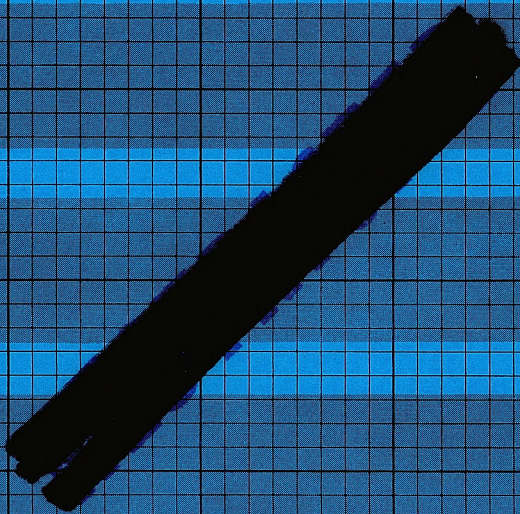


BULKLEY-NECHAKO REGION



SOCIO-ECONOMIC FACTORS
AFFECTING LAND USE

BULKLEY-NECHAKO REGION

April
1977

DEPARTMENT OF INDIAN AFFAIRS
and NORTHERN DEVELOPMENT

PRINCE GEORGE
BRITISH COLUMBIA

TO BE RETURNED TO ROOM

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~~RESOURCES DEVELOPMENT SECTION,
DEVELOPMENT SERVICES DIVISION,
INDIAN-ESKIMO ECONOMIC DEVELOPMENT BRANCH,
DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN
DEVELOPMENT, CENTENNIAL TOWER.~~

WHY NOT RETURN IT, YOU WILL THEN
KNOW WHERE TO BORROW IT AGAIN.

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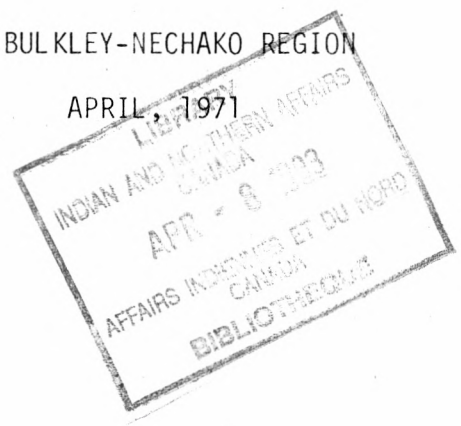
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SOCIO-ECONOMIC FACTORS
AFFECTING
LAND USE

IN

THE BULKLEY-NECHAKO REGION

APRIL, 1971

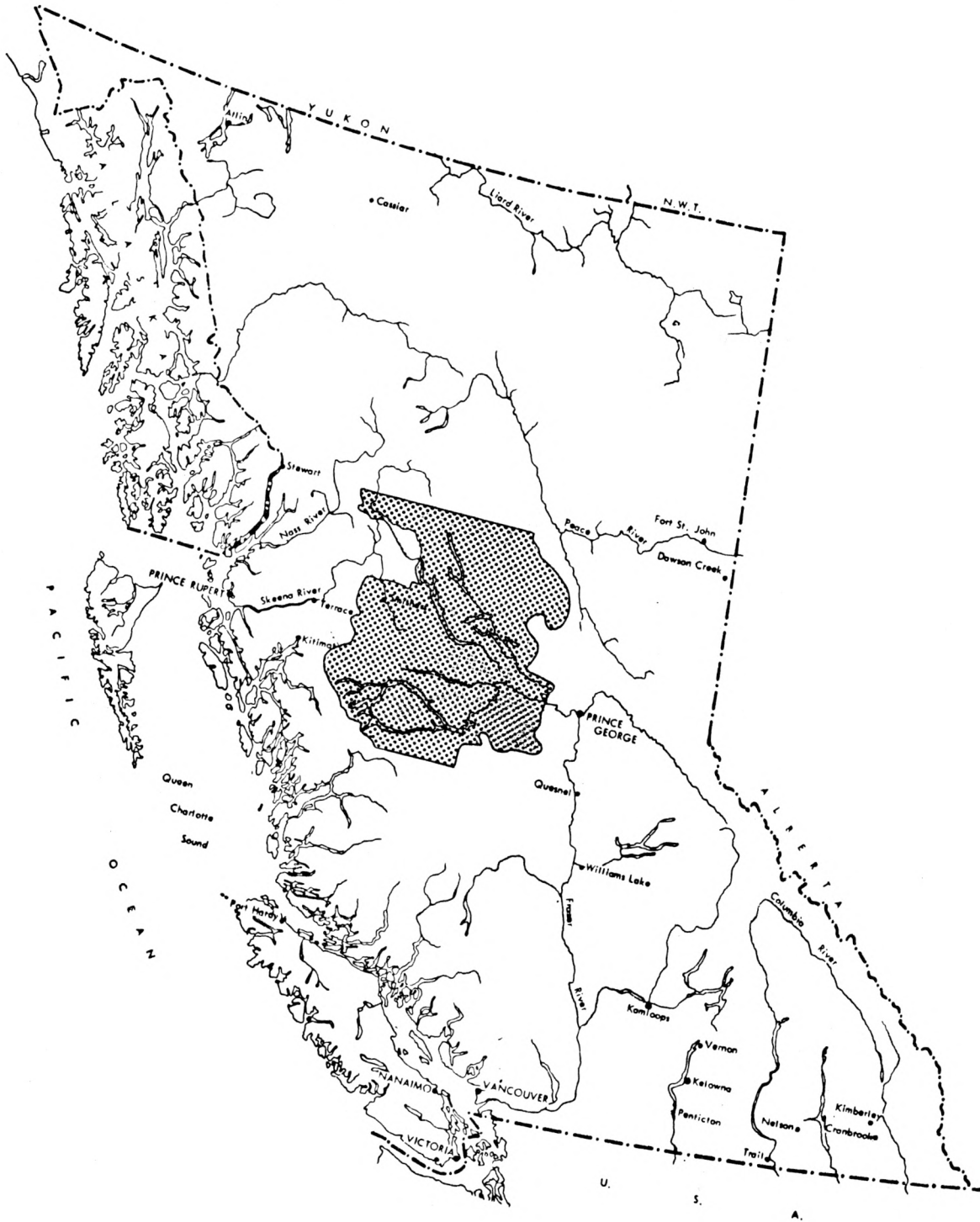


DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT
Prince George, B. C.

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THE BULKLEY-NECHAKO REGION (In Relation to British Columbia)



PURPOSE AND SCOPE

An accurate analysis of regional socio-economic conditions is an integral part of a land use report, a development feasibility study, or an appraisal of market value. A land use report essentially relates physical characteristics of a specific parcel of land to socio-economic conditions in order to determine the highest and best use of the parcel. A development feasibility study examines the capability of a parcel of land to be developed for a specific use. Operating costs are related to income to develop a cash flow presentation which is the basis for judging the feasibility of the development. The prediction of incomes are largely influenced by regional socio-economic conditions. An appraisal of market values or an appraisal of loss or damage caused by a taking of land begins with an analysis of regional socio-economic data. This analysis is the one basic component of an appraisal which influences all other calculations. The determination of highest and best use and interpretation of sales data is largely influenced by an analysis of regional socio-economic conditions.

Basically, these three exercises:- land use studies, land appraisals and development feasibility studies, are involved with establishing land use priorities and land use priorities must be compatible with regional socio-economic conditions. In fact, it is not unusual to abandon a development project after completing a regional socio-economic study. If socio-economic conditions do not invite profitable development of a parcel for a specific use, there is nothing to be gained by continuing the study to include a detailed analysis of the engineering aspects of the proposal.

The purpose of this report, therefore, is to examine the resources of the region; to offer a historical account of the development of these resources; to examine significant existing developments within the region and finally to co-ordinate these findings with proposed expansion programs of existing, and new industries to reach significant conclusions regarding future trends. Finally, these conclusions will relate to the use and development of land within the region in order that land managers, such as individual Indian bands, can use the information as an aid in deciding whether or not a land appraisal, a development proposal or a land use study would be beneficial. Further it is anticipated that this presentation can be used as a reference document by land use consultants and appraisers in the completion of assignments contracted with the band or the Indian Affairs

Department. When several such assignments have been commissioned within a region, it is repetitious and costly for each researcher to retrace the same routes as his colleagues in search of socio-economic data. He can use this document as a reference text and briefly comment on its content in his report, thus reducing the bulk of material presented and the final cost of the project.

