Soil Survey and Land Evaluation

of the

Yukon Territory

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SOIL SURVEY AND LAND EVALUATION

OF THE

YUKON TERRITORY

H.P.W. Rostad, L.M. Kozak, and D.F. Acton

Assisted in the field by:
R.A. White, I. Young, A. Anderson, R. Stushnoff, S. Preston, and P. Brimacombe

Grazing Potential by:
W.L. Pringle, C.D.A., Beaverlodge

Soil Fertility section by:
J.L. Henry, Soil Science Department, University of Saskatchewan

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Introduction

The survey was conducted as part of a project to inventory and assess the soil and climatic resources for agriculture in the Territory on behalf of the Territorial Government and the Department of Indian Affairs and Northern Development. The areas surveyed were selected on the basis of a preliminary evaluation of the climate, native vegetation, current land use, and of those areas where agricultural leases were being applied for.

The survey was basically of an exploratory nature, with the soils studied in the most detail near the highways and in less detail in remote areas. The survey consisted of classifying and mapping the soils in Soil Associations or groups of soils with similar properties and delineating their extent on aerial photographs. Interpretive maps were also prepared which grouped the map units into various classes for the following uses or interpretations:

1. Soil Capability for Agriculture
2. Grazing Capability
3. Crop Suitability
4. Suitability for Irrigation
5. Suitability as a Source of Topsoil
6. Suitability for Road Construction
7. Suitability as a Source of Sand or Gravel
8. Suitability for Area Type Landfills
9. Surface Texture
10. Subsoil Texture
11. Soil Drainage and Permafrost
12. Surficial Material and Topography.

Agriculture in the Yukon

Agriculture has been practised in the Yukon since the late 1800's. During the years of the gold rush from 1875 to 1900, agriculture expanded to provide some of the food for the thousands of miners who rushed to the goldfields. After the gold rush slowed and thousands of people left the Yukon, many farms were abandoned as the demand for food decreased. After that time only a few farms near major towns, remained to supply vegetables and forages. In the nineteen-twenties farming operations were carried on at the Pelly Farm and in the Indian River Valley. Both are located on the old Dawson Trail but now are isolated being 20 - 30 miles from the new highways.

According to the Dominion Bureau of Statistics, Yukon had 41 farms in 1931 and only 12 in 1971. In 1971 only 3 farms reported more than $2500 in sales. A more detailed study of farming in the Yukon has been reported on by Peake and Walker (1975).

Climate

The climate of the Yukon is continental in nature, cold in the winter and warm in the summer. The annual precipitation varies from 260 to 430 mm with more than one-half coming in the form of rain during the summer months. In the area surveyed the major river valleys, except the Klondike, Takhini and Dezadeash have climates that allow the production of early maturing cereal grains and vegetables. All of the upland areas (lacustrine or morainal) are too cool for cereals but could support the growth of seeded forages.

Soils

The majority of the soils in the survey area have formed in deposits of fluvial origin and are composed of either sand or gravel. Some of these soils have surface layers (10 - 50 cm thick) of a finer texture, often very fine sandy loam to silt loam. The soils on the floodplains of the major rivers have mixed layers of organic and mineral material throughout the profile. Except for strongly acid soils in the Klondike valley, the floodplain soils are always neutral to alkaline.

The upland soils are developed in gravelly morainal deposits in the Watson Lake and Whitehorse areas, medium textured morainal deposits in the Pelly and McQuesten areas and fine textured lacustrine deposits in the Whitehorse - Takhini area. The soils in the Watson Lake and Dawson - McQuesten - Mayo areas are usually moderately to strongly acid while the soils in the south-central Yukon are neutral to alkaline. Except for soils in unglaciated regions, all other soil profiles are weakly developed consisting of Brunisols or Regosols.

The soils in the Carmacks, Faro and Ross River sheets have a surface cover (10 - 30 cm) of white volcanic ash occurring above the B horizon and below the leaf litter.

Soil Capability for Agriculture

Adverse climate places a severe restraint on agriculture in the Yukon. Approximately 85 percent of the survey area has insufficient heat units to consistently mature cereal crops for grain production. In addition, low rainfall in western Yukon can severely restrict the yield of cereals and forages.

The Whitehorse and Dawson map sheets generally have no reasonable extent of soils with a climate suitable for growing cereals. The Pelly Crossing and Carmacks sheets have 46,996 hectares of land with suitable climate but 63 percent of this land comprises soils too coarse in texture for cereal production. The McQuesten - Mayo area has 21,200 hectares

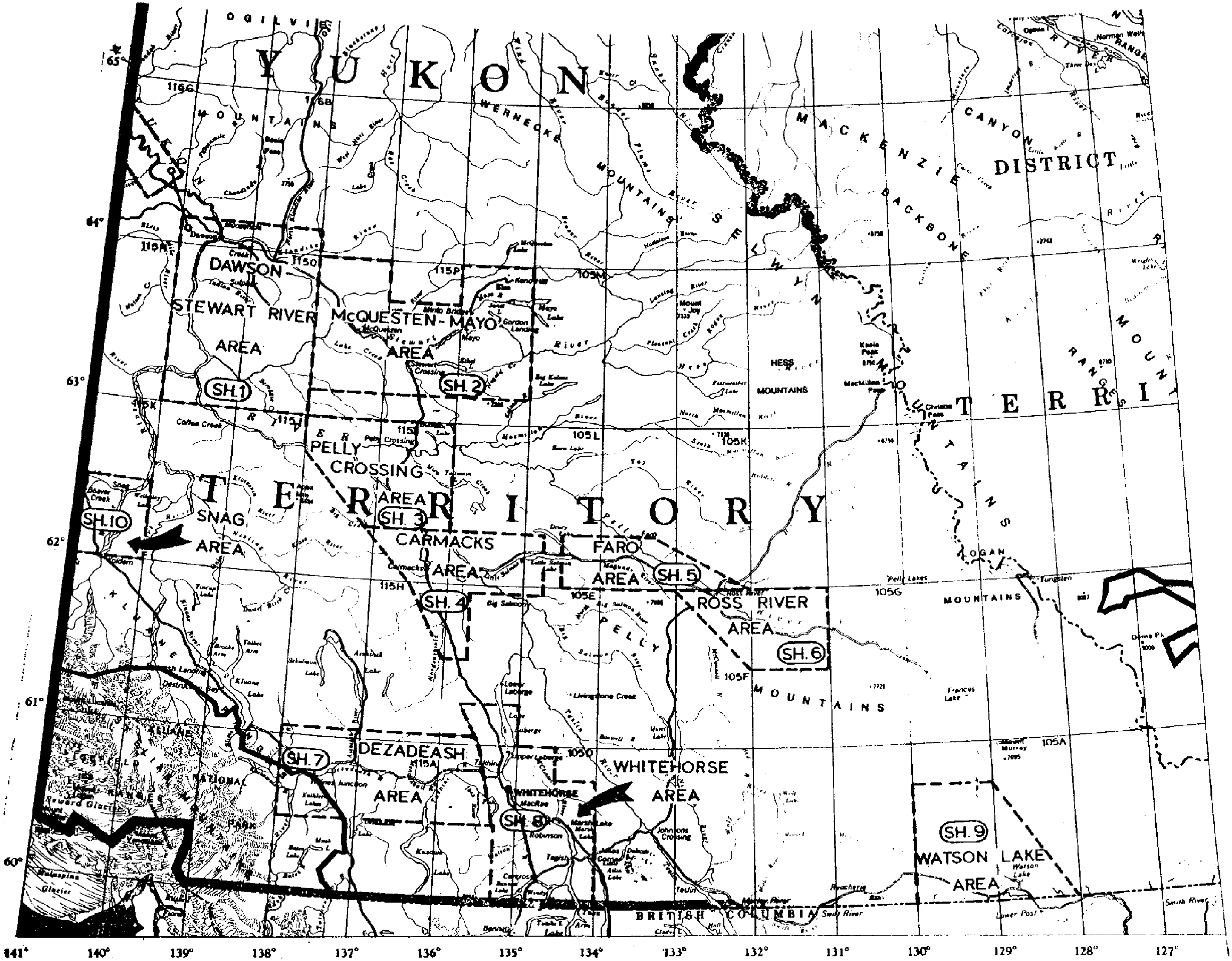


Fig. 1. Index to Map Sheets and Survey Area Sheets.

classified as Class 3 or suitable for cereal production and the Watson Lake area has 4800 hectares of Class 3 soils. Of the soils in regions too cool for cereal grains 53 percent are rated as Agricultural Capability Class 5 or suitable for seeded forages, 17 percent are Class 6, suitable only for native grazing and 30 percent are Class 7 or non-agricultural.

Vegetables can be grown in all regions, but the range of varieties decreases and more use is made of greenhouses as it gets cooler.

Table 1. Areal extent of Agricultural Capability Class in the survey area (hectares).

Area	Class 3 and 4	Class5	Class 6	Class 7
Dawson - Stewart Crossing - Mayo	24380	166912	17238	133613
Pelly Crossing - Carmacks	27730	143721	17127	67691
Watson Lake	10447	209267	267	97737
Faro - Ross River	644	31912	67235	12768
Whitehorse		73240	17472	79278
Takhini - Dezadeash		126215	14887	26178
Snag		35821	2018	17766
Total	63201	641494	136244	435031

Grazing Capability

There are some areas in the Yukon where the productivity of the native forages are adequate to allow grazing by livestock. Essentially all of the southern Yukon is treed. Due to the low annual precipitation (260 - 300 mm) and the frequent forest fires, the grass species form a fair proportion of the plant community. On new burn areas some soil types support a lush forage growth for a number of years before the tree canopy closes over. In other areas the trees are widely enough spaced that vigorous grass growth occurs even in the presence of mature stands of trees. Still other areas are too dry (south facing slopes), too wet (meadows), or too saline for tree growth and this allows good growth of grasses or sedges.

The treed areas with some grazing potential have an annual yield of approximately 100 - 450 kg/ha of grazable forages. Areas with less than 100 kg/ha productivity are not considered to have a significant grazing potential. Open areas such as meadows or saline areas have productivities ranging up to 2000 kg/ha and are suitable for hay production.

In the survey area approximately 1,156,285 hectares were rated as Class VII (no grazing), 221,479 hectares as Class V (10 - 100 kg/ha) and 32,053 hectares as Class III or IV (100 - 450 kg/ha).

Agricultural Potential in the Yukon

Due to the scarcity of markets and the high cost of inputs, the main agricultural enterprises will necessarily be oriented to livestock production and garden crops for local consumption.

To serve the present local market, livestock numbers (cattle) would need to be approximately 6000. This assumes an annual slaughter of 2000 head of cattle to feed a population of 25,000. A livestock industry of this size would require approximately 10,000 hectares of seeded hay land and 55,000 hectares of Class III and IV grazing land.

If residents of the Yukon consume as much vegetables as the average Canadian then a population of 25,000 could be supplied by 80 hectares of potatoes, 10 hectares of cabbages and 15 hectares of carrots. It is unlikely, however, if local growers or producers could capture the whole local market. In fact, many provinces in Canada don't supply all of their own vegetables or meat but import some from other areas.

There is a potential for livestock production or market gardening in certain areas. Both types of enterprises must however locate on suitable soil types and in favored locations to minimize input costs and costs related to selling the produce.

Livestock enterprises should locate in areas with soils of high native grazing capability and on soil types especially productive for growing hay for winter feeding. Some areas with good grazing potential are the French Creek, Pelly River, Lake Laberge and Takhini burn areas. Market gardens are best located on the floodplains of the larger rivers. The most suitable soils for this purpose, those of the Stewart Crossing, Pelly Crossing, and Carmacks Associations are neutral, fertile and often high in organic matter. They will also usually have favorable climate although some depressional areas may have frost hazards. The Whitehorse area with the largest market potential has a poor climate for market gardening; although some of the lowest floodplains with good air drainage to the river or gentle south-facing slopes may be suitable for this purpose.

At the present time there is a steady market for baled hay for winter feed for horses belonging to Big Game Outfitters or urban residents. An immediate expansion in this market would be realized if Outfitters overwintered their horses in the Yukon and kept them from grazing during the winter months.

In addition to livestock production and market gardening, many other types of agricultural operations are possible. Milk production or dairying is feasable if the problems of fluid milk marketing can be overcome. Seeded forages for hay and pasture would also be necessary. Swine production is feasable if locally grown barley and oats can be obtained at reasonable prices. Poultry and egg production is possible but they also require grain and protein supplement for feed and also heated housing for the winter months. Sheep could be raised utilizing native range but would need to be protected from predators. Honey production is feasable and has been practised in various locations in the Yukon. The main requirements for successful honey production are willows and wild flowers in the spring, and fireweed, clovers, and other legumes in July and early August (Harris et al., 1972). Rapeseed as a cash crop can be grown in climatically favorable areas but the cost of marketing the grain would be high.

Climate

The climate of the Yukon is continental in nature, with cold winters and warm summers. In the survey area the mean annual temperature varies between 4.7 and 0.8 degrees below zero Celsius. Many local variations in temperature also occur. South and west-facing slopes receive more heat from the sun than north-facing slopes. Since cold air is heavier than warm air it drains into low areas, thus affecting the frost hazard. The highest rainfall occurs in the southeastern and northwestern parts of the Territory with the lowest occurring in the Aishihik - Whitehorse area.

An agrometeorological study was carried out in the Yukon during 1975-76. This study involved a number of new temporary weather stations. It will be discussed in a separate report prepared for DIAND by the Atmospheric Environment Service. The Climatic Classes discussed in this soils report are those established by the British Columbia Land Inventory (1972) and the boundaries of the climatic regions were outlined by F.J. Eley, Project Co-ordinator, Yukon - N.W.T. Agrometeorology Study, Atmospheric Environment Service.

To classify a particular land area in regards to its Climatic Class for agriculture, we must first be able to estimate the various climatic parameters such as temperature and precipitation. Once these estimates are obtained, it is possible to estimate the type of crops that can be grown and the average yield to expect if we have the agricultural experience in areas with similar parameters. Unfortunately the agricultural experience is lacking for the Yukon. Unlike the prairie region of Saskatchewan and Alberta the Yukon suffers from both low rainfall and low temperatures at the same time. In fact the growing degree day heat units for Yukon are much less than the northern prairie region. In northern Alberta the short frost-free period usually limits the northern extension of agriculture while in the Yukon the low growing degree day heat units appear to be most limiting, according to the Climate Classification used in this study.

Not all workers agree on the number of growing degree days necessary for crop production. The British Columbia classification states that 1000 growing degree days above $5^{O}C$ are necessary for cereal crops and more than 735 for seeded forage crops. Harris et al. (1972) suggest that 613 growing degree days are necessary to grow most cool-season crops. Workers in Alaska (Searby and Branton, 1974) suggest a lower limit of 830 growing degree days above $5^{O}C$ as necessary for presently known field crops. All these parameters are just a guide as to the type of crops to grow, but the real answer is found through trial and error. The extended photoperiod or longer daylength in the Yukon may allow crops to mature with a shorter growing degree day period than is necessary in more southerly areas.

As stated previously, the climatic classification used in the Yukon is based on the scheme used by the British Columbia Land Inventory. The BCLI scheme has seven classes with classes 1 - 4 suitable for cultivated grain crops, class 5 suitable for seeded forages, class 6 suitable only for native grazing, and class 7 as non-agricultural. Certain limits of frost free period and growing degree days above $42^{O}F$ were set up for each class. These parameters were then used by Eley (1977) to draw boundaries for the various climatic classes in the Yukon.

The mapped boundaries between class 3 and class 5 appear reasonable. However, the boundaries between class 5 and class 6 and between class 6 and class 7 appear to be more questionable. For example, the areas mapped as 6G (G indicates growing degree day limitation) between the Klondike and McQuesten Rivers and along the Annie Lake Road near Whitehorse should according to the classification used, be restricted only to native grazing.

However forage crops have been grown in some of these areas, suggesting that they be rated as class 5. Also, areas mapped as class 7 or non-agricultural contained some high yielding alpine meadows and should have been class 6. There is a danger in extrapolating a classification scheme from one area of the country to another, modifications are necessary to suit each particular region.

For the purpose of this report, all areas below approximately 1000 metres in elevation were considered to have climate no worse than class 5. The boundaries between class 3 and class 5 climate were accepted as correct. It must be remembered also that local "hot" or "cold" spots can occur in any region due to aspect (south or north-facing slopes) or presence of frost pockets.

The various climatic data from long term weather stations in Yukon are shown in Table 2. In addition some data from northern Alberta and British Columbia is included. In most cases the Yukon stations report lower mean annual temperatures, lower precipitation, and lower growing degree days than the Alberta stations. They have a wide range of frost-free periods ranging from 21 days at Haines Junction to 96 days at Watson Lake.

It is generally thought that cereal grains and vegetables need about 60 frost-free days and approximately 1000 growing degree days to mature. All stations except Haines Junction have enough frost-free days, but none have adequate growing degree days, although some are very close. Except for Watson Lake and Dawson, most stations in the Yukon have very low summer precipitation (136 - 165 mm). Due to the lower growing season temperatures, the moisture efficiency of most plants will be high. Even

Table 2. Climatic data for selected stations in the Canadian Northwest.

	Beaverlodge	Dawson	Fort Nelson	Fort Selkirk	Fort Vermillion	Haines Junction	Hay River	Mayo	Watson Lake	Whitehorse
Annual Precipitation (mm)	470	325	434	276	353	282	340	293	432	260
May-Sept. Precipitation	259	191	254	158	208	136	167	165	213	140
Mean Annual Temperature (°C)	2.1	- 4.7	- 1.1	- 4.7	- 1.6	- 3.2	- 3.8	- 3.8	- 2.9	- 0.8
Mean July Temperature	15.7	15.5	16.7	14.7	16.5	12.2	15.6	14.8	14.9	14.1
Maximum July Temperature	22.3	22.2	-	22.1	23.7	19.7	20.6	21.9	21.2	20.1
Minimum July Temperature	8.9	8.8	-	7.3	9.2	4.6	10.6	7.6	8.7	8.1
GDD+ May-September	1176	991	1301	-	1187	381	989	823	953	877
Frost Free Period (days)	109	83	102	59	81	21	96	62	96	87
Elevation (m)	762	324	375	435	279	609	161	495	685	697
Years of Data	29	69	-	17	29	26	27	45	32	29
Source of Data	1,4	1,2	2,3	1,2,5	2,4	1,2	1,2	1,2	1,2	1,2

+GDD - Growing degree days with temperature greater than 5°C.

Sources:

1. Temperature and Precipitation, 1941-1970, The North, Y.T., and N.W.T. Environment Canada
2. Canada Department of Agriculture Publication 1466, Farming Potential of the Canadian Northwest.
3. Soils of the Fort Nelson Area of British Columbia. K.W.G. Valentine. Canada Agriculture, Vancouver, B.C.
4. Risk Analyses of Weekly Climatic Data for Agricultural and Irrigation Planning. Tech. Bull. Prepared by Mauro C. Coligado, Wolfgang Baier, and Wilbur K. Sly. Agrometeorology Section. Plant Research Institute, Canada Agriculture.
5. J.L. Bergsteinsson, unpublished.

so, most soils in the south-central Yukon will suffer moderate droughts on occasion. Forages and garden crops would benefit from supplemental irrigation in most years.

Methods of Survey

Soil Survey is the systematic delineation of land areas in which the soils, the associated soil properties, and topography are all within defined limits. This survey was designed to provide an inventory of agricultural resources and as such, is oriented to agricultural capabilty. Within limits, the information from this survey can and has been used for other types of interpretations (see section "Interpretive Maps").

Field Mapping Procedure: The field survey crew consisted of four mapping parties made up of four professional pedologists and four students.

The Yukon Survey Area was covered from Watson Lake to Dawson during 1976 in the months of June, July and August. The majority of the area was covered by making soil inspection along the highways and all possible trails. Limited use was made of a helicopter for more remote areas. Soil boundaries were delineated on black and white aerial photographs and then transferred to 1:50,000 topographic maps. The aerial photographs varied in age from 5 years to more than 30 years old and in scale from 0.75 inches per mile to 5 inches per mile.

Reliability of the Soil Maps: The reliability or accuracy of the soil boundaries and map units depends on the complexity of the soils, the amount of access, and the time available for soil inspections. In most of the river valleys the various soil types were relatively easy to delineate on aerial photographs since they occurred on floodplains, various terrace levels, or pitted outwash plains. Upland soils such as in the Whitehorse area are more difficult to map out by aerial photographs.

The reliability of map units is higher along the highways compared to remote areas. In many cases field observations on one side of a river valley were extrapolated to the other side. The scale of mapping (1 inch = 2 miles) is such that many small soil areas cannot be shown. In fact delineated soil areas may include up to 40% inclusions of different soils. While these maps are useful for regional planning, more field work may be necessary to accurately characterize small site locations (5 - 10 hectares in size).

The time and manpower available for the survey was limiting, The time and manpower used in each area is listed in Table 3. The Whitehorse Urban area was mapped in considerable detail, utilizing 5 inch per mile aerial photographs.

Survey Areas: The Yukon was divided into six survey areas, each with its own unique set of soil mapping units or associations. The differences in soil properties were too great from area to area to use the same soil association name across the Yukon. For example the soils in the Dawson area are extremely acid compared to dominantly alkaline soils near Whitehorse. The six survey areas are: Dawson - Stewart Crossing - Mayo (Sheet 1 and 2), Pelly Crossing - Carmacks (Sheets 3 and 4), Faro - Ross River (Sheets 5 and 6), Watson Lake (Sheet 9), Whitehorse (Sheet 8) and Snag (Sheet 10). There was very little new soil survey work done in Sheet 7 (Takhini - Dezadeash), it was primarily a grazing assessment.

Table 3 . The time and manpower available for each area mapped.

Area	Map Sheet Number	Acreage (hectares)	Manpower (mapping parties)	Time (days
Dawson-Stewart Crossing-Mayo	1 and 2	369565	4	20
Pelly Crossing-Carmacks	3 and 4	278731	4	16
Whitehorse	8	214183	3	18
Takhini-Dezadeash	7	187517	1	5
Faro-Ross RIver	5 and 6	112559	1	5
Snag	10	59510	1	3
Watson Lake	9	331937	4	10
Beaver Creek, Teslin, Destruction Bay, B.L.T.			2	3

Due to cartographic constraints of maximum allowable size of map, the Yukon was divided into 10 map sheets (Fig. 2).

Soil Classification: The Canadian System of Classification has been used to classify the soil of the area (see the appendix for a more detailed discussion). The system is categorical in nature, the categories from the highest to the lowest level being termed order, great group, subgroup, family, and series.

Fig. 2. Index to Map Sheets and Survey Area Sheets.

The soils of the Brunisolic Order represent the majority of the soils mapped in the Yukon. They are subdivided on the basis of solum acidity. The Dystric Brunisols having a pH less than 5.5 and the Eutric Brunisols with a pH higher than 5.5.

The Regosols, or poorly developed soils, are normally found on the lower floodplains of the rivers and streams. These soils are usually quite fertile.

The Gleysols are the wet soils and often have a thin layer (5 - 30 cm) of peat on the surface.

Soil Map and Legend: The Soil Association is the major subdivision delineated on the soil maps. The Association is a group of soils in an area occurring on similar parent material. The associations are given geographic place names for identification. For example the Champagne Association includes all soils developed on silty clay lacustrine parent material in the Whitehorse area. It will include Brunisols, Luvisols and Gleysols occurring on the same parent material.

The Soil Association is subdivided into map units on the basis of the relative proportion and type of profiles occurring in each delineated area on the map. For example the map unit Ch3 contains dominantly (60 - 85% Orthic Gray Luvisol soils and from 15 - 40% Gleyed Orthic Regosol soils all occurring on the same silty clay lacustrine parent material.

The map edit shown on the map will include the map unit, texture (most of the time), topography, landform, and occasionally information on stone content or erosion hazard.

While the soil map contains much information about the soils of an area, most users of this information will likely find it easier to use one of the interpretive maps prepared (see section on "Interpretive Maps").

Dawson - Stewart Crossing - Mayo

Location and Extent

The Dawson - Stewart Crossing - Mayo area is located in map sheets 105M, 115P, 115O and 116B and comprises Sheet 1 and Sheet 2 in the map set. The total area surveyed is approximately 0.4 million hectares and occurs primarily in the valleys of the Yukon, Stewart and Klondike Rivers. The communities of Dawson, Stewart Crossing and Mayo are within the map area. The mining communities of Elsa and Clinton Creek are just outside the surveyed area. These communities are connected by all-weather highways with the southern Yukon. The total population of the area including the mining communities is about 2500.

Physiography

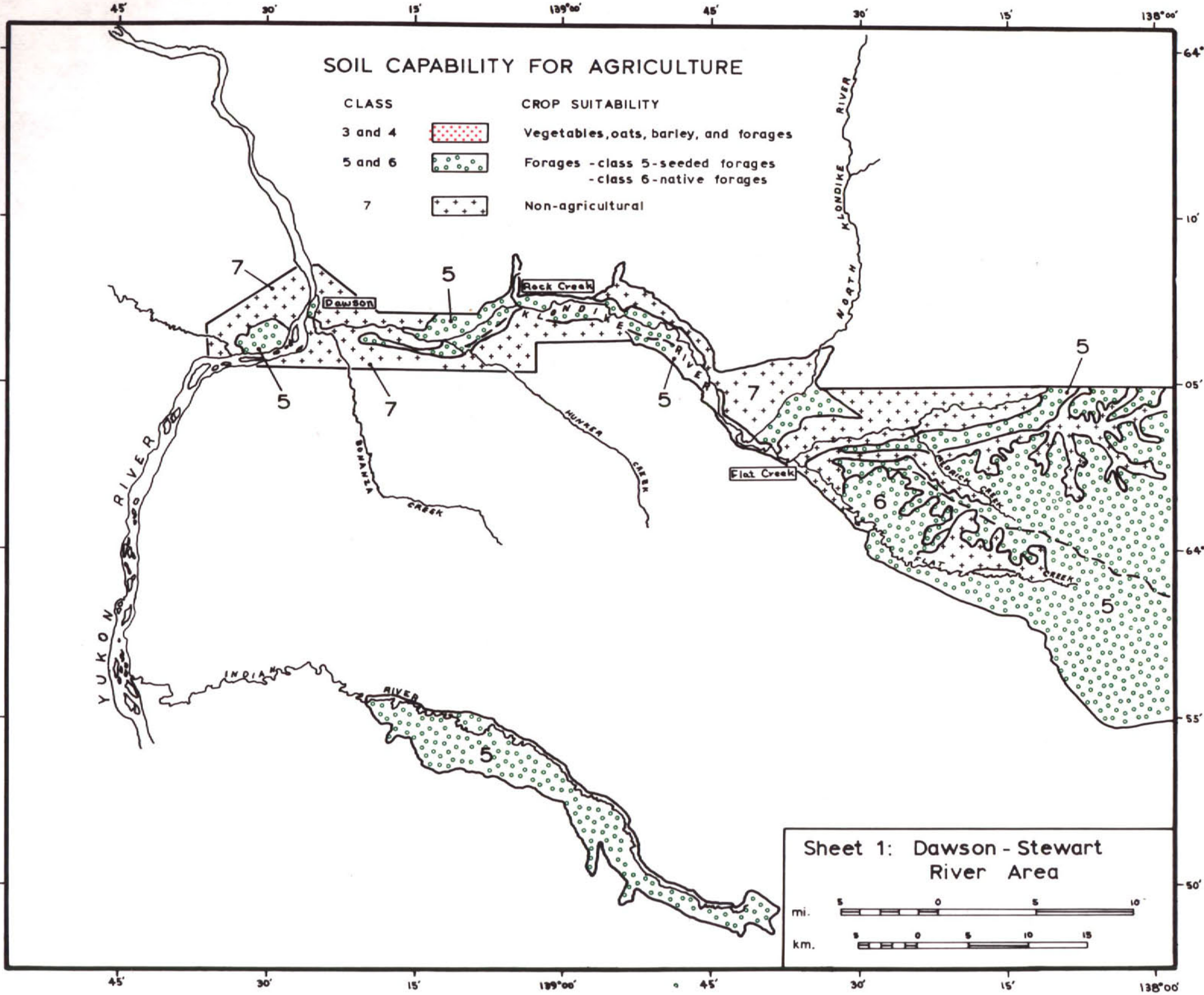
The survey area falls within the Stewart Plateau, Tintina Valley and Klondike Plateau subdivisions of the Yukon Plateau. The survey areas occur in the valleys of the Stewart, Klondike, and Yukon Rivers and the general low area of the Tintina Valley between McQuesten and Klondike Valley.

The Stewart River enters the survey area above Mayo at an elevation of approximately 550 m and flows southwest to Stewart Crossing where it turns northwest as it enters the Tintina Valley. It exits the Tintina Valley north of McQuesten and flows west to meet the Yukon River. Most of the higher terraces of the Stewart River lie between 450 and 600 m.

The upland morainal area between McQuesten and the Klondike River lies between 500 and 700 m.

The Klondike River enters the Tintina Valley from the northeast at an elevation of about 500 m, flows west, exits the Tintina Valley at 400 m and finally enters the Yukon River at Dawson at an elevation of 320 m. The main part of the terraces of the Klondike River downstream from Flat Creek are less than 30 meters above the present river. There are no distinct escarpments between various terrace levels as occurs on the Stewart River, but rather a gradual slope from the valley walls to the edge of the river.

The Indian River Valley is an isolated low area in the Klondike Plateau with elevations from 425 to 550 m. In all cases the surveyed area includes the broad fluvial or morainal plains and ends abruptly at the steep surrounding mountainsides.



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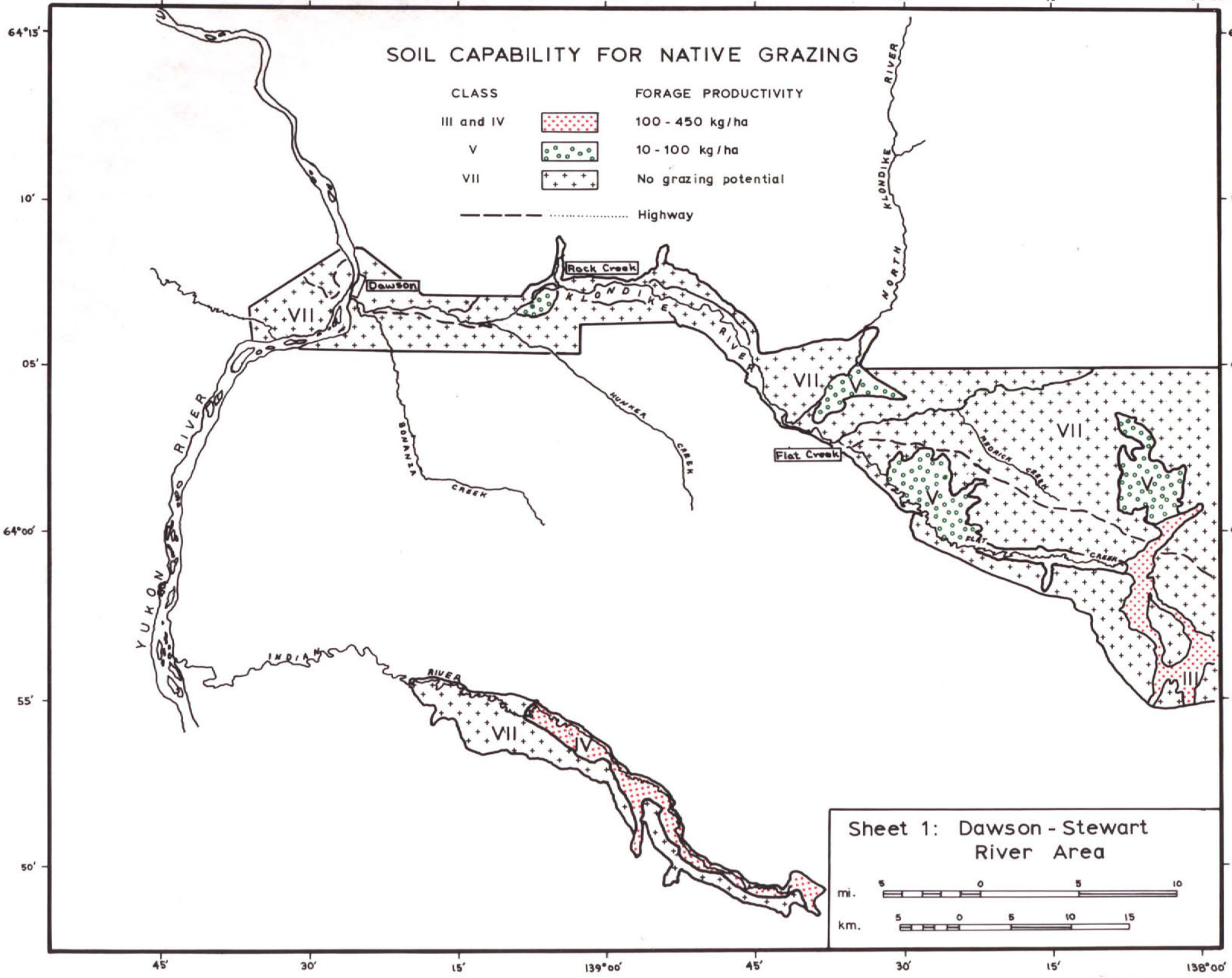

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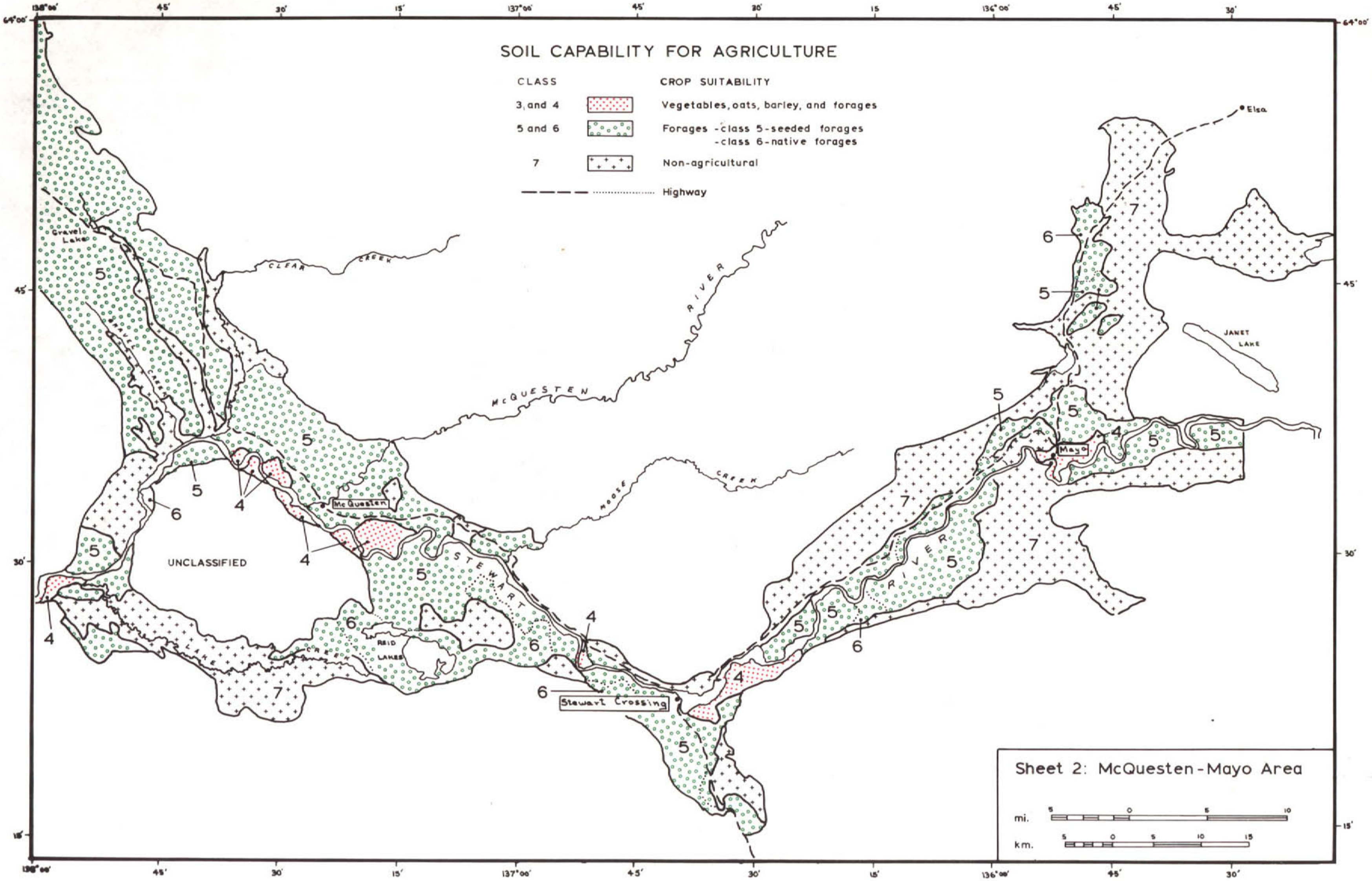

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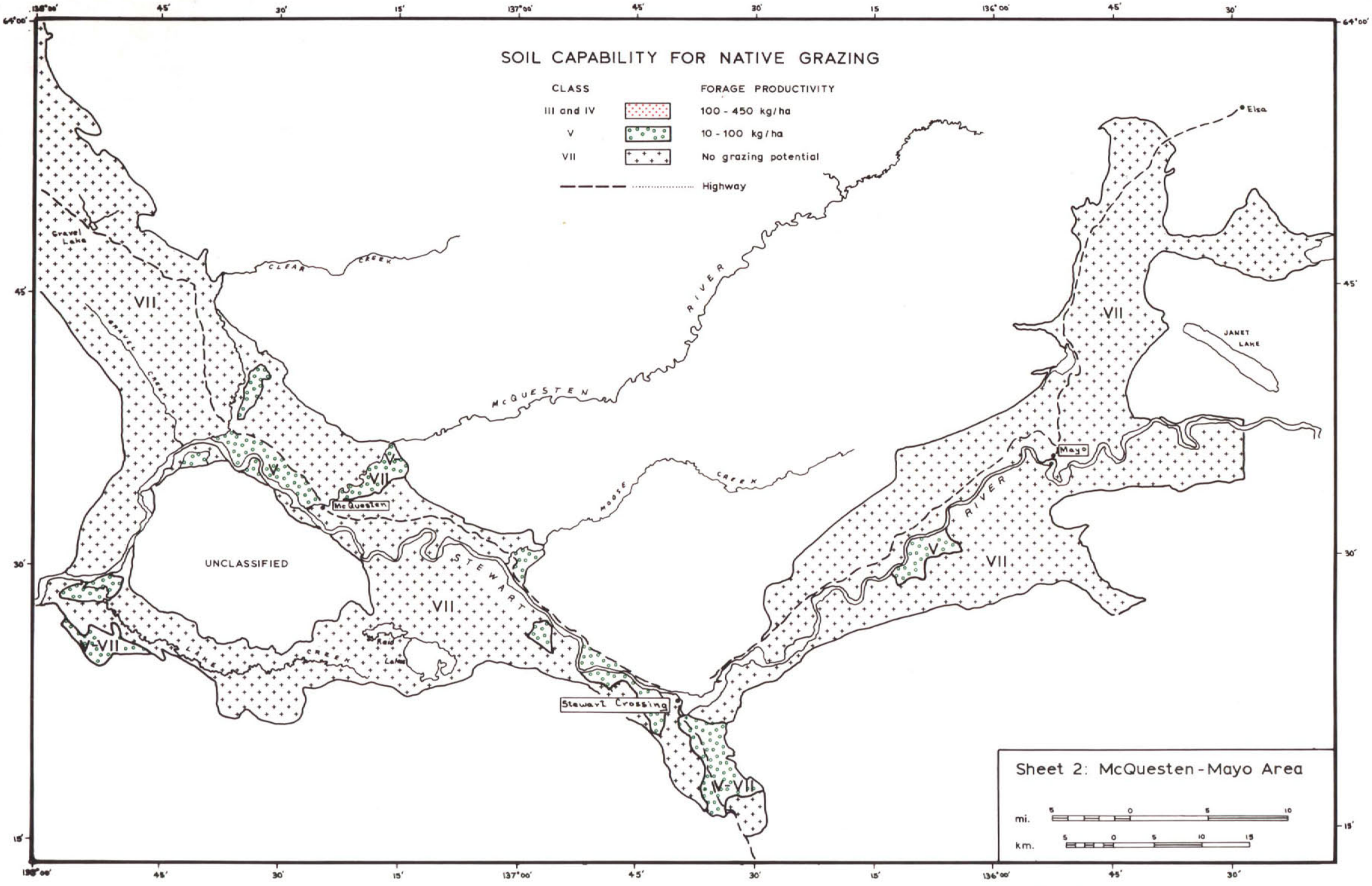

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Summary of Agricultural Interpretations

Soil Capability for Agriculture and Grazing

Due to the cool summer temperatures, most of the soils in the Dawson-Stewart-Mayo area can be rated no better than Class 5 for agriculture. The only exceptions are the soils on the floodplains of the Stewart and Yukon Rivers that have a Class 3 climatic rating. In addition to the limitation of climate (CH) some soils have the additional limitation of wetness (W), steep slopes (T) or low moisture holding capacity (M).

There are approximately 2700 hectares Class 3, 167,000 hectares Class 5 and 17,000 hectares Class 6 (Table 5). Class 3 land is suitable for growing oats and barley for grain, Class 4 is marginal, Class 5 is suitable for seeded forages and Class 6 is suitable only for native grazing. Vegetables can be grown most anywhere , but special precautions must be taken to guard against summer frost.

Most of the grazing land is poor (Class V, 10 - 100 kg/ha) (27,885 hectares) with better grazing land in local areas near French Creek (3,000 hectares) and Indian River (4,000 hectares) (Table 6).

Soils

Most of the soils are fluvial in origin, associated with the Stewart, Yukon, Klondike or Indian Rivers. The main associations were defined according to their surface texture, whether the subsoil is gravel or sand and the depth to the gravel.

The soils on the floodplains of the Stewart and Yukon Rivers are neutral to slightly alkaline in reaction. Most of the other soils, such as the Klondike, Dry Creek, McQueston and Two Sisters Associations are strongly to moderately acid.

Table 4 . Description and Agricultural Capability of Soil Associations in the Dawson - Stewart Crossing - Mayo area.

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Clear Creek	well drained, silty lacustrine deposits	nearly level uplands	5CH
Dry Creek	well drained, silty over gravelly fluvial deposits	undulating terraces of the Stewart River	5CH
Eureka Creek	poorly drained sandy fluvial deposits	sloping terraces	5W
Forty Mile	well to poorly drained loamy sand fluvial deposits	level to undulating terraces of the Yukon River	5M, 5W
French Creek	poorly drained, cryic, fluvial deposits	level valley bottoms	5W
Indian River	well to poorly drained, silty fluvial deposits	nearly level floodplain of the Indian River	5CH, 5W
Klondike	well to poorly drained silty and sandy, fluvial deposits	nearly level floodplain	5CH, 5W
Mayo River	well drained, sandy fluvial deposits	level to steeply sloping uplands	5M
McQuesten	well drained, gravelly, fluvial deposits	undulating terraces of the Stewart River	6M, 7M
Stewart Crossing	well to poorly drained, silty alluvial deposits	undulating floodplain of the Stewart River	3CH, 5W

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Sunnydale	well to poorly drained, silty, fluvial deposits	sloping terraces of the Yukon River	5CH
Two Sisters	well drained, silty, morainal deposits	hummocky to undulating uplands	5CH

Table 5. Area of Capability for Agriculture Classes and Subclasses in the Dawson-Stewart Crossing - Mayo Area

Classes and Subclasses	Dawson Area Sheet #1 Acres	Dawson Area Sheet #1 Hectares	Classes and Subclasses	McQuesten-Mayo Area Sheet #2 Acres	McQuesten-Mayo Area Sheet #2 Hectares	Total Acres	Total Hectares	% of Total Area
3M	423	171	3M	5090	2061			
			3M4M	443	180			
			3M5M	724	293			
Class 3	423	171		6257	2534	6680	2705	0.7
4M	1083	439	4M	37204	15067			
			4M5M	4424	1792			
			4M5W	5245	2124			
			4M7R	479	194			
			4MT	197	80			
			4MT5M	611	247			
			4M6M	4279	1733			
Class 4	1083	439		52439	21236	53522	21675	5.9
5CH	71629	29010	5I	1024	415			
5CH5M	6545	2651	5CH	90545	36671			
5CH5W	8536	3457	5CH5W	6846	2773			
5I	3083	1249	5CH5M	6874	2784			
5W	66212	26816	5M	28148	11400			
5W5CH	16291	6587	5M6M	1042	422			
5W3M	18881	7647	5M5W	4106	1663			
5W7TE	428	173	5M4M	1458	590			
5W7I	4105	1663	5M7M	7031	2848			
5W6E	8982	3638	5M5T	4803	1945			
5W7R	399	162	5W	2936	1189			
5M	4506	1825	5W5M	21701	8789			
5M4M	570	231	5W4M	18713	7579			
5M5W	175	71	5W3M	1883	763			
5P	3447	1396						
5TE	1227	497						
Class 5	215016	87081		197110	79831	412126	166912	45.2

Table 5. Area of Capability for Agriculture Classes and Subclasses in the Dawson-Stewart Crossing - Mayo Area Con't

Classes and Subclasses	Dawson Area Sheet #1 Acres	Dawson Area Sheet #1 Hectares	Classes and Subclasses	McQuesten-Mayo Area Sheet #2 Acres	McQuesten-Mayo Area Sheet #2 Hectares	Total Acres	Total Hectares	% of Total Area
6TE	7894	3197	6M	15934	6453			
6M	11783	4772	6M4M	1402	568			
			6M5W	3038	1230			
			6W	2514	1018			
Class 6	19677	7969		22888	9269	42565	17238	4.7
7TE	48686	19718	7T	90614	36699			
7M	744	301	7TE	1309	530			
7MT	4097	1659	7M	99406	40259			
7T	426	173	7M5M	3568	1404			
			7MT	40759	16507			
			7M5CH	900	365			
			7M4M	1135	460			
			7I	19087	7730			
			7IT	11788	4774			
			7I5W	1456	590			
			7I7T	6035	2444			
Class 7	53953	21851		275957	111762	329910	133613	36.1
Water	38705	15676		29002	11746	67707	27422	7.4
Total	328857	133187		583653	236378	912510	369565	100.0

Sheet #1 (Insert Map)

5M	26314	10657
5ME	3715	1504
Class 5	30029	12161
7I	639	259
Class 7	639	259
Water	15477	6268
Total	46145	18688

Table 6. Area of Grazing Capability Classes in the Dawson - Stewart Crossing - Mayo Area.

