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THE STIKINE-ISKUT RIVER BASIN:

AN OVERVIEW OF ENVIRONMENTAL INFORMATION

April 1978

Inland Waters Directorate
Pacific and Yukon Region
Vancouver, B.C.

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ABSTRACT

This overview study of the Stikine-Iskut River Basin describes the status of environmental knowledge to 1977. The study brings together information relevant to the future management of the water resource. Information on existing physical and social characteristics of the river basin are presented and some gaps in environmental knowledge are identified. The report summarizes available information on physiography, climate, water resources, vegetation, soils, wildlife and fisheries. Social development includes a review of population and amenities, general economy, transportation and parks and recreation. Information provided has been compiled from various sources and the appendices provide a useful reference for data discussed in the report.

The overview has provided the basis for identifying potential conflicts between possible future developments and the water resource. Resource development potentials are covered under discussions of geology, hydroelectric power, forestry and agriculture. Recreational, mineral and hydroelectric values are identified as perhaps the greatest resource assets and potentials of this river basin.

RÉSUMÉ

Cette étude du bassin hydrographique Stikine-Iskut donne un aperçu des connaissances sur l'environnement en 1977. L'étude reassemble l'information relative à l'exploitation future des ressources en eau. On peut y trouver de l'information sur les caractéristiques physiques et sociales du bassin hydrographique, ainsi que les lacunes qui existant dans les connaissances environnementales. Le rapport contient un résumé de l'information disposible sur la physiographie, le climat, les ressources en eau, la végétation, les sols, la faune et les poissons. Le développement social comprend une étude de la population et des commodités, de l'économie en général, des moyens de transport et des parcs et loisirs. L'information présentée dans le rapport provient de differéntes sources, et les appendices peuvent servir de références en ce qui concerne les données qui so trouvent dans le rapport.

Cet aperçu a servi de base à l'identification des conflits qui pourraient survenir entre les nouveaux developpements possibles et les ressources en eau. Les possibilités d'exploitation des ressources sont traitées en meme temps que les discussions relatives à la géologic, l'énergie hydro-électrique, la foresterie et l'agriculture. Il ressort de cette étude que les valeurs en ressources et les possibilités les plus importantes de ce bassin hydrographique sont probablement la récréation, les minéraux et l'hydro-électricité.

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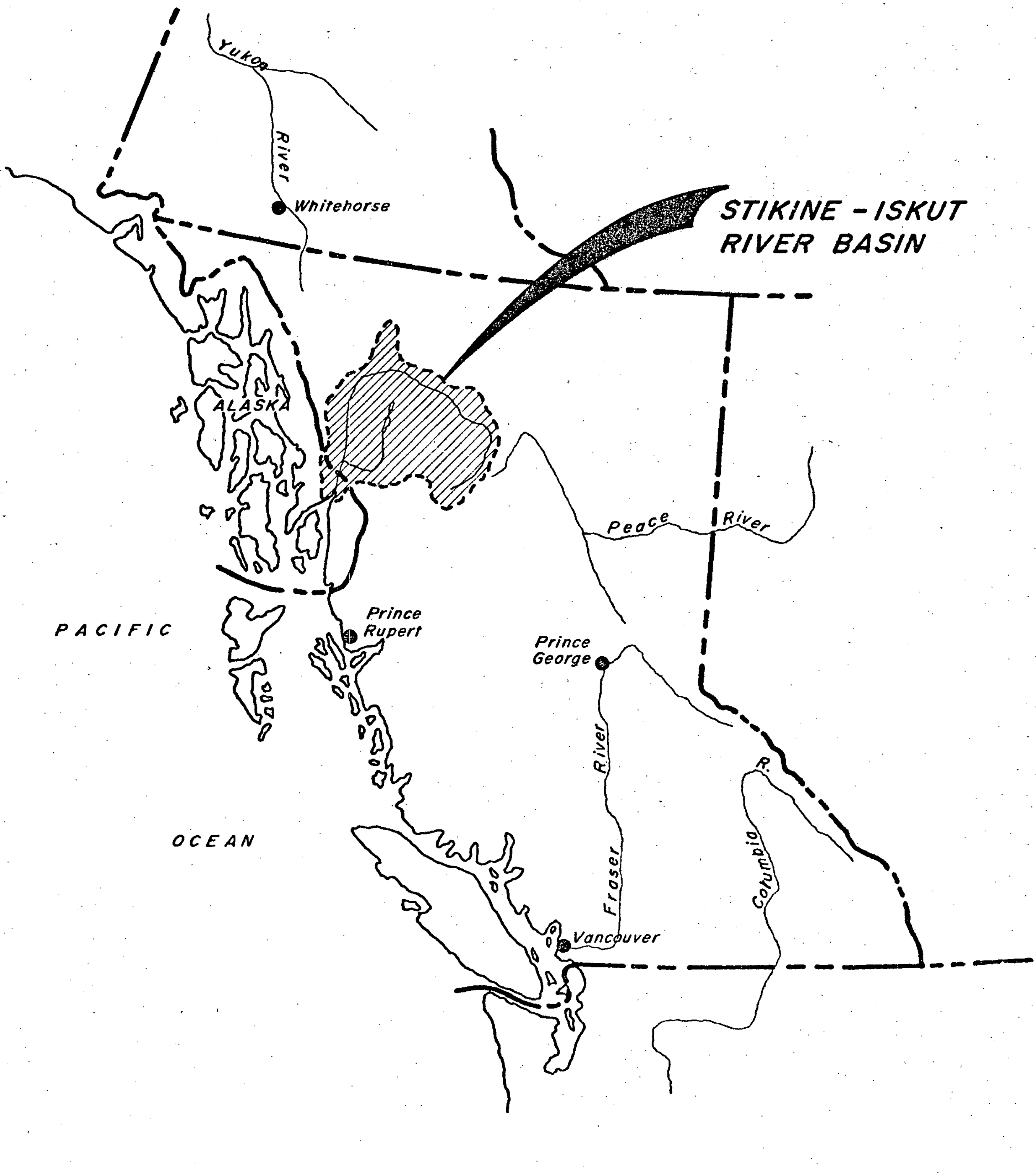


STIKINE - ISKUT
RIVER BASIN
Yukon
River
Whitehorse
ALASKA
Peace
River
PACIFIC
OCEAN
Prince
Rupert
Prince
George
River
Fraser
Columbia
R.
Vancouver

INTRODUCTION

The Stikine and Iskut River Basin is relatively untouched by civilization. There is no industry apart from trapping and outfitting, and as a result the population base is scattered and transient. Truly wilderness in character, access to the area is limited to charter air and boat services and to one highway which is presently undergoing construction to an "all-weather" level.

While previous basin studies have been concerned with major water uses and identified developments in the basins which affect water and water use, this approach would be inappropriate in a discussion of the Stikine and Iskut River Basin. At present, the only consumptive use of the water resource is a small domestic supply, while recreation and tourism are the primary non-consumptive users.

This study shall present a survey of existing physical and social characteristics of the basin and discuss areas of potential development. The overview has attempted to identify potential conflicts between future industrial development (i.e., dams, mining and forestry) and the water resource.

The study was conducted under the direction of Dr. V. G. Bartnik, Head, Water Impact Assessment Division, Water Planning and Management Branch, and the report was prepared by Ms. E. Sumpton and Ms. D. Walters.

I. HISTORICAL PERSPECTIVE

Despite its isolation, the Stikine-Iskut River Basin has a longer history than more accessible areas of British Columbia.

As early as 1741 the northern British Columbia coastal waters were explored by the Russian American Company, and in 1799 that company was granted full trading privileges on the Pacific coast and islands north of the 55th parallel of latitude. The Hudson Bay Company, in 1834, established posts at Dease Lake and on the lower Stikine, however, the latter was abandoned as Russian-American resistance was too strong. So in 1839 the Hudson Bay Company leased the trading rights to the panhandle, and in 1840 took over the Russian fort at Wrangell (present name). These privileges ended when the Russian government sold their rights to the United States. In 1903 it was decided jointly that the United States have possession of the heads of all bays and inlets, whereas Canada retain all but the mouths to the larger rivers draining into the Pacific. Thus, access to the Pacific from northwest British Columbia is possible only through American territorial waters.

In 1861 a minor gold discovery on the Stikine River near Telegraph Creek brought a handful of settlers and enough attention to result in the creation of the "Stikeen Territory", and in 1863 the territory was absorbed into British Columbia.

A year later Perry M. Collins, of Collins Overland Telegraph Company, convinced Western Union Telegraph and the United States government to advance him funds to build a round-the-world telegraph line across North America from New York, through Russia and Europe to London. By late summer of 1866 the line reached Hazelton, B.C. from California but was never continued as it was upstaged by the completion of a trans-Atlantic cable. Collin's dream is perpetuated in the names Telegraph Creek and Telegraph Trail which are situated along the right-of-way.

The Cassiar gold rush of 1873 lured thousands of men north through the Stikine Valley to the interior gold fields. Supply posts were set up at Telegraph Creek and sixteen kilometres downstream at Glenora. Stern-wheeler steamers from Wrangell, Alaska unloaded the hopeful prospectors and they gathered their provisions for the long trek to Dease Lake, then another riverboat journey up the lake to the gold fields at McDame Creek and Dease River. Glenora became the sight of the first attempt at agriculture in the Stikine. A few vegetables were grown, but mostly hay and grains for pack animal feed.

The valley was virtually neglected for the next twenty-five years, but was revived in 1897 during the Klondike gold rush. The Stikine was used once again as an access route, and Glenora became a booming town of two thousand complete with stores,church, a newspaper, and of course, bars. The Federal Government announced plans to construct a railway from Glenora to either Dease Lake or Teslin Lake, but the plans were shelved upon completion of a Whitehorse to Skagway line.

The gold rush over, Glenora became a ghost town while Telegraph Creek, the administrative centre, stabilized its population at 150-300 persons.

In 1901, the right-of-way for the old Collins Telegraph line was used by the Federal Government to connect several northern communities with Vancouver. After the new telegraph line was completed prospectors, ranchers, and geological surveyors trickled into the area. Many copper claims were established - nine on the Iskut and one just south of Glenora. The largest and most inaccessible mineral deposit, the Groundhog Coalfield, was located at the headwaters of the Stikine and Skeena Rivers. This field consists of seven hundred claims each not less than two kilometres square and is believed to be the largest anthracite coal deposit in Canada (Source #28).

In 1925, Telegraph Creek had a hotel, several stores, a Hudson Bay Company post, and a government agent; it was also the main out-fitting point in the area for guides and big-game hunters. In 1932, the tractor trail to Dease Lake from Telegraph Creek was made suitable for truck traffic to serve mining companies and posts at Dease Lake, Lower Liard, and McDame Creek.

World War Two brought a slight boom with the installation of military airfields up the Pacific coast to Alaska. Several steamer companies started regular supply services for the construction camps and survey crews, but gradually these services were cut back as interest in the area waned and they were discontinued entirely in 1971.

II. PHYSICAL RESOURCES

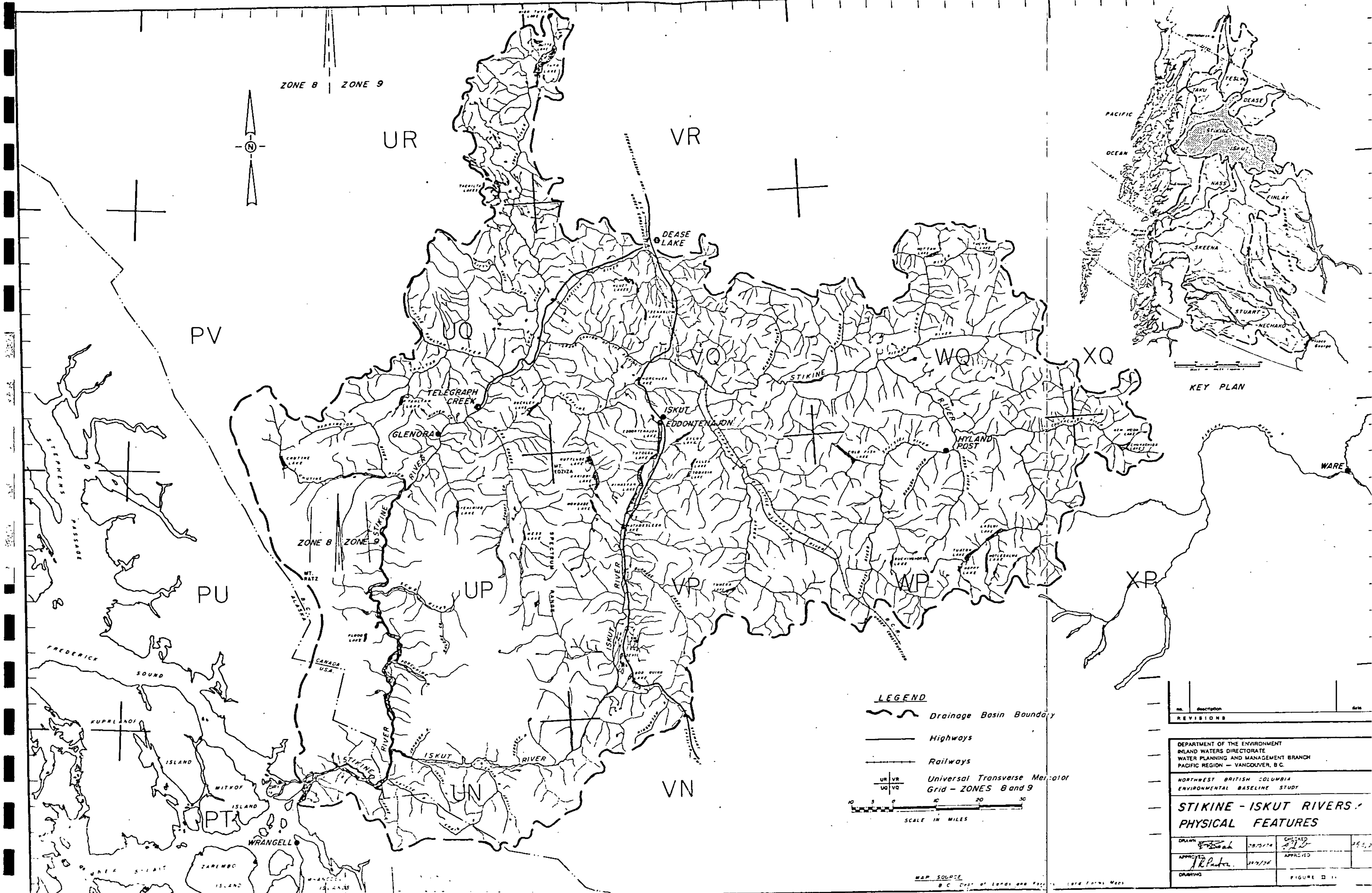
1. Physiography

The Stikine River basin occupies about 51,000 km^2 of northwestern British Columbia. (Source 54). Rising in the Skeena mountains, it flows north and west across the Stikine Plateau. Its tributaries, the Chukachida, Spatsizi, Pitman, McBride, Kehlechua, and Klappan Rivers, drain the Omineca, Skeena, and Cassiar Mountains. For sixty-four kilometres before it turns south, the river is contained in a narrow gorge called the "Grand Canyon". After it is joined by the Tanzilla, Tuya and Tahltan Rivers, the Stikine cuts its way south and west through the Coast Mountains. Eleven kilometres upstream of the International Boundary is the confluence with the Iskut River which occupies the divide between the Boundary Ranges of the Coast Mountains and the Skeena Mountains. Finally the Stikine enters Frederick Sound in Alaska territory (See Figure II.1.1).

The three major physiographic units which the Stikine traverses on its journey to the Pacific are distinct geologically and geomorphologically: a) the Coast Mountains belong to the Western System of the Canadian Cordillera and b) the Stikine Plateau and c) the Omineca-Skeena-Cassiar Mountains to the Central Plateau and Mountain subdivision of the Interior System of the Cordillera. The units and their sub-regions are shown on Figure II.1.2 and discussed below.

a) Coast Mountains

The most spectacular peaks and the most extensive glaciation of the Coast Mountains are found in the Boundary Ranges which run along the northern coast. It is a region of extreme topographic relief: from sea level where the Stikine empties into Frederick Sound to the peak of Mount Ratz is more than 10,000 feet (3050 m).



no.	description	date

REVISIONS

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INLAND WATERS DIRECTORATE
WATER PLANNING AND MANAGEMENT BRANCH
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NORTHWEST BRITISH COLUMBIA
ENVIRONMENTAL BASELINE STUDY

STIKINE - ISKUT RIVERS : PHYSICAL FEATURES

DRAWN		CHECKED	
APPROVED		APPROVED	
DRAWING		FIGURE	

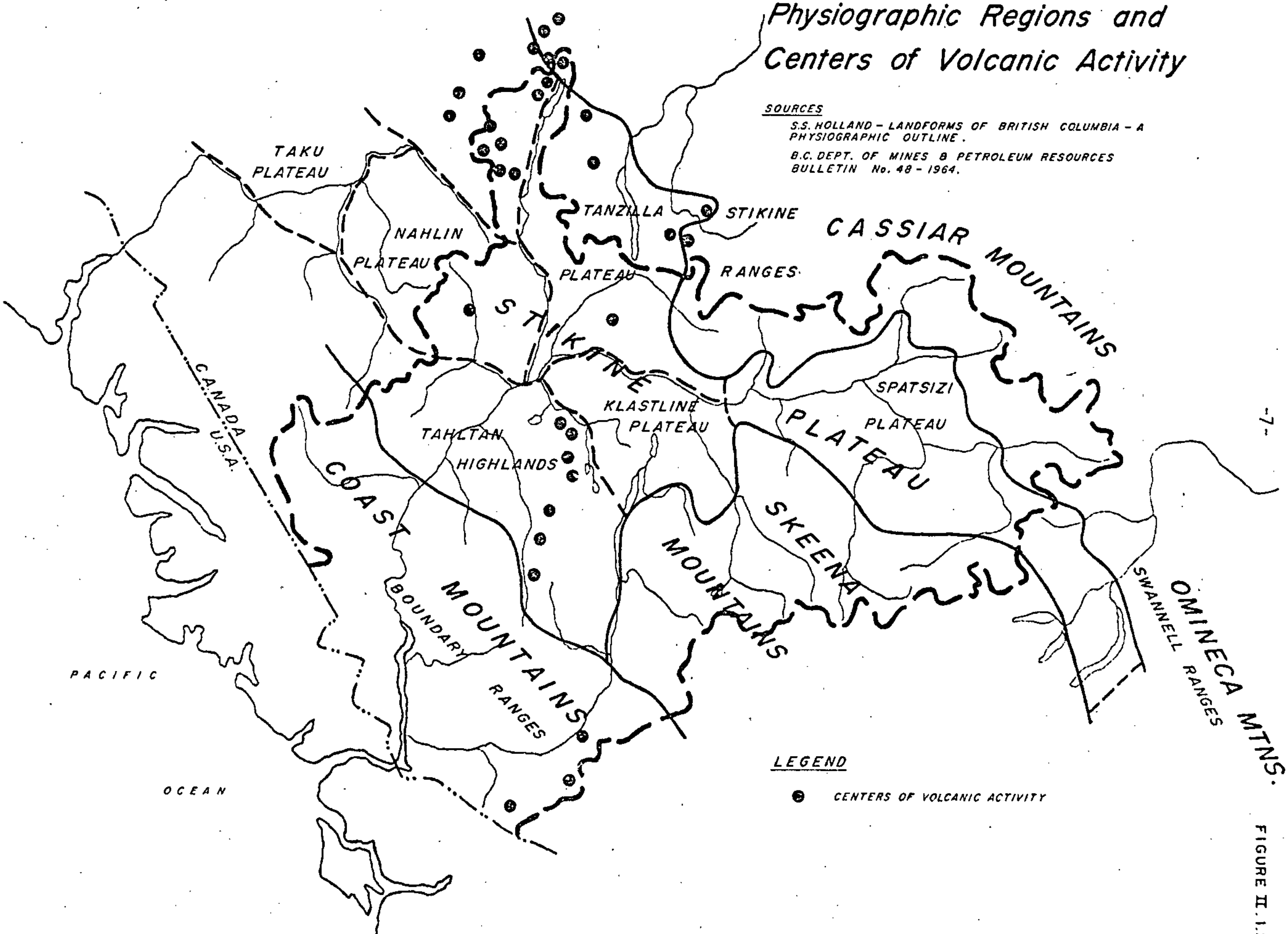
FIGURE II.1.2

Physiographic Regions and Centers of Volcanic Activity

SOURCES

S.S. HOLLAND - LANDFORMS OF BRITISH COLUMBIA - A PHYSIOGRAPHIC OUTLINE.

B.C. DEPT. OF MINES & PETROLEUM RESOURCES BULLETIN No. 48 - 1964.



Deeply incised valley walls rise to rounded ridges at the 4000-5000 foot (1220-1525 m) level and converge on jagged peaks at higher elevations. The ridges follow no preferred orientation, reflecting the irregular crystalline formations which compose them. The mountains consist mainly of intrusive granitic rocks of Jurassic age and older, although sedimentary and volcanic from the Paleozoic and Mesozoic periods are found along the eastern margin of the region.

The topographic features characteristic of extensive glaciation are apparent everywhere. The rounded ridges, truncated spurs, over-steepened valley walls, and hanging valleys indicate that all but the highest peaks were once overridden by continental ice. The serrate nature of the dominant spires is due to the fact that they emerged above the ice sheet. Rapid erosion and prolonged alpine glaciation have modified much of the evidence of the last glacial advance. Cirque glaciers presently occupy peaks above 6500 feet (1985 m) from which tongues of ice extend to lower elevations. Ice fields cap the high mountain complexes, and their valley glaciers extend well below treeline. Flood Glacier, for example, terminates in the Stikine Valley at an elevation of 500 feet (153 m) while timberline is at approximately 4000 feet (1220 m).

The wide valley which is cut by the narrow channel of the Iskut River suggests that this was once the path of a much larger river. The flow of the Stikine was likely diverted via the Morchuea Lake lowlands to the Iskut at a time when the Stikine Valley was blocked by ice. The Stikine itself is relatively narrow. Alluvial fans dumped by fast flowing tributaries have forced the main channel into a sinuous braided course past shifting gravel bars and islands.

A few centres of volcanic activity are located within the Boundary Ranges, primarily near the Iskut River and south in the Unuk River. The most interesting of these, Hoodoo Mountain, is one of northern B.C.'s most spectacular landforms. Almost perfectly circular, it rises with gentle slopes to an ice filled crater at 6500 feet (1985 m). Tall waterfalls, high irregular cliffs, hoodoos, and other odd monumental forms give the mountain a unique appearance. The volcano was likely formed in the early Pleistocene, but since most recent flows are only a few hundred years old, it is possible that the volcano is merely dormant.

b) Skeena - Omineca - Cassiar Mountains

These three mountain regions occupy one fifth (11 300 km^2) of the Stikine River basin. Although geologically distinct, they are grouped together here as they represent the Interior Mountain System with characteristic hydrologic controls. The Skeena Mountains are long linear ridges generally below 6500 feet (1985 m), composed of complex tightly folded sedimentary rocks which trend northwest. These rocks are predominately argillite, shale, and greywacke. The flat nearly concordant summits of the ridges suggest they are remnants of a Tertiary erosion surface. Individual peaks reach elevations greater than 7800 feet (2380 m), and exhibit the serrate nature of peaks intensely glaciated during the last ice advance. Only the northern-most tip of the Swannell Ranges, part of the Omineca Mountains, are drained by the Stikine or its tributaries. Their geologic structure consists of a core of granitic rocks surrounded by older metamorphics and volcanics.

The Cassiar Mountains (specifically the Stikine Ranges) are composed of a granitic core intruded into older sedimentary and volcanic rocks. Quartzite, limestone and gneiss are the major minerals present.

c) Stikine Plateau

The Stikine Plateau is a highly heterogeneous region occupying 26 000 km^2 or approximately half of the Stikine River basin. It is composed of several individual units: the Kawdy, Nahlin, Klastline, Tanzilla, and Spatsizi Plateaus at about 5000 feet (1525 m) elevation, and the Tahltan highlands, which are intermediate between the coast mountains and the plateau proper (See Figure II.1.2).

This upland plateau is a remnant of a Tertiary erosion surface which had been reduced by stream action to a land of irregular but low to moderate relief before the Pliocene. Renewed dissection of the plain followed the uplifting which characterized the Pliocene period, although the degree of incision varied widely throughout the region. The Spatsizi, Nahlin, and Kawdy Plateaus are relatively undissected, while the Tahltan Highlands exhibit much greater dissection.

In general the topography is gently rolling with wide, U-shaped valleys. Readily discernable is evidence of the Pleistocene ice-sheet which covered the land to an elevation of 7000 feet (2135 m). Deposited over most of the surface was a thin layer of glacial drift. Drumlin formations on the Klastline and Kawdy Plateaus indicate the direction of ice movement. Drainage patterns were interrupted by drift or ice-dams; many small lakes now occupy blocked valleys and ice-scoured depressions. Erosional features include the distinctive sculpting of higher ridges in the Tahltan Highlands and the Klastline and Kawdy Plateaus by cirque glaciers.

Within the Highlands, glaciers remain on the peaks of the Spectrum Range and Mount Edziza.

Underlying the Plateau are sedimentary and volcanic rocks of Paleozoic and Mesozoic age, although their distribution and structure vary from area to area. The rock beds of the Tanzilla and Kawdy Plateaus are highly folded, whereas those of the Spatsizi Plateau are generally only gently warped to flat-lying (except along its southwest margin). This latter plateau is composed of sandstone, shale, conglomerate, and mirror coal from the Upper Cretaceous and Paleocene periods. The proportion of volcanic material is highest on the Kawdy and Nahlin Plateaus and the Tahltan Highlands which contain several centres of volcanic activity. (These are shown on Figure II.1.2). Small cinder cones are also visible on the Tanzilla Plateau.

Peculiar to the Kawdy Plateau are steep-sided, flat-topped conical volcanoes called "tuyas", which rise 1000-2000 feet (305-610 m) above the local plateau elevations. There are several whose drainage is wholly or partially to the Stikine. The tuyas consist of nearly horizontal beds of basaltic lava capping outward-dipping beds of fragmental volcanic rocks. They are thought to have been built by volcanic eruptions in lakes; as the lava chilled on contact with the water, the outward-dipping beds were formed. The lavas topping the mountains were released after the volcanoes had grown above water level. Conventional cinder cones are also present on the Kawdy Plateau.

The only volcano on the Nahlin Plateau is Level Mountain, located on the boundary of the Stikine basin north of the Tahltan River. This shield volcano is 20 miles (32 km) in diameter, and culminates in Meszah Peak at 7150 feet (2181 m). Gently outward-dipping beds of thin basaltic lavas parallel the slopes of the mountain. Generally pre-Pleistocene in age it exhibits some evidence of dissection and ice erosion, but retains its original dome shape.

Dominating the southeastern quarter of the Tahltan Highlands is Mount Edziza, which peaks at 9050 feet (2760 m) above sea level. This shield volcano was built up by lava and ash eruptions before and during the Pleistocene, but extrusions have continued into recent time. Weathered lava flows extend north and east from a number of small volcanic cones on the slopes leading to the peak. Cinder cones are characteristic of the Edziza-Spectrum Range area. The latter region extends south of Mount Edziza and is so named for the brilliantly coloured lavas which underlie it.

Lava flows are responsible for another conspicuous feature of the Stikine Plateau: the Grand Canyon of the Stikine River. After recent flows from Mount Edziza had blocked the old channel, the Stikine River eroded the sixty-four kilometre Canyon forming near vertical lava walls over a hundred metres high.

2. Climate

Some characteristics of the climate of the Stikine River basin can be assumed merely from its geographic position. Its latitude, approximately 57.5^{0} to 59^{0} North, implies a rigorous climate of long, cold winters and brief, pleasant summers. Warm, moist air masses moving towards the coast are forced to rise by the Coast Mountains resulting in heavy precipitation. Conditions are drier in the interior Stikine Plateau, but precipitation increases again on the Skeena and Cassiar Mountains. Proximity to the Gulf of Alaska results in frequent storm activity throughout the year. In winter, however, Arctic air masses dominate bringing clear, calm, and very cold conditions. Heavy snowstorms are caused by the occasional mixing of the two air masses; these storms punctuate the long periods of cold, stable weather.