The usefulness of the document will decrease as time passes. Current statistics and predictions of future trends will eventually become history and the report will be obsolete. However, the Buckley-Nechako region is entering a most significant period of its development history. Now is the time when the greatest beneficial contributions will be made to land use planning and some of the greatest errors in this field will inadvertently happen. It is, therefore, evident that a report of this nature is timely in that it will serve its greatest utility during the next five years. After that period a revision should be published. It should be emphasized, however, that even though the report may become obsolete, it can be used by band members as an outline and summary of the factors which affect the value and use of land. It presents a standard approach to analysing data and this same approach can be applied to current data if the band wishes to complete their own analysis of conditions that affect the value and use of their land.

This report does not attempt to analyse world-wide economic conditions as they affect the value and use of land within the region. It is recognized, however, that international economic conditions have a direct effect on the sale and marketing of goods produced within the region and, therefore, significant international economic developments will affect socio-economic conditions of the region. For example, the attitude that various nations have towards the International Common Market, the rise and fall of the interest rate in the United States or the exchange rate of the Canada-U.S. dollar all have a significant effect on the development of the region. It is suffice to note that large international corporations versed with world economic conditions have faith in the future and have invested several millions of dollars to develop the resources of the region. Their development will be accelerated in the future and, therefore, the writer of this document must share this faith with the developers and the report assumes an optimistic attitude for the future. The region is dependent upon the international economic climate for its successful development, but nations are also becoming dependent upon the region for its resources.

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The report is presented under the following headings.

- A. Development History
- B. Physical Description
- C. Climate
- D. Human Resources (Populations)
- E. Natural Resources
 Mining, Agriculture, Forestry, Recreation
- F. Transportation
- G. Manufacturing
- H. Regional District Administration, Regulations & Zoning
- I. Land Values
- K. Future Outlook and Land Use Potentials

The characteristics of each of these components are presented and related to the value and use of land within the region. It is emphasized that the scope of the report is restricted to only those characteristics of the above components that affect the value and use of land and, therefore, the data will have limitations if used for other purposes.

DEVELOPMENT HISTORY

The first British Columbia settlement was established at Fort St. James in 1806 and became the administrative centre or capital of the province, then known as New Caledonia. Fort St. James lost its political status in 1857 when the capital was moved to Fort Langley and finally to Victoria. During this period fur trade was the only source of income to the region until the Cariboo gold rush attracted fortune seekers in 1859.

The region benefited from a further population influx in 1860 when an attempt was made to construct a telegraph line through British Columbia and Alaska and across the Bering Strait to Russia. The project subsequently failed in 1896 when an Atlantic cable was successfully laid. Remnants of this original telegraph line can still be found throughout the region.

The growth of the region received a further impetus with the gold rush to Manson Creek and Germansen Landing in 1871, but it was not until the turn of the century that permanent settlement became a significant factor. The construction of the Grand Trunk Pacific Railway, now part of the Canadian National Railway, commenced in 1907 and the last spike was hammered near Fort Fraser in 1914. With this modern transportation facility, settlements at Vanderhoof, Burns Lake and Smithers became firmly established. Fort St. James lying some forty miles north of this main transportation route did not receive the same benefits from this transportation facility as areas located closer to the railway corridor. Because of this transportation disadvantage, agriculture progressed slowly at Fort St. James.

It is reported that during the economic depression of the 1930's some 5,000 gold miners settled in and around Germansen Landing and Manson Creek. Most of these pioneers left the area as economic conditions improved in other parts of the province. However, those remaining, pursued their fortunes with relatively large hydraulic machinery and imposing scars on the landscape are left as evidence of their activities.

Settlement was slow but steady until the Second World War when several developments affected the regional economy. A large mercury mine flourished at Pinchi Lake near Fort St. James, but subsequently ceased to operate when the war time requirements for mercury diminished. The loss of this industry in the region may have been a significant set back had it not been for the logging and sawmilling industries, which became firmly established to meet the healthy demand for lumber. Hence, lumbering became the main

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economic force in Fort St. James and it holds this position today.

The construction of the \$470 million Alcan project at Kitimat, in the early 1950's, doubled the populations at Burns Lake and Vanderhoof when a large construction force made these points their administration centres for the construction of the Kenney Dam. The water impounded behind Kenney Dam forms the Nechako Reservoir whose waters feed through the hydro electric plant at Kemano.

These early developments are of significance to this report because with each economic surge, transportation facilities improved and a certain percentage of the labour force remained in the region to become permanent settlers. Improved transportation and the establishment of populations and commerce encouraged further development and in 1965 the Endako molybdenum mine came into production and a new town was established at the site of the old Fraser Lake village. The Granisle copper mine commenced production in 1966 on Babine Lake and in 1968 Pinchi mercury mine was re-opened. Also in 1968 the Pacific Great Eastern Railway completed its extension to Fort St. James and a further extension to Takla Lake is presently under construction. Expansion breeds further expansion and high voltage power lines have been extended west and north of Vanderhoof to accommodate the power using industries. In 1969, a large sawmill-veneer complex was completed at Fort St. James along with a similar plant at Houston with a pulp mill promised in the near future.

Agricultural development progresses along with industrial development. However, it represents a slower, less spectacular movement which is not as widely publicized. Significant agricultural neighbourhoods have developed near Vanderhoof and Smithers with smaller areas growing throughout the valley.

The above historical summary is relevant to land use within the region because as the demand for land for various uses increases, land becomes more valuable. As land becomes more valuable it can carry larger, more significant development costs which must be expended before a profit can be enjoyed from the development. Compared to other more densely populated areas of the province, the subject region is in the embryonic stage of development and land values for certain uses verify this fact.

PHYSICAL DESCRIPTION

The Bulkley-Nechako region covers approximately 29,800 square miles and lies between north latitude 53 degrees and 56 degrees. It is bounded on the east and west roughly by the 125th and 128th meridian lines. It extends nearly 210 miles north and south and 220 miles east and west, covering approximately 8.1% of the entire province.

The region lies partly within the coast range mountain system and partly within the interior plateau. The coast mountain area is characterized by deeply entrenched valleys which broaden in width where the mountains become lower and more rounded. The Nechako plateau which comprises a part of the entire interior plateau area, forms most of the district. The east-west drainage divide is centrally located within the district. The Nechako plain forms the eastern flank and is part of the Fraser River basin. The western flank is drained by the Bulkley River which empties into the Skeena River at Hazelton. The Bulkley basin is mainly characterized by rough, mountainous terrain while the Nechako basin to the east contains more moderate topography with a maximum relief of only a few hundred feet. The formation of the Nechako basin represents most of the region and consists primarily of rolling land, with numerous glacial lake basins. The valleys are broad and the divides consist of rounded hills that rise 1500 feet to 2500 feet above the valley floors. The following physiographic map illustrates the glacial geology of the region.

Exploratively speaking, the proportion of the area that is topographically suitable for agricultural development is very limited and is confined to a few river terraces and valley bottoms. The geology of the area is concisely described in the Department of Agriculture Soil Survey Bulletin No. 4 as follows:

"During the pleistocene or glacial era, the portion of the Province under review was, except for a few scattered rock outcrops, entirely covered by an ice sheet. Deposition resulting therefrom consisted of a complex mixture of rock material which doubtless originated mainly in the west and southwest. Many types of land forms have resulted and these surface features, as they appear today, are largely the result of glacial deposition and subsequent erosion."