Dawson Area			McQuesten - Mayo Area					
Sheet 1			Sheet 2			Total		% of Total Area
Class	Acres	Hectares	Class	Acres	Hectares	Acres	Hectares	
III - V	1139	461	III	161	65			
III - VII	4570	1851	III - VII	2514	1018			
Class III	5709	2312		2675	1083	8384	3395	1.0
IV - V	6960	2819						
IV - VII	3359	1360						
Class IV	10319	4179				10319	4179	1.1
V	4393	1779	V	21618	8755			
V - VII	11140	4512	V - VII	31223	12645			
V - IV	478	194						
Class V	16011	6485		52841	21400	68852	27885	7.5
VII	236215	95667	VII	419730	169991			
VII - V	21896	8868	VII - V	79397	32156			
Class VII	258111	104535		499127	202147	757238	306682	83.0
Water	38705	15676		29002	11746	67707	27422	7.4
Total	328855	133187		583645	236376	912500	369563	

Sheet #1 (Insert Map)

VII	30667	12320
Water	15478	6268
Total	46145	18688

Table 7. Area of Soil Associations, Map Units and Complexes in the Dawson - Stewart Crossing - Mayo Area

Map Units Associations and Complexes	Dawson Area Sheet #1		McQuesten-Mayo Area Sheet #2		Total		% of Total Area
	Acres	Hectares	Acres	Hectares	Acres	Hectares	
Av	3083	1248	1024	415			
Alluvium	3083	1248	1024	415	4107	1663	.4
Cc2			1304	528			
Clear Creek			1304	528	1304	528	.1
Dk1			25656	10391			
Dk2			10108	4094			
Dry Creek			35764	14485	35764	14485	3.9
Ec2	15296	6195					
Eureka Creek	15296	6195			15296	6195	1.7
Fc1	6164	2496	6646	2692			
Fc2	13148	5325	5450	2207			
French Creek	19312	7821	12096	4899	31408	12720	3.4
Fe			55443	22454			
Ferry Hill			55443	22454	55443	22454	6.1
Hw	14922	6043	18619	7541			
Hillwash	14922	6043	18619	7541	33541	13584	3.7
Ir1	175	71					
Ir2	7263	2941					
Ir3	6259	2535					
Indian River	13697	5547			13697	5547	1.5
Kn1	337	136					
Kn2	10586	4287					
Kn3	3877	1570					
Kn4	37807	15312					
Klondike	52607	21305			52607	21305	5.8
Mc1	127	51	71014	28761			
Mc2			52261	21166			
McQuesten	127	51	123275	49927	123402	49978	13.5
Md	15972	6469					
Medrick Creek	15972	6469			15972	6469	1.8
Mh	27664	11204					
Moosehide Hills	27664	11204			27664	11204	3.0

Table 7. Area of Soil Associations, Map Units and Complexes in the Dawson - Stewart Crossing - Mayo Area Con't.

Map Units Associations and Complexes	Dawson Area Sheet #1 Acres	Dawson Area Sheet #1 Hectares	McQuesten-Mayo Area Sheet # 2 Acres	McQuesten-Mayo Area Sheet # 2 Hectares	Total Acres	Total Hectares	% of Total Area
Mr1	3343	1354	55713	22564			
Mr2	8996	3643	27187	11011			
Mayo River	12339	4997	82900	33575	95239	38572	10.4
Mt	4097	1659					
Mine Spoils	4097	1659			4097	1659	.5
Sd1	985	399					
Sd2	4509	1826					
Sd3	13212	5351					
Sunnydale	18706	7576			18706	7576	2.1
St1	423	171	8461	3427			
St2	18881	7647	35651	14439			
St3	1653	670	27697	11217			
St4	175	71	7256	2939			
Stewart Crossing	21132	8559	79065	32022	100197	40581	11.0
Tp	4533	1836	38365	15538			
Tributary Floodplain	4533	1836	38365	15538	42898	17374	4.7
Ts1	32047	12979	1294	524			
Ts2			24211	9830			
Ts3	23416	9483	36142	14638			
Ts4	11207	4539	45085	18259			
Two Sisters	66670	27001	106792	43251	173462	70252	19.0
Water	38705	15675	29002	11746	67707	27421	7.4
Total	328862	133186	583649	236381	912511	369567	100.0
Sheet #1 (Insert Map)							
Ft1	10439	4228					
Ft2	19590	7934					
Forty Mile	30029	12162					
Tp	639	258					
Tributary Floodplain	639	258					
Water	15477	6268					
Total	46145	18688					

A considerable portion of the soils on the floodplains of the major rivers are poorly drained while the upland and terrace are almost all well drained. The acreage of all associations and complexes is given in Table 7 .

Climate

The weather recording stations for this area are all located at low elevations in the valleys. The area has a cool climate with a mean annual temperature of -4.7^{o}C at Dawson and -3.8^{o}C at Mayo. The frost free period is 83 days at Dawson and 62 days at Mayo (Table 2). The climate at Mayo is marginal for cereals and vegetables but adequate at Dawson for these same crops. These two stations only represent the climate on the low floodplains of the Stewart and Yukon Rivers. The higher terraces and uplands have a more severe climate and are rated as Class 5 (F.J. Eley). The Class 5 areas are best suited for seeded forages.

Agricultural Potential

There is a large acreage with the capability for growing forage crops (167,000 hectares) but only a limited acreage (7500 hectares) of fair native grazing (greater than 100 kg/ha) necessary for economic livestock production. The only fair native grazing in the area occurs near French Creek and in the Indian River valley. Both of these areas are some distance from markets and both have severe climatic limitations.

Grain for feed and cool season vegetables could be grown on the floodplain soils of the Stewart River near Mayo and Stewart Crossing and on the Yukon River near Dawson. The Cumulic Regosol soils in the Klondike valley provide an ideal medium for growth of cereals or vegetables, but climate appears to be a serious limitation. The Klondike soils will require fertilizer and lime inputs for good yields of hay or vegetable crops.

A substantial local market comprising surrounding mining centers is present for locally produced vegetables and meat. Small scattered areas of good soils are present on the floodplains that could grow vegetables or forages. Livestock enterprises for this area may be difficult to establish because of the expensive land clearing and seeding necessary to grow all of the winter feed and most of the summer pasture. Predation by bears or wolves will also be a serious problem in the remote areas.

Regional Agricultural Interpretations

Dawson - Klondike Region

(a) Location: This region includes the Klondike valley from Dawson and east to Florence Creek and the Yukon valley from the Stewart River north to the Alaska border. This region is included on sheet 1 of the map set (Fig.1).

(b) Soil Associations - Materials and Topography: The soils on the floodplain of the Klondike River are mapped in the Klondike Association. They include well to imperfectly drained Regosols and poorly drained Cryosols (Fig.3).

Fig. 3 . The landscape of the poorly drained portions of the Klondike Association. The soils are frozen the year round. The dominant vegetation is shrub birch, labrador tea, and occasional black spruce.

They are composed dominantly of sandy or silty material 5 - 70 cm thick over coarse sand or gravel. The soils are quite acid in reaction (pH <5.5) and are usually high in organic matter.

The soils along the Yukon River, south of Dawson, are mapped in two associations. The Stewart Crossing Association includes the soils on the floodplain. They are silty or sandy over sand or gravel and are often poorly drained. The soils on the higher terraces, dominantly imperfectly drained, are mapped in the Sunnydale Association. These soils are often sloping to the river and susceptible to water erosion. The Stewart Crossing and the Sunnydale soils are neutral to alkaline in reaction.

North of Dawson the soils on the floodplains and terraces are mapped in the Forty Mile Association. The soils on the low level terrace, next to the river, are well drained Orthic Regosols developed on brown to black sand and loamy sand. The higher, sloping terraces are usually quite wet, supporting a dense growth of black spruce.

(c) Soil Capability for Agriculture and Grazing Capability: The only portion of this region with Class 3 climate is the low floodplain of the Yukon River. There are almost no soils in this Class 3 climate area that are suitable for cultivation. The majority of soils in this region are Agricultural Capability Class 5 due to climate limitations (CH) or limitations due to excess wetness (W). The acreage of the various classes is shown in Table 5 . There is very little native grazing in this region (1000 hectares) and what is present is of very low productivity (<100 kg/ha, Class V).

(d) Potential for Agricultural Development: The potential for livestock production in this region is low because of the lack of good native grazing. Any livestock industry will require cleared and seeded land to provide all the livestock feed.

The soils in the Klondike valley can be used to grow forages. The imperfectly drained Cumulic Regosols (usually too small in extent to be shown on the map) will be the most productive soils for forages. The frozen, poorly drained soils can also be cleared and seeded to forages (Fig. 4). The above site after clearing and breaking had thawed by late June in contrast to the uncultivated site in Fig. 3 which remained frozen. Cultivation and perhaps minimal ditching will allow the soil to thaw out and dry enough to permit the use of farm implements. The field in Fig. 5 is on similar soil but has been under cultivation for many years. These soils will require additions of lime and potassium fertilizer for adequate forage yields.

Fig. 4 . A newly cleared field on poorly drained Klondike soils. Before clearing this site was similar to that in Fig. 3 .

Fig. 5 . Cultivated field on imperfectly drained Klondike soils being used to grow hay for sale.

Market gardening should be feasable on climatically favorable sites (south facing slopes, good air drainage) on the Cumulic Regosols (mixed organic and mineral layering). As with forage crops, fertilizer and lime will be necessary for maximum yields.

The well drained Klondike soils occur on gravel bars along the Klondike River. These coarse textured soils are not well suited for agriculture. They support a good growth of spruce and aspen and are best left as a scenic corridor along the Klondike River.

The scale of mapping (1 inch equals 2 miles) has not allowed the separation of the various types of soil occurring in the Klondike valley. Field inspections will be necessary to choose suitable gardening soils (Cumulic Regosols) or soils for growing forages (peaty Gleysols).

The soils along the Yukon River are too limited in extent and too widespread to have much potential for agriculture. There may be small, selected areas that could be used for market gardening or forages, but none of sufficient size for large scale farming enterprises. The area north of the Yukon River, near Forty Mile, although climatically favorable has very low potential for agriculture. The soils are coarse textured and would have low productivity for forages or cereals.

Flat Creek - Gravel Lake Upland Region

(a) Location: This region occurs on both sheet 1 and sheet 2 along the Klondike highway between the Klondike valley and the Stewart River valley.

(b) Soil Associations - Materials and Topography: This region is a gently undulating plain about 500 m above sea level at the southeastern edge and reaching 700 m at the northwest, where it is abruptly truncated by the Klondike River.

Most of the soils in this region are mapped in the Two Sisters Association which contain dominantly Brunisolic soils developed on loam textured morainal deposits. In most cases, the morainal material is from 70 - 100 cm thick over gravel.

The other major soil in the area occurs on the wide, flat bottomed valleys (French Creek Association). The valleys are a few hundred meters to over one kilometer wide. The soils are dominantly Gleysolic Static Cryosols (poorly drained, peaty and frozen) and some Gleyed Regosols and Organic soils. The French Creek soils are not as peaty nor as wet as the vegetation (fen-like) and landform might suggest. The soils are frozen in the peaty layer or at the contact with the mineral soil for most of the summer. The vegetation is a dense shrub cover of willow and shrub birch with high sedge hummocks and sphagnum moss growing between them (Fig. 6).

Fig. 6 . Landscape of the poorly drained French Creek Association.

(c) Soil Capability for Agriculture and Grazing Capability: Due to the high elevation these soils are too cool to grow cereal crops. The widespread occurrence of black spruce growing on well drained sites suggest cool summer temperatures. Because of the cool climate these soils are rated as Class 5 or suitable only for forages.

The grass cover is very sparse on the well drained soils and is not sufficient for grazing livestock (Class VII). The poorly drained French

Creek soils have predominantly good native grazing (Class III, 200 - 450 kg/ha). Some of this grazing land may be flooded in the spring or early summer.

The sloping soils occurring near Flat Creek (Medrick Creek Complex) are rated as Agricultural Capability Class 6 or 7 due to steep slopes and danger of erosion. The area of Capability Classes for Agriculture and Grazing are shown in Table 5 .

(d) Potential for Agricultural Development: There is some potential for livestock production in this region. It is centered around the good grazing land on some of the French Creek soils.

To have a viable livestock operation in this region, a farmer will need spring, summer and fall grazing land in addition to hayland for winter feeding. The French Creek soils in their natural state can provide summer and fall grazing in most years, but can't be relied on for early summer grazing especially during wet years. There is no native hay available in the area so a farm operator will have to rely on planted forages. Forage can be grown on both the French Creek and Two Sisters soils. Due to the sparse tree cover and greater moisture supply, the French Creek soils should be given first consideration for this type of use. But by using only French Creek soils, there is always the danger of flooding in some extremely wet years with the consequence being no hay or grazing land. A well-balanced farm operation will of necessity have pasture and hay lands on both the well-drained uplands and poorly-drained valley bottoms. It should also be noted that the extent of easily accessible French Creek soils is limited. In addition, they may have a higher value as browzing for wildlife.

Indian River Region

(a) Location: This region is located in the Indian River valley from Australia Creek west to Ruby Creek and is on sheet 1 of the map set.

(b) Soil Associations - Materials and Topography: The soils occurring on the valley bottom are mapped in the Indian River Association. They are primarily Gleyed Regosols on the higher areas and peaty Gleysols (wet soils) in the low, swampy areas.

The soils on the higher terraces belong to the Eureka Creek Association. Over most of the surveyed area, the slope on the Eureka Creek soils is about 400 feet per mile, usually in a step-like sequence of old terraces. These soils are sandy loam to silt loam and are quite wet throughout the summer. They seem to be affected by seepage water coming down from higher slopes.

(c) Soil Capability for Agriculture and Grazing Capability: Most of the soils in the valley are rated as Class 5 or suitable for forages. The main limitation on the well drained soils is climate (CH) and this is compounded on the poorly drained soils by excessive wetness (W).

The vegetation on the Indian River soils is extremely variable, ranging from willow and sedge hummocks on the wet areas to tall stands of white spruce and aspen on the drier areas (Fig. 7). The imperfectly to poorly drained sites have grazing ranging from Class V to Class IV (10 - 200 kg/ha grazable forages). The Eureka Creek soils have no native grazing.

Fig. 7 . Landscape in the Indian River valley. The soils in the foreground are imperfectly drained Regosols of the Indian River Association. The vegetation is dominantly willow and short white spruce. The large trees (spruce and aspen) in the right background occur on well drained soils next to the Indian River. The left background is the sloping Eureka Creek soil landscape.

(d) Potential for Agricultural Development: The varied mixture of well, imperfectly, and poorly drained soils and fairly productive native grasses and sedges suggests that this area has good potential for livestock production. The imperfectly drained Cumulic Regosols (high organic matter) could be utilized for growing forages for winter feed, while the Gleysols (poorly drained soils) could be utilized as summer pasture. Some of the sloping Eureka Creek soils at higher elevations could also be cleared and seeded to forages, if needed. Precautions should be taken to guard against erosion on some of the steeper slopes. The organic layer should not be removed during clearing and drainage ditches should be designed to prevent excessive runoff. A balanced farm operation will need to include some of the better Indian River soils in addition to the wet Eureka Creek soils. The biggest disadvantage to farming in the Indian River area is the distance from markets and the poor roads in the area. The wet soils are also a hinderance to building suitable roads.

McQuesten - Stewart - Mayo Region

(a) Location: This region includes all terrace and floodplain soils along or near the Stewart River from west of Ice Chest Mountain to Mayo. This region is located in sheet 2 of the map set.

(b) Soil Associations - Materials and Topography: There are two major terrace levels along the Stewart River, with the McQuesten and Dry Creek gravelly substrate soils on the higher terraces, and the silty-sandy Stewart Crossing soils on the low floodplain. The very sandy Mayo River soils occur on both levels.

The McQuesten and Dry Creek soils both have gravelly substrata, their primary difference being the thickness of the surface silty layer. The McQuesten soils have less than 20 cm of a silty layer while the Dry Creek soils commonly have from 20 - 50 cm of silty surface layer. The thicker silt layer increases the amount of availabe water in the soil. The McQuesten and Dry Creek soils are usually nearly level with occasional steep slopes marking the break between terraces levels (Fig. 8).

The soils on the low floodplain are mapped in the Stewart Crossing Association. The surface texture of these soils varies from loamy sand to silty clay loam. The topography is nearly level to slightly channelled.

Fig. 8 . The steep escarpment marking the break bewteen two terrace levels along the Stewart River. McQuesten soils occur on the lower terrace, while Dry Creek soils occur on the upper terrace on the extreme left. The embankment is over 30 meters high.

The Mayo River soils are developed in loamy sand fluvial material. They occur on the low terraces as well as on higher sloping terraces. The extent of each association is given in Table 7 .

(c) Soil Capability for Agricultural and Grazing Capability: The floodplains have a Class 3 climatic rating. The imperfectly and well drained silt loam soils on the floodplain (Stewart Crossing Association) have an Agricultural Capability rating of 3CH with cool summer temperatures and low rainfall the main limitation. These soils are capable of growing coarse grains (oats and barley) and cool season vegetables. The poorly drained soils (map unit St2) are rated as 5W because of a wetness limitation.

The soils on the higher terraces are cooler due to their higher elevation and are given a Class 5 climatic rating. Soils with greater than 10 cm of silt over gravel have an Agricultural Capability rating of 5CH or 5M. The main limitations are climate (cool temperatures) and low moisture holding capacity (soils with less than 20 cm of silt). The loamy sand soils (Mayo River) are also 5M. If the soils are gravelly to the surface or on very steep slopes they are rated as Class 6 or 7. They are Class 6 if there is native grazing present, Class 7 or non-agricultural if no grazing is present.

The best native grazing in this region is Grazing Capability Class V (10 - 100 kg/ha). It is only marginal for ranging livestock.

(d) Potential for Agricultural Development: Any type of agricultural development in this region will encounter relatively expensive land clearing costs. There is no good grazing or hayland, so most livestock enterprises must rely on seeded pasture and hay. The best native grazing land has less than 100 kg/ha forage and at best, will serve only as supplemental range for short periods. The best soils for either forages or cereals are the Stewart Crossing silt loam to silty clay loam soils on the level floodplains. This includes the well drained soils mapped in map units St1, St3 and perhaps some of the St4. The largest area of the finer textured Stewart Crossing soils (1000 ha) is mapped just east of Mayo. Small scattered areas of Stewart Crossing sandy loams can be found at various locations along the Stewart River. These soils are rated as Class 4 and are marginal for growing cereal crops. As mentioned earlier the wet or poorly drained soils (map unit St2) are Class 5 and are suitable only for forages. Some of the St2 areas have numerous water bodies and may be to wet to clear and grow forages.

Market gardening is feasable on the finer textured (silt loam) Stewart Crossing soils. Sites should be chosen that have south facing slopes and good air drainage to guard against summer frosts.

The Dry Creek soils occurring at higher elevations are marginal for cereals or vegetables due to the cooler climate. They are however suitable for forages.

Pelly Crossing-Carmacks Area

Location and Extent

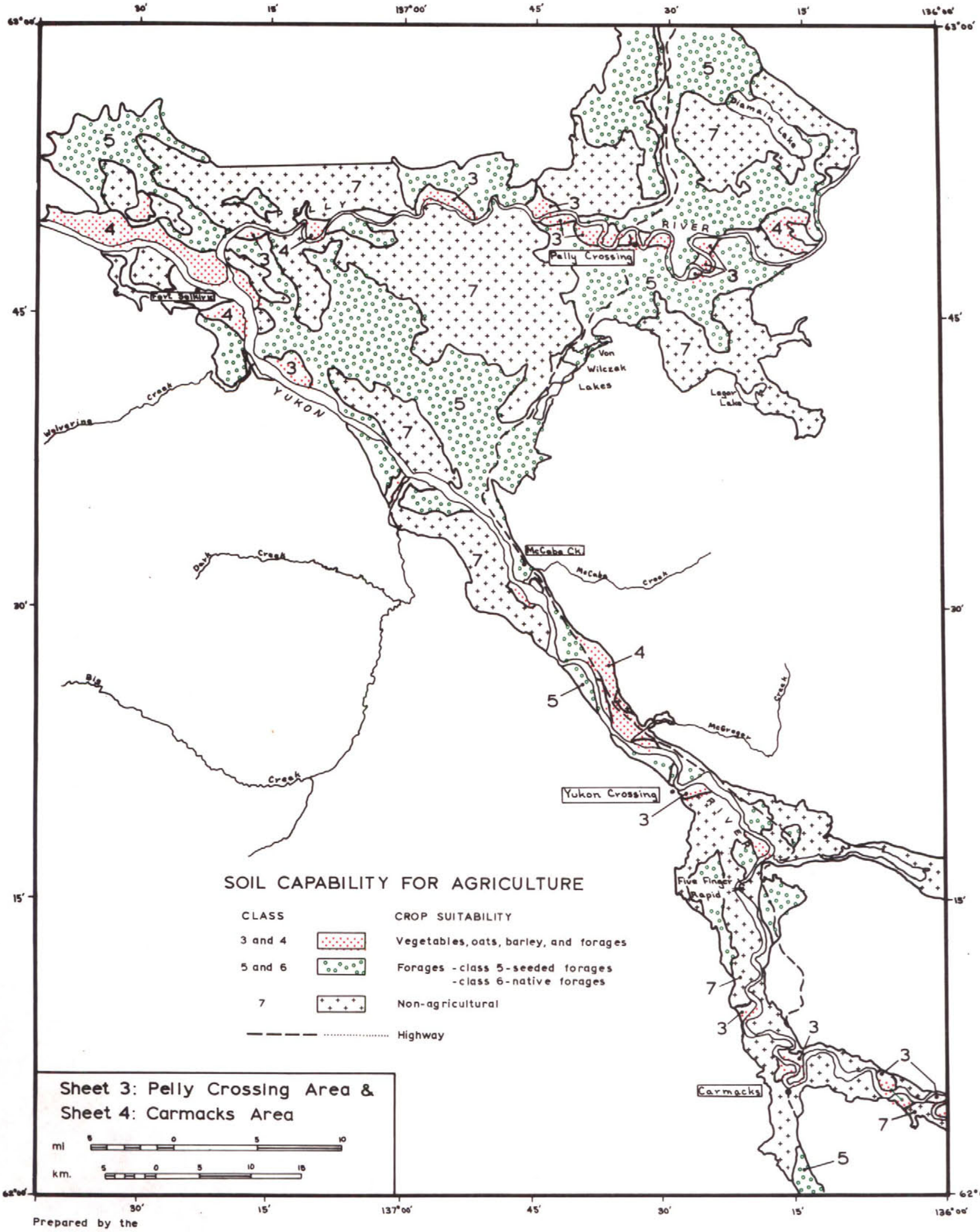
The Pelly Crossing-Carmacks area is located in map sheets 115I and small portions of 115H and 105L. It comprises Sheet 3 and Sheet 4 in the map set. The total area surveyed is approximately 0.3 million hectares. The communities of Pelly Crossing and Carmacks are within the map area. The total population of the map area is approximately 400. Both communities are linked to Whitehorse by the Klondike highway. The Robert Campbell highway joins Carmacks, Faro and Ross River to the Alaska highway at Watson Lake.

Physiography

The survey area falls within the Lewes Plateau and Klondike Plateau subdivisions of the Yukon Plateau. The survey area is located primarily in the Yukon and Pelly River valleys and associated morainal uplands in map sheet 115I plus portions of the Tatchun, Little Salmon and Nordenskiöld valleys.

The Pelly River enters the map area just below Granite Canyon at an elevation of approximately 500 m and flows westward, meandering in a wide terraced valley and finally flows into the Yukon River near Fort Selkirk. The Yukon River enters the area 45 km southeast of Carmacks at an elevation of 560 m and flows northwest before leaving the survey area just below Fort Selkirk at an elevation of 430 m.

The southern part of the area (south of Minto) is blanketed by a layer of volcanic ash from 10 - 30 cm thick. There was no sign of the ash along the Pelly River or surrounding uplands.



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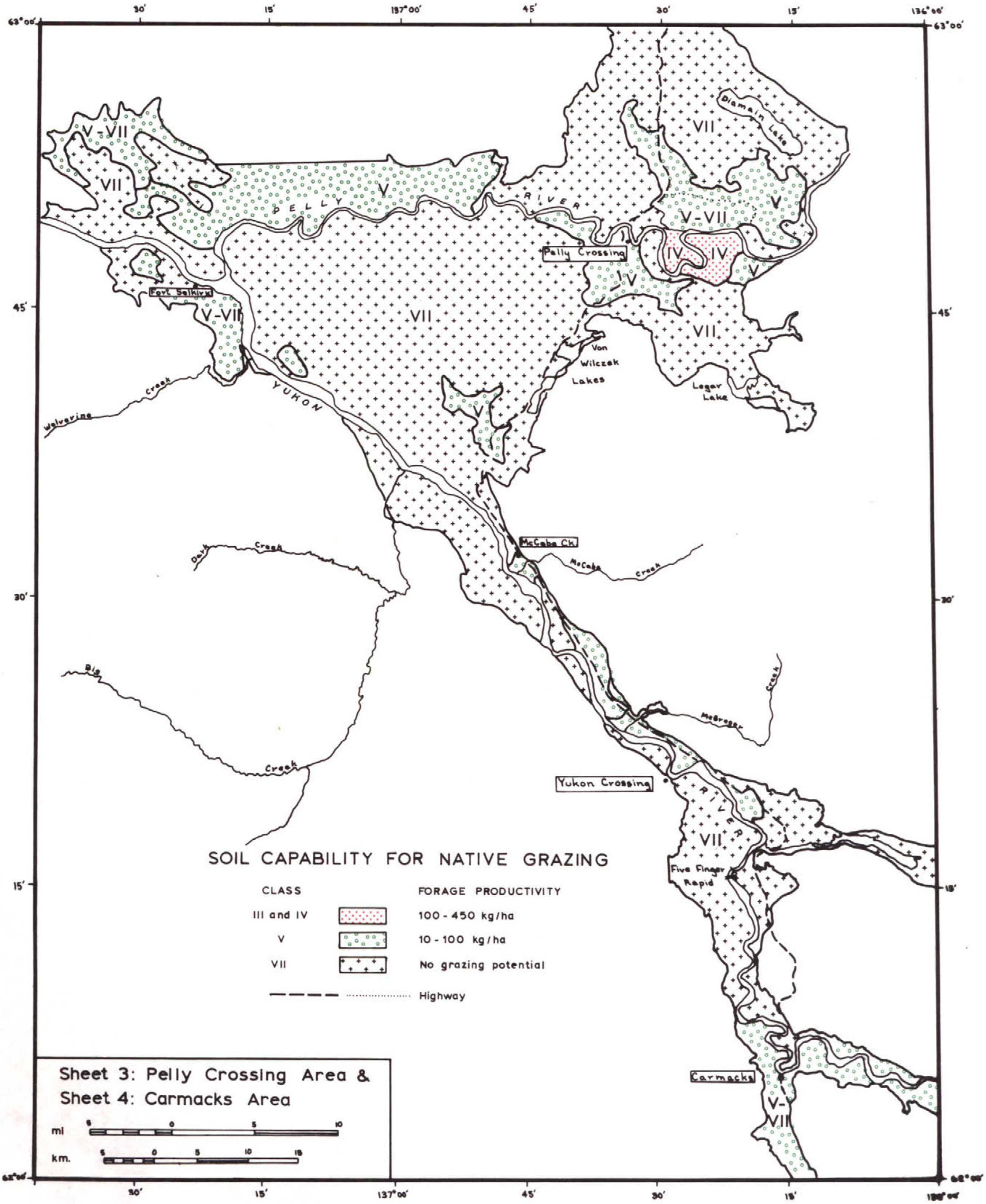

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Summary of Agricultural Interpretations

Soil Capability for Agriculture and Grazing

This area has the largest extent of arable (Class 3 and 4) soils in the Yukon (27,730 hectares)(Table 10). It also has a substantial area of fair (Class III and IV) native grazing (9746 ha). In addition there are 64,000 hectares of marginal grazing land (Class V, 10 - 100 kg/ha grazable forages) (Table 9).

The climate in the Yukon and Pelly River Valleys is suitable for cereals and vegetables. The upland soil areas are considered as having a moderately severe limitation with respect to a lack of heat units during the growing season. The best Agricultural Capability Class attained in uplands is Class 5 which is suitable primarily for seeded forages.

Soils

The soils occurring south of Minto have a 10 - 30 cm surface layer consisting of volcanic ash. The ash is absent north of Minto. A separate group of associations was set up for the ash covered and ash-free soils even though the lower material may be similar.

The main types of soils occurring in the area are medium textured morainal (54,459 ha), silty loess covered morainal (69,185 ha), sandy and silty floodplains (10,399 ha), sand and gravelly terraces (56,898 ha) and 24,101 hectares of pitted outwash (Table 8).

Climate

There is limited long term climatic data available for this area. Data from Fort Selkirk indicate this area has warmer July temperatures and lower rainfall than some other Yukon stations. The frost free period was only 59 days but data gathered in a climatological study (F.J. Eley, AES) suggest that the lowland areas have a longer frost free period.

The floodplains and terraces have a Class 3 climatic rating while the uplands are Class 5.

Agricultural Potential

There are 27,730 hectares suitable for growing feed grains or vegetables and 143,000 hectares suitable for seeded forages. In addition there are about 10,000 hectares with fair native grazing (Class III and IV, 100 - 450 kg/ha grazable forages). The area along the Pelly River has the most promise for a livestock industry because of the general mixture of Class 3 (cereals) and Class 5 (seeded forages) land together with fair grazing land.

Table 8. Acreage of Map Units, Associations, and Complexes in the Pelly Crossing - Carmacks Area.

Map Units Associations and Complexes	Pelly Crossing Area Sheet #3		Carmacks Area Sheet #4		Total		% of Total Area
	Acres	Hectares	Acres	Hectares	Acres	Hectares	
Bc1	7728	3130					
Bradens Canyon	7728	3130			7728	3130	1.1
Be1			2656	1076			
Berdoe			2656	1076	2656	1076	0.4
Ck1	897	363	265	107			
Ck2	267	108	1045	423			
Ck3	1848	748	1566	634			
Ck4	515	209	5324	2156			
Carmacks	3527	1428	8200	3320	11727	4748	1.7
Dm1	115948	46959					
Dm2	36619	14831					
Dm3	9891	4006					
Diamain Lake	162458	65796			162458	65796	23.6
Ex	7603	3079					
Exposure	7603	3079			7603	3079	1.1
Ff1	434	176	7484	3031			
Five Fingers	434	176	7484	3031	7918	3207	1.2
Fs1	18189	7367					
Fort Selkirk	18189	7367			18189	7367	2.7
Gc1	17519	7095					
Gc2	5959	2413					
Granite Canyon	23478	9508			23478	9508	3.4
Hw	39801	16120	15412	6242			
Hillwash	39801	15120	15412	6242	55213	23362	8.0
Ls1	13602	5509	45906	18592			
Little Salmon	13602	5509	45906	18592	59508	24101	8.6
Mb1	1463	592	27318	11064			
McCabe Creek	1463	592	27318	11064	28781	11656	4.2
Mk1	6394	2590					
Mica Creek	6394	2590			6394	2590	0.9

Map Units Associations and Complexes	Pelly Crossing Area Sheet #3		Carmacks Area Sheet #4		Total		% of Total Area
	Acres	Hectares	Acres	Hectares	Acres	Hectares	
Mt1	12293	4979	23784	9633			
Mt2			516	209			
Minto Landing	12293	4979	24300	9842	36593	14821	5.3
My1	10409	4216	3395	1375			
Midway Lodge	10409	4216	3395	1375	13804	5591	2.0
Nr			11207	4539			
Nordenskiold			11207	4539	11207	4539	1.6
Px1	2290	927					
Px2	3575	1448					
Px3	2745	1112					
Px4	5344	2164					
Pelly Crossing	13954	5651			13954	5651	2.0
Tp	11139	4511	13975	5660			
Tributary Floodplain	11139	4511	13975	5660	25114	10171	3.7
Vw1	85202	34506					
Vw2	34953	14156					
Von Wilczek	120155	48552			120155	48662	17.5
Wc1	11914	4825					
Wilkinson Cabin	11914	4825			11914	4825	1.7
Yc1			8369	3389			
Yukon Crossing			8369	3389	8369	3389	1.2
ZZ	38203	15472	17259	6990			
Water	38203	15472	17259	6990	55462	22462	8.1
TOTALS	502744	203611	185481	75120	688225	278731	100.0

Table 9 . Acreage of Grazing Classes in the Pelly Crossing - Carmacks Area.

Pelly Crossing Area Sheet #3			Carmacks Area Sheet #4			Total		% of Total Area
Class	Acres	Hectares	Class	Acres	Hectares	Acres	Hectares	
III	526	213						
Class III	526	213				526	213	0.1
IV	10463	4238	IV-VII	11207	4539			
IV-VII	1875	759						
Class IV	12338	4997		11207	4539	23545	9536	3.4
V	68279	27653	V	27838	11275			
V-VI	15159	6139	V-VI	2482	1005			
V-VII	37579	15219	V-VII	7065	2861			
Class V	121017	49011		37385	15141	158402	64152	23.0
VI	10644	4311	VI	2590	1049			
VI-IV	789	320	VI-V	7030	2847			
VI-V	131	53						
VI-VII	987	400						
Class VI	12551	5084		9620	3896	22171	8980	3.2
VII	288410	116806	VII	98607	39936			
VII-IV	2087	845	VII-V	11403	4618			
VII-V	27612	11183						
Class VII	318109	128834		110010	44554	428119	173388	62.2
Water	38203	15472		17259	6990	55462	22462	8.1
Totals	502744	203611		185481	75120	688225	278731	100.0

Table 10. Acreage of Capability for Agriculture Classes and Subclasses in the Pelly Crossing - Carmacks Area.

Classes and Subclasses	Pelly Crossing Area Sheet #3 Acres	Hectares	Carmacks Area Sheet #4 Class	Acres	Hectares	Total Acres	Hectares	% of Total Area
3M	12886	5219	3M	5378	2178			
Class 3	12886	5219		5378	2178	18264	7397	2.6
4M	28362	11487	4M	10306	4174			
4M 5M	7884	3193	4M 5M	1686	683			
			4M 7M	740	300			
			4M 5TM	1226	496			
Class 4	36246	14680		13958	5653	50204	20333	7.3
5M	25726	10419	5M	18367	7439			
5T	91587	37093	5T	1285	520			
5CH	134875	54624	5TM	5432	2200			
5MT	9570	3876	5T 7T	1305	529			
5TE	11526	4668	5CH 5W	11207	4538			
5TM	554	224	5M 3M	321	130			
5M 4CH	2901	1775	5M 4M	442	179			
5M 4M	1374	556	5M 6M	3759	1522			
5T 7R	6943	2812	5M 7M	1176	476			
5T 6T	855	346						
5T 7T	22585	9151						
5T 5W	3070	1243						
Class 5	311576	126188		43294	17533	354870	143721	51.6
6I	2182	884	6M	6352	2473			
6M	7860	3183	6T	587	238			
6T	789	319	6I 5W	1169	473			
6MT	131	53	6T 7R	1627	659			
6TE	1394	565	6M 5M	13167	5333			
			6TM 5T	7030	2847			
Class 6	12356	5004		29932	12123	42288	17127	6.1
7I	7011	2839	7M	30012	12155			
7M	5430	2199	7T	11854	4801			
7R	5056	2060	7TM	7340	2973			
7T	7654	3100	7I 5W	12633	5116			
7IT	1946	788	7T 7R	5180	2098			
7MT	10632	4306	7M 5M	7432	3010			
7TE	34737	14068	7M 6M	1209	490			
7M 5M	772	313						
7M 7R	2093	848						
7R 7TE	2516	1019						

Class and Subclasses	Pelly Crossing Area Sheet #3		Carmacks Area Sheet #4			Total		% of Total Area
	Acres	Hectares	Class	Acres	Hectares	Acres	Hectares	
7T 7R	3675	1488						
7T 5W	9925	4020						
Class 7	91477	37048		75660	30643	167137	67691	24.3
Water	38203	15472		17259	5990	55462	22462	8.1
TOTALS	502744	203611		185481	75120	688225	278731	100.0

Table 11. Description and Agricultural Capability of Soil Associations in the Pelly Crossing - Carmacks Area.

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Berdoe	well drained, loamy sandy, ash covered fluvial deposits	Inclined fluvial fan	5M
Bradens Canyon	well drained, sandy fluvial deposits	nearly level terraces of the Pelly River	4M, 5M
Carmacks	well drained, silty, ash covered alluvial deposits	nearly level floodplains of the Yukon River	3M, 4M
Diamain Lake	well to poorly drained silty eolian over morainal deposits	undulating to rolling uplands	5CH, 7T
Five Fingers	well drained, sandy, ash covered morainal deposits	rolling uplands	5CH, 7T
Fort Selkirk	well drained, gravelly fluvial deposits	nearly level terraces of the Pelly River	6M
Granite Canyon	well drained, sandy fluvial deposits	nearly level to hummocky uplands	5M, 7T
Little Salmon	well drained, gravelly fluvial deposits	hummocky and pitted uplands	7T
McCabe Creek	well drained, sandy, ash covered fluvial deposits	nearly level terraces of the Yukon River	5M, 4M
Midway Lodge	well drained, silty, ash covered fluvial deposits	nearly level terraces of the Yukon River	4M
Minto Landing	well drained, gravelly, ash covered fluvial deposits	nearly level terraces of the Yukon River	7M, 5M

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Mica Creek	well drained, silty morainal deposits	undulating uplands	5CH
Pelly Crossing	well drained, silty alluvial deposits	nearly level floodplain of the Pelly River	3M, 4M
Von Wilczek	well to poorly drained sandy morainal deposits	rolling to undulating uplands	5CH, 7T
Wilkinson Cabin	well drained, silty fluvial deposits	nearly level terraces of the Pelly River	4M
Yukon Crossing	well drained, silty eolian over morainal deposits	undulating to rolling uplands	5CH, 7T

Regional Agricultural Interpretations

Northern Upland Regions

(a) Location: This region includes the upland between Minto and the Pelly valley and north of the Pelly valley from Diamain Lake to the basalt plateau north of Fort Selkirk.

(b) Soil Associations - Materials and Topography: The majority of the soils in this region are mapped in the Diamain Lake Association. It consists of silt loam eolian veneer over fluvial or eolian sand over loam textured morainal deposits (Fig. 9). The texture of the solum becomes coarser with depth varying from silt loam at the surface to loamy sand at the 20 - 70 cm depth. The loamy sand is not always present and loam textured morainal material may be encountered in the top meter of soil. The topography varies from nearly level (3 - 5% slopes) to fairly steep slopes (greater than 15% slopes).

The second major soil association mapped in the upland region includes soils developed on sandy loam morainal deposits (Von Wilczek Association). Most of these soils have steep slopes (10 - 30%).

An area of finer textured morainal deposits (Mica Creek Association) were mapped just south of Pelly Crossing. These soils occur on slopes of 2 - 5%. There is not a silty loess covering on the Von Wilczek or Mica Creek soils.

(c) Soil Capability for Agriculture and Grazing Capability: These soils all occur in a Class 5 climatic area. The best soils can be rated no higher than Agricultural Capability Class 5 or suitable for seeded forages. The soils on steep slopes (greater than 15% are rated as Class 6T or 7T.

Fig. 9 . Profile of the Orthic Eutric Brunisol Subgroup of the Diamain Lake association.

Bm_1 0-20 cm, reddish brown silt loam
Bm_2 20-43 cm, reddish yellow very fine sandy loam
II B 43-70 cm, yellowish brown loamy sand
III C 70-100 cm, grayish brown loam (morainal material)

Except where recently burned, these areas are covered by tall dense forest. The Diamain Lake soils support especially lush forest growth (Fig. 10). The heavily forested areas have no native grazing while the burned areas are rated as Grazing Capability Class V (10 - 100 kg/ha) or marginal for ranging livestock.

(d) Potential for Agricultural Development: The only agriculture practised in the region at the present time is hay harvesting in some meadows near the Von Wilczek Lakes. The more level soils (less than 10% slopes) in the upland would be suitable for growing forages perhaps as a supplement to grazing land in the lower valley. The Mica Creek soils occur at fairly low elevations (520 - 580 m) and could possibly be utilized for growing feed grain. Also some of the Diamain Lake soils north of Fort Selkirk on the basalt plateau are at low elevations and may be suitable for growing cereal grain. While the Diamain Lake soils are excellent for forages they also support some of the best forest stands in the central Yukon.

<u>Pelly River Valley Region</u>

(a) Location: This region includes the floodplains and terraces of the Pelly River and the northern portion of the Yukon River on sheet 3 of the map set.

(b) Soil Associations - Materials and Topography: Like most other major river valleys in the central Yukon, the Pelly River valley contains various terrace levels from low floodplains to higher, gravelly terraces (Fig. 11).

Fig. 10. Photo of the mixedwood vegetation occurring on the Diamain Lake soils.

Fig. 11. The floodplain and gravelly and sandy terraces of the Pelly River east of the Pelly Crossing.

Fig. 12. Newly cleared land on the Pelly Crossing association. Note the undulating topography associated with abandoned river channels. The steep hills in the background are the south-facing banks of the Pelly valley.

The soils occurring on the lower terraces of the Pelly River are mapped in the Pelly Crossing Association (Fig. 12). They are a mixture of Regosols and Brunisols with the Regosols occurring nearest the river. Some of the Regosols have alternating layers of organic and mineral soil (Cumulic Regosols). The surface texture varies from silt loam to loamy sand.

The higher terraces contain a mixture of soils from gravelly (Fort Selkirk Association), silt loam over gravel (Wilkonson Cabin Association) and sandy loam over gravel (Bradens Canyon Association).

Most of the soils have nearly level topography with occasional steep slopes at the escarpment separating two terrace levels (Fig. 11).

(c) Soil Capability for Agriculture and Grazing Capability: This region is in a Class 3 climatic area. The Agricultural Capability of the soils will depend primarily on the surface texture. Due to the low rainfall in the area the fine sandy loam to silt loam soils on the higher terraces are rated as 4M. The silt loam soils on the floodplain (Pelly Crossing Association) are rated as 3M. The sandy loam and loamy sand soils are rated as Class 5M or suitable only for seeded forages. Soils that are gravelly to the surface are rated as Class 6M or suitable only for native grazing.

The soils in the Pelly valley have the highest grazing potential in the north-central Yukon. Burned areas on Fort Selkirk soils are regenerating to short scrubby aspen (Fig. 13). The Grazing Capability on these sites is Class IV (100- 200 kg/ha grazable forages). The Pelly Crossing and Wilkonson Cabin soils have a mixture of Classes IV, V and VII Grazing Capabilities.

Fig. 13. An area with Grazing Capability Class III and IV (100 - 450 kg/ha) on gravelly Fort Selkirk soils on a terrace of the Pelly River. The area is presently being grazed by horses and that may be restricting the regeneration of the tree species.

(d) Potential for Agricultural Development: There is a good potential for limited livestock production in the Pelly Valley. There are approximately 3000 hectares of Fort Selkirk soils with fairly good native grazing (100 - 200 kg/ha) east of Pelly Crossing. Nearby there are adequate areas of finer textured soils (Pelly Crossing, Wilkinson Cabin and Mica Creek Associations) that could be used to grow coarse grains and hay for winter feed. The river meanders across the valley almost enclosing large pieces of suitable grazing and cropping land. The natural barriers of the river and steep terrace escarpments will reduce fencing costs. If the cereals and hay crops were seeded on the Pelly Crossing soils near the river they would be near a reliable supply of water for irrigation. A cow-calf operation with 50 cows would require at least 400 hectares of pasture and 100 hectares of beter land for cereals and hay. Without supplemental irrigation these acreages should be increased about 30% to carry the farmer through drought years. Because there is not an easily obtainable alternate source of livestock feed in the Yukon, farmers must always have a surplus of feed to guard against occasional droughts or summer frosts.

There are some smaller areas of good soils along the Pelly Ranch road, west of Pelly Crossing, that could be utilized for livestock production in conjunction with grazing leases on the morainal uplands. The amount of good grazing land is limited and thus more seeded pasture must be utilized.