During the cold spells temperatures are lowest in the valley bottoms as dense, cold air pools there. On an annual basis though, protected valleys are warmer and drier than highland areas.

The meteorological data necessary to support the climate patterns described above and to provide the regional detail is unfortunately rather limited as the network of monitoring stations in northern British Columbia is very sparse. The only station within the Stikine basin which has been operating for any length of time is at Telegraph Creek: its record is discontinuous and contains only 18 years of data (prior to 1976). Three other stations may be applicable to the region or, at least, are representative of northwest British Columbia. These are: Dease Lake, virtually within the Stikine basin to the north; Stewart, representative of coastal mountain conditions; and Ware, on the Finlay River seventy-two kilometres to the east (See Figure II.1.1). A number of other stations within the basin have operated for various periods of time. Table II.2.1 summarizes those stations relevant to the basin since 1970 including location, elevation, and period of record.

The parameters measured at the above stations are temperature extremes and precipitation. (Mean temperatures are derived from the maximum and minimum values recorded each day). Ware also records rain intensity and Dease Lake rain intensity, hourly winds, and sunshine. Mean values of temperature and precipitation for the major stations are presented in Table II.2.2 (when examining these data it must be remembered that the number of years used in calculating the means varies from 5-8 for Ware to 25-29 for Stewart). The records for each station are compiled in Appendix II.2.1.

There is a distinct trend in temperature observable in the Table II.2.2 data. Stewart is warmer on an annual basis and has a much milder climate than the other stations. Telegraph Creek is consistently warmer than Dease Lake. These results are likely a function of latitude as well as continentality. The precipitation data suggests a rainshadow in the immediate line of the coast mountains, the effect of which decreases eastwardly. However, given the low density of stations, no further clarification of the values is possible nor is any resolution of regional climatic regimes attainable. The records of the temporary stations do not overlap to the extent where their input for comparative purposes would be useful.

Although detailed meteorologic data is limited or non-existent for most of the Stikine basin, some descriptive information is available. E.A. Kerr, a geologist with Geological Survey of Canada, spent some time in the region in the 1920's. In his report on the lower Stikine and western Iskut River areas, three climatic zones are described (Source #45).

Table II.2.1

Climatic Stations

Station Name	Location		Elevation	Record
Telegraph Creek	57°54'N	131°10'W	600' (183 m)	66-69, 73-
Kinaskan Lake	57°32'N	130°12'W	2675' (816 m)	66 - presently summers only
Schaft Creek	57°21'N	131°00'W	3000' (915 m)	69-74
Todagin Ranch	57°36'N	130°04'W	2950' (900 m)	73-
Galore Creek	57°07'N	131°27'W	2590' (790 m)	July - Oct. 72
Hyland Post	57°39'N	128°10'W	3500' (1068 m)	Jan - Mar 72
Iskut	~57°50'N	129°58'W	2900' (885 m)	Sept - Dec 73
McBride River	~57°57'N	129°15'W	3000' (915 m)	75-
Eddontenajon	~57°50'N	129°58'W	2900' (885 m)	Sept - Oct 72
(Outside Basin)				
Dease Lake*	58°25'N	130°00'W	2678' (817 m)	climatic normals available; sunshine record since 1972
Stewart	56°01'N	129°59'W	25' (8 m)	
Ware**	57°26'N	125°38'W	2550' (778 m)	67-70, 72-

* Also records hourly winds, sunshine, rain intensity

** Also records rain intensity

(Source #5)

(Source #33)

Table II.2.2

Mean Values of Temperature and Precipitation for Major Stations

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Mean Daily Temperature (^{o}F)													
Telegraph Creek	4.8	14.8	26.6	39.6	50.0	57.1	59.9	58.8	50.9	39.1	21.6	10.2	36.0
Dease Lake	- 2.8	8.2	19.1	31.8	43.5	51.4	54.7	52.6	45.3	34.3	17.1	3.9	29.9
Stewart	23.2	28.0	33.4	40.4	49.5	55.2	57.8	58.8	50.1	41.4	32.0	26.0	41.2
Ware	- 5.5	11.4	21.0	34.9	43.7	52.7	55.0	53.2	46.4	33.7	17.0	5.0	30.7
Mean Daily Maximum Temperature (^{o}F)													
Telegraph Creek	11.2	22.7	38.5	51.0	63.7	71.0	72.7	71.5	62.8	47.7	27.8	16.6	46.4
Dease Lake	5.6	18.4	31.2	42.7	56.2	64.4	66.9	64.8	56.0	42.6	24.6	11.6	40.4
Stewart	28.1	33.5	40.6	49.6	60.8	66.7	68.7	67.1	58.8	46.6	36.1	30.4	48.9
Mean Daily Minimum Temperature (^{o}F)													
Telegraph Creek	- 2.8	3.3	15.3	27.2	36.0	44.3	48.1	45.5	39.9	30.7	16.7	3.9	25.7
Dease Lake	-11.3	- 2.1	7.0	20.8	30.7	38.3	42.4	40.5	34.5	26.0	9.5	- 4.0	19.4
Stewart	18.2	22.5	26.1	31.2	38.3	43.7	47.0	46.4	41.6	36.2	27.6	21.7	33.4
Number of Days with Frost													
Telegraph Creek	31	28	30	24	9	-	-	-	3	17	29	31	202
Dease Lake	31	28	31	29	20	5	1	3	11	25	29	31	244
Stewart	29	26	26	17	4	-	-	-	2	8	22	30	164

Table II.2.2 (Cont'd)

Mean Total Precipitation (in.)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Telegraph Creek	1.46	0.91	0.66	0.40	0.34	0.72	0.93	1.03	1.43	1.99	1.41	1.27	12.55
Dease Lake	1.11	1.02	0.83	0.46	0.84	1.51	2.12	2.13	1.72	1.34	1.26	1.19	15.53
Stewart	7.35	5.78	4.75	3.65	2.61	3.10	3.29	4.34	7.25	14.14	7.98	8.33	72.57
Ware	1.51	1.14	0.66	0.38	1.40	1.21	2.28	1.15	2.11	0.99	1.61	1.96	16.40

(Source #33)

One, the 'wet belt', extends coastwards from a boundary drawn between the Little Canyon of the Stikine to the canyon of the Iskut. Annual precipitation in this mountainous area is approximately 75-150 inches (191-381 cm), which for nine months of the year falls as snow. Snow depths can reach more than eight to ten feet (2 to 3 m) on the river flats. Above timberline, the ground is free of snow from August to mid-October, except on southern slopes which may be clear in May.. Temperatures on the coast range between 23-27°F (-5--8°C) and 30-39°F (-1-4°C) daily in the winter months. Average minimum temperatures are 44-50°F (7-10°C) in the summer, near maximums are 61-69°F (16-21°C).

Northeast of the wet belt is an intermediate zone which becomes drier towards its northern limit near Mess and Winter Creeks. There is little rain in the summer, snow accumulation is less, and sunshine hours increase markedly.

Precipitation in the dry belt is very light; snow rarely accumulates to a depth greater than 18 inches (46 cm), and the average annual precipitation is about 10 inches (25 cm) (records at Telegraph Creek indicate 12.5 inches (32 cm)) .

Wind direction is customarily up-valley in summer and down-valley in winter. Cold air draining from the glaciers of the Coast Mountains flows toward the hotter, drier plateau in the summer months, and augments the cold plateau air flowing towards the warmer ocean in winter. Daily wind patterns will follow the same trend as diurnal temperatures change.

Geologists chronicling explorations in the Groundhog coalfield noted that many references over the years described the summers in that area as being 'exceptionally wet'. It would appear that very wet is the rule rather than the exception. Snowfall is also heavy. (Source #28)

It was reported that present day tree growth is thicker, which was attributed to the climate becoming wetter. However, various visitors to the Spatsizi Plateau have recorded that winter snowfall there is light enough to permit the overwintering of horses.

3. Water Resources

Substantially more hydrologic information is available for the basin than climatic data. The hydro-electric potential of the Stikine and Iskut rivers has been recognized for many years; the earliest discharge measurement for the area was recorded in 1954. Several continuous streamflow monitoring stations were established in 1964. These stations, and others added to the network since, are shown on Figure II.3.1 and described in Table II.3.1. Appendix II.3.1 contains historical data to 1976 from which the monthly and annual mean discharges have been taken (Table II.3.2). The discharge figures indicate that runoff in the upper Stikine peaks in June, while the Iskut system reaches its maximum a little later. Table II.3.3 presents maximum and minimum daily discharge values for two stations on the Stikine and two on the Iskut. These figures indicate that seasonal fluctuations in flows are more pronounced in the Stikine than in the Iskut. The later discharge peak evident in the Iskut data (Table II.3.2 and Appendix II.3.1) typifies the influence of glacial melt on the runoff pattern. It is likely that intense storm activity in the fall causes secondary and maximum discharge peaks for the coastal mountain rivers. (Source 61). Detailed information on daily water levels for most hydrographic stations in the basin is available from Water Survey of Canada - Historical Records of Daily Discharge and Water Levels.

FIGURE II . 3.1

HYDROMETRIC AND WATER QUALITY STATIONS

SOURCE
B.C. ACTIVE HYDROMETRIC STATIONS, DEPT. OF ENERGY, MINES & RESOURSES, DEC. 1972

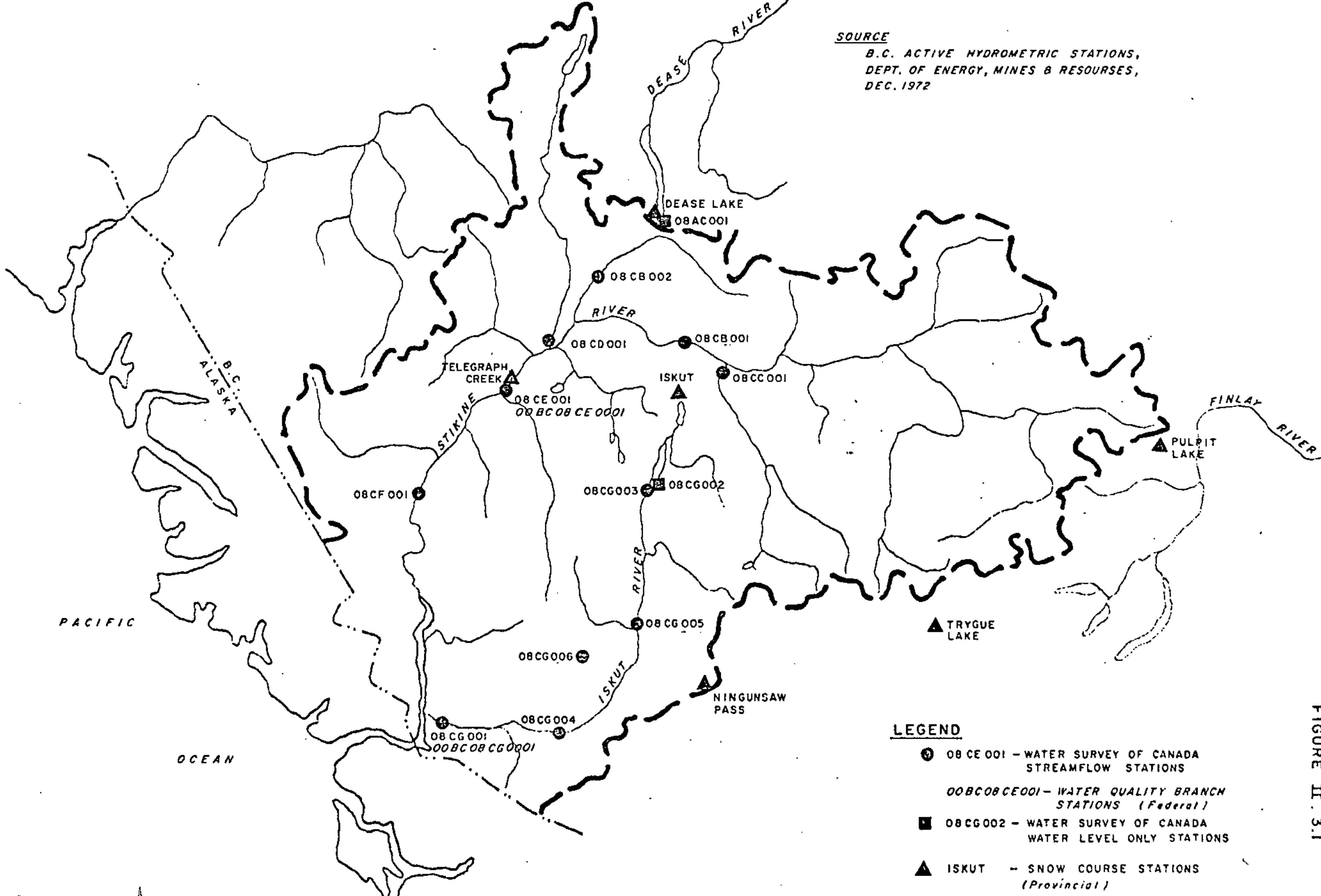


Table II.3.1

Hydrologic Data

Hydrometric Stations - Active		Period of Record
08CB001	Stikine River above Grand Canyon	64-
08CC001	Klappan River near Telegraph Creek	64-
08CD001	Tuya River near Telegraph Creek	64-
08CE001	Stikine River at Telegraph Creek	64-
08CF001	Stikine River above Butterfly Creek	71-
08CG001	Iskut River below Johnson River	64-
08CG002	Kinaskan Lake near Telegraph Creek	
08CG003	Iskut River at outlet of Kinaskan Lake	64-
08CG004	Iskut River above Snippaker Creek	67-
08CG005	More Creek near mouth	72-
08CG006	Forrest Kerr Creek above 1500 Ft. Contour	72-
Hydrometric Stations - Discontinued		
08CB002	Tanzilla River near Telegraph Creek	59-66

(Source #62)
(Source #64)

Table II.3.2

Monthly and Annual Mean Discharges (cfs)

	Jan	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Tanzanilla River nr. Telegraph Creek 08CB002	117	85.0	92.9	157	953	2270	1420	709	605	617	294	155	485
Tuya River nr. Telegraph Creek 08CD001	239	211	193	265	3490	5970	1770	972	1270	1110	476	319	1330
Stikine River above Grand Canyon 08CB001	1580	1260	1200	1650	12100	38600	27200	15700	11100	8490	3900	2210	10300
Stikine River at Telegraph Creek 08CE001	2360	2070	1910	2870	21100	51400	35400	19400	14100	11000	5330	3110	14000
Stikine River above Butterfly Creek 08CF001	3610	3210	2890	3650	26100	65800	63800	42300	28300	20500	8410	4720	23000
Klappan River nr. Telegraph Creek 08CC001	372	335	305	399	2060	7860	7800	4900	3060	1940	850	474	2520
More Creek nr. the mouth 08CG005	196	170	162	229	1190	3280	5320	4830	2410	1980	719	293	1770

Table II.3.2 (Cont'd)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Iskut River above Snippaker Creek 08CG004	1170	963	1050	1470	8720	24200	26100	21200	13400	9170	4460	1970	9430
Iskut River at outlet of Kinaskan Lake 08CG003	142	131	120	138	347	1410	1650	1130	785	609	330	188	577
Iskut River below Johnson River 08CG001	2230	2030	2250	3930	14300	35000	42300	34100	22500	17500	8070	3820	15300
Forrest Kerr Creek above 1500 foot contour 08CG006	41.3	31.1	24.3	46.7	359	1280	2830	2730	1280	852	224	66.0	777

(Source 62)

Table II.3.3

Maximum and Minimum Daily Discharges

Stations

Year		Stikine River above Butterfly Creek 08CF001	Stikine River at Telegraph Creek 08CE001	Iskut River below Johnson River 08CG001	Iskut River above Snippaker Creek 08CG004
1976	Maximum Discharge (cfs)	119,000 (Jul)	82,100 (Jul)	70,700 (Aug)	41,200 (Aug)
	Minimum Discharge (cfs)	2,600 (Apr)	1,840 (Apr)	1,680 (Jan)	810 (Jan)
1975	Maximum Discharge (cfs)	107,000 (Jul)	63,700 (Jun)	84,100 (Jul)	51,400(Jul)
	Minimum Discharge (cfs)	2,930 (Mar)	2,000 (Mar)	1,260 (Dec)	805 (Dec)
1974	Maximum Discharge (cfs)	80,700 (Jul)	62,300 (Jul)	161,000 (Oct)	70,500 (Oct)
	Minimum Discharge (cfs)	2,600 (Mar)	1,600 (Apr)	1,250 (Feb)	635 (Feb)
1973	Maximum Discharge (cfs)	92,500 (Jun)	67,300 (Jun)	53,600 (Aug)	35,400 (Aug)
	Minimum Discharge (cfs)	2,900 (Jan)	1,900 (Mar)	1,500 (Dec)	688 (Mar)
1972	Maximum Discharge (cfs)	145,000 (Jun)	116,000 (May)	63,400 (Jul)	42,000 (Jul)
	Minimum Discharge (cfs)	2,520 (Apr)	1,700 (Apr)	1,170 (Mar)	592 (Mar)
1971 (Sep-Dec only)	Maximum Discharge (cfs)	37,000 (Sep)	74,700 (Jun)	66,700 (Jun)	45,300 (Jun)
	Minimum Discharge (cfs)	3,480 (Dec)	1,660 (Apr)	1,400 (Jan)	675 (Feb)

(Source 61)

Increases in discharge could also be attributed to annual flash floods which are a common feature of glacial valleys; an icedam may hold back meltwaters until the pressure forces it to break, causing flooding downstream. An example of the possible magnitude of daily fluctuations in discharge rates is seen at the Iskut River above Snippaker Creek. In October 1974 the daily discharge rates rose from 27,700 cfs to 58,800 cfs and 70,500 cfs on the 7th, 8th and 9th respectively. Then, on October 10th dropped to 37,700 cfs. However, the maximum instantaneous discharge reached 89,000 cfs on October 9th (Source 61). Telegraph Creek, the nearest climatic station, did not experience heavy rainfalls in that period (Source 32).

There are six snow course stations with data applicable to the region. One station borders on the basin while two others are definitely outside but may be applicable to the eastern half of the basin. The stations are listed in Table II.3.4 and their approximate locations indicated on Figure II.3.1. Mean values of snow depth and water equivalent for several dates are given in Table II.3.5.

Water quality parameters have been measured periodically at two locations: Stikine River at Telegraph Creek (station 00BC 08 CE 0001) and Iskut River below Johnson River (station 00BC 08 CG 0001). Data for 1961 to 1971 is assembled in Appendix II.3.2.

Although the hydrologic data is an improvement over that available on climatology, it too cannot be described as comprehensive. For example, the flow of the Stikine River is not monitored below Butterfly Creek and hence the contribution of the water storage in the Coast Mountains is not quantified.

Table II.3.4

Snowcourse Stations

Location	Elevation	Years of Record	Latitude
Telegraph Creek	580m	2-3	57°57'N 131°09'W
Iskut	1000m	3-4	57°51'N 130°00'W
Dease Lake	820m	12-13	58°26'N 130°01'W
Ningunsaw Pass	690m	2-3	56°48'N 129°57'W
Trygue Lake	1400m	8-14	57°00'N 127°27'W
Pulpit Lake	1310m	8-14	57°32'N 126°47'W

Table II.3.5

Mean Values of Snow Depth and Water Equivalent

	Feb 1		Mar 1		Apr 1		May 1		May 15		June 1	
	Snow Depth (cm)	Water Equiv. (mm)	Snow Depth (cm)	Water Equiv. (mm)	Snow Depth (cm)	Water Equiv. (mm)	Snow Depth (cm)	Water Equiv. (mm)	Snow Depth (cm)	Water Equiv. (mm)	Snow Depth (cm)	Water Equiv. (mm)
Telegraph Cr.	64	142	66	157	66	174	-	-	-	-	-	-
Iskut	47	83	45	82	50	121	2	3	-	-	-	-
Dease Lake	57	101	59	120	57	139	17	53	-	-	-	-
Ningunsaw P.	113	240	164	504	151	508	67	317	32	139	-	-
Trygue Lake	104	254	121	314	127	364	124	437	-	-	-	-
Pulpit Lake	116	286	130	357	138	414	129	442	-	-	-	-

(Source #11)
(Source #8)

According to Slaymaker (1972) the Stikine River has an estimated mean annual discharge of 1350 cms (48,214 cfs) where it enters Alaska, after draining an area of about 51,000 km^2. This yields an average discharge intensity of approximately .029 cms/km^2, which corresponds to approximately 910 mm of runoff per year. Precipitation over the basin averages 1180 mm per year. (Source 54)

The individual contributions of the different physiographic regions to the average runoff regime of the basin vary greatly (see Table II.3.6). The discharge intensity for the 26% of the basin occupied by the Boundary Ranges is .075 cms/km^2 (2180 mm annual runoff). The Skeena Mountains contribute 690 mm of annual runoff or .022 cms/km^2. Heavy fall rains in this region may also swell its discharge volumes to produce a secondary hydrograph peak. The Stikine Plateau, occupying 51% of the basin, shows a mean discharge intensity of .011 cms/km^2 (350 mm runoff); this drier region would not exhibit a significant fall discharge peak, nor would the Cassiar (0.015 cms/km^2, 470 mm) and Omineca (.018 cms/km^2, 570 mm) Mountains. (Source 54). Furthermore autumn precipitation may be in the form of snow earlier in the colder inland region than in the western ranges.

A report on observations made in 1925 by E. A. Kerr, Geological Survey of Canada, noted that tributaries to the Stikine are clear most of the year, but at high water the sediment load is so great that the Stikine Channel aggrades. The Stikine is navigable in summer from the mouth to Telegraph Creek, a distance of 120 miles (193 km), while the Iskut is navigable for 35 miles (56 km) and in winter both rivers usually freeze to near salt water, so that travel on the ice is possible.

Table II.3.6

Contributions of the Physiographic Regions to Average Run-off Regime

Stikine River basin discharge: contributions from each physiographic region

Physiographic region	Discharge intensity (c.m.s./ sq. km.)	Percentage of basin above Telegraph Creek	Percentage of basin in B.C.
Stikine Plateau	0.011	65	51
Cassiar Mountains	0.015	19	13
Skeena Mountains	0.022	16	10
Coast Mountains	0.075	—	26

(Source #54)

4. Vegetation & Soils

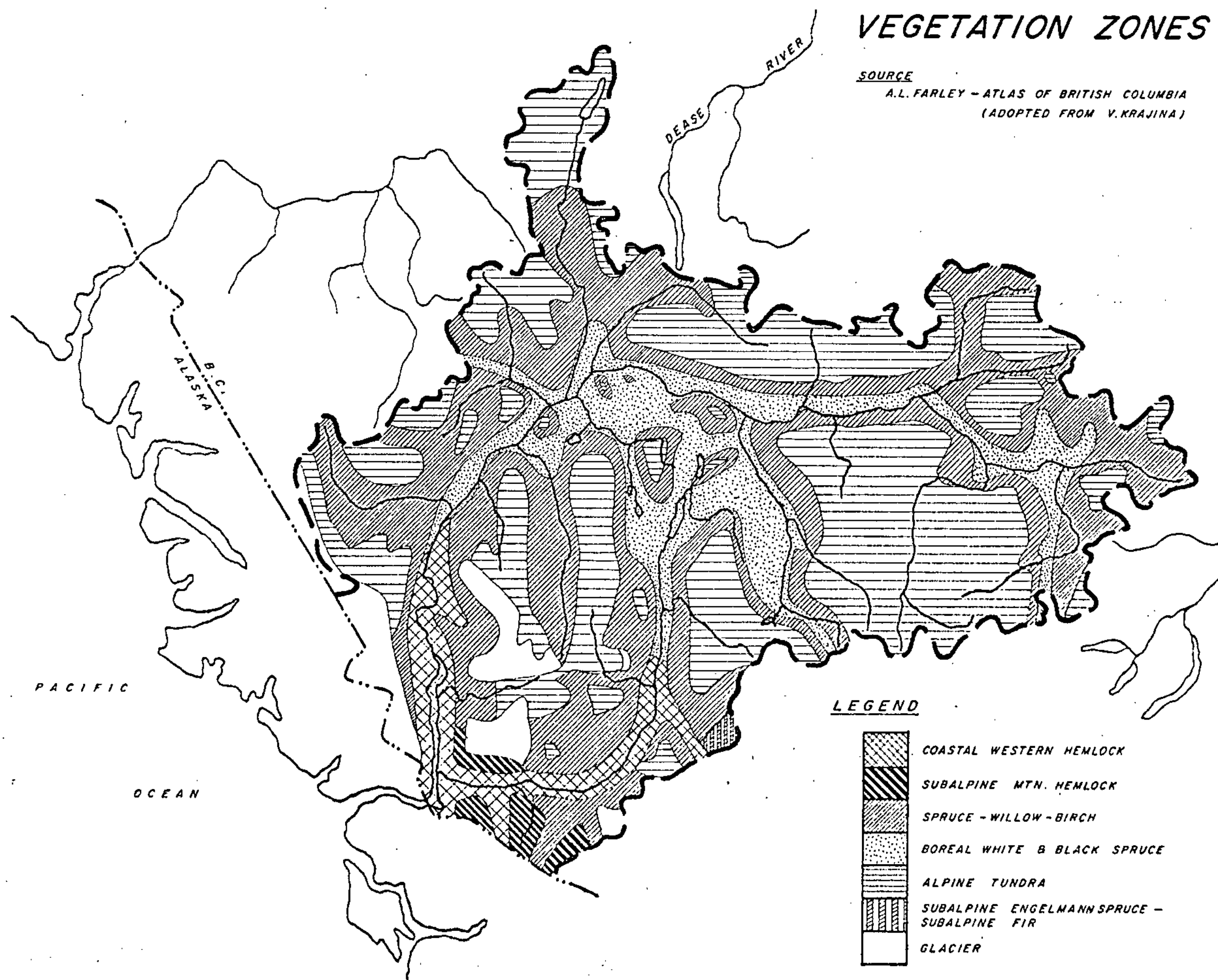
Under this heading, the study area shall be divided into two major zones: coastal and interior.

The coastal vegetation zone is comprised mainly of mature coastal western hemlock and sitka spruce, with balsam, cottonwood, aspen, birch and willow as supplementary vegetation along the river valleys. The Stikine River marks the northern limit of coastal western hemlock and Engelmann spruce. In February, 1975, a 5056 acre (2022 hectare) ecological reserve was established at Bob Quinn Lake on the Lower Iskut River to preserve these species. The thick underbrush is comprised of smaller shrubs including alder, devil's club, and many edible varieties, i.e., cranberries, huckleberries, currants, soapallali, and salmonberries.

The vegetation in the Interior zone is smaller and less dense due to a marked drop in precipitation and more severe winters. Sparsely timbered areas are extensive with lodgepole pine, aspen, balsam, alpine fir, and black and white spruce as the predominant species. Unfortunately, many sections of the interior Stikine valley have been burned within the last fifty years giving rise to much fallen timber and secondary growth. Many dry, steeper slopes carry little but wild grasses.

At an elevation of approximately 900 metres, trees (willows and junipers predominantly) appear stunted and dwarfed and finally give way to the barren alpine tundra zone. Heathers, grasses, mosses, lichens, bryophytes and a few low shrubs are the only forms of vegetation able to adapt to the harsh environment. (Temperatures rarely exceed 10°C and are below 0°C for 7-11 months of the year). Permanent snow-fields and glaciers cap the mountains of the coast range and frequently extend below treeline (See Figure II.4.1).

