga taxifolia
Engelman Spruce   Picea engelmanni
White Pine        Pinus monticola
Balsam Fir        Abies lasiocarpa
Lodgepole or Jackpine Pinus contorta
Poplar or Aspen   Populus tremuloides
Cottonwood        Populus trichocarpa
Tamarack           Larix occidentalis

**Douglas Fir (Pseudotsuga taxifolia).**

This species is found throughout the entire district although mostly in the form of second growth. It is generally short and has a fairly heavy taper, and very seldom exceeds a maximum diameter of 24 inches and a height of 90 feet. An average size would be 10 inches and a height of 50-60 feet.
Engelman Spruce (Picea engelmanni)

Engelman Spruce is found all over the Upper Kootenay country. In the lower extremities this species occurs more frequently in the sidehills back from the river, while in the more Northern sections it can be found over large areas of the bottom land as well as on the sideslopes.

The Spruce is the best merchantable timber in the valley. It reaches a maximum diameter of 24-26 inches and a height of 100 feet in certain localities, but the average size is much smaller. This tree in the better stands, prunes well and is tall and straight and does not appear to be afflicted with insect diseases of any kind.

White Pine (Pinus monticola)

This species was found only in very scattered localities and generally at elevations over 5,000 feet. It is very scrubby and never exceeds 2-4 inches in diameter and 10-12 feet high.

Balsam Fir (Abies lasiocarpa)

Balsam Fir was found generally throughout
the region and in places it formed almost pure stands of second growth. In some sections the Balsam attains a fairly good size; trees being found 18-20 inches in diameter and 60-80 feet in height. The average size of the tree is much smaller averaging 6-8 inches in diameter.

Lodgepole Pine or Jack Pine (Pinus contorta.)

This species is the most common one found in this section of the country, it having come in as the second growth on 90 percent of the burned-over areas. The pine does not reach any very large size 10-12 inches being the maximum and the average size being about 4-6 inches.

An insect which appears to be a form of dendroctonus is attacking the Jack Pine throughout the country and is killing it off.

Poplar or Aspen (Populus tremuloides.)

Is found over the bottom land all along the main valley. It does not reach any very great
size (10-12 inches being the maximum diameter and the average tree is much smaller.

Cottonwood (*Populus trichocarpa*)

Found only along the main valley bottom and along the lower bench lands in mixture with the softwood species. It does not seem to reach any abnormal size in this section 14-16 inches being the maximum.

**Forest Types.**

The forest types in this section can be divided into three classes i.e. (1) Spruce-Douglas Fir type which makes up all areas of virgin timber left in this part of the valley. (2) Spruce-Jack Pine type which has come in over very old burns. (3) Pure Jack Pine type which can be found on all burns under forty years of age.

1. **Spruce-Douglas Fir Type.**

This type can only be found in very scattered localities, the largest area being located above Vermillion River on the east side of the Kootenay River.
The Spruce makes up about 75 percent of the total stand, the Douglas making up the other 25 percent. This type favors a slightly sandy moist soil and thrives on the lower bench lands, it can, however, be found up to elevations of 5,500 feet.

2. **Spruce-Jack Pine Type.**

The Spruce-Jack Pine type is quite common over the south sections of the area examined and occurs chiefly on the lower slopes and first benches. The species composing this type can be found in different percentages but in general they are Spruce 50%, Jack Pine 50%.

3. **Pure Jack Pine Type.**

This type is the most prominent in the valley covering about 75 percent of the total timbered surface. It is made up of a dense stand of pure Jack Pine which has come in over areas burned over during the last four or five decades.

**Quantity of Timber.**

This country has at an earlier date been a
splendid timber country but fires have done tremendous damage in the last hundred years with the result that now we have left only a few scattered areas of virgin timber covering a total area of about 3,000 acres and containing timber to the total amount of about 30,000,000 feet B.M. Second growth averaging 3-5 M. to the acre is found over some 18,000 acres which is located for the most part in the north-eastern portion of the valley containing some 72,000,000 board feet of timber. Younger second growth about 1,500 to the acre covers approximately 55,000 acres containing some 82,000,000 board feet of timber.

<table>
<thead>
<tr>
<th>Total Quantity of Timber</th>
<th>Acres</th>
<th>Timber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statutory Timber Lands 5M and over</td>
<td>2,240</td>
<td>30,000,000</td>
</tr>
<tr>
<td>Timber Lands 3-5 M per acre</td>
<td>17,580</td>
<td>72,000,000</td>
</tr>
<tr>
<td>Second growth 0-3 M. per acre</td>
<td>54,780</td>
<td>82,000,000</td>
</tr>
<tr>
<td>Total Stand...........</td>
<td></td>
<td>184,000,000 ft. B.M.</td>
</tr>
</tbody>
</table>

Location of Timber with reference to Ownership.