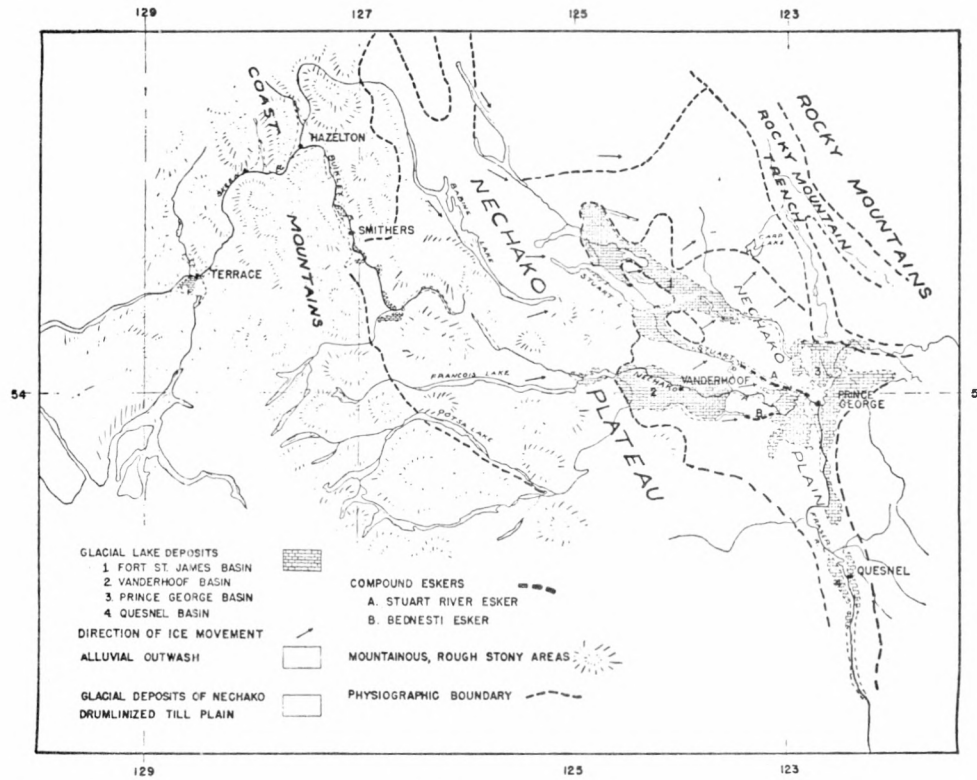


Fig. 2—Physiographic divisions and glacial geology of the central interior area, British Columbia. (Adapted from Armstrong and Tipper.)

The following sketch from the Soil Survey Report, illustrates the general topographic characteristics.

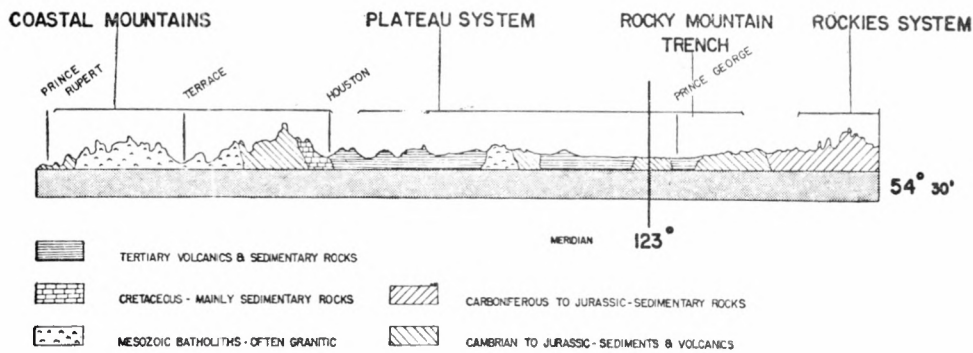


Fig. 3—Cross section of north central British Columbia showing approximate topography and general nature of the rock formations. (Adapted from Brink and Farstad).

Vegetation shows the effect of coastal influences in the western extremity, while the eastern portion might be described as a transitional montaine forest, characterized primarily by the species Engelman Spruce (*Picea Engelmannii*) and White Spruce (*Picea Glauca*), Lodgepole Pine (*Pinus Contorta*) and Aspen (*Populus Tremuloides*), Sub-Alpine Fir (*Abies lasiocarpa*) grow at the higher and moister elevations. The undercover in spruce-pine stands and pure pine in sandy locations is sparse, but under the open aspen-pine forests, the undercover is characterized by such species as pine grass, several asters, paintbrush, lupines, strawberries, vetch, pea-vine, bedstraw, meadow rue, fireweed, yellow rattle, false dandelion and hawk weeds along with shrubs such as soopalallie, rose, twinflowering honeysuckle, buck brush and spiraea.

Climax stands are rare because of the history of frequent forest fires which have ravaged the area. A few "islands" of native grasslands can be found in the "sea" of forests. Alpine meadows and alpine tundra is prevalent in the northern extremity of Tweedsmuir Park which lies near the south boundary of the region.

The natural flow of main drainage systems has been disrupted in the southeast corner of the region, by the construction of Kenney Dam, which diverts water from the Nechako system, westward through Ootsa Lake to the Hydro Power dam at Kemano. The water level of the Nechako River is largely influenced by controls exercised at Kemano.

CLIMATIC DATA

The following table is of interest from an agricultural viewpoint:

Factors Affecting Crop Growth at Selected Locations

	<u>April- August Precipitation</u> (Inches)	<u>April- August Heat Units</u>	<u>April- August Mean Temperature</u> (F)	<u>Frost Free Days</u>	<u>Days Above 28 F*</u>
Vanderhoof	6.72	1,408	51.2	49	119
Fort St. James	7.36	1,316	50.6	49	102
Wistaria	6.72	1,086	49.1	62	103
Smithers AP	7.27	1,453	51.5	79	123
Smithers CDA	7.29	1,316	50.6	52	97

* 28 F is considered a killing frost

Local agricultural authorities describe the area south of Francois Lake as an area with severe agricultural limitations. The table confirms that climatic conditions are not as favourable for crop production south of Francois Lake as they are in other reaches of the region.

From a social and recreational viewpoint, the following statistics are of interest. Average annual temperatures within the region range between 35 and 38 degrees Fahrenheit which, of course, is much lower than regions further south in the province. The average summer temperature ranges between 52 and 56 degrees Fahrenheit compared to a range of 62 to 66 degrees in the East Kootenays and the Okanagan. The latter mentioned communities have a reputation for offering ideal climatic conditions for recreational purposes which are generally associated with water sports. It, therefore, becomes evident why water sports, other than fishing, are not generally enjoyed within the subject region. In fact, it is reported that frost can be experienced any night of the year throughout the region while in southern localities this is not generally the case.

Total annual precipitation varies between 16 and 20 inches. The semi-arid regions of the southern interior experience approximately 14 inches which creates a more favourable environment for recreation.

AVERAGE ANNUAL AND MONTHLY MEAN TEMPERATURES*

(Degrees Fahrenheit)

Month	Smithers	Burns Lake	Endako	Vanderhoof	Fort
	Airport				St. James
January	14	11	10	11	10
February	22	20	23	16	15
March	29	26	25	28	26
April	39	36	37	38	37
May	49	45	44	48	48
June	54	52	51	54	54
July	58	55	57	58	58
August	57	55	55	55	56
September	50	48	47	49	49
October	40	39	39	40	39
November	28	26	22	26	26
December	19	17	15	16	16
Annual	38	36	35	37	36
Years Recorded	23	13	5	30	30

*Average mean temperature - mean maximum plus mean minimum, divided by two.

EXTREMES OF TEMPERATURE FOR EACH MONTH OF THE YEAR, 1967

(Degrees Fahrenheit)

Month	Smithers Airport		Burns Lake		Endako		Vanderhoof		Fort St. James	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
January	-16	44	-30	38	-33	42	-40	43	-41	41
February	- 3	45	-14	46	-11	50	-15	51	-10	44
March	-12	49	-21	49	-30	52	-27	51	-22	46
April	12	67	- 3	63	1	63	- 1	64	5	60
May	27	73	23	71	18	70	23	72	25	72
June	36	83	32	85	28	86	28	87	30	86
July	35	81	33	79	28	81	30	82	35	79
August	38	88	32	87	28	88	28	90	36	89
September	31	83	28	81	25	80	25	83	31	80
October	22	54	24	54	20	58	22	61	27	57
November	8	60	10	49	M	M	8	50	- 2	50
December	-23	36	M	M	M	M	-31	43	-26	38
Absolute*	-47	93	-52	90	-45	91	-61	93	-57	98

* Highest and lowest temperatures ever recorded at station.

M - Missing.

Source: Climate of British Columbia, British Columbia Department of Agriculture.