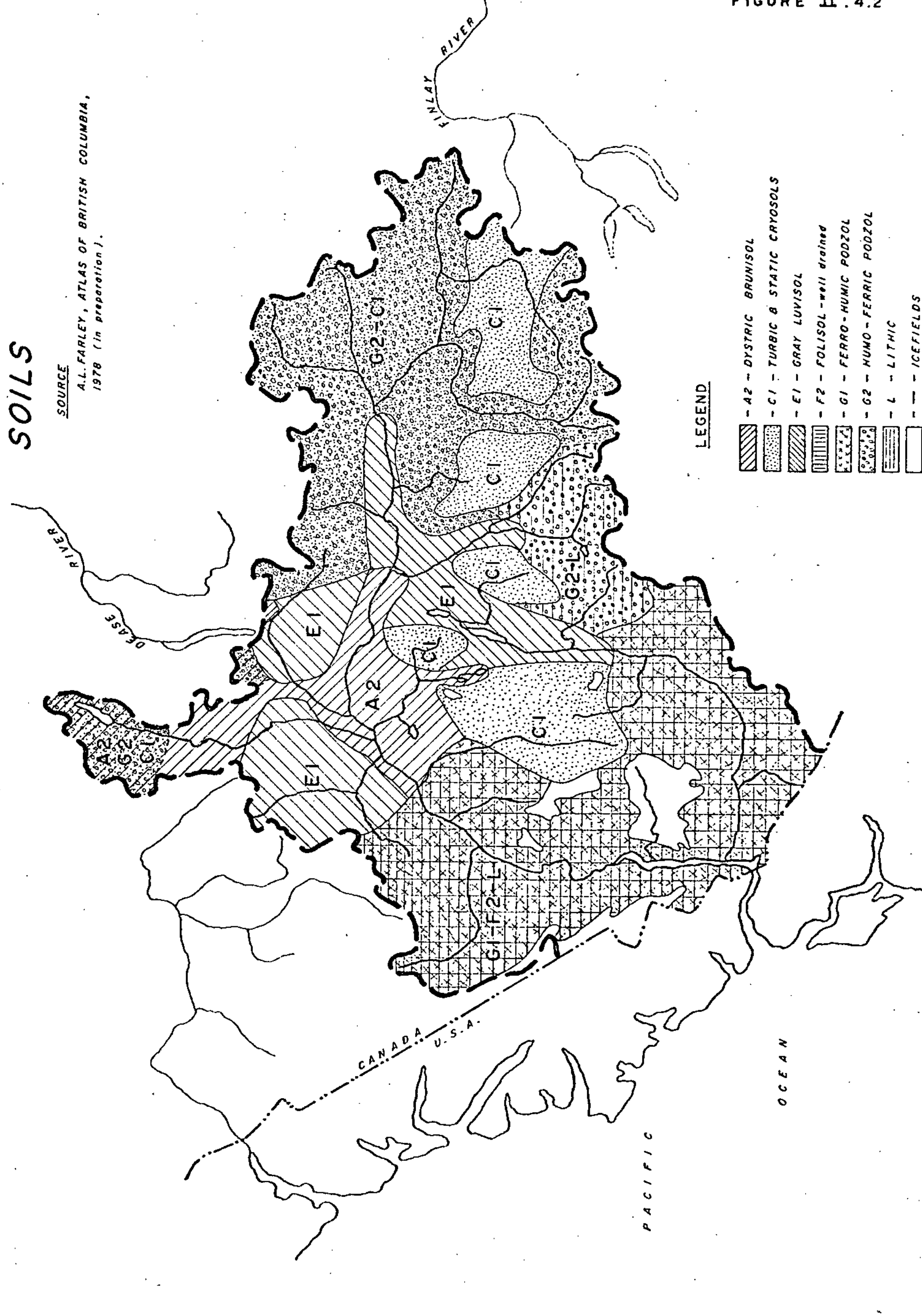
FIGURE II. 4.1


VEGETATION ZONES
SOURCE
A.L. FARLEY - ATLAS OF BRITISH COLUMBIA
(ADOPTED FROM V. KRAJINA)
DEASE RIVER
FINLAY RIVER
B.C.
ALASKA
PACIFIC
OCEAN
LEGEND
COASTAL WESTERN HEMLOCK
SUBALPINE MTN. HEMLOCK
SPRUCE - WILLOW - BIRCH
BOREAL WHITE & BLACK SPRUCE
ALPINE TUNDRA
SUBALPINE ENGELMANN SPRUCE - SUBALPINE FIR
GLACIER

There is little detailed information available on soils in the Stikine basin. A few general statements are possible however.

Soil development is basically a function of parental material, topography, and climate. The soils in the study area have formed from two main varieties of parent materials: glacial boulder clay (till) and alluvial deposits. Coupled with a cold, rigorous climate the resultant soil types are: ferro-humic podzols, folisols, and lithic on the forested lower slopes of the coastal mountains; dystric brunisol on the dry interior slopes with grey luvisols in the river valleys; and predominantly turbic and static cryosolic soils in the alpine tundra regions (See Figure II.4.2).

FIGURE II.4.2


SOILS
SOURCE
A.L. FARLEY, ATLAS OF BRITISH COLUMBIA, 1978 (in preparation).
LEGEND
- A2 - DYSTRIC BRUNISOL
- C1 - TURBIC & STATIC CRYOSOLS
- E1 - GRAY LUVISOL
- F2 - FOLISOL - well drained
- G1 - FERRO-HUMIC PODZOL
- G2 - HUMO-FERRIC PODZOL
- L - LITHIC
- - - ICEFIELDS
FINLAY RIVER
DEASE RIVER
G2-C1
C1
G2-L
E1
A2
A2 G2 C1
G1-F2-L
CANADA
U.S.A.
PACIFIC OCEAN

5. Wildlife & Fisheries

There is an abundance of wildlife in northwestern British Columbia, so much so that the area is regarded as having the best hunting in the province. Guiding and outfitting have become the two primary industries of the region. Trapping has suffered somewhat of a decline in the past few years due to depressed prices for natural furs, however, trap-lines are still laid out extensively with controls being enforced through a provincial registry system.

The game populations are very susceptible to hunting pressures. Gladys Lake Ecological Reserve in Spatsizi Wilderness Conservancy was established to curb the local problem of over-hunting Stone sheep, a subspecies of the Thinhorn sheep which is found only in northwest British Columbia. Also, stringent quotas are enforced in Spatsizi on the annual kills of various animals.

The study area is well populated with Mountain sheep; Mountain goats; moose; Black, Brown and Grizzly bears; Coast and Black-tail deer; wolves, wolverines, and coyotes; and many smaller fur-bearing animals such as beaver, mink, muskrat, fox, marten, groundhog, weasel, and marmot. The Northwest is said to be the most heavily populated Mountain caribou region in British Columbia per square kilometre, with the larger Osborn caribou being the predominant subspecies. Geese and ducks nest along the rivers, while grouse and ptarmigan are found on the interior plateaus.

Very little information is available on fisheries in the study area. In 1965, an exploratory program to study the viability of commercial fishing in Canadian waters on the Stikine was conducted by the Federal Government. The B.C. Fish and Wild-life Branch is presently compiling an inventory and catalogue of fish and wildlife in the Stikine. Simultaneously, the federal Fisheries and Marine Service is preparing an overview of the Stikine with an accent on salmon studies.

All species of Pacific salmon are indigenous to the Stikine. However, due to natural falls, rock slides, and other migration barriers only a fraction of the total drainage area is accessible to salmon. A major block, the Grand Canyon, is situated a few miles upstream of Telegraph Creek. It denies access to greater than fifty percent of the total drainage area of the system.

Sockeye and Chinook salmon spawn in June and July along the Stikine River and its tributaries the Tahltan and Tuya, and along the Iskut River. In late summer, Coho and Pink salmon spawn along the Iskut, while Chum salmon generally remain along the lower tributaries of the Stikine in American territory (Source #30).

The potential for commercial fishing in the Canadian waters of the Stikine is minimal. The small size of salmon stocks, high discharge velocities, and abrupt fluctuations in water levels make standard fishing equipment inadequate (Source #30).

Operating costs would be high due to the isolation of the area. The nearest market is Prince Rupert - nearly five hundred kilometres distant. To be economically feasible, any salmon caught would have to be locally processed, or at least refrigerated, and then transported out in bulk at the end of the season.

Indian families from Telegraph Creek catch approximately four to seven thousand pieces of salmon per season, enough for their year's supply of dried or smoked fish.

Sport fishing is popular among local residents and visitors. Coastal Cutthroat trout and Rainbow trout inhabit most of the rivers and lakes along with Lake trout, Dolly Varden and grayling.

III. POTENTIAL FOR DEVELOPMENT

1. Economic Geology

There are no mining operations active in the region at the present time, and none are known to be planned for the near future. However, considerable exploration has revealed much mineral potential which may be economically desirable to exploit in future years.

A survey of geologists resulted in a 'probablistic forecast' of the mineral endowment of the Canadian Northwest (Source #2). The geologists were instructed to disregard known deposits. A series of maps prepared during the course of the survey indicates the estimated reserves of gold, silver, copper, lead, zinc, nickel, molybdenum, and asbestos. The aggregate values of these reserves in the Stikine area ranges from very low ($0-1,000/mi^2) in the Spatsizi Plateau around Hyland Post and southeast of Tuya Lake, to very high ($800,000 +mi^2) in the coastal mountains. The potential deposits of copper and iron are the largest in northern British Columbia: 800 tons Cu/mi^2 and 4,000 tons Fe/mi^2. The forecast for nickel is low for northwestern Canada, however the Iskut River area has among the highest probable tonnages indicated on the map. The only mineral the area is relatively poorly endowed with is tungsten. The eastern portion of the basin has a low mineral potential with the exception of asbestos; a belt running from the headwater of the Stikine to the Clinton Creek deposit in the Yukon has a forecast asbestos endowment of $50,000/mi^2.

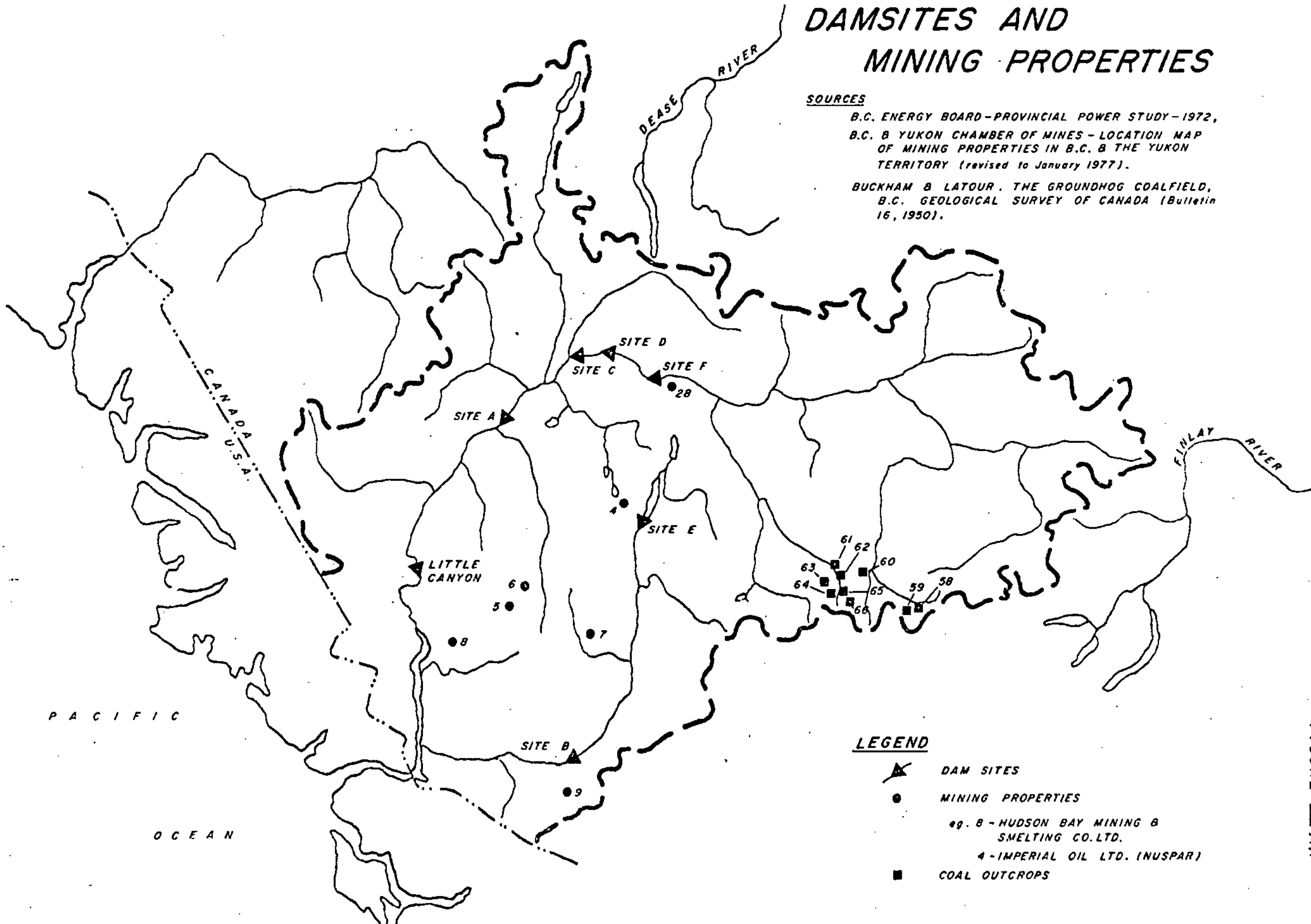
Mining properties held in past years have been explored for some or all of these minerals, however, copper prospects are the most promising. All of the current (1977) mining properties within the Stikine basin are for copper, although some are combined with molybdenum, nickel or gold (See Table III.1.1, Figure III.1.1).

Table III.1.1

Mining Properties

4	Imperial Oil Ltd. (Nuspar)	Copper, Molybdenum
5	Liard Copper Mining Ltd.	Copper, Molybdenum
6	Paramount Mining Ltd.	Copper
7	Northern Valley Mines Ltd.	Copper
8	Hudson Bay Mining & Smelting Co. Ltd. (Stikine)	Copper
9	Nickel Mountain Mines Ltd.	Nickel, Copper
28	Texasgulf Inc. (Silver Standard)	Copper, Gold

(Source #27)


DAMSITES AND MINING PROPERTIES
SOURCES
B.C. ENERGY BOARD-PROVINCIAL POWER STUDY-1972,
B.C. & YUKON CHAMBER OF MINES-LOCATION MAP OF MINING PROPERTIES IN B.C. & THE YUKON TERRITORY (revised to January 1977).
BUCKHAM & LATOUR. THE GROUNDHOG COALFIELD, B.C. GEOLOGICAL SURVEY OF CANADA (Bulletin 16, 1950).
DEASE RIVER
FINLAY RIVER
SITE A
SITE B
SITE C
SITE D
SITE E
SITE F
LITTLE CANYON
CANADA
U.S.A.
PACIFIC
OCEAN
4
5
6
7
8
9
28
58
59
60
61
62
63
64
65
66
LEGEND
DAM SITES
MINING PROPERTIES
eg. 8 - HUDSON BAY MINING & SMELTING CO.LTD.
4 - IMPERIAL OIL LTD. (NUSPAR)
COAL OUTCROPS

A very large copper deposit is presently held by Hudson Bay Mining and Smelting Co. Ltd., (formerly Stikine Copper). This property is located in the Coast Mountains near the Porcupine River. Measured and indicated reserves are rumoured to be 79 million tons of 1% Cu in one zone, and 59 million tons of 1.2% ore grade in a southern zone. This is one of the largest potential copper ore deposits yet found in western Canada. Access difficulties are partially responsible for the delay in development plans for this prospect. (Source 21)

The above property is the only one for which economic development can be foreseen. Options on mining properties are very transitory: the location of a prospect is no indication of a potential mine. After a year's drilling and testing on a property, a mining company will often give up its option and locate a property elsewhere. Thus only three of the properties on the 1977 location map were being explored in 1973. In addition to Stikine Copper, Spartan Explorations had a copper-molybdenum prospect on the Klastine Plateau west of Kinaskan Lake. This option is now held by Imperial Oil (Nuspar) Ltd. South of the Iskut River, a nickel-copper deposit is being explored by Nickel Mountain Mines. No details on either of these two properties are available.

Coal

Within the Skeena Mountains, near the headwaters of the Stikine, Spatsizi, and Skeena rivers is located the Groundhog coalfield. This thermal grade deposit of anthracite coal is approximately two hundred and sixty square kilometres in area. (Source 29)

Its existence was first noted in 1900 by surveyors for the Department of Railways and Canals. Public interest peaked in 1911-12 when it was expected that a branch line of the Grand Trunk Pacific Railway would be constructed up the Skeena River from Hazelton.

However, after that project failed, little exploration was done for many years. Occurrences of coal out-crops found within the Stikine basin prior to 1950 are shown on Figure III.1.1 and described in Table III.1.2.

Recent work has revealed contradictory opinions as to the value of the deposit. It is formed of upper Jurassic and lower Cretaceous sedimentary rocks of the Hazelton Group. The geologic structure is very complex as the strata have been deformed to lie in folds over-turned to the north-east, and are further contorted by minor fractures, folds, and crumples. The folds are crossed by faults; quartz veins fill cross-fractures.

The value of the deposit has been downgraded for the following reasons (Source #28):

a) the complexity of the geology makes the correlation of coal difficult even within a small area. Thus the exact number of the thin coalbeds cannot be determined from the number of outcrops. The lack of continuity and the steeply-dipping bed makes mining by open-pit methods impractical. However, the seams are bracketed by incompetent shale which would require support in an underground mining operation.

b) the coal has a low volatile and high ash content. It is impure, and the proportion of fines in a mined sample would be high. Also, the coal is friable and would be susceptible to degradation by transportation and weathering.

c) rocks of the Sustut Group limit the coalfield to the north-east. As the Sustut Group is not known to contain commercial seams, the possibility that Sustut Group rocks may underly the upper part of the coal-field reduces its potential.

Table III.1.2

Coal Outcrops

58	:	coal, 9.8% ash
59	:	many seams, 9.0% ash
60	:	first recorded observation - "impure anthracite"
61,62	:	much crushed seam
63	:	two seams - one dirty, other cleaner, 6.6 - 7.2% ash
64	:	two seams, dirty, 22.1% ash
65	:	"fair quality"
66	:	two seams, dirty, 22.1% ash

(Source #28)

In contradiction to these discouraging reports, other articles express optimism. Mapping and drilling done in 1970 supports a more encouraging economic outlook. Several coal seams over five feet thick have been found which may have considerable areal extent. Not all beds are deformed: some flat and gently dipping strata exist. Despite the poor coking qualities of the coal, it has a high heat content - over 17,000 Btu/lb on a dry basis (ash included). In contrast to the reports of high ash content, a recent study appraising the coalfields of B.C. describes the ash content as being 'generally quite low' (Source #29).

As a result of difficult access in the past, the prospecting, developing, and transportation costs have been too exorbitant to seriously consider exploiting the coal deposits. However, the area is no longer remote since the construction of the Stewart-Cassiar Highway one hundred and twenty kilometres to the west. The route of the partly constructed Dease Lake extension of the British Columbia Railway passes through the coalfield. If and when the rail line is completed the development of Groundhog will become more feasible.

Minor coal-bearing formations have been found in sedimentary basins of north-central B.C. One of the most significant of these is on the Tuya River but no further information is available.

2. Hydro-Electric Power

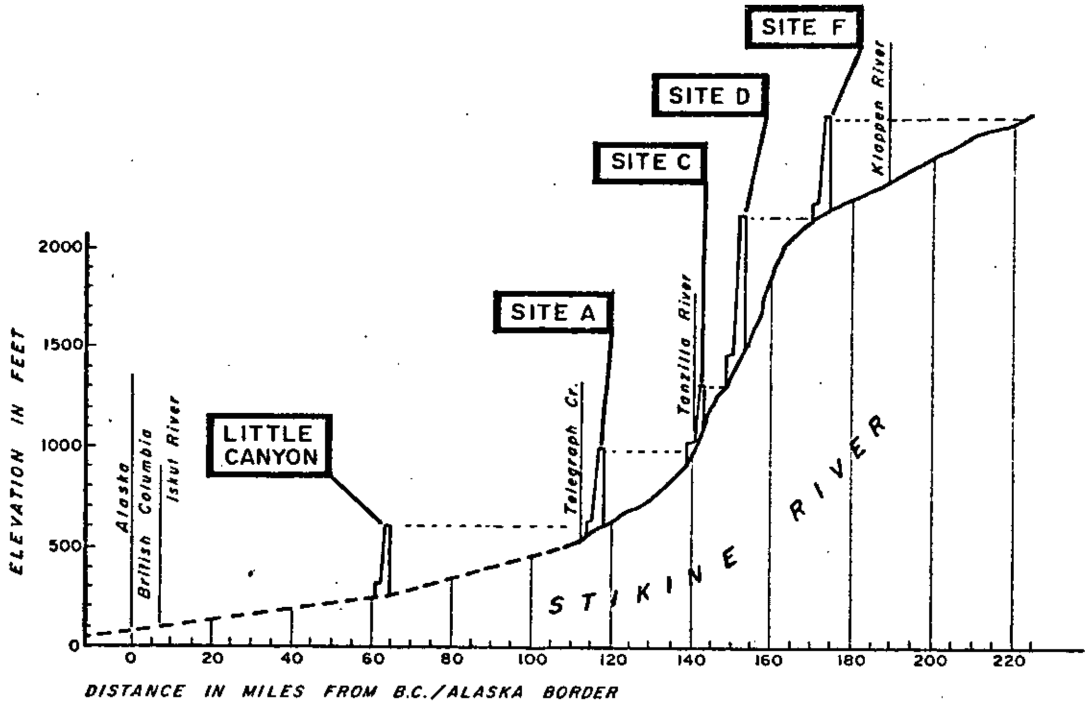
The Stikine River basin has long been recognized as a potential source of hydro-electric power. The river has never ranked high on priority lists, however, due to the relative abundance of alternate power sites in the province which are closer and more accessible to industry and population centers. But as the province's need for power expands, development of the Stikine basin is gaining in importance.

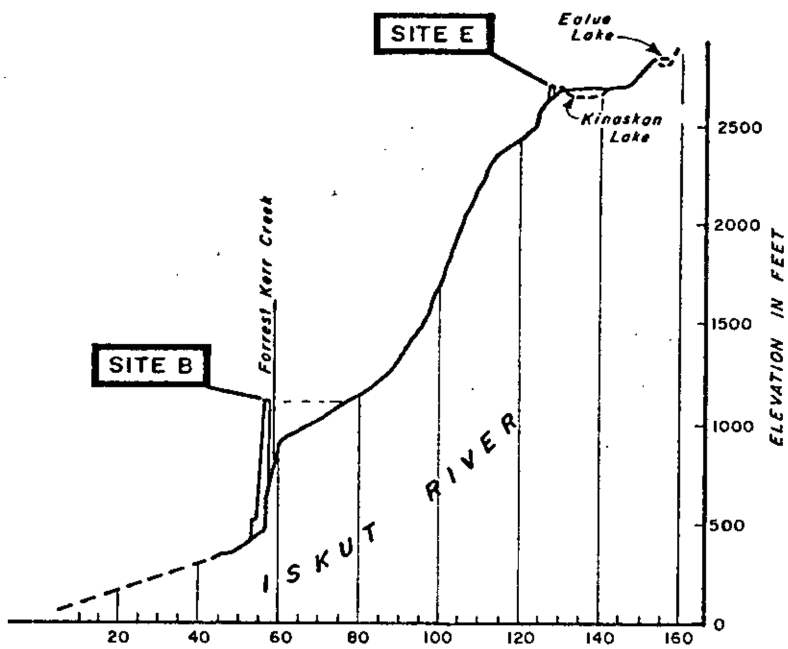
There are many favourable dam sites in the basin. Numerous streams drop from hanging valleys into the main river. The valleys are wide and glaciated and in some places partly dammed by moraines thus offering natural storage areas. However, there are large seasonal fluctuations in discharge reaching maximums in late June and continuing high through July and August (Source #61). Since the Iskut receives most of its water from the coastal mountains, unlike the Stikine which originates in the interior ranges, the Iskut is subject to more frequent and abrupt changes in discharge from rainfall and storm activity especially in late autumn and early spring (See Water Resource Section, Page 19).

Engineers and biologists from British Columbia Hydro and Power Authority are presently re-investigating five potential hydro sites on the Stikine River (See Figure III.1.1 and Table III.2.1). The sites would develop 2420 feet (738 m) of head in continuous steps along 155 miles (250 km) of river beginning at the downstream end with a dam at Little Canyon, about 65 miles (105 km) upstream of the Alaska border. Little Canyon would have two dams (a 350 foot (107 m) earthfill dam across the ancient channel and a 400 foot (122 m) rockfill across the present channel); a 4-unit power plant which would discharge a total of 31,000 cfs at a maximum net head of 345 feet (105 m) and produce a total output of 800 MW; and a storage facility with a capacity of 3.2 million acre feet (see Figure III.2.2 for river profiles).

FIGURE III.2.2

RIVER PROFILES





LEGEND

- POTENTIAL POWERHOUSE
- " DAM
- " DAM & POWERHOUSE

SOURCE

B.C. ENERGY BOARD – PROVINCIAL POWER STUDY, 1972.

Table III.2.1

B.C. Hydro Projects and Costs for Stikine-Iskut River Basin

	Maximum Capacity MW	Number of Units No.	Maximum Net Head ft	Type of Dam -	Spillway Capacity cfs	Active Storage 10^6 ac ft	Drawdown ft	Average Flow cfs
Little Canyon	800	4	345	rock	500,000	3.2	100	23,600
Stikine Site A	450	2	380	earth	420,000	pondage		12,600
Stikine Site C	255	2	280	concrete	270,000	pondage		9,580
Stikine Site D	700	2	770	concrete arch	270,000	pondage		9,500
Stikine Site F	470	2	485	earth	270,000	3.6	185	9,400
Iskut Site B	350	2	600	rock	275,000	0.8	162	8,460
Iskut Site E Storage	N/A	N/A	N/A	lake drawdown		0.3	45	533

	Average Annual Energy 10^6 kWh	Average Annual Energy av MW	Annual Capacity Factor %	Capital Cost 10^6 $	Annual Cost 10^6 $	Cost of Max. Capacity per MW 10^3 $	Cost of Average Energy per kWh sills
Little Canyon	4,770	544	68	347	23.2	434	4.9
Stikine Site A	3,000	342	76	215	14.6	478	4.9
Stikine Site C	1,810	207	81	104	7.2	408	4.0
Stikine Site D	4,950	565	81	229	15.5	327	3.1
Stikine Site F	2,660	304	65	247	16.6	525	6.2
Iskut Site B	2,330	266	76	168	12.3	523	5.3
Iskut Site E Storage				15			

(Source #48)

Development of this dam-site, however, would endanger the migratory route of sockeye salmon along the Stikine to the Tahltan and Tuya Rivers.

Stikine Site A, situated ten kilometres upstream of Telegraph Creek, would consist of a 500 foot (153 m) earthfill dam, an underground powerhouse containing two turbines with a total plant capacity of 450 MW, a discharge rate of 15,600 cfs, and maximum head of 380 feet (116 m). The reservoir could only handle daily pondage, long-term regulation would be provided further upstream at Site F.

Forty-eight kilometres upstream of Telegraph Creek in the Grand Canyon is Site C: a 200 foot (61 m) concrete gravity dam; an underground powerhouse three kilometres downstream which would discharge at a rate of 12,000 cfs, have a maximum net head of 280 feet (85 m), and produce a total output of 255 MW. Again the reservoir is small and would be used for daily pondage only.

Site D, sixty-eight kilometres upstream of Telegraph Creek and still in the Grand Canyon, would house a 600 foot (183 m) concrete arch dam, 2 turbines discharging 12,000 cfs at a maximum net head of 770 feet (235 m) with a total plant output of 700 MW. As with sites A and C only daily pondage is possible.

Stikine Site F, located at the upstream end of the Grand Canyon, would have 3.6 million acre feet of active storage and provide long-term regulation for the downstream dams. A 550 foot (168 m) earthfill dam with two turbines discharging 12,800 cfs at a maximum net head of 485 feet (148 m) would produce an output of 470 MW.

Two projects on the Iskut River are also under consideration. Iskut Site B, located immediately downstream from the mouth of Forrest Kerr Creek, would consist of a 400 foot (122 m) rockfill dam across the main channel and a 150 foot (46 m) earthfill saddle dam across an ancient channel.

It would develop 640 feet (195 m) of head and 800,000 acre-feet of active storage. An underground powerhouse located two kilometres downstream would discharge 1800 cfs and have an output of 350 MW at full reservoir.