Salinity may be a problem on some of the Pelly Crossing soils. Soils tested on the Bradley Ranch were slightly saline in the upper 40 cm. The average salt content over the whole field was not high enough to prevent the growth of cereals but would reduce the yield somewhat.

Market gardening would be possible on the Pelly Crossing soils. The best choice would be Cumulic Regosols (high organic matter) near the river. The high organic matter content increases the moisture holding capacity and nitrate supplying power of soil. Summer frosts will be a problem for tender crops. Some form of protection either from temporary shelters or spraying with water during the frost will be necessary.

Carmacks Region

(a) Location: This region includes all the ash covered soils in the valleys and uplands south of Minto. The majority of the region is on sheet 4 but a small portion occurs on the southern part of sheet 3.

(b) Soil Associations - Materials and Topography: All of the soils southeast of Minto have a surface layer composed of white volcanic ash. The ash layer varied in thickness from 10 - 30 cm. The ash was deposited about 1900 years ago (Bostock, 1948) and covered Brunisolic soil profiles typical for the area (Fig. 14).

A separate group of soil associations was established for the soils with the ash cover. In most other respects they are similar to the soils in the Pelly River valley.

The Minto Landing soils are gravelly to within 20 cm of the ash layer (Fig. 14). The McCabe Creek soils have more than 20 cm of sandy material over gravel while the Midway Lodge soils have more than 20 cm of silty material over gravel. The soils on the alluvial floodplain of the Yukon River are mapped in the Carmacks Association. They have from 40 - 80 cm of fine sandy loam to silt loam material over loamy sand alluvial material. The above soils occur in the Yukon valley and are nearly level to gently undulating.

A small area (3389 hectares) of eolian silt over morainal deposits occurs west of Five Fingers Rapid and is mapped in the Yukon Crossing Association. About one-half of these soils are on steep, hummocky or rolling topography.

A fairly extensive area (24,100 hectares) of pitted and hummocky glaciofluvial outwash occurs throughout the southern part of the area (Little Salmon Association). These soils always occur on steep slopes (10 - 45%).

Fig. 14. An Orthic Eutric Brunisol profile of the Minto Landing Association. There is about 35 cm of white volcanic ash over yellowish brown sand over calcareous gravel.

The soils in the area south of Carmacks in the Nordenskiöld River Valley are a mixture of sandy fluvial and silty fluvial or lacustrine deposits and are mapped in the Nordenskiöld Complex. The topography has the appearance of a mass of small kettle lakes formed either during glaciation or as a result of more recent melting of permafrost. Some of the larger, more stable depressions have a thick organic deposit covering the mineral soil.

(c) Soil Capability for Agriculture and Grazing Capability: The area in the Yukon Valley is considered to have a Class 3 climate although the rainfall may be slightly less than in the Pelly Valley region. The loamy sand soils are rated Class 5M or suitable only for forages. The soils with gravelly textures near the surface are rated as 6M if native grazing is present. The silt loam to sandy loam soils on the higher terraces are rated as 4M. The silt loam soils on the floodplain with higher organic matter contents are rated as 3M or suitable for cerals or vegetables.

The upland soils, the fluvial soils in the Nordenskiöld valley, and the fluvial soils upstream from Carmacks near the Little Salmon River are in a Class 5 climatic area. In addition to the climatic limitation most of the upland soils have severe topographic limitations of very steep slopes (Class 6T and 7T).

The majority of the soils in this region have a low Grazing Capability (Class V and VII, less than 100 kg/ha grazalbe forages).

(d) Potential for Agricultural Development: The potential for agricultural development in this region is not very high. There are no extensive areas to be utilized for grazing. Any farming operation would be facing fairly expensive clearing costs. The Nordenskiöld Valley has some small scattered areas of potentially good grazing. These are located on some open meadows that are subject to occasional flooding. These areas could serve as supplemental hay or pasture for a livestock enterprise whose main operation relied on cultivated forages.

There are some fairly good soils that could be used for cereals or vegetables. The silty Carmacks soils would be the most productive for vegetables, cereals and forages. Their high organic matter content will supply a fair portion of the nitrogen required for crops and increase the moisture holding capacity. The greatest extent of these soils occur east along the Robert Campbell Highway. The silty to very fine sandy loam Midway Lodge soils are also suitable for cereals and forages. However, they tend to be more droughty and less fertile than the Carmacks soils. Also being higher up and further back from the river they are not as easily irrigated.

Faro - Ross River Area

Location and Extent

The Faro - Ross River area comprises parts of map sheets 105L, 105K, 105F and 105G. It is located along the Robert Campbell Highway from Little Salmon Lake on the west to the Big Campbell River on the east.

There are two communities within the map area. Faro, with a population of 1200 is a mining town built exclusively for the lead-zinc-silver Anvil Mine. Ross River (Pop. 317) is located on the floodplain of the Pelly River at the junction of the North and South Canol Roads.

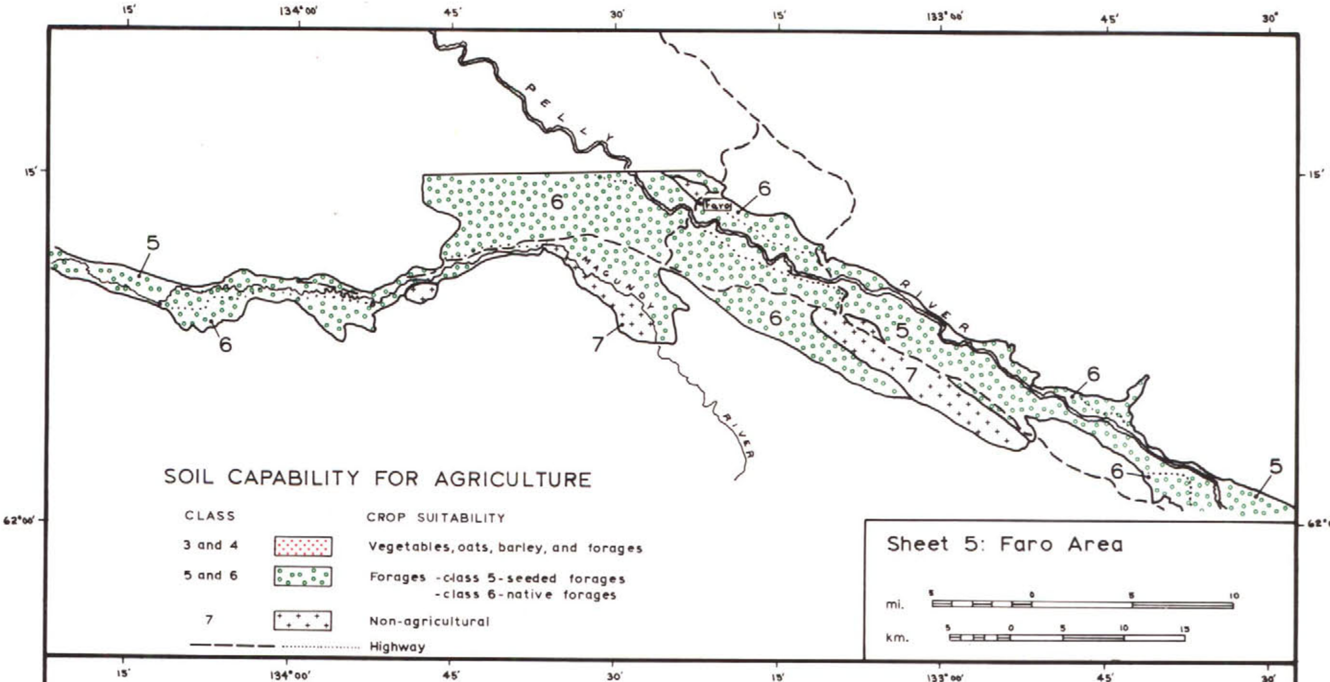
The area surveyed is 121,323 hectares and comprises sheet 5 and sheet 6 of the map set.

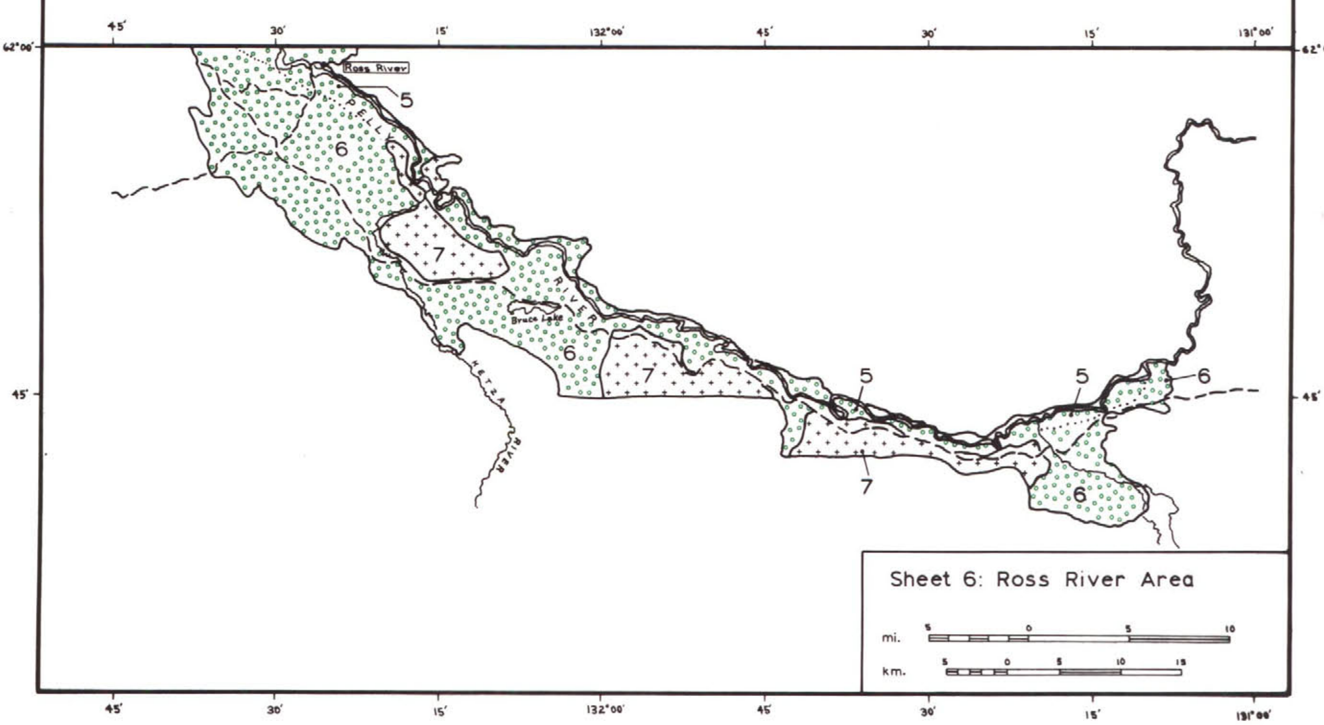
Physiography

The dominant physiographic features of the area is the deep linear Tintina Valley extending from the headwaters of the Hoole River to northwest of Faro. The surrounding mountains vary from 600 - 900 m above the valley floor.

The Pelly River enters the survey area and the Tintina Valley west of Finlayson Lake at an elevation of about 700 m. It leaves the survey area just northwest of Faro at an elevation of 600 m. The Pelly River has cut a deep valley in the morainal fill of the older, wider Tintina Valley.

The morainal material within the Tintina Valley has a distinct drumlinoid landform with the linear pattern trending northwest-southeast. East of the valley near the Hoole River, the morainal deposits have a hummocky to undulating landform.





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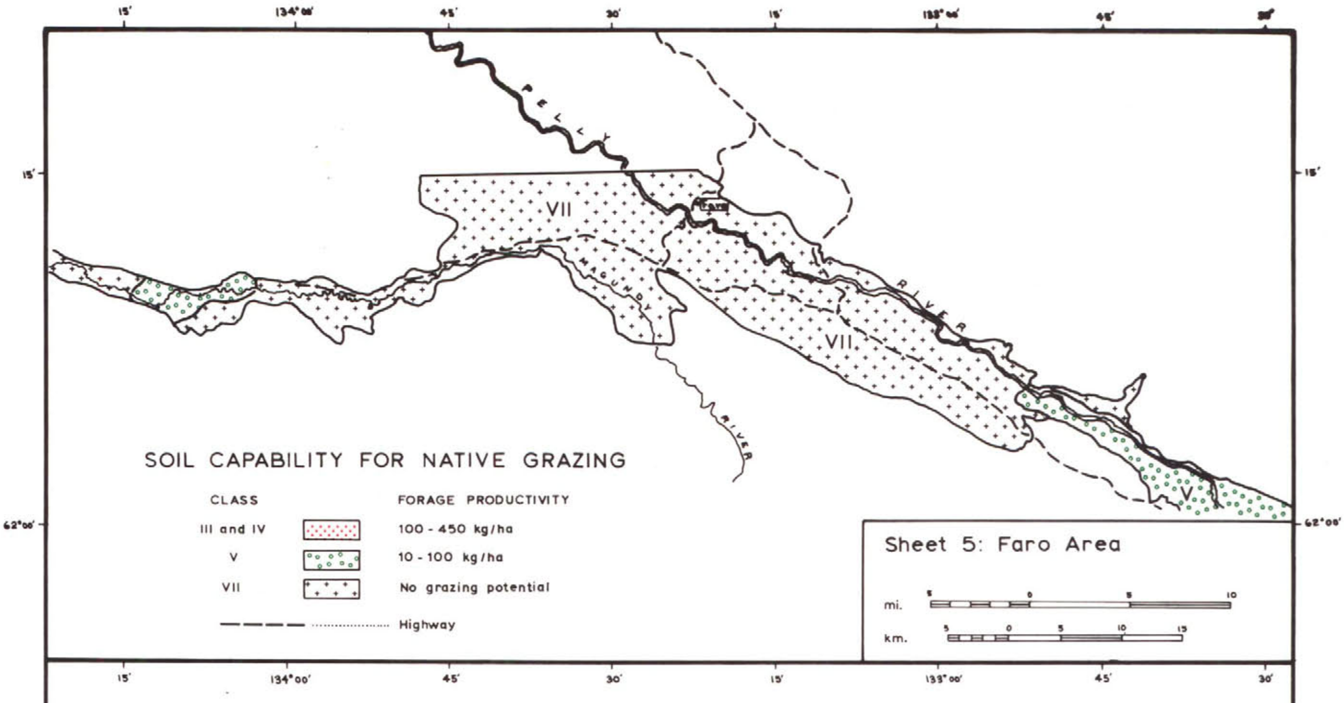

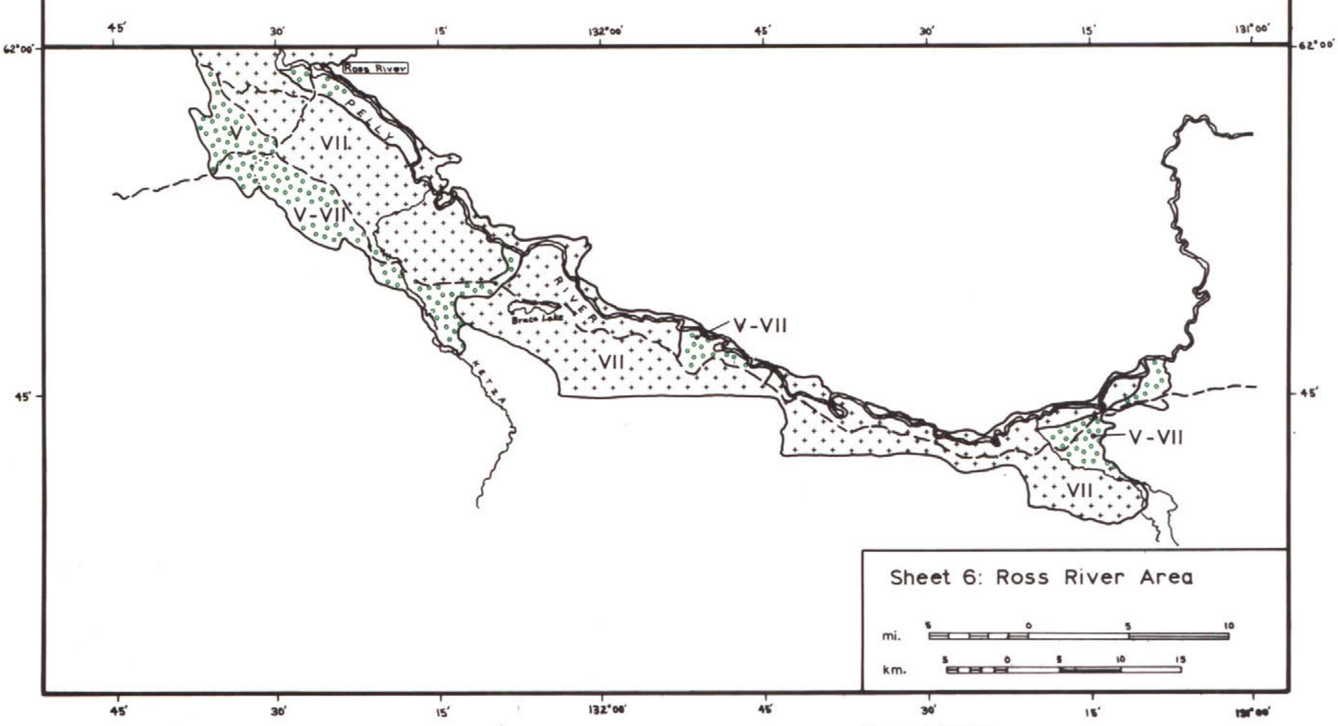

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Extensive outwash deposits occur above the Pelly River at elevations of 800 - 900 m above sea level. The major portion was deposited by the Lapie and Ketza Rivers flowing north out of the Pelly Mountains into the Pelly River. Other outwash materials were deposited near the Hoole River and near Mink Creek.

Summary of Agricultural Interpretations

Soil Capability for Agriculture and Grazing Capability

Due to the cool summer temperatures, most of the soils in this area can be rated no higher than Class 5 for Agricultural Capability.

There are approximately 600 hectares of Class 4 land, marginal for cereal grains, 32,000 hectares of Class 5 land, suitable for seeded forages, 67,000 hectares of Class 6 land, suitable only for native grazing, and 13,000 hectares Class 7, or non-agricultural land (Table 14). Some of the land in the area has a potential for livestock grazing without clearing or reseeding. Approximately 22,000 hectares have a Grazing Capability rating of Class V (10 - 100 kg/ha)(Table 15).

Soils

The soils of the Faro - Ross River area are dominantly coarse textured fluvial and medium to coarse textured morainal. There are about 60,000 hectares of fluvial soils with the Magundy River and Ross River soils occurring in the lower valleys and the Glenlyon, Lapie River and Van Gorder soils occurring on the upland regions. There are also about 51,000 hectares of morainal soils, consisting of the Fisheye Lake and Hoole River Associations (Table 13). All of the soils are neutral to slightly alkaline in the lower solum.

Climate

The cooler climate in this area than in other surveyed areas in central Yukon can be attributed to higher elevations. Due to the cool temperatures, only forage crops can be grown with any degree of success. Some of the medium textured soils, in the upland regions above 800 meters, support the growth of black spruce, which is indicative of cool summer temperatures.

Agricultural Potential

There are about 32,000 hectares suitable for growing seeded forages. However the cost of clearing and breaking the land would be high. Approximately 22,000 hectares have sufficient native forages to allow grazing by livestock in conjunction with higher yielding seeded pastures. Much of the available grazing land is presently being utilized by Outfitters as pasture for horses.

Market gardens to serve the growing urban centers of Faro and Ross River might be feasable on sites with a favorable climate. Use could also be made of temporary plastic shelters or greenhouses for vegetables such as peas, tomatoes, cucumbers, and celery. Plastic mulches can also be used to increase the soil temperature and thus hasten maturity of vegetables.

Table 12. Description and Agricultural Capability of Soil Associations in the Faro - Ross River Area.

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Fisheye Lake	well drained, sandy to gravelly loam morainal deposits	steep, ridged and hummocky uplands	6T, 7T
Glenlyon	well drained, gravelly fluvial deposits	level to undulating terraces	6M, 7M
Hoole River	well to poorly drained, loamy morainal deposits	undulating to hummocky uplands	5CH, 7T
Lapie River	well to poorly drained, fluvial deposits	nearly level uplands	6M
Magundy River	well to poorly drained, sandy alluvial deposits	nearly level floodplains of the Magundy and Pelly Rivers	5CH
Ross River	well to poorly drained, gravelly fluvial deposits	nearly level lower terraces of the Pelly River	6M, 7M
Drury Creek	cryic, poorly drained, fluvial deposits	nearly level to ridged lower terrace of Magundy R.	6W, 7W
Van Gorder	well to poorly drained, gravelly fluvial deposits	steep, hummocky and pitted uplands along the Pelly River	7T

Table 13. Acreage of Map Units, Associations and Complexes in the Faro - Ross River Area.

Map Units Associations and Complexes	Faro Area Sheet #5 Acres	Faro Area Sheet #5 Hectares	Faro Area % of Total	Ross River Area Sheet #6 Acres	Ross River Area Sheet #6 Hectares	Ross River Area % of Total	Total Acres	Total Hectares	% of Total Area
DY	3188	1291	2.2				3188	1291	1.1
Drury Creek	3188	1291	2.2				3188	1291	1.1
EX	11719	4746	8.2				11719	4746	3.9
Exposure	11719	4746	8.2				11719	4746	3.9
FK 1	60172	24370	42.0	43723	17708	28.0	103895	42078	34.7
Fisheye Lake	60172	24370	42.0	43723	17708	28.0	103895	42078	34.7
GN 1	15293	6194	10.7	2879	1166	1.8	18172	7360	6.1
Glenlyon	15293	6194	10.7	2879	1166	1.8	18172	7360	6.1
HO 1				22271	9020	14.2	22271	9020	7.4
Hoole River				22271	9020	14.2	22271	9020	7.4
HW	4497	1821	3.2	269	109	0.2	4766	1930	1.6
Hillwash	4497	1821	3.2	269	109	0.2	4766	1930	1.6
LP 1	2141	867	1.5	28682	11616	18.4	30823	12483	10.3
LP 2				18018	7297	11.5	18018	7297	6.0
Lapie River	2141	867	1.5	46700	18913	29.9	48841	19780	16.3

Map Units Associations and Complexes	Faro Area Sheet #5 Acres	Faro Area Sheet #5 Hectares	Faro Area % of Total	Ross River Area Sheet #6 Acres	Ross River Area Sheet #6 Hectares	Ross River Area % of Total	Total Acres	Total Hectares	% of Total Area
MG 1	2750	1114	1.9				2750	1114	0.9
MG 2	17458	7070	12.2				17458	7070	5.8
Magundy River	20208	8184	14.1				20208	8184	6.7
RS 1	8402	3403	5.8	9176	3716	5.9	17578	7119	5.9
RS 2	83	34	0.1	11662	4723	7.4	11745	4757	3.9
Ross River	8485	3437	5.9	20838	8439	13.3	29323	11876	9.8
TP				965	391	0.6	965	391	0.3
Tributary Floodplain				965	391	0.6	965	391	0.3
VG 1	5610	2272	3.9	8970	3633	5.7	14580	5905	4.9
Van Gorder	5610	2272	3.9	8970	3633	5.7	14580	5905	4.9
ZZ	8421	3411	5.9	9825	3979	6.3	18246	7390	6.1
Lake	3388	1372	2.4				3388	1372	1.1
Water	11809	4783	8.3	9825	3979	6.3	21634	8762	7.2
Totals	143122	57965	100.0	156440	63358	100.0	299562	121323	100.0

Table 14. Acreage of Capability for Agriculture Classes and Subclasses in the Faro - Ross River Area.

Class	Faro Area			Ross River Area					
	Sheet #5		% of	Sheet #6		% of	Total		% of
	Acres	Hectares	Total	Acres	Hectares	Total	Acres	Hectares	Total Area
4M	1180	478	0.9	409	166	0.3	1589	644	0.6
Class 4	1180	478	0.9	409	166	0.3	1589	644	0.6
5M	12723	5152	9.7	13948	5649	9.5	26671	10801	9.6
5M 5W	17541	7104	13.3				17541	7104	6.3
5T	8233	3334	6.3	479	194	0.3	8712	3528	3.1
5CH	71	29	0.1	22271	9020	15.2	22342	9049	8.1
5W 6P	3188	1291	2.4				3188	1291	1.2
5M 6M	342	139	0.3				342	139	0.1
Class 5	42098	17049	32.1	36698	14863	25.0	78796	31912	28.4
6M	10013	4055	7.6	54054	21892	36.9	64067	25947	23.1
6MT	6708	2717	5.1				6708	2717	2.4
6T	44802	18145	34.1	998	404	0.7	45800	18549	16.5
6TE				965	391	0.7	965	391	0.3
6TM				7357	2979	5.0	7357	2979	2.6
6T 7R	7065	2861	5.4	34051	13791	23.2	41116	16652	14.8
Class 6	68588	27778	52.2	97425	39457	66.5	166013	67235	59.7
7M	1712	693	1.3	2004	812	1.3	3715	1505	1.3
7R	11719	4746	8.9				11719	4746	4.2
7T	1517	615	1.2	9808	3972	6.7	11325	4587	4.1
7TE	4497	1821	3.4	269	109	0.2	4766	1930	1.7
Class 7	19445	7875	14.8	12081	4893	8.2	31526	12768	11.3
Totals	131311	53180	100.0	146613	59379	100.0	277924	112559	100.0

Table 15. Acreage of Grazing Classes in the Faro - Ross River Area.

Class	Faro Area Sheet #5 Acres	Faro Area Sheet #5 Hectares	Faro Area % of Total	Ross River Area Sheet #6 Acres	Ross River Area Sheet #6 Hectares	Ross River Area % of Total	Total Acres	Total Hectares	% of Total Area
V	4481	1815	3.4	9526	3858	6.5	14007	5673	5.0
V-VII	11791	4775	9.0	26807	10857	18.3	38598	15632	13.9
V-III-VII				2913	1180	2.0	2913	1180	1.1
Class V	16272	6590	12.4	39246	15895	26.8	55518	22485	20.0
VII	21428	8678	16.3	34352	13913	23.4	55780	22591	20.1
VII-V	93611	37912	71.3	73015	29571	49.8	166626	67483	59.9
Class VII	115039	46590	87.6	107367	43484	73.2	222406	90074	80.0
Totals	131311	53180	100.0	146613	59379	100.0	277924	112559	100.0

Regional Agricultural Interpretations

Magundy River - Faro Region

(a) Location: This includes the land in the Magundy River Valley and in the Pelly River Valley from Faro to 30 kilometers upstream from Faro. This includes most of sheet 5 of the map set.

(b) Soil Associations - Materials and Topography: The soils have formed in fluvial materials that were deposited by the Magundry and Pelly Rivers.

The south end of the Magundy Valley is mapped in the Drury Creek Complex. It contains sloughs and frozen peaty Gleysols in the low areas and stony till and sand ridges in the higher areas. The upstream portions of the Magundy River Floodplain and the Pelly River Floodplain near Faro are composed of loamy sand to fine sandy loam, imperfectly drained Regosols and are mapped in the Magundy River Association. These soils are very immature with no profile development. They do not have volcanic ash on the surface. The higher terraces of the Magundy River are corase textured, often gravelly to the surface but mantled with volcanic ash. They are mapped in the Glenlyon Association.

(c) Soil Capability for Agriculture and Grazing Capability: Most of the region is in a Class 5 climatic area and as such is suitable only for forages. Some of the finer textured Magundy River soils (fine sandy loam to silt loam) could possibly be used to grow oats or barley. The coarse textured soils (loamy sand and gravelly sandy loam) are rated as Agricultural Capability Class 5 and 6 due to a low moisture holding capacity (M). Most of the soil areas mapped have minor amounts of native grazing (Mixed Class VII and V).

(d) Potential for Agricultural Development: The potential for a livestock industry in this area is low because of the lack of good native grazing and hay. Some of the finer textured soils (fine sandy loam to silt loam) in the Magundy Valley could be utilized for seeded forages or perhaps oats or barley for feed grain.

Ross River - Hoole River Region

(a) Location: This region, extending from Faro to Mink Creek includes the uplands between the Pelly River and St Cyr Range, and the fluvial deposits associated with the Pelly River. This includes sheet 6 and the southern portion of sheet 5.

(b) Soil Associations - Materials and Topography: The upland area from Faro to Horton Creek is composed of gravelly to loamy morainal deposits with a distinct drumlinoid landform (Fisheye Lake Association) with the linear pattern trending northwest-southeast. The slopes are usually in excess of 10 - 15%.

Further south near Ross River the upland southwest of the drumlin area is covered by gravelly outwash (Lapie River Association) associated with the Lapie and Ketza Rivers. These soils are usually coarse textured with many cobbles 5 - 15 cm in diameter in the lower solum.

The soils in the Pelly River Valley north and south of Ross River are formed in well drained sandy and gravelly deposits and are mapped in the Ross River Association. They differ from the Magundy River soils by being better drained, having more profile development (Brunisols versus Regosols) and they have a thin (10 - 15 cm) volcanic ash surface layer. The Ross River soils differ from the Lapie River soils by their physiographic location (90 - 150 meters lower in elevation) and the characteristics of the gravel parent material. The Ross River gravels are usually dark brown to black colored while the upland gravels are lighter in color.

Some higher terraces of the Pelly River are mostly steeply sloping sand or gravel deposits (Van Gorder Complex). Some of the more level portions of the landscape remain frozen for most of the summer.

The upland morainal deposits east from Horton Creek are mapped in the Hoole River Association. These soils have smoother slopes (less than 15% slopes) than the Fisheye Lake soils. They also appear to have a cooler climate as evidence by the occurrence of black spruce on well drained sites.

(c) Soil Capability for Agriculture and Grazing Capability: This region has moderately severe climatic limitations of low growing degree days and short frost free period. The best soils can be rated no higher than Class 5 or suitable for seeded forages. The fluvial soils with a fine sandy loam surface texture and morainal soils with slopes less than 15% are rated as Agricultural Capability Class 5. The main limitations are climate (CH) for all soils, plus the additional limitation of low moisture holding capacity (M) for the fluvial soils, and steep slopes (T) for soils on 10 - 15% slopes. Soils on slopes greater than 15% are classified as 6T or 7T depending upon their native grazing capability. The gravelly fluvial soils are rated as Capability Class 6M.

The well drained fluvial soils have from 10 - 100 kg/ha grazable forages (Grazing Class V). The imperfectly and poorly drained sites have closed stands of white or black spruce and no grazable forages. The Fisheye Lake soils have mixed Class V and VII grazing with open aspen and spruce stands with grass on south facing slopes and black spruce and moss on north facing slopes.

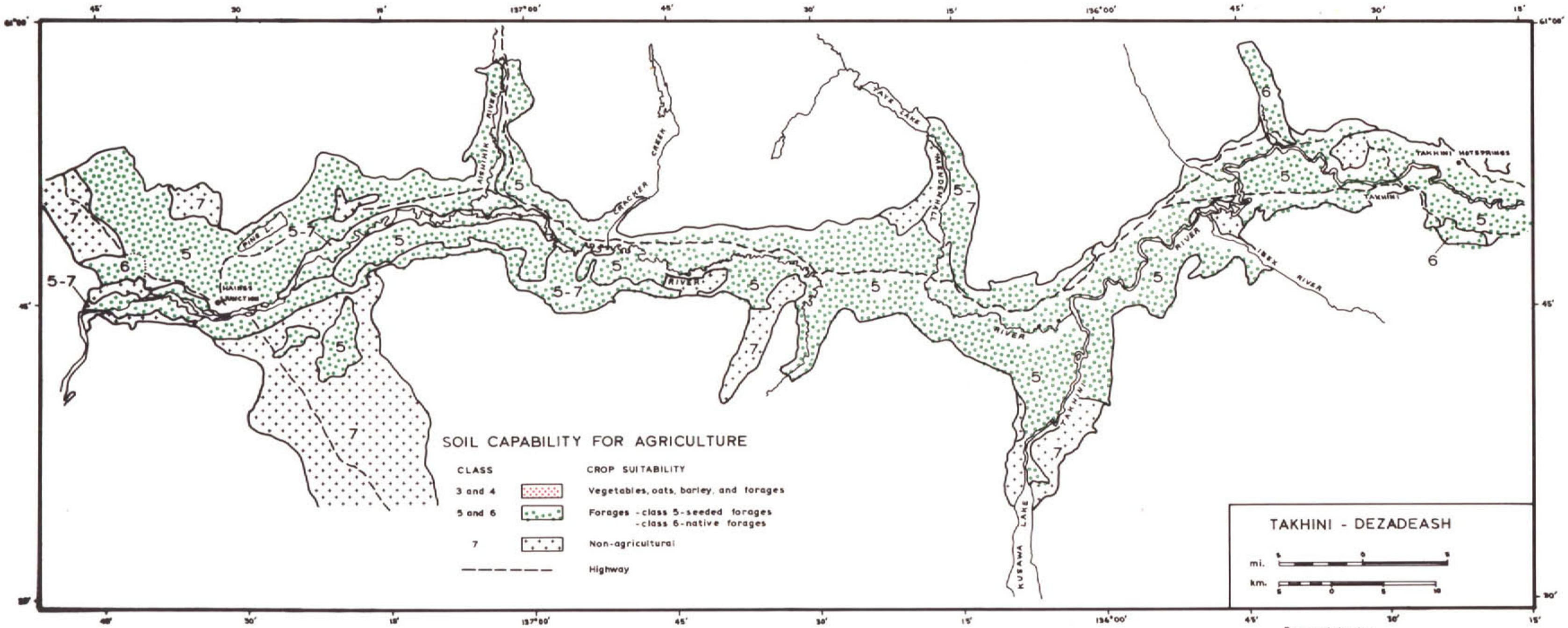
(d) Potential for Agricultural Development: Most of the grazing land in this region is being utilized by Outfitters as pasture for their horses. Due to the low productivity of the native forage (10 - 100 kg/ha) there should be supplemental feed provided such as some higher yielding seeded pasture or as hay. There is very little native hay present in the area. Any livestock enterprise which includes winter feeding will require seeded forages for hay production. The finer textured Ross River soils are most suitable for this purpose.

The upland fluvial soils (Lapie River Association) should only be utilized for native grazing. The expense of clearing, cultivation and seeding is too great for the small expected increase in productivity over the native forages. If the trees were kept off the moister sites, a higher productivity could be expected from the native grasses. An example of this occurs at milepost 172 were open grassy areas have a productivity in excess of 200 kg/ha (Fig. 15).

Extensive areas of open grassland occur on steep south facing slopes on the Fisheye Lake soils and on the high, steep hills northeast of Ross River (Fig. 16). Special precautions should be taken to see that these areas aren't overgrazed or serious erosion could result.

Fig. 15. Open, grassy areas just east of Mink Creek on the Robert Campbell highway. The productivity of the native grasses is in excess of 200 kg/ha. The soil profiles resemble those of Chernozems present on the prairies.

Fig. 16. Steep south facing slopes across the Pelly River from the town of Ross River. These areas may be grazed by livestock, but care must be taken not to overgraze as serious erosion may occur.



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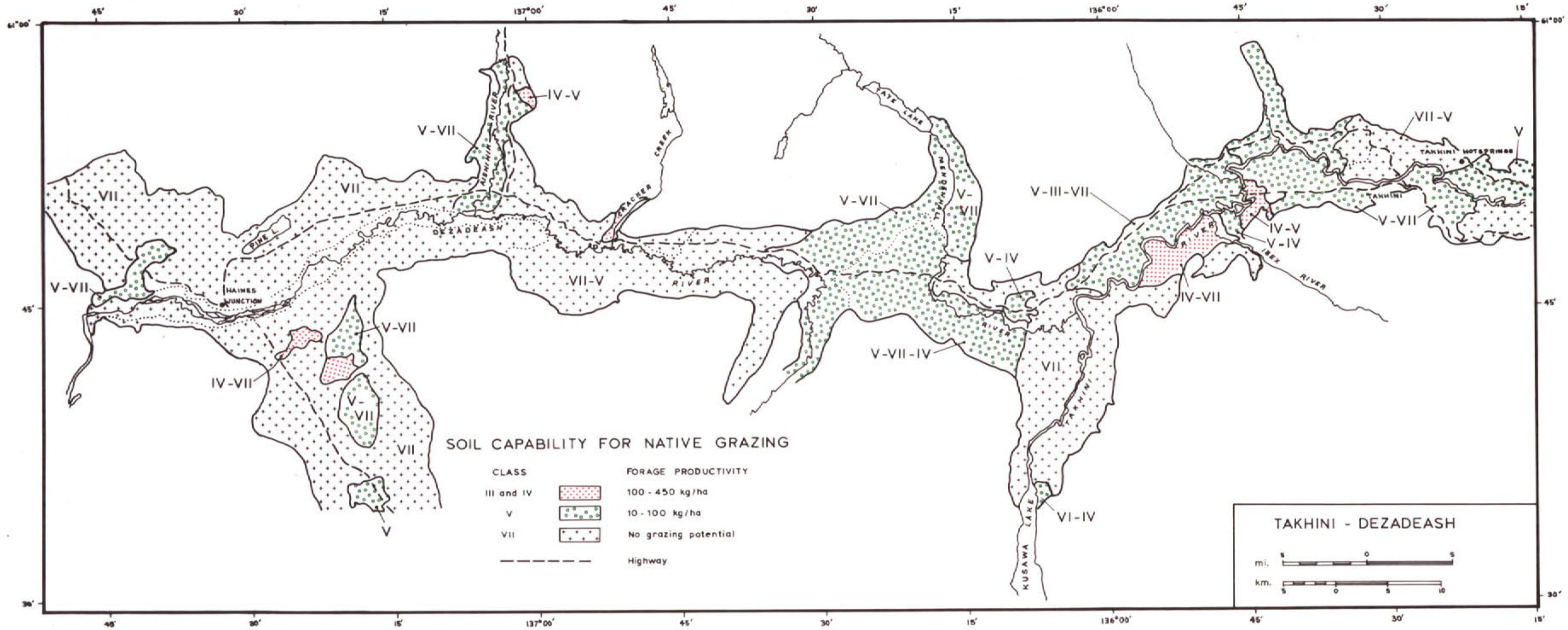

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Takhini - Dezadeash Area

Location and Extent

The Takhini - Dezadeash area is located on NTS sheets 105D and 115A and comprises sheet 7 of the map set. This area was surveyed previously by Day (1962). A portion of the Takhini - Dezadeash map area was surveyed in more detail and is included in sheet 8, the Whitehorse area. The remaining portion in sheet 7 is approximately 165,000 hectares.

The area is traversed by the Alaska Highway from Whitehorse to Haines Junction.

The community of Haines Junction is within the map area. It was the location of the former 1019 Agricultural Experimental Farm, now the headquarters of the Kluane National Park.

Summary of Agricultural Interpretations

Soil Capability for Agriculture and Grazing

Due to the cool summer temperatures the soils in the Takhini - Dezadeash Valley cannot have an Agricultural Capability rating higher than Class 5. In addition to the limitation of climate (CH), some soils have the additional limitation of wetness (W), steep slopes (T), or low moisture holding capacity (M).

Approximately 40% of the soils are fine textured with only a climatic limitation while 20% are coarse textured and have the additional limitation of low moisture holding capacity. The remainder are further downrated due to steep slopes, excess stones (P) or excessive salinity (N).

The majority of the area has low Grazing Capability (Class VII or V, less than 100 kg/ha grazable forages). The only significant area with some potential for grazing is that portion of the region burned in the large forest fire about 20 years ago. Some of the areas are regenerating very slowly to trees and at present have a good cover of grass and fireweed. The Grazing Capabilities range up to Class III and IV (100 - 450 kg/ha). In some areas the spruce snags will present a problem to ranging livestock.

Soils

The Soil Series shown on the soils map have all been described by Day (1962). The majority of the soils are developed in fine textured (silty clay to silty clay loam) lacustrine material (Table 16).

Sands and gravels are located between the lacustrine plain and the mountain ranges. In some areas, wind action has formed sand dunes.

Climate

Whitehorse and Haines Junction are the locations of the two weather reporting stations for the area. The mean annual temperature for Whitehorse and Haines Junction is -0.8^{o}C and -3.2^{o}C respectively, whereas the mean July temperature is 14.1 and 12.2^{o}C, respectively. Haines Junction has much cooler summer temperatures and shorter frost-free period than would be expected considering the types of crops grown at the 1019 experimental farm. It has been suggested (F.J. Eley, 1977) that the cold winds off the icefields in the St. Elias Mountains are responsible for the cool summer temperature. It is also reported that summer frosts are of such short duration that many types of plants are not affected by such frosts. While it is known that temperatures are warmer at Whitehorse, the whole Takhini - Dezadeash valley has cool summer temperatures and thus a Class 5 climatic rating.

Table 16. Description and Agricultural Capability of Soil Series in the Takhini - Dezadeash Area.

Series	Soil Group	Texture	Landform	Agricultural Capability
Aishihik	Orthic Eutric Brunsiol	loamy sand	level to hummocky fluvial deposits	5M
Alluvium	Regosols and Gleysols	variable	nearly level alluvial deposits	5I, 7I
Alsek	Gleyed Regosol	sand over silty clay	gently sloping fluvial deposits	7M, 5M
Archibald	Orthic Eutric Brunisol	loam to clay loam	gently sloping morainal deposits	5CH
Auriol	Gleyed Regosol	silty clay	nearly level lacustrine deposits	5CH
Bear Creek	Orthic Eutric Brunsiol	loam to clay loam	gently sloping morainal deposits	5CH
Bratnober	Orthic Gray Luvisol	silty clay	level to undulating lacustrine deposits	5CH
Canyon	Orthic Eutric Brunsiol	gravelly sand	level to hummocky fluvial deposits	6M, 7M
Champagne	Orthic Eutric Brunsiol	silty clay	level to undulating lacustrine deposits	5CH
Cracker	Peaty Gleysol	silty clay loam	nearly level fluvial deposits	5CH
Croucher	Orthic Eutric Brunsiol, Orthic Gray Luvisol and Regosol	silt loam	nearly level fluvial deposits	5CH
Eroded River Banks		variable	steep slopes	7TE
Haeckel	Orthic Eutric Brunisol	loamy sand	hummocky to ridged morainal deposits	5M, 6T, 7T
Haines	Regosol	gravelly sand	gently sloping fluvial deposits	7M, 6M

Series	Soil Group	Texture	Landform	Agricultural Capability
Hard Time	Regosol	silty clay	moderately sloping colluvial material	7T
Jo-Jo	Peaty Gleysol	silty clay	level lacustrine deposits	5W
Klowtaton	Orthic Eutric Brunsiol	sandy loam over silty clay	fluvial veneer over lacustrine	5CH
Kusawa	Orthic Gray Luvisol	sandy loam over clay over loamy sand	nearly level fluvial deposits	5CH
Laberge	Peaty Gleysol	sandy loam	nearly level fluvial deposits	5W
Lewes	Orthic Eutric Brunsiol	fine sandy loam over silty clay	fluvial veneer over lacustrine	5CH
Mendenhall	Orthic Gleysol	silty clay	level lacustrine deposits	5W
Mucky Peat	Organic		level	5W
Paint	Peaty Gleysol	silty clay loam	level lacustrine deposits	5W
Pine Creek	Regosol	silty clay	nearly level lacustrine deposits	5CH
Ruby	Orthic Dark Gray Chernozem	silty clay	level to undulating lacustrine deposits	5CH
Saline Meadows	Orthic Regosol	sandy loam to clay	level fluvial or lacustrine deposits	6N
Shaneinbaw	Saline Gleysol	silty clay	level lacustrine deposits	6N
Summit	Orthic Eutric Brunisol	gravelly loam	strongly sloping morainal deposits	7T

Series	Soil Group	Texture	Landform	Agricultural Capability
Takhini	Dark Gray Luvisol	silty clay	level to undulating lacustrine deposits	5CH
Taye	Regosol	silt loam	nearly level alluvial deposits	5CH
Van Bibber	Peaty Gleysol	silty clay	moderately and strongly sloping lacustrine deposits	5W
Whitehorse	Regosols and Brunisols	loamy sand	Ridged wind modified fluvial deposits	7SE, 6SE
Yukon	Orthic Eutric Brunisol	fine sandy loam over loamy sand	nearly level fluvial deposits	5CH

Table 17. Area of Soil Capability for Agriculture Classes and Subclasses in the Takhini-Dezadeash Area (Sheet #7)

Classes and Subclasses	Acres	Hectares	% of Total Area
5CH	193633	78421	
5M	16749	6783	
5W	56047	22699	
5W7W	2525	1023	
5CH5W	3070	1243	
5CH6N	12724	5153	
5W5CH	2082	843	
5CH7M	24815	10050	
Class 5	311645	126215	67.3
6M	13713	5554	
6W6M	300	122	
6M5CH	3344	1354	
6TE	911	369	
6ME	12899	5224	
6T	5277	2137	
6N	314	127	
Class 6	36758	14887	7.9
7T	18029	7302	
7M	14725	5964	
7MT	5457	2210	
7W	5884	2383	
7M7W	212	86	
7TE	13741	5565	
7W6M	1548	627	
7W5M	1334	540	
7W5W	38	15	
7ME	3670	1486	
Class 7	64638	26178	14.0
Water	49969	20237	10.8
Total	463010	187517	

Table 18. Area of Grazing Capability Classes in the Takhini-Dezadeash Area (Sheet #7)

Classes	Acres	Hectares	% of Total
III-V	5430	2199	
Class III	5430	2199	1.2
IV	1022	414	
IV-V	1359	550	
IV-VII	7515	3044	
Class IV	9896	4008	2.1
V	10180	4123	
V-VII	70161	28415	
V-III-VII	13481	5460	
V-VII-IV	9161	3710	
V-IV	3201	1296	
Class V	106184	43004	22.9
VII	203159	82278	
VII-V	78353	31733	
VII-IV	10007	4053	
Class VII	291519	118065	63.0
Water	49969	20237	10.8
Total	462998	187513	100.0

Table 19. Area of Series and Complexes in the Takhini-Dezadeash Area (Sheet #7)

Soil Series and Complexes	Acres	Hectares	% of Total
Aishihik	25423	10296	6.1
Alluvium	50421	20421	12.3
Alsek	2801	1134	.7
Archibald	9543	3865	2.4
Auriol	1991	806	.5
Bear Creek	7846	3178	1.9
Bratnober	338	137	.1
Canyon	21704	8790	5.2
Champagne	111378	45108	27.0
Eroded	14652	5934	3.5
Haeckel	43662	17683	10.5
Haines	5487	2222	1.3
Hard Time	1678	680	.4
Jo-Jo	1701	689	.4
Klowtaton	18692	7570	4.5
Kusawa	1481	600	.3
Laberge	803	325	.2
Lewes	2472	1001	.6
Mendenhall	4667	1890	1.1
Paint	71	29	.1
Pine Creek	4726	1914	1.1
Ruby	32369	13109	7.9
Sloughs	3384	1371	.8
Shaneinbaw	314	127	.1
Summit	8705	3526	2.1
Takhini	4831	1957	1.2
Taye	5037	2040	1.2
Van Bibber	10298	4171	2.5
Whitehorse	16569	6710	4.0
	413045	167283	100.0

This area has the lowest summer rainfall in the southern Yukon (140 mm in Whitehorse, 136 mm in Haines Junction).