AVERAGE MONTHLY AND ANNUAL TOTAL PRECIPITATION

<u>Monthly</u>	<u>Smithers Airport</u>	<u>Burns Lake</u>	<u>Endako</u>	<u>Vanderhoof</u>	<u>Fort St. James</u>
January	2.17	1.86	2.26	1.64	1.58
February	1.30	1.23	0.94	1.10	1.35
March	0.94	0.93	1.24	0.85	0.95
April	0.89	0.80	0.98	0.75	0.75
May	1.31	1.24	1.16	1.11	1.24
June	1.78	1.64	1.82	1.89	1.82
July	1.96	2.54	2.22	1.46	1.92
August	1.42	2.03	2.30	1.38	1.55
September	1.79	1.58	1.77	1.36	1.57
October	2.34	1.70	1.80	1.40	1.51
November	2.35	1.99	1.97	1.50	1.73
December	2.36	1.91	2.01	1.81	1.68
Annual	20.61	19.45	20.47	16.25	17.66
Winter Snowfall	76.20	73.20	94.70	61.60	67.70
Altitude (feet)	1,718	2,320	2,260	2,250	2,280
Years Recorded	23	14	5	30	30

Source: Climate of British Columbia, British Columbia Department of Agriculture, Reports for 1966 and 1967.

HUMAN RESOURCES

Population centres have developed along the rail-highway corridor which follows the valley of the Bulkley and Nechako rivers. The forest industry is the largest employer, followed by construction, mining, the service trades and agriculture. The 1966 census showed the total population within the region to be 21,323 while the present estimate is approximately 25,000.

Population projection studies suggest a figure of 40,000 persons by 1980. The growth rate from 1961 to 1966 was 16.6% which is well above the provincial average, but much lower than the rate of increase of all of northern British Columbia. It is anticipated that the major impetus to the population increase in the future will be the expansion of forest industries at Houston and Fort St. James. Mining activities, agriculture, tourism and transportation will also contribute.

The 1966 census also showed that over half the population was comprised of people under 20 years of age while in British Columbia as a whole, 39.1% were in this age group. Thus, the need for recreational facilities to cater to family groups is evident.

Indians on reserves totalled 1,916 in 1966 or 9% of the total population. 35.2% of the Indians on reserves were within the 20 to 64 year age group, providing a potential labour force within the region.

The average sized family is 4.4 persons compared with the provincial average of 3.6. The proportion of females is 47.1% of the population. These statistics are interesting in that public opinion commonly regards this region as an area bountiful in recreation facilities for the outdoor sportsman. This may be true. However, when one examines the statistics above, it becomes evident that there is a potential for the development of less robust recreational facilities which would appeal to women and young children.

The following summarizes the population of the larger centres, (1966 census):

Smithers Village	3,135
Vanderhoof Village	1,507
Burns Lake Village	1,290
Fort St. James Village	1,213 **
Houston Village	699 *
Telkwa Village	668
Fraser Lake Village	860
Fort Fraser	353

* 1971 estimate - 2,400. The new district of Houston is expected to have a population of some 5,000 to 6,000 by 1975.

** 1970 estimate - 2,000.

The remaining population within the region is centered around smaller communities of less than 300 people and listed as follows in order of size:

Decker Lake	Topley	Quick
Pendleton Bay	South Bank	Colleymount
Palling	Tintagel	Tatalrose
Endako	Francois Lake	Wistaria

NATURAL RESOURCESMining

Mineral explorations and development could have a sudden extreme affect on land use within the region. It is difficult, however, to judge future mineral production with any reasonable accuracy because it is impossible to predict the future demands for ore deposits which have not been discovered. Nevertheless, one can assume that as transportation improves throughout the region and the present voltage of electrical power is increased, mineral exploration and development will be accelerated. The Provincial Government has adapted this concept as evidenced by the P.G.E. extension and Hydro Power development.

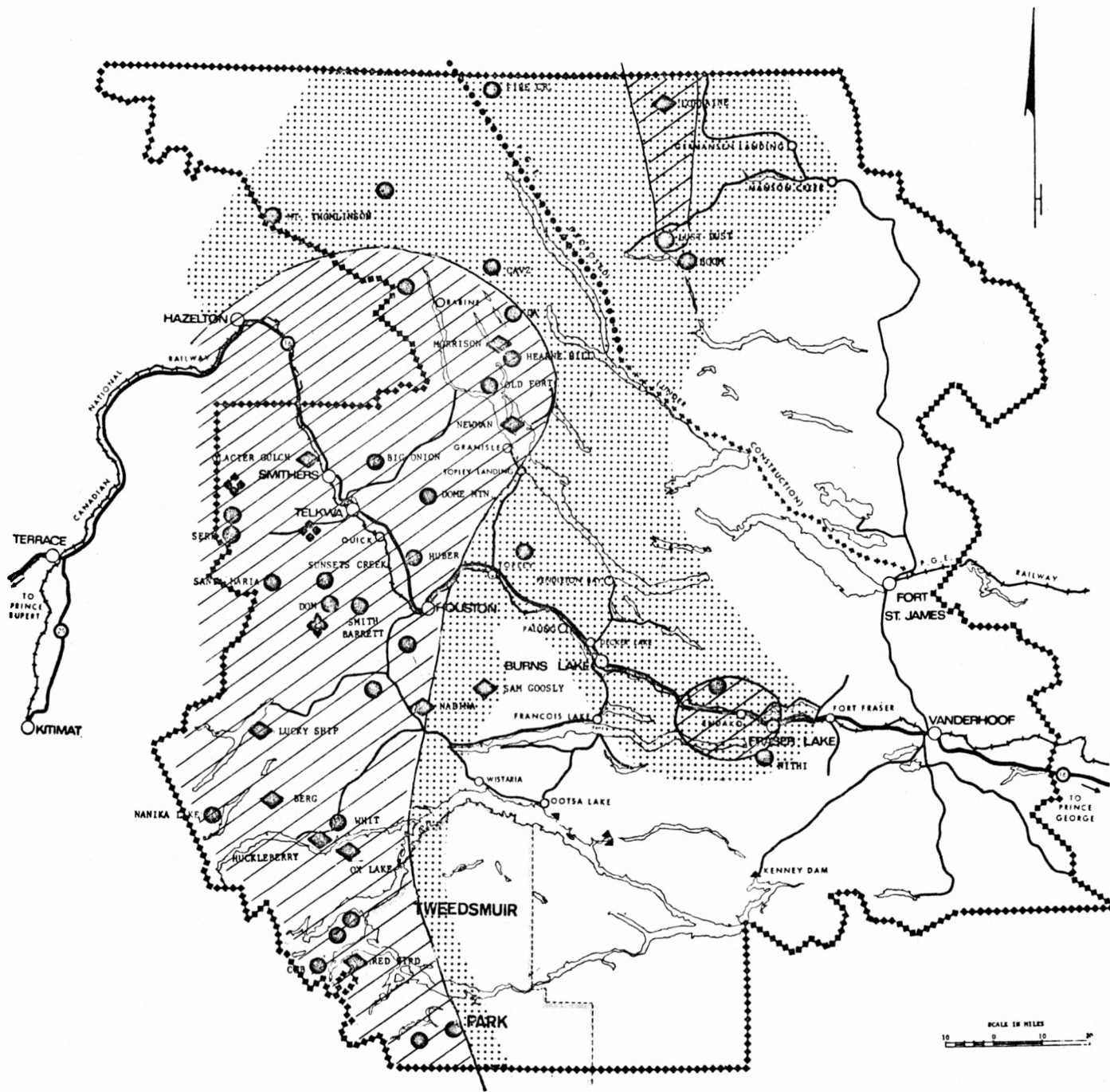
The attached mineral potential map shows the western portion of the region to contain high mineral potential along with an area west of Manson Creek and Germansen Landing and an area surrounding Endako. The Takla Lake area contains moderate potential while the Stuart-Trembler Lake area lies in a low potential area. Smithers and Telkwa areas offer the most potential.

Three mines have operated within the region. The Pinchi mercury mine operated from 1940 to 1944, producing 691,624 tons of ore containing 4,018,804 lbs. of mercury. The Takla mercury mine operated from 1943 to 1944 and produced 11,250 tons of ore with 132,088 lbs. of mercury. The Snowbird mine operated from 1939 to 1953 producing 104,485 lbs. of antimony.




There are three major producing properties within the region at the present time. Endako mine started production in 1965 and is now producing some 12,000,000 lbs. of molybdenum a year. It employs nearly 500 workers. Granisle mine started production in 1966 on Babine Lake and its mill has a rated capacity of 6,000 tons per day. In 1969, 24,000,000 lbs. of copper were produced. Granisle employs about 130 workers. The mercury mine at Pinchi Lake was reopened by Cominco Ltd. in 1968 and the rated capacity of the mill is 800 tons per day. The mine employs approximately 100 workers. The estimated gross value of production from all mines within the region was about \$60,000,000.00 in 1969.