Iskut Site E, located at the outlet of Kinaskan Lake 113 kilometres upstream from Site B, would involve excavating a canal from the lake to the central structure thus dropping the water level of the lake fourteen metres. This would create an active storage area of 300,000 acre feet. No power would be generated at Site E, but the storage would be used to regulate flow for the power project downstream at Site B.

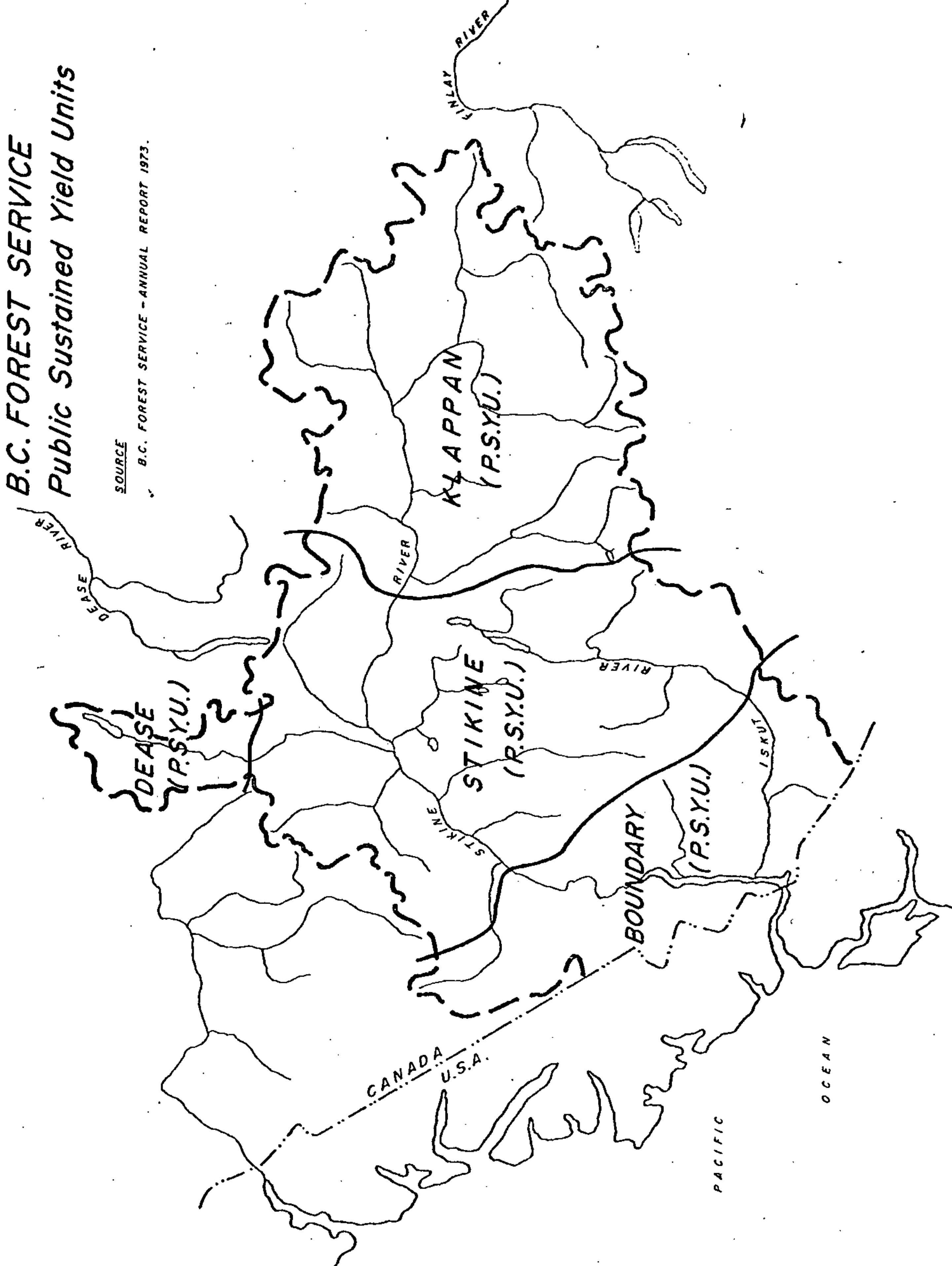
The sites mentioned are all tentative and subject to in-depth investigations and environmental assessments. Despite obvious concern for fisheries, development of hydro power at certain sites in the Stikine may not be detrimental to salmon populations as more than fifty percent of the basin is already inaccessible due to natural blockages. However, other problems such as: lack of long term data; fluctuating water levels; transmission distances; and the sheer isolation of the basin must be overcome before the potential of the Stikine can be fully realized.

3. Forestry

Two Public Sustained Yield Units, Stikine and Klappan, are totally contained within the basin, while two others, Boundary and Dease Lake, are partially included in the basin.(See Figure III.3.1). Forest cover maps and statistics re species, volumes, and rates of growth have been compiled for the PSYU's by the B.C. Forest Service. (See Appendix III.3.1 and III.3.2). The principal species are hemlock and spruce near the coast and spruce, balsam, and lodgepole pine in the interior. The best timber is located in the Coast Mountains: in the Stikine Valley below Telegraph Creek sitka spruce commonly reaches diameters of two metres, while western hemlock reaches one metre. This belt of good timber varies from three to eight kilometres wide along the river valley. Inland, forest cover and undergrowth is less dense and smaller. Here, forest fires are a major concern. A harsh climate, thin soils, rugged terrain, and permanent alpine snowfields are factors which sharply modify the extent of forest land in both areas. Potential annual cut has been estimated at 56,200 mcf (thousands of cubic feet) with an actual volume of 3 billion cubic feet mcf's. However, there are no commercial logging operations in the study area.

It is presently not feasible to log the Stikine because of transportation problems - there is neither rail nor road access to the coastal timber stands, and only limited access to the lower grade interior stands. Attempts have been made to float logs down the Stikine to tidewater at Wrangell, Alaska, however, they have not proved economic. Other factors which affect future development include: a small local market; high labour costs; construction costs; and the need for more advanced levels of production and technology.

FIGURE III.3.1



A large percentage of the forests are over-mature which leads to problems in bleaching and pulp quality, and reduces the volumes of saw and peeler logs available. The best long-term management practise would be to cut the existing timber and reforest (Source #2).

Speculations for the future of a forest industry in the Stikine-Iskut Basin include a forest products complex which would be a combined pulp, paper and lumber operation, probably in the vicinity of Telegraph Creek. It is difficult to forecast when any such developments will occur, certainly an expanded transportation system and a larger population base is essential.

4. Agriculture

The Stikine-Iskut River valleys are poorly suited to agriculture. Scattered pockets of arable soil, a rigorous climate, high altitude, and generally unfavourable topography are major factors limiting the extent to which agriculture can be practised. These adverse physical aspects create high land-clearing costs and inflated labour and transport costs which further limit the economic viability of farming in the Stikine.

Several writers have suggested that valley bottoms around Telegraph Creek and extending as far as Dease Lake are suitable for hardy crops (Source #10). The areas are seemingly flat enough and sufficiently drained. In fact,several homesteaders have small vegetable plots at the mouths of creeks leading into the Stikine River, and there is a large ranch three kilometres east of Glenora. Here, hay and potatotes are grown, but mostly as feed for the horses. Farming as a sole means of livelihood is not yet practical, but the small home gardens do supplement imported foods.

Telegraph Creek has a frost-free season of greater than one hundred days making livestock raising and production of certain varieties of vegetables and field crops a distinct possibility. Individual site factors such as stoniness, soil type, and drainage would require close examination, as would the use of fertilizers, irrigation, and crop rotation.

However, local markets would have to expand considerably in order to make farming economical. Even then, local farms may not be profitable as competition from outside markets, enhanced by an improved transportation system and higher quality products, could prove to be too strong.

IV. SOCIAL DEVELOPMENT

1. Population and Amenities

The study area is vastly wilderness in character. Telegraph Creek and Eddontenajon are the only population centres; together they total 425 people, 350 of whom are Indians. These figures are extremely susceptible to seasonal fluctuations - total numbers swelling in the summer and fall with research teams, hunting parties, and tourists, while declining but centralizing around the two villages in the winter months. There are two occupied Indian reserves, one near Telegraph Creek and the other at Iskut (Eddontenajon). (See Table IV.1.1 for Schedule of Indian Reserves and Figure IV.1.1 for their location).

Telegraph Creek is located on sloping terraces about 45-135 metres above the Stikine River. The town is the local distribution and supply centre for the area boasting two stores, a Hudson Bay Company Post, a hotel or tourist camp, telegraph and Post Office, elementary school, warehouse, RCMP and government sub-agent, and a church.

There is a weekly mail service by plane from Atlin, a diesel generator which supplies the town's electricity, and radio-telephones. Six transport companies service Telegraph Creek, but their head offices are farther south in the bigger centers. Water supply and sewage disposal are the individual's responsibility.

Eddontenajon is located at Eddontenajon Lake halfway along Highway 37. There is a motel, cabins, two general stores, Post Office, service station, and boat rentals.

As Highway 37 nears completion it is speculated that the population shall shift from Telegraph Creek to Eddontenajon or further north to Dease Lake.

Several hunting and fishing lodges are located within the basin.

Table IV.1.1

Schedule of Indian Reserves

Classy Creek	Res. #8	Tahltan Band	1 mi S. of Mincho Lake, 5 mi N. of mouth of Classy Creek on the Tuya River approx. acreage 640
Hiusta's Meadow	Res. #2	Tahltan Band	3 mi N. of the mouth of the Tahltan R. on the Stikine R. approx. acreage 40 58°03'N 130°56'W
Kluachon	Res. #1	Tahltan Band	Lot 6993 District of Cassiar approx. acreage 47.7
Kluachon Lake pop. 166	Res. #1	Tahltan Band	on bend of Kluachon Lake, 42 mi E. of Telegraph Creek approx. acreage 39.8 57°50'N, 130°W
Stikine River	Res. #7	Tahltan Band	on left bank of the Stikine R., 1 mi west of Telegraph Creek approx. acreage 113 57°54'N 131°10'W
Tahltan	Res. #1	Tahltan Band	on right bank of Stikine R., at mouth of Tahltan River approx. acreage 375 58°01'N 130°59'W
Tahltan	Res. #10	Tahltan Band	1 mi N. of mouth of Klastline R. on Stikine R. approx. acreage 641 58°04'N 130°47'W
Tahltan Forks	Res. #5	Tahltan Band	at forks of the Tahltan R. 3 mi E. of Saloon Lake approx. acreage 47.7 58°07'N 131°20'W

Table IV.1.1 (Cont'd)

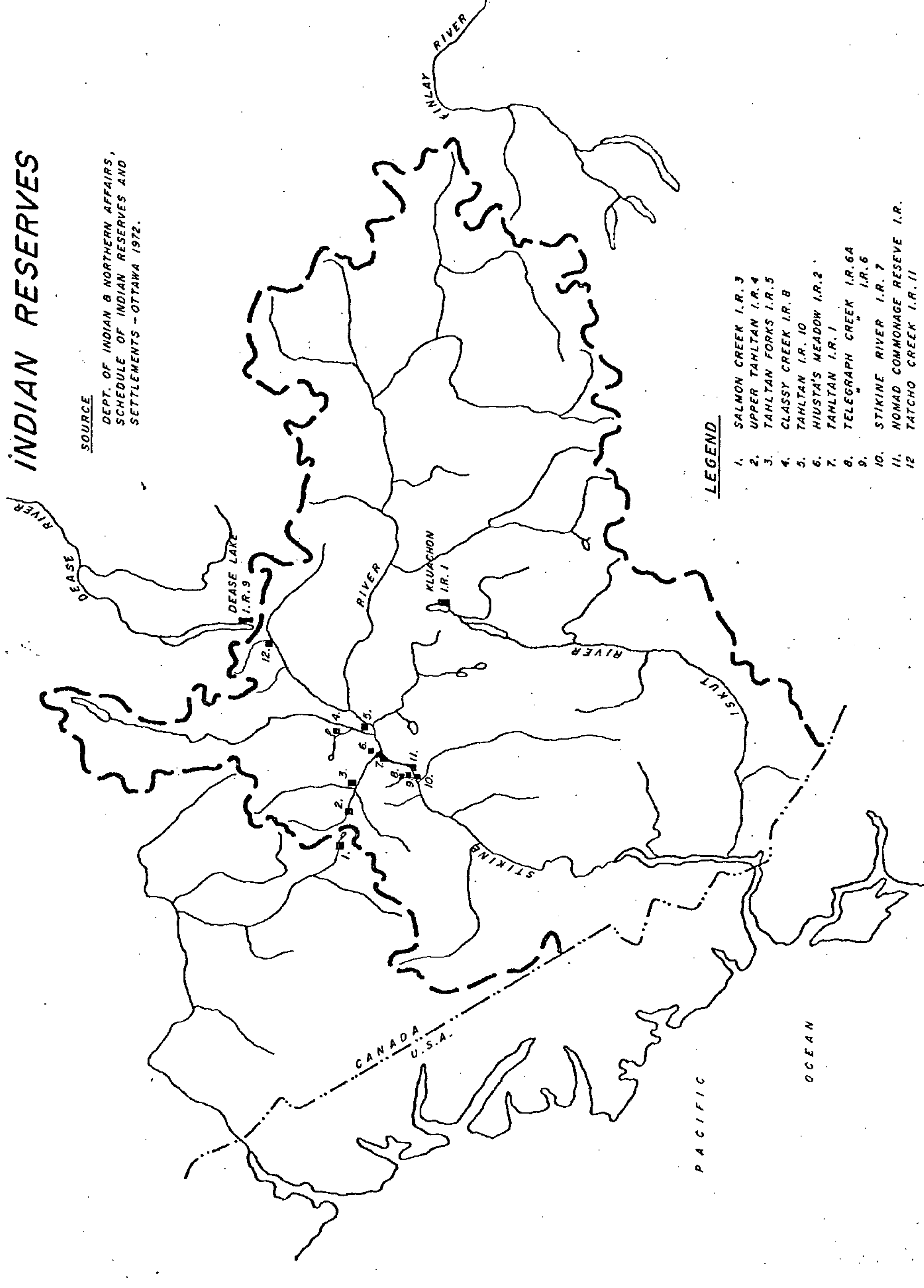
Tatcho Creek	Res. #11	Tahltan Band	on right bank of Tatsho Creek, 7 miles S.W. of Dease Lake P.O. approx. acreage 549 58°23'N 130°09'W
Telegraph Creek pop. 191	Res. #6	Tahltan Band	at Telegraph Creek, right bank of the Stikine R. approx. acreage 60 57°54'N 131°10'W
	Res. #6A	Tahltan Band	adjoins #6. acreage 79.7 57°54'N 131°10'W
Upper Tahltan	Res. #4	Tahltan Band	on the Little Tahltan R., 2 mi south of Saloon Lake approx. acreage 160 58°09'N 131°22'W

Total acreage of band: 3432.9

Total acreage of band in region: 2792.9

(Source #41)

FIGURE IV.1.1


INDIAN RESERVES
SOURCE
DEPT. OF INDIAN & NORTHERN AFFAIRS,
SCHEDULE OF INDIAN RESERVES AND
SETTLEMENTS - OTTAWA 1972.
LEGEND
1. SALMON CREEK I.R.3
2. UPPER TAHLTAN I.R.4
3. TAHLTAN FORKS I.R.5
4. CLASSY CREEK I.R.8
5. TAHLTAN I.R.10
6. HIUSTA'S MEADOW I.R.2
7. TAHLTAN I.R.1
8. TELEGRAPH CREEK I.R.6A
9. " I.R.6
10. STIKINE RIVER I.R.7
11. NOMAD COMMONAGE RESEVE I.R.
12 TATCHO CREEK I.R.11
FINLAY RIVER
DEASE RIVER
DEASE LAKE I.R.9
RIVER
KLUACHON I.R.1
ISKUT RIVER
STIKINE
CANADA
U.S.A.
PACIFIC OCEAN

2. General Economy

The economy is very simple, being virtually unsupported by any form of industry. The majority of the population is employed in seasonal activities such as trapping, guiding, and packing. Historically, trapping provided quite a large cash income to the area, however, in recent years competition from various fur substitutes has lowered the price of wild fur. The basin is also one of the finest hunting regions in North America. Guiding and packing employ several Indians as non-resident hunters are required to be accompanied by a local guide. Subsistence fishing and welfare cheques augment the Indians' meagre income.

There are a few administrative and commercial positions which are held mainly by whites who come to the area for one to three year terms.

Much exploratory work is and has been conducted in the area as a thorough knowledge of the resource base is still incomplete. Research teams, often totalling over 250 men, include groups from British Columbia Hydro and Power Authority, several mining companies, university personnel, and various government departments i.e. B.C. Forest Service, B.C. Fish and Wildlife Branch, B.C. Environmental Land Use Committee, B.C. Parks Branch, and the Canada Fisheries and Marine Service.

3. Transportation

The Stikine River was traditionally an access route to the north, but after completion of the Alaska Highway, in 1942, it was virtually forgotten. The rivers and trails continued to be used by a handful of prospectors, outfitters, and surveyors; while the one hundred kilometre gravel road from Telegraph Creek to Dease Lake served a few mines and trading posts in the Dease Lake basin. In 1960, Telegraph Creek was linked with the Alaska Highway via Dease Lake and Cassiar, and by 1972, Dease Lake was connected with Stewart, at the head of Portland Canal, giving the asbestos concentrates from the Cassiar mine direct access to ocean shipping. This link, Highway 37, is a two lane gravel road which follows the Iskut River valley and continues north to Dease Lake. Construction is underway to connect this route to Highway 16 near New Hazelton, presently this 166 kilometre access to Highway 37 is a private logging road and public use is restricted (Source #48). The portion of Highway 37 traversing the Stikine basin is in relatively good condition, improvements are not being planned until the rest of the highway is brought to the same standard. However, three temporary bridges are scheduled to be replaced, and the highway is expected to be paved by the end of 1979.

The most northerly portion of the Dease Lake extension of the British Columbia Railway lies in the study region. The line follows the Little Klappan and Klappan Rivers to their confluence with the Stikine, which it follows westerly until veering north to parallel Highway 37. The provincial government has halted construction on the line due to lack of funding. A Canadian National Railways line, which was to run from Terrace to Meziadin Junction and eventually to the Groundhog Coalfield,has also been shelved pending settlement of native land claims (Source #48).

Trans-Provincial Airlines operate a regular float plane service from Terrace to Dease Lake twice weekly with stops at Bob Quinn Lake, Eddontenajon, Telegraph Creek and Schaft Creek if required. (See Table IV.3.1 for location of airfields within the study area). Bush and float planes and helicopters are used extensively by hunting and fishing parties, government research teams, and geologists.

The Stikine River is navigable as far upstream as Telegraph Creek, however, regular riverboat service was discontinued in 1971. Boats are available on a charter basis from Wrangell, Alaska.

Possible future developments in the study area include a British Columbia Railway extension from the Klappan River along the Klastline River to Telegraph Creek, and a road north from Telegraph Creek to Atlin. The Government of Alaska has suggested linking their panhandle cities to the continental roadwork system which would involve a route up the Stikine and Taku River valleys.

Improvement of the transportation network could stimulate tourism and development of the mineral, hydro-electric, and forest resources of the area.

Table IV.3.1

Airfields

Aerodromes			Longest Usable Area	Location	Operator
land base	Eddontenajon	unlicenced	2000'	57-50N, 129-58W	B.C. Dept. of Highways
	Telegraph Creek	unlicenced	2600'	57-54N, 131-11W	Trans Provincial Air Carriers Ltd., Terrace, B.C.
water base	Kinaskan Lake	unlicenced	10 mi	57-32N, 130-12W	R.S. Hyland, Kinaskan Lake via Eddontenajon
	Telegraph Creek	unlicenced	2 mi	57-54N, 131-11W	Trans Provincial Air Carriers Ltd., Terrace, B.C.

Additional airports at:			
	Hyland Post - Stikine R.	3000'	Cataline Investments
	Burrage Creek - Iskut R.	4000'	Department of Highways
	Schaft Creek	4000'	Hecla Mines
	Galore Creek		

(Source #3)

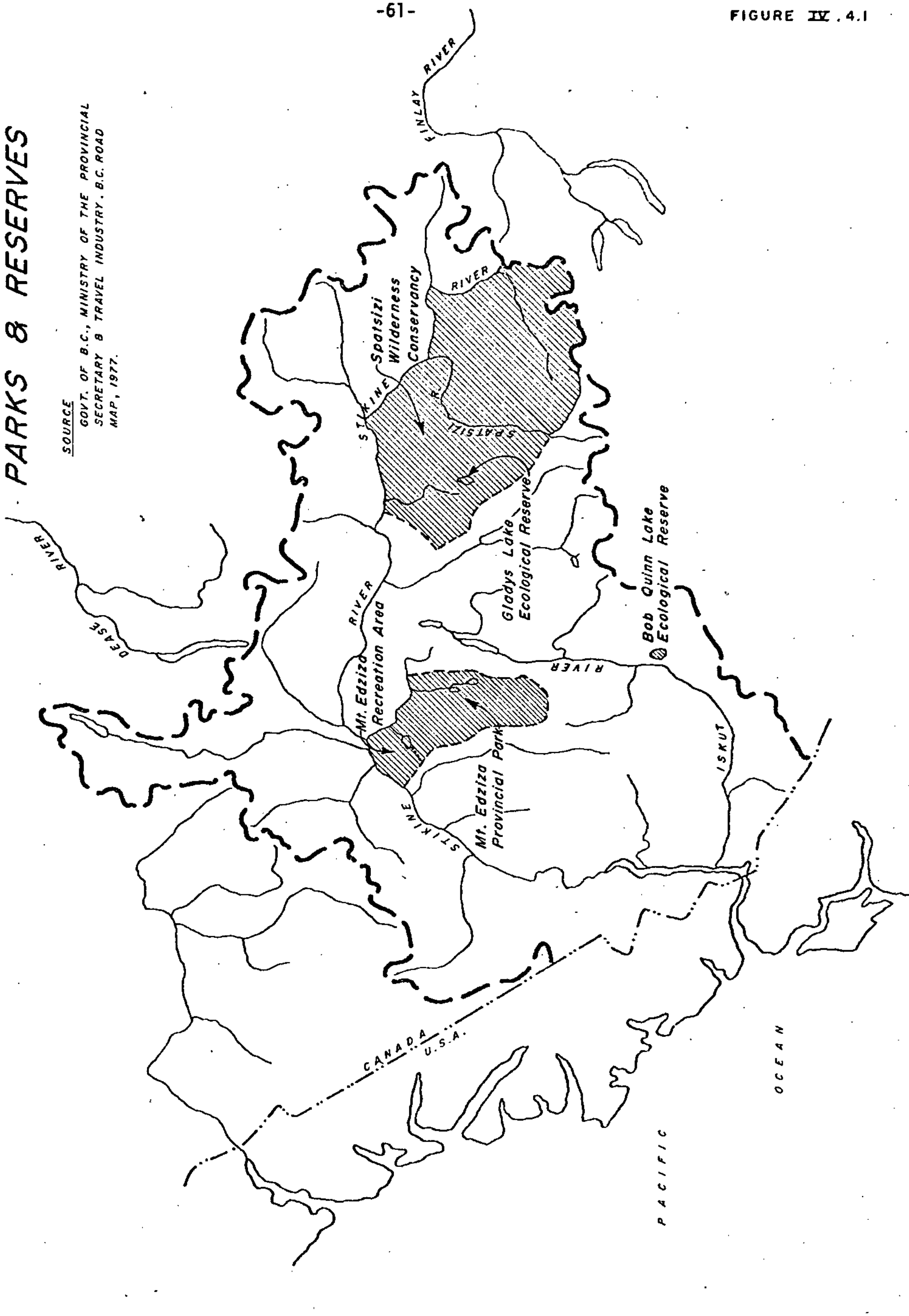
4. Parks & Recreation

Two Class A provincial parks and one recreation area are located within the basin. (Exploitation of natural resources is not permitted in Class A parks, while it is conditionally permitted in recreation areas). Mount Edziza Park (326,000 acres, 130 000 hectares) and the adjacent Mount Edziza Recreation Area (249,000 acres, 99 600 hectares) surrounds the colourful volcanic cone (Mt. Edziza) on Spectrum Range, west of the Iskut River and southeast of Telegraph Creek. Spatsizi Plateau Wilderness Conservancy, near the headwaters of the Stikine River, at 1.7 million acres (680 000 hectares) is the largest Class A park in the province. It includes Gladys Lake Ecological Reserve (approximately 200,000 acres, 80 000 hectares) which was established for the protection of Stone sheep and Mountain goat. Another ecological reserve exists near Bob Quinn Lake (5,056 acres, 2022 hectares) to preserve the coastal western hemlock zone and the associated Engelmann Spruce and subalpine fir zone near its northern limit. (See Figure IV.4.1 for location of parks and reserves).

Recreation potential abounds in the Stikine - Iskut River basin. Several companies offer canoe and raft expeditions down the Stikine, but the major attraction is big-game hunting. One of the finest hunting areas in British Columbia, the Stikine offers moose, Mountain goat, Mountain sheep, Black and Grizzly bears, deer and caribou as well as grouse, ptarmigan and waterfowl. Fishing is excellent also; salmon, trout, Lake char, and Dolly Varden are abundant in the clear streams.

Tourists are attracted to the area for its scenery and fishing, but also for its advantage of being an alternate route to the Alaska Highway. When Highway 37 is completely upgraded it is expected that tourism may increase as much as twenty to thirty per cent (Source #3).

FIGURE IV.4.1



PARKS & RESERVES

SOURCE
GOVT. OF B.C., MINISTRY OF THE PROVINCIAL SECRETARY & TRAVEL INDUSTRY. B.C. ROAD MAP, 1977.

Hopefully, improved facilities and accommodations will accompany the increase. At present, there is only one BCAA approved motel and restaurant in the study area, at Eddontenajon. However, there is accommodation in Telegraph Creek and a resort at Kinaskan Lake. Several private hunting lodges are in the area, also.