Agricultural Potential

There is a considerable area suitable for growing forages (100,000 ha) although most of this land will require expensive clearing of the trees. Due to the low rainfall, forage yields will tend to be low. Most crops would benefit from supplemental irrigation.

The majority of the fair grazing land is located east of Champagne. There are some small scattered open areas that are slightly slaine, moderately wet, or very dry where trees do poorly. These areas have from 200 - 600 kg/ha of grazable forages. Most of the fair grazing land is in the recent burn area. Where the trees are slow to come back, there is usually substantial growth of grass and fireweed (100 - 600 kg/ha). This burn area would be economical to develop. Clearing costs should be much lower than usual and there is an adequate supply of grazing land.

Regional Agricultural Interpretations

Champagne - Takhini Valley Region

(a) Location: This region includes the land east of Champagne along the Takhini River to the eastern edge of the map sheet.

(b) Soil Series - Materials and Topography: The previous survey of Day (1962) mapped the individual Series whereas in the present survey in the Whitehorse area, the unit of mapping was the Soil Association. The Soil Association is a combination of Soil Series occurring on the same parent material. For example the Champagne Association mapped in the Whitehorse area is a combination of the Champagne, Bratnober, Ruby, Takhini, and Jo-Jo Series.

The Soil Series and their general description are shown in Table 16.

The majority of the soils in this area are developed on fine textured lacustrine deposits (Champagne, Bratnober, Ruby, Takhini, Mendenhall, Jo-Jo and Shaneinbaw Series). The last three named above are poorly drained and Shaneinbaw is also moderately saline. The topography is usually nearly level to gently sloping.

The coarse textured soils are located along the edges of the lacustrine plain or valley walls and in some of the tributary valleys. The gravelly soils are mapped in the Canyon Series, while the loamy sand soils belong to the Aishihik and Whitehorse Series. The Whitehorse soils have been wind modified in the past. Some sandy soils exposed to strong winds funnelling up the tributary valleys have active dunes.

(c) Soil Capability for Agriculture and Grazing Capability: Due to the cool climate in this region, the best soils can be rated no higher than Class 5 or suitable for forages. It may be possible to grow oats or barley for feed, but they will likely be frozen most years. Due to the low rainfall in the area, forages will not likely do well on the coarse textured soils. The Agricultural Capability ratings for the various soils are shown in Table 16.

Approximately one-fifth of the area has fair native grazing (Class III and IV, 100 - 400 kg/ha) and about one-third is Class V (10 - 100 kg/ha), or marginal for grazing. Some of the better, small patches of fair to good grazing occur on open grassy areas on poorly drained or saline soils (Jo-Jo, Mendenhall, Shaneinbaw Series). The rest of the fair grazing land occurs on the recent burn, especially where regeneration is slow.

Fig. 17. The vegetation in a part of the Takhini Burn that is not regenerating to tree species. The dominant vegetation is grasses and fireweed. (For a more detailed description see the section "Assessment of the Grazing Potential...".)

Fig. 18. Grassland vegetation on a slight depressional area near Mile 948 on the Alaska Highway. Some of the soils here are slightly saline (conductivity between 1 and 2 mmhos/cm). The Grazing Capability is Class III (200 - 450 kg/ha).

(d) Potential for Agricultural Development: The biggest asset this area has for agricultural development is the large amount of fair grazing land. In addition there are large areas of soils suitable for growing hay for winter feed (fine textured lacustrine soils). Some of the burned areas may require light clearing to remove snags and dead trees to allow access by livestock. It should also be relatively inexpensive to clear regenerating burned areas to plant forages for hay. Since native grazing is an economic necessity for a livestock enterprise, areas that are dominantly Grazing Class VII should be left as forest land. The only exception might be for clearing small areas in favorable locations for a market garden.

Market gardens should be located on slight south facing slopes, preferably near a river. Good air drainage should be provided by removing the trees from the lower side of the fields. Good access to a river will also lower the irrigation costs, a necessity in this semiarid region.

Haines Junction - Dezadeash Valley Region

(a) Location: This region includes the land west of Champagne to west of Haines Junction. An area not mapped previously, from Haines Junction to Kathleen Lake was also included.

(b) Soil Series - Materials and Topography: A description of all the Series mapped is included in Table 16.

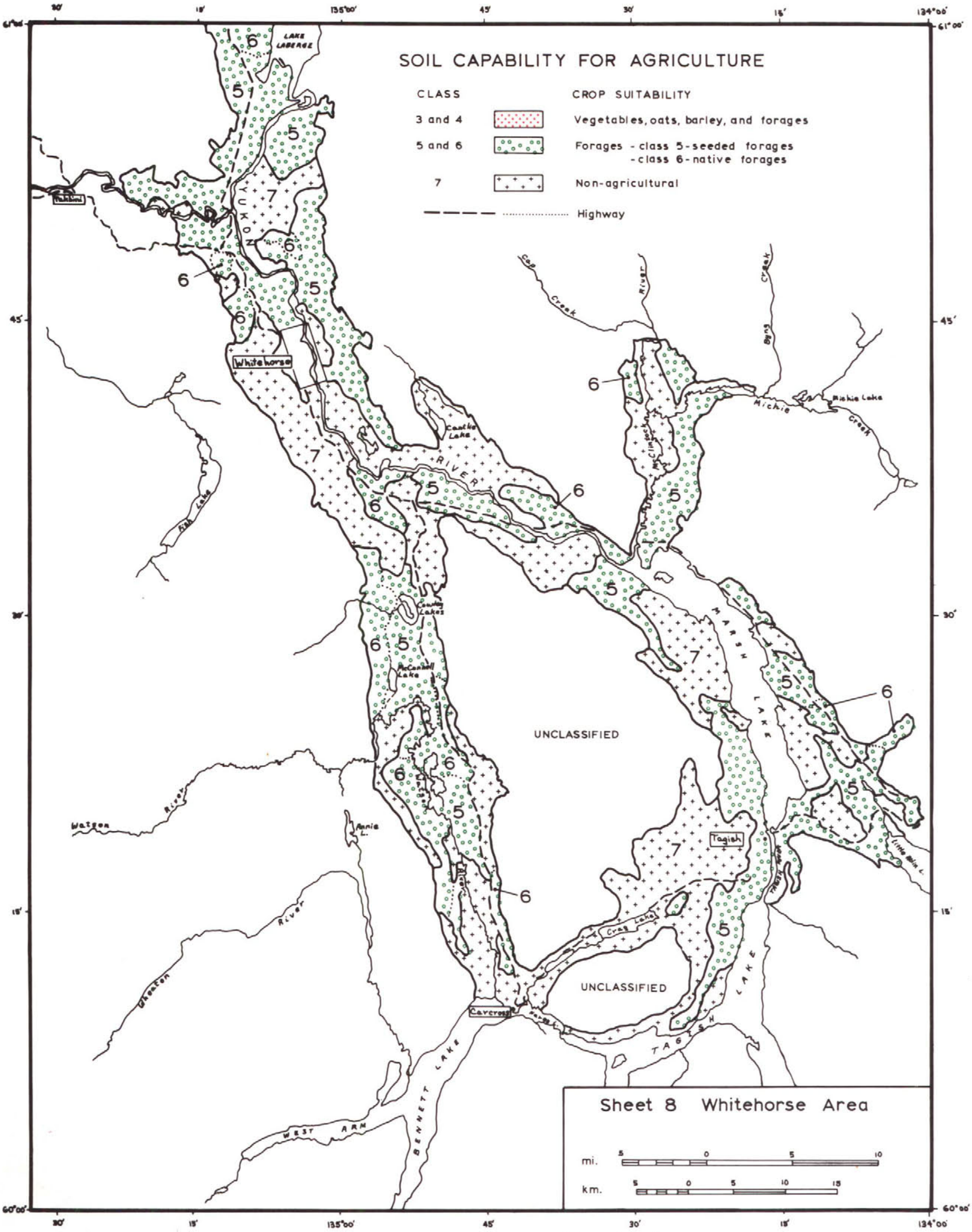
As with the Takhini Region, the dominant soils are developed in fine textured (silty clay) lacustrine materials. Near Haines Junction there are some recent soils deposited by a lake formed by the temporary damming of the Alsek River (Auriol, Paint and Pine Creek Series). There are also some medium and coarse textured morainal deposits (Archibald, Bear Creek, and Haeckel Series) in the Haines Junction area. Sandy fluvial soils (Aishihik Series) are of limited extent in this region. A fairly extensive gravelly outwash plain is located west of Haines Junction. Gravels are being deposited at the present time (Haines Series) by streams from glaciers in the mountains.

(c) Soil Capability for Agriculture and Grazing Capability: The best soils in the region can be rated no higher than Class 5 due to the cool summer temperatures. Grain crops were grown at the experimental farm at Mile 1019 for a number of years, however, the incidence of frosts during the growing season was high. Cereal grain for feed may be grown in some years but frost would undoubtedly lower the yield and quality in most years.

Due to the low rainfall in the area forages and cereals should be grown on the finer textured soils (silt loam to silty clay) of the Champagne, Ruby, Auriol and Pine Creek Series. Although most of the soils in this region are rated as Agricultural Capability Class 5 and suitable for forages, the coarse textured fluvial soils and the rolling morainal soils are less desirable for agriculture than the fine textured lacustrine soils. The gravelly soils (Haines and Canyon Series) and the stony morainal soils (Summit Series) are mostly Class 7, or non-agricultural.

The majority of the grazing land in the region is limited to scattered areas of Grazing Capability Class V (10 - 100 kg/ha). This type of grazing is only marginal and would need to be supplemented by nearby, higher yielding seeded pastures. The majority of the soils were growing tall, closed stands of white spruce and thus support very little growth of grass.

(d) Potential for Agricultural Development: The potential for agricultural development is low because of the lack of fair native grazing. Most farming enterprises will require substantial clearing and breaking of forest land. If clearing costs are not a factor then approximately 40% of the region could be utilized for seeded agricultural crops. Since only four days by one party was spent in the field mapping the grazing potential, some small high yielding native forage areas may have been missed. In any event, Class V or IV grazing land (10-200 kg/ha grazable forages) could form the main portion of a livestock enterprise. Additional hectares of seeded forages for spring and fall grazing and for winter feed would be necessary. Under no circumstances could native hay and pasture alone be relied upon for a livestock enterprise.



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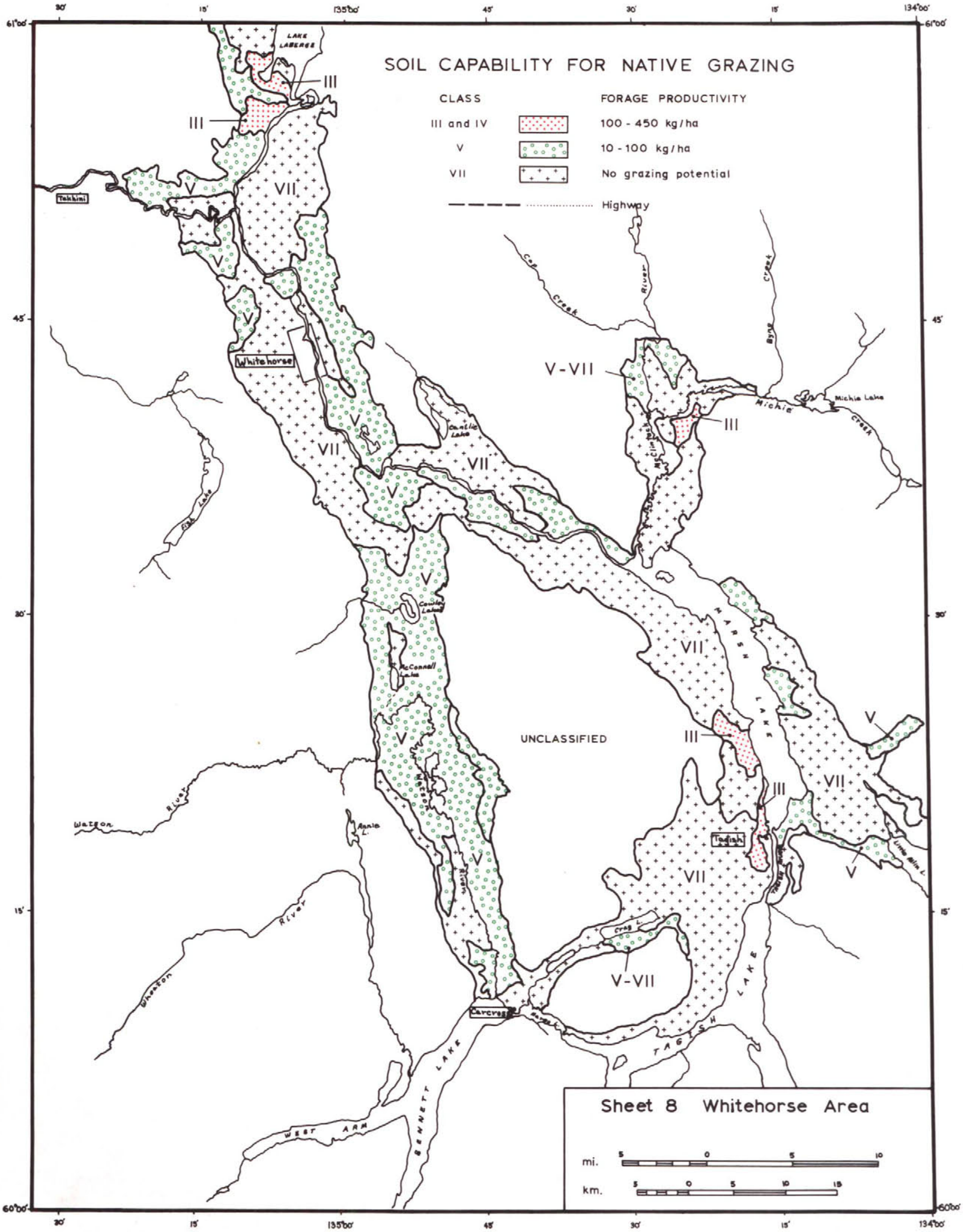

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Whitehorse Area

Location and Extent

The Whitehorse area is located primarily in NTS map sheet 105D, with a small portion of 105E. It is sheet 8 of the map set. The total area surveyed is approximately 0.2 million hectares. The majority of the people in the Yukon live in this area in the communities of Whitehorse, Porter Creek, Carcross and Tagish. The total population of the area is approximately 15,000. The import and export of most goods is via the White Pass and Yukon railroad to Skagway Alaska and via the Alaska Highway to Dawson Creek B.C. and beyond.

Physiography

The survey area falls within the Teslin Plateau subdivision of the Yukon Plateau.

Bennett, Tagish, and Marsh Lakes, forming the headwaters of the Yukon River, are located in the survey area at an elevation of 656 meters above sea level. The Yukon River flows west and then north into Lake Laberge in the northern part of the area. The Takhini River flows east through the lacustrine clays of glacial Lake Champagne and enters the Yukon River south of Lake Laberge. The southern portion of the area, in the vicinity of the Carcross Road is drained by the Cowley Creek and Watson River.

Summary of Agricultural Interpertations

Soil Capability for Agriculture and Grazing Capability

Due to the cool summer temperatures, most of the soils in the Whitehorse area can be rated no higher than Class 5 for Agricultural

Capability. There are approximately 71,000 hectares of Class 5 land, suitable for seeded forages, 12,000 hectares of Class 6 land, suitable only for native grazing, and 45,000 hectares Class 7, or non-agricultural land. Some of the land in the survey area has potential for livestock grazing without clearing and reseeding. Approximately 5800 hectares have a Grazing Capability rating of IV or higher (productivity of 100 - 900 kg/ha) while 38,000 hectares are Class V (10 - 100 kg/ha). The remaining 81,000 hectares have no potential for native grazing. The acreage of the Capability Classes for Agriculture and Grazing are in Tables 21 and 22.

Soils

Many of the Soil Associations mapped were described previously by Day (1962). The majority of the soils are formed in deposits of fluvial origin (65,144 hectares), of which approximately 30% are medium textured (fine sandy loam to silt loam). There are 13,770 hectares of fine textured lacustrine soils (silt loam to silty clay) and 28,731 hectares of stony gravelly morainal soils (Table 23). All of the soils are neutral to alkaline with high concentrations of soluble salts (salinity) a potential problem on some fine textured lacustrine or fluvial soils.

Climate

The Whitehorse area has a mean annual temperature of -0.8°C, the highest in the Yukon. The mean July temperature is 14.1°C, cooler than most reporting stations in the Yukon. The winters are milder in the

Table 20. Description and Agricultural Capability of Soil Associations in the Whitehorse Area.

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Aishihik	well to poorly drained, loamy sand fluvial deposits	level to hummocky upland deposits	6M, 7M
Bear Creek	well drained, sandy fluvial over morainal deposits	nearly level to hummocky uplands	5CH
Bennett Lake	well drained, silty lacustrine deposits	level to hummocky uplands	5CH
Canyon	well drained, gravelly fluvial deposits	level to hummocky uplands	6M, 7M
Champagne	well to poorly drained, silty clay lacustrine deposits	level to undulating uplands	5CH
Croucher	well drained, sandy to silty fluvial deposits	nearly level terraces of the Yukon River	5CH
Haeckel	well drained, gravelly morainal deposits	hummocky to ridged uplands	5CH, 6T
Klowtaton	well to imperfectly drained, sandy fluvial over lacustrine deposits	level to undulating uplands	5CH
Kusawa	well drained, sandy to silty fluvial deposits	nearly level terraces of the Yukon River	5CH
Lewes	well drained, loamy fluvial over lacustrine	nearly level terraces of the Yukon River	5CH
Lewes Lake	well to poorly drained, silty lacustrine deposits	nearly level uplands	5CH

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Porter Creek	well drained, sandy fluvial over morainal deposits	nearly level uplands	5CH
Taye	well drained, silty alluvial deposits	nearly level floodplain of the Yukon River	4M, 5CH
Watson River	well drained, loamy morainal deposits	ridged uplands	6T
Whitehorse	well drained, loamy sand fluvial deposits	ridged, wind modified uplands	7SE
Yukon	well drained, sandy loam fluvial deposits	nearly level terraces of the Yukon River	5CH
Fox Lake Road	well to poorly drained, silty fluvial and lacustrine deposits	level to hummocky uplands near Fox Lake	5CH
Richthofen	well drained, sandy fluvial and morainal deposits	hummocky uplands	6T
Saline Meadow	well to imperfectly drained fluvial deposits		5N

Table 21. Area of Capability for Agriculture Classes and Subclasses in the Whitehorse Area (Sheet #8)

Classes and Subclasses	Acres	Hectares	% of Total
5T	1 202	487	
5M	37 040	15 001	
5M 5Ch	10 166	4 117	
5M 7M	3 674	1 488	
5M 7R	11 483	4 651	
5MT	8 747	3 543	
5W	9 909	4 013	
5W7I	8 162	3 306	
5CH	58 298	23 611	
5CH 5M	14 179	5 742	
5CH 7R	6 914	2 800	
5CH 5N	4 874	1 974	
5CH 5W	3 123	1 265	
5CH 5WN	1 487	602	
5CH 7M	246	100	
5W 5M	816	330	
5N	518	210	
Class 5	180 838	73 240	43.1
6M	10 310	4 176	
6M 5M	1 393	564	
6M 5CH	592	240	
6M 5MT	1 071	434	
6ME 5CH	1 667	675	
6M 6CH	3 269	1 324	
6CH	9 606	3 890	
6CH 7T	1 963	795	
6CH 5M	8 389	3 398	
6CH 7R	1 693	686	
6CH 6M	1 200	486	
6ME	1 985	804	
Class 6	43 138	17 472	10.3
7T	38 746	15 692	
7MT	488	198	
7M	8 099	3 280	
7ME	10 083	4 084	
7TE	12 283	4 975	
7T 7R	17 958	7 273	
7R 7T	7 371	2 985	
7R 5CH	6 262	2 536	
7R	836	339	
7M 7CH	997	404	

7CH	34 151	13 831	
7CH 7M	14 818	6 001	
7CH 5MT	4 045	1 638	
7CH 7R	6 097	2 469	
7CH 5M	6 311	2 556	
7I 5W	20 059	8 124	
7R 6CH	7 143	2 893	
Class 7	195 747	79 278	46.6
Total	419 723	169 990	100.0
Water	109 119	44 193	
Total	528 842	214 183	

Table 22. Area of Grazing Capability Classes in the Whitehorse Area (Sheet #8)

Classes	Acres	Hectares	% of Total Area
II - IV	2 144	868	
Class II	2 144	868	0.5
III	4 128	1 672	
III - IV	2 646	1 072	
III - VII	2 980	1 207	
III - V	4 257	1 724	
Class III	14 011	5 675	3.3
IV	3 284	1 330	
IV - VII	1 286	521	
Class IV	4 570	1 851	1.1
V	77 198	31 265	
V - VII	43 488	17 613	
V - VI	3 900	1 580	
V - IV	695	281	
Class V	125 281	50 739	29.9
VI	2 084	844	
VI - VII	4 488	1 818	
Class VI	6 572	2 662	1.6
VII	236 726	95 874	
VII - IV	13 329	5 398	
VII - V	13 493	5 465	
VII - VI	3 584	1 452	
Class VII	267 132	108 189	63.6
Total	419 710	169 984	100.0
Water	109 119	44 193	
Total	528 829	214 177	

Table 23. Area of Soil Association, Map Units, and Complexes in the Whitehorse Area (Sheet #8)

Map Units Associations and Complexes	Acres	Hectares	% of Total
As1	80 132	32 453	
As2	7 556	3 060	
As3	8 612	3 488	
Aishihik	96 300	39 001	22.9
Av	8 162	3 306	
Alluvium	8 162	3 306	1.9
Bk1	6 331	2 564	
Bk2	3 341	1 353	
Bennett Lake	9 672	3 917	2.3
Br1	5 038	2 040	
Bear Creek	5 038	2 040	1.2
Ch1	4 073	1 650	
Ch2	4 874	1 974	
Ch3	4 494	1 820	
Ch4	3 123	1 265	
Champagne	16 564	6 709	3.9
Cn1	36 041	14 597	
Cn2	3 579	1 450	
Canyon	39 620	16 047	9.4
Cr1	5 945	2 408	
Cr2	373	151	
Cr3	1 439	583	
Croucher	7 757	3 142	1.8
Ex	21 612	8 753	
Exposure	21 612	8 753	5.2
Fx1	5 924	2 939	
Fx2	3 059	1 239	
Fx3	1 487	602	
Fox Lake Road	10 470	4 240	2.5
Hk1	96 183	38 954	
Hk2	2 465	998	
Haeckel	98 648	39 952	23.5
Hw	30 241	12 248	
Hillwash	30 241	12 248	7.2

Ko1	3 872	1 568	
Ko2	230	93	
Klowtaton	4 102	1 661	1.0
Ku1	1 653	669	
Kusawa	1 653	669	0.4
Lk1	4 045	1 638	
Lk3	1 488	603	
Lewes Lake	5 533	2 241	1.3
Lw1	6 526	2 643	
Lewes	6 526	2 643	1.6
Pc1	1 211	490	
Porter Creek	1 211	490	0.3
Rn1	9 051	3 666	
Richthofen	9 051	3 666	2.2
Sm	518	210	
Saline Meadow	518	210	0.1
Ta1	167	68	
Taye	167	68	0.04
Tp	20 806	8 426	
Tributary Floodplain	20 806	8 426	5.0
Wh1	13 735	5 563	
Whitehorse	13 735	5 563	3.3
Ws1	8 274	3 351	
Watson River	8 274	3 351	2.0
Yu1	4 059	1 644	
Yukon	4 059	1 644	1.0
Total Soil	419 719	169 987	100.04
Water	109 119	44 193	
Total	528 838	214 180	

Whitehorse area and for this reason the incidence of permafrost is much less. The mean annual precipitation (260 mm) and the May - September rainfall (140 mm) are low, nearly the lowest in southern Yukon. The frost free period (87 days) is adequate for cereals and vegetables but the growing degree day heat units (877) are too low for cereal grains. This data indicates that there is a serious risk for growing cereals for grain or vegetables in the Whitehorse area because of low temperatures and low rainfall.

Agricultural Potential

There are about 71,000 hectares suitable for growing seeded forages for livestock. In addition about 5800 hectares have sufficient native forages to allow grazing by livestock (carrying capacity of 0.7 - 3 ha/animal/month). An additional 38,000 hectares have a limited potential for grazing with a carrying capacity of 3 to 30 hectares per animal per month. This poorer class of grazing land must be supplemented by inclusions of higher yielding meadows or seeded pasture. Of the total land area (120,000 ha) surveyed in the Whitehorse area 83,000 hectares have some potential for livestock production either as hay or pasture land.

Regional Agricultural Interpretations

Lake Laberge Region

(a) Location: This region includes the land north of Whitehorse on both sides of the Yukon River to Lake Laberge and west of Lake Laberge to Fox Lake.

(b) Soil Association - Materials and Topography: The majority of the soils in this region are developed in sandy and silty fluvial deposits of the Yukon and Takhini Rivers. Some general characteristics of the Associations are given in Table 20.

The Takhini River has cut through silty clay lacustrine deposits similar to that in the Champagne Association. Before cutting down, the Takhini River deposited fine sandy material over the clay lacustrine. The thin fluvial veneer is the parent material of the Lewes Association (fine sandy loam) and the Klowtaton Association (loamy sand). The thicker fluvial deposits make up the parent materials of the Kusawa and Yukon Associations (fine sandy loam over loamy sand), Croucher Association (fine sandy loam over silty clay) and the Aishihik and Canyon Associations (sandy and gravelly). In addition there is a large area of sandy fluvial deposits that have been modified by wind action forming duned topography (Whiterhorse Association). Two Soil Complexes are mapped west of Lake Laberge along the Klondike Highway. The Fox Lake Road Complex consists of mixed fluvial and lacustrine material in low areas near Lake Laberge and Fox Lake. The Richthofen Complex consists of sandy fluvial and morainal deposits in the uplands.

The silty to fine sandy fluvial soils have nearly level to undulating topography while the wind modified sands have steep (10 - 30%)

ridged topography. The area west of Lake Laberge is dominantly hummocky fluvial and morainal mixed with steep sided rock outcrops.

(c) Soil Capability for Agriculture and Grazing Capability: Most of the region is in a Class 5 climatic area with low growing season temperatures. Some of the low floodplains (Alluvium Complex) and some areas with south-facing slopes have a Class 3 climate. The soils with an Agricultural Capability rating of Class 5 are suitable for growing seeded forages, while the Class 3 soils could be used for cereals or vegetables. Some soils that have a Class 5 rating with only a climatic limitation may be suitable for cereals or vegetables if the site is near the river and has adequate air drainage.

The loamy sand soils (Aishihik Association) are rated as Class 5 with the main limitation a low moisture holding capacity (M). Although this soil is suitable for growing seeded forages, the productivity will be less than that occurring on finer textured fluvial soils (Croucher, Kusawa, Lewes).

The sandy wind modified soils (Whitehorse Association) are rated as Class 6 if they have some native grazing and Class 7, or non-agricultural, if no grass is present. The main limitations are low moisture holding capacity (M) and a serious erosion hazard (E).

The soils mapped west of Lake Laberge (Fox Lake Road and Richthofen Complex) have limitations of climate and topography that restrict the production of cereals. These soils are best suited for native grazing and hay production, or seeded forages on the smoother topography.

The soils in this region have the highest grazing potential in the Whitehorse Area. There are approximately 2600 hectares with a Grazing

Capability of III or IV which have an expected yield of from 100 to 450 kg/ha of grazable forages. These higher grazing capabilities occur on some of the Croucher, Kusawa, Yukon and Fox Lake Road soils. The sandy and gravelly soils (Aishihik, Whitehorse, and Canyon) generally have Grazing Capabilities of V or VII which yield less than 100 kg/ha of grazable forages. Class VII has no grazing potential while Class V could be used as grazing land in conjunction with nearby, higher yielding pasture.

(d) Potential for Agricultural Development: Due to the low summer temperatures or low growing degree days above $5^{\circ}C$, the potential for cereal production or market gardening in the Lake Laberge Region is low, although higher than in the rest of the Whitehorse Area. Some of the soils on the low terraces with fine textured sola (Lewes or Alluvium) are the most favorable sites for cereal or vegetable production. Other soils near the river with sufficient slope to permit cold air drainage (Croucher, Yukon, or Klowtaton) may also be suitable for cereals or vegetables.

This region has some potential for livestock production by utilizing areas with fair (Class III or IV) grazing capability for pasture and seeding forages for hay production on finer textured fluvial or lacustrine deposits.

Whitehorse Region

(a) Location: This region includes the land from Whitehorse south to Cowley Lakes and southeast to Marsh Lake.

(b) Soil Associations - Materials and Topography: The majority of the soils in this region are developed in coarse textured fluvial and gravelly morainal deposits.

The gravelly morainal soils in the uplands are mapped in the Haeckel Association (Fig. 19). The surface texture is sandy loam to gravelly sand

Fig. 19 . Profile of an Orthic Eutric Brunisol developed in stony, gravelly till. This soil is included in the Haeckel Association.

0 - 32 cm	Bm	
32 - 100 cm	Ck	calcareous grey parent material

Fig. 19a. A thick, but slow growing regrowth of lodgepole pine on a burnt area. There has been very little regrowth of understory. Grazing Class VII.

loam and the subsoil is usually quite stony. The topography is hummocky to ridged with moderately steep slopes.

The loamy sand fluvial deposits are mapped in the Aishihik Association and the gravelly fluvial deposits belong in the Canyon Association. Both soils occur on a wide range of topographic classes, from nearly level to steep.

There is a small area (1700 ha) of finer textured fluvial deposits south of the Yukon River along the Alaska Highway and east of the Carcross Road. About 940 ha of this area is mapped in Bear Creek Association, a soil with a thin, fine sandy loam fluvial veneer over till. The other 760 ha were mapped in the Croucher Association which is a fine sandy loam to silt loam fluvial material overlying silty clay.

(c) Soil Capability for Agriculture and Grazing Capability: In addition to climatic limitations of low growing degree days and short frost-free period on the uplands, this region also has severe soil limitations. The Aishihik, Canyon, and Haeckel soils are coarse textured and have a low moisture holding capacity (Fig. 20). The Haeckel soils have the additional limitations of steep slopes and excessive stones. Because they occur at higher elevations (730 - 800 meters above sea level) the Haeckel soils also have more severe climatic limitations. The short frost free period and low summer temperatures may even reduce the productivity of seeded forages. Aishihik is the only coarse textured soil suitable for growing seeded forages, but productivity will be low because of the very low rainfall in the Whitehorse area. The Croucher and Bear Creek soils are both well suited for growing seeded forages although the climate is too severe for cereals and vegetables.

Fig. 20. This soil is the Canyon Assocation located near Whitehorse. The soil is gravelly and is rated as Class 6M. The productivity of the native grasses is less than 100 kg/ha or marginal for livestock grazing. The trees are lodgepole pine.

The Grazing Capability rating is low (V - VII) for most soils with all soils yielding less than 100 kg/ha.

(d) Potential for Agricultural Development: Except for the 1700 hectares of finer textured soils, this region has no potential for agricultural development. Most soils are either too coarse textured, too steep, or too stony to be considered suitable for agricultural development. The soils with some potential (Bear Creek and Croucher Associations) occur between the Alaska Highway and the Yukon River thus also making them valuable recreational land.

Cowley Lakes - Carcross Region

(a) Location: This region is located on both sides of the Carcross Road between Cowley Lakes and Carcross.

(b) Soil Associations - Materials and Topography: The upland gravelly morainal soils in this region belong to the Haeckel Association and are similar to the soils described in the Whitehorse Region.

The soils in the lower areas are a complex mixture of silty lacustrine (Bennett Lake, Lewes Lake, and Champagne Associations) and coarse textured fluvial deposits (Aishihik and Canyon Associations).

The Champagne Association is a silty clay lacustrine material on nearly level topography.

The Lewes Lake Association is a mixture of Regosols (weakly developed) and Gleysols (wet soils) on high calcareous silt loam lacustrine material. In some cases the parent material contains a significant proportion of marl (calcium carbonate of biologic origin). These areas are level to gently undulating and often appear as semi-open meadows.

Another area of silty lacustrine material is mapped in the Bennett Lake Association. This soil has Brunisolic profiles and a silt loam surface texture. It usually occurs on undulating to hummocky topography associated with sandy fluvial soils (Aishihik and Klowtaton Associations) above the valley bottom but below the upland morainal deposits.

(c) Soil Capability for Agriculture and Grazing Capability: The upland morainal soils (Haeckel) are Class 5 or 6 because of adverse climate and topography.

The silty lacustrine soils (Champagne, Bennett Lake, and Lewes Lake Associations) and the sandy fluvial (Aishihik) soils are suitable for growing seeded forages. The gravelly Canyon soils are Class 7, or non-agricultural, except where some native grazing is present.

Most of the area has a low Grazing Capability (Class V) yielding about 50 - 100 kg/ha of grazable forages. There are a few scattered areas with higher productivity (100 - 450 kg/ha).

(d) Potential for Agricultural Development: There is no potential for cereal grains and very little for vegetables in this area due to cool summer temperatures and short frost free season. Seeded forages will yield reasonably well on the finer textured lacustrine soils (Champagne, Bennett Lake and Lewes Lake Associations). There is at present some livestock being produced in the region and probably one or two more of these enterprises could be established, with each utilizing the better areas of native grazing and clearing enough land for seeded forages for hay production.

Tagish - Marsh Lake - M'Clintock River Region

(a) Location: This region includes the area from Carcross to Tagish, north along both sides of Marsh Lake and north up the M'Clintock River Valley.

(b) Soil Associations - Materials and Topography: There is approximately the same distribution of soils in this region as in the Cowley Lakes - Carcross Region. The uplands are gravelly or loamy morainal deposits (Haeckel or Watson River Associations), while the lowlands are dominantly sandy (Aishihik), or gravelly (Canyon) fluvial deposits interspersed with scattered silty clay (Champagne) or silt loam (Bennett Lake) lacustrine deposits.

The morainal deposits usually have hummocky and ridged topography and often are moderately stony. Most of the sandy Aishihik soils occur on steep hummocky or ridged topography of which the area near Judas Creek is a typical example. Most of the lacustrine areas are nearly level to gently undulating and often contain large depressional areas consisting of open meadows. There is a small (1000 ha) area of gently undulating, fine textured fluvial (Croucher Association) deposits south of Michie Creek in the M'Clintock River Valley.

(c) Soil Capability for Agriculture and Grazing Capability: This region has a Class 5 climate rating due to cool summer temperatures. Most of the soils will have an Agricultural Capability rating of Class 5. Soils with excessive stones or steep slopes are rated as Class 6 or 7. Since only forages can be grown in this area, it is advisable to plant them on the best soils which are those on the finer textured lacustrine or fluvial materials.

The finer textured soils also have the best native grazing (up to 450 kg/ha) especially those soil areas that include saline soils or wet meadow soils (Fig. 21). The areas with moderate salinity often support very little tree growth and consequently have a much higher native forage yield. This region has a number of open meadows that are presently being utilized for hay production. They yield in excess of 2000 kg/ha of high quality (see Grazing Section) native hay.

(d) Potential for Agricultural Production: Livestock production is at present the main agricultural enterprise in this region. These producers are utilizing native forages for both pasture and hay. This type of enterprise is most likely to succeed because of the low costs involved. Any expansion of the livestock industry in this region will necessitate clearing land to plant forages for hay, as most of the native hayfields have already been utilized. If new land is needed for forage production the best choice would be the very fine sandy loam to silty clay loam textured lacustrine and fluvial soils (Champagne, Bennett Lake, and Croucher Associations). The saline soils should never be seeded to annual crops but left in their native state or seeded to a salt tolerant forage.

Fig. 21. Good growth of grass (800 kg/ha) on a slightly saline soil near the Carcross Road. The dominant species of grass is mat muhly.

Watson Lake Area

Location and Extent

The Watson Lake area is located in map sheet 105A and is sheet 9 in the map set. The total area surveyed is about 332,000 hectares. The communities of Watson Lake and Upper Liard, with a total population of about 1300, lie within the survey area. Both communities are located on the Alaska Highway.

Physiography

The survey area falls within the Liard Plain subdivision of the Northern Plateau Area. The Liard River enters the survey area in the northwest at an elevation of 760 m and flows through the area leaving in the southeast corner at an elevation of 590 m. Many major streams (Frances, Meister, Rancheria, and Little Rancheria) enter the area from various directions and flow into the Liard River. Most streams have deposited extensive gravel deposits before cutting down to their present level. The surrounding morainal deposits rise to elevations of from 750 - 900 meters above sea level.

Summary of Agricultural Interpretations

Soil Capability for Agriculture and Grazing Capability

There are less than 600 hectares in the Watson Lake Area considered to have significant capability for native grazing (Table 26). Approximately 10,000 hectares are rated as Agricultural Capability Class 3 or 4 and suitable for cereals or vegetables. They are all located on the low terraces of the Liard River. A large area of 209,267 hectares of sandy fluvial and morainal soils are rated as Class 5 due to the low moisture holding capacity of the fluvial soils and the low growing season temperatures (low growing degree days above 5°C). These soils are suitable for seeded forages. Approximately 100,000 hectares are rated as Class 7 or not suitable for agriculture due to severe limitations such as topography, low moisture holding capacity or excessive wetness (Table 27).

Soils

Most of the Soil Associations mapped were described previously by Lavkulich (1970). They consist of silty and sandy alluvial soils on the floodplains of the major streams (Farm Road Association) and sandy and gravelly soils on the higher terraces (Sawmill Road and Upper Liard Associations). The upland region consists mainly of gravelly sandy loam morainal deposits (Wye Junction and Tom Creek Associations) and sandy and gravelly fluvial deposits (Watson Lake and Dodo Lake Associations). The Farm Road soils are neutral to alkaline in reaction but all the other soils have quite acid sola (pH less than 5.5).

Climate

The Watson Lake area has a cool climate with a mean annual temperature of -2.9°C. The weather station at the airport has a total growing degree day above 5°C of 953 which suggests a Class 5 climatic rating. Most of the upland areas have a Class 5 climatic rating due to low growing degree days. Because of the low summer temperatures, cereals crops and vegetables would be slow to mature and would be subject to fall frosts before fully ripening. The floodplains of the Liard River, because of their lower elevation, are regarded as having a climate suitable for coarse grains and most cool season vegetables. The season is still to short for wheat, corn or tomatoes without some protection against frost.

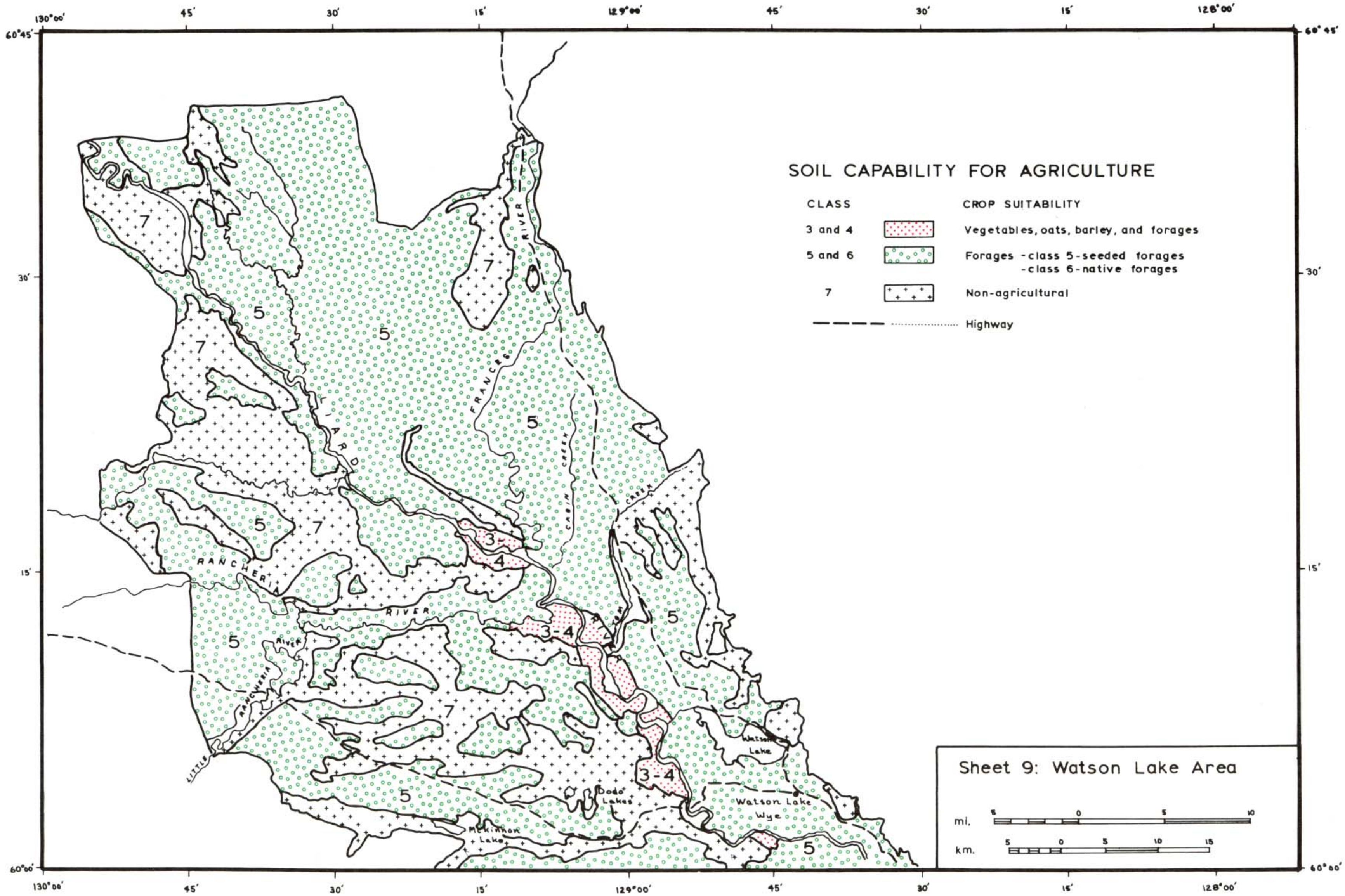

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Table 24. Acreage of Map Units, Associations, and Complexes in the Watson Lake Area.

Map Units, Associations and Complexes	Acres	Hectares	% of total
Alluvium	5192	2103	0.7
D1	51077	20686	
Dodo Lakes	51077	20686	6.2
Fm1	21378	8658	
Fm2	3034	1229	
Fm3	1979	802	
Fm4	15458	6260	
Fm5	355	144	
Farm Road	42204	17093	5.2
False Pass Creek	43196	17494	5.3
Hillwash	28829	11676	3.5
Sr1	108592	43980	
Sr2	12252	4962	
Sawmill Road	120844	48942	14.7
Tc1	156640	63439	
Tc2	54428	22043	
Tc3	11692	4735	
Tom Creek	222760	90217	27.2
Tributary Floodplain	38573	15622	4.7
Up1	16978	6876	
Up2	18411	7456	
Up3	7997	3239	
Up4	4056	1642	
Up5	4363	1767	
Upper Liard	51805	20980	6.3
Wk1	8563	2368	
Watson Lake	8563	3468	1.0

Map Units, Associations and Complexes	Acres	Hectares	% of total
Wy1	89844	36387	
Wy2	121	49	
Wy3	37005	14987	
Wy4	43100	17456	
Wy5	1381	559	
Wye Junction	171451	69438	20.9
Water	35109	14219	4.3
Total	819603	331938	

Table 25. Acreage of Capability Classes and Subclasses in the Watson Lake Area.