Jade was discovered near the south end of Takla Lake in 1968. This large deposit is presently producing 15 to 40 tons per year. Jade discoveries appear periodically throughout the entire region.

MINERAL POTENTIAL



Mineral Potential

-  High
-  Moderate
-  Low

-  Major Prospects
-  Other Prospects
-  Coal Exploration

In 1967 mining exploration within the region employed 87 workers. There is no record of the extent of increased employment in this field in recent years. However, there are approximately 10 potential producers which will likely be developed in the future as economic conditions improve. It has been estimated that the mineral reserves on these 10 properties represent a combined value at current prices of about \$7,000 million. It is, therefore, apparent that although existing mining and milling activities are insignificant compared to forest development within the region, the potential of this resource is exciting and could have an extremely favourable affect on the economy in the future.

Although it is near impossible to be specific regarding the effects that exploration and mining will have on land use in the future, it is interesting to generalize in view of the exciting potential of the area. Transportation facilities are being developed along with increased electrical power for industrial development. It is evident, therefore, that exploration and development will be accelerated in the future. The effect of these activities on land use might be summarized as follows:

Exploration provides employment for local residents. New settlers are attracted to the area in search of employment through the publicity that mining exploration receives. The local economy receives an impetus through increased payrolls and more dollars are circulated. A healthy employment rate is accompanied by a desire to purchase land and build homes. Following the employment force are the land speculators and developers who place a further strain on the land inventory. Finally, a situation develops where land suitable for specific purposes such as access roads, industrial, commercial and residential sites, become scarce and land values increase and thus, the use and sale of land becomes very competitive and conflicts arise. Land use conflicts are already evident on some Indian Reserves within the region. However, for the most part, Indian reserves throughout the region are presently unencumbered by conflicting or obnoxious uses and some are located so as to enjoy the benefits which might be expected from increased mining exploration and development within the region. It has been suggested that a smelter site may be required in the future as part of a plan to serve the "Pacific Rim" countries. However, it is premature to judge the effect that such a development would have on the region.

Agricultural

Studies by Dominion experimental stations and the provincial Department of Agriculture have concluded that climatic conditions, more than any other factor, will limit the expansion of agriculture within the region. The climate over most of the area is best suited for the production of perennial forage crops. Therefore, cattle ranching is most commonly recommended.

Agricultural settlements have been in existence within the region for a century and although advancement has not been brisk, growth has been steady. It is expected that other sectors of the economy will grow more rapidly in the future and agriculture will continue to decline in relative importance. Although alienation of potential farmland, from the Crown provincial, to settlers has been very active, only a small part of the arable land is presently being farmed. It is evident throughout the region that farmers are not managing their land intensively and, in fact, a significant proportion of the privately held agricultural land is being wasted. The development of agricultural lands will accelerate in the future as the demand for arable lands increases. Five thousand acres were cleared in the Vanderhoof area in 1970 indicating that a movement towards more intensive farming is in progress. The Department of Agriculture recommends greater use of irrigation to increase the yields from productive areas.

Present farming practices base their operations on the production of feeder beef cattle for export. Most other commodities are grown on a much smaller scale and generally supply only the local market. Although the income generated from farming is insignificant compared with that of other industries, farming practices will increase in significance in the future as the other industries expand. New industries bring in new settlers and the market for local farm produce likewise expands.

A wide range of soil types are found throughout the region. The most arable soils are developed on lake deposited parent material which is found in relative abundance around Vanderhoof and north to Fort St. James. South of Burns Lake, these soils are found in pockets among the lakes. In the Smithers-Houston area, soils generally tend to be sandier with the exception of areas terracing along the Bulkley River where Telkwa clay is found.

A 1965 survey showed that 254 out of the 549 farms in the region were classed as commercial farms. However, only 70 had total sales of agricultural produce which exceeded \$10,000. It is, therefore, apparent that very few operations have been self-supporting and off-time employment has been a necessity.

Because of the high cost of farming small units, there has been a trend to consolidation and this is expected to continue. However, this trend towards consolidation will only apply to those landowners who conscientiously wish to develop an economic farm unit. As populations increase, there will be a trend in the opposite direction. Many of the new settlers will arrive from larger centres where the opportunity to purchase inexpensive acreage did not exist. These people thought nothing of devoting an hour or two to commuting to and from work in the large centres. In their new environment, the opportunity to purchase 20, 40 or 160 acres within a half hour drive from the employment centres will appeal to them. They may attempt farming on a small scale to supplement their salaries. Thus the uneconomic small farm holdings might become more prominent.

This same trend will have its influence on the potential and use of Indian reserve land. These same people in their search for arable land could be enticed to lease parcels of Indian reserves for agricultural purposes. Further, with the increased popularity of horseback riding and the greater number of families which own a horse, either as a pet or for recreational purposes, a significant demand will arise for pasture, close to the population centres. Several Indian reserves are well located within the region to accommodate this type of use.

Marketing of produce grown within the region has been a problem in the past. One would suspect that local growers would have an advantage over imported produce because of transportation costs. Such is not the case. Retailers generally prefer to commit themselves to southern suppliers because fresh produce can be delivered on a year around basis. The short growing season within the region places the local grower in a poor competitive position.

Finally, it is once again emphasized that climatic conditions offer severe limitations to any form of commercial agricultural practices within the region. It has been suggested that the production of forage crops complementing a cattle ranching industry offers the best chance of success. However, it is necessary for ranchers to carry enough stored forage to sustain their stock for at least six and a half months. Most existing ranches are having difficulty producing enough winter feed of sufficiently high quality to carry the stock over this long period. It is, therefore, apparent that until farmers can increase their yield from productive acres, farming will remain a marginal industry.

Forestry

Prior to World War II, the forestry potential of the region was relatively untouched. Several small mills operated, but their annual harvests barely dented the productive capacity of the forests. Since World War II, forest industries have become the leading source of employment in Fort St. James, Vanderhoof, Fort Fraser, Burns Lake, Pendleton Bay, Houston and Telkwa. Less than ten years ago the annual allowable cut of the forest was not being utilized and an entrepreneur was able to secure saw log quota from the Forest Service. During the past five years major changes have occurred in the industry and the small operators have given way to large centralized, integrated complexes. The forests are fully committed at the intermediate utilization level and further plant expansions are forthcoming to meet the commitments these large companies have undertaken at the close utilization level. Major manufacturing facilities will be restricted to Houston and Fort St. James. At the present time there is only one small independent sawmill between Fraser Lake and Smithers. This transition period has seriously affected the private wood owners within the region. The larger companies are reluctant at this time to purchase private logs until their commitments with the B. C. Forest Service have been satisfied. This has been most apparent on Francois Lake where smaller mills formerly operated on the lake and used the lake to transport logs from other areas adjacent to the lake. There are no mills purchasing logs off Francois Lake at the present time and, therefore, there is no market for logs in this neighbourhood. This depressed condition will improve when the large companies expand further to meet the demands of improved markets and log shortages develop. Tree farming will gain prominence as an optimum use for private lands.

The effect that the development of the forest resources will have on general land use policies throughout the region and to the use of Indian reserves in particular, might be summarized as follows.

1. As the price and demand for private wood increases, it is conceivable the highest and best use of several privately owned parcels and Indian reserves will be for tree farming purposes. These acres, at the present time, are not exposed to any particular use pressures and, therefore, they have been indiscriminately logged periodically with little thought towards insuring regeneration of the forest. Where large acreages are involved it will become apparent that a significant periodic income can be derived through the harvest of a forest crop and more attention will

be given to forestry practices. It is likely also that these parcels could support secondary uses without jeopardizing the value of the primary use and, therefore, such uses as recreation and, perhaps, agriculture will exist in harmony with the primary use of growing fibre. It is, therefore, important, at this stage of the economic expansion of the region, that the use of such acreage should not be committed to uses other than forestry until the economic environment has matured and it is possible to accurately measure the incomes that might be enjoyed through the production of a forest crop.