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APPENDIX II.2.1

Climatic Records for Telegraph Creek, Ware and other stations

Appendix II.2.1

Climatic Records for Telegraph Creek, Ware and other stations

Telegraph Creek	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Mean daily temp. (^{o}F) (a) (Yrs. of record)	4.8 (17)	14.8 (17)	26.6 (17)	39.6 (16)	50.0 (17)	57.1 (17)	59.9 (17)	58.8 (17)	50.9 (17)	39.1 (17)	21.6 (18)	10.2 (18)	36.0
Mean daily max. temp. (b)	11.2	22.7	38.5	51.0	63.7	71.0	72.7	71.5	62.8	47.7	27.8	16.6	46.4
Mean daily min. temp. (b)	-2.8	3.3	15.3	27.2	36.0	44.3	48.1	45.5	39.9	30.7	16.7	3.9	25.7
Extreme max. recorded (b) (Yrs. of record)	46 (16)	49 (20)	59 (16)	71 (15)	86 (14)	95 (16)	92 (15)	90 (16)	84 (17)	71 (17)	52 (13)	47 (15)	95
Extreme min. recorded (c) (Yrs. of record)	-43 (12)	-38 (15)	-21 (15)	-1 (14)	23 (11)	30 (12)	36 (11)	32 (11)	19 (12)	2 (13)	-23 (10)	-40 (12)	-43
Mean total precipitation (a) (inches) (Yrs. of record)	1.46 (18)	0.91 (18)	0.66 (17)	0.40 (17)	0.34 (18)	0.72 (18)	0.93 (18)	1.03 (18)	1.43 (18)	1.99 (17)	1.41 (19)	1.27 (17)	12.55
No. of days with frost (d)	31	28	30	24	9	-	-	-	3	17	29	31	202

Ware	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Mean daily temperature (Yrs. of record)	-5.5 (8)	11.4 (8)	21.0 (8)	34.9 (8)	43.7 (7)	52.7 (7)	55.0 (6)	53.2 (6)	46.4 (5)	33.7 (7)	17.0 (8)	5.0 (8)	30.7
Mean total precipitation (Yrs. of record)	1.51 (8)	1.14 (8)	0.66 (8)	0.38 (8)	1.40 (6)	1.21 (6)	2.28 (6)	1.15 (6)	2.11 (5)	0.99 (7)	1.61 (8)	1.96 (8)	16.40

Notes:

(a) Mean calculated with up to and including 1975 data

(b) From 'Climatic Normals 1941 - 1970', based on 15 - 19 years of data between 1941 and 1970

(c) From 'Climatic Normals 1941 - 1970', based on 10 - 14 years of data between 1941 and 1970

(d) From 'Temperature and Precipitation 1941 - 1970 for British Columbia', based on 10 - 14 years of data between 1941 and 1970

Appendix II.2.1

Climatic Records for Telegraph Creek, Ware and other stations

Telegraph Creek		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Mean daily and annual temperature	1975	8	10	25	40	49	54	61	58	52	40	18	11	36
	74	-3	21	22	41	48	52	57	61	51	40	28	22	37
	73	M	M	M	M	M	M	M	M	M	M	9	10	M
	72													
	71													
	70													
	69	-14	7	30	43	53	64	60	55	51	M	M	M	M
	68	2	13	30	M	49	56	62	58	49	39	28	-2	M
	67	5	21	21	41	51	61	59	60	51	41	25	10	37
	66	M	M	M	M	M	M	M	M	M	36	17	13	M
average		7	15	27	39	50	57	60	59	51	39	22	10	36
Mean daily and annual precipitation	1975	1.85	0.97	0.95	0.70	0.16	1.03	0.41	1.74	0.81	1.07	1.08	2.70	13.47
	74	1.34	0.84	0.30	0.87	0.47	0.25	1.15	0.84	2.88	5.14	1.07	1.52	16.67
	73	M	M	M	M	M	M	M	M	M	M	0.78	0.43	M
	72													
	71													
	70													
	69	0.49	0.02	0.56	0.36	0.42	0.80	0.40	1.27	1.26	M	M	M	M
	68	2.55	0.64	M	M	0.47	1.30	0.71	1.25	1.65	0.45	4.00	M	M
	67	1.65	1.29	0.63	0.05	0.90	0.28	0.83	1.05	2.48	0.50	0.89	M	M
	66	M	M	M	M	M	M	M	M	M	M	2.51	1.32	M
average		1.46	0.91	0.66	0.40	0.34	0.72	0.93	1.03	1.43	1.99	1.41	1.27	12.55

Ware														
Temperature	1975	3	1	19	34	44	53	59	54	48	35	12	6	31
	74	-12	13	15	35	41	48	52	M	46	37	24	18	M
	73	2	10	25	35	45	50	M	53	44	33	0	7	M
	72	M	M	M	M	M	M	M	M	M	31	23	-5	M
	71	-10	14	21	36	M	M	M	M	M	M	M	M	M
	70	- 1	22	26	35	43	54	53	53	M	M	12	0	M
	69	-24	7	21	38	44	57	55	51	M	32	24	17	M
	68	- 2	9	28	33	45	51	57	42	46	33	21	-8	30
	67	0	15	12	33	44	56	54	56	48	35	20	5	32
average		-5.5	11.4	21.0	34.9	43.7	52.7	55.0	53.2	46.4	33.7	17.0	5.0	30.7
Precipitation	1975	1.84	0.45	0.59	0.12	1.19	1.42	3.34	1.87	0.48	0.58	2.22	2.23	16.33
	74	2.08	1.62	1.54	1.30	2.71	1.13	3.34	1.43	2.26	1.74	0.52	2.69	22.35
	75	0.82	1.90	0.48	0.26	1.67	2.34	1.98	0.35	3.17	0.75	1.50	1.65	16.87
	72	M	M	M	M	M	M	M	M	M	1.72	1.67	3.34	M
	71	2.28	0.21	0.56	0.14	M	M	M	M	M	M	M	M	M
	70	0.90	1.38	0.55	0.18	M	M	M	M	M	M	0.90	M	M
	69	0.54	1.33	0.25	0.67	1.29	0.46	0.62	1.52	M	0.59	3.24	0.97	M
	68	1.85	0.44	0.25	0.20	1.24	0.97	1.85	1.10	3.05	1.30	1.38	1.08	14.71
	67	1.80	1.81	1.04	0.15	0.32	0.92	2.56	0.63	1.58	0.25	1.48	1.73	14.27
average		1.51	1.14	0.66	0.38	1.40	1.21	2.28	1.15	2.11	0.99	1.61	1.96	16.40

Climatic Records for Telegraph Creek, Ware and other stations

Schaft Creek		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Temperature	1974	M	M	M	M	M	42	51	56	46	M	M	M	M
	73	7	12	24	32	40	47	51	49	44	31	4	M	M
	72	-1	6	22	28	42	49	57	54	43	35	21	6	30
	71	-2	20	23	35	41	52	57	54	44	33	21	4	32
	70	M	M	M	M	M	48	51	50	43	35	15	6	M
	69	M	M	M	M	M	M	52	48	M	M	M	M	M
Precipitation	1974	M	M	M	M	M	0.86	0.66	0.49	3.89	M	M	M	M
	73	4.60	4.03	0.98	0.55	1.47	0.87	1.23	1.53	3.53	4.03	2.09	M	M
	72	1.22	2.56	1.60	0.78	M	0.94	1.72	1.86	2.02	6.88	3.20	5.85	M
	71	4.44	1.58	4.42	2.09	0.13	0.66	1.27	2.19	2.01	4.58	5.99	1.66	31.02
	70						2.15	0.83	1.54	2.79	4.89	1.90	3.63	M
	69							0.66	2.32					
Iskut														
Temperature	1973									43	33	5	12	
Precipitation	1973									2.93	1.24	0.76	0.24	
Eddontenajon														
Precipitation	1972									1.91	1.91			
Todagin Ranch														
Temperature	1975	6	4	16	M	41	47	53	50	46	34	15	10	M
	74	-3	19	16	33	40	45	49	52	46	36	23	M	M
	73	M	M	M	M	M	M	M	M	43	32	3	9	M
Precipitation	1975	1.29	0.78	0.93	M	0.56	0.73	1.96	1.78	0.87	1.35	1.09	1.58	M
	74	1.26	0.28	0.58	0.58	0.39	0.83	1.93	1.71	2.76	3.26	0.66	M	M
	73	M	M	M	M	M	M	M	M	2.59	0.86	0.58	0.68	M
Kinaskan Lake														
Temperature	1975	M	M	M	M	M	52	58	50	M	M	M	M	M
	74	M	M	M	M	M	48	50	53	49	M	M	M	M
	73	M	M	M	M	M	47	52	50	42	M	M	M	M
	72	M	M	M	M	M	M	55	54	43	M	M	M	M
	71	M	M	M	M	M	M	57	54	44	M	M	M	M
	70	6	24	26	31	40	49	50	50	42	35	18	4	31
	69	-13	8	23	34	43	56	51	48	44	35	26	20	31
	68	3	15	27	30	42	47	54	51	43	32	24	2	31
	67	6	20	13	30	41	53	51	54	46	35	23	15	32
	66	M	M	M	M	M	M	M	M	M	29	16	14	M
Precipitation	1975	M	M	M	M	M	0.59	1.22	M	M	M	M	M	M
	74	M	M	M	M	M	0.75	2.08	1.31	1.42	M	M	M	M
	73	M	M	M	M	M	1.34	1.44	1.63	3.34	M	M	M	M
	72	M	M	M	M	M	M	2.47	1.15	1.14	M	M	M	M
	71	M	M	M	M	M	M	0.77	2.87	1.22	M	M	M	M
	70	1.13	1.83	0.90	0.58	0.84	1.83	1.06	1.36	1.72	3.28	1.66	M	M
	69	1.02	0.33	0.77	1.22	0.39	1.30	0.73	3.10	1.55	0.76	7.15	1.67	19.99
	68	3.76	1.21	0.87	0.96	0.58	0.91	1.53	1.29	3.08	2.54	3.87	1.41	22.01
	67	3.19	3.53	0.94	0.45	0.96	0.43	0.86	2.03	2.95	2.43	1.25	1.25	20.27
	66	M	M	M	M	M	M	M	M	M	M	1.94	2.05	M

Appendix II.2.1

Climatic Records for Telegraph Creek, Ware and other stations

Hyland Post		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Temperature	1972	-15	-1	21	M	M	M	M	M	M	M	M	-11	M
Precipitation	1971	0.74	1.58	1.38	M	M	M	M	M	M	M	M	0.80	M
Galore Creek														
Temperature	1973	M	M	M	M	M	M	49	49	43	33	M	M	M
Precipitation	1973							3.69	6.15	7.33				
McBride River														
Temperature	1975						50	56	52	47	34	12	6	M
Precipitation	1975						1.59	2.35	1.95	1.59	1.01	1.22	1.83	

Appendix II.2.1

Climatic Records for Telegraph Creek, Ware and other stations

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Mean Rainfall													
Dease Lake	0.03	0.01	0.02	0.05	0.66	1.48	2.08	2.13	1.69	0.62	0.12	0.02	8.91
Stewart	1.92	1.90	2.32	3.30	2.56	3.10	3.29	4.34	7.25	13.64	5.37	2.32	51.31
Mean Snowfall													
Dease Lake	11.6	11.5	9.0	4.6	1.8	0.3	0.5	T	0.3	7.4	13.5	13.0	73.5
Stewart	54.3	38.8	24.3	3.6	0.5	0.0	0.0	0.0	0.0	4.8	24.0	59.2	209.5
Mean Total Precipitation													
Dease Lake	1.11	1.02	0.83	0.46	0.84	1.51	2.12	2.13	1.72	1.34	1.26	1.19	15.53
Stewart	7.35	5.78	4.75	3.65	2.61	3.10	3.29	4.34	7.25	14.14	7.98	8.33	72.57
Greatest Rainfall in 24 hrs.													
Telegraph Creek	0.32	0.13	1.00	0.77	0.60	1.04	0.98	0.60	1.56	1.36	0.67	0.34	1.56
Dease Lake	0.46	0.10	0.44	0.29	0.79	1.10	1.57	1.80	0.91	0.84	0.34	0.22	1.80
Stewart	3.20	2.35	1.86	3.65	1.42	2.30	1.80	3.50	3.60	7.00	3.22	4.00	7.00
Greatest Snowfall in 24 hrs.													
Telegraph Creek	12.2	8.3	6.5	3.9	0.0	0.0	0.0	0.0	0.0	3.2	10.0	6.0	12.2
Dease Lake	9.2	10.1	10.3	6.1	6.0	2.5	11.3	0.7	1.4	11.1	10.2	8.6	11.3
Stewart	32.0	35.0	18.0	11.0	5.0	0.0	0.0	0.0	0.0	12.0	30.0	32.0	35.0
Greatest Precip. in 24 hrs.													
Telegraph Creek	1.22	0.83	1.00	0.77	0.60	1.04	0.98	0.84	1.56	1.36	1.00	0.60	1.56
Dease Lake	0.77	0.94	0.96	0.47	0.79	1.10	2.33	1.80	0.91	1.11	0.90	0.89	2.33
Stewart	3.36	3.50	2.08	3.65	1.42	2.30	1.80	3.50	3.60	7.00	3.42	4.20	7.00
Mean Daily Temperature (°F)													
Dease Lake	-2.8	8.2	19.1	31.8	43.5	51.4	54.7	52.6	45.3	34.3	17.1	3.9	29.9
Stewart	23.2	28.0	33.4	40.4	49.5	55.2	57.8	58.8	50.1	41.4	32.0	26.0	41.2
Mean Daily Maximum (°F)													
Dease Lake	5.6	18.4	31.2	42.7	56.2	64.4	66.9	64.8	56.0	42.6	24.6	11.6	40.4
Stewart	28.1	33.0	40.6	49.6	60.8	66.7	68.7	67.1	58.8	46.6	36.1	30.4	48.9
Mean Daily Minimum (°F)													
Dease Lake	-11.3	-2.1	7.0	20.8	30.7	38.3	42.4	40.5	34.5	26.0	9.5	-4.0	19.4
Stewart	18.2	22.5	26.1	31.2	38.3	43.7	47.0	46.4	41.6	36.2	27.6	21.7	33.4
Extreme Maximum (°F) - Yrs. of Record													
Dease Lake	48-25	53	55	66	89	93	89	88	84	69-26	58	45	93
Stewart	56-54	56-56	70-55	75-54	89-53	94-53	92-53	90-51	82-53	69-52	58-54	48-54	94

Appendix II.2.1

Climatic Records for Telegraph Creek, Ware and other stations

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Extreme Minimum (^oF) - Yrs. of Record													
Dease Lake	-60-25	-55	-45	-25	12	22	28	21	5	-10-26	-38	-51	-60
Stewart	-22-51	-19-55	-10-54	7-53	22-52	27-51	32-51	32-49	25-53	9-52	-5-51	-15-53	-22
Sunshine Hours Dease Lake													
1975	43	M	170	182	260	211	214	171	160	70	56	18	M
74	M	M	M	137	221	176	182	221	128	90	37	17	M
73	65	87	92	177	194	219	202	157	156	83	93	37	1562
72	M	M	M	M	M	M	M	M	M	M	117	31	M
Germansen Landing Std '41-'70 Ave	35	79	140	191	259	289	267	228	128	89	33	15	1753

APPENDIX II.3.1

Historical Hydrologic Data

TANZILLA RIVER NEAR TELEGRAPH CREEK - STATION NO. 08CB002

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1959	---	---	---	---	---	2510	1010	798	726	745	---	---	---	1959
1960	---	---	---	---	1390	2400	1390	581	477	637	236	140	---	1960
1961	140	77.0	77.0	164	1210	1820	904	364	477	774	---	---	---	1961
1962	---	---	---	---	---	3530	3170	956	---	551	344	---	---	1962
1963	---	---	---	---	---	1890	1600	680	595	---	---	---	---	1963
1964	---	---	---	---	---	---	---	891	513	444	267	146	---	1964
1965	109	87.4	80.6	105	512	1790	909	431	729	550	330	178	485	1965
1966	103	90.7	121	203	698	1950	932	974	716	---	---	---	---	1966
MEAN	117	85.0	92.9	157	953	2270	1420	709	605	617	294	155	485	MEAN

LOCATION - LAT 58 17 37 N, LONG 130 30 44 W   DRAINAGE AREA 616 SQ MILES, NATURAL FLOW

666 TANZILLA RIVER NEAR TELEGRAPH CREEK - STATION NO. 08CB002

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1959	4100 CFS AT 1720 PST ON JUN 17	3980 CFS ON JUN 17	---	---	1959
1960	4470 CFS AT 1230 PST ON JUN 25	4380 CFS ON JUN 25	---	---	1960
1961	3920 CFS AT 2330 PST ON JUN 7	3700 CFS ON JUN 7	77.0 CFS ON FEB 1 *	---	1961
1962	6770 CFS AT 1400 PST ON JUL 8	6540 CFS ON JUL 8 *	101 CFS ON FEB 24	---	1962
1963	3070 CFS AT 0130 PST ON JUL 11	2760 CFS ON JUN 18	---	---	1963
1964	6820 CFS AT 1930 PST ON JUN 3 *	6440 CFS ON JUN 3	---	---	1964
1965	---	3800 CFS ON JUN 3	80.0 CFS ON MAR 21	351000 AC-FT	1965
1966	3820 CFS AT 1030 PST ON JUN 6	3700 CFS ON JUN 6	89.0 CFS ON MAR 8	---	1966
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		351000 AC-FT	MEAN

TUYA RIVER NEAR TELEGRAPH CREEK - STATION NO. 08CD001

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1962	---	---	---	---	2630	9220	4320	1700	1560	983	---	---	---	1962
1963	---	---	---	---	---	---	1530	588	764	---	---	---	---	1963
1964	---	---	---	---	2220	8140	1500	1060	761	789	539	316	---	1964
1965	245	222	174	252	2800	5610	1040	418	473	636	252	190	1030	1965
1966	156	142	196	317	---	---	---	---	---	1190	449	273	---	1966
1967	225	197	181	219	4270	6850	1250	614	919	1020	353	250	1360	1967
1968	215	191	179	248	4090	3210	818	453	2040	1120	373	220	1100	1968
1969	128	112	112	294	4130	3010	854	2000	2180	837	517	483	1230	1969
1970	325	265	229	323	3170	5080	1080	672	1240	1460	539	324	1230	1970
1971	265	244	218	221	3150	5850	970	551	939	856	458	344	1170	1971
1972	262	246	214	198	4800	6630	1190	1030	1730	1740	446	218	1560	1972
1973	187	189	175	207	4170	5360	2030	1020	2040	904	518	455	1440	1973
1974	299	206	190	230	3210	6280	3240	1310	715	2180	799	430	1600	1974
1975	298	242	211	245	3300	5250	2180	1560	1250	954	385	297	1350	1975
1976	268	274	235	431	3480	7160	2820	636	1130	861	557	349	1510	1976
MEAN	239	211	193	265	3490	5970	1770	972	1270	1110	476	319	1330	MEAN

LOCATION - LAT 58 04 20 N, LONG 130 49 27 W   DRAINAGE AREA 1390 SQ MILES, NATURAL FLOW

692 TUYA RIVER NEAR TELEGRAPH CREEK - STATION NO. 08CD001

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1962	16100 CFS AT 1100 PST ON JUN 15	14900 CFS ON JUN 15	216 CFS ON MAR 31	---	1962
1963	6670 CFS AT 1400 PST ON JUN 18	6140 CFS ON JUN 18	---	---	1963
1964	25800 CFS AT 0800 PST ON JUN 2 *	20500 CFS ON JUN 2 *	---	---	1964
1965	15900 CFS AT 0615 PST ON MAY 31	13400 CFS ON JUN 2	147 CFS ON APR 7	743000 AC-FT	1965
1966	11300 CFS ON JUN 7	---	136 CFS ON MAR 6	---	1966
1967	17400 CFS AT 0600 PST ON MAY 31	15100 CFS ON MAY 31	176 CFS ON MAR 19	986000 AC-FT	1967
1968	13700 CFS AT 0530 PST ON MAY 20	11200 CFS ON MAY 22	162 CFS ON DEC 31	796000 AC-FT	1968
1969	18800 CFS AT 0230 PST ON MAY 26	14400 CFS ON MAY 26	108 CFS ON MAR 21 *	889000 AC-FT	1969
1970	21200 CFS AT 0939 PST ON JUN 4	17700 CFS ON JUN 4	221 CFS ON MAR 20	889000 AC-FT	1970
1971	11800 CFS AT 0949 PST ON JUN 10	10300 CFS ON JUN 8	205 CFS ON MAR 27	849000 AC-FT	1971
1972	21800 CFS AT 0454 PST ON MAY 31	18800 CFS ON MAY 31	180 CFS ON DEC 25	1130000 AC-FT	1972
1973	11900 CFS AT 0532 PST ON MAY 16	10100 CFS ON MAY 16	155 CFS ON APR 7	1040000 AC-FT	1973
1974	9570 CFS AT 0759 PST ON JUN 3	8670 CFS ON JUN 3	183 CFS ON APR 1	1160000 AC-FT	1974
1975	8540 CFS AT 1633 PST ON JUN 28	7540 CFS ON JUN 29	196 CFS ON APR 7	978000 AC-FT	1975
1976	10500 CFS AT 0844 PST ON JUN 8	9800 CFS ON JUN 11	217 CFS ON APR 7	1100000 AC-FT	1976
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		960000 AC-FT	MEAN

From: Water Survey of Canada, Fisheries and Environment Canada 1977. Historical Streamflow Summary British Columbia to 1976

STIKINE RIVER ABOVE GRAND CANYON - STATION NO. 08CB001

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1957	---	---	---	---	---	---	---	---	7190	5420	---	---	---	1957
1958	---	1170	1180	---	---	---	11600	8270	5680	8180	5130	---	---	1958
1959	---	---	---	1270	13900	47600	30200	13100	13400	7060	---	---	---	1959
1960	---	---	1310	---	---	---	---	15900	7900	9350	3510	2400	---	1960
1961	2400	1400	1400	3520	21100	42200	21000	9570	8690	12900	---	---	---	1961
1962	---	---	1300	---	---	50200	41100	20600	10600	5900	5270	---	---	1962
1963	---	---	---	---	---	32200	38900	15400	11300	8320	3550	---	---	1963
1964	---	---	---	---	5870	54500	27100	18300	7600	7470	3970	1390	---	1964
1965	1160	1030	1040	1800	8460	29400	25800	11300	9360	7030	4300	2530	8630	1965
1966	1470	1260	1480	3180	9710	37300	29200	16800	10900	7680	3420	2180	10400	1966
1967	1770	1210	893	1170	12500	52500	21000	12700	12000	10400	3300	2320	11000	1967
1968	1610	1270	1270	1230	14200	28700	26900	11500	17900	7900	2840	1490	9750	1968
1969	856	736	724	1540	15000	35500	16300	20300	15900	7090	4000	3390	10100	1969
1970	2280	1640	1460	1510	8160	42100	23300	17400	11000	10500	3850	2080	10500	1970
1971	1530	1320	1180	1230	12000	38800	19600	13200	11500	7970	3030	1730	9450	1971
1972	1300	1360	1170	1060	15000	45100	23800	16300	9330	7880	3740	1970	10700	1972
1973	1290	1180	1160	1400	14200	34400	30600	15000	18200	6450	3010	2290	10800	1973
1974	1590	1230	1100	1280	9270	26200	35300	23800	12200	17800	6490	3270	11700	1974
1975	1790	1520	1310	1610	9630	25500	31200	17000	9780	6420	2800	1900	9260	1975
1976	1490	1360	1150	1360	12700	33900	35800	21100	12400	8130	4140	1990	11300	1976
MEAN	1580	1260	1200	1650	12100	38600	27200	15700	11100	8490	3900	2210	10300	MEAN

LOCATION - LAT 58 02 38 N DRAINAGE AREA 7240 SQ MILES
LONG 129 56 45 W NATURAL FLOW

STIKINE RIVER ABOVE GRAND CANYON - STATION NO. 08CB001

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1957	---	---	---	---	1957
1958	---	---	1020 CFS ON MAR 23	---	1958
1959	78300 CFS AT 0700 PST ON JUN 23	77600 CFS ON JUN 23	975 CFS ON MAR 18	---	1959
1960	---	---	1300 CFS ON MAR 17	---	1960
1961	77500 CFS AT 0600 PST ON JUN 8	76200 CFS ON JUN 8	1400 CFS ON FEB 1	---	1961
1962	72100 CFS AT 1300 PST ON JUN 26	71100 CFS ON JUN 26	1300 CFS ON MAR 8	---	1962
1963	67700 CFS AT 0500 PST ON JUL 11	66800 CFS ON JUL 11	---	---	1963
1964	84600 CFS AT 0900 PST ON JUN 12 •	84400 CFS ON JUN 12 •	---	---	1964
1965	48000 CFS AT 1300 PST ON JUN 3	46800 CFS ON JUN 3	940 CFS ON MAR 31	6250000 AC-FT	1965
1966	65900 CFS ON JUN 18	65400 CFS ON JUN 18	1200 CFS ON FEB 28	7560000 AC-FT	1966
1967	66800 CFS AT 1430 PST ON JUN 7	64700 CFS ON JUN 7	848 CFS ON MAR 16	7960000 AC-FT	1967
1968	40400 CFS AT 1400 PST ON JUN 11	39200 CFS ON JUN 11	1140 CFS ON DEC 31	7090000 AC-FT	1968
1969	52600 CFS AT 1430 PST ON JUN 12	51300 CFS ON JUN 12	700 CFS ON MAR 25 •	7340000 AC-FT	1969
1970	73500 CFS AT 2032 PST ON JUN 4	69700 CFS ON JUN 4	1300 CFS ON APR 11	7570000 AC-FT	1970
1971	55400 CFS AT 1602 PST ON JUN 24	53600 CFS ON JUN 24	1050 CFS ON APR 7	6850000 AC-FT	1971
1972	83800 CFS AT 2139 PST ON JUN 14	81400 CFS ON JUN 15	1030 CFS ON APR 5	7750000 AC-FT	1972
1973	49200 CFS AT 1644 PST ON JUN 14	46700 CFS ON JUN 14	1130 CFS ON MAR 29	7820000 AC-FT	1973
1974	50000 CFS AT 1437 PST ON JUL 17	48600 CFS ON JUL 17	1040 CFS ON APR 1	8480000 AC-FT	1974
1975	47600 CFS AT 1034 PST ON JUL 1	47300 CFS ON JUL 1	1210 CFS ON MAR 28	8710000 AC-FT	1975
1976	61600 CFS AT 1153 PST ON JUL 1	60600 CFS ON JUL 1	1010 CFS ON APR 11	8230000 AC-FT	1976
		• - EXTREME RECORDED FOR THE PERIOD OF RECORD		7470000 AC-FT	MEAN

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STIKINE RIVER ABOVE BUTTERFLY CREEK - STATION NO. 08CF001

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1971	---	---	---	---	---	---	---	---	24400	15500	6980	4310	---	1971
1972	3220	3160	2830	2610	28500	85400	53400	42800	32500	20800	7760	4560	24000	1972
1973	3060	2980	3030	4080	30800	68700	62100	36400	32000	12700	5330	4230	22200	1973
1974	3390	2800	2660	4060	22700	51300	61700	47000	29700	42000	14300	7330	24200	1974
1975	5000	3870	3110	3770	22700	53600	69200	37600	23500	13600	4800	3700	20500	1975
1976	3400	3220	2820	3730	25900	70200	72800	47600	27700	18400	11300	4210	24300	1976
MEAN	3610	3210	2890	3650	26100	65800	63800	42300	28300	20500	8410	4720	23000	MEAN

LOCATION - LAT 57 29 10 N DRAINAGE AREA 13900 SQ MILES
LONG 131 45 00 W NATURAL FLOW

STIKINE RIVER ABOVE BUTTERFLY CREEK - STATION NO. 08CF001

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1971	---	---	---	---	1971
1972	147000 CFS AT 1227 PST ON JUN 15 •	145000 CFS ON JUN 15 •	2520 CFS ON APR 16 •	17400000 AC-FT	1972
1973	95000 CFS AT 0207 PST ON JUN 15	92500 CFS ON JUN 15	2900 CFS ON JAN 20	16100000 AC-FT	1973
1974	83100 CFS AT 0232 PST ON JUL 18	80700 CFS ON JUL 18	2600 CFS ON MAR 25	17500000 AC-FT	1974
1975	109000 CFS AT 0411 PST ON JUL 5	107000 CFS ON JUL 4	2930 CFS ON MAR 21	14800000 AC-FT	1975
1976	121000 CFS AT 0027 PST ON JUL 2	119000 CFS ON JUL 1	2600 CFS ON APR 6	17700000 AC-FT	1976
		• - EXTREME RECORDED FOR THE PERIOD OF RECORD		16700000 AC-FT	MEAN

STIKINE RIVER AT TELEGRAPH CREEK - STATION NO. 08CE001 647

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1954	---	---	---	---	---	---	---	---	9320	7670	---	---	---	1954
1955	---	---	---	---	8520	50400	54400	20000	11100	7720	---	---	---	1955
1956	---	---	---	---	19000	32600	28400	13100	11700	5910	---	---	---	1956
1957	---	---	---	---	39200	43500	27700	17200	9800	7250	---	---	---	1957
1958	---	1840	1750	3830	27800	38600	14000	9570	6870	9620	6660	---	---	1958
1959	---	---	---	---	21800	73100	38000	16800	17400	9780	---	---	---	1959
1960	---	---	1770	3440	24800	53000	48000	20100	10300	13100	5110	3200	---	1960
1961	3200	2120	2120	4410	31400	59500	27200	11400	11000	17700	---	---	---	1961
1962	---	2520	1950	3730	17200	72100	59000	28900	17200	8920	7560	---	---	1962
1963	---	---	---	---	26900	44000	49100	19200	14500	10800	---	---	---	1963
1964	---	---	---	---	---	76700	32700	22600	9950	9560	5270	2390	---	1964
1965	2180	2060	2140	3700	15300	84400	31300	13600	11500	9000	5660	3320	12000	1965
1966	1910	1630	2050	4110	12900	48700	33800	20200	13900	10300	4540	3060	13100	1966
1967	2540	2130	2000	2380	20000	67100	26200	15100	14500	13500	4320	2830	14400	1967
1968	2420	2240	1930	2030	23100	36700	31600	13800	22400	10800	3860	2380	12800	1968
1969	1340	1160	1130	2170	22900	44800	20300	25800	21500	10400	5750	4440	13500	1969
1970	3280	2540	2220	2320	14500	54900	29100	21200	14200	14700	5550	3030	14000	1970
1971	2210	2020	1860	1900	16700	53200	25300	16700	14800	10200	3410	2530	12800	1971
1972	1990	2040	1830	1740	23500	61100	29400	21100	14300	12900	5660	3260	14900	1972
1973	2190	2210	2050	2570	22300	48200	38500	20800	23200	9310	3600	3150	14900	1973
1974	2290	1920	1690	2620	16900	39900	45700	29600	15300	24700	8700	4730	16300	1974
1975	2930	2470	2110	2490	16100	37500	40800	22600	13500	8880	3700	2550	13000	1975
1976	2260	2200	1930	2530	20200	50800	47500	27700	16200	11000	5860	2680	15900	1976
MEAN	2360	2070	1910	2870	21100	51400	35400	19400	14100	11000	5330	3110	14000	MEAN