Classes and Subclasses	Acres	Hectares	% of total
3CH	9733	3942	
3CH 5M	1156	468	
Total Class 3	10889	4410	1.3
4M	7568	3065	
4M 7M	7338	2972	
Total Class 4	14906	6037	1.8
5CH	154888	62730	
5CH 5W	124077	50251	
5TE	4323	1751	
5TE 5W	10741	4350	
5TP	549	222	
5M	89248	36145	
5M 5W	4380	1774	
5M 7M	11976	4850	
5M 7W	573	232	
5MP	20049	8120	
5W	62257	25214	
5W 7W	17823	7218	
5W 7T	1270	514	
5W 7I	5741	2325	
5W 5M	3159	1279	
5I 7T	5659	2292	
Total Class 5	516713	209267	63.1
6MP	659	267	
Total Class 6	659	267	0.1
7M	102258	41414	
7M 7W	1057	428	
7M 5M	2821	1143	
7MT	8005	3242	
7MT 7W	5214	2112	
7MP	10552	4274	
7W	21841	8846	
7W 7M	4681	1896	
7W 5M	17109	6929	
7T	39485	15991	
7T 7I	3034	1229	
7T 7R	10357	4195	
7TP	646	262	

Classes and Subclasses	Acres	Hectares	% of total
7TE	10843	4391	
7I 7W	2321	940	
7I 7T	1099	445	
Total Class 7	241323	97737	29.4
Water	35109	14219	4.3
Total Area	819599	331937	

Table 26. Acreage of Grazing Classes in the Watson Lake Area.

Class	Acres	Hectares	% of total
IV-VII	315	128	.04
V	184	75	.02
V-VII	659	267	.08
VII-V	624	253	.08
VII	782702	316994	95.5
Water	35109	14219	4.3
Total	819583	331936	

Table 27. Description and Agricultural Capability of Soil Associations in the Watson Lake Area

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Dodo Lake	well to poorly drained, gravelly fluvial deposits	steep hummocky and pitted uplands	7T
False Pass Creek	fibric and mesic organic deposits		7W
Farm Road	well to poorly drained alluvial deposits	nearly level floodplain of the Liard River	3M, 5M
Sawmill Road	well to poorly drained, sandy and gravelly fluvial deposits	nearly level to undulating high terraces of the Liard River	5M, 7M
Tom Creek	well to poorly drained, gravelly loam morainal deposits	undulating to ridged uplands	5CH
Upper Liard	well to poorly drained, gravelly fluvial deposits	nearly level middle terraces of the Liard River	7M, 5M
Watson Lake	well to poorly drained, gravelly fluvial deposits	hummocky uplands	5M, 7M
Windid Lake	poorly drained, silty lacustrine deposits	undulating uplands	5W
Wye Junction	well to poorly drained, gravelly loam morainal deposits.	hummocky to ridged uplands	5CH

The summer precipitation is about 25% higher than other areas in the southern Yukon.

Agricultural Potential

There are about 10,000 hectares capable of growing feed grains and 200,000 hectares that can be seeded to forages. However there is less than 600 hectares that can be utilized for native grazing and no significant areas of native hay. A livestock industry will require expensive clearing and breaking operations to provide all the pasture and hay lands. At the present time an Outfitter is growing oats-hay to feed his horses (Fig. 22). It is probably only this type of operation with high cash returns that can afford the high costs of bringing land into production in this area.

Fig. 22 . Crop of oats growing on Watson Lake soils.

Regional Agricultural Interpretations

Floodplains and River Terraces

(a) Location: This region includes all floodplains and terraces of the major rivers, namely Liard, Frances, Meister and Rancheria Rivers.

(b) Soil Association - Materials and Topography: All of the soils in this region are of fluvial origin, mostly sandy and gravelly. The soils on the floodplains are mapped in the Farm Road Association and consist dominantly of loamy sand to very fine sandy loam over sandy and gravelly fluvial deposits. All of the Farm Road soils are weakly developed and are classified mostly as Orthic and Cumulic Regosols. The topography, characteristic of floodplain deposits, is channelled and terraced.

The Upper Liard Association includes the well drained sandy and gravelly soils on the lower and middle terraces just above the floodplains. The topography is sometimes undulating, but most often is slightly terraced or channelled. The surface texture is usually sandy loam to gravelly loamy sand.

The soils on the high terraces were mapped in the Sawmill Road Association. The texture of these soils are dominantly loamy sand to sand, although some areas tend to be gravelly. The topography is dominantly undulating to hummocky with slopes 2 - 9 percent.

(c) Soil Capability for Agriculture and Grazing Capability: The Farm Road soils are in a Climatic Class 3 area while the Upper Liard and Sawmill Road soils are in a Class 5 climatic area due to low growing season temperatures associated with their higher elevations. The Farm Road very fine sandy loam and silt loam soils are Agricultural Capability Class 3 with the main limitation one of low growing season temperatures.

The fine sandy loam and sandy loam soils are Class 4, the loamy sand soils Class 5 and the gravelly soils Class 7 all because of a low moisture holding capacity. The Class 3 and 4 soils are suitable for growing cereals and vegetables, the Class 5 are suitable for forages while the Class 7 are non-agricultural. The Sawmill Road and Upper Liard soils with sandy loam or loamy sand surface textures are Class 5 while the gravelly soils are Class 7 (Fig.23). The main limitation, in addition to climate mentioned previously, is the low moisture holding capacity of the sandy and gravelly soils.

There are only 723 hectares on some Sawmill Road and Upper Liard soils with any significant native grazing. The productivity is less than 100 kg/ha.

(d) Potential for Agricultural Development: There is not much potential for developing a livestock industry in this region because there is very little native grazing or native hay. The best soils in the region for forages or cereal production are the Farm Road soils. These soils also are very productive for forestry and are presently being harvested for lumber production (Fig. 24). Some of the Sawmill Road and Upper Liard soils could be seeded to forages, but their low productivity would not justify the high clearing costs involved. Market gardens would be feasable on the Farm Road soils near the river.

Upland Fluvial and Morainal Region

(a) Location: This region includes the morainal uplands and fluvial deposits not associated with major streams but of glacial origin.

(b) Soil Associations - Materials and Topography: The morainal deposits are composed dominantly of a loose, gravelly sandy loam till over

Fig. 23. Gravelly fluvial deposits near Watson Lake. Although the pine stand is fairly open, there is no native grazing. This site is rated in Agricultural Capability Class 7M.

Fig. 24. Lumbering on the floodplain of the Liard River upstream from Watson Lake. This soil belongs to the Farm Road Association. If it has a silt loam surface texture, it will have an Agricultural Capability Class 3.

a compact till (Lavkulich, 1970). The morainal soils are separated into two associations. The upland soils south of the Liard River are dominantly well drained Brunisols and are mapped in the Wye Junction Association. The upland soils in the northern part of the area are dominantly Gleyed Brunisols and Rego Gleysols - peaty phase (wet soils) and are mapped in the Tom Creek Association. The Tom Creek soils may be slightly finer textured in the lower solum thus causing the formation of wetter soils (Lavkulich, 1970). The topography is hummocky and ridged with slopes from 5 - 30%. Some of the Wye Junction soils have very fine sandy loam to silt loam surface layers.

The upland fluvial soils mapped near the town of Watson Lake belong to the Watson Lake Association. It is a gravelly soil with variable thickness of sandy loam to silt loam surface. The other upland fluvial soil occurs on a steep, hummocky, pitted outwash plain west of Watson Lake and is mapped in the Dodo Lake Association. These soils usually have loam sand to sand textured sola and very steep slopes (10 - 45%).

(c) Soil Capability for Agriculture and Grazing Capability: Most of this region is in a Climatic Class 5 area with low growing season temperatures. There are a few local areas of Class 3 climate near the town of Watson Lake and north of the Lake (Watson Lake). The Wye Junction and Tom Creek soils with slopes less than 16% are Class 5 and suitable for forages but the main limitation is one of wetness. Soils with slopes greater than 16% are Class 7 or not suitable for agriculture. The Watson Lake soils with a silt loam surface layer are Class 5 while the coarser textured soils are Class 7. All of the Dodo Lake soils are Class 7 due to steep slopes and very low moisture holding capacity.

(d) Potential for Agricultural Development: The only agricultural activity in the region is annual oat hay production north of Watson Lake and small gardens in the town. Forage production would do well on the Wye Junction and Tom Creek soils and on some of the finer textured Watson Lake soils. In all cases the cost of bringing the land into production is high. None of the soils have any potential for native grazing.

Snag Area

Location and Extent

The Snag area is located in Map Sheet 115K in the southwestern corner of Yukon (sheet 10 of map set). The western edge of the survey area extends from the settlement of Beaver Creek north to Snag Creek, and then east to 14 km beyond the abandoned settlement of Snag. The majority of the area lies south of Snag; the most southerly portion of the area is approximately 20 km from Snag. The total area surveyed covers approximately 59,500 hectares.

The area is serviced almost entirely by the Alaska Highway which skirts the western edge of the survey area. The only other road into the area is James Trail. It extends from mile 1188 of the Alaska highway north as far as Snag. This road is seldom used anymore since the airfield at Snag, the settlement of Snag, and the radio towers north of Snag have been abandoned.

The majority of the area is quite remote. The only settlement in the area is Beaver Creek. It has a population of 106. Beaver Creek is 6 km directly east of Alaska and approximately 32 km southeast of the border crossing along the Alaska highway. Beaver Creek serves primarily as a tourist stop over and highway maintenance camp. The Canadian Customs offices are also located here.

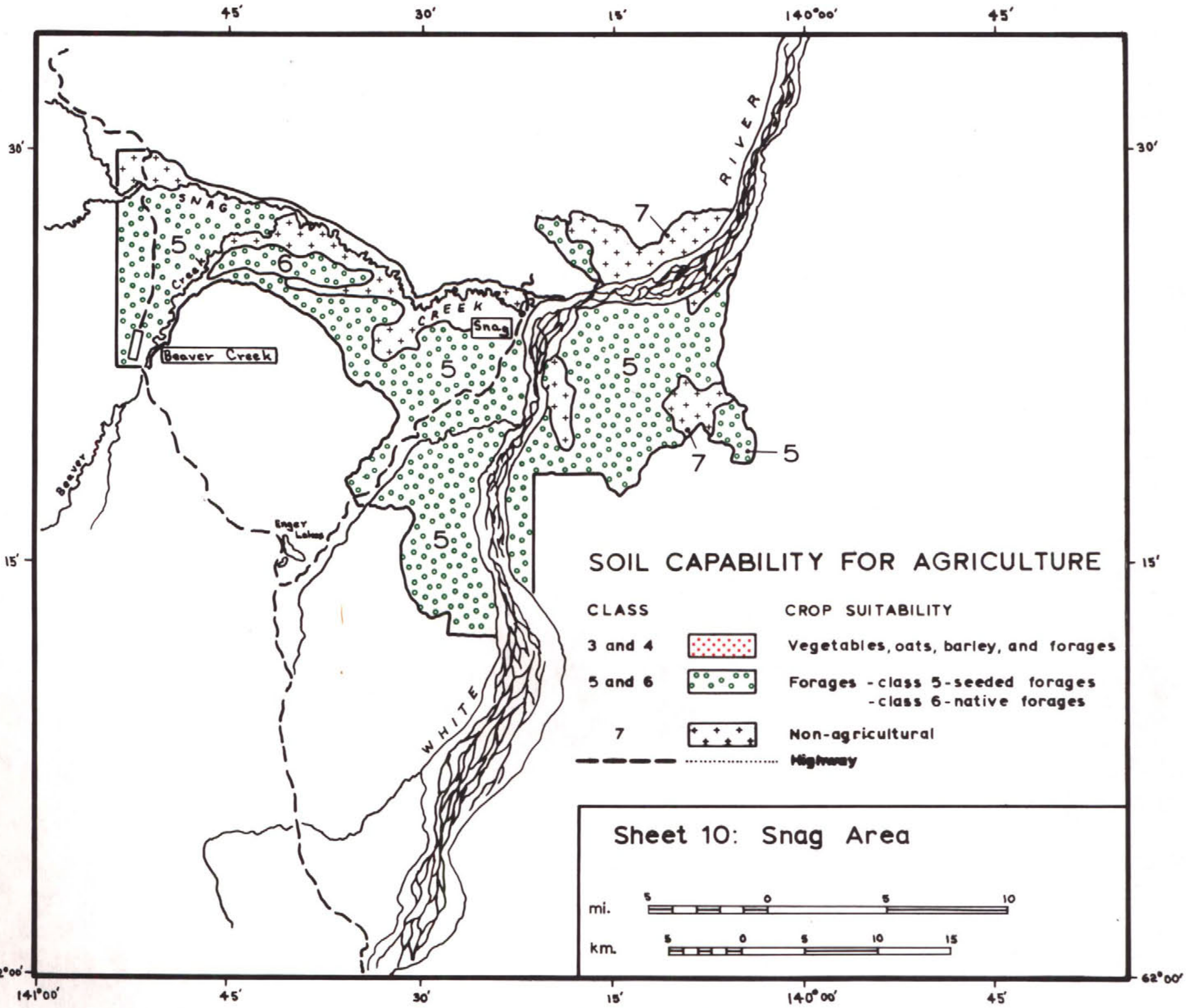
Physiography

The Snag survey area lies entirely within the Wellesley Basin, a subdivision of the Yukon Plateau. The Wellesley Basin is a broad trench whose floor lies between 610 and 760 m in elevation except where it is broken by large bedrock ridges and hills up to 1525 m high. The Wellesley Basin is surrounded by the Klondike Plateau to the north and east, the Kluane Plateau to the south, the Shakwak Valley and Nutzotin ranges to the southwest, and the Alaska border to the west. The basin is drained by the White and Donjek Rivers and their tributaries.

The survey area is located in the northwestern part of the Wellesley Basin. The drainage in this area is accomplished by the White River and its tributaries. In the western part of the survey area the two most important tributaries are Snag Creek and Beaver Creek. Beaver Creek enters the survey area in the southwest and flows northeast until it joins Snag Creek north of the Macauley Ridge. Snag Creek then continues east to its confluence with the White River at Snag. A large part of the broad depression through which Snag and Beaver Creek flow is very poorly drained and is dotted with small lakes or ponds.

The entire central part of the survey area is drained primarily by the White River. There are only two small streams in this area. Dry Creek flows northeast and enters the White River just below the Snag airfield. Lake Creek flows northward along the eastern edge of the survey area until it reaches the White River in the northeast corner of the survey area.

The Snag area is part of an extensive lowland belt. The majority of this area lies below 610 m with some of it reaching an elevation of 670 m. The entire surveyed area exhibits a relief of only 91 m. The northern limit of the survey area is marked by hills that rise up to 823 m. The southern edge of the survey area rests against the bedrock outcrops of the Macauley Ridge, with a maximum elevation of 1077 m. The western and southeastern limits of the survey area have no natural topographic boundaries but continue as part of the lowland belt within the Wellesley Basin.



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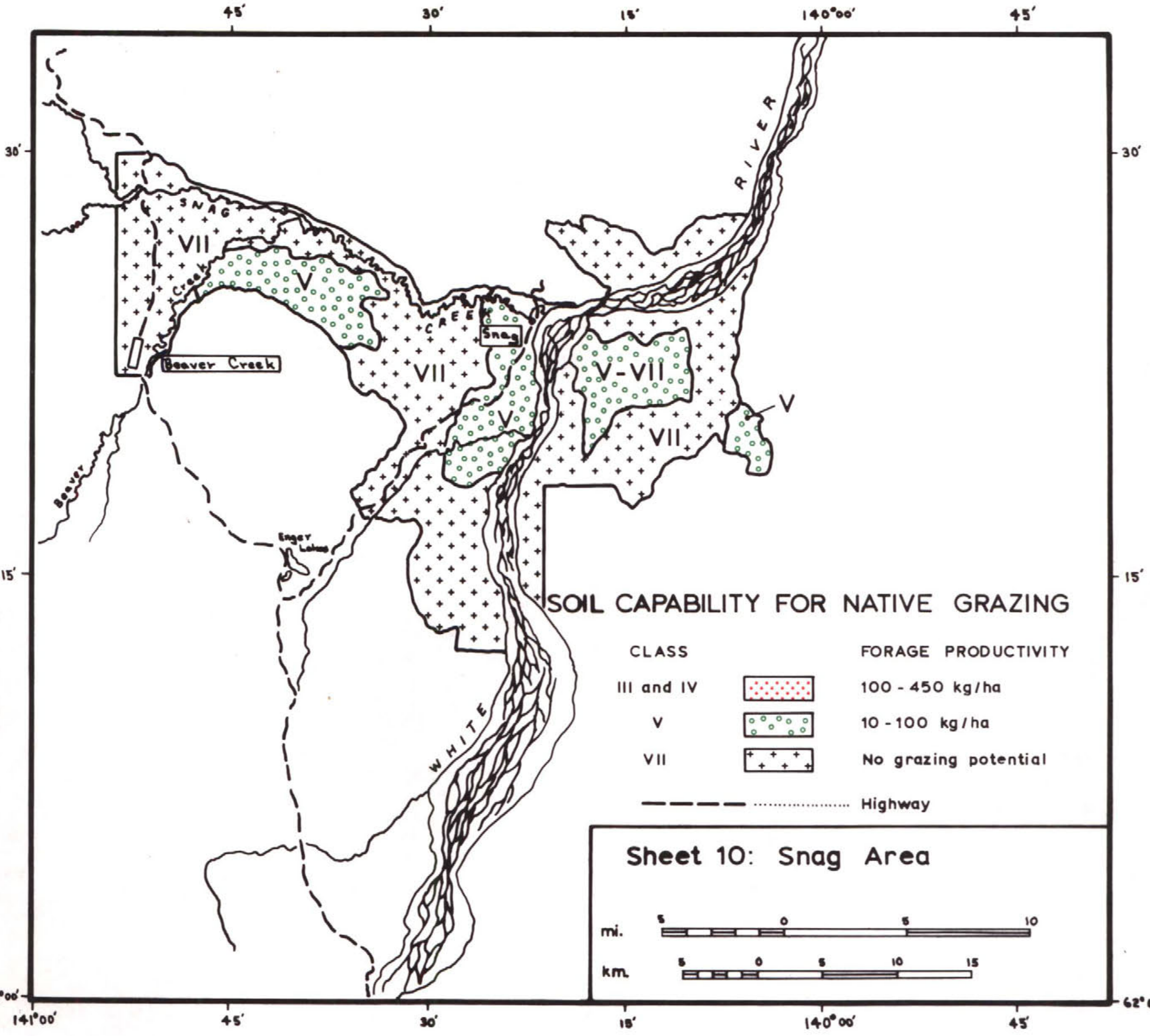

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Summary of Agricultural Interpretations

Soil Capability for Agriculture and Grazing

Because of the cool summer temperatures the best soils in the Snag area can be rated no higher than Class 5 for Agricultural Capability. Approximately 60% of the total area (35,821 hectares) is Class 5 (Table 28), suitable for seeded forage or improved pasture. There is also about 2000 hectares of Class 6 soil, but this can only be used for native grazing. The rest of the area is either Class 7 or water.

Approximately 21% of the total area in the Snag Map Sheet (Table 30) has sufficient grass to provide some native pasture. There is approximately 8,854 hectares with a Grazing Capability of Class V and another 4,020 hectares with a Grazing Capability of Class V-VII. These areas, however, do not provide sufficient grass for sustained grazing. Supplemental feed or improved pasture may have to be used in conjunction with these native pastures.

Soils

A brief description of the soils in the Snag area and their Agricultural Capability ratings are given in Table 31 and the areal extent of each soil association can be found in Table 32.

The majority of the soils in the Snag area belong to the Snag Creek Association (22,502 hectares). These are found on the higher terraces and consist of a thin veneer of silts over gravel. The Beaver Creek soils (6,129 hectares) consist of silts or sand over sand or gravel and are found on the lower terraces along Beaver Creek and the White River. The Beaver Creek soils tend to be quite variable.

Table 28. Acreage of Agricultural Capability Classes and Subclasses in the Snag Area

Classes and Subclasses	Acres	Hectares	% of Total
5M	11099	4492	7.5
5CH	7336	2969	5.0
5M//5W	826	334	0.6
5T/5W	4860	1967	3.3
5CH/5W	4150	1680	2.8
5M//7W	37159	15038	25.3
5CH//7W	1109	449	0.8
5T/7W	10272	4157	7.0
5W/7I	1423	576	1.0
5CH/7W	10276	4159	7.0
Total Class 5	88510	35821	60.2
6W//5M	591	239	0.4
6W//5W	4396	1779	3.0
Total Class 6	4987	2018	3.4
7I	24456	9897	16.6
7T	6603	2672	4.5
7W//5M	5925	2398	4.0
7W//5W	6915	2799	4.7
Total Class 7	43899	17766	29.8
Water	9648	3905	6.6
Total Area	147044	59510	100.0

Table 29. Acreage of Crop Suitability Classes in the Snag Area

Class	Acres	Hectares	% of Total
F	61994	25089	42.2
FP	26825	10856	18.2
P	4987	2018	3.4
N	43591	17641	29.6
Water	9648	3905	6.6
Total Area	147045	59509	100.0

Table 30. Acreage of Grazing Classes in the Snag Area

Class	Acres	Hectares	% of Total
V	21879	8854	14.9
V-VII	9934	4020	6.7
VII	105585	42730	71.8
Water	9648	3905	6.6
Total Area	147046	59509	100.0

Table 31. Description and Agricultural Capability rating of Soil Associations in the Snag Area.

Soil Association	Soil Material	Topography and Location	Agricultural Capability
Snag Creek	well to poorly drained, very fine sandy loam to silty loam eolian veneer over fluvial gravel	undulating to hummocky terraces in the Beaver Creek and White River Valleys	5M, 7W
Beaver Creek	well to poorly drained loamy sand to silty loam over fluvial sand or gravel	level to undulating or channelled terraces and floodplains along Beaver Creek and the White River	5CH, 5W, 7W
Enger Lakes	well to poorly drained loamy morainal deposits	hummocky to undulating and rolling uplands	5CH, 5W, 7W
Mirror Creek	well to poorly drained, fine sandy loam to silty loam eolian veneer over morainal deposits	undulating and inclined uplands	5CH, 7W
Wolf Creek	well to imperfectly drained very fine sandy loam to silty loam eolian deposits	hummocky uplands along the White River	5T, 7T

Table 32. Acreage of Map Units, Associations, and Complexes in the Snag Area

Map Units, Associations and Complexes	Acres	Hectares	% of Total
Bv1	2380	963	1.6
Bv2	11311	4578	7.7
Bv3	1109	449	0.8
Bv4	344	139	0.2
Beaver Creek	15144	6129	10.3
Es1	1111	450	0.8
Es2	9458	3828	6.4
Es3	2770	1121	1.9
Es4	15545	6291	10.5
Enger Lakes	28884	11690	19.6
Mi1	1345	544	0.9
Mi2	1766	715	1.2
Mi3	2175	880	1.5
Mirror Creek	5286	2139	3.6
Sn1	3184	1289	2.2
Sn2	37159	15038	25.3
Sn3	4866	1969	3.3
Sn4	3876	1569	2.6
Sn5	6516	2637	4.4
Snag Creek	55601	22502	37.8
Wr1	6603	2672	4.5
Wolf Creek	6603	2672	4.5
Alluvium	8803	3562	6.0
Tributary Floodplain	17076	6911	11.6
Water	9648	3905	6.6
Total Area	147047	59510	100.0

The upland soils consist of morainal and eolian materials. The morainal soils (11,690 hectares) belong to the Enger Lakes soil association. The Wolf Creek soils (2,672 hectares) are eolian and the Mirror Creek soils (2,139 hectares) are shallow eolian deposits over morainal.

Climate

The Snag area has a relatively cool climate compared to other parts of the Yukon. The winters are long and cold, and the summers are warm but short. The January mean at Snag is -28^{o}C and the July mean is 14^{o}C. Spring and fall seasons are very short. The mean annual precipitation at Snag is 360 mm. About 182 mm of this precipitation occurs during June, July, and August.

Due to the short frost free period and the relatively cool summer temperatures in the Snag area, only forage crops might be grown with any degree of success. With the exception of private gardens there has been no agricultural enterprise attempted in this area. Permafrost is very common in almost all the low areas or where there is a thick insulating cover of moss under the trees.

Agricultural Potential

There are about 35,000 hectares suitable for growing seeded forages or improved pasture. Approximately 10,000 hectares of this land already has some native grass that could be grazed. It may be possible to establish a small livestock enterprise which could utilize the native forages in conjunction with higher yielding seeded pastures. There is also an additional 2000 hectares of land that could be used for native range but which is not suitable for seeded forage. These areas are all densely treed, so the cost of clearing and breaking would be high and may deter any agricultural development.

Regional Agricultural Interpretations

Beaver Creek Region

(a) Location: This region includes the land between Beaver Creek and Snag Creek, and north of Macauley Ridge.

(b) Soil Association - Materials and Topography: The soils in this region are developed on the floodplain deposits of Beaver Creek.

The higher terraces are mapped in the Snag Creek Association. These soils consist of a thin veneer of very fine sandy or silt loam material, 15 to 25 cm thick, over coarse fluvial gravels (Fig. 25). This veneer is usually reddish-brown and is non-calcareous. It may grade sharply into the coarse gravels as in Fig. 25, or there may be more commonly a second layer, 15 to 20 cm thick, of stony or gravelly material with a fine sandy loam to silt loam matrix.

Fig. 25. An Orthic Eutric Brunisol with 20 cm of fine sandy loam to very fine sandy loam material over gravel. This soil belongs to the Snag Creek soil association. The transition into the gravels is very distinct; usually this boundary is less distinct in which case there would be a stony or gravelly layer within a finer matrix between the eolian veneer and the gravel.

The soils on the lower terraces are mapped in the Beaver Creek Association. These soils usually consist of sandy to silty fluvial deposits over sand or loamy sand. Occasionally gravel is encountered within the control section. The surface texture is quite variable, but is usually a fine or very fine sandy loam or silt loam. These soils are often imperfectly to poorly drained and are frequently frozen.

The topography in this region is quite gentle. The higher gravel terraces are usually level to gently undulating. The lower terraces are level to gently undulating or channelled. In either case, the slope seldom exceeds 5%.

(c) Soil Capability for Agriculture and Grazing Capability: Most of the Snag Creek soils in this region are well drained. They have an Agricultural Capability rating of Class 5 with low moisture holding capacity as the main limitation. These soils are suitable for seeded forage.

Over half of the Beaver Creek soils in this region are very poorly drained and are usually frozen. These soils have an Agricultural Capability rating of Class 7 with wetness as the main limitation. The rest of the Beaver Creek soils in this region have an Agricultural Capability rating of Class 5 with cool summer temperatures as the main limitation. These soils are also suitable for seeded forage.

There is very little potential grazing in this area. All of the Snag Creek soils in this region have no grazing and only one small area of Beaver Creek soil has a Grazing Capability of Class V.

(d) Potential for Agricultural Development: The Agricultural potential of this region is very limited. The better soils are only

Fig. 26. A typical aspen stand found on many of the well drained Snag Creek soils located on the higher terraces along Beaver Creek and White River. This particular aspen stand is regenerating to white spruce. The photo was taken along a fire break west of Beaver Creek.

Fig. 27. Black spruce forest located on a lower terrace along Beaver Creek. Photo taken just below the escarpment southeast of Beaver Creek. Note the higher elevation of the Macauley Ridge in the background.

suitable for seeded forage. The only area with any grazing is inaccessible and usually too wet to be grazed. It may be possible to develop a small livestock industry near Beaver Creek, but it would be necessary to use improved pasture in the summer and seeded forage for winter feed. An alternative venture might be to provide forage for outfitters or other livestock industry elsewhere. Even though this area is rather remote it is on the Alaska highway, so forage products could be shipped out.

The well drained soils are all densely treed so clearing and breaking would be very expensive. This may deter any agricultural endeavor. There are good stands of white spruce on some of the lower terraces. These areas should not be broken but left in forest production.

Snag Region

(a) Location: The Snag Region includes the area west and south of Snag, between Macauley Ridge and the White River.

(b) Soil Association - Materials and Topography: The majority of the soils in this region are developed in sandy and gravelly fluvial deposits. These soils are mapped in the Beaver Creek and Snag Creek Associations and are the same as described for the Beaver Creek Region.

In addition, some of the soils in this region are developed in moderately calcareous morainal deposits. Most of these have a very fine sandy loam to loam surface texture and a loam to clay loam subsoil texture. These deposits form the parent material of the Enger Lakes Association. In other areas there is a veneer of fine sand or silt over the morainal deposits. These soils are then mapped in the Mirror Creek Association.

The thickness of this veneer is variable but it is generally between 30 and 80 cm.

The Mirror Creek and Beaver Creek soils in this area are usually developed on gently undulating topography. Some of the Beaver Creek soils are channelled. The Snag Creek soils in this area are somewhat rougher than they were in the Beaver Creek Region. The topography is gently undulating to hummocky, with some of the slopes exceeding 10%. The Enger Lakes soils are rolling and hummocky. These morainal deposits have gentle (6 to 9%) and moderate (10 to 15%) slopes.

(c) Soil Capability for Agriculture and Grazing Capability: The Agricultural Capability rating of most of the Enger Lakes, Beaver Creek, and Mirror Creek soils in this region is 5CH. The main limitation of these soils is the cool summer temperatures. The Snag Creek soils are rated 5M with low moisture holding capacity as the main limitation. All of these soils are only suitable for seeded forages.

A few of the Mirror Creek and Beaver Creek soils and several of the Snag Creek soils along James Trail have a Grazing Capability rating of Class V. These areas are producing between 10 - 100 kg/ha of palatable forage.

(d) Potential for Agricultural Development: The Snag Region is probably one of the most promising for agricultural development in the Snag map sheet area. Most of the well drained soils in this area are located along James Trail. These are suitable for seeded forage or improved pasture. There are also some relatively large areas of well drained land with some grazing potential. In addition, there are a few small low areas (poorly drained) that produce larger amounts of grass and sedge. However, in general, the natural forage production is too low (10 - 100 kg/ha) for sustained grazing, so improved pasture areas or supplemental feed would have to be provided. The climate is generally too severe for grain production, but, some small areas with suitable aspect and relief might be found that could be used for annual grain crops. This area is almost entirely treed so that before agricultural development could take place, the land would have to be cleared and broken.

Lake Creek Region

(a) Location: The majority of the region lies east of the White River, between the White River and Lake Creek. A small portion of the region is located on the opposite side of the White River northeast of Snag.

(b) Soil Associations - Materials and Topography: The majority of the soils mapped in this area are the same as described for the Beaver Creek and Snag regions. The only other Soil Association in this region is Wolf Creek. These soils are calcareous and are either fluvial or eolian deposits. They usually have a very fine sandy loam or silt loam texture. The Wolf Creek soils occur on rather steep hummocky topography (10 to 30%). The Beaver Creek soils occur on level topography, the Snag Creek soils on gently undulating to hummocky topography, and the Enger Lakes soils on rolling or hummocky topography.

(c) Soil Capability for Agriculture and Grazing Capability: The Enger Lakes and Beaver Creek soils have an Agricultural Capability rating of Class 5 with cool summer temperatures as the main limitation. The Snag Creek soils are also Class 5 with a low moisture holding capacity as the main limitation. Class 5 soils are suitable for seeded forage. The Wolf Creek soils in this region are Class 7 because of the steep slopes. Class 7 soils are non-agricultural.

There is very little native grazing in this region. One area had a Grazing Capability of Class V-VII and another of Class V. These areas only produce between 10 and 100 kg/ha of palatable forage.

(d) Potential for Agricultural Development: The only feasible agricultural development for this region would be forage production or livestock. The soils are suitable for seeded forage or improved pasture, however, there is little natural grass. Much of the area is poorly drained. The well drained areas are treed so that the land would have to be cleared and broken. There are no roads into this region so it is relatively inaccessible. Development of any agricultural enterprise in this region would be costly.

ASSESSMENT OF THE GRAZING POTENTIAL

Introduction

From July 15 to August 1, 1976 the grazing values and foraging potential of designated areas in the Yukon Territory were studied in conjunction with a soil survey supervised by Dr. H. Rostad.

For the most part the study was carried out with members of the soil survey group. Instruction was given as to the type of vegetation and an estimate was made of the yield of palatable forage so that a grazing capability could be applied to the map sheets along with the soils information.

Observations and forage clipping were carried out mainly in the settled areas of the Territory. Most of the specific study sites were within 30 kilometers of Whitehorse, close to roads within the designated soil survey area.

Grazing Classification

It was decided to classify the grazing capability according to the total yield of palatable forage. A similar system has been used in British Columbia (Demarchi, 1976).

The following classes were recognized:

Class	Oven dry wt of forage (kg/ha)
I	900 - 1800
II	450 - 900
III	200 - 450

Class	Oven dry wt of forage (kg/ha)
IV	100 - 200
V	10 - 100
VI	too steep (erodable soil)
VII	less than 50

This system has a wide weight amplitude for each class. When estimating carrying capacity from a forage yield a seasonal carry over of 30-40% of the total forage must be assumed. It must be remembered that an animal unit (one mature cow with her calf) requires approximately 300 kg (660 lb) oven dry wt (O.D.W.) of palatable range forage per month (Lodge et al., 1971). She must leave at least 30-40% of the total ungrazed in order to perpetuate the palatable range species.

The yields from the various ranges were measured by clipping all palatable vegetation within a 1 m^2 circle using hand shears. The material from 5 sample plots per site was weighed and a sub sample was saved for the determination of percent dry matter. The material was then ground to pass a 1 mm sieve and the chemical analysis determined. Forage yield for 12 sites and forage quality for 24 sites is recorded in Table 33.

The measured areas were used to relate to other sites where estimates of range class were made.

In making estimates of forage production, the use of palatable browse was not taken into consideration even though it is recognized that cattle commonly utilize browse plants.

In classifying sites and estimating range potential in 1976 it was recognized that it was a single season judgement. It should be noted that forage production in Yukon during 1976 greatly exceeded that which was

Table 33. Forage yield and analysis from selected sites in the Yukon Territory.

Date	Site	Area	Vegetation Type	D.M.[1]% (kg/ha)	C.P.[2]	%Ca	%P	%Mg	%K	ppm Zn	ppm Mn	ppm Cu
July 15	15-4	Lorne Siding	Fes Alt Cal pur	74	8.8	0.78	0.24	0.17	1.03	13.7	92.5	1.7
July 17	17-1	Lewes Lake	Fes ov, Agtr, Cal pur (Dry)	224	10.3	0.86	0.17	0.02	1.33	20.6	20.0	1.6
July 17	17-3	Lorne Siding	Muhl rich (Dry)	820	7.5	0.36	0.14	0.15	0.62	12.5	46.2	0.7
July 19	19-1a	Takhini Bend	Ag yuk	238	9.8	0.51	0.21	0.17	1.64	12.5	52.5	0.7
July 19	19-1b	Takhini Bend	Fes ov, Cal bur	206	7.1	0.42	0.14	0.14	0.71	11.5	58.1	0.6
July 19	19-2	Takhini Bend	Jun arct, Fes brack, Ag tr, Poa	380	8.2	0.56	0.17	0.21	1.33	17.9	60.0	2.9
July 19	19-3	Kusawa burn	Des caes, Poa, Ep ang	570	7.8	0.47	0.22	0.18	1.33	12.5	20.0	1.6
July 19	19-5	Aishihik										
July 19	19-5	Aishihik	Ag yuk	170	12.1	-	-	-	-	-	-	-
July 21	21-1	Lorne Mtn	Fes alt	263	8.6	0.51	0.19	0.06	1.12	12.6	96.6	0.6
July 21	21-3	Carcross	Des caes	730	6.4	0.30	0.11	0.11	0.84	20.0	15.0	1.0
July 22	22-2	Annie L. Rd	Cal pur, Fes alt	223	9.6	0.66	0.16	0.06	1.23	17.4	81.2	1.0
July 23	23-2	Harder Meadow #1	Poa, Ag tr, C ath, Arnica sp.	2138	10.7	0.56	0.24	0.07	1.71	31.6	39.1	5.1
		<u>Samples for Analysis only</u>										
July 15	15-5	Carcross Hay	Pucc nut		11.0	0.30	0.21	0.13	1.47	23.7	8.7	5.1
July 15	15-5	Carcross Hay	Cal in, C aquat		10.4	0.27	0.12	0.17	0.37	15.2	115.0	0.7
July 19	19-6	Takhini	Brome (cultivated)		7.8	0.41	0.18	0.17	1.47	14.7	38.7	0.6
July 23	23-3	Harder Meadow #2	C rost, <u>Poa</u> sp, <u>Glycera</u> sp.		12.3	0.41	0.27	0.15	1.89	27.1	82.5	2.7
July 24	24-3	Nares Mtn	Fes alt, <u>Poa alpina</u>		10.2	0.41	0.13	0.04	0.71	15.2	183.1	0.5
July 24	24-4	Lorne Mtn	Fes alt		10.0	0.37	0.18	0.05	1.10	20.6	172.5	0.6
July 24	24-5	Talley-Ho Mtn	Fes alt		10.5	0.47	0.17	0.06	1.63	31.2	203.7	0.6
July 27	27-1	Dawson	Brome (cultivated)		10.9	0.67	0.15	0.13	1.23	34.7	33.7	3.9
July 27	27-2	Indian River	Brome (cultivated)		10.7	0.69	0.12	0.16	1.30	33.7	75.0	3.9
July 29	29-1	Pelly Crossing	Br pum, Cal pur		9.7	0.60	0.21	0.07	1.60	11.2	81.9	0.63
July 29	29-4	Von Wilzek L	<u>Poa</u> pal, Jun arct		7.4	0.27	0.15	0.29	1.10	10.0	130.0	3.6
Aug 9	9-1	Toole Ranch Watson L	<u>Oats</u> (green)		10.0	0.34	0.37	0.09	2.06	21.4	76.0	2.4

[1]Dry matter [2]Crude protein

observed in 1974. There is a clear indication that available moisture made the difference. This fact was considered in making estimates of grazing capacity and the placement of range areas into the various seven categories.

Over the survey area in Yukon there were definite areas where grazing by domestic stock would offer a feasible land use alternative. For the most part these lay close to centres of population within the designated soil survey areas. These will be dealt with individually indicating their potential and their possible problems.

In addition, some accessible sub-alpine sites were observed. Even though they were not in the designated survey area, they appeared to offer a good summer range potential for livestock

Vegetation and Grazing

Grazing capabilities of areas vary with the degree of tree cover, the species present, the fire history, and the soil type. By and large, most of the Yukon is treed. The forest cover varies in type and density. White spruce (*Picea glauca*) and lodgepole pine (*Pinus contorta*) occur in both pure and mixed stands along with trembling aspen (*Populus tremuloides*). In wet basin areas black spruce (*Picea mariana*) dominates with a moss or Labrador tea (*Ledum groenlandicum*) understory. Such vegetation often signifies the presence of permafrost. Because the region as a whole suffers from drought (less than 300 mm (12 in) annual precipitation), the forest tends to be open and the ground cover of grasses and forbs may be found in varying amounts beneath the trees. Elevation and slope make a difference in ground cover. South-facing slopes are often devoid of trees and produce a true grassland community. North-facing slopes are usually heavily treed. At elevations above 1100 m an open subalpine vegetation is dominant.

Johnson and Raup (1964), have described the vegetation of Southern Yukon. They emphasize the general range of the following seven tree species: lodgepole pine (*Pinus contorta* var. *latifolia*), white birch (*Betula papyrifera* var. *neoalaskana*), black spruce (*Picea mariana*), white spruce (*Picea glauca* var. *porsildii*), balsam poplar (*Populus balsamifera*), and trembling aspen (*Populus tremuloides*). In addition to these trees, a few species of willows approach tree size. Willows such as *Salix arbusculoides* and *Salix padophylla* always occur under larger trees. These authors also describe the grasslands of the Dezadeash and Shakwak Valleys. They collected 27 species of grasses, nearly all of them native to the prairies. They claim that 18 of the species have wide ranges in Boreal America and 17 of the 18 extend their range into the Arctic Tundra. The remaining nine are primarily western or north-western American species. Five of these have extensive range in the north-west while the other four are species of Alaska and Yukon. The species that are native to Alaska and Yukon include: *Agropyron yukonense*, *Festuca altaica*, *Agropyron alaskanum*, and *Bromus pumpellianus* var. *arcticus*. The richest of the Dezadeash prairies have a mixture of grasses in their primary flora, some of which are strongly rhizomatus and turf-forming such as: *Agropyron trachycaulum* (var. *trachycaulum*, var. *unilaterale*, and *novae-angliae*), *Festuca rubra*, *Agrostis scabra*, *Trisetum spicatum* var. *molle*, *Hierochloe* odorata ~~*edorate*~~, *Calamagrostis inexpansa* var. *brevior*. Where the soils are better drained *Agropyron yukonense* becomes prominent and some dry prairie species, *Calamagrostis purpurascens*, *Poa glauca*, *Festuca saximontana* are added. On the wetter areas the prairie is often reduced to pure stands of *Hierochloe odorata*, a grass, or *Juncus balticus* var. *littoralis*, a rush. Common flowering herbs are: *Pentstemon procerus*, *Potentilla arguta*, *P. anserina*, *P. diversifolia* var. *glacophylla*, *Polemonium pulcherrimum*, *Hedysarum mackenzii*, *Anemone multifida* var. *hudsoniana*, *Senecio pauperculus*, *Solidago decumbens* var. *oreophila*.

In addition to the above, some meadows are predominantly hairgrass (*Deschampsia caespitosa*). Other important common components are yellow locoweed (*Oxytropis campestris* var. *gracilis*), purple locoweed (*Oxytropis splendens*), blue gentian (*Gentiana glauca*), stonecrop (*Sedum lanceolatum*), and wild flax (*Linum lewisii*). Identification of plants is according to Hulten (1968).

A more detailed description of the grazing capability for the different regions in the Yukon is included in the appendix.

Plant Succession Following Fire:

Wildfire is one of the most important influences on native vegetation in the Yukon. Evidence of fire is seen on almost all areas of the Yukon that have potential for grazing. The flats along the Pelly River, the area west of Whitehorse to the Dezadeash River, land in the valley near Carcross, and the Indian River area all show a recent fire history.

The rapidity with which species are replaced and the species that first come in after a burn depends largely upon the severity of the fire and the availability of coniferous seed. Generally the first stage of succession following a burn in white spruce is a weed stage dominated by fireweed and grasses that are capable of regenerating from root stalks. At the same time willow and aspen may form from some remnant clumps or from individual undamaged underground parts. Five to ten years following a severe burn the area may be dominated by shrubs and deciduous trees. It is this stage where fairly lush ground vegetation of grasses and forbs make the best interim range for both wildlife and livestock. During the early stages of succession beneath the shrubs and protected by them may be found a few small spruce or lodgepole pine if seed trees are found near by. At later stages, 10-20 years after the fire, these evergreens become visible forming an integral part of the tree canopy.

When a hot fire occurs in lodgepole pine, the succession may miss the shrub stage going directly to a dense pine stand. This occurs on lighter soils where the pine was reasonably mature when burnt and where trees had a great many cones to provide a large amount of seed. The seed is released by the fire and falls into the ash layer where it germinates and produces a "dog hair" stand. Such dense stands of pine do not provide much grazing past the 5th year following the fire.

Range Management

Carrying Capacities: The land area was classified according to the amount of grazable forages present during the grazing season. When estimating carrying capacity from a forage yield, a seasonal carry over of 30 - 40% of the total forage must be assumed. One animal unit (one mature cow with her calf) requires approximately 300 kg (600 lb) oven dry wt of palatable forage per month (Lodge et al., 1971). The yield of forage must be high enough that the animal does not need to cover too much ground to obtain her daily feed requirements. The lower limit is considered to be about 100 kg/ha or class IV grazing capability. Class V (10 - 100 kg/ha) can be used as grazing land if it is supplemented by nearby higher yielding areas such as meadows or seeded pasture. The carrying capacities for various classes of grazing land are summarized in Table 34.

Grazing Restrictions: Overgrazing of rangeland should be avoided. Where animals range freely and use the land year round, there is a real danger of changing the species composition of the grassland and producing a range of poor quality. Early spring grazing of palatable grasses will so weaken them that other less desirable, less palatable plants will become dominant.

Table 34. Carrying Capacity for 4 month season.

Class	Wt of forage	Usable forage*	Carrying Capacity
I	900 - 1800/ha	600 - 1200	1 - 2 ha/unit[+] (2.5 - 5 acres/unit)
II	450 - 900	300 - 600	2 - 4 ha/unit (5 - 10)
III	200 - 450	130 - 300	4 - 9 ha/unit (10 - 22)
IV	100 - 200	65 - 130	9 - 19 ha/unit (22 - 44)
V	10 - 100	10 - 65	18 - 120 ha/unit (44 - 300)

*Seasonal carryover of about 30%.

[+]An animal unit made up of one mature cow and her calf.
Each unit requires 1200 kg of forage in the 4 month season.

Some form of management of horses or cattle is necessary to help assure that the ranges are not overgrazed. There must be a time during the year when all public ranges are closed to domestic livestock use. It is suggested that the ranges be open to grazing only from May 15 - October 31. Where cattle are ranged, it would be advisable to institute some means of managing them either by fencing, salting, or riding so that they do not become a menace to traffic along roads or wander onto private lands.