Practically all of the timber on the area can be logged although a large percent. of it is located on the slopes quite a distance back from the
river. Of the entire stand 70 percent, is still Government owned, 20 percent, is held by private owners in the form of pre-empted and purchased land, the other 10 percent, is held under timber licenses.

Burned-over Lands.

This section of the country has been badly fire swept, about 75 percent of the total area examined having suffered from this cause during the last six decades. The only large section of the country which escaped the fire is that area lying on the east side of the Kootenay River North from the Vermillion River.

The timber loss through these fires has been tremendous. Indications point to the fact that the entire valley was at one time entirely covered by a Fir and Spruce Type of forest. Many large snags and stubs still remaining scattered throughout the valley being conclusive evidence to this end. The actual loss in dollars and cents would be hard to determine, but taking a general average of 5,000 feet per acre over the burned area would bring a fire loss of approximately 275,000,000 board feet of timber;
taking a nominal stumpage value of $1.00 per M. for all timber would bring the damage considerably over a quarter of a million dollars.

Reproduction.

The burned-over areas are reproducing throughout. In the valley bottom, Jack Pine is coming in very fast, it covering about 75 percent of the total second growth area. On the side hills and further back in the hills other species, such as Douglas Fir, Spruce and Balsam Fir are found mixed in with the Jack Pine.

Fire Protection.

At the present time one Fire Guard patrols this section, the District being under the supervision of the District Forester at Cranbrook. Fire of late years has been kept out of the Upper Kootenay Valley and the work of the Fire Guard is much augmented by the general climatic conditions. That portion of the Valley lying between the Little Vermillion Pass and the Dominion Railway Belt on the west side of the Kootenay is a bad fire trap and is very liable to burn inside the next few years; the conditions which exist
over this area would make the fire almost impossible to combat; a heavy windfall often ten feet in height is found all over, with a fairly heavy reproduction of ten to twenty year Jack Pine coming up through the debris. This fire would be fairly well kept in check by natural guards such as the river and green timber on the east and the mountains on the west, with the exception of this one fire hazard the entire Kootenay Valley could not be considered a bad fire country, as it receives a considerable amount of rain through the entire summer season.

Agricultural Lands.

Of the area examined some 38,000 acres can be classified as agricultural land; of this area 25,000 acres are Application to Purchase land and some 4,000 acres are already taken up by pre-emptors leaving in the vicinity of 9,000 acres of good agricultural land still not taken up.

The soil throughout is of a good character and truck and cereal crops should thrive, this is borne out by the fact that during the last season some splendid patches of potatoes and other garden stuff, together with considerable grain, was grown in this country. The large natural meadows found here and there along the valley
contain splendid soil and with very little working could be made to grow almost anything.

Roads, Trails, etc.

At the present time the trails in this section of the country are in very poor shape; the main trail crossing the Sinclair Summit runs up the centre of the valley, crossing and re-crossing the Kootenay at several places between that point and the Railway Belt. Another trail crosses from the Columbia Valley through the Vermillion Pass and across the Kootenay Valley and up the main Vermillion River to Banff. A main wagon road is now being built which runs from the Columbia Valley through the Sinclair Summit and up the Kootenay Valley as far as the head of Vermillion River where it crosses the Kootenay and runs up the Vermillion to Banff, this road will be completed this fall from the Columbia Valley to the Kootenay River. When completed this wagon road will open communication with the Kootenay Valley from both east and west. A wagon road could also be very
easily constructed which would run north up the valley coming out at the C.P.R. main line near Leenchoil.

Grazing Lands.

The open stands of Jack Pine which occur throughout are well grassed over and would afford splendid grazing to a large quantity of stock. Large natural tray meadows can be found scattered here and there all over the valley. Stock has been wintered in this section of the country for many years and has to be fed about five months of the year. Besides the pine grass which can be found everywhere, blue grass, bunch grass, joint grass, red top and wild vetch are very common.

Costs.

The reconnaissance was run in conjunction with a large amount of examination work which was being done in the valley and the extra cost for the reconnaissance would be very small. The cost of the entire work in the Kootenay would be as follows:
Provisions $78.62
Trav. Expenses 104.83
Salaries 293.52
Depreciation on Pack train 47.17 $524.14

This would make an average cost per sq. mile of $3.74 or a cost of about 5 mills.

Respectfully submitted,

"H.B. Murray"

Approved "J.D. Gilmour.
District Forester.

September 22, 1914."