2. Land use conflicts will arise as forestry gains prominence as an optimum use. Forestry access roads will be required through parcels which have been committed to other uses, and such forestry practices as slash burning and the somewhat obnoxious influence of saw milling operations and the movement of heavy equipment associated with logging, may not be compatible with the use presently enjoyed by adjacent lands. It is difficult to offer a general solution to such conflicts since each situation involves an assessment of different land use priorities. It is important, however, that landowners should be aware of the highest and best use of their parcels in order that the land will not be committed to other uses which might conflict with the highest and best use potential which may not be so evident at the present time. For example, an acreage parcel fronting on the Maurice River near Houston may appear to enjoy its highest and best use for recreational purposes. However, if it lies adjacent to the proposed pulp mill, perhaps other uses should be considered. Likewise an acreage may appear to possess a good potential for residential development because of certain aesthetic values, but if the road traversing the site is planned as a main extraction route for high speed logging trucks, perhaps, other uses should be explored.

Conflicts can be avoided only by long range planning. The forest managers are well versed on long range planning because they are dealing with a natural resource which is harvested once every 100 years. Other private landowners, in order to protect their vested interests, should also become interested in long range planning.

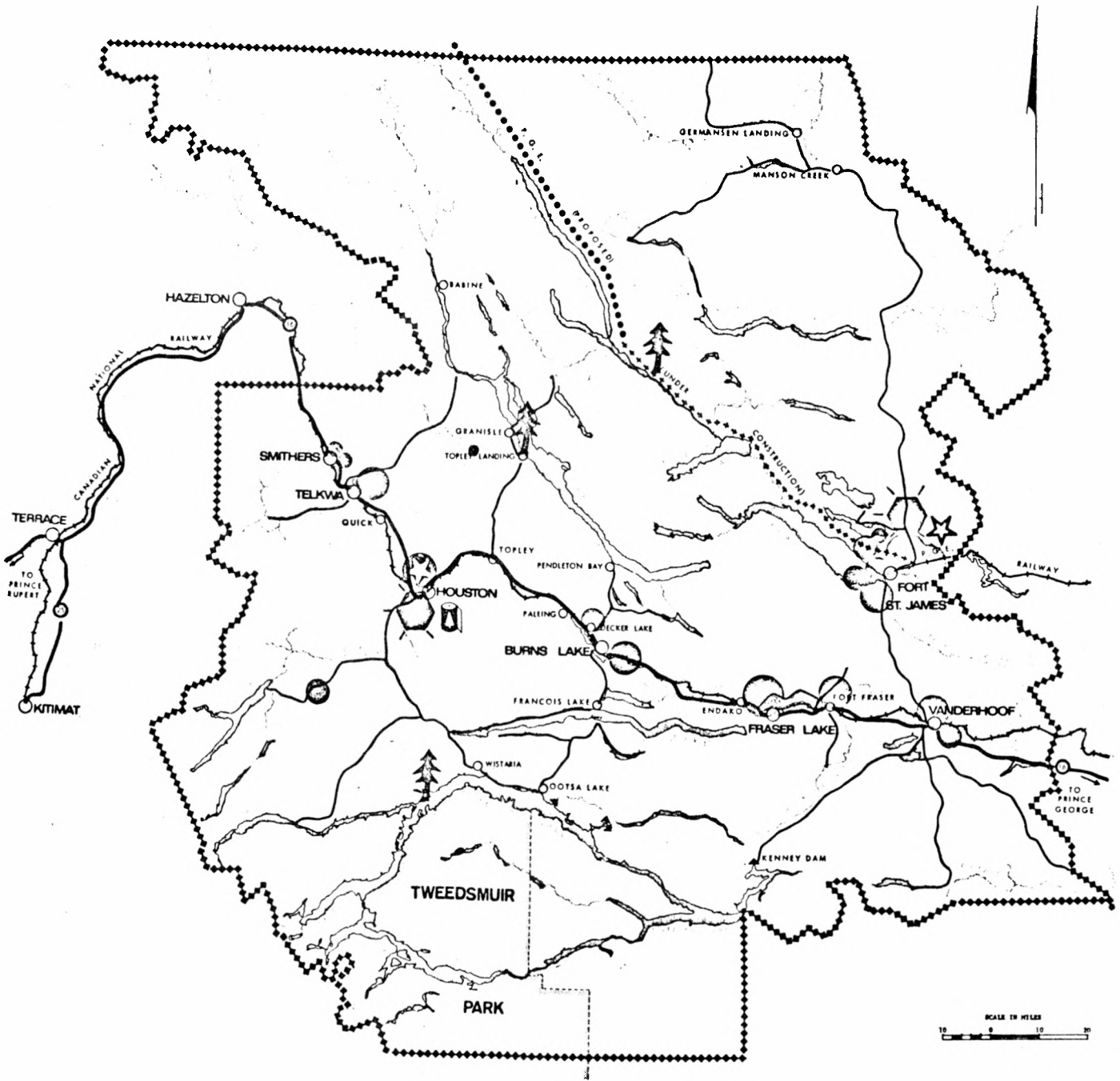
3. The pressures on land use will become greater simply through the increase in population brought about by industrial expansion. Houston, with a 1966 census population of 699 expanded to 2,000 people by 1970 and the 1975 prediction ranges between 5,000 and 6,000 people. A significant enlargement of the present townsite at Topley Landing is planned to house the logging staff of Bulkley Valley Forest Industries. Eurocan's logging

camp on Ootsa Lake may develop as a townsite as the utilization of the surrounding forests becomes more complete. The stud mill, planer mill, veneer plant and maintenance depot built by Takla Forest Products at Fort St. James caused the company to construct 40 new houses to accommodate their permanent staff. When one considers the relationship between the productive capacity of the forests and the present annual harvest, it becomes evident that a much greater expansion will be experienced within the region in the future if the productive capacity of the forests are to be completely utilized. Other smaller companies such as Northern Interior Forest Products Limited, Plateau Sawmills Limited, Stuart Lake Lumber Co. Ltd. and Decker Lake Forest Products Ltd. also will find it necessary to expand and employ more people when close utilization of the forest becomes mandatory.

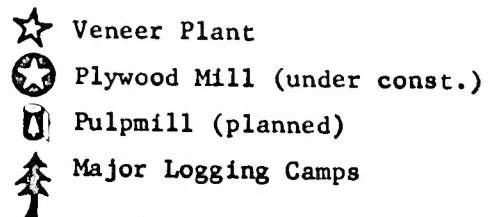
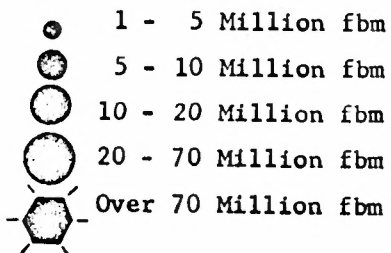
The present population of approximately 25,000 will increase to 40,000 by 1980. The growth rate from 1961 to 1966 was 16.6% which is well above the Provincial average. The projected figure suggests an average annual growth rate of only 6% expressed over the broader population base of 25,000 people. It is, therefore, likely that the 1980 estimate of 40,000 persons is a very conservative estimate.

In view of the expansion of the forest industries to accommodate better utilization of the forests, it is evident that the population will at least, double during the next decade. This population increase will be accompanied by an equal increase in the demand for land or the use of land for various purposes. In fact, in spite of the fact that the region contains approximately 29,800 square miles or 8.1% of the province, it is conceivable that there may be a shortage of land in certain localities for specific purposes. Therefore, once again, it is emphasized that landowners should not be too hasty in committing their acreage to specific uses at this time without giving considerable thought to the long range potential in view of the population increases resulting from industrial expansion.

FOREST INDUSTRIES in 1970 (Planned)



Saw and Planing Mills 1970
Annual Lumber Production



Recreation

The British Columbia government in their economic study of the Bulkley-Nechako region, reports "The Bulkley-Nechako region has a potential to become one of the greatest outdoor recreational regions of British Columbia's central interior. This district possesses some of the most varied and beautiful scenery in the province and has something to offer every visitor whether one seeks active sports or more sedentary pursuits."