More intensive management might require seeding cool season grasses (Russian wildrye) for early spring grazing and delay grazing the native grasses until 3 weeks after spring growth has started. By delayed grazing, the productivity of the native grasses can be maintained at a higher level. Seeded forages can also supply late fall grazing.

Supplemental Seeded Forages: Livestock production in Yukon will be dependent largely on a supply of local hay for wintering livestock. Most native haylands are already being utilized, so any expansion of the livestock industry will require additional acreage of seeded forages.

Land clearing is costly, therefore those areas that have burnt over or where the land is partially open will more likely be chosen for development before areas containing large standing trees. Standard land clearing methods such as that described in B.C. Department of Agricultural Engineering Branch, Land Clearing in British Columbia, Bulletin No. 73-3 is recommended. This publication also describes tree removal, land breaking, root picking, and land preparation. Prior to seeding, all new land should be soil sampled to determine the plant nutrient status. Any outstanding deficiencies should be corrected by the application of a recommended fertilizer before seeding is commenced.

The recommended varieties of forage to seed are given in Table 40 in the Cropping Practises section. Seeded forage as pasture will be required if the native grazing is class V (10 - 100 kg/ha). Seeded pasture is also recommended for spring and fall grazing.

Annual cereals such as oats are also valuable as a hay crop. A popular annual forage crop in Alaska (Alaska Rural Development Council, 1974) is a mixture of oats and field peas put up as silage.

Acreage Requirements: Livestock enterprises will vary from the subsistence level or hobby farmer with few cattle to a full scale operation with a 100 cow herd.

In order to raise 2 horses and 5 cows, as an example of a hobby level operation, there will need to be at least 14 ha in hay. In addition there would need to be approximately 12 ha of seeded pasture or at least 175 ha of class V native pasture.

A larger operation must have access to fair native grazing (class III or IV) to be economically viable. If such an operation has 100 cows it will require a productive land base of approximately 780 ha. Using the nutrient requirements as given by the National Academy of Sciences (1970) for beef cattle, a 100 cow herd shipping calves would need winter feed of about 1300 kg of hay per day. For a 240 day feeding period the requirement would be 312 tonnes. In addition, for a 125 day grazing period the 100 cow herd (includes 100 cows, 90 calves, 20 heifers, and 5 horses) would require 186,000 kg of forage. If the hayland (seeded forage) could produce 2000kg/ha then approximately 160 ha would be needed for hay. If the grazing land was a mixture of class III and IV with an average productivity of 300 kg/ha (210 kg/ha usable forage) the acreage required would be 885 ha. However an enterprise of this size would probably have two fields of seeded pasture for early spring grazing and late fall grazing thereby reducing the acreage required for both hay and native grazing. The above figures also depend on normal rainfall and other climatic factors. Due to the general lack of hay for sale in the Yukon, a farm operator should always plan on having on hand hay surplus to his annual needs.

Weeds and Poisonous Plants: The Yukon ranges abound in poisonous plant species. These have not been reported as causing problems, however, the grazing pressure, particularly by cattle, has been very slight so poisoning has not occurred. Should grazing become more common, then the number of plants with known poisonous properties that presently occupy some Yukon ranges would, from observations and experiences elsewhere, be sufficient to cause serious losses. It could even be predicted that under even moderate grazing pressure there would be an increase in members of the less palatable poisonous species.

On the open lands and on the lighter soils, poison camas (*Zygadenus elegans*), larkspur (*Delphinium glaucum*), and loco-weed (*Oxytropis campestris*, *O. splendens*), are found in relative abundance. In the forest and in forest opens at higher elevations, larkspur, lupine (*Lupinus arcticus*), and the highly toxic monkshood (*Aconitum delphinifolium*), may be commonly seen.

Other weeds have moved in and are invading waste places. Where animals have been confined and grazing has been excessive, or where ground has been broken and left bare, foxtail barley (*Hordeum jubatum*) seems well adapted, and occupies a majority of roadsides and disturbed ground particularly in southern Yukon along the Alaska Highway. A very serious menace was observed in the form of viper's-bugloss, (*Echium vulgare*). This plant which is a rhizomatus biennial was growing along the Alaska Highway and on the Atshihik road. It was also seen in seeded fields in the vicinity of Cowley Lake. The fields in question had been cleared, roughly cultivated, and seeded to fescue, smooth brome, and alsike clover. The viper's bugloss was well established on the 4 year old clearing and solid patches, where all other vegetation was excluded, were in evidence. These fields will be a source of infection for the rest of the valley because bugloss has a burr-like seed that can be transported by animals. A concerted effort should be made to contain this menace before it becomes too prevalent for any form of control.

A weed that is very conspicuous but seems to be present only in waste places was observed on the roadsides in the Dawson area. Showy knotweed (*Polygonium alaskanum*) was prevalent along the Dawson Highway, seemingly confining itself to the Klondike Valley. It is a vigorous biennial that seems to have weedy tendencies. Even though it was not observed growing in cultivated areas it is suspected that it would have the capability of moving into overused grazing land or pastures if such lands were available. This plant is listed as a native and so does not arouse any serious concern.

Insects: For anyone who has been travelling during the summer in Yukon, it must be clear that the presence of biting and sucking insects is a factor that has a profound influence on the activities of both animals and man.

Mosquitos are found in all locations but are most prevalent along the valleys and near lakes.

Blackflies can be a serious problem in areas traversed by fast-flowing rivers (Fredeen, 1973). Attacks are commonest in May or June, but may recur throughout the summer. Livestock can be seriously affected by blackflies. Milk production and weight gains are less when animals are hyperactive and do not graze properly. In cases of severe attack the livestock should have access to darkened shelters.

No surveys have been conducted in the Yukon to determine the severity of the blackfly problem and its possible effect on livestock production.

Leasing Policy: Because of the various types of users, any grazing policy will have to be flexible enough to satisfy both the small and large operator.

It is therefore recommended that the granting of grazing privilege on crown land should be based on the following:

1. Establishing a period of range use, either for the whole territory or for portions of the territory, with regards to cattle or horses; and the establishment of an equitable fee structure so that grazing management can be controlled on specific range areas. This cannot be done arbitrarily but must be accomplished in committee with the permittees or livestock owners.

2. A range survey of the range in question so that a carrying capacity may be set, and so that overstocking will not be attempted, and any conflicts with other land use interests will be resolved to mutual satisfaction. The currrent soil and grazing reconnaisance may be sufficient to start with, but more detailed inventory may be needed for some areas.
3. The ability of the livestock owner to winter and care for the animals he owns. This is referred to as being commensurate and should include an adequate winter feed supply along with land and buildings sufficient to house and handle the livestock. Animals left on grazing lease year-long should not be tolerated.

For those people with small numbers of livestock and for those who do not have grazing on deeded land, it is suggested that a facility, similar to the prairie community pasture, be established. This area would be chosen in a favoured location, properly fenced, and managed, so that all animals which now run freely on unfenced leases could be controlled.

Soil Fertility

To determine their fertility level soils were sampled in many cultivated field locations throughout the Yukon. The samples were taken at arbitrary depths from 10 or more sites within the field unit and the samples from each depth were composited. The samples were dried immediately and analyzed by the Saskatchewan Soil Testing Laboratory using the standard techniques.

In addition, soil profile samples were also analyzed by the same method to provide more extensive information.

The laboratory data for both sets of samples appears in Table 38 and the following discussion will provide the interpretation for each of the measurements made.

pH

Soil pH is a measure of the acidity or alkalinity of soils. Acid soils frequently result in poor production due to unavailability of certain plant nutrients and toxicities of other elements.

Acid soils are normally corrected by additions of lime. Significant differences exist between crops in their ability to produce at a satisfactory level in varying degrees of soil acidity. Interpretive criteria based on extensive research work in the Peace River region is provided in Table 35.

Soils in the Whitehorse, Takhini - Dezadeash, Pelly Crossing, and Carmacks areas have near neutral pH values and would not require lime applications for the production of any crops.

In all other areas some acid soils do occur. The most strongly acid soils occur in the Dawson - Stewart Crossing - Mayo area. Certain

Table 35. Interpretation of pH measurements.*

pH	Acidity Rating	Effects on Crops
6.0-8.0	Near Neutral	No significant effects.
5.5-6.0	Medium	Yields of nontolerant crops (alfalfa and sweet clover) are reduced.
5.0-5.5	Strong	Yields of alfalfa severely reduced and yields of other crops (wheat, barley and rapeseed) reduced to some extent.
4.5-5.0	Very Strong	Alfalfa barely grows. Yields of wheat, barley and rapeseed severely reduced and yields of all other crops reduced to some degree.

*This table adapted from Hoyt, P.B., Nyborg, M. and Penney, D.C. 1974. "Farming Acid Soils in Alberta and Northeastern B.C." Agric. Can. Pub. No. 1521.

soils in this area may require lime applications, particularly for successful production of legume crops. It is likely that for grass crops and cereal grains a reasonable level of production might be obtained on all but the most strongly acid soils without lime application. It is not likely that lime applications would be made unless a relatively inexpensive source of a liming material became available. (Limited marl ($CaCO_3$) deposits are present in the Mayo and Whitehorse areas and would be suitable liming material.)

Soil Salinity

The soil salinity measurements determine the level of readily soluble salts in the soils. High concentrations of soluble salts in soils interfere with plant uptake of water and nutrients. Interpretive criteria for the salinity measurements appear in Table 36.

Soils in the Watson Lake and Faro - Ross River areas are essentially free of salts. Minor amounts of salinity occur in some members of the Sunnydale soil association in the Dawson area and in the Champagne soils in the Whitehorse and Takhini - Dezadeash area. These levels of salts should present little problem to the production of most crops.

In the Pelly Crossing Association some soils have moderate salinity levels which could have a serious effect on the production of many crops.

Soil salinity is one of the most difficult problems to correct in that there are no chemical amendments that can be added to alleviate the effects of the salt. Even in areas of highly developed agriculture where all production inputs are readily available, soil salinity is at best very difficult to correct. The only known means to correct a salinity

Table 36. Interpretation of salinity measurements.

Salinity level (mmhos/cm)	Texture	Salinity Rating	Effects on Annual Crops	Effects on Forage Crops
0-1.2 0-1.3 0-1.4	I* II III	Non-saline	No significant effects	No significant effects
1.3-2.4 1.4-2.5 1.5-2.8	I II III	Slightly saline	Wheat, oats and flax slightly affected	Red clover and timothy not tolerant. Alsike and reed canary slightly tolerant
2.5-4.7 2.6-5.0 2.9-5.7	I II III	Moderately saline	Barley and rapeseed slightly affected	Crested and intermediate wheatgrass fairly tolerant. Sweet clover and alfalfa tolerant but difficult to establish
4.8-9.4 5.1-10.0 5.8-11.4	I II III	Severely saline	Most annual crops not tolerant	Bromegrass, Russian wild rye and slender wheatgrass tolerant
9.5+ 10.1+ 11.5+	I II III	Very severely saline	Annual crops not tolerant	Tall wheatgrass tolerant

*I = coarse textured soils (sands to sandy loam)
II = medium textured soils (loam to clay loam)
III = fine textured soils (clay and heavy clay)

problem is to install an underground drainage system and then apply large quantities of irrigation water to leach out the excess salt. This operation would be clearly impossible under agricultural conditions in the Yukon.

Any future development involving clearing of land in the Yukon should avoid areas with even moderate salinity levels. Under cultivation and particularly where summerfallow is practiced, salinity levels frequently increase and can very quickly put an area out of agricultural production.

Nitrogen

Most of the total nitrogen in any soil is tied up in the organic form and is not available for plant growth. It is only upon biological action that the nitrogen is released into the available nitrate or ammonium form.

The data in Table 37 provides the interpretive criteria for nitrate nitrogen levels. It is important to note that this interpretive criteria is as it applies to Saskatchewan conditions. For nitrogen (and the other nutrients measured) it is likely that even higher soil levels would be required under Yukon conditions to provide sufficient nutrients for crops.

In preparing this report the Alaskan literature was reviewed and soil test benchmarks from Alaska were obtained. The experience in Alaska would agree with the theory that climatic conditions in the Yukon would lead to higher required soil levels of nutrients than in prairie conditions.

A wide range of nitrogen levels were measured in the Yukon soils. Nitrate nitrogen was low in all of the profile samples obtained. Some

Table 37. Soil test benchmarks for Saskatchewan condition.

NO_3-Nitrogen lbs/acre in 0-24"	Rating	Available* Phosphorus lbs/acre in 0-24"	Rating	Available* Potassium lbs/acre in 0-24"	Rating	SO_4-Sulphur lbs/acre in 0-24"	Rating
0 - 15	VL	0 - 10	VL	0 - 60	VL	1 - 16	L
16 - 30	L	11 - 15	L	61 - 120	L	17 - 32	M
31 - 45	M	16 - 20	M	121 - 180	M	32+	H
46 - 50	H	21 - 30	H	181 - 240	H		
		31 - 40	VH				

VL - very low, L - low, M - medium, H - high, VH - very high.

*As measured by a sodium bicarbonate extraction.

Table 38. Fertility Data

Dawson - Stewart Crossing - Mayo Area

General Description		Lab No.	Sample Depth (inches)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter %
							(lbs per acre)				
Soils developed on	Silt loam	S0513	0-6	Sunnydale	7.3	1.5	42	25	85	24	8.4
sloping terraces	Regosol		6-12		7.2	1.0	13	23	40	24	
above the Yukon	Frozen at 60 cm		12-24		7.1	0.8	20	42	90	48	
River, usually	(June, 1976)										
calcareous											
	Silt loam	S0516	0-6	Sunnydale	6.8	0.3	7	48	100	24	6.2
	seeded to brome		6-12		7.3	0.3	4	21	50	14	
	grass		12-24		7.5	0.3	4	22	90	19	
	Sandy loam	S0519	0-6	Sunnydale	6.5	0.2	3	17	160	10	6.6
	Hay field		6-12		6.6	0.2	2	10	65	7	
			12-24		6.6	0.2	2	14	100	10	
Floodplain soils of	Gleyed Regosol	S0522	0-6	Klondike	5.9	0.3	4	15	120	24	7.5
the Klondike River.	Recently cleared		6-12		5.9	0.2	2	18	80	24	
May have silty or			12-24		6.2	0.2	6	36	140	48	
sandy layer over											
gravel. Some are	Silt loam over	S0525	0-6	Klondike	6.1	0.6	3	41	135	24	8.6
very wet (gleysols)	gravel (80 cm)		6-12		6.2	1.1	2	30	75	24	
with peaty surface	Regosol - Very		12-24		6.1	0.4	4	44	120	48	
layer. Noncalcar-	old hay field										
eous and acid.											
	Sandy loam over	S0528	0-6	Klondike	5.7	0.3	6	18	300	24	8.6
	gravel (30 cm)		6-12		6.0	0.2	2	10	115	14	
	Recently cleared		12-24		6.4	0.2	4	14	160	18	
	Fine sandy loam	S0531	0-6	Klondike	5.9	0.4	32	22	240	16	7.4
	over gravel				6.0	0.3	26	19	125	13	
	(50 cm)				6.2	0.3	30	32	160	20	
Island in the Yukon River		S0534	0-6	Alluvium	7.0	0.6	24	120	300	21	5.0
Cumulic Regosol			6-12		7.2	0.4	18	84	220	13	
			12-24		7.6	0.3	24	62	320	16	
Alluvial fan in the Indian River		S0537	0-6	Indian River	6.0	0.3	2	18	145	11	7.8
Vallye. Well drained. Very old			6-12		6.9	0.3	1	15	70	9	
pasture.			12-24		6.6	0.3	2	42	150	20	
Fine sandy loam over gravel. High		S0507	0-6	Dry Creek	6.8	0.2	2	26	55	5	1.9
terrace of the Stewart River.			6-12		7.0	0.2	1	23	35	5	
Hay field.			12-24		7.1	0.3	2	34	80	10	
Floodplain soil of the Stewart		S0510	0-6	Stewart	7.4	0.3	7	21	110	11	4.2
River. Silt loam surface. Usually			6-12	Crossing	7.7	0.3	4	12	65	6	
calcareous.			12-24		7.8	0.3	4	14	100	33	

Soil Profiles* - Uncultivated Soils

ppm x 2 = lbs per acre for 6 inch layer of soil

General Description	Lab No.	Sample Depth (cm)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter %
						parts per million (ppm)				
Floodplain of the Klondike River	76-72	0-17	Klondike	5.4	0.3	4	10	90	13+	9.5
Gleyed Cumulic Regosol	76-73	17-34		5.7	0.3	3	10	60	13+	5.2
	76-74	34-50		5.6	0.2	2	9	45	10	
	76-75	50-80		6.3	0.2	3	6	35	5	
Morainal soils on the upland near	76-61	5-0	Two Sisters	5.2	0.4	3	58	450+	55	43.0
Gravel Lake	76-62	0-20		4.9	0.1	2	7	30	1	.7
	76-63	20-51		5.1	0.1	2	9	25	1	.3
	76-64	51-70		5.2	0.1	2	11	30	1	
	76-65	70-100		5.6	0.1	2	12	25	1	
	76-66	4-0	Two Sisters	5.4	0.3	2	41	205	30	26.0
	76-67	0-4		4.8	0.2	2	14	25	4	1.5
	76-68	4-25		5.1	0.1	2	6	15	1	.5
	76-69	25-50		5.6	0.1	2	8	20	1	
	76-70	50-90		5.9	0.2	2	10	25	1	
	76-71	90-120		6.1	0.2	2	9	30	1	
Silt loam over gravel. Terrace	76-57	0-10	Dry Creek	5.0	0.2	2	12	75	4	.9
of the Stewart River.	76-58	10-21		5.1	0.1	2	10	60	1	.9
	76-59	21-33		5.3	0.1	2	15	30	1	.2
	76-60	33-50		5.9	0.2	1	8	35	1	.2

*The first set of samples for each area (Lab No. SO---) are from cultivated fields and are composites of about 10 samples. The soil profile samples are single samples from an uncultivated area.

General Description	Lab. No.	Sample Depth (cm)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N (parts per million (ppm))	Phosphorus P (parts per million (ppm))	Potassium K (parts per million (ppm))	Sulphur SO_4-S (parts per million (ppm))	Organi Matter %
Floodplain of the Stewart River	76-53	0-15	Stewart	7.3	0.8	3	5	30	13+	5.0
	76-54	15-35	Crossing	7.7	0.4	1	3	30	13+	1.7
	76-55	35-36		7.6	0.3	3	2	35	13+	
Gravel terrace of the Stewart River	76-48	4-0	McQuesten	4.9	0.4	3	60+	450+	13+	35
	76-49	0-10		4.8	0.1	2	9	40	3	1.5
	76-50	10-20		5.1	0.1	2	6	30	1	.5
	76-51	20-45		5.3	0.1	2	7	25	1	
	76-52	45-50		5.4	0.2	2	7	15	1	
Loamy sand fluvial soils	76-43	0-11	Mayo River	6.5	0.2	2	7	20	2	.9
	76-44	11-25		6.8	0.2	2	4	15	2	.9
	76-45	25-43		6.9	0.2	1	2	10	2	.2
	76-46.	43-57		6.9	0.2	1	2	10	1	.3
	76-47	57-70		7.0	0.2	2	1	10	1	

Fertility Data

Pelly Crossing - Carmacks Area

General Description		Lab No.	Sample Depth (inches)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter
							(lbs per acre)				
Floodplain soils along the Pelly River. Usually silt loam over loamy sand.	Pelly Ranch Cumulic Regosols Oats crop	S0540	0-6	Pelly Crossing	7.5	2.8	43	15	240	24	8.5
			6-12		7.7	2.1	55	8	135	24	
			12-24		7.7	1.5	70	12	210	48	
	Pelly Ranch Silt. Mixed Regosols and Brunisols	S0543	0-6	Pelly Crossing	7.6	2.1	37	11	145	24	6.3
			6-12		7.7	1.4	23	4	110	24	
			12-24		8.0	1.0	28	8	180	48	
	Garden. Had been fertilized before sampling	S0555	0-6	Pelly Crossing	7.1	0.6	25	120	330	15	4.2
			6-12		7.2	0.6	11	116	195	13	
			12-24		7.5	0.6	8	148	310	48	
Floodplain soils along the Yukon River. Usually volcanic ash (10-30 cm) over silt loam over loamy sand	Hay field Regosols	S0546	0-6	Carmacks	7.3	0.3	2	60	545	24	2.7
			6-12		7.6	0.3	1	54	340	12	
			12-24		7.9	0.3	2	60	430	32	
	Fine sandy loam Brunisol Newly cleared	S0549	0-6	Carmacks	6.7	0.3	1	55	325	8	2.9
			6-12		7.0	0.2	1	42	310	5	
			12-24		8.1	0.7	4	48	440	48	
Gravelly terrace of the Yukon River. May have thin (5-20 cm) silty or sand surface layer plus layer of volcanic ash.		S0558	0-6	Minto Landing	7.5	1.3	47	40	235	24	3.5
			6-12		7.8	2.3	29	19	240	24	
			12-24		8.1	1.3	26	20	290	48	
Hummocky silty lacustrine soils in the Nordenskiold Valley.		S0552	0-6	Nordenskiold	6.8	0.4	2	51	270	24	5.4
			6-12		7.1	0.6	3	34	210	24	
			12-24		7.2	1.0	8	34	350	48	
Sandy alluvial fan in the Nordenskiold Valley.		S0561	0-6	Berdoe	7.4	0.4	8	13	460	24	7.0
			6-12		7.6	0.9	7	10	245	24	
			12-24		7.6	0.9	10	16	350	48	
Silty soils south of Braeburn Lodge	Garden plot	S0564	0-6	Fox Lake	7.5	0.4	10	35	370	24	7.4
			6-12		6.9	0.9	30	17	170	24	
			12-24		7.2	0.7	36	20	270	48	
	Garden plot	S0567	0-6	Fox Lake	7.4	0.6	23	16	265	24	3.9
			6-12		7.4	0.4	6	9	195	24	
			12-24		7.3	0.3	12	14	380	48	

Soil Profiles* - Uncultivated Soils

ppm x 2 = lbs per acre for 6 inch layer of soil

General Description	Lab No.	Sample Depth (cm)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phorphorus P	Potassium K	Sulphur SO_4-S	Organic Matter %
						parts per million (ppm)				
Floodplain soils along the Pelly River. Silt loam over sandy loam.	76-91	7-0	Pelly Crossing	6.8	0.3	5	42	335	25	36.6
	76-92	0-20		7.0	0.2	1	48	135	7	
	76-93	20-77		7.9	0.3	2	7	35	5	1.7
	76-94	77-100		8.3	0.3	1	5	30	5	
	76-95	100-120		8.2	0.3	1	3	35	13+	
Sandy soil on terrace of the Yukon River. Surface layer is silty volcanic ash layer. Other horizons are fine sandy loam.	76-82	0-30	Midway Lodge	6.6	0.1	2	17	90	5	1.0
	76-83	30-44		7.3	0.2	1	16	80	4	.5
	76-84	44-60		7.6	0.3	2	21	75	4	.5
	76-85	60-72		7.7	0.3	2	16	70	4	
	76-86	72-92		7.9	0.4	3	6	40	6	
	76-87	92-110		8.0	0.3	3	5	50	3	
Gravelly terrace of the Pelly River. 16 cm of silt loam material over gravelly sandy loam.	76-88	0-15	Fort Selkirk	6.6	0.3	3	18	115	5	5.0
	76-89	15-30		6.2	0.2	3	16	45	2	1.4
	76-90	30-45		6.4	0.2	4	9	30	1	.5
Loess covered morainal soils of the upland north of Pelly Crossing. Silt loam over loamy sand over glacial till.	76-76	5-0	Diamain Lake	5.8	0.4	2	56	295	30	2.9
	76-77	0-14		6.1	0.2	2	28	65	5	1.0
	76-78	14-34		6.4	0.2	2	23	45	2	.5
	76-79	34-60		7.3	0.3	2	8	25	2	.7
	76-80	60-80		6.5	0.2	1	5	25	1	.3

*The first set of samples for each area (Lab No. S0---) are from cultivated fields and are composites of about 10 samples. The soil profile samples are single samples from an uncultivated area.

Fertility Data

Faro - Ross River Area

General Description	Lab No.	Sample Depth (inches)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter
						(lbs per acre)				
Fine sandy loam over coarse sand. Garden plot in town of Ross River. Gravelly terrace of the Pelly River.	S0625	0-6	Ross River	7.4	0.8	86	74	100	24	6.7
		6-12		7.6	0.7	54	43	65	24	
		12-24		8.0	0.4	46	42	100	28	

Soil Profiles* - Uncultivated Soils

ppm x 2 = lbs per acre for 6 inch layer of soil

General Description	Lab No.	Sample Depth (cm)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter %
						parts per million (ppm)				
Gravelly outwash in the uplands south-east of Ross River. Both samples are Ah surface horizons in a grassland area.	76-96	0-15	Lapie River	5.2	0.2	1	6	35	5	1
	76-97	0-24		6.6	0.2	4	6	25	7	1 1

Watson Lake Area

General Description		Lab No.	Sample Depth (inches)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter %
							(lbs per acre)				
Gravelly outwash soils near Watson Lake. May have a shallow silty surface layer.	Oats field Orthic Eutric Brunisol	S0628	0-6	Watson Lake	6.0	0.2	5	31	195	24	1 6
			6-12		6.2	0.2	3	20	75	13	
			12-24		6.4	0.2	6	32	150	30	
	Cumulic Regosols and Gleysols. Patchy oat crop.	S0631	0-6	Watson Lake	5.2	0.6	10	23	140	24	25 8
			6-12		5.3	0.4	7	24	95	24	
			12-24		5.3	0.3	12	40	160	48	
Upland morainal soils. Gravelly loam texture. May have shallow (5-15 cm) silty surface.	Well drained gravelly loam	S0635	0-6	Wye Junction	5.0	0.1	1	25	85	4	1.9
			6-12		5.5	0.1	1	10	50	3	
			12-24		5.9	0.2	2	10	160	6	
	Newly cleared 17 cm of organic material on surface peaty Gleysol	S0638	0-6	Wye Junction	7.0	0.4	3	15	255	24	[illegible]4
			6-12		7.2	0.3	1	5	70	13	
			12-24		7.5	0.3	2	6	140	12	
Floodplain soil along the Liard River. Cumulic Regosol. Loamy fine sand over sand.		S0641	0-6	Farm Road	7.2	0.4	15	17	145	12	3
			6-12		7.4	0.4	18	9	115	10	
			12-24		7.5	0.3	18	8	180	7	

Soil Profiles* - Uncultivated Soils

ppm x 2 = lbs per acre for 6 inch layer of soil

General Description		Lab No.	Sample Depth (cm)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter %
							parts per million (ppm)				
Gravelly outwash, sandy or silty layer on the surface.		76-117	0-10	Watson Lake	5.7	0.2	1	37	85	2	.5
		76-118	14-30		5.5	0.2	1	13	25	1	
Upland morainal soils	Top 18 cm are silt loam in texture lower is gravelly sandy loam.	76-120	0-10	Wye Junction	5.5	0.1	1	55	60	1	1.2
		76-121	10-18		5.4	0.1	1	32	60	1	.5
		76-122	18-35		5.3	0.1	1	22	55	1	.3
	Top layer is silt loam	76-102	0-12	Wye Junction	5.9	0.2	1	40	50	5	1.9
		76-103	17-35		5.8	0.1	1	8	30	1	
Sandy or gravelly soil on terraces of the Liard River.		76-124	0-10	Sawmill Road	4.4	0.1	1	25	30	1	.5
		76-125	10-30		5.4	0.1	1	16	25	1	.9

*The first set of samples for each area (Lab No. SO---) are from cultivated fields and are composites of about 10 samples. The soil profile samples are single samples from an uncultivated area.

Fertility Data

Whitehorse and Takhini - Dezadeash Areas

General Description		Lab No.	Sample Depth (inches)	Soil Association	pH	Salinity Level (mmhos/cm)	Nitrogen NO_3-N	Phosphorus P	Potassium K	Sulphur SO_4-S	Organic Matter %
							(lbs per acre)				
Silty clay lacustrine soils	West of Little Atlin Lake	S0573	0-6	Champagne	6.4	0.3	5	14	195	24	4.3
			6-12		7.3	0.7	3	7	120	24	
			12-24		7.6	1.4	4	12	280	48	
	Gleysol. 25 cm organic layer on the surface	S0585	0-6	Champagne	7.4	1.0	9	19	875	24	20.5
			6-12		7.7	1.0	7	14	655	24	
			12-24		8.2	0.9	6	16	1370	48	
	Gleyed Regosol Hay field. Annie Lake Road	S0588	0-6	Champagne	7.4	1.9	41	16	410	24	20.8
			6-12		7.8	1.1	16	7	300	24	
			12-24		8.0	0.8	16	8	600	48	
	Mile 956 on Alaska Highway not cleared	S0603	0-6	Champagne	6.6	0.4	3	13	350	24	5.1
			6-12		7.3	0.9	2	7	240	24	
			12-24		7.7	2.4	2	10	390	48	
	Orthic Gray Luvisol. Mile 960 Alaska Highway	S0606	0-6	Champagne	6.9	0.4	2	19	405	24	7.7
			6-12		7.1	0.6	2	10	295	24	
			12-24		7.5	0.5	4	22	500	48	
Calcareous organic soil		S0591	0-6	Organic soil	7.2	2.8	15	17	750	24	29.6
			6-12		7.4	2.6	11	16	620	24	
			12-24		7.5	1.9	26	34	1170	48	
Silty lacustrine soils	Carcross road Hay field	S0594	0-6	Blue Lake	7.1	0.4	4	29	300	24	6.1
			6-12		7.2	0.3	3	20	195	24	
			12-24		7.7	0.3	4	40	330	48	
	Fine sandy loam Fertilizer added before sampling	S0570	0-6	Blue Lake	7.6	0.7	17	54	200	24	4.4
			6-12		7.9	0.4	6	31	100	24	
			12-24		8.0	0.6	8	30	140	48	
Sandy material over silty clay, glesol. Ten Mile Ranch area. Hay field.		S0579	0-6	Klotowton	7.5	0.8	14	30	640	24	12.4
			6-12		7.8	0.4	8	15	385	24	
			12-24		7.9	0.6	38	36	660	48	
Loamy sand fluvial. Near Carcross cleared in 1974. Used for vegetables. May have been manured or fertilized.		S0579	0-6	Aishihik	7.2	0.7	42	68	405	15	3.2
			6-12		7.4	0.3	15	50	315	9	
			12-24		7.7	0.3	18	60	460	20	
Fine sandy loam fluvial material over silty clay lacustrine. Takhini Hot Spring road. Oats and brome field.		S0600	0-6	Lewes	7.4	0.4	2	58	205	22	2.2
			6-12		7.7	0.4	2	38	155	13	
			12-24		8.2	0.4	4	44	250	30	
Fine sandy loam fluvial. North of Whitehorse.		S0597	0-6	Yukon	7.6	1.4	2	24	300	24	6.9
			6-12		7.9	1.0	1	10	215	24	
			12-24		8.0	0.8	2	10	300	48	
Silty clay loam lacustrine Orthic Regosols. Both are located on old 1019 Experimental Farm.	Fine sandy loam over silty clay	S0609	0-6	Pine Creek	7.1	0.7	2	18	255	24	8.0
			6-12		7.4	1.0	2	10	145	24	
			12-24		7.6	1.0	4	12	330	48	
	Fine sandy loam over clay loam	S0612	0-6	Pine Creek	6.9	0.3	1	14	295	24	8.0
			6-12		7.3	0.4	2	9	190	24	
			12-24		7.6	0.4	4	10	320	48	
1019 Experimental farm. Morainal soil. Slightly stony at 12 inches.		S0615	0-6	Archibald	7.1	0.4	1	18	390	14	4.3
			6-12		7.2	0.4	1	9	245	9	
			12-24		7.5	0.4	2	6	330	48	
Gleysol on Quill Creek north of Haines Junction.		S0621	0-6	Auriol	5.8	0.2	2	28	325	24	6.9
			6-12		6.4	0.3	1	24	145	17	
			12-24		6.9	0.3	2	78	210	24	

of the samples from cultivated fields showed high nitrate nitrogen values but in nearly 50% of the cases of high nitrogen there was also some level of salinity associated with it. The levels of salts appeared to be enough to reduce production slightly and hence reduce the rate of uptake of nitrogen by the crops.

It is almost certain that continued grass crop production would require heavy input of fertilizer nitrogen to maintain production at an acceptable level. Rates of approximately 40-60 lbs N/acre/year would likely be required.

For vegetable crop production or annual cereal grain production it would be possible to set up a rotation sequence including some summerfallow. This would allow the available nitrogen level to build up sufficiently to grow one crop (see Cropping Practices Section for more detail).

Phosphorus

Phosphorus measurements (Table 38) showed a very wide range. Most of the extremely high values came from poorly drained alluvial soils (Lab No. S0534) or garden plots which had been subjected to varying levels of fertilization (Lab No. S0555). In areas of poor drainage it is not likely that the available phosphorus level is completely indicative of the phosphorus requirement. It has been well established that cool soil temperatures associated with wet areas can result in a fertilizer phosphate requirement even with high soil levels.

For annual cereal grains it is likely that a small rate of phosphorus (20-30 lb P_2O_5/acre) placed with the seed would result in substantial yield increases and in substantial advancement of maturity. Indeed, the maturity effect may be the biggest reason for strong responses to phosphorus recorded in the limited amount of research work that has been done in the Yukon.

For potatoes and various vegetable crops it is likely that phosphorus fertilizers would be required for most soils testing 30 or less lbs phosphorus per acre in the 0 to 6 inch layer.

For perennial grass crops it is probable that some reasonable level of production could be obtained without additional phosphorus inputs where phosphorus levels are above 20 lbs P/acre in the 0 to 6 inch layer. In many cases yield increases to phosphorus may be obtained even at slightly higher soil test values but they may not be economic increases when the high cost of fertilizer is considered.

Potassium

One of the most surprising conclusions to be drawn from all the analytical data presented is the rather high incidence of soils very low in potassium. The data presented in Table 37 provide a first approximation to an interpretation of the potassium soil test values. Again, it should be indicated that for Yukon conditions it is likely that higher soil potassium levels would be required to provide adequate production. This conclusion is confirmed by Alaskan soil test benchmarks.

Any soils testing less than 180 lbs/acre in the 0 to 6 inch layer could be suspected of potassium deficiencies for crops such as potatoes, barley and alfalfa. Soils testing less than 120 lbs/acre in the 0 to 6 inch layer may be deficient for almost all crops.

Several of the sandy and silty textured soils in the Dawson - Mayo and Watson Lake areas are extremely deficient in potassium (e.g. Dry Creek Soil Association with 55 lb K/acre in the 0 to 6 inch depth). Soils with this level of potassium are probably severely potassium deficient. It is likely that for crops such as barley, potatoes and alfalfa reasonble levels of production on these types of soils could not be obtained without significant additions of potassium fertilizers. It is likely that some of the sandy soils in the Yukon could be "potassium deserts" for certain crops.

The rates of potassium required would not be large for cereal grains where potassium can be placed with the seed. Annual rates of seed placed application of 20 to 30 lbs K_2O per acre would supply the requirements. For vegetables, legume and grass crops it is likely that annual broadcast applications of some 50 - 100 lbs K_2O/acre may be required on some of the severely potassium deficient soils.

Sulphur

Sulphur levels appear adequate in most soils in the Yukon. Noteable exceptions are well drained, coarse textured sandy or gravelly soils (Lab No. S0507, S0635). For these soils fertilizer sulphur additions may be required but the rates will not be large. Annual rates of applications of from 15 - 30 lbs sulphur per acre should be adequate for most crops. In many cases it may be possible to simply use a sulphur containing nitrogen or phorphorus source.

General Conclusions

On the basis of the analyses performed it can be generally concluded that the soils in the study areas are not highly fertile and will present some problems with respect to plant nutrients. On some soils these problems may not be serious and reasonable levels of production may be obtained with minimum or no fertilizer inputs. Certainly, data from the Agriculture Canada Research Station maintained at Mile 1019 on the Alaska Highway show that reasonable levels of cereal grain production can be obtained with no fertilizer input. In many areas it is likely that fertilizer use will markedly increase production but strict recommendations could not be made until economic data is available on the value of the crop produced and the cost of the fertilizer input.

The most serious limitation is likely that of nitrogen for continued grass production and of potassium on selected soils. In these situations it may be that reasonable levels of production cannot be maintained unless significant fertilizer inputs are made.

It is likely that phosphorus fertilization will be beneficial on all soils for most crops but perhaps not absolutely necessary for limited production. Nitrogen fertilization will be necessary on most soils for continuous production of grain and forages. Less nitrogen will be necessary if summerfallow or legumes are utilized in a rotation. Potassium deficiency will be limiting crop production on most soils in the Dawson - Mayo and Watson Lake areas and on sandy soils in other areas of the Yukon.

Soil Salinity Hazard

During the course of the survey most cultivated fields in the Yukon were sampled for fertility analysis. For this analysis approximately ten samples at three depths were taken from each field and each depth was composited. These samples are number SO plus three digits (Table 39). In addition, single soil samples were taken from suspected problem areas. The conductivity of all the above samples was measured on a soil-water mixture in a 1:1 ratio. The normal laboratory practise is to make a soil paste and extract the water with a vacuum apparatus. The ratio of soil to water will then vary according to the texture but is usually about 1:0.5. This means that our salinity values are approximately one-half those determined by standard methods and reported in scientific literature. The 1:1 ratio method is quicker and allows the use of portable equipment in the field for measurement of salinity levels. The following discussion will regard conductivity measurements on 1:1 soil-water ratios.

Ballantyne (1962) has suggested that oats and barley should produce a good crop up to a conductivity of 2 to 3 mmhos/cm. Most of the samples taken were less than 2 with a few in the 2 - 4 mmhos/cm range (Table 39). This data indicates that at the present time salinity is not a severe problem in the Yukon. Annual cropping of cereals could accentuate the problem by increasing evaporation of water at the surface of the soil and precipitation of salts.

There was only one known incidence of salinity in the Dawson area. This occurred in a hay field on a lower terrace of the Yukon River at Sunnydale. The salinity was highest on the surface (1.5) and decreased with depth (0.8). This level would not significantly affect the yield of most crops. The majority of the soils in the Dawson - Mayo area are moderately acid and have very little soluble salts.

There were two instances of salinity noted in the Pelly Crossing - Carmacks area. One was the cultivated fields at the Pelly Ranch and the other in a clearing near Minto. The two fields sampled at the Pelly Ranch had decreasing conductivities with depth. Both of these fields also had relatively high concentrations of nitrates in the top 60 cm. Salinity did not appear to be a problem on uncultivated Pelly Crossing soils.

Salinity is more widespread in the Whitehorse and Takhini - Dezadeash areas. Part of the salinity problem in this area is due to slightly to moderately saline silty clay lacustrine parent materials (Champagne soils, 1-5 mmhos/cm). At the present time, salinity is not a major problem. Slight salinity appears to restrict tree growth and thus increase the yield of grazable forages. Overgrazing or cultivation could intensify and increase the salinity problem. A good growth of grass is necessary to keep the water content of the soil low and thus allow rainwater and snow melt to leach salts downward. Overgrazing saline areas also appears to allow the invasion of foxtail barley, an unpalatable forage.

Widespread agricultural development could encounter problems with salinity in the Pelly Crossing and Whitehorse area. As long as the major agricultural enterprises involve native grazing and perennial forage production, the acreage of soils affected by salinity should not increase. In areas where salinity may be a hazard (lacustrine and fluvial soils in sheets 3, 4, 7, and 8) soils should be sampled and analyzed for salinity before any land is cleared or broken. Moderate salinity levels (2 - 5 mmhos/cm) at 30 - 100 cm depth may not create a hazard to crop production, but care must be taken to prevent the upward movement of salts to the surface.

Table 39. Salinity levels in Yukon soils.

Salinity

Sample No.	Depth (cm)	Soil Association	Location	Conductivity mmhos/cm
S0513	0-15	Sunnydale	Dawson	1.50
	15-30			1.00
	30-60			0.80
S0540	0-15	Pelly Crossing	Pelly River	2.80
	15-30			2.10
	30-60			1.50
S0543	0-15	Pelly Crossing	Pelly River	2.10
	15-30			1.40
	30-60			1.00
S0558	0-15	Minto Landing	Minto	1.30
	15-30			2.30
	30-60			1.30
S0573	0-15	Lewes Lake	Carcross Road	0.30
	15-30			0.70
	30-60			1.40
S0588	0-15	Bennett Lake	Annie Lake Road	1.90
	15-30			1.10
	30-60			0.80
S0591	0-15	Organic Soil	Annie Lake Road	2.80
	15-30			2.60
	30-60			1.90
S0597	0-15	Yukon	Mile 3 Klondike Highway	1.40
	15-30			1.00
	30-60			0.80
S0603	0-15	Champagne	Stony Creek area	0.40
	15-30			0.90
	30-60			2.40
HR 1	100-105	Champagne	Mile 968.8 on Alaska Highway	1.61
HR 2	25-30	Champagne	Mile 970.7 on Alaska Highway	2.00
HR 3	25-30	Klowtaton	Mile 3 on Aishihik Road	1.50

Sample No.	Depth (cm)	Soil Association	Location	Conductivity mmhos/cm
HR 4	45-50	Champagne	Mile 964.7 on Alaska Highway	3.28
HR 5	55-60	Champagne	Mile 964.7 on Alaska Highway	3.25
HR 6	45-50	Champagne	Mile 949.5 on Alaska Highway	1.13
HR 7	15-20	Champagne	Mile 949.5 on Alaska Highway	0.81
HR 8	40-65	Champagne	Mile 949.4 on Alaska Highway	1.22
HR 9	10-30	Champagne (Saline Phase)	Mile 945.0 on Alaska Highway	3.30
HR 10	10-30	Champagne (Saline Phase)	Mile 944.3 on Alaska Highway	3.30
R.A.W. 1(A)	0-20 20-60	Farm Road	Junction of Liard River and False Pass Creek	0.24 0.27
R.A.W. 12-3	0-20	Farm Road	2.5 miles North of Mile 644 on Alaska Highway	0.11
R.A.W. 19-6	0-20	Yukon	Mile 7.4 on Klondike Highway from Dawson-Mayo Junction (J)	2.70
R.A.W. 19-7	0-20	Kusawa	Mile 8.0 on Klondike Highway	0.52
R.A.W. 19-8	0.20	Kusawa	Between S.W. tip of Lake Laberge and Yukon River.	0.15
R.A.W. 19-14	0-20 20-60	Yukon	South end of peninsula between S.W. tip of Lake Laberge and Yukon River	2.51 1.90
R.A.W. 20-9	50-70	Saline Meadow	Mile 8.9 on Klondike Highway	2.19
R.A.W. 20-10	10-19 19-60	Kusawa	Mile 8.3 on Klondike Highway	0.45 1.52

Sample No.	Depth (cm)	Soil Association	Location	Conductivity mmhos/cm
R.A.W. 20-13	0-20	Lewes	On Takhini Hotsprings Road 3.0 miles West of Klondike Highway	1.20
R.A.W. 21-8	0-20		0.3 miles West of Mile 7.4 on Klondike Highway	0.79
R.A.W. 26-3(A)	0-20	Kusawa	In slough 1 mile East of Mile 8.0 on Klondike Highway	1.15
R.A.W. 26-3(B)	0-20	Kusawa	Under tall aspen at same location	2.50
R.A.W. 26-4	0-20	Croucher	Just North of R.A.W. 26-3	0.52
T38(A)	0-15 15-30	Diamain Lake	5.5 miles along Lammers Road, North of Mile 148 on Klondike Highway. Edge of meadow	0.59 0.23
T38(B)	0-15 15-25 25-40	Diamain Lake	Same location. Center of meadow	0.73 0.73 0.30
T6	0-20 20-40 40-60	Champagne	0.5 mile N.W. of Tagish	4.60 4.28 5.05
T112	10-20 35-55	Champagne	1.0 miles S.E. of Mile 7 of Carcross Road from Jakes Corner	0.12 1.40
T59	30-55 65-80	Champagne	11.0 mile East of Carcross	0.30 0.45
T54	0-15 15-30	Champagne	10.5 miles East of Carcross	0.23 0.30
T77	20-50 50-90	Lewes Lake	0.75 miles South of Tagish along the Carcross Road	0.27 0.20
T83	12-30 30-50	Champgane	3.0 miles East of Tagish along the Carcross Road	1.92 0.99

Sample No.	Depth (cm)	Soil Association	Location	Conductivity mmhos/cm
A.A. 1	0-20	Aishihik	0.5 miles S.W. of Robinson	2.42
Sampson #1	20-40	Fox Lake Road	West of Lake Laberge	2.95
Sampson #2	20-40	Fox Lake Road	Dry open area, West of Lake Laberge	0.90
Sampson #3	20-40	Fox Lake Road	Wet bare patch, West of Lake Laberge	3.0
R.A.W. 1.1(A)	0-23	Pelly Crossing	Slough in oat field on Pelly Farm	4.50
R.A.W. 1.1(B)	0-23	Pelly Crossing	North end of garden patch on Pelly Farm	2.80
R.A.W. 1.1(C)	0-20	Alluvium	Along highway by Tatchun Creek in Carmacks Area	0.22
R.S. 2	0-15 15-30	Lewes Lake	3 miles North of Carcross on Carcross Road	0.19 0.42
R.S. 6	0-23	Lewes Lake	Under willow-birch brush, 3 miles North of Carcross on Carcross Road	0.22
R.S. 4	0-20	Lewes Lake	Under birch brush around Fraser's Meadow on Carcross Road	0.20
R.S. 7	0-23	Lewes Lake	Fraser's Meadow on Carcross Road	0.30

Cropping Practices

Forage Production: The major type of agricultural enterprise likely to occur in the Yukon is one with an emphasis on livestock production.