LOCATION - LAT 57 54 03 N
LONG 131 09 16 W

DRAINAGE AREA 10800 SQ MILES
NATURAL FLOW

STIKINE RIVER AT TELEGRAPH CREEK - STATION NO. 08CE001

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1954	---	---	---	---	1954
1955	---	120000 CFS ON JUN 26 *	---	---	1955
1956	---	50200 CFS ON JUN 20	---	---	1956
1957	---	104000 CFS ON MAY 23	---	---	1957
1958	---	78600 CFS ON MAY 28	1420 CFS ON MAR 24	---	1958
1959	---	120000 CFS ON JUN 23	---	---	1959
1960	---	90300 CFS ON JUN 27	1670 CFS ON FEB 26	---	1960
1961	---	111000 CFS ON JUN 8	2120 CFS ON FEB 1	---	1961
1962	---	103000 CFS ON JUN 23	1950 CFS ON FEB 12	---	1962
1963	---	90500 CFS ON JUL 11	---	---	1963
1964	---	119000 CFS ON JUN 11	---	---	1964
1965	---	80300 CFS ON JUN 3	1800 CFS ON APR 6	8720000 AC-FT	1965
1966	---	80300 CFS ON JUN 18	1550 CFS ON FEB 27	9520000 AC-FT	1966
1967	---	85600 CFS ON JUN 7	1950 CFS ON MAR 22	10400000 AC-FT	1967
1968	---	61600 CFS ON MAY 23	1780 CFS ON DEC 31	9280000 AC-FT	1968
1969	---	74000 CFS ON MAY 26	1100 CFS ON MAR 21 *	9800000 AC-FT	1969
1970	---	92100 CFS ON JUN 4	2010 CFS ON APR 5	10100000 AC-FT	1970
1971	---	74700 CFS ON JUN 10	1660 CFS ON APR 6	9240000 AC-FT	1971
1972	119000 CFS AT 2017 PST ON MAY 31 *	116000 CFS ON MAY 31	1700 CFS ON APR 12	10800000 AC-FT	1972
1973	72100 CFS AT 2102 PST ON JUN 14	67300 CFS ON JUN 15	1900 CFS ON MAR 31	10800000 AC-FT	1973
1974	66000 CFS AT 2019 PST ON JUL 17	62300 CFS ON JUL 17	1600 CFS ON APR 5	11800000 AC-FT	1974
1975	64400 CFS AT 2035 PST ON JUN 30	63700 CFS ON JUN 30	2000 CFS ON MAR 25	9440000 AC-FT	1975
1976	85500 CFS AT 0007 PST ON JUL 2	82100 CFS ON JUL 1	1840 CFS ON APR 9	11600000 AC-FT	1976
				10100000 AC-FT	MEAN

* - EXTREME RECORDED FOR THE PERIOD OF RECORD

KLAPPAN RIVER NEAR TELEGRAPH CREEK - STATION NO. 08CC001

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1962	---	---	---	---	---	---	---	---	2700	1080	1100	---	---	1962
1963	---	---	---	---	---	6510	10200	5240	4270	---	---	---	---	1963
1964	---	---	---	---	---	10200	7810	5010	1950	1820	915	370	---	1964
1965	315	331	339	551	1690	6110	8480	4300	2230	1510	727	444	2270	1965
1966	328	246	258	522	1360	7320	9110	4660	2860	1840	715	487	2490	1966
1967	424	326	274	311	2170	11700	5590	4450	3800	2570	924	376	2750	1967
1968	377	378	351	333	2770	6180	7820	3420	3630	1530	686	444	2330	1968
1969	297	285	280	523	3060	11000	4990	4740	3590	1690	818	656	2670	1969
1970	489	424	358	379	1440	8680	6830	5080	2230	1880	640	331	2410	1970
1971	301	289	266	295	1650	8900	6520	5010	2980	1730	526	401	2420	1971
1972	349	331	301	315	2380	9270	7850	5050	2350	1890	686	450	2610	1972
1973	361	352	339	493	2560	7080	7780	4630	3980	1460	565	507	2520	1973
1974	374	291	253	267	1480	4650	7300	6180	3480	4090	1550	681	2570	1974
1975	462	412	370	412	1930	5740	9660	4250	2550	1780	827	492	2420	1975
1976	386	350	276	390	2250	6730	9220	6520	3240	2320	1220	529	2800	1976
MEAN	372	335	305	399	2060	7860	7800	4900	3060	1940	850	474	2520	MEAN

LOCATION - LAT 57 54 00 N　　DRAINAGE AREA 1370 SQ MILES
LONG 129 42 14 W　　NATURAL FLOW

KLAPPAN RIVER NEAR TELEGRAPH CREEK - STATION NO. 08CC001

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1962	---	---	---	---	1962
1963	18800 CFS AT 0715 PST ON JUL 11 *	18400 CFS ON JUL 11 *	---	---	1963
1964	17500 CFS AT 1330 PST ON JUN 12	17300 CFS ON JUN 12	---	---	1964
1965	13700 CFS AT 1300 PST ON JUL 12	13000 CFS ON JUL 12	265 CFS ON DEC 28	1640000 AC-FT	1965
1966	14100 CFS AT 2300 PST ON JUN 17	13400 CFS ON JUN 18	218 CFS ON MAR 11 *	1800000 AC-FT	1966
1967	17700 CFS AT 0245 PST ON JUN 23	17500 CFS ON JUN 22	269 CFS ON MAR 16	1990000 AC-FT	1967
1968	13000 CFS AT 1315 PST ON JUL 5	12300 CFS ON JUL 5	310 CFS ON MAR 31	1690000 AC-FT	1968
1969	16900 CFS AT 1230 PST ON JUN 12	16600 CFS ON JUN 12	270 CFS ON MAR 20	1930000 AC-FT	1969
1970	15200 CFS AT 1545 PST ON JUN 4	14600 CFS ON JUN 4	295 CFS ON DEC 29	1740000 AC-FT	1970
1971	16100 CFS AT 0650 PST ON JUN 24	14900 CFS ON JUN 24	252 CFS ON MAR 25	1750000 AC-FT	1971
1972	18800 CFS AT 1615 PST ON JUN 14	18400 CFS ON JUN 14	292 CFS ON APR 3	1890000 AC-FT	1972
1973	12400 CFS AT 0649 PST ON SEP 7	11300 CFS ON SEP 7	330 CFS ON MAR 2	1830000 AC-FT	1973
1974	11600 CFS AT 1155 PST ON JUL 10	11100 CFS ON JUL 10	236 CFS ON MAR 9	1860000 AC-FT	1974
1975	16000 CFS AT 1107 PST ON JUL 5	15800 CFS ON JUL 4	350 CFS ON MAR 7	1750000 AC-FT	1975
1976	17000 CFS AT 0846 PST ON JUL 1	16600 CFS ON JUL 1	250 CFS ON APR 1	2030000 AC-FT	1976
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		1830000 AC-FT	MEAN

MORE CREEK NEAR THE MOUTH - STATION NO. 08CG005

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1972	120	99.1	144	186	---	---	5470	4690	2110	1430	551	256	---	1972
1973	217	197	165	272	1330	3530	---	---	---	---	512	250	---	1973
1974	188	158	160	266	1040	2290	3150	3680	3110	3700	1080	425	1610	1974
1975	308	266	219	210	1290	3550	6090	3220	1150	610	403	187	1470	1975
1976	146	131	122	212	1110	3730	6560	7740	3250	2160	1050	346	2230	1976
MEAN	196	170	162	229	1190	3280	5320	4830	2410	1980	719	293	1770	MEAN

LOCATION - LAT 57 02 27 N　　DRAINAGE AREA 304 SQ MILES
LONG 130 24 05 W　　NATURAL FLOW

MORE CREEK NEAR THE MOUTH - STATION NO. 08CG005

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1972	26200 CFS AT 1429 PST ON OCT 6 *	7560 CFS ON JUL 7	91.0 CFS ON MAR 8 *	---	1972
1973	---	---	150 CFS ON MAR 23	---	1973
1974	21300 CFS AT 1822 PST ON OCT 8	16000 CFS ON OCT 8	145 CFS ON MAR 3	1170000 AC-FT	1974
1975	10600 CFS AT 0118 PST ON JUL 9	9610 CFS ON JUL 8	159 CFS ON APR 8	1060000 AC-FT	1975
1976	---	19200 CFS ON AUG 11 *	111 CFS ON MAR 15	1620000 AC-FT	1976
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		1280000 AC-FT	MEAN

ISKUT RIVER ABOVE SNIPPAKER CREEK - STATION NO. 08CG004

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1967	---	988	886	1220	7940	32100	20300	22800	19900	10800	4180	2380	---	1967
1968	1390	1100	1740	1650	10400	19000	29200	18400	14400	5680	2950	1680	9050	1968
1969	837	720	840	1630	10200	35000	21000	16900	13400	6370	9920	4660	10100	1969
1970	2030	1610	1690	1950	7050	27600	25000	23400	13200	7530	3840	1280	9720	1970
1971	837	773	930	1180	6840	27500	29500	24600	11600	7110	2380	1220	9600	1971
1972	856	676	855	983	9860	26100	31900	23900	10700	9700	3590	1860	10100	1972
1973	1160	896	820	1860	9550	21300	26000	21300	13400	5100	2220	1110	8780	1973
1974	760	646	785	1650	8050	14000	18800	20500	14400	24600	6900	2820	9570	1974
1975	1590	1120	1070	1410	9330	19300	31500	15900	9280	5340	1950	1070	8290	1975
1976	1110	1100	856	1160	7980	20500	27500	24500	14000	9490	6670	1610	9750	1976
MEAN	1170	963	1050	1470	8720	24200	26100	21200	13400	9170	4460	1970	9430	MEAN

LOCATION - LAT 56 41 55 N
LONG 130 52 23 W

DRAINAGE AREA 2790 SQ MILES
NATURAL FLOW

ISKUT RIVER ABOVE SNIPPAKER CREEK - STATION NO. 08CG004

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1967	55600 CFS AT 2000 PST ON JUN 23	52400 CFS ON JUN 23	824 CFS ON MAR 23	---	1967
1968	41500 CFS AT 1520 PST ON JUL 6	39700 CFS ON JUL 5	860 CFS ON FEB 4	6540000 AC-FT	1968
1969	56500 CFS AT 0600 PST ON JUN 16	53200 CFS ON JUN 16	701 CFS ON MAR 16	7340000 AC-FT	1969
1970	48400 CFS AT 0930 PST ON JUN 4	44500 CFS ON JUN 4	950 CFS ON DEC 31	7030000 AC-FT	1970
1971	49900 CFS AT 2348 PST ON JUN 23	45300 CFS ON JUN 23	675 CFS ON FEB 10	6950000 AC-FT	1971
1972	45600 CFS AT 2006 PST ON OCT 6	42000 CFS ON JUL 8	592 CFS ON MAR 8 *	7350000 AC-FT	1972
1973	37000 CFS AT 1345 PST ON JUL 20	35400 CFS ON AUG 4	688 CFS ON MAR 20	6350000 AC-FT	1973
1974	89000 CFS AT 0008 PST ON OCT 9 *	70500 CFS ON OCT 9 *	635 CFS ON FEB 28	6930000 AC-FT	1974
1975	53200 CFS AT 0603 PST ON JUL 9	51400 CFS ON JUL 10	805 CFS ON DEC 17	6010000 AC-FT	1975
1976	46200 CFS AT 0315 PST ON JUL 1	41200 CFS ON AUG 11	810 CFS ON JAN 14	7080000 AC-FT	1976
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		6840000 AC-FT	MEAN

ISKUT RIVER AT OUTLET OF KINASKAN LAKE - STATION NO. 08CG003

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1964	---	---	---	---	---	---	---	---	---	---	285	145	---	1964
1965	118	143	135	105	255	1230	1600	949	618	422	262	163	502	1965
1966	54.7	37.6	46.9	243	381	1190	1680	1180	818	486	221	140	543	1966
1967	125	127	136	131	442	2290	1460	973	780	696	261	174	634	1967
1968	112	99.1	110	124	342	1100	1510	921	869	558	259	163	515	1968
1969	117	102	102	136	369	1660	1060	804	776	511	341	262	521	1969
1970	189	154	125	114	250	1470	1310	1030	549	471	288	153	511	1970
1971	154	159	118	105	292	1570	1530	1080	708	---	---	---	---	1971
1972	---	---	---	116	337	2060	1900	1400	783	562	353	173	---	1972
1973	165	166	131	121	477	1520	1930	1260	1020	535	241	182	650	1973
1974	168	151	127	121	246	722	1460	1410	1020	1400	788	308	664	1974
1975	209	151	175	220	374	881	1920	965	704	449	238	151	539	1975
1976	147	153	111	122	396	1230	2430	1640	770	634	418	241	693	1976
MEAN	142	131	120	138	347	1410	1650	1130	785	609	330	188	577	MEAN

LOCATION - LAT 57 32 00 N
LONG 130 12 28 W

DRAINAGE AREA 484 SQ MILES
NATURAL FLOW

ISKUT RIVER AT OUTLET OF KINASKAN LAKE - STATION NO. 08CG003

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1964	---	---	---	---	1964
1965	---	1980 CFS ON JUL 17	97.5 CFS ON APR 22	363000 AC-FT	1965
1966	---	1860 CFS ON JUL 22	34.2 CFS ON MAR 15 *	393000 AC-FT	1966
1967	---	3000 CFS ON JUN 24 *	111 CFS ON JAN 29	459000 AC-FT	1967
1968	---	1770 CFS ON JUL 12	97.0 CFS ON FEB 6	374000 AC-FT	1968
1969	---	2130 CFS ON JUN 17	99.0 CFS ON FEB 23	377000 AC-FT	1969
1970	---	2040 CFS ON JUN 24	110 CFS ON APR 20	370000 AC-FT	1970
1971	---	2340 CFS ON JUN 25	100 CFS ON APR 10	---	1971
1972	2870 CFS AT 1907 PST ON JUN 17	2830 CFS ON JUN 18	---	---	1972
1973	2390 CFS AT 1255 PST ON JUN 27	2360 CFS ON JUN 27	112 CFS ON APR 20	470000 AC-FT	1973
1974	1830 CFS AT 0620 PST ON OCT 23	1830 CFS ON OCT 23	111 CFS ON APR 19	481000 AC-FT	1974
1975	2600 CFS AT 1509 PST ON JUL 12	2520 CFS ON JUL 12	140 CFS ON FEB 6	391000 AC-FT	1975
1976	2940 CFS AT 0321 PST ON JUL 13 *	2900 CFS ON JUL 13	99.0 CFS ON APR 13	503000 AC-FT	1976
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		418000 AC-FT	MEAN

ISKUT RIVER BELOW JOHNSON RIVER - STATION NO. 08CG001

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1959	---	---	---	---	15200	38800	47300	26500	17200	15600	6740	8110	---	1959
1960	---	---	---	---	---	---	53900	38900	19200	20900	7390	3220	---	1960
1961	2600	2080	2190	---	---	39500	45500	37100	16800	47000	10700	4320	---	1961
1962	2620	3020	2190	7060	16900	33600	46600	34800	21700	11800	12400	---	---	1962
1963	---	---	---	---	17500	25900	42700	34800	34800	19500	---	---	---	1963
1964	---	---	2530	4080	10600	45600	42100	32300	14100	15600	6060	2550	---	1964
1965	2320	2200	2310	3950	11000	26500	43300	36400	17200	8560	5470	3280	13600	1965
1966	2070	1590	2560	4760	11700	30800	44900	30800	24700	14000	7240	3170	14900	1966
1967	2210	1690	1320	2470	16900	51600	33000	41000	36900	18000	7410	3070	18000	1967
1968	2450	2110	4750	4230	16700	26700	44900	28300	26200	11100	6530	2720	14800	1968
1969	1420	1270	1640	4190	16200	54400	32800	26500	21200	11100	18400	8790	16500	1969
1970	3410	3760	3560	4350	12300	38600	34600	34400	19900	14600	7580	2900	15100	1970
1971	1620	1550	2000	2940	11400	38700	44100	41200	21500	13300	5150	2480	15600	1971
1972	1660	1350	1760	2500	15600	37300	47200	39100	20200	17700	6390	3110	16200	1972
1973	2290	2200	1990	4480	16100	30400	37500	33000	22800	8460	3650	1660	13800	1973
1974	1380	1270	1530	3290	12500	21500	29400	33600	28100	41000	10200	6160	15900	1974
1975	2950	1990	1670	3610	13900	26500	49300	26300	17500	9960	3320	1610	13300	1975
1976	2250	2350	1800	3080	13700	29000	41800	38100	24200	16100	12500	3930	15800	1976
MEAN	2230	2030	2250	3930	14300	35000	42300	34100	22500	17500	8070	3820	15300	MEAN

LOCATION - LAT 56 44 20 N
LONG 131 40 25 W

DRAINAGE AREA 3610 SQ MILES
NATURAL FLOW

ISKUT RIVER BELOW JOHNSON RIVER - STATION NO. 08CG001

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1959	65700 CFS AT 1330 PST ON JUL 20	64700 CFS ON JUL 20	---	---	1959
1960	97400 CFS AT 1000 PST ON JUL 18	91600 CFS ON JUL 18	---	---	1960
1961	280000 CFS ON OCT 15 *	243000 CFS ON OCT 15 *	1700 CFS ON JAN 25	---	1961
1962	59600 CFS AT 1300 PST ON JUL 24	58000 CFS ON JUL 24	1620 CFS ON JAN 19	---	1962
1963	68600 CFS AT 1500 PST ON JUL 10	64700 CFS ON JUL 10	---	---	1963
1964	---	70500 CFS ON JUN 11	2100 CFS ON DEC 31	---	1964
1965	66400 CFS AT 1700 PST ON OCT 19	62200 CFS ON JUL 12	1880 CFS ON JAN 12	9860000 AC-FT	1965
1966	93700 CFS AT 1630 PST ON SEP 5	84300 CFS ON SEP 5	1500 CFS ON FEB 26	10800000 AC-FT	1966
1967	83300 CFS AT 0230 PST ON AUG 11	78400 CFS ON AUG 10	980 CFS ON MAR 15 *	13000000 AC-FT	1967
1968	---	61000 CFS ON JUL 10	1530 CFS ON FEB 4	10700000 AC-FT	1968
1969	119000 CFS AT 1700 PST ON NOV 2	104000 CFS ON NOV 2	1250 CFS ON FEB 20	12000000 AC-FT	1969
1970	77700 CFS AT 0832 PST ON JUN 4	72000 CFS ON JUN 4	2020 CFS ON DEC 31	10900000 AC-FT	1970
1971	---	66700 CFS ON JUN 23	1400 CFS ON JAN 31	11300000 AC-FT	1971
1972	64800 CFS AT 1200 PST ON JUL 8	63400 CFS ON JUL 8	1170 CFS ON MAR 8	11800000 AC-FT	1972
1973	55900 CFS AT 1115 PST ON AUG 4	53600 CFS ON AUG 4	1500 CFS ON DEC 31	9980000 AC-FT	1973
1974	182000 CFS AT 0844 PST ON OCT 9	161000 CFS ON OCT 9	1250 CFS ON FEB 18	11600000 AC-FT	1974
1975	87200 CFS AT 0756 PST ON JUL 11	84100 CFS ON JUL 11	1260 CFS ON DEC 17	9650000 AC-FT	1975
1976	82000 CFS AT 0049 PST ON NOV 4	70700 CFS ON AUG 11	1680 CFS ON JAN 12	11500000 AC-FT	1976
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		11100000 AC-FT	MEAN

FORREST KERR CREEK ABOVE 1500 FOOT CONTOUR - STATION NO. 08CG006

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1972	---	---	---	---	---	---	3880	3370	1420	1190	125	52.6	---	1972
1973	43.1	33.7	24.9	21.9	345	1340	2340	1600	952	258	99.3	41.3	595	1973
1974	31.7	24.4	20.1	89.7	437	1020	1920	3040	2110	1970	335	83.3	931	1974
1975	51.5	34.7	27.7	28.0	348	1340	3620	2810	857	358	145	63.7	816	1975
1976	38.9	31.5	24.4	47.1	307	1410	2410	2820	1080	486	414	89.0	767	1976
MEAN	41.3	31.1	24.3	46.7	359	1280	2830	2730	1280	852	224	66.0	777	MEAN

LOCATION - LAT 56 54 50 N, LONG 130 43 30 W — DRAINAGE AREA 120 SQ MILES, NATURAL FLOW

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FORREST KERR CREEK ABOVE 1500 FOOT CONTOUR - STATION NO. 08CG006

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1972	6350 CFS AT 1152 PST ON OCT 6	5690 CFS ON JUL 21	---	---	1972
1973	4920 CFS AT 1752 PST ON AUG 8	3980 CFS ON AUG 8	21.0 CFS ON APR 25	431000 AC-FT	1973
1974	6370 CFS AT 0910 PST ON OCT 8	5790 CFS ON OCT 8	19.4 CFS ON MAR 7 *	674000 AC-FT	1974
1975	5840 CFS AT 1901 PST ON JUL 10	5350 CFS ON JUL 10	21.8 CFS ON APR 7	590000 AC-FT	1975
1976	6440 CFS AT 0456 PST ON AUG 11 *	5930 CFS ON AUG 11 *	22.7 CFS ON MAR 14	557000 AC-FT	1976
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		563000 AC-FT	MEAN

FORSTER CREEK NEAR WILMER - STATION NO. 08NA009

MONTHLY AND ANNUAL MEAN DISCHARGES IN CUBIC FEET PER SECOND FOR THE PERIOD OF RECORD

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN	YEAR
1912	---	---	---	---	---	646	732	613	272	194	---	---	---	1912
1913	---	---	---	---	306	1220	986	869	501	282	129	106	---	1913
1914	---	---	---	151	411	930	1570	730	412	277	209	---	---	1914
1915	---	---	---	115	362	496	856	1170	498	173	---	---	---	1915
1917	---	---	---	---	---	---	---	---	---	238	135	80.1	---	1917
1918	74.0	75.0	75.0	126	287	1370	1010	605	356	260	152	125	377	1918
1919	100	85.0	85.0	---	---	---	---	---	---	---	---	---	---	1919
MEAN	87.0	80.0	80.0	131	342	932	1030	797	408	237	156	104	377	MEAN

LOCATION - LAT 50 35 18 N, LONG 116 07 45 W — DRAINAGE AREA 196 SQ MILES, NATURAL FLOW

FORSTER CREEK NEAR WILMER - STATION NO. 08NA009

ANNUAL EXTREMES OF DISCHARGE IN CFS AND ANNUAL TOTAL DISCHARGE IN AC-FT FOR THE PERIOD OF RECORD

YEAR	MAXIMUM INSTANTANEOUS DISCHARGE	MAXIMUM DAILY DISCHARGE	MINIMUM DAILY DISCHARGE	TOTAL DISCHARGE	YEAR
1912	---	1110 CFS ON JUN 24	---	---	1912
1913	---	1930 CFS ON JUN 9	---	---	1913
1914	---	3220 CFS ON JUL 15 *	---	---	1914
1915	---	1580 CFS ON AUG 7	---	---	1915
1917	---	---	---	---	1917
1918	---	2860 CFS ON JUN 14	70.0 CFS ON APR 5 *	273000 AC-FT	1918
1919	---	---	---	---	1919
		* - EXTREME RECORDED FOR THE PERIOD OF RECORD		273000 AC-FT	MEAN

APPENDIX II.3.2

Water Quality Data: Stikine River at Telegraph Creek; Iskut River below Johnson River

STATION **00BC08CE0001** LATITUDE **57** D **53** M **55** S LONGITUDE **131** D **9** M **53** S

STIKINE RIVER AT TELEGRAPH CREEK, BRITISH COLUMBIA

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	10101L ALKALINITY TOTAL	06201L BICARBONT. (CALCD.)	06301L CARBONATE (CALCD.)	17203L CHLORIDE DISSOLVED	09104L FLUORIDE DISSOLVED	14102L SILICA REACTIVE	16303L SULPHATE DISSOLVED
						CACO3	HCO3	CO3	CL	F	SIO2	SO4
D	M	Y	H	M	CFS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
4	9	68			20400	45	55	0	0.1		5.6	13.5
15	10	68			10400	61	75	0	0.2		7.1	13.2
13	2	69			1160	101	123	0	0.5	0.08	9.6	23.9
24	4	69			3180	74	91	0	0.6		7.3	15.3
30	5	69			40900	35	42	0	0.3		4.7	6.3
21	7	69			17800	86	105	0		L.1 05L		12.8
23	8	69			26400	46	55	0	0.2		5.9	11.4
31	10	69	12	00		67	82	0	0.2		7.0	16.2
26	1	70			2980	88	107	0	0.4	L.1 05L	8.7	19.4
16	2	70			2480	81	98	0	0.3		7.8	17.3
31	3	70			2080	87	105	0	0.2		8.5	15.5
2	10	70			22800	41	50	0	0.2	L.1 05L	5.7	9.4
3	6	71			51100	32	39	0	0.2		5.0	6.6
22	9	71			14600	51	62	0	0.3		5.5	12.8
11	12	71			2630	81	99	0	0.2	L.1 05L	7.7	17.5

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	06001L CARBON TOTAL ORGANIC	07105L NITROGEN DISSOLVED NO3 & NO2	15413L PHOSPHORUS TOTAL PHOSPHATE	15314L PHOSPHORUS TOTAL INORG. PO4	08301L OXYGEN TOTAL COD	08102F OXYGEN DISSOLVED
						C	N	P	P	O2	O2
D	M	Y	H	M	CFS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
19	4	61			4000			L.005			
19	7	61			23400						
26	10	61			14200			L.005			
30	4	62			4450						5.3 01L
26	6	62			101000						
25	4	67					0.068				
24	5	67			25500		L.005				
7	6	67			85600		0.045				
5	7	67			31100		0.023	0.010			
1	8	67			19200		L.005				
30	8	67			13200		L.005				
27	9	67			13500		L.005	0.007			
	11	67					0.023				
5	2	68			2260		L.005				
18	3	68			1900		0.045				
27	5	68			40500		0.068				
26	6	68			13100		0.090				
12	8	68			12400		L.005	0.007			
4	9	68			20400		0.023				
15	10	68			10400		0.045				
13	2	69			1160		0.088	0.016			
24	4	69			3180		0.016				
30	5	69			40900		0.041				
21	7	69			17800		0.011		L.005		
23	8	69			26400		L.005				
31	10	69	12	00			0.020				
26	1	70			2980		0.050		0.010		