Relative to the remainder of British Columbia's north central interior, this statement cannot be disputed. However, relative to the outstanding recreational features offered in other parts of the province, our subject area possesses only moderate advantages. It has been noted by recreational authorities that the majority of tourists do not search far beyond the main highways for their recreational needs. The subject region does possess some exciting recreational features in its far reaches, but portions of the narrow corridor of land adjacent to Highway 16 might very nearly be described as drab from a recreational standpoint. Francois Lake, Ootsa Lake and Tweedsmuir Park, to the south of the main highway corridor, constitute a vast recreational area which is relatively untouched because of lack of road access. Several smaller lakes also exist in these outer reaches where sportsmen who can afford the use of an aircraft can enjoy excellent fishing and hunting. However, the number of tourists who pursue this type of diversion is a very small percentage of the tourists who pass through the region. It might be concluded, therefore, that the appeal of the recreational resources has limitations.

The region contains several attractive lakes. However, tourists seeking water sports and beach activities might be disappointed. The main factors limiting this type of recreation are:

1. Lack of extensive, sandy beaches.
2. A vigorous population of mosquitoes, black flies and other insect pests.
3. Water temperatures which appeal only to the young and hardy.
4. A short summer season which can be interrupted at any time by periods of cold summer rains or frosty nights.

With regard to this latter point, it should be emphasized that summer rains in the southern part of the province do not seriously restrict the comfort of summer recreation. On the other hand, the severe temperature drops that often accompany summer rains within the subject region generally brings a halt to all recreational activities.

It is not the intention of the writer to completely discredit the region from a recreational standpoint. However, one must judge the area relative to other recreational areas within the province in order to properly assess the value of the overall recreational resource.

On the credit side of the ledger, one should not overlook the fact that some southern interior lakes are threatened by pollution and the public awareness of these conditions is seriously affecting the tourist trade in these areas. It is not uncommon for tourists to travel northward to less populated areas in search of unpolluted waters and this may become a more significant factor in the future. It is fortunate that the Provincial Government has the power now to enforce regulations to prevent the pollution of streams and lakes before it gains a foothold.

The major lakes of the region possess an attractive potential for water excursions. The waterway from Fort St. James via Stewart Lake to Trembler Lake and on to Takla Lake represents over a hundred miles of water travel which taps several exciting recreational features offering pleasant lakeside camping. Treacherous winds on Stewart Lake, however, often restrict this type of recreation. Babine Lake also offers a hundred miles of water travel for boating enthusiasts. Francois Lake is similarly endowed while the Ootsa and White Sail Lakes in Tweedsmuir Park offer a complete travel loop to boaters whose crafts can be portaged. This water loop, however, lost much of its appeal when the shoreline values were destroyed by indiscriminate flooding of the reservoir. No treatment of the adjacent upland was exercised between the original high water level and the new flood level and, therefore, much of the shoreline is practically inaccessible from the lake. The recreational pleasures offered by the Nation Lakes, Chuchi and Tchentlo, lie practically untouched. It is likely that access, developed by mining and forestry will "open up" this area within the next decade.

The Provincial Parks Branch have established camping facilities in six locations throughout the region. The use made of these facilities during 1969 is summarized in the following table:

Beaumont Park

Day Visitors	42,832
Camper Nights	17,112

McClure Lake Park

Day Visitors	17,232
Camper Nights	8,568

Topley Landing Park	
Day Visitors	6,396
Camper Nights	3,132
Ethel F. Wilson Park	
Day Visitors	9,000
Camper Nights	3,000
Pendleton Bay	
Day Visitors	8,400
Camper Nights	2,984
Smithers Landing	
Day Visitors	6,768
Camper Nights	4,240

The above table shows that certain areas within the region are exposed to fairly heavy use. Public campsites tend to become a focal point for recreational activity and, therefore, the location of campsites significantly influences the pattern of tourist travel. Francois Lake is very conspicuous by its absence on the above table. It should also be noted that the Provincial Parks Branch conduct intensive surveys before selecting a camping area for development. Anticipated use is the main criteria and it is surprising to learn that these six areas mentioned above warranted development prior to Francois Lake.

The development of recreational facilities to satisfy a commercial demand is one aspect of the recreational spectrum. A second aspect is the development of the lake frontage property for summer homesite purposes. The region possesses an exciting potential for this type of land use. The central portion of the region contains several lakes, large and small, which lack only road access before this potential can be enjoyed. At the present time, intensive development is most evident only in the vicinity of population centres. Portions of Stuart Lake, Francois Lake and Babine Lake support summer homesite communities while Takla Lake, Nation Lake and Ootsa Lake are relatively undeveloped. Although access has been the main factor limiting development, the availability of these lands has influenced their development. The majority of the frontage is owned by the Crown Provincial. Some areas are administered by the Department of Lands and summer homesites are available through a 21 year leasing arrangement. Other lakes, are within Provincial forests and the alienation of lake frontage is administered by the Forest Service through a special use permit issued on a renewable one-year basis. It is not uncommon for a land applicant to encounter difficulty in his search for a summer homesite when

the alienation of lake frontage is administered by two authorities under two different sets of regulations. Consequently, the leasing of Crown lake frontage for summer homesite purposes has not proceeded as briskly as it might have if the procedure were administered under one authority. However, considerable activity has been evident where road access exists.

This method of acquiring a summer homesite parcel appeals particularly to the lower income groups because the aquisition cost is low compared to the cost of purchasing lake frontage. Annual rentals within the region range between \$75.00 and \$125.00 per year. However, the construction of a substantial summer home requires capital which the majority of the population does not have. And, therefore, the assignment of these leases is fairly common when the original lessee realizes that he cannot afford the cost of building a cabin. A summer homesite fronting on a lake is an expensive luxury generally enjoyed only by those earning in excess of \$10,000 per year. The average declared income in 1967 within the region was \$4,315.00 which is 12.9% below the provincial average. Only 3.9% of the total tax payers within the region earned over \$10,000 in 1967.

This relatively low annual income is primarily due to the seasonal nature of the employment offered by most industries. However, the current expansion of the lumbering industry is basing its production on a 12 month per year schedule. Average incomes will, therefore, increase and the demand for summer homesites will become a significant part of the recreational development plan for the entire region. Indian reserves, therefore, fronting on attractive lakes need only to wait until the economic environment improves before their frontage will develop significant values for this purpose.

A factor that is affecting the development potential of lake frontage property more critically now than in the past is the effect of sewage disposal systems on the quality of lake water. Fairly stringent regulations have been established by the Provincial Department of Health to control this hazard and the effect of these regulations is restricting development in the southern regions of the province where attractive lake frontage properties have become relatively useless because the Department of Health will not approve a plan of subdivision. Whether or not the development of Indian reserve lands can be controlled by Provincial or Regional bylaws may be questionable at the present time. However, these laws and regulations have been established to

protect the recreational environment and, in the long run, will have a beneficial affect on land values. It would, therefore, be in the best interests of Indian bands as well as the general public to develop their lake frontage properties in accordance with the regulations. Therefore, lake frontage parcels which contain a water table less than four feet below the surface, or display swampy surface conditions, or are situated on an impermeable clay type soil will be exposed to much higher development costs than parcels containing more favourable sewage disposal characteristics.

Finally, it is concluded that the subject region possesses several attractive recreational features but there are significant limiting factors affecting this potential. It is the writer's opinion that many of these limiting factors will decline in significance as the population within the region increases and local demand for recreational outlets becomes more urgent. In other words, it is folly to judge the recreational potential of a community based solely on present use. One must, therefore, assess the potentials and the socio-economic factors summarized above, in order to properly evaluate the recreational characteristics of the region. With this in mind, the need for recreational facilities designed for the use of local family groups should not be overlooked when planning for the future.

TRANSPORTATION

The region is served by four chartered airlines and two helicopter companies. The latter are based at Burns Lake and Smithers. Northern Mountain Airlines and Ominica Air Services Limited provide recreational flying by small aircraft centered at Fort St. James, Smithers, and Burns Lake. Pacific Western Airlines Limited provide regular scheduled flights from Smithers to Vancouver via Prince George and Terrace.

The northern trans-provincial highway, Highway 16, is paved and provides the main arterial route east and west through the region. Lateral highways from Burns Lake to Francois Lake and from Vanderhoof to Fort St. James will be completely paved by 1971. A network of secondary gravel and dirt roads provide access throughout the region to areas possessing considerable natural resource wealth. The C.N.R. offers express, freight and passenger service through the region and to east and west main terminals. Local cartage companies are centered in Smithers, Houston, Vanderhoof, Fraser Lake, Fort St. James, Endako and Burns Lake. A daily bus serves Highway 16 communities.