The major portion of the land base for this operation will be utilized for native grazing. To provide a sustained yield the native range must be managed properly. The plant composing the edible portion of the native stand cannot sustain early season heavy grazing (Kilcher, 1977). This means that seasonal grazing must be delayed for about three weeks after spring growth has started.

The early spring grazing should be provided by an early cool season grass seeded for pasture. Relatively few hectares of seeded pasture will withstand heavy use while protecting the native pasture. Russian Wildrye is a variety of grass well suited to early spring or late fall grazing.

Most of the future hay requirements for livestock will have to be supplied by seeded forage crops. The list of varieties available for this area are given in Table 40. A grass-legume mixture will likely give a higher yield than grass alone, as the legume can add nitrogen to the soil. It is important to innoculate all legume seed with the appropriate commercial mixture of bacteria so that plants will be able to add nitrogen to the soil.

For further information on varieties and seeding rates see Alberta Agriculture Agdex 120/32 January, 1977 or Forage Crop Recommendations for Peace River, zone 6, Hay and Pasture, 1977-78 B.C. Department of Agriculture.

Market Gardening: To be successful the gardens should be located in climatically favored areas such as gentle south facing slopes. There should also be good air drainage away from the garden plots. To prevent trapping of cold air, the trees below the garden plots should be removed to facilitate good air drainage. Also the garden should not be located in a basin area. The gardens should be located near a source of water for irrigation. Yields of most vegetable crops will be low without supplemental irrigation.

Special practises can be followed that will speed maturity of the crop or reduce the risk of frost. Sheets of plastic can be used to cover the soil with small holes to allow the vegetables to grow through. The plastic will increase the soil temperature, conserve moisture, and also retard weed growth. This method won't however protect the plants from frost. Temporary plastic shelters that cover the plants are useful for heat loving plants such as tomatoes, peppers and cucumbers. In addition these plants can be grown inside permanent greenhouses. Tests conducted at the 1019 Experimental Farm at Haines Junction has shown that spraying water over a crop during a frost will protect the plants even with several degrees of frost.

Most garden crops will require high inputs of fertilizer or manure for adequate yields. Potassium will be lacking for potatoes on the coarser textured soils in all areas and on all soils in the Dawson and Watson Lake areas. It might be advantageous for a market gardener to use a crop rotation to conserve moisture and nutrients. Crop rotations including legumes or cereal grain will also reduce the incidence of plant diseases and insect infestations. Barnyard manure and legumes in conjunction with fallowing could be used to restore higher nutrient levels in the soil. The advisability of these practises will depend on the relative cost of land versus the cost of fertilizers, herbicides, and insecticides. A market garden of 2 - 5 hectares would be adequate for intensive management and high inputs of fertilizer. Market gardening with crop rotations and perhaps livestock will require much larger acreages. Further information on gardening can be obtained from Agriculture Canada publication 1192 (Gubbels, 1963).

Grain Production: Because of the cool climate and lack of markets, the only cereal grains grown will be oats and barley for livestock feeds. The grain may be harvested as an annual hay crop or ripened and harvested as feed grain. If possible the grain should be grown on the finer textured more fertile soils (silt loam to silty clay, soils with high organic matter content) in order to realize the highest yield with the least amount of inputs. Fertilizer phosphorus (11-48-0 fertilizer) should be applied with the seed to get the crop off to a good start and hasten maturity. If nitrogen is needed it can be supplied either as chemical fertilizer, barnyard manure, or leaving the land in fallow for one summer. Land that may have a salinity problem should not be summerfallowed, it should be annual cropped or seeded down to a saline tolerant forage such as Russian wild rye or Reed canary grass depending on the moisture status.

Table 40. Adapted varieties of forage crops for the Yukon.

Crop or Mixture	Seeding rate kg/ha
Dry Areas	
Bromegrass (Polar)	10
Russian Wildrye (Sawki)	8
Crested wheatgrass (Fairway)	6
Alfalfa* (anik or B.L. 1019)	10
White sweetclover (Polara)	8
Brome + Crested wheatgrass + alfalfa	6 + 4 + 2
Medium Moist Areas	
Bromegrass (Polar)	10
Timothy (climax)	5
Creeping red fescue (Boreal)	6
Alfalfa* (B.L. 1019)	8
Wet Areas	
Timothy (Climax)	5
Reed canarygrass (Castor)	5
Alsike clover (Dawn)	4
Annual Seeded Hay	
Oats (Grizzly or Victory)	100

*Legume seed should be innoculated with the proper commercial bacteria so that they will add nitrogen to the soil.

Interpretive Maps

The basic soil survey in the Yukon Territory consisted of classifying and mapping the soils of selected areas. A great deal of information was obtained and for the most part it is included on the soils map or in the report. To make this information easier to use, a series of interpretive maps were drawn to help convey the suitability of the various soil, vegetation, and landform features shown in the map and documented in the report for certain uses.

To prepare these maps the initial information provided on each soils map had to be digitized and the data processed in Ottawa. A computer printout of all the map units and soil edits was then produced. Once these map unit lists were available each soil edit was rated. This information was then fed back into the computer so that interpretive maps could be generated. All this information will be stored so most any type of interpretive map can be produced. Each of the soil edits was rated for the following uses or interpretations:

1. Soil Capability for Agriculture
2. Soil Capability for Grazing
3. Crop Suitability
4. Suitability for Irrigation
5. Suitability as a Source of Topsoil
6. Suitability for Road Construction
7. Suitability as a Source of Sand or Gravel
8. Suitability for Area Type Landfills
9. Surface Texture
10. Subsoil Texture
11. Soil Drainage and Permafrost
12. Surficial Material and Topography

The criteria for suitability for topsoil, road construction, and area type landfills were taken from the USDA handbook, "Guide for Interpreting

Engineering Uses of Soils".

Soil Capability for Agriculture

The soils of each map sheet were placed in capability classes on the basis of soil, landscape, and climatic characteristics that affect their suitability for agricultural use. Only permanent soil and landscape factors such as permeability, erosion, fertility, hazard from flooding, low moisture holding capacity, wetness, degree of slope, stoniness, and the limitation imposed by the regional climate affect the classification. Economic factors such as distance from markets, cost of clearing, etc., do not affect this classification. There are seven capability classes. The first three capability classes are suitable for sustained agriculture; Class 4 is marginal for arable agriculture; Class 5 is suitable for improved hay or grazing; Class 6 for unimproved grazing; and Class 7 is for land considered incapable of use for agriculture.

The soils within a capability class are similar only with respect to degree, but not kind, of limitation. Each class contains many different kinds of soils, which may require different types of management. All limitations may be applied at different class levels. The capability classes, the limitations, and the symbols used in rating each soil edit are listed below:

Classes

3 - suitable for grain crops
4 - marginal for grain crops
5 - suitable for seeded forages
6 - suitable for native grazing
7 - non-agricultural

Symbols

3M=5W class 3M is 50-60% of area
3M/5W class 3M is 60-75% of area
3M//5W class 3M is 75-90% of area

Limitations

M - low moisture holding capacity
T - steep slopes
W - excessive wetness
I - flooding
P - stoniness
E - erosion
CH - climate - cool summer temperatures
N - excessive salinity
R - bedrock

Limitations

M - low moisture holding capacity.

This applies to soils that do not have the storage capacity in the rooting zone to hold all the water that fell as rain during the summer or from snowmelt in the spring. In most areas, sandy loam soils are class 4M, loamy sand soils are 5M, and gravelly soils are 6M or 7M.

T - steep slope.

In most cases slopes from 6-9% are class 4T, 10-15% are 5T and greater than 15% are 6T or 7T. The complexity of the slope or the soil type may also affect this rating.

W - excessive wetness.

This applies to soils where excess water other than stream overflow affects crop production. In an area as dry as the Yukon, this limitation is used only for very wet soils such as Gleysols or Organic soils. In most cases Gleysols are 5W and Organic soils are 7W.

I - flooding

This applies to soils that are flooded due to stream overflow such as along creeks or rivers.

P - stoniness.

This is used where excess stones on the surface will hinder cultivation. This limitation is used primarily where the stones are too numerous to pick and the soil is rated 6P or 7P.

E - erosion.

This applies to soils where erosion would be a serious hazard if the soils were cultivated. Water erosion is a hazard on steep slopes (7E) and wind erosion will be a hazard on some very sandy soils (6E or 7E).

N - excessive salinity.

This limitation was used when the salt concentration was high enough to restrict the growth of most cereal crops (5N or 6N).

R - bedrock.

This limitation was used where bedrock outcrops were present. They were usually devoid of vegetation (7R).

CH - climate.

This limitation is used where cool summer temperatures and short frost free period are the main limiting factors for crop production.

There are no soils in Class 1 or 2 in Yukon because of adverse climate.

Each Soil Association is given a basic Agricultural Capability rating depending upon the climate conditions of the region. This basic capability rating may be altered depending upon the additional information provided in each soil edit. For example, the Pelly Crossing Association in Sheet 3 is considered to be a 3CH area for climate. If a particular Pelly Crossing soil had a clay loam or silty clay loam texture, it would be given a 3CH rating. If the soil texture were silt loam or very fine sandy loam it would be given a 3M rating due to low moisture holding capacity. A fine sandy loam or sandy loam texture would make it 4M. If this soil happens to be on Class 4 topography it would become 4T if it was 3M initially and 4TM if it was 4M initially. The presence of Gleysols in the map unit would also alter the rating. The soil may be rated 4M/5W which means that 60 to 75% of the soil is 4M and 25 to 40% is rated as 5W due to wetness. Likewise, the other limitations such as stones, flooding, etc., must be considered when arriving at a final capability rating.

The ratings that are applied to specific soil areas have some limitations. In some instances a Soil Association may span a wide range of climatic conditions due to differences in elevation. Also, some small land areas with a favorable aspect may be more suitable for crop production than the capability rating might suggest. Similarly, a 3M soil that is given a 5T rating due to topography may consist of gently undulating topography mixed with several steeper slopes. Market gardens and cereal crops could be grown on the more level areas. In most deliniated soil areas you might find some soil that is a little better or a little worse than the Agricultural Capability might suggest. In most cases, however, the Agricultural Capability gives a good estimate of the true capability of a particular soil area.

Soil Capability for Grazing

The vegetation of each area was assessed simultaneously with the soil survey and the general productivity of the soils for supporting grazing species was estimated. The Grazing Capability was classified according to the total yield of palatable forage.

The following classes were recognized:

Classes	Productivity (oven dry weight forage kg/ha)
I	900 - 1800
II	450 - 900
III	200 - 450
IV	100 - 200
V	10 - 100
VI	steep erodable slopes
VII	less than 50

If an area is producing less than 100 kg/ha of palatable forage it can not be considered a viable range unless it is utilized in conjunction with a very productive area such as a meadow, or seeded pasture. Therefore, Class V areas are considered to be questionable for range use. Class VI areas occur on steep hillsides or river banks where the grasses tend to stabilize these slopes. Even though these areas may have a good production of grasses, they should not be grazed because of the hazard of erosion. Class VII may be found on areas of dense coniferous growth on which palatable vegetation is very sparse or it may be more open areas of pine or spruce where ground vegetation is chiefly moss, lichen, or low shrub.

The usable grazing types are Classes I to IV.

Class I, because it has the highest yield, can only be found on wet meadow areas. They are useful for grazing in their present state but are likely to be the first areas to be used for hayfields. Class II must also include meadow areas but these are less productive. Class III may occur in pine, spruce, and aspen areas where the tree cover is sufficiently open to provide a good growth of grasses. Class IV areas occur where the tree growth is denser or the soils are less productive.

Each soil area mapped in the Yukon Territory is rated for its Grazing Capability. This rating usually reflects the average of the grazing potential over that soil area. A soil rated as Class V is generally forested and as such will contain some dense stands of aspen or spruce that have no underlying grass growth, however, on the average this area will produce approximately 10 to 100 kg/ha of palatable forage.

Certain soil areas are best described by using a grazing complex. For example, an area with some good grass growth and some rather poor grass growth may be rated as IV-VII, or III-VII as the case may be. The dominant grazing class is always given first, so that, an area rated as Class IV-VII is dominantly Class IV for grazing but it also contains a significant amount of Class VII.

Even though an area is given a Class VII rating it may contain some small, isolated areas with good grass or sedge growth. These are usually confined to low wet areas but are too small to be significant, therefore they have little influence on the total grazing potential of a specific soil area.

Crop Suitability

The interpretations for Crop Suitability are based almost entirely on the Agricultural Capability of the soil. The following classes and criteria were used.

Classes

G - grain (barley or oats)

GD - marginal for grain

M - market gardens

F - planted forages

P - native pasture

N - non-agricultural

Criteria: G - areas with capability class 3 or 4.

GD - upland areas where frost might be a limiting factor for grain

M - areas with capability class 3 or 4, it is the dominant class on low, moist and fertile alluvial soils.

F - capability class 5.

P - used whenever the dominant grazing class is V or better

Soils are considered to be suitable for grain production if they are in a 3CH climatic area and marginal for grain if they are in a borderline 5CH area.

Several classes can be used together. Areas with an Agricultural Capability of 3 or 4 will be Class GM or GDM and GMP or GDMP if there is some grazing. Class F is only used on Class 5 soils and if there is some grazing it becomes FP. It is understood that forages can be grown on any soil that is suitable for grain or market gardens.

Class 3 and 4 soils that are Cumulic Regosols or Gleyed Orthic Regosols are placed in Class MG or MGD suggesting that these soils are preferentially suited to market garden production, but could also be used for grain production.

All Class 7 soils are non-agricultural (Class N) and all Class 6 soils are only suitable for native grazing so would be Class P.

<u>Suitability for Irrigation</u>

The major factors in rating the soils for irrigation purposes are slope class, solum texture, salinity, and the amount of poorly drained soil in each map unit. The classes, limitations and criteria are listed below.

Classes	Limitations
E - excellent	T - steep slopes
F - fair	W - wetness
P - poor	S - salinity hazard
VP - very poor	G - coarse textured solum
	C - fine textured solum

Criteria: E - 0 - 2.5% slopes, sicl-sil texture

F - 2.5% - 5.0% slopes, sicl-sic texture, at least 20 cm fl-sil surface layer

P - sl-ls texture, some saline soils in map unit

VP - >6% slopes, gls and gsl texture, poorly drained, saline soils

Very few soils are rated as excellent for irrigation purposes. To be excellent the soils have to be at least Class 2 for topography and have a solum texture of fine sandy loam to silt loam. When the soils are rated as F,P, or VP the main limitation is also included in the actual irrigation rating. For example, a soil with 2.5 to 5.0% slope, but a solum texture of loamy sand (ls) would be rated P-G. This soil is poor for irrigation because of its coarse textured solum. In some cases, a soil could be rated VP for several reasons, however, only the dominant limitation is usually used in the rating.

In some instances two irrigation ratings are used together. This occurs when the edit happens to be a soil complex or if the map unit is such that two ratings are preferable. The dominant rating is placed first and the less dominant rating is placed second. An example of such a rating is VP-G + F-T where most of the soil is rated as very poor due to its coarse solum texture and the remainder is fair, limited only by unfavorable slopes.

These irrigation rating are somewhat over simplified. Several factors can be responsible for a soil having a VP rating but only the dominant limitation is used in the rating. It is sometimes difficult to decide which limitation would have the controlling influence. These ratings tend to be an average for the particular soil so that smaller, more suitable areas might be found that could be used for irrigation. These ratings do not take into account other factors such as proximity to a suitable source of water or temperature of the available water. Nevertheless, these irrigation ratings should serve as an ample guide to the selection of appropriate areas suitable for irrigation.

Suitability as a Source of Topsoil

This suitability rating is intended for use by engineers, landscapers, nurserymen, planners, and others who make decisions about selecting, stockpiling, and using topsoil. The term "topsoil" refers to soil material used to cover barren surfaces generally made barren by construction, so as to improve soil conditions for establishment of adapted vegetation.

The soil should be relatively abundant and easy to excavate, it should have physical, chemical, and biological characteristics favorable to the establishment and growth of plants, and it should be friable and easy to handle and spread. Subsequently, factors such as thickness, texture, natural fertility, slope, and wetness of the surface layer become important in determining whether or not a soil is suitable as a source of topsoil.

The following classes, limitations, and criteria are used to rate each soil as a source of topsoil.

Classes	Limitations
E - excellent	C - clayey
F - fair	S - sand
P - poor	G - gravelly
	R - stony
	T - steep slopes
	W - wet areas

Criteria: E - at least 40 cm of suitable material, 0-9% slopes.

F - 20-40 cm of suitable material, 10-15% slopes.

P - <20 cm of suitable material, $>15\%$ slopes, wet areas (gleysols), stony soils.

Suitable material in this criteria refers to soil with a sandy loam to silt loam texture. Therefore, soils that have at least 40 cm of sandy loam to silt loam material and a slope of less than 9% are rated as excellent.

A soil is rated as fair if it has a slope of 10 to 15% or only 20 to 40 cm of suitable material. A soil is also rated as fair if it has a solum with a clay loam to silty clay loam texture.

A soil can be rated as poor for a number of reasons. If it has less than 20 cm of suitable material or a slope greater than 15% it is rated as poor. If the soil is very stony or contains many wet areas it is also rated as poor. And if the soil has a very fine texture (c or sic) or a very coarse texture (ls, s, gs, gls, gsl) it is rated as poor.

When soils are rated as F or P the dominant soil limitation is included in the rating. For example a soil with 40 cm of suitable material and a slope of 10 to 15% would be rated as F-T. If there is a soil complex two ratings may be used. For example, F-T + P-C would mean that the majority of the area has an F rating due to steep slopes and the rest of the area has a P rating due to the fine texture of the solum.

The rating system that is used tends to be quite specific and considers most of the important factors. The only exceptions might be the natural fertility and reaction of the soil, however, this information is not always available.

Suitability for Road Construction

The location of roads and highways is affected by susceptibility to flooding, high water table, steepness of slopes, and stability of the soil material. Highly plastic clays, poorly graded silt, and soil material that has a high content of organic matter are difficult to compact, low in stability, susceptible to frost action, and consequently are undesirable for roadfill. On the other hand, well-graded, coarse-grained material, or a mixture of clay and coarse grained material is suitable as a source of roadfill.

The classes, limitations, and criteria used for rating the soils for their suitability for road construction are listed below.

Classes	Limitations
E - excellent	T - steep slopes
F - fair	F - permafrost
P - poor	S - silty texture
	W - wet areas
	I - flooding hazards
	M - morainal deposits
	R - stones

Criteria: E - 0-5% slopes, gravelly or sandy in top meter

F - 6-15% slopes, silty or sandy morainal deposits

P - >15% slopes, silty and clayey lacustrine or fluvial materials, stones class 4-5, high incidence of permafrost, flooding by stream overflow.

Most of these criteria are straight forward and easy to apply. Gravelly and sandy soils on gentle slopes are rated as excellent. These same soils with 6 to 15% slopes are rated as fair. Silty or sandy morainal deposits are also rated as fair, however, morainal deposits that are very sandy or gravelly will be rated excellent. Soils that have greater than 15% slope, or are fine textured, or have stones class 4 or 5, or have a high incidence of permafrost, or are subject to flooding are rated as poor.

For soils that are rated as F or P, the limitations are included in the rating symbol. For example, a soil might be rated as P-WF, meaning it is poor because of wetness and permafrost. Several limitations can be used with the F or P rating and if necessary two ratings can be given to a complex area. If two ratings are used the dominant rating is given first. For example, E + F-T would mean that the majority of the area is rated as excellent for road construction but a significant part of the area is rated fair because of steep slopes.

The location of a road can often be altered so that severe limitations are avoided. Even in poor areas the path of the road can be such that it will bypass the steep slopes, or very wet areas, etc.

Suitability as a Source of Sand or Gravel

The amount, quality, and accessibility of coarse-grained materials are the most important features that affect the suitability of a soil as a source of sand or gravel.

The classes and criteria used in rating the soils are listed below.

Classes	Material
E - excellent	G - gravel
F - fair	S - sand
P - poor	

Criteria: E - greater than 1 meter of fluvial gravel or sand, coarser textured than sandy loam

F - greater than 1 meter of sandy loam material

P - less than 1 meter of sand or gravel, or no known deposits present

To be rated as excellent the soil should have a loamy sand, sand, gravelly sand, or gravelly loamy sand texture. The finer textured sands, such as sandy loams and fine sandy loams are rated as fair. If there is less than 1 meter of sand or gravel or if there are no known deposits of sand or gravel present the soil is rated as poor. In some cases, however, only a meter of sand or gravel might be sufficient for certain purposes, but for most construction applications it would be too shallow.

G and S are used in conjunction with the E and F ratings. For example, if an area is rated as excellent for sand it would be E-S or if it was rated as excellent for sand or gravel it would be E-SG. Two ratings can be used if there is a soil complex. For example, an area might be rated P + E-G where the dominant soil is poor as a source for either sand or gravel while the other soil is excellent for gravel.

The degree of sorting of the sand or gravel may be variable. Areas rated as poor such as morainal materials may have small inclusions of good sand or gravel too small to be shown on the map.

Suitability for Area Type Landfills

Soil limitations for area type landfills are concerned with soil permeability, drainage, and slopes. The ratings used for area type landfills do not necessarily apply to trench type sanitary landfills even though the same limitations must be considered. Area type landfills are the predominant type of landfill in use throughout the Yukon Territory.

The following classes, limitations, and criteria were used to rate the soils for area type landfills.

Classes	Limitations
E - excellent	P - high permeability
F - fair	W - wet areas
P - poor	T - steep slopes
	I - flooding limitations
	F - permafrost

Criteria: E - very fine sandy loam or finer at least one meter thick, 0-9% slopes.

F - fine textured surface 30-100 cm thick over coarser, materials 10-30% slopes.

P - less than 30 cm of fine material over sand or gravel, >30% slopes, wet areas, flooding hazard.

In area type landfills the refuse is placed on the surface of the soil and eventually a cover of soil material is placed over the fill when it is completed. Finer textured soils are more suitable as a covering material than are sands or gravels and they also prevent leachates from the landfill penetrating the soil and polluting water supplies. Therefore, soils that have at least 1 meter of very fine sandy loam or finer material, are rated as excellent if the slope class is less than 9%. Soils with steeper slopes or only 30 to 100 cm of fine material over coarser material are rated as fair. Soils with very little or no fine textured material or with slopes greater than 30% are rated as poor. Soils that contain excessive wet areas or are subject to flooding are also rated as poor.

The limitations responsible for down grading a soil are included with the F or P rating. A soil that is sandy or gravelly would be rated as P-P which means that it is poor for area type landfills because of its high permeability. If the slopes of the sandy or gravelly soil were greater than 30% it would be rated P-PT. Two ratings can be used for soil complexes where the need arises. The first rating is always the dominant one.

Surface Texture (0 - 15 cm)

In this classification the soils are grouped together according to the texture of the surface layer (0-15 cm). This interpretive map will be useful for agronomic purposes such as selecting a suitable soil for special crops or determining erosion potential. The classes used are listed below.

U - texture unknown

V - variable, varies from gravelly sand to clay

G - gravelly

S - sand, loamy sand

SL - fine sandy loam and sandy loam

L - loamy morainal material (mixture of sand, silt, clay and gravel)

SI - silt loam, very fine sandy loam

C - silty clay loam to silty clay

O - Organic

The symbol U was used in cases where the surveyor did not know what the texture was because of lack of access to the area. The symbol V for variable was used for soils that tend to have very variable textures, such as Alluvium or Tributary Floodplain. The gravelly class would normally apply to fluvial gravels but was also used for morainal soils with gravelly loamy sand textures.

Subsoil Texture (40 - 100 cm)

This classification attempts to group soils according to their dominant texture in the 40 - 100 cm depth. In most cases these classes are the best estimate of the type of material that occurs between 40 cm and perhaps 300 cm. This classification in intended as a guide to engineers in their search for suitable fill materials for construction projects. The classes used are listed below.

U - texture unknown

V - variable, varies from gravelly sand to clay

G - gravelly

S - sand, loamy sand

SL - fine sandy loam and sandy loam

GM - gravelly morainal

L - loamy morainal material (mixture of sand, silt, clay and gravel)

SI - silt loam, very fine sandy loam

C - silty clay loam to silty clay

O - organic

The Class U refers to steep valley slopes or mountainsides while V refers to recent stream alluvial deposits. The Classes G (gravelly) and S (sandy) are now restricted only to fluvial deposits. Morainal deposits of the same texture (unsorted gravelly and sandy) are now Class GM. Class SI (silty) and C (Clayey) are restricted to sorted water deposited lacustrine or fluvial material, while Class L (loamy morainal) refers to medium textured morainal deposits. Class O for organic soils is used only when the organic material is greater than 40 cm thick. In this case the material indicated may not always extend below 100 cm.

Soil Drainage and Permafrost

This classification groups soils according to their internal drainage or relative degree of wetness. A modifier (F) is added in areas where permafrost is present in a portion of the landscape. The classes used are listed below.

D - well drained (dry)

M - imperfectly drained (moist-gleyed subgroups)

W - very poorly drained (wet-gleysols)

F - permafrost

The symbol M refers to areas of imperfectly drained soils or gleyed subgroups. These soils are commonly mottled in the B and C horizons and the water table level is at the 2 or 3 meter depth for moderately long periods during the year.

The symbol W refers to gleysols or organic soils that are poorly or very poorly drained. The gleysols may have free water at the surface for only a short time in the spring, but the water table remains high all year. The organic soils often have free water at or near the surface for most of the year. Permafrost is a problem primarily in the soils that have an insulating layer of organic material on the surface. However, permafrost was also noted on some well drained soils on level land and especially on north-facing slopes.

The F symbol is always used as a modifier of the drainage symbol. It an area has more than one drainage class, a plus (+) sign is used and the first class is dominant (50-85%) and the second class is significant (15-50%).

Surficial Material and Topography

This classification groups soils according to the source of the surficial material and the dominant slope class. These maps should be useful for regional planners regarding preliminary route and location assessment. The classes used are listed below.

Surficial Material	Topography
A - Alluvial	1 - Level to very gentle slopes (0-5%)
C - Colluvial	2 - Gentle to moderate slopes (6-15%)
E - Eolian	3 - Strong slopes (16-30%)
F - Fluvial	4 - Very strong to extreme slopes (31+%)
L - Lacustrine	
M - Morainal	
O - Organic	
R - Rock	
U - Undifferentiated	

The alluvial material is that occurring on recent floodplains of rivers and streams. They are variable in texture, ranging from loamy sand to silt loam. The majority of the alluvial deposits consist of 30- 60 cm of silty material over sand or gravel. The topography is usually of a channelled nature. In some areas these soils are subject to annual flooding but most are never flooded except under exceptional circumstances.

Colluvial material is a heterogeneous mixture that accumulates at the base or on the sides of steep slopes. It will often contain large rocks and is usually shallow over bedrock.

Eolian refers to material deposited by wind such as silty loess deposits. Most eolian deposits are thin, ranging from 10 - 50 cm of a silt loam to fine sandy loam material over fluvial gravels or morainal deposits.

Fluvial deposits that have been modified by wind such as duned sandy areas are also classified as eolian.

Fluvial refers to all materials other than alluvial floodplains that have been deposited by rivers or glacial meltwater. They are variable in texture, ranging from gravel to silt loam. The majority of the fluvial deposits are gravelly or sandy, some with a thin surface layer of finer material. Most of the fluvial deposits of the major rivers are nearly level to gently sloping with steep pitted topography on some of the upland glaciofluvial deposits.

The lacustrine deposits are usually nearly level with textures ranging from silt loam to silty clay. Most of the lacustrine deposits are in the Whitehorse - Takhini area.

Morainal deposits are unsorted mixtures of gravel, sand, silt and clay. The texture is usually uniform within a region, but varies greatly across the Yukon. The morainal deposits are loam textured in the Dawson - Mayo and Pelly Crossing areas and gravelly textured in the Whitehorse and Watson Lake areas. The topography ranges from gentle to strong slopes. The morainal deposits have a variable stone content.

Organic refers to deposits with more than 40 cm of organic material on the surface. The thickness of the organic material is not known. Organic soils are usually very wet and often frozen the year round.

Rock refers to hard bedrock occurring at or near the surface. The commonest occurrence in the map area is steep sided hills in complex with morainal or fluvial deposits.

Undifferentiated is used primarily with steep eroded slopes occurring along major rivers and streams.

A plus (+) sign is used to denote two or more materials occurring together in an area. If one material occurs over another and is less than one meter thick it is indicated with a slash (/). An example is eolian silt over till as occurs in the Diamain Lake Association north of Pelly Crossing (E/M).

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GLOSSARY

acid soil - A soil material having a pH of less than 7.0.

alkaline soil - Any soil that has a pH greater than 7.0.

alluvial fan - A fan-shaped deposit of alluvium laid down by a stream where it emerges from an upland into less steeply sloping terrain.

alluvium - Material such as clay, silt, sand, and gravel deposited by modern rivers and streams.

arable soil - Soil suitable for plowing and cultivation.

association, soil - A natural grouping of soil associates based on similarities in climatic or physiographic factors and soil parent materials. It may include a number of soil associates provided that they are all present in significant proportions.

available nutrient - The portion of any element or compound in the soil that can be readily absorbed and assimilated by growing plants. ("Available" should not be confused with "exchangeable".)

available water - The portion of water in a soil that can be readily absorbed by plant roots. Most workers consider it to be the water held in the soil against a pressure of up to approximately 15 bars. See also field capacity and moisture tension, soil.

beach deposits - Sediments that are modified in their degree of sorting, or surface relief, or both, by the action of waves in forming beaches.

bedrock - The solid rock that underlies soil and the regolith or that is exposed at the surface.

bog - Permanently wet land having low bearing strength.

Brunisolic - An order of soils whose horizons are developed sufficiently to exclude the soils from the Regosolic order, but that lack the degrees or kinds of horizon development specified for soils of the other orders. These soils, which occur under a wide variety of climatic and vegetative conditions, all have Bm or Btj horizons. The great groups Melanic Brunisol, Eutric Brunisol, Sombric Brunisol, and Dystric Brunsiol belong to this order.

bulk density - The mass of dry soil per unit bulk volume. The bulk volume is determined before the soil is dried to constant weight at 105°C. It has been called apparent density.

calcareous soil - Soil containing sufficient calcium carbonate, often with magnesium carbonate, to effervesce visibly when treated with cold 0.1 N hydrochloric acid.

capability class - A rating that indicates the capability of land for some use such as agriculture, forestry, recreation, or wildlife. In the Canadian system, it is a grouping of lands that have the same relative degree of limitation or hazard. The degree of limitation or hazard is nil in Class 1 and becomes progressively greater to Class 7.

capability subclass - A grouping of lands that have similar kinds of limitations and hazards. It provides information on the kind of conservation problem or limitation. The class and subclass together provide information about the degree and kind of limitation, for broad land-use planning and for the assessment of conservation needs.

catena - A nontaxonomic grouping of a sequence of soils of about the same age, derived from similar parent materials, and occurring under similar climatic conditions, but having unlike characteristics because of variations in relief and in drainage.

cation exchange capacity - The total amount of exchangeable cations that a soil can adsorb. It is sometimes called "total exchange capacity", "base exchange capacity", or "cation adsorption capacity". It is expressed in milliequivalents per 100 g of soil or of other adsorbing materials such as clay. See also effective cation exchange.

Chernozemic - An order of soils that have developed under xerophytic or mesophytic grasses and forbs, or under grassland-forest transition vegetation, in cool to cold, subarid to subhumid climates. The soils have a dark-colored surface (Ah, Ahe, or Ap) horizon and a B or C horizon, or both, of high base saturation. The order consists of the Brown, Dark Brown, Black, and Dark Gray great groups.

classification, soil - The systematic arrangement of soils into categories on the basis of their characteristics. Broad groupings are made on the basis of general characteristics, and subdivisions on the basis of more detailed differences in specific properties.

clay - (i) As a particle-size term: a size fraction less than 0.002 mm in equivalent diameter, or some other limit (geologists and engineers). (ii) As a rock term: a natural, earthy, fine grained material that develops plasticity with a small amount of water. (iii) As a soil term: a textural class. See also texture, soil. (iv) As a soil separate: a material usually consisting largely of clay minerals but commonly also of amorphous free oxides and primary minerals.

clay loam - Soil material that contains 27% to 40% clay and 20% to 45% sand. See also texture, soil.

clayey - Containing large amounts of clay, or having properties similar to those of clay.

coarse texture - The texture exhibited by sands, loamy sands, and sandy loams except very fine sandy loam. A soil containing large quantities of these textural classes.

colluvium - A heterogeneous mixture of material that as a result of gravitational action has moved down a slope and settled at its base. See also creep.

complex, soil - A mapping unit used in detailed and reconnaissance soil surveys where two or more defined soil units are so intimately intermixed geographically that it is impractical, because of the scale used, to separate them.

control section, soil - The vertical section upon which the taxonomic classification of soil is based. The control section usually extends to a depth of 100 cm (40 inches) in mineral materials and (tentative, system of soil classification for Canada) to 160 cm (64 inches) in organic materials.

cryic layer - A perennially frozen layer.

Cryosolic - An order of soils proposed for adoption in the Canadian taxonomic system. Cryosolic soils are mineral or organic soils that have perennially frozen material within 1 m (3 ft) of the surface in some part of the soil body, or pedon. They mean annual soil temperature is less than 0°C (32°F). They are the dominant soils of the zone of continuous permafrost and become less widespread to the south in the zone of discontinuous permafrost; their maximum development occurs in organic and poorly drained, fine textured materials. The vegetation associated with Cryosolic soils varies from sparse plant cover in the high arctic, through tundra, to subarctic and northern boreal forests. The active layer of these soils is frequently saturated with water, especially near the frozen layers, and colors associated with gleying are therefore common in mineral soils, even those that occur on well drained portions of the landscape. They may or may not be markedly affected by cryoturbation. The order has three great groups: Turbic Cryosol, comprising mineral soils that display marked cryosturbation and generally occur on patterned ground; Static Cryosol, mineral soils without marked cryoturbation; and Organo Cryosol, organic soils.

cryoturbation - Frost action, including frost heaving.

deposit - Material left in a new position by a natural transporting agent such as water, wind, ice, or gravity, or by the activity of man.

drumlin - An elongate or oval hill of glacial drift, commonly glacial till, deposited by glacier ice and having its long axis parallel to the direction of ice movement.

dunes - Wind-built ridges and hills of sand formed in the same manner as snowdrifts. They are started by some obstruction, such as a bush, boulder, or fence, that causes an eddy or otherwise thwarts the sand-laden wind. Once begun, the dunes themselves offer further resistance and they grow to form various shapes.

Dystric Brunsiol - A great group of soils in the Brunisolic order. The soils may have mull Ah horizons less than 5 cm (2 inches) thick. They have Bm horizons in which the base saturation (NaCl) is usually 65% to 100% and the pH ($CaCl_2$) is usually 5.5 or lower.

eolian deposit - Sand, or silt, or both, deposited by the wind. See also loess and dunes.

erosion - (i) The wearing away of the land surface by running water, wind, ice, or other geologcial agents, including such processes as gravitational creep. (ii) Detachment and movement of soil or rock by water, wind, ice, or gravity.

Eutric Brunisol - A great group of soils in the Brunisolic order. The soils may have mull Ah horizons less than 5 cm (2 inches) thick, and they have Bm horizons in which the base saturation (NaCl) is 100%.

evapotranspiration - The loss of water from a given area during a specified time by evaporation from the soil surface and by transpiration from the plants. Potential evapotranspiration is the maximum transpiration that can occur in a given weather situation with a low-growing crop that is not short of water and does not completely shade the ground.

fertility, soil - The status of a soil in relation to the amount and availability to plants of elements necessary for plant growth.

Fibrisol - A great group of soils in the Organic order that are saturated for most of the year. The soils have a dominantly fibric middle tier, or middle and surface tiers if a terric, lithic, hydric, or cryic contact occurs in the middle tier.

field capacity - The percentage of water remaining in the soil 2 or 3 days after the soil has been saturated and free drainage has practically ceased. The percentage may be expressed in terms of weight or volume.

fine texture - Consisting of or containing large quantities of the fine fractions, particularly of silt and clay. It includes all the textural classes of clay loams and clays: clay loam, sandy clay loam, silty clay loam, sandy clay, silty clay, and clay. Sometimes it is subdivided into clayey texture and moderately fine texture.

floodplain - The land bordering a stream, built up of sediments from overflow of the stream and subject to inundation when the stream is at flood stage.

fluvial deposits - All sediments, past and present, deposited by flowing water, including glaciofluvial deposits. Wave-worked deposits and deposits resulting from sheet erosion and mass wasting are not included.

friable - A consistence term pertaining to the ease of crumbling of soils.

genesis, soil - (i) The mode of origin of the soil, especially the processes or soil-forming factors responsible for the development of the solum, the true soil, from unconsolidated parent material. (ii) The division of soil science dealing with soil genesis (i).

glacial drift - All rock material carried by glacier ice and glacial meltwater, or rafted by icebergs. This term includes till, stratified drift, and scattered rock fragments.

gleyed soil - Soil affected by gleysation.

gleysation - A soil-forming process, operating under poor drainage conditions, which results in the reduction of iron and other elements and in gray colors, and mottles.

Gleysolic - An order of soils developed under wet conditions and permanent or periodic reduction. These soils have low chromas, or prominent mottling, or both, in some horizons. The great groups Gleysol, Humic Gleysol, and Luvic Gleysol are included in the order.

gravel - Rock fragments 2 mm to 7.5 cm (3 inches) in diameter.

Gray Luvisol - A great group of soils in the Luvisolic order occurring in moderately cool climates, where the mean annual temperature is usually lower than 5.5°C (42°F). The soils have developed under deciduous and coniferous forest cover, and have an eluviated light-colored surface (Ae) horizon, a brownish illuvial B (Bt) horizon, and usually a calcareous C horizon. The solum is base saturated (NaCl extraction). The Ahe horizon, if present, is less than 5 cm (2 inches) thick. This group includes soils formerly called Gray Wooded.

great group - A category in the Canadian system of soil classification. It is a taxonomic group of soils having certain morphological features in common and a similar pedogenic environment. Examples are Black, Solonetz, Gray Brown Luvisol, Humic Podzol, Melanic Brunisol, Regosol, Gleysol, and Fibrisol.

groundwater - Water that is passing through or standing in the soil and the underlying strata. It is free to move by gravity.

horizon, soil - A layer of soil or soil material approximately parallel to the lands surface; it differs from adjacent genetically related layers in properties such as color, structure, texture, consistence, and chemical, biological, and mineralogical composition.

humus - (i) The fraction of the soil organic matter that remains after most of the added plant and animal residues have decomposed. It is usually dark colored. (ii) Humus is also used in a broader sense to designate the humus forms referred to as forest humus. They include principally mor, moder, and mull. See also organic matter, soil; mor; moder; mull; and horizon, soil. (iii) All the dead organic material on and in the soil that undergoes continuous breakdown, change, and synthesis.

irrigation - The artificial application of water to the soil for the benefit of growing crops.

lacustrine deposit - Material deposited in lake water and later exposed either by lowering of the water level or by uplifting of the land. These sediments range in texture from sands to clays.

land - The solid part of the earth's surface or any part thereof. A tract of land is defined geographically as a specific area of the earth's surface. Its characteristics embrace all reasonably stable, or predictably cyclic, attributes of the biosphere vertically above and below this area, including those of the atmosphere, the soil, and the underlying geology, the hydrology, the plant and animal populations, and the results of past and present human activity, to the extent that these attributes exert a significant influence on the present and future uses of land by man.

landforms - The various shapes of the land surface resulting from a variety of actions such as deposition or sedimentation (eskers, lacustrine basins), erosion (gullies, canyons), and earth crust movements (mountains).

landscape - All the natural features such as fields, hills, forests, and water that distinguish one part of the earth's surface from another part. Usually it is the portion of land or territory that the eye can see in a single view, including all its natural characteristics.

leaching - The removal from the soil of materials in solution.

lime, agricultural - A soil amendment consisting principally of calcium carbonate, and including magnesium carbonate and perhaps other materials. It is used to supply calcium and magnesium as essential elements for growth of plants and to neutralize soil acidity.

loess - Material transported and deposited by wind and consisting of predominantly silt-sized particles.

Luvisolic - An order of soils that have eluvial (Ae) horizons, and illuvial (B) horizons in which silicate clay is the main accumulation product. The soils developed under forest or forest-grassland transition in a moderate to cool climate.

marl - A soft, unconsolidated earthy deposit consisting of calcium carbonate or magnesium carbonate, or both, and often shells, usually mixed with varying amounts of clay or other impurities.

marsh - Periodically flooded or continually wet areas having the surface not deeply submerged. It is covered dominantly with sedges, cattails, rushes, or other hydrophytic plants.

matrix, soil - The main soil constituent or material that encloses other soil features, for example, concretions embedded in a fine-grained matrix.

medium texture - Intermediate between fine-textured and coarse-textured soils. It includes the following textural classes: very fine sandy loam, loam, silt loam, and silt.

Mesisol - A great group of soils in the Organic order that are saturated for most of the year. The soils have a dominantly mesic middle tier, or middle and surface tiers if a terric, lithic, hydric, or cryic contact occurs in the middle tier.

microclimate - (i) The climate of a small area resulting from the modification of the general climate by local differences in elevation or exposure. (ii) The sequence of atmospheric changes within a very small region.

mineral soil - A soil consisting predominantly of, and having its properties determined predominantly by, mineral matter. It contains less than 17% organic carbon except for an organic surface layer that may be up to 40 cm (16 inches) thick if formed of mixed peat (bulk density 0.1 or more) or 60 cm (24 inches) if of fibric moss peat (bulk density less than 0.1).

moderately coarse texture - Consisting predominantly of coarse particles. In soil textural classification, it includes all the sandy loams except the very fine sandy loam.

moderately fine texture - Consisting predominantly of intermediate-sized soil particles with or without small amounts of fine or coarse particles. In soil textural classification, it includes clay loam, sandy clay loam, and silty clay loam.

moisture soil - Water contained in the soil.

moraine - An accumulation of earth, generally with stones, carried and finally deposited by a glacier. Several kinds of moraines are distinguished, such as ground moraine and end moraine.

neutral soil - A soil in which the surface layer, to plow depth, is neither acid nor alkaline in reaction.

order, soil - A category in the Canadian system of soil classification. All the soils of Canada have been divided into nine orders: Chernozemic, Solonetzic, Luvisolic, Podzolic, Brunsiolic, Cryosolic, Regosolic, Gleysolic, and Organic. All the soils within an order have one or more characteristics in common.

Organic - An order of soils that have developed dominantly from organic deposits. The majority of Organic soils are saturated for most of the year, unless artificially drained, but some of them are not usually saturated for more than a few days. They contain 17% or more organic carbon, and:

1) if the surface layer consists of fibric organic material and the bulk density is less than 0.1 (with or without a mesic or humic Op less than 15 cm (6 inches) thick), the organic material must extend to a depth of at least 60 cm (24 inches); or
2) if the surface layer consists of organic material with a bulk density of 0.1 or more, the organic material must extend to a depth of at least 40 cm (16 inches); or
3) if a lithic contact occurs at a depth shallower than stated in 1) or 2) above, the organic material must extend to a depth of at least 10 cm (4 inches).

organic matter - The organic fraction of the soil; includes plant and animal residues at various stages of decomposition, cells and tissues of soil organisms, and substances synthesized by the soil population. It is usually determined on coils that have been sieved through a 2.0-mm sieve.

outwash - Sediments washed out by flowing water beyond the glacier and laid down as stratified drift in thin foreset beds. The particle size may vary from boulders to silt.

overndry soil - Soil that has been dried at 105^{o}C until it has reached constant weight.

parent material - The unconsolidated and more or less chemically weathered mineral or organic matter from which the solum of a soil has developed by pedogenic processes.

particle-size analysis - The determination of the various amounts of the different separates in a soil sample, usually by sedimentation, sieving, micrometry, or combinations of these methods. Has been called grain-size analysis or mechanical analysis.

particle-size distribution - The amounts of the various soil separates in a soil sample, usually expressed as weight percentages. Has been called grain-size distribution.

peat - Unconsolidated soil material consisting largely of undecomposed, or only slightly decomposed, organic matter.

pedology - The asepcts of soil science dealing with the origin, morphology, genesis, distribution, mapping, and taxonomy of soils, and classification in terms of their use.

permafrost - (i) Perennially frozen material underlying the solum. (ii) A perennially frozen soil horizon.

permeability, soil - (i) The ease with which gases and liquids penetrate or pass through a bulk mass of soil or a layer of soil. Because different soil horizons vary in permeability, the specific horizon should be designated. (ii) The property of a porous medium that relates to the ease with which gases or liquids can pass through it.

pH, soil - The negative logarithm of the hydrogen-ion activity of a soil. The degree of acidity or alkalinity of a soil as determined by means of a glass, quinhydrone, or other suitable electrode or indicator at a specified moisture content or soil-water ratio, and expressed in terms of the pH scale.