WATER QUALITY DATA 1961-1971

STATION 00BC08CE0001 LATITUDE 57 D 53 M 55 S LONGITUDE 131 D 9 M 53 S

STIKINE RIVER AT TELEGRAPH CREEK, BRITISH COLUMBIA

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	02041L SPECIFIC CONDUCT.	00201L TOTAL DISSOLVED SOLIDS (CALCD.)	10603L HARDNESS TOTAL	20101L CALCIUM DISSOLVED	12101L MAGNESIUM DISSOLVED (CALCD.)	19103L POTASSIUM DISSOLVED	11103L SODIUM DISSOLVED
								CACO3	CA	MG	K	NA
D	M	Y	H	M	CFS	UHMO CM	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
1	8	67			19200	127	70	57.3	18.9	2.5	0.5	2.3
30	8	67			13200	132	73	59.3	17.0	4.1	0.5	2.5
27	9	67			13500	140	78	64.6	18.5	4.5	0.5	2.4
	11	67				180	74	82.2	24.1	5.3	0.8	3.8
5	2	68			2260	199	119	100.	27.1	7.9	0.8	4.6
18	3	68			1900	203	115	99.1	27.0	7.7	0.7	4.3
27	5	68			40500	92	49	41.4	11.8	2.9	0.5	1.5
26	6	68			13100	99	57	46.4	12.8	3.5	0.4	1.5
12	8	68			12400	137	73	60.8	16.6	4.7	0.4	2.4
4	9	68			20400	118	68	53.6	14.9	4.0	0.4	2.4
15	10	68			10400	151	85	68.9	19.0	5.2	0.5	2.7
13	2	69			1160	232	139	111.	29.4	9.1	0.9	4.8
24	4	69			3180	174	103	83.6	25.7	4.7	0.9	3.9
30	5	69			40900	86	49	39.2	12.1	2.2	0.5	1.6
21	7	69			17800	120		55.2	15.5	4.0		
23	8	69			26400	115	66	53.8	15.7	3.5	0.4	2.0
31	10	69	12	00		172	95	78.4	22.7	5.3	0.5	3.0
26	1	70			2980	216	122	101.	27.9	7.6	0.9	4.6
16	2	70			2480	197	111	90.4	26.4	5.9	0.8	3.9
31	3	70			2080	208	116	98.0	27.2	7.3	0.8	4.1
2	10	70			22800	130	59	48.5	14.0	3.3	0.4	1.9
3	6	71			51100	76	46	35.9	11.1	2.0	0.4	1.1
22	9	71			14600	122	72	59.6	16.6	4.4	0.4	2.1
11	12	71			2630	203	113	93.4	29.4	4.9	0.6	3.7

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	10101L ALKALINITY TOTAL	06201L BICARBONT. (CALCD.)	06301L CARBONATE (CALCD.)	17203L CHLORIDE DISSOLVED	09104L FLUORIDE DISSOLVED	14102L SILICA REACTIVE	16303L SULPHATE DISSOLVED
						CACO3	HCO3	CO3	CL	F	SIO2	SO4
D	M	Y	H	M	CFS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
19	4	61			4000	85	103	0				17.3
19	7	61			23400	45	54	0				12.2
26	10	61			14200	60	73	0				15.6
30	4	62			4450	85	103	0				15.9
26	6	62			101000	34	41	0				7.4
25	4	67				81	99	0	0.7	0.12	7.6	16.6
24	5	67			25500	53	65	0	0.3	0.10	6.2	7.5
7	6	67			85600	36	44	0	0.5	0.06	5.0	5.6
5	7	67			31100	45	55	0	0.3	0.04	5.7	9.8
1	8	67			19200	48	58	0	0.3	0.04	5.2	11.5
30	8	67			13200	50	61	0	0.3	0.07	4.9	13.9
27	9	67			13500	54	66	0	0.3	0.03	6.5	12.4
	11	67				24	29	0	0.2	0.08	7.6	18.4
5	2	68			2260	84	103	0	0.5	0.15	7.8	19.3
18	3	68			1900	86	105	0	0.1	0.09	6.0	17.6
27	5	68			40500	35	43	0	0.3		4.5	6.3
26	6	68			13100	39	47	0	0.2		4.4	11.0
12	8	68			12400	51	62	0	0.2	0.05	5.0	13.6

STATION **00BC08CE0001** LATITUDE **57** D **53** M **55** S LONGITUDE **131** D **9** M **53** S

STIKINE RIVER AT TELEGRAPH CREEK, BRITISH COLUMBIA

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	97183F DISCHARGE MONTHLY MEAN	02061F TEMP.	10301L PH	02011L COLOUR APPARENT	02073L TURBIDITY
D	M	Y	H	M	CFS	CFS	DEG C	PH UNITS	REL UNITS	JTU
19	4	61			4000	4410	3.3 61S	7.8	10	15.0
19	7	61			23400	27200	15.6 61S	7.2	5	6.0
26	10	61			14200	17700	1.1 61S	7.6	10	8.3
30	4	62			4450	3730	5.0 61S	7.5	30	300.
26	6	62			101000	72100	12.2 61S	7.2		175.
25	4	67					8.9	7.8	20	27.0
24	5	67			25500	20000	13.3	7.7	50	53.0
7	6	67			85600	67100	16.0	7.6	20	70.0
5	7	67			31100	26200		7.8	5	31.0
1	8	67			19200	15100		8.0	10	22.0
30	8	67			13200	15100	12.8	8.0	5	15.0
27	9	67			13500	14500	8.3	8.1	40	35.0
	11	67					1.7	8.0	10	7.8
5	2	68			2260	2240	0.0	8.3	5	1.0
18	3	68			1900	1930	0.0	8.2	L5	2.0
27	5	68			40500	23100	7.8	7.9		
26	6	68			13100	36700	13.3	7.9	30	45.0
12	8	68			12400	13800	14.4	8.0	10	18.0
4	9	68			20400	22400	11.1	7.9	10	21.0
15	10	68			10400	10800	4.4	8.0	5	5.4
13	2	69			1160	1160	0.0	7.9	5	0.4
24	4	69			3180	2170	0.0	8.0	10	62.0
30	5	69			40900	22900	8.9	7.5	30	70.0
21	7	69			17800	20300	16.7	8.0	20	31.0
23	8	69			26400	25800	9.4	8.0	20	25.0
31	10	69	12	00			1.1 61S	8.1	10	8.6
26	1	70			2980	3280	0.0	8.2	5	13.0
16	2	70			2480	2540	0.0	8.0	L5	4.9
31	3	70			2080	2220	1.7	8.0	5	15.0
2	10	70			22800	14700	6.7	8.1	20	22.0
3	6	71			51100	53200	7.8 61S	7.7	25	125.
22	9	71			14600	14800	9.4 61S	7.7.	20	15.0
11	12	71			2630	2530	0.0 61S	7.9	5	1.5

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	02041L SPECIFIC CONDUCT.	00201L TOTAL DISSOLVED SOLIDS (CALCD.)	10603L HARDNESS TOTAL	20101L CALCIUM DISSOLVED	12101L MAGNESIUM DISSOLVED (CALCD.)	19103L POTASSIUM DISSOLVED	11103L SODIUM DISSOLVED
D	M	Y	H	M	CFS	UHMO CM	MG L	CACO3 MG L	CA MG L	MG MG L	K MG L	NA MG/L
19	4	61			4000	196	114		23.9 02L			
19	7	61			23400	116	66		14.5 02L			
26	10	61			14200	149	86		19.0 02L			
30	4	62			4450	198	113		24.0 02L			
26	6	62			101000	79	48		10.5 02L			
25	4	67				210	112	95.5	24.8	8.2	0.8	4.9
24	5	67			25500	122	69	56.0	17.3	3.1	0.7	2.4
7	6	67			85600	93	50	40.7	12.0	2.6	0.6	1.7
5	7	67			31100	116	64	51.8	14.8	3.6	0.5	1.9

From: Water Quality Branch, Environment Canada
<u>Water Quality Data, British Columbia 1961-1971.</u>

WATER QUALITY DATA 1961-1971

STATION **00BC08CE0001** LATITUDE **57** D **53** M **55** S LONGITUDE **131** D **9** M **53** S

STIKINE RIVER AT TELEGRAPH CREEK, BRITISH COLUMBIA

SAMPLE DATE D	M	Y	TIME PST H	M	97163F DISCHARGE DAILY MEAN CFS	06001L CARBON TOTAL ORGANIC C MG/L	07105L NITROGEN DISSOLVED NO3 & NO2 N MG/L	15413L PHOSPHORUS TOTAL PHOSPHATE P MG/L	15314L PHOSPHORUS TOTAL INORG. PO4 P MG/L	08301L OXYGEN TOTAL COD O2 MG/L	08102F OXYGEN DISSOLVED O2 MG/L
16	2	70			2480		0.063				
31	3	70			2080		0.057				
2	10	70			22800		L.005				
3	6	71			51100		0.050		L.005		
22	9	71			14600		L.005				
11	12	71			2630	5.0	0.060				

SAMPLE DATE D	M	Y	TIME PST H	M	26302L IRON SUSPENDED FE MG/L	82103L LEAD DISSOLVED PB MG/L	82302L LEAD EXTRBLE. PB MG/L	25302L MANGANESE EXTRBLE. MN MG/L	80301P MERCURY EXTRBLE. HG MG/L
19	4	61			0.66 01L			0. 03L	
19	7	61			1.06 01L			0.05 03L	
26	10	61			0.62 01L			0.00 03L	
30	4	62			6.62 01L			0.05 03L	
26	6	62			3. 01L		0.02 03L	0.03 03L	
25	4	67			0.018				
27	9	67				L.05 01L			
18	3	68				L.05 01L			
12	8	68				L.05 01L			
26	1	70					L.01 01L	L.01 04L	
2	10	70					L.01 01L	L.01 04L	
11	12	71				L.001			

SAMPLE DATE D	M	Y	TIME PST H	M	29105L COPPER DISSOLVED CU MG/L	29305L COPPER EXTRBLE. CU MG/L	29301L COPPER EXTRBL. CU MG/L	30105L ZINC DISSOLVED ZN MG/L	30304L ZINC EXTRBL. ZN MG/L	10901L TOX. UNITS TOTAL (CU + ZN) (CALCD.) REL UNITS
19	4	61					L.01		0. 01L	
26	10	61					L.01		0. 01L	
30	4	62					0.03		0. 01L	
26	6	62					L.01			
25	4	67			L.01 06L			0.01 04L		
5	7	67			L.01 06L			0.01 04L		
27	9	67			L.01 06L			L.01 04L		
18	3	68			L.01 06L			L.01 04L		
12	8	68			L.01 06L			L.01 04L		
26	1	70				L.01 06L			0.05	0.028
2	10	70				L.01 06L			L.01	0.000
11	12	71			0.003			0.007		

STATION **00BC08CE0001** LATITUDE **57** D **53** M **55** S LONGITUDE **131** D **9** M **53** S

STIKINE RIVER AT TELEGRAPH CREEK, BRITISH COLUMBIA

SAMPLE DATE			TIME PST		06401L FREE CO2 (CALCD)	00210L SATURATION INDEX (CALCD)	00211L STABILITY INDEX (CALCD)	11201L SODIUM ABSORPTION RATIO	10401L RESIDUE NONFILTR.	10501L RESIDUE FIXED NONFILTR.	10451L RESIDUE FILTERABLE	10551L RESIDUE FIXED FILTERABLE
D	M	Y	H	M	MG/L	PH UNITS	PH UNITS	REL UNITS	MG/L	MG/L	MG/L	MG/L
19	4	61			2.6	-0.3	8.4	0.18				
19	7	61			5.5	-1.4	10.0	0.12				
26	10	61			2.9	-0.8	9.2	0.13				
30	4	62			5.2	-0.6	8.6	0.16				
26	6	62			4.1	-1.6	10.4	0.10				
25	4	67			2.5	-0.4	8.5	0.22		64		58
24	5	67			2.0	-0.8	9.4	0.14				
7	6	67			1.8	-1.2	10.0	0.12				
5	7	67			1.4	-0.8	9.4	0.11	69	65	77	13
1	8	67			0.9	-0.4	8.8	0.13				
30	8	67			1.0	-0.5	8.9	0.14				
27	9	67			0.8	-0.4	8.9	0.13				
	11	67			0.5	-0.7	9.4	0.18				
5	2	68			0.8	0.3	7.8	0.20				
18	3	68			1.0	0.1	8.0	0.19				
27	5	68			0.9	-0.9	9.7	0.10				
26	6	68			0.9	-0.8	9.5	0.10				
12	8	68			1.0	-0.5	9.1	0.13	24	20		
4	9	68			1.1	-0.7	9.2	0.14				
15	10	68			1.2	-0.3	8.6	0.14				
13	2	69			2.4	-0.1	8.1	0.20			141	127
24	4	69			1.4	-0.2	8.4	0.19				
30	5	69			2.1	-1.2	9.9	0.11				
21	7	69			1.6				39	35		
23	8	69			0.9	-0.6	9.1	0.12				
31	10	69	12	00	1.0	-0.1	8.4	0.15				
26	1	70			1.1	0.2	7.8	0.20	31	25		
16	2	70			1.5	-0.1	8.2	0.18				
31	3	70			1.7	0.0	8.0	0.18				
2	10	70			0.6	-0.5	9.1	0.12	30	28		
3	6	71			1.2	-1.2	10.2	0.08				
22	9	71			1.9	-0.8	9.2	0.12				
11	12	71			2.0	-0.2	8.2	0.17				

WATER QUALITY DATA 1961-1971

STATION **00BC08CG0001** LATITUDE **56** D **44** M **20** S LONGITUDE **131** D **40** M **25** S

ISKUT RIVER BELOW JOHNSON RIVER, APPROX. 5 MILES FROM MOUTH, BRITISH COLUMBIA

SAMPLE DATE D	M	Y	TIME PST H	M	97163F DISCHARGE DAILY MEAN CFS	97163F DISCHARGE MONTHLY MEAN CFS	02061F TEMP. DEG C	10301L PH PH UNITS	02011L COLOUR APPARENT REL UNITS	02073L TURBIDITY JTU
11	3	69			1260	1640	0.6	7.9	5	3.2
5	7	69			33400	32800	8.3	7.8		85.0
24	10	69			6270	11100	2.8	8.1	5	6.0
5	5	70			6270	12300	6.1	8.1	10	18.0
16	9	70			11400	19900	8.3	7.9	10	33.0
3	11	70			14100	7580	4.4	8.1	5	28.0
17	3	71			2000	2080	1.7 61S	7.9	L5	3.3
18	5	71			9580	11400	6.1 61S	7.9	15	22.0
15	6	71			26100	38700	7.8 61S	7.9	L5	56.0
10	9	71			17700	21500	6.7 61S	8.0	L5	38.0
4	11	71			4880	5150		8.1	5	5.2

SAMPLE DATE D	M	Y	TIME PST H	M	97163F DISCHARGE DAILY MEAN CFS	02041L SPECIFIC CONDUCT. UHMO CM	00201L TOTAL DISSOLVED SOLIDS (CALCD.) MG L	10603L HARDNESS TOTAL CACO3 MG L	20101L CALCIUM DISSOLVED CA MG L	12101L MAGNESIUM DISSOLVED (CALCD.) MG MG/L	19103L POTASSIUM DISSOLVED K MG/L	11103L SODIUM DISSOLVED NA MG/L
11	3	69			1260	276	159	124.	40.4	5.6	1.6	8.0
5	7	69			33400	122	75	63.1	16.6	5.3	0.7	1.6
24	10	69			6270	198	109	90.4	32.9	2.0	1.0	2.5
5	5	70			6270	212	120	96.8	32.2	4.0	1.1	4.3
16	9	70			11400	152	85	69.1	22.7	3.0	0.8	2.4
3	11	70			14100	173	95	75.8	25.3	3.1	1.0	2.9
17	3	71			2000	250	145	117.	38.4	5.1	1.3	5.5
18	5	71			9580	177	101	80.5	25.7	4.0	0.8	5.2
15	6	71			26100	131	71	59.4	19.1	2.8	0.7	1.6
10	9	71			17700	139	76	63.1	22.0	2.0	0.8	1.8
4	11	71			4880	228	134	101.	33.5	4.2	1.2	4.0

SAMPLE DATE D	M	Y	TIME PST H	M	97163F DISCHARGE DAILY MEAN CFS	10101L ALKALINITY TOTAL CACO3 MG L	06201L BICARBONT. (CALCD.) HCO3 MG L	06301L CARBONATE (CALCD.) CO3 MG L	17203L CHLORIDE DISSOLVED CL MG L	09104L FLUORIDE DISSOLVED F MG L	14102L SILICA REACTIVE SIO2 MG/L	16303L SULPHATE DISSOLVED SO4 MG/L
11	3	69			1260	92	112	0	4.6	0.12	5.8	37.8
5	7	69			33400	45	55	0	0.2	L.01	2.8	20.9
24	10	69			6270	70	86	0	0.7	L.1 05L	5.3	22.8
5	5	70			6270	73	88	0	1.3	0.1 05L	5.4	28.4
16	9	70			11400	51	62	0	0.6	L.1 05L	3.6	21.4
3	11	70			14100	59	72	0	0.7		4.7	21.7
17	3	71			2000	91	111	0	2.7		6.4	30.6
18	5	71			9580	61	75	0	0.8		4.8	23.2
15	6	71			26100	46	56	0	0.3	L.1 05L	3.6	15.7

STATION **00BC08CG0001** LATITUDE **56** D **44** M **20** S LONGITUDE **131** D **40** M **25** S

ISKUT RIVER BELOW JOHNSON RIVER, APPROX. 5 MILES FROM MOUTH, BRITISH COLUMBIA

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	10101L ALKALINITY TOTAL	06201L BICARBONT. (CALCD.)	06301L CARBONATE (CALCD.)	17203L CHLORIDE DISSOLVED	09104L FLUORIDE DISSOLVED	14102L SILICA REACTIVE	16303L SULPHATE DISSOLVED
						CACO3	HCO3	CO3	CL	F	SIO2	SO4
D	M	Y	H	M	CFS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
10	9	71			17700	49	60	0	0.3		3.7	16.3
4	11	71			4880	74	90	0	1.2	L.1 05L	5.8	40.0

SAMPLE DATE			TIME PST		97163F DISCHARGE DAILY MEAN	06001L CARBON TOTAL ORGANIC	07105L NITROGEN DISSOLVED NO3 & NO2	15413L PHOSPHORUS TOTAL PHOSPHATE	15314L PHOSPHORUS TOTAL INORG. PO4	08301L OXYGEN TOTAL COD	08102F OXYGEN DISSOLVED
						C	N	P	P	O2	O2
D	M	Y	H	M	CFS.	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
11	3	69			1260		0.158	0.007			
5	7	69			33400		0.007				
24	10	69			6270		0.170		L.005		
5	5	70			6270		0.221		L.005		
16	9	70			11400		0.034				
3	11	70			14100		0.110				
17	3	71			2000		0.150				
18	5	71			9580		0.220				
15	6	71			26100	4.0	0.450				
10	9	71			17700		0.090				
4	11	71			4880	2.0	0.240				

SAMPLE DATE			TIME PST		26302L IRON SUSPENDED	82103L LEAD DISSOLVED	82302L LEAD EXTRBLE.	25302L MANGANESE EXTRBLE.	80301P MERCURY EXTRBLE.
					FE	PB	PB	MN	HG
D	M	Y	H	M	MG/L	MG/L	MG/L	MG/L	MG/L
11	3	69			0.040		L.01 01L	L.01 04L	
5	7	69					L.01 01L		
24	10	69					L.01 01L	L.01 04L	
5	5	70					L.01 01L	L.01 04L	
16	9	70					L.01 01L	L.01 04L	
15	6	71				L.001			
4	11	71				L.001			

STATION **00BC08CG0001** LATITUDE 56 D 44 M 20 S LONGITUDE 131 D 40 M 25 S

ISKUT RIVER BELOW JOHNSON RIVER, APPROX. 5 MILES FROM MOUTH, BRITISH COLUMBIA

SAMPLE DATE D	M	Y	TIME PST H	M	29105L COPPER DISSOLVED CU MG/L	29305L COPPER EXTRBLE. CU MG/L	29301L COPPER EXTRBL. CU MG/L	30105L ZINC DISSOLVED ZN MG/L	30304L ZINC EXTRBL. ZN MG/L	10901L TOX. UNITS TOTAL (CU + ZN) (CALCD) REL. UNITS
11	3	69				L.01	06L		L.01	0.000
5	7	69				L.01	06L		L.01	0.000
24	10	69				L.01	06L		0.03	0.018
5	5	70				L.01	06L		L.01	0.000
16	9	70				L.01	06L		L.01	0.000
15	6	71			L.001			0.002		
4	11	71			0.002			0.008		

SAMPLE DATE D	M	Y	TIME PST H	M	06401L FREE CO2 (CALCD.) MG/L	00210L SATURATION INDEX (CALCD) PH UNITS	00211L STABILITY INDEX (CALCD) PH UNITS	11201L SODIUM ABSORPTION RATIO REL. UNITS	10401L RESIDUE NONFILTR. MG/L	10501L RESIDUE FIXED NONFILTR. MG/L	10451L RESIDUE FILTERABLE MG/L	10551L RESIDUE FIXED FILTERABLE MG/L
11	3	69			2.2	0.0	7.8	0.31				
5	7	69			1.4	-0.7	9.2	0.09	240	235		
24	10	69			1.1	0.0	8.0	0.11	8	4		
5	5	70			1.1	0.1	7.9	0.19	18	16		
16	9	70			1.2	-0.5	8.8	0.13	38	38		
3	11	70			0.9	-0.2	8.4	0.14				
17	3	71			2.2	0.1	7.8	0.22				
18	5	71			1.5	-0.4	8.6	0.25				
15	6	71			1.1	-0.6	9.1	0.09	92	89		
10	9	71			0.9	-0.4	8.7	0.10				
4	11	71			1.1	0.0	8.0	0.17	3	1		

APPENDIX III.3.1

Stikine P.S.Y.U. Forest Unit Survey Report

REPORT ON THE 1970 UNIT SURVEY

OF THE

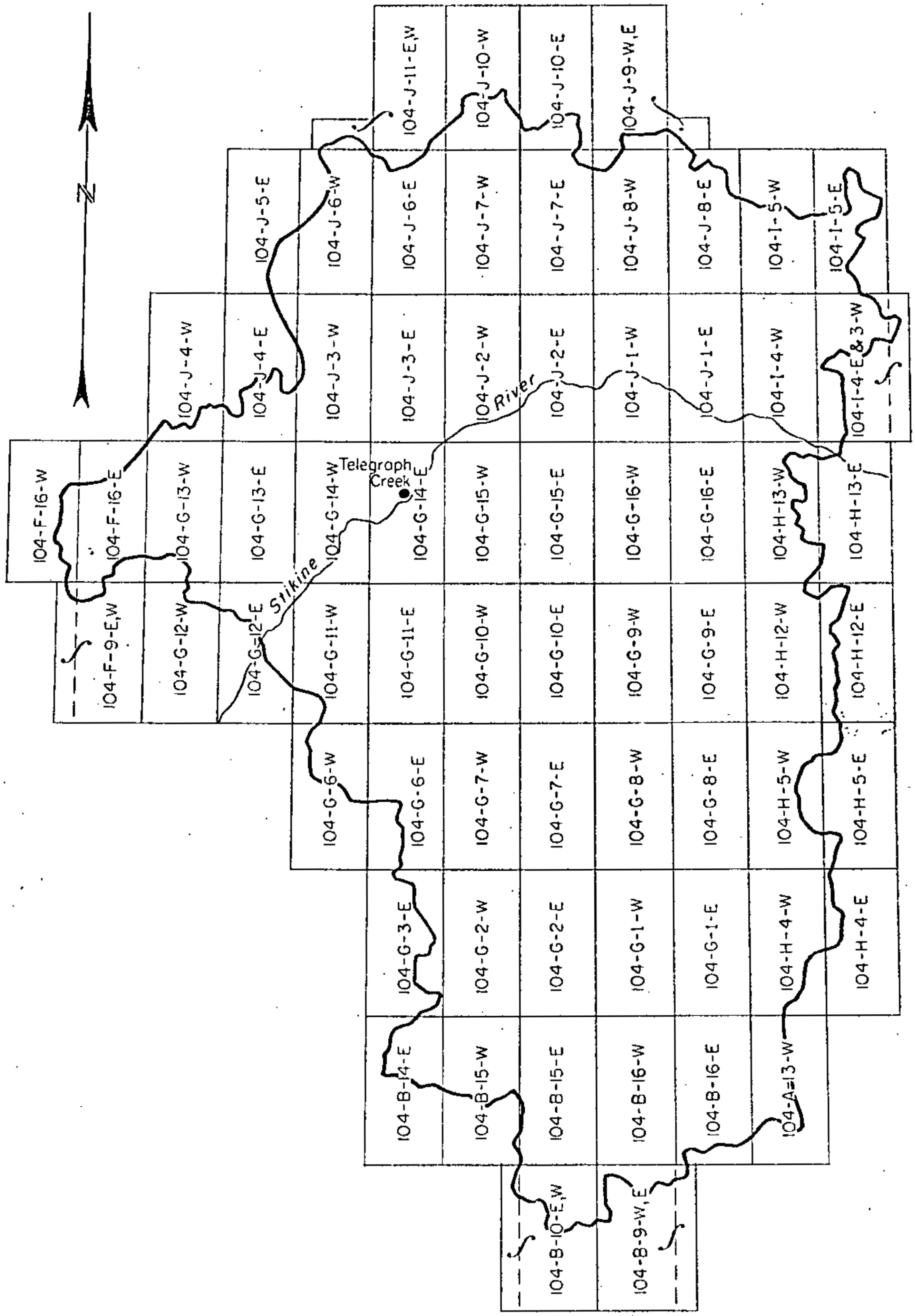
STIKINE P.S.Y.U. (PROPOSED)

Forest Inventory Division

E. L. Young, Forester i/c

April, 1971.

File: S.C.172



Key to 69 available forest cover maps for the

STIKINE P.S.Y.U. (Proposed)

Map Scale: 1 inch = 40 chains

STIKINE P.S.Y.U. (PROPOSED) - 1970

FOREWORD

This report, which is based on a 1970 unit survey, presents a synopsis of the forest inventory by area and volume for the entire Stikine P.S.Y.U. (proposed). Timber sale and fire history for the area have been incorporated up to September, 1970, completion date of the field work. Effective date of ownership status is November, 1970. This report therefore replaces all previous figures or bulletins on this area.

In addition to this report, detailed map area and map volume statements are available for each of the 69 maps (shown on the key) which cover this unit. In effect, the maps at forty-chain to one-inch scale,plus the above statements, complete the survey report.

CLASS OF SURVEY

The Stikine P.S.Y.U. (Proposed) is a Class B survey. We have been able to provide:

(1) a detailed map area statement, and a map volume statement for each of the 69 maps;

(2) forest cover maps at a scale of forty chains to one inch;

(3) forty-chain air photos. These were flown by the Air Surveys Division in 1968 to 1970 and provide the basis for the air and ground classification. The classification procedures used were of our latest standard, as outlined in this Division's manual.

(4) volumes based on 340 samples (both half-acre and two-fifth acre),established in mature types during the period of 1953 to 1970 inclusive. These local samples account for the volume on 92 per cent of the total mature Crown area. The balance of the area is based mainly on Zone 3 average volume per acre estimates. Individual sample volume statements for mature samples are readily available on request. All samples including those prior to the above date are shown plotted on the maps by number and year. Distribution by forest type of all samples 1953+ is as follows:

Mature	-	340
Immature	-	141
A For.	-	4
N.C.	-	1
N.P.	-	11
		497

(5) forest classification, incorporating all previous survey data. In addition to ground measurements, observations were recorded with the use of a helicopter.

(6) a volume estimate for that portion of the area shown in item 4, with a sampling error within $\pm 4\%$ at a probability of 19 times out of 20. This error was based on net volumes at 7.1"+ d.b.h.

(7) volumes based on 1962 "Standard Cubic-Foot Volume Tables for Commercial Tree Species of B.C." To these volumes, merchantable volume (utilization) factors and net volume (loss) factors were then applied, the result being a net volume estimate of 7.1"+ d.b.h. to a close utilization standard (1 foot stump and 4 inch top d.i.b.) less decay. (See Table 4.)

(8) net mean annual increments (M.A.I.'s) at culmination age based on recently compiled volume over age curves from local samples. The latter account for 79 per cent of the immature area with the balance covered by Zone 3 volume over age curves. All volumes are reported to a *close utilization standard and are net with deduction for decay only.

RESULTS

A. Area Statement:

The Stikine P.S.Y.U. (proposed) contains 1,558,440 acres of Crown forest land and 3,459,828 acres of non-forest land outlined as follows:

(1) Mature - 891,019 acres

(2) Immature - 382,244 acres

(3) Residual - Nil acres (type of stand remaining, usually after diameter limit logging)

(4) N.S.R. - 193,006 acres

(5) N.C. - 92,171 acres

(6) N.F. - 3,459,828 acres.