Marina facilities on Stewart Lake, Babine Lake, and Francois Lake rent boats for sports fishing. Transportation across Francois Lake is provided by a free government ferry, giving access to the network of public roads between Francois Lake and Ootsa Lake.

MANUFACTURING

Primary manufacturing industries within the region have been listed under the section entitled Natural Resources. All manufacturing industries in the region are dependent upon local natural resources.

Secondary industries are developing as the primary industries expand. Machinery depots and fabricating shops have established in Vanderhoof, Fort St. James, Burns Lake, Houston and Smithers to serve the forestry and mining industry. These centres also support distribution depots and maintenance shops for agricultural equipment. Warehousing for the purpose of storing goods for distribution will likely become an important by-product of the manufacturing industries in such centres as Fort St. James, Houston and Smithers.

A detailed discussion of the manufacturing potentials of the region would be irrelevant to this report. We are concerned with the effects that

manufacturing will have on the value and use of land and, therefore, it is suffice to note that:-

1. The mining industry is in the embryonic stage, but exploration is brisk and a modest prediction would suggest that the land requirements for manufacturing plants associated with this industry (smelters, mills, refineries) can only accelerate in the future. The market potential of the Pacific Rim countries which can be serviced through the ports of Prince Rupert or Kitimat are presently being aggressively explored by politicians and industrialists. It would be presumptuous for this author to offer specific predictions and, therefore, it should simply be mentioned that there will be demands for land to accommodate such manufacturing industries in the future.

2. The land requirements for the forest industry are easier to predict at this time because the major companies have negotiated firm commitments with the Provincial Government regarding the use of natural resources and these commitments include the construction of manufacturing plants within a specified period of time. It is known that Takla Forest Products Ltd. at Fort St. James will be expanding their existing manufacturing facilities at that center. However, it is likely that their land requirements will be satisfied by the Pacific Great Eastern Railway Industrial Park which has been reserved adjacent to existing manufacturing facilities. Bulkley Valley Forest Industries Ltd. have programmed the completion of their pulp mill by 1973. Land has been assembled for this purpose. Eurocan Pulp and Paper Company Ltd. are presently only operating a logging camp for 150 men on Ootsa Lake. It will be interesting to observe whether or not the company plans a town and sawmill for this site in the future. The four smaller companies mentioned in the section headed Forest Resources, may require new sites for their expansion programs, but it is unlikely that their requirements would place a significant demand on the present inventory of such sites.

The most significant factor relative to the purpose of this report is the fact as the primary industries expand other secondary industries will be attracted to the region and, of course, will be searching for

manufacturing sites. At the present time Fort St. James has the P.G.E. Industrial Park and Houston has planned an industrial area. Primary and secondary manufacturing industries in search of sites prefer to locate in established industrial parks, serviced by all amenities and therefore, their enthusiasm to establish in a specific locality is increased when such sites can be displayed.

It is evident, therefore, that land which enjoys the characteristics demanded by manufacturing industries, will have significant value and their potentials should be widely advertised at this time in order that they will be exposed to the market when industrialists are searching the region for such sites. A good manufacturing site should contain the following features.

1. Flat, firm well drained soil removed from all dangers of flooding.
2. If the proposed industry produces obnoxious odors, the direction of prevailing winds bears an important influence.
3. If the industry produces wastes which are obnoxious to the environment, a site should contain the physical characteristics necessary to disperse the wastes in accordance with the anti-pollution regulations.
4. If the value of adjacent lands is likely to be decreased by loud, unpleasant noises resulting from the manufacturing plan, the potential of adjacent lands should be considered.
5. The construction of a railway spur should be feasible.
6. The construction of road access should not be encumbered either legally or physically.
7. High voltage power should be available.
8. For some industries the availability of natural gas is important.
9. Some manufacturing industries prefer to be located close to their source of raw material.
10. Some industries, i.e. pulp mills and smelters, require large volumes of water. An adequate water source is, therefore, important.
11. Most industries prefer to be close to a labour source in order to avoid the expense of maintaining a camp.
12. The proximity of all amenities is an important factor for the purpose of servicing the manufacturing plant itself and providing recreational outlets and services for the employees.

Indian reserves possessing these characteristics should not become

firmly committed to other long term uses. Interim uses involving a minimum of development expense could be considered although, if the site is particularly ideal for industrial purposes, it should be reserved specifically for that purpose and its availability advertised.

REGIONAL DISTRICT ADMINISTRATION,
REGULATIONS & ZONING

Head offices for the regional district are located in Burns Lake. The office is staffed by a secretary-manager, planner and building inspector. New construction is approved by the permit system and construction practices are governed by building regulations which are policed by the building inspector.

A zoning bylaw has been approved covering the growth areas which essentially includes the areas adjacent to the main highway. Whether or not the development of Indian reserves can be governed by the zoning bylaws may be questionable. However, the zoning bylaw will influence the establishment of neighbourhoods zoned for specific uses and it is good practice to conform with existing zoning regulations in developing Indian reserves in order to protect land values throughout the general neighbourhood. In other words, it is suggested that it is in the best interests of individual bands to develop in accordance with regulations and bylaws established by the regional district.

A copy of the zoning bylaw and building regulations is available at the regional district office in Burns Lake.

LAND VALUES

Land values are influenced by use pressures, scarcity and available amenities. A sudden increase in land values occurs within neighbourhoods where an industrial expansion project is announced. For example, land values in and adjacent to the village of Houston increased drastically with the announcement of Bulkley Valley Forest Industries proposed development program. Further, land values at Fort St. James increased with the extension of the P.G.E. Railway to that centre and also with the construction of the new sawmill and veneer plant by Takla Development Limited. It is, therefore, safe to assume that Indian reserves located within neighbourhoods which are experiencing industrial expansion will also increase in value. To suggest a value schedule for land within various neighbourhoods would involve considerable research and is beyond the scope of this report. The following value ranges are suggested for various land uses and can be used as a guide for estimating approximate values of specific parcels. However, because of the many factors that effect value, these figures should not be interpreted as representative of true market value for any specific parcel.

- Undeveloped acreage with no agricultural value and beyond the influence of population centres - \$10.00 to \$20.00 per acre plus timber value.
- Undeveloped acreage suitable for agricultural development, but beyond the influence of population centres - \$20.00 to \$50.00 per acre plus timber values.
- Cleared agricultural land suitable for pasture only - \$75.00 to \$100.00 per acre.
- Cleared agricultural land suitable for annual cropping - \$100.00 to \$200.00 per acre.
- Small parcels (up to five acres) with road access and power suitable for homesite purposes - \$200.00 to \$500.00 per acre.
- Small surveyed lots within townsites serviced by road, water and power - \$1,000.00 to \$1,500.00.
- Fully serviced residential lots within a growing community (i.e. Houston) - \$3,000.00 to \$4,000.00.
- Lake frontage acreage - \$7.00 to \$20.00 per front foot.
- Lake frontage residential lots - \$10.00 to \$40.00 per front foot.

- Commercial sites within towns - extremely variable.
- Industrial land with trackage \$400.00 to \$2,000.00 per acre.

SUMMARY AND FUTURE OUTLOOK

This regional analysis touches on highlights as they relate to the use and development of land within the region. In a region on the brink of development, it would be faulty to propose a land use plan based on past or even present conditions. It is necessary to analyze future trends and the causes of such trends in order to plan a development which will not be obsolete in the future. Although neighbourhood influences and physical characteristics of land are important, regional factors and world marketing conditions will likely have a greater influence on future land use potentials.

From the above summary it is concluded that historically, development of the region will make its most significant strides during the next decade. During this term the population is expected to double and the demands on land for agriculture, forestry, minerals and recreational purposes will also increase. As populations increase, the demand for local agricultural products will also increase. As the present forest operations increase their utilization of the forest, a greater volume of products will be manufactured involving more employment and larger payrolls. Thus, more local inhabitants will have the means to enjoy commercial regional recreational facilities. Likewise the development of mineral resources will increase payrolls and bring more permanent settlers into the region, once again increasing the demand for land for a variety of purposes. Development attracts spectators and the number of tourists visiting the region will increase placing a strain on existing recreational facilities. It is concluded that the recreational environment within the region is not comparable with that of regions further south, but that the area does have several recreational advantages. Hunting and fishing are the main attractions at the present time, but the needs of local family groups must be considered in the future.

Although the climate of the area is not harsh, it is not as appealing