Podzolic - An order of soil having podzolic B horizons (Bh, Bhf, or Bf) in which amorphous combinations of organic matter (dominantly fulvic acid), Al, and usually Fe are accumulated. The sola are acid and the B horizons have a high pH-dependent charge. The great groups in the order are Humic Podzol, Ferro-Humic Podzol, and Humo-Ferric Pedzol.

profile, soil - A vertical section of the soil through all its horizons and extending into the parent material.

reaction, soil - The degree of acidity or alkalinity of a soil, usually expressed as a pH value. Descriptive terms commonly associated with certain ranges in pH are: extremely acid, less than 4.5; very strongly acid, 4.5-5.0; strongly acid, 5.1-5.5; moderately acid, 5.6-6.0; slightly acid, 6.1-6.5; neutral, 6.6-7.3; slightly alkaline, 7.4-7.8; moderately alkaline, 7.9-8.4; strongly alkaline, 8.5-9.0; and very strongly alkaline, greater than 9.0.

Regosolic - An order of soils having no horizon development or development of the A and B horizons insufficient to meet the requirements of the other orders. Regosol is the only great group in this order.

relief - Elevations or inequalities of a land surface, considered collectively. Land having no unevenness or differences of elevation is called level; gentle relief is called undulating, strong relief, rolling, and very strong relief, hilly.

saline soil - A nonalkali soil that contains enough soluble salts to interfere with the growth of most crop plants. The conductivity of the saturation extract is greater than 4 mmhos/cm, the exchangeable-sodium percentage is less than 15, and the pH is usually less than 8.5.

salinity, soil - The amount of soluble salts in a soil, expressed in terms of percentage, parts per million, or other convenient ratios.

sand - (i) A soil particle between 0.05 and 2.0 mm in diameter. (ii) Any one of five soil separates: very coarse sand, coarse sand, medium sand, fine sand, or very fine sand. (iii) A soil textural class.

separates soil - Mineral particles, less than 2.0 mm in equivalent diameter, ranging between specified size limits. The names and size limits of separates recognized by pedologists in Canada and the United States are: very coarse sand, 2.0 to 1.0 mm; coarse sand, 1.0 to 0.5 mm; medium sand, 0.5 to 0.25 mm; fine sand, 0.25 to 0.10 mm; very fine sand 0.10 to 0.05 mm; silt, 0.05 to 0.002 mm; and clay, less than 0.002 mm. The separates recognized by the International Society of Soil Science are (I) coarse sand, 2.0 to 0.2 mm; (II) fine sand, 0.2 to 0.02 mm; (III) silt, 0.02 to 0.002 mm; and (IV) clay, less than 0.002 mm.

series, soil - A category in the Canadian system of soil classification. This is the basic unit of soil classification, and consists of soils that are essentially alike in all major profile characteristics except the texture of the surface.

silt - (i) A soil separate consisting of particles between 0.05 and 0.002 mm in equivalent diameter. (ii) A soil textural class.

soil - The unconsolidated material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

solum (plural sola) - The upper horizons of a soil in which the parent material has been modified and in which most plant roots are contained. It usually consists of A and B horizons.

stones - Rock fragments greater than 25 cm (10 inches) in diameter if rounded and greater than 30 cm (15 inches) along the greater axis if flat. In engineering practice these fragments are included with boulders, which are considered to be greater than 20 cm (8 inches) in diameter.

stony land - Areas containing sufficient stones to make the use of machinery impractical; usually 15% to 90% of the surface soil is covered with stones.

subgroup, soil - A category in the Canadian classification system. These soils are subdivisions of the great groups and therefore each soil is defined more specifically.

survey, soil - (Pedology) The systematic examination, description, classification, and mapping of soils in an area. Soil surveys are classified according to the kind and intensity of the field examination.

swamp - An area saturated with water throughout much of the year, but with the surface of the soil usually not deeply submerged. It is generally characterized by tree or shrub vegetation.

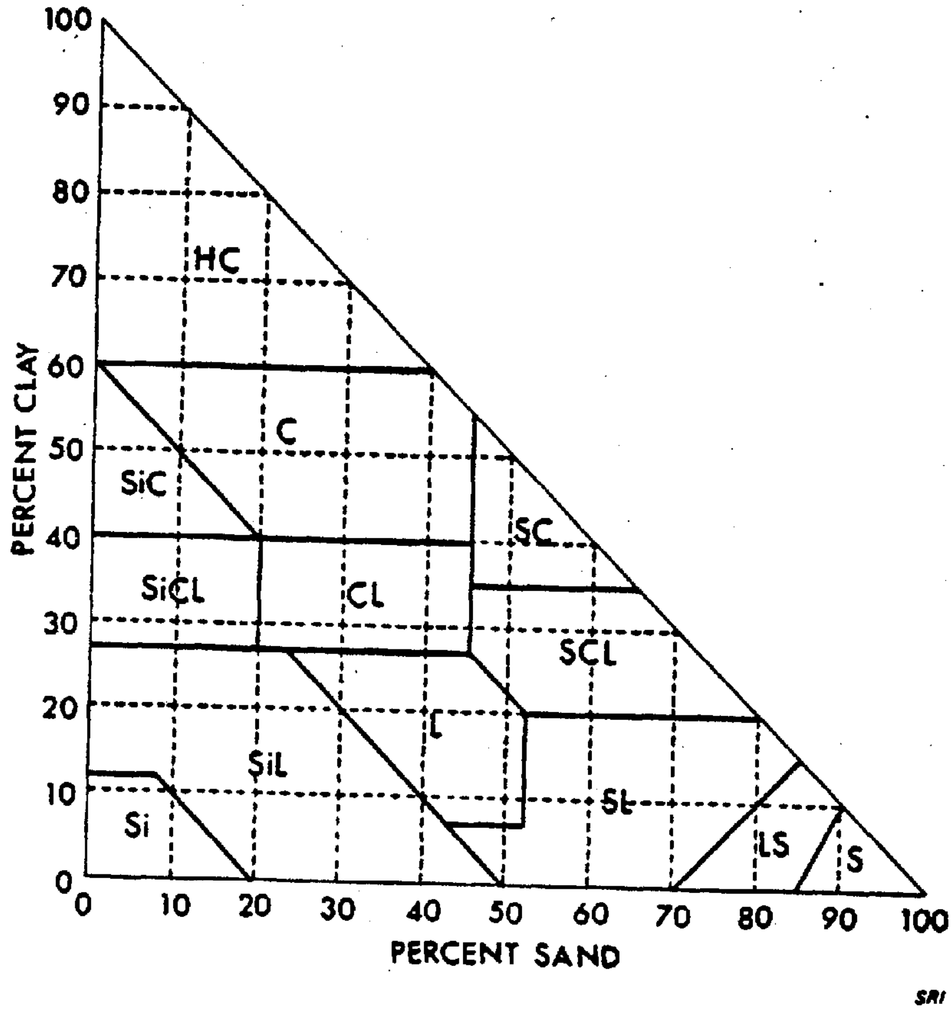
terrace - A nearly level usually narrow, plain bordering a river, lake, or sea. Rivers sometimes are bordered by a number of terraces at different levels. There are also man-made terraces.

texture, soil - The relative proportions of the various soil separates in a soil as described by the classes of soil texture.

till - Unstratified glacial drift deposited directly by the ice and consisting of clay, sand, gravel, and boulders intermingled in any proportion.

topography - The physical features of a district or region, such as those represented on a map, taken collectively; especially, the relief and contours of the land.

topsoil - (i) The layer of soil moved in cultivation. See also surface soil. (ii) The A horizon. (iii) The Ah horizon. (iv) Presumably fertile soil material used to topdress roadbanks, gardens, and lawns.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Appendix 1

Description of Soil Associations and Complexes

Soil Associations and Complexes of the Dawson-Stewart Crossing-Mayo Area

Alluvium Complex

Series Present: Orthic and Cumulic Regosols and Rego Gleysols.

Surface Texture: Variable, ranges from gravel to clay.

Parent Material: Variable textured alluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level to undulating channelled.

Location: The recent floodplains of major streams.

Extent: 1663 hectares

Vegetation: Dominantly willow on the most recent portions grading to alder and balsam poplar on the higher portions.

Agricultural Capability: Usually 5I or 7I due to annual flooding hazard.

Map Units:

Av - Dominantly Orthic and Cumulic Regosols and significant Gleysols.

Clear Creek Association

Series Present: Orthic Eutric Brunisols and Gleyed Eutric Brunisols.

Surface Texture: Silt loam to very fine sandy loam.

Parent Material: Yellowish brown to greyish brown slightly calcareous lacustrine material.

Drainage: Well to imperfectly drained.

Landform: Gently sloping lacustrine plain.

Location: Mile 40 on the Klondike highway west of Clear Creek.

Extent: 528 hectares in sheet 2.

Vegetation: Dominantly aspen forest with regenerating black and white spruce.

Agricultural Capability: Due to their occurence at high elevations (> 500 m) this area has a short frost-free period. These soils are suited only for seeded forages.

Map Units:

Cc1 - Dominantly Orthic Eutric Brunisols.

Dry Creek Association

Series Present: Orthic Dystric Brunisols and Orthic Eutric Brunisols.

Surface Texture: Silt loam to very fine sandy loam.

Parent Material: 20-70 cm of silty material over fluvial gravels.

Landform: Nearly level to undulating terraces of the Stewart River.

Drainage: Well drained

Location: Upper terraces of the Stewart River from Mayo to McQuesten.

Extent: 14485 ~~160250~~ hectares

Vegetation: Dominantly aspen and white spruce forest with shrubs consisting of soapberry, bearberry and cranberry. Also varying amounts of purple reedgrass, lupine and twinflower. Feathermoss is the dominant groundcover under spruce.

Agricultural Capability: These soils are located in a class 5 climatic region thus their capability rating is 5CH with cool growing season temperatures as the main limitation. They have low potential for native grazing, usually less than 100 kg/ha grazable forages.

Profile Description: Orthic Dystric Brunisol

Horizon	Depth (cm)	
L-H	5 - 0	Undecomposed leaf litter
Bm1	0 - 10	Light yellowish brown (10YR 6/4 dry) very fine sandy loam, very weak medium subangular blocky, pH 5.0.
Bm2	10 - 21	Yellowish brown (10YR 5/6 dry) very fine sandy loam, weak coarse subangular blocky, pH 4.1.
Bm3	21 - 33	Yellowish brown (10YR 5/6 dry) loamy fine sand, laminated, pH 5.1.
II C	33 - 50	Yellowish brown (10YR 5/4 dry) gravelly loamy sand, single grain, pH 5.9.

Map Units:

DK1 - Dominantly Orthic Dystric and Eutric Brunisols

Eureka Creek Association

Series Present: Orthic Eutric Brunisols, Rego Gleysol-peaty phase.

Surface Texture: Variable, sandy loam to silt loam.

Parent Material: Fluvial sands and silts.

Drainage: Mostly poorly drained, some well to imperfectly drained.

Landform: Sloping terraces.

Location: South side of the Indian River Valley.

Extent: 6195 ~~92,500~~ hectares.

Vegetation: Mainly black spruce forests with occasional aspen or white spruce.

Agricultural Capability: The limitations of wetness and short frost-free period restrict these soils to forage production.

Map Units:

Ec1 - Dominantly Orthic Eutric Brunisols

Ec2 - Dominantly Rego Gleysols - peaty phase and significant Orthic Eutric Brunisols.

Ferry Hill Complex

Series Present: Orthic Regosols, Cumulic Regosols, and Orthic Eutric Brunisols.

Surface Texture: Variable, sand to clay loam.

Parent Material: Variable, fluvial, colluvial, and morainal deposits.

Drainage: Well to poorly drained.

Landform: Steeply sloping colluvial.

Location: Steep slopes between the mountains and the Stewart River Valley.

Extent: ~~6000~~ 22454 hectares.

Vegetation: Black spruce and willow on the wet sites, with aspen and white spruce on the drier slopes. Some of the driest south-facing slopes were bare of trees and had only a grass cover.

Agricultural Capability: Due to the extremely steep slopes these soils have no capability for agriculture.

Map Units:

Fe - Dominantly Orthic and Cumulic Regosols and significant Orthic Eutric Brunisols.

Forty Mile Association

Series Present: Orthic Regosols and Rego Gleysols - peaty phase.

Surface Texture: Loamy sand.

Parent Material: Dark brown to black colored fluvial sands and gravels.

Drainage: Well to poorly drained.

Landform: Level to undulating fluvial terraces.

Location: Fluvial terraces of the Yukon River from Forty Mile to the Alaska border.

Extent: 12162 ~~38,000~~ hectares.

Vegetation: Mixed forests of black spruce, aspen and white spruce.

Agricultural Capability: The Orthic Regosols are rated as class 5 due to low moisture holding capacity and the Rego Gleysols as class 5 due to excessive wetness.

Map Units:

Ft1 - Dominantly Orthic Eutric Brunisols

Ft2 - Dominantly Rego Gleysols - peaty phase and significant Orthic Regosols.

Hillwash Complex

Series Present: Regosols and Brunisols

Surface Texture: Variable

Parent Material: Colluvial deposits

Drainage: Well drained

Landform: Usually strongly sloping

Location: Includes the steep eroded slopes along major streams and escarpments.

Extent: 13584 hectares

Vegetation: Depends on the texture of the material and aspect of the slope. South-facing slopes are often covered with white spruce or aspen in the northern areas and grass covered in the southern portions. North-facing slopes often have a cover of black spruce.

Agricultural Capability: Usually class 7 due to steep slopes.

Map Units:

Hw - Dominantly Regosols and Brunisols

Indian River Association

Series Present: Gleyed Regosols, Gleyed Cumulic Regosols, and Rego Gleysols - peaty phase.

Surface Texture: Very fine sandy loam to silt loam.

Parent Material: Alluvial floodplain deposits.

Drainage: Imperfectly and poorly drained.

Landform: Nearly level alluvial

Location: Lower terraces of the Indian River.

Extent: 5547 ~~32,000~~ hectares.

Vegetation: Solid stands of white spruce or aspen on the well to imperfectly drained sites. These occur near the river or as islands that escaped recent fires. Some imperfectly to poorly drained areas are covered with tall willows and scattered short (2-5 m) white spruce, aspen or white birch. There is fair growth of grass or sedge in the open stands.

Agricultural Capability: Most of these soils will be rated as class 5 due to cool summer temperatures or excessive wetness and thus suitable for forages. Some favorable sites with good air drainage might be suitable for cereals or vegetables. A large portion of the area has adequate forage for native grazing.

Map Units:

Ir1 - Dominantly Gleyed Regosols and significant Gleyed Cumulic Regosols.

Ir2 - Dominantly Gleyed Regosols and significant Gleyed Cumulic Regosols and Rego Gleysols - peaty phase.

Ir3 - Dominantly Rego Gleysols - peaty phase.

French Creek Association

Series Present: Gleysolic Static Cryosols - peaty phase, Gleyed Regosols, and Organics.

Surface Texture: Loamy sand to fine sandy loam.

Parent Material: Sandy fluvial deposits.

Drainage: Poorly to imperfectly drained.

Landform: Nearly level to undulating fluvial

Location: Glacial meltwater channels in the uplands between McQuesten and the Klondike River.

Extent: ~~93,000~~ 12720 hectares.

Vegetation: Dense shrub growth of willow and shrub birch with high sedge hummocks and sphagnum moss. There are scattered black spruce which become thicker near the edges of the drainageway transitional to the uplands.

Agricultural Capability: These soils have good capability for native grazing and are also suitable for seeded forages.

Map Units:

Fc1 - Dominantly Gleysolic Static Cryosols - peaty phase and significant Gleyed Regosols

Fc2 - Dominantly Gleysolic Static Cryosols - peaty phase and significant Organics

Klondike Association

Series Present: Orthic Regosols, Gleyed Regosols - peaty phase, Gleyed Cumulic Regosols, and Gleysolic Static Cryosols - peaty phase.

Surface Texture: Variable, silt loam to gravelly sandy loam.

Parent Material: Variable thickness of sandy or silty fluvial material over fluvial gravels.

Drainage: Variable, well to poorly drained.

Landform: Nearly level to slightly channelled terrace of the Klondike and North Klondike Rivers.

Location: Klondike Valley near Dawson.

Extent: 21305 ~~5206~~ hectares in sheet 1 and sheet 2.

Vegetation: Tall aspen and white spruce on the well-drained sites with willow or balsam poplar on the Gleyed Regosols. Shrub birch, labrador tea, willow, and black spruce on the poorly drained Cryic Rego Gleysols.

Agricultural Capability: The well and imperfectly drained silt loam soils in favorable climatic sites (south-facing, good air drainage) will be class 3 with climate (short growing season) as the main limitation. The poorly drained soils will be Class 5 because of wetness and will be restricted to forage production.

Profile Description: Gleyed Cumulic Regosol

Horizon	Depth (cm)	
Ap	0 - 17	Dark greyish brown (10YR4/2 dry), silt loam, granular, pH 5.4.
C1	17 - 34	Brown (10YR5/3 dry) silt loam, weak coarse angular blocky, pH 5.7.
C2	34 - 50	Dark greyish brown (10YR4/2 dry), very fine sandy loam, structureless, pH 5.6.
IIC	50 - 80	Dark greyish brown (10YR4/2 dry) loamy fine sand, single grain, pH 6.3.

Map Units:

Kn1 - Dominantly Gleyed Cumulic Regosols

Kn2 - Dominantly Orthic Regosols and significant Gleyed Regosols - peaty phase

Kn3 - Dominantly Gleyed Regosols - peaty phase

Kn4 - Dominatly Gleysolic Static Cryosols - peaty phase and significant Gleyed Regosols - peaty phase

Mayo River Association

Series Present: Orthic Eutric Brunisols, and Orthic Dystric Brunisols.

Surface Texture: Loamy sand.

Parent Material: Sandy fluvial deposits.

Landform: Nearly level to steeply inclined fluvial deposits of the Stewart River and associated uplands.

Drainage: Well drained.

Location: Along the highways south and east of Stewart Crossing and southeast of Ice Chest Mountain.

Extent: 38572 ~~32,050~~ hectares.

Vegetation: Open stands of white spruce on the moist sites, with open aspen or pine forests on the drier sites north of the Stewart River. Sparse grass cover under the aspen with reindeer moss covering the ground under the lodgepole pine.

Agricultural Capability: These soils are rated as class 5 because of a limitation due to low moisture holding capacity. They would be suitable only for seeded forages and would generally have a low productivity.

Profile Description: Orthic Eutric Brunisol

Horizon	Depth (cm)	
L - H	4 - 0	Partially decomposed leaves and pine needles.
Bm 1	0 - 11	Brown (10YR 5/3 dry) loamy sand, single grain pH 6.5.
Bm 2	11 - 25	Brown (10YR 5/3 dry) loamy sand, single grain pH 6.8.
Bm 3	25 - 43	Brown (10YR 5.5/3 dry) loamy sand, single grain, pH 6.9.
C 1	43 - 57	Brown (10YR 5/3 dry) loamy sand, single grain, pH 6.9.
C 2	57 - 70	Greyish brown (10YR 5/2 dry) loamy sand, single grain, pH 7.0, frozen on June 1, 1976.

Map Units:

Mr1 - Dominantly Orthic Dystric and Eutric Brunisols

Mr2 - Dominantly Orthic Dystric and Eutric Brunisols and significant Gleysols

McQuesten Association

Series Present: Orthic Dystric Brunisols, Rego Gleysols and Orthic Eutric Brunisols.

Surface Texture: Variable, gravelly sandy loam to silt loam.

Parent Material: Less than 20 cm of silty material over fluvial gravels.

Drainage: Well and poorly drained.

Landform: Nearly level terraces of the Stewart River.

Location: On the medium and high terraces of the Stewart River between Ice Chest Mountain and Mayo.

Extent: 49978 ~~86,000~~ hectares.

Vegetation: Short to moderately tall stands of white spruce and aspen with soapberry, bearberry and feathermoss as groundcover.

Agricultural Capability: Some of the soils have limited amounts of natural grass for grazing and are rated as class 6. The soils with no grass and which are gravelly at the surface will be class 7 or not suitable for agriculture.

Profile Description: Orthic Dystric Brunisol

Horizon	Depth (cm)	
L-H	4 - 0	Partially decomposed leaf litter
Bm 1	0 -10	Light yellowish brown (10YR 6/4 dry) silt loam, weak medium to coarse platy, pH 4.8.
Bm2	10-20	Light yellowish brown (10YR 6/4 dry) gravelly fine sandy loam, weak medium to coarse platy, pH 5.1.
IIC 1	20-45	Dark brown (10YR 3/4 moist) gravelly loamy sand, single grain, pH 5.3.
IIC 2	45-60	Dark brown (10YR 3/3 moist) gravelly loamy sandy, single grain, pH 5.4.

Map Units:

Mc1 - Dominantly Orthic Dystric and Eutric Brunisols

Mc2 - Dominantly Orthic Dystric and Eutric Brunisols and significant Gleysols

Medrick Creek Complex

Series Present: Orthic Dystric Brunisols, Gleyed Dystric Brunisols, Orthic Regosols, and Gleysols.

Surface Texture: Variable, gravelly loam to silt loam.

Parent Material: Mixture of fluvial, colluvial, and morainal.

Drainage: Well to poorly drained.

Landform: Steeply sloping to depressional.

Location: Eroded valley slopes between the Klondike River Valley and the level upland to the southeast.

Extent: ~~26,000~~ 6469 hectares.

Vegetation: Black spruce and willow on the poorly drained drainageways and aspen on the dry hillslopes.

Agricultural Capability: Due to the steep slopes and danger of erosion, these soils are rated as class 6 or 7. The class 6 soils have some native grazing while the class 7 soils are not suitable for any type of Agriculture.

Map Units:

Md1 - Dominantly Orthic Dystric and Eutric Brunisols and significant Orthic Regosols.

Md2 - Dominantly Gleyed Dystric and Eutric Brunisols and significant Gleysols.

<u>Moosehide Hills Complex</u>

Series Present: Orthic Regosols, Gleysolic Static Cryosols

Surface Texture: Variable, loamy sand to clay loam.

Parent Material: Colluvial veneer shallow over bedrock.

Drainage: Well to poorly drained.

Landform: Steeply sloping colluvial deposits on the valley walls.

Location: On the valley slopes of the Klondike Valley and surrounding area.

Extent: 11204 ~~62,000~~ hectares.

Vegetation: Aspen and white spruce on the well to imperfectly drained southfacing slopes. Black spruce on the frozen north-facing slopes.

Agricultural Capability: These soils have no capability for agriculture because of steep slopes.

Map Units:

Mh - Dominantly Orthic Regosols and significant Gleyed Regosols.

Stewart Crossing Association

Series Present: Orthic Regosols, Gleyed Regosols, Orthic Eutric Brunisols, Rego Gleysols and Organics.

Surface Texture: Sandy loam to silty clay loam.

Parent Material: Silty to fine sandy alluvial material over loamy sand alluvial deposits.

Drainage: Well to very poorly drained.

Landform: Undulating and channelled alluvial

Location: On the floodplain and low terraces of the Stewart River.

Extent: 40581 ~~30,000~~ hectares.

Vegetation: There is a varied tree species composition with balsam poplar and white spruce on the moister sites and aspen and poplar birch on the higher more well drained sites. Black spruce grows in the wetter sites, with willows, sedges, and mosses in the wettest areas.

Agricultural Capability: The well and imperfectly drained soils of silt loam or finer texture are class 3 with the main limitation being a short cool growing season. This soil is suitable for cereals or forages. The poorly drained soils are class 5 because of wetness and suitable only for forages. There is very little native grazing.

Profile Description: Orthic Regosol

Horizon	Depth (cm)	
Ap	0 - 15	Dark grayish brown (10YR 4/2 dry) very fine sandy loam, moderate medium platy, pH 7.3.
Ck1	15 - 35	Brown (10YR 5/3 dry) silt loam, moderate medium platy, pH 7.7.
Ck2	35 - 60	Greyish brown (10YR 5/2 dry) loamy fine sandy, weak fine platy, pH 7.6.

Map Units:

St1 - Dominantly Orthic Regosols and significant Orthic Eutric Brunisols

St2 - Dominantly Rego Gleysols and significant Orthic Regosols.

St3 - Dominantly Orthic Regosols and significant Gleyed Regosols.

St4 - Dominantly Orthic Regosols and significant Gleysols and Organics.

Sunnydale Association

Series Present: Cumulic Regosols, Orthic Regosols, Orthic Eutric Brunisols, and Rego Gleysols.

Surface Texture: Very fine sandy loam to silt loam.

Parent Material: Slightly calacareous silt loam to very fine sandy loam fluvial material.

Drainage: Well to poorly drained.

Landform: Sloping terraces of the Yukon River.

Location: High terraces of the Yukon River near Dawson.

Extent: ~~9260~~ 7576 hectares.

Vegetation: Mixwood forests with aspen, white spruce and black spruce. Some poorly drained areas have solid stands of black spruce.

Agricultural Capability: Due to a short frost-free period these soils are rated as class 5, suitable only for forages.

Map Units:

Sd1 - Dominantly Cumulic Regosols and significant Orthic Regosols

Sd2 - Dominantly Orthic Regosols and significant Orthic Eutric Brunisols.

Sd3 - Dominantly Rego Gleysols and significant Orthic Eutric Brunisols

Tributary Floodplain Complex

Series Present: Rego Gleysols and Orthic Regosols

Surface Texture: Variable, ranging from gravel to clay.

Parent Material: Mixed alluvial, lacustrine, and morainal.

Drainage: Poorly to well drained.

Landform: Variable, ranging from channelled to strongly sloping.

Location: Includes the floodplain and eroding banks of small streams.

Extent: 17374 ~~10171~~ hectares

Vegetation: Variable, ranging from riparian shrubs on the floodplain to aspen or white spruce on the well drained steeper slopes.

Agricultural Capability: Usually a class 7 due to wetness and steep slopes.

Map Units:

Tp - Dominantly Gleysols and Regosols and significant Brunisols

Two Sisters Association

Series Present: Orthic Dystric Brunisols, Gleyed Dystric Brunisols, Brunisolic Grey Luvisols and Gleysols.

Surface Texture: Fine sandy loam to loam.

Parent Material: Loam textured morainal often with gravel encountered in the top metre of soil.

Drainage: Well to poorly drained.

Landform: Hummocky to undulating.

Location: Morainal upland in the Tintina Valley between McQuesten and the Klondike River.

Extent: 70252 ~~180,000~~ hectares.

Vegetation: Both aspen and black spruce forests occur on the well and imperfectly drained silts. The shrub and herb layer is sparse with scattered willow, labrador tea, and bearberry. Grass cover is limited, less than 50 kg/ha of grazable forages.

Agricultural Capability: Due to their occurence at higher elevations (500-700 m) there is a short cool growing season and thus the best soils can be rated no better than class 5 or suitable only for forages.

Profile Description: Orthic Dystric Brunisol

Horizon	Depth (cm)	
L - H	5 - 0	Partially decomposed leaves and moss.
Bm 1	0 - 20	Dark yellowish brown (10YR 4/4 moist) sandy loam, granular, pH 4.9.
Bm 2	20 - 51	Greyish brown (10YR 5/2 moist) silt loam, moderate fine to medium subangular blocky, pH 5.1.
C	51 - 70	Strong brown (7.5YR 5/6 moist) silt loam, moderate fine subangular blocky, pH 5.2.

Horizon	Depth (cm)	
II C	70 - 100	Light yellowish brown (10YR 6/4 moist) gravelly sand, single grain, pH 5.6.

Map Units:

Ts1 - Dominantly Orthic Dystric Brunisols

Ts2 - Dominantly Orthic Dystric Brunisols and significant Brunisolic Gray Luvisols.

Ts3 - Dominantly Orthic Dystric Brunisols and significant Gleyed Dystric Brunisols.

Ts4 - Dominantly Orthic Dystric Brunisols and significant Gleyed Dystric Brunisols and Gleysols.

Soil Associations and Complexes

of the

Pelly Crossing-Carmacks Area

Berdoe Association

Series Present: Orthic Regosols and Orthic Eutric Brunisols.

Surface Texture: Loamy sand to fine sandy loam.

Parent Material: Sandy and gravelly fluvial fans.

Drainage: Well drained.

Landform: Sloping fluvial fans.

Location: Along the valley wall of the Nordenskoild River.

Extent: 1076 hectares

Vegetation: Mixed aspen and white spruce forests.

Agricultural Capability: These soils are quite coarse-textured and therefore doughty. They are rated as Class 5 and are best suited to forages.

Map Units:

Be1 - Dominantly Orthic Regosols and Orthic Eutric Brunisols

Bradens Canyon Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Loamy sand to fine sandy loam.

Parent Material: Sandy fluvial deposits.

Drainage: Well drained.

Landform: Nearly level fluvial terrace.

Location: FLuvial terraces of the Pelly River.

Extent: 3130 hectares

Vegetation: Open aspen forests with rose, lupine, buffalo berry and bearberry in the understory.

Agricultural Capability: These soils are rated as Class 5M due to the coarse-textured nature of the solum. This soil usually occurs in combination with the gravelly Fort Selkirk Association and usually has a grazing capability of Class 5 or better (50 - 200 kg/ha grazable forages).

Map Units:

Bc1 - Dominantly Orthic Eutric Brunisols

Carmacks Association

Series Present: Cumulic Regosols, Orthic Regosols, Gleyed Regosols and Orthic Eutric Brunisols.

Surface Texture: Sandy loam to silt loam.

Parent Material: Sandy loam to silt loam material over loamy sand alluvial deposits. Five to twenty cm of ash on the surface.

Drainage: Well to imperfectly drained.

Landform: Nearly level alluvial .

Location: On the floodplain of the Yukon River near Carmacks.

Extent: 4748 hectares

Vegetation: The dominant trees are balsam poplar and white spruce on the moist sites with an understory of willow, rose, and reed grass.

Agricultural Capability: The fine sandy loam to silt loam soils are rated as Class 3 with the main limitation one of climate (short cool season and low rainfall). These soils are suitable for growing coarse grains and vegetables. They have a low capability for native grazing, usually Class 7.

Map Units:

Ck1 - Dominantly Cumulic Regosols

Ck2 - Dominantly Orthic Regosols and significant Orthic Eutric Brunisols

Ck3 - Dominantly Orthic Eutric Brunisols

Ck4 - Dominantly Cumulic Regosols and significant Gleyed Regosols

Diamain Lake Association

Series Present: Orthic Eutric Brunisols, Gleyed . Eutric Brunisols and Rego Gleysols.

Surface Texture: Very fine sandy loam to silt loam.

Parent Material: 20 to 40 cm of silt loam or very fine sandy loam grading to loamy sand at 80 to 100 cm and then loam textured till. The lower loamy sand material is not always present.

Drainage: Well to poorly drained.

Landform: Eolian veneer 20 - 40 cm thick over undulating fluvial to rolling morainal

Location: Upland areas north and south of the Pelly River from Granite Canyon to Fort Selkirk.

Extent: 65796 hectares

Vegetation: The vegetation of a large part of the Diamain Lake soils have been burned and is regenerating to aspen, willow and fireweed. The mature forests are of three types. Tall (15 - 25 m) aspen with a dense understory of rose, cranberry and buffalo berry and a low groundcover of bearberry and twinflower. A mixed forest with some spruce and more moss and fewer herbs in the groundcover. There are also relatively small areas of productive spruce, most of which has been logged. Spruce trees with diameters up to 60 cm are found but the average is nearer to 30 cm on 100 - 130 year aged trees.

Agricultural Capability: Due to the cool summer temperatures these soils are rated as class 5CH and are suitable only for forages. Some areas have marginal native grazing (10-100 kg/ha).

<u>Profile Description</u>: Orthic Eutric Brunisol

Horizon	Depth (cm)	
L-H	5 - 0	Partially decomposed leaf litter.
Bm1	0 - 14	Brown (7.5YR 5/4 dry) silt loam, massive, pH 6.1.
Bm2	14 - 34	Yellowish brown (10YR 5/6 dry) very fine sandy loam, massive, pH 6.4
IIBm1	34 - 60	Yellowish brown (10YR 5/4 dry) loamy sand, single grain, pH 7.3.
IIBm2	60 - 80	Brown (10YR 5/3 dry) loamy sand, single grain, pH 6.5.
IIICk	80+	Moderately calcareous, loam textured till.

Map Units:

Dm1 - Dominantly Orthic Eutric Brunisols

Dm2 - Dominantly Orthic Eutric Brunisols and significant Gleyed Eutric Brunisols.

Dm3 - Dominantly Orthic Eutric Brunisols and significant Rego Gleysols

Exposure Complex

General Description: The Exposure Complex is used for hard bedrock exposures. They are usually devoid of soil and are generally steeply sloping.

Extent: 3079 hectares

Agricultural Capability: Class 7R, not suitable for agriculture.

Five Fingers Rapid Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Fine sandy loam to loamy sand.

Parent Material: Fine sandy loam to loam morainal deposits. Thin (5 - 10 cm) volcanic ash layer on the surface.

Drainage: Well to poorly drained.

Landform: Ridged and rolling morainal

Location: Upland region south of Minto near Five Fingers Rapids.

Extent: 3207 hectares

Vegetation: Tree vegetation of aspen, white spruce, and lodgepole pine.

Agricultural Capability: Due to their high elevation (610 m) these soils are rated as Class 5 because of very cool summer temperatures and short frost free season. Most of them also occur in areas with steep slopes.

Map Units:

Ff1 - Dominantly Orthic Eutric Brunisols

Fort Selkirk Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Sandy loam to gravelly loamy sand.

Parent Material: Sandy loam to gravelly loamy sand over gravelly sand fluvial deposits.

Drainage: Well drained.

Landform: Nearly level fluvial [illegible].

Location: On terraces of the Pelly River and Yukon River north of Minto.

Extent: 7367 hectares

Vegetation: Open aspen forest, often scrubby on the coarser gravels. Usually good grass cover (100 - 200 kg/ha) under these stands. Other species in these stands are rose, lupine, willow, buffalo berry and bearberry.

Agricultural Capability: Areas with good growth of grass are rated as Class 6. Areas with no grass are rated as Class 7 or non-agricultural due to the very low moisture holding capacity of the gravels.

Profile Description: Orthic Eutric Brunisol

Horizon	Depth (cm)	
AB	0 - 15	Dark brown (10YR 4/3 dry) very fine sandy loam, weak very coarse subangular blocky, pH 6.6.
IIBm	15 - 30	Light yellowish brown (10YR 6/4 dry) gravelly loamy coarse sand, single grain, pH 6.2.
IIC	30 - 45	Very pale brown (10YR 7/3 dry) very gravelly coarse sand, single grain, pH 6.4.

Map Units:

Fs1 - Dominantly Orthic Eutric Brunisols

Granite Canyon Association

Series Present: Orthic Eutric Brunisols, Gleyed Eutric Brunisols and Rego Gleysols.

Surface Texture: Sandy loam to loamy sand.

Parent Material: Sandy fluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level to hummocky upland fluvial

Location: In the upland regions near Diamain Lake and east of Fort Selkirk.

Extent: 9508 hectares

Vegetation: The dominant tree species is white spruce with occasional aspen. The shrub layer is dominated by bearberry and cranberry with mosses and lichens on the forest floor.

Agricultural Capability: These soils are rated as Class 5 due to their low moisture holding capacity. As well, many of these soils occur on steep slopes. They may be utilized for seeded forages.

Map Units:

Gc1 - Dominantly Orthic Eutric Brunisols

Gc2 - Dominantly Orthic Eutric Brunisols and significant Gleyed Eutric Brunisols and Rego Gleysols.

Hillwash Complex

Series Present: Regosols and Brunisols

Surface Texture: Variable

Parent Material: Colluvial deposits

Drainage: Well drained

Landform: Usually strongly sloping

Location: Includes the steep eroded slopes along major streams and escarpments.

Extent: 22362 hectares

Vegetation: Depends on the texture of the material and aspect of the slope. South-facing slopes are often devoid of trees and have a grass cover. North-facing slopes often have a cover of black spruce.

Map Units:

Hw - Dominantly Regosols and Brunisols

Little Salmon Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Gravelly loamy sand to silt loam.

Parent Material: Poorly sorted glaciofluvial gravels. Often a thin cover (5 - 15 cm) of volcanic ash.

Drainage: Well drained.

Landform: Very steep slopes on pitted fluvial

Location: Upland areas west of the Yukon River at Carmacks and near Tatchun Lake.

Extent: 24101 hectares

Vegetation: Aspen and white spruce in the sheltered, moist areas and grass on the dry south-facing slopes.

Agricultural Capability: Due to the steep droughty slopes, these soils have no capability for agriculture.

Map Units:

Ls1 - Dominantly Orthic Eutric Brunisols

McCabe Creek Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Loamy sand to sandy loam.

Parent Material: Sandy fluvial deposits with a thin (5 - 30 cm) volcanic ash cover.

Drainage: Well drained.

Landform: Nearly level fluvial

Location: On middle to higher terraces of the Yukon River upstream from Minto to the Little Salmon River.

Extent: 11656 hectares

Vegetation: The dominant trees are white spruce, with a herb layer of bastard toad flax and mosses and lichens on the ground.

Agricultural Capability: These soils are rated as Class 5 due to the low moisture holding capacity of the loamy sand soil material. They are suited only for seeded forages. They generally have a low potential for grazing of native forages.

Map Units:

Mb1 - Dominantly Orthic Eutric Brunisols

Mica Creek Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Silt loam to silty clay loam.

Parent Material: Silty clay loam morainal deposits.

Landform: Gently undulating morainal

Drainage: Well drained.

Location: The upland region just south of the Pelly River Valley near Pelly Crossing.

Extent: 2590 hectares

Vegetation: Most of the vegetation on the Mica Creek is a result of a recent burn. Regenerating to willow and aspen. Vigorous groundcover of rose, lupines, bluebells, daisies and grass. These soils will have fair grazing until the trees get larger.

Agricultural Capability: If the climate is suitable (long enough frost free period) these soils will be rated as Class 3. They are at a lower elevation than the majority of the upland soils (Von Wilzek and Diamain Lake) but slightly higher than the fluvial soils in the Pelly Valley.

Map Units:

Mk1 - Dominantly Orthic Eutric Brunisols

Midway Lodge Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Fine sandy loam to silt loam.

Parent Material: 10 to 30 cm of ash over 20 to 50 cm fine sandy loam to silt loam material over sandy or gravelly fluvial deposits.

Drainage: Well drained.

Landform: Nearly level fluvial

Location: Middle and higher terraces of the Yukon River upstream from Minto to the Little Salmon River.

Extent: 5591 hectares

Vegetation: Dominantly white spruce and aspen with very few shrubs or grasses.

Agricultural Capability: These soils are rated as Class 4 due to a combination of their low moisture holding capacity and low rainfall in the area. They could be utilized for growing coarse grains or forages.

Profile Description: Orthic Eutric Brunisol

Horizon	Depth (cm)	
L-H	6 - 0	Paritally decomposed leaf litter.
Ash layer	0 - 30	White (5YR 8/1 dry) volcanic ash, pH 6.6.
Bm1	30 - 44	Light olive brown (2.5Y 5/6 dry) very fine sandy loam structureless, pH 7.3.

Horizon	Depth (cm)	
Bm2	44 - 60	Light olive brown (2.5Y 5/6 dry) fine sandy loam, structureless, pH 7.6.
Bm3	60 - 72	Light yellowish brown (2.5Y 6/4 dry) fine sandy loam, structureless, pH 7.7.
IICk	72 - 90	Light brownish gray (10YR 6/2 dry) sandy loam, structureless, pH 7.9.
IIICk	90 - 110	Pale brown (10YR 6/3 dry) loamy sand, structureless, pH 8.0.

Map Units:

My1 - Dominantly Orthic Eutric Brunisols

Minto Landing Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Fine sandy loam to loamy sand.

Parent Material: 10 to 30 cm of volcanic ash over fluvial gravels.

Drainage: Well drained.

Landform: Nearly level fluvial [illegible]

Location: On the low terraces of the Yukon River upstream from Minto to the Little Salmon River.

Extent: 14821 hectares

Vegetation: Mixedwood forest of spruce and aspen with occasional lodgepole pine in the southern regions.

Agricultural Capability: Due to the gravelly nature of the subsoil, these soils are not suitable for cultivation. If sufficient native grass is present they can be used for grazing.

Map Units:

Mtl - Dominantly Orthic Eutric Brunisols

Nordenskiold Complex

Series Present: Regosols, Brunisols, Rego Gleysols, and Fibrisols.

Surface Texture: Variable, loamy sand to silt loam.

Parent Material: Sandy and silty fluvial and lacustrine deposits.

Drainage: Well to very poorly drained.

Landform: Nearly level to hummocky. Frequent pools of water in depressions left by melting of permafrost.

Location: In the Nordenskiold Valley between Carmacks and Twin Lakes.

Extent: 4539 hectares

Vegetation: Mixedwood forest of white spruce and aspen on the well drained sites.

Agricultural Capability: These soils are rated as class 5, with the main limitation being climate (CH), topography (T), and wetness (W). They are suitable for seeded forages.

Map Units:

Nr - Dominantly Regosols and Brunisols and significant Rego Gleysols and Organic Cryosols.

Pelly Crossing Association

Series Present: Cumulic Regosols, Orthic Regosols, Gleyed Regosols and Orthic Eutric Brunisols.

Surface Texture: Sandy loam to silt loam.

Parent Material: Sandy loam to silt loam over loamy sand alluvial deposits.

Drainage: Well to imperfectly drained.

Landform: Nearly level alluvial

Location: On the floodplain of the Pelly River.

Extent: 5651 hectares

Vegetation: The active portion of the floodplain is frequently covered by willows. The slightly higher portions are dominantly balsam poplar and white spruce.

Agricultural Capability: The fine sandy loam to silt loam soils are rated as Class 3 due to the lack of sufficient moisture. They are well suited for growing coarse grains or vegetables. The coarser textured soils (loamy sand) are best suited for forages and are rated as Class 5.

Profile Description: Orthic Eutric Brunisol

Horizon	Depth (cm)	
L-H	7 - 0	Dark reddish brown (5YR 2.5/2 dry) partially decomposed leaf litter.
Bm	0 - 20	Yellowish brown (10YR 5/4 moist) very fine sandy loam, structureless, pH 7.0.

Horizon	Depth (cm)	
Ck	20 - 77	Greyish brown (10YR 5/2 dry) very fine sandy loam, structureless, pH 7.9.
IICk	77 - 100	Greyish brown (10YR 5/2 dry) sand, structureless, pH 8.3.

Map Units:

PX1 - Dominantly Cumulic Regosols

PX2 - Dominantly Orthic Regosols and significant Orthic Eutric Brunisols

PX3 - Dominantly Orthic Eutric Brunisols

PX4 - Dominantly Cumulic Regosols and significant Gleyed Regosols

Tributary Floodplain Complex

Series Present: Rego Gleysols and Orthic Regosols

Surface Texture: Variable, ranging from gravel to clay.

Parent Material: Mixed alluvial, lacustrine, and morainal.

Drainage: Poorly to well drained.

Landform: Variable, ranging from channelled to strongly sloping.

Location: Includes the floodplain and eroding banks of small streams.

Extent: 10171 hectares

Vegetation: Variable, ranging from riparian shrubs on the floodplain to aspen or white spruce on the well drained steeper slopes.

Agricultural Capability: Usually a class 7 due to wetness and steep slopes.

Map Units:

Tp - Dominantly Gleysols and Regosols and significant Brunisols

Von Wilczek Association

Series Present: Orthic Eutric Brunisols and Rego Gleysols.

Surface Texture: Sandy loam to very fine sandy loam.

Parent Material: Loam to sandy loam morainal deposits sometimes shallow over bedrock.

Drainage: Well to poorly drained.

Landform: Rolling to steeply sloping morainal

Location: The upland areas north and south of the Pelly River from Pelly Crossing to Fort Selkirk.

Extent: 48662 hectares

Vegetation: Mixedwood forest of aspen and white spruce with shrub layer of willow, buffalo berry and bearberry.

Agricultural Capability: Due to their occurrence at higher elevations, these soils are rated as Class 5, suitable only for forages. In addition to the limitation of short growing season, these soils have the added limitation of steep slopes.

Map Units:

Vw1 - Dominantly Orthic Eutric Brunisols

Vw2 - Dominantly Orthic Eutric Brunisols and significant Rego Gleysols

Wilkinson Cabin Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Very fine sandy loam to silt loam.

Parent Material: Very fine sandy loam to silt loam material 20 - 60 cm thick over fluvial sands or gravel.

Drainage: Well drained.

Landform: Nearly level fluvial

Location: On terraces of the Pelly River.

Extent: 4825 hectares

Vegetation: Tall dense stands of aspen.

Agricultural Capability: These soils are rated as Class 4 due to their low moisture holding capacity. They can be used to grow coarse grains or vegetables but would benefit significantly from supplemental irrigation.

Map Units:

Wc1 - Dominantly Orthic Eutric Brunisols

Yukon Crossing Association

Series Present: Orthic Eutric Brunisols and Rego Humic Gleysols.

Surface Texture: Silt loam.

Parent Material: 5 - 15 cm of volcanic ash over 20 - 50 cm of silt loam over sandy fluvial or morainal deposits.

Drainage: Well to poorly drained.

Landform: Undulating to hummocky morainal

Location: The upland area west of the Yukon River between Carmacks and Minto.

Extent: 3389 hectares

Vegetation: Mixedwood aspen and white spruce. Steep south-facing slopes often grass covered with few trees.

Agricultural Capability: Most of the Yukon Crossing soils occur on steep slopes and will be rated as Class 6 or 7. Some of the smoother areas may