In addition to the total Crown area, a further 17,262 acres within the unit boundary, is classed as alienated.

B. Volume Statement:

The estimated volume at 7.1"+ d.b.h. to a *close utilization standard less decay on the 891,019 acres of total mature Crown area is:

2,693,582,000 cubic feet.

*Close utilization = 1 foot stump and 4 inch top d.i.b.

REMARKS

In order to fully understand the report, maps and statements the user must know:

1. Utilization Standards:-

Close - utilization to a 1 foot stump and a 4 inch top d.i.b.
Intermediate - utilization to a 1-1/2 foot stump and an 8 inch top d.i.b.
Rough - utilization to a 2 foot stump and a 12 inch top d.i.b.

2. Maturity Classes:-

Mature - coniferous stands over 120 years of age;
lodgepole pine and deciduous stands over 80 years of age.
Immature - stands under the preceding limits.

3. Site Classes:-

Four site classes are recognized; namely good, medium, poor, and low. Site index is based on height at 100 years, as per the site index tables, by species, listed in the Inventory Division field pocket manual.

4. Abbreviations:-

H - Hemlock
B - Balsam
S - Spruce
Pl - Lodgepole Pine
Cot - Cottonwood
Bi - Birch
A - Aspen
NSR - Not sufficiently restocked
NC - Non-commercial

Note: The species symbol Sb (Black Spruce) has been used for map labels only. Summary statements list black or white spruce as species symbol "S".

5. Codes:-

Age Class	Limits Years
1	1- 20
2	21- 40
3	41- 60
4	61- 80
5	81-100
6	101-120
7	121-140
8	141-250
9	251+

Height Class	Limits Ft.
1	1- 35
2	36- 65
3	66- 95
4	96-125
5	126-155
6	156-185
7	186-215
8	216+

Stk. Class	Apply To	Limits - No. of trees per acre 11.1"+ d.b.h.
0	all immature	N.A.
1	mature	31+
2	mature	1-30

6. Alienated Lands:-

Volumes are provided only for those areas for which the Forest Service can dispose of timber values. This excludes Crown grants, parks, farm wood-lots and like tenure.

STIKINE P.S.Y.U. (PROPOSED)

- 1970 -

TABLE 1

TOTAL FOREST AND NON-FOREST CROWN AREA IN ACRES

FOREST LAND	Age Class	SITE Good	SITE Medium	SITE Poor	SITE Low	TOTAL
	1- 20	260	1,250	29,077	11,845	42,432
	21- 40	432	23,145	58,578	8,308	90,463
	41- 60	727	4,368	64,273	2,516	71,884
	61- 80	4,704	31,460	80,231	1,090	117,485
	81-100	1,175	3,343	24,012	-	28,530
	101-120	2,235	6,497	22,078	640	31,450
IMMATURE TOTAL		9,533	70,063	278,249	24,399	382,244
MATURE TOTAL		31,556	177,692	677,793	3,978	891,019
RESIDUAL TOTAL		-	-	-	-	-
N.S.R. TOTAL		-	1,308	191,698	-	193,006
N.C. TOTAL		10	2,671	88,190	1,300	92,171
TOTAL		41,099	251,734	1,235,930	29,677	1,558,440

NON-FOREST LAND	Alpine Forest	Alpine	Swamp	Water	Rock	N.P.	Roads	Other	TOTAL
	345,764	2,302,684	38,897	71,292	19,119	677,340	2,494	2,238	3,459,828

* GRAND TOTAL CROWN	5,018,268

* In addition to this area a further 17,262 acres, within the unit boundary, are classed as alienated.

STIKINE P.S.Y.U. (PROPOSED)

- 1970 -

TABLE 2

TOTAL IMMATURE CROWN AREA IN ACRES BY SITE AND AGE CLASS

FOREST TYPE	GOOD SITE ACRES BY AGE CLASS 1-20	21-40	41-60	61-80	81-100	101-120	TOTAL	MEDIUM SITE ACRES BY AGE CLASS 1-20	21-40	41-60	61-80	81-100	101-120	TOTAL
IB,HS	-	-	-	-	-	-	-	-	-	-	-	-	145	145
B,BPl,BDec.	-	-	-	-	135	-	135	-	-	90	-	415	230	735
BS	-	-	250	-	-	130	380	-	-	-	-	-	745	745
S	-	-	75	225	20	735	1,055	-	15	430	1,382	685	1,895	4,407
SB	-	-	-	652	145	150	947	-	35	-	425	560	-	1,020
SPl	-	-	-	1,030	565	1,080	2,675	-	225	865	467	995	485	3,037
SDec.	-	-	-	40	310	140	490	-	-	-	963	60	2,937	3,960
Pl	-	190	402	1,120	-	-	1,712	633	16,755	969	8,298	-	-	26,655
PlS,PlB	260	120	-	690	-	-	1,070	550	685	311	5,477	-	-	7,023
PlDec.	-	122	-	942	-	-	1,064	67	3,205	50	4,142	-	-	7,464
Cot,CotMix.	-	-	-	5	-	-	5	-	-	60	495	-	60	615
A,ADec,BiA, Bi	-	-	-	-	-	-	-	-	1,735	1,345	8,859	-	-	11,939
AConif.	-	-	-	-	-	-	-	-	490	248	952	628	-	2,318
TOTAL	260	432	727	4,704	1,175	2,235	9,533	1,250	23,145	4,368	31,460	3,343	6,497	70,063

FOREST TYPE	POOR SITE ACRES BY AGE CLASS 1-20	21-40	41-60	61-80	81-100	101-120	TOTAL	LOW SITE ACRES BY AGE CLASS 1-20	21-40	41-60	61-80	81-100	101-120	TOTAL	GRA TOT AC
IB,HS	-	220	-	-	-	-	220	-	-	-	-	-	-	-	
B,BPl,BDec.	1,665	945	1,730	2,414	5,906	5,552	18,212	-	101	57	105	-	640	903	19
BS	-	-	45	1,600	1,659	1,144	4,448	-	-	-	95	-	-	95	5
S	50	7,299	1,270	5,046	5,536	4,182	23,383	-	115	-	-	-	-	115	28
SB	-	695	1,000	955	455	4,065	7,170	-	-	-	-	-	-	-	9
SPl	130	1,180	3,310	2,021	1,237	2,147	10,025	-	-	-	-	-	-	-	15
SDec.	1,760	1,270	1,838	1,083	5,892	2,253	14,096	-	-	-	-	-	-	-	18
Pl	70	14,979	4,347	8,508	-	-	27,904	526	700	1,610	-	-	-	2,836	59
PlS,PlB	-	2,758	1,020	4,395	-	-	8,173	-	-	-	-	-	-	-	16
PlDec.	1,515	4,950	8,038	1,418	-	-	15,921	-	-	-	-	-	-	-	24
Cot,CotMix.	-	-	155	434	-	80	669	-	-	130	-	-	-	130	1
A,ADec,BiA, Bi	23,887	19,644	31,310	45,195	-	-	120,036	10,269	7,392	719	890	-	-	19,270	151
AConif.	-	4,638	10,210	7,162	3,327	2,655	27,992	1,050	-	-	-	-	-	1,050	31
TOTAL	29,077	58,578	64,273	80,231	24,012	22,078	278,249	11,845	8,308	2,516	1,090	-	640	24,399	38

STIKINE P.S.Y.U. (PROPOSED)

- 1970 -

TABLE 3
NET M.A.I. IN CUBIC FEET PER ACRE AT CULMINATION AGE BY SITE CLASSES
FOR TOTAL IMMATURE CROWN AREA

7.1"+ d.b.h. Close Utilization less decay

FOREST TYPE	GOOD SITE				MEDIUM SITE				POOR SITE				LOW SITE				TOTAL ACRES	GRAND TOTAL M.A.I
	Culmination age	M.A.I.	Acres	Total M.A.I.	Culmination age	M.A.I.	Acres	Total M.A.I.	Culmination age	M.A.I.	Acres	Total M.A.I.	Culmination age	M.A.I.	Acres	Total M.A.I.		
HB,HS			-		106	54	145	7,830	122	40	220	8,800			-		365	16,630
B + BMix.	71	63	515	32,445			-				-		126	11	998	10,978	1,513	43,423
S,SPl,SDec	85	49	4,220	206,780			-				-		125	7	115	805	4,335	207,585
SB,S,SMix, B + BMix.	72	59	947	55,873	82	38	13,904	*528,352	133	20	77,334	*1,546,680			-		92,185	2,130,905
Pl + PlDec	100	43	2,776	119,368	122	25	34,119	*852,975	108	14	43,825	*613,550	137	11	2,836	31,196	83,556	1,617,089
PlS,PlB	84	53	1,070	56,710	109	27	7,023	189,621	113	20	8,173	163,460			-		16,266	409,791
Cot,CotMix.	80	43	5	215	91	38	615	23,370	90	19	669	12,711	90	10	130	1,300	1,419	37,596
AConif.			-		87	39	2,318	90,402	93	21	27,992	587,832	98	6	1,050	6,300	31,360	684,534
A,ADec, BiA,Bi			-		105	24	11,939	*286,536	116	8	120,036	*960,288	118	5	19,270	96,350	151,245	1,343,174
GRAND TOTAL			9,533	471,391			70,063	1,979,086			278,249	3,893,321			24,399	146,929	382,244	6,490,727

* Local M.A.I.'s: others zonal (Zone 3)

STIKINE P.S.Y.U. (PROPOSED)

1970

TABLE 4

NET VOLUME IN M.C.F. FOR TOTAL MATURE CROWN AREA
7.1"+ d.b.h. *Close Utilization Less Decay Only

- ALL SITES COMBINED -

SPECIES	FOREST TYPE																			GRAND TOTAL
	H,HPl	HB	HS	B,BPl,BA	BH	BS	S	SH	SB	SPl	SDec.	Pl	PlS,PlB	PlDec.	CotConif.	Cot,CotA	BiPl,Bi	AConif	A,ADec.	
H	89,710	25,930	166,580	763	13,200	-	-	7,018	-	-	911	-	484	-	10	-	-	-	-	304,606
B	3,813	15,995	15,384	592,453	31,248	183,650	8,829	2,926	99,771	7,513	3,587	4,276	45,805	550	2,950	464	40	28	615	1,019,897
S	5,096	1,681	23,981	71,662	1,797	87,455	306,320	15,290	200,415	90,268	44,111	8,509	61,239	1,667	3,661	816	-	3,188	4,304	931,460
Pl	1,688	45	2	29,437	6	6,341	10,437	927	12,859	24,040	1,005	97,153	102,408	7,723	-	40	441	2,948	4,922	302,422
Cot	-	11	-	856	-	1,338	3,843	306	3,188	809	3,664	286	3,146	147	4,909	11,393	24	175	1,687	35,802
Bi	1	-	85	17	-	342	97	39	557	62	-	50	1,114	227	60	207	714	83	2,384	6,039
A	220	-	-	431	-	1,842	10,000	-	3,993	411	11,560	3,320	5,896	2,072	35	1,495	57	7,966	44,058	93,356
TOTAL VOLUME	100,528	43,662	206,032	695,619	46,251	280,968	339,526	26,506	320,783	123,103	64,858	113,594	220,092	12,386	11,625	14,415	1,276	14,388	57,970	2,693,582
TOTAL AREA	16,769	7,251	32,670	260,106	9,768	97,340	122,080	4,576	100,993	40,217	30,012	42,442	61,072	5,042	2,717	5,490	497	4,799	47,178	891,019

* Close Utilization = 1 foot stump and 4 inch top d.i.b.

APPENDIX III.3.2

Forest Inventory Statistics of P.S.Y.U.'s
in Kitimat Stikine Regional District

Appendix III.3.2

Forest Inventory Statistics

Source: Bauder & Gray. Economic Development of the Regional District of Kitimat-Stikine British Columbia. Vancouver, 1971.

FOREST & NON FOREST AREA IN ACRES

NAME	FOREST LAND (in acres) MATURE	IMMATURE	RESIDUAL	NOT SUFFICIENTLY RESTRICTED	NON COMMERCIAL	TOTAL	NON FOREST LAND	TOTAL AREA
Boundary P.S.Y.U.	326,541	15,986	-	13,140	19,096	374,763	3,543,681	3,918,445
Klappan P.S.Y.U.	705,224	220,206	-	15,560	187,474	1,128,464	3,325,325	4,453,789
Stikine P.S.Y.U.	827,761	390,481	-	351,687	16,840	1,586,769	3,361,145	4,947,914

FOREST AREA IN ACRES BY SITE CLASS

	SITE CLASSIFICATION GOOD	MEDIUM	POOR	LOW	TOTAL FOREST AREA
Boundary P.S.Y.U.	71,021	228,178	75,564	-	374,763
Klappan P.S.Y.U.	11,520	282,596	807,411	26,937	1,128,464
Stikine P.S.Y.U.	37,102	563,118	956,238	30,311	1,586,769

NET VOLUME IN M.C.F. OF MATURE PINE AND BROAD-LEAVED SPECIES (7.1"+ D.B.H. CLOSE UTILIZATION LESS DECAY)

	WHITE PINE	LODGEPOLE PINE	COTTON-WOOD	ALDER	BIRCH	ASPEN	TOTAL PINE AND BROAD-LEAVED	TOTAL ALL SPECIES TABLE R6A & R6B
Boundary P.S.Y.U.	-	38,902	156,112	77	9,064	17,413	221,568	1,891,058
Klappan P.S.Y.U.	-	451,414	6,597	-	878	24,267	483,156	1,572,508
Stikine P.S.Y.U.	-	738,585	6,966	35	10,258	54,062	809,906	3,142,920

NET VOLUME IN M.C.F. OF MATURE CONIFEROUS SPECIES OTHER THAN PINE (7.1"+ D.B.H. CLOSE UTILIZATION LESS DECAY)

	FIR	CEDAR	HEMLOCK	BALSAM	SPRUCE	YELLOW CEDAR	LARCH	TOTAL CONIF. OTHER THAN PINE
Boundary P.S.Y.U.	-	126,045	791,875	262,423	489,147	-	-	1,669,490
Klappan P.S.Y.U.	-	-	-	271,322	817,973	-	57	1,089,352
Stikine P.S.Y.U.	-	-	421,673	681,741	1,229,600	-	-	2,333,014

Appendix III.3.2

Forest Inventory Statistics

Source: Bauder & Gray. Economic Development of the Regional District of Kitimat-Stikine British Columbia. Vancouver, 1971.

NET ANNUAL GROWTH AND AVERAGE MEAN ANNUAL INCREMENT (M.A.I.) IN CUBIC FEET AT CULMINATION AGE ON IMMATURE FOREST LAND

	GOOD		MEDIUM		POOR		LOW			
NAME	AVE. MAI PER ACRE	TOTAL GROWTH	AVE. MAI PER ACRE	TOTAL GROWTH	AVE. MAI PER ACRE	TOTAL GROWTH	AVE. MAI PER ACRE	TOTAL GROWTH	AVE. MAI PER ACRE	GRAND TOTAL GROWTH
Boundary P.S.Y.U.	102	121,380	27	28,620	40	549,540	-	-	44	699,540
Klappan P.S.Y.U.	38	420,800	30	1,637,928	17	2,476,853	6	48,600	21	4,584,181
Stikine P.S.Y.U.	53	514,564	29	3,051,375	18	4,848,024	6	20,920	26	8,434,883

ROTATION AGE AND POSSIBLE ALLOWABLE ANNUAL CUT AT CLOSE UTILIZATION LESS DECAY ONLY, IF ALL LANDS ON WHICH THE FOREST SERVICE CAN DISPOSE OF TIMBER VALUES WERE UNDER SUSTAINED-YIELD

NAME	ROTATION AGE (YEARS)	ALLOWABLE ANNUAL CUT 6" TOP D.I.B. (M.C.F.)
Boundary P.S.Y.U.	91	14,800
Klappan P.S.Y.U.	101	13,400
Stikine P.S.Y.U.	97	28,000

STIKINE-ISKUT RIVERS

Public Information Bulletin

January 1979

PREFACE

Preliminary studies of potential hydroelectric sites on the Stikine and Iskut Rivers are being conducted by B. C. Hydro. This public information bulletin describes investigations to assess the engineering, economic and environmental feasibility of hydro projects on the two rivers.

Inquiries regarding the Stikine-Iskut studies should be addressed to:

Community Relations Department
B.C. Hydro
970 Burrard Street
Vancouver, B.C.
V6Z 1Y3

1. HYDRO'S PLANNING PROCESS

In its efforts to plan for future electrical demand, B.C. Hydro continually assesses a wide range of potential energy sources.

At the present time many potential generation projects are in various stages of study. These include coal-fired thermal projects, hydroelectric sites and a geothermal project.

The objective of this continuing program is to ensure that as electrical demand requires, Hydro will have readily-available information on various alternative energy sources so that the most desirable, from an environmental and economic viewpoint, can be recommended for development.

Power from the Stikine-Iskut would not be available to the provincial transmission grid until the 1990's at the earliest.

No decision has been made by Hydro to seek government approval for development of any project in the Stikine-Iskut basin. Such a decision could not be made until the early 1980's and it will then depend on results of engineering and environmental studies.

Rec'd 15 Feb 1979 following telephoned request
RJO

APPENDIX IV

Agencies Contacted and/or Visited

APPENDIX IV

Agencies Contacted and/or Visited

1. B.C. Hydro and Power Authority
2. B.C. Telephone Company
3. B.C. and Yukon Chamber of Mines
4. Federal Government Departments:
   a. Energy Mines and Resources
      - Geological Survey of Canada
   b. Fisheries and Environment
      - Atmospheric Environment Service
      - Environmental Management Service
         - Inland Waters Directorate
            Water Planning and Management Branch
            Water Quality Branch
            Water Survey of Canada
         - Lands Directorate
         - Canada Wildlife Service
      - Fisheries and Marine Service
   c. Indian and Northern Affairs
   d. Manpower and Immigration
      - Economic Analyses and Forecast Branch
   e. Statistics Canada
5. Provincial Government Departments:
   a. Agriculture
   b. Economic Development
   c. Education
   d. Environment
      - Environmental Land Use Secretariat
      - Land Commission
      - Pollution Control Branch
      - Water Rights
      - Water Investigations Branch

APPENDIX IV (cont'd)

   e. Finance
   f. Forest Service
   g. Highways
   h. Mines and Petroleum Resources
   i. Municipal Affairs
   j. Ministry of the Provincial Secretary and Travel Industry
   k. Recreation and Conservation
      - Fish and Wildlife
      - Parks
      - Recreation

6. University of British Columbia
   a. Agriculture/Forestry Library
   b. Geography Department
   c. Geology Department
   d. Main Library

7. Vancouver Public Library - Robson/Burrard Branch

2. RIVER REGIMES

The Stikine and Iskut river basins are located in northwestern British Columbia, near the Alaska panhandle and immediately north and east of Wrangell, Alaska. They are shown on the attached map.

The Stikine River rises on the Stikine plateau and surrounding mountain ranges. The river flows southward a total distance of some 500 km to the B.C. - Alaska border.

The Iskut is the largest tributary of the Stikine. Eleven km upstream from the Alaska border, the rivers join and flow 43 km to the Pacific Ocean. For the last 32 km, the Stikine-Iskut passes through U.S. territory.

The Iskut River has its source in the highlands above Eddontenajon Lake. In its upper reaches the river connects a series of lakes, after which it flows a distance of some 190 km from the outlet of Kinaskan Lake to its confluence with the Stikine.

Two significant tributaries of the Iskut in the present study are More Creek and Forrest Kerr Creek. Both have their headwaters in the Coast Mountain ice fields and receive much of their flow from glaciers.

3. ALTERNATIVE SITES

B. C. Hydro has investigated a number of plans for the development of hydro-electric generating plants on the Stikine and Iskut Rivers. These investigations have indicated the need for further study on each river.

(a) Stikine

On the Stikine, the study will be directed to two damsites, one at Site Z and one at Site C1 as shown on the attached map. It is estimated that the total installed capacity would be 1,950 Megawatts*. As a comparison the G.M. Shrum Generating Station at the Bennett Dam has a capacity of 2,116 MW.

Both sites are located in the Grand Canyon because of the canyon's steep river gradient and generally favourable foundation conditions.

* A megawatt (MW) is one thousand kilowatts (kW) or one million watts.

In addition, there are two damsites further downstream, known as Site A and Little Canyon. (These sites were noted in the report prepared for the B.C. Energy Board in 1972.) However, as well as being less economic than the upstream projects, dams at the downstream sites could block salmon which migrate up the Stikine River. In view of the combined head of 207 m at these sites, it would be difficult, with current technology, to provide facilities which would permit successful passage of salmon. Consequently, possible projects at Site A and Little Canyon are not being considered at the present time.

A possible low head development at Site B2, which is located between Site A and Site C1, was examined also. Site B2 is about 610 m upstream from the confluence of the Klastline River and is likely near the upstream limit of salmon migration in the Stikine. A project at Site B2 would have an installed capacity of 155 MW but is relatively uneconomic and is not being studied in detail at the present time.

(b) Iskut

The proposal being studied for development of the Iskut would involve a dam on the Iskut River at Site B, a dam on More Creek, and a dam across upper Forrest Kerr Creek to divert run off into More Creek. These damsites are shown on the attached map. It is estimated that the total installed capacity would be 740 MW.

4. TRANSMISSION

Transmission lines would be required to integrate the Stikine and Iskut plants into the provincial transmission grid. General overview studies have been initiated to assess the major factors that must be faced. Should overall project feasibility be proved, more detailed transmission studies would follow.

The overview study will assess reasonable transmission line corridors and the social environmental and economic implications of each. Two major northern transmission route possibilities can roughly be described as the BCR route and the Bulkley Valley - Stewart-Cassiar Highway route.

Also under consideration is the possibility of integrating the Stikine-Iskut transmission study with that for the Liard, now also under study. The two northern transmission routes for the Liard now evident can roughly be described as the Rocky Mountain Trench route and the East Slopes of Rockies route. The relative economics of these various major routes and of their integration will be assessed.

Additional feasible routes may become evident as the studies proceed.

5. FUTURE INVESTIGATIONS

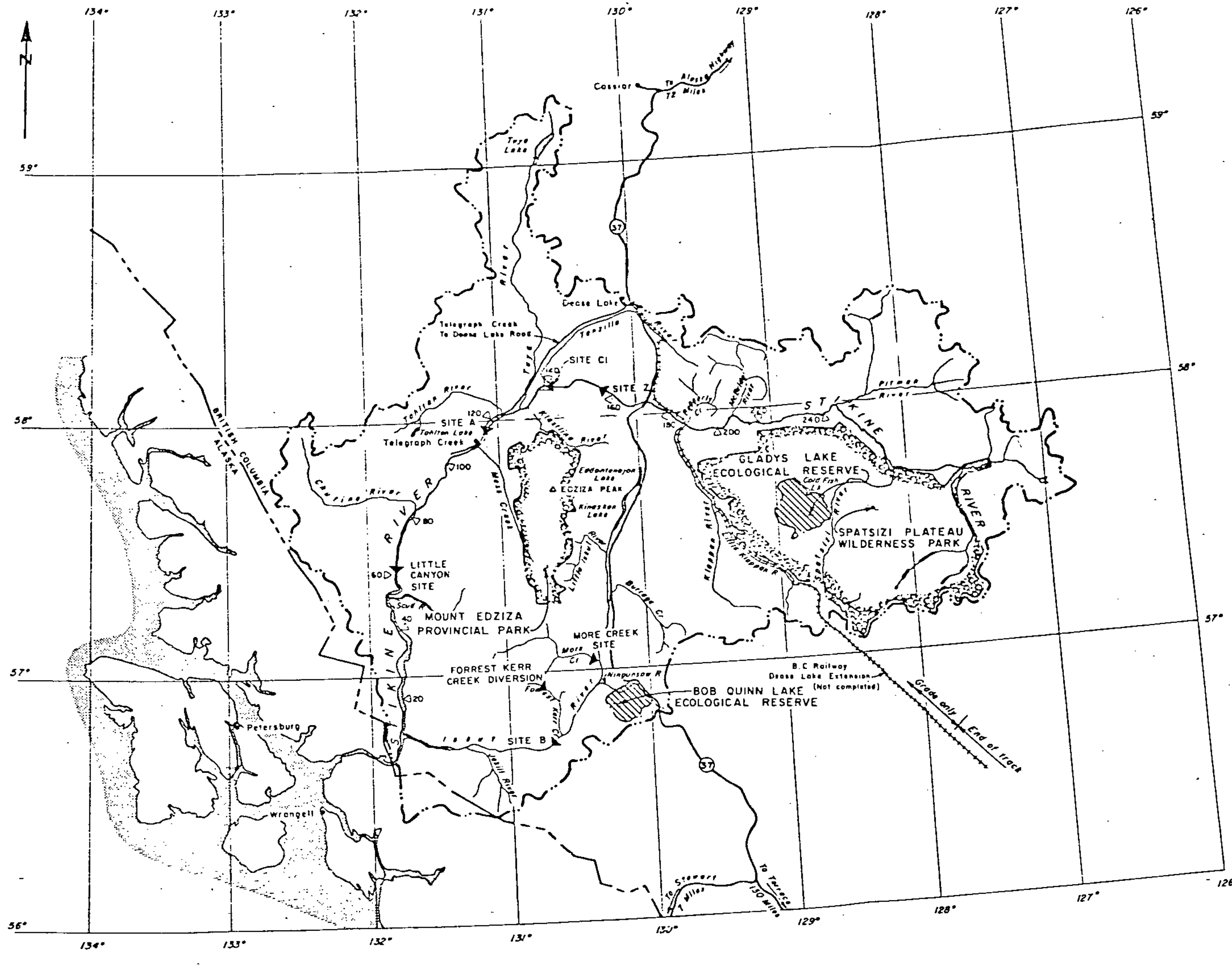
More detailed studies of the Stikine-Iskut will be carried out by Hydro over the next two years. The program will include field explorations, primarily to confirm foundation conditions at the various dam and powerhouse sites. Foundation drilling and seismic refraction surveys will be carried out to determine depth to bedrock and characteristics of overburden and bedrock at the project sites.

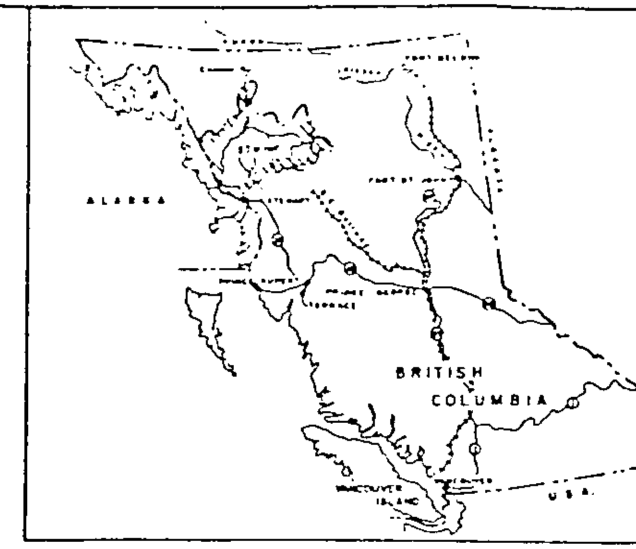
Also during the next two years, detailed studies will be carried on the possible environmental and social effects. Physical and biological studies will be performed to predict the impacts of river flow regulation on aquatic and terrestrial ecologies. Studies will also be conducted to assess the impacts of river development on the scenic and wildlife resources of the Grand Canyon of the Stikine and the area immediately upstream.

THOM THOMPSON

COMMUNITY RELATIONS
B.C. HYDRO
VANCOUVER, B.C. V6Z 1Y3

663-2405





KEY PLAN

LEGEND:

- ● CITY, TOWN OR SETTLEMENT
- PROJECT SITES
- DISTANCE ALONG THE STIKINE RIVER FROM BRITISH COLUMBIA/ALASKA BORDER (MILES)
- LIMIT OF DRAINAGE AREA
- (37) HIGHWAY
- RAILWAY

Scale: 20 0 20 40 60 80 100 Kilo

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

STIKINE - ISKUT RIVER

AREA PLAN

DATE JUN 1978	EXHIBIT 1	R
DWN D.J.	DWG No 915 - C14 - D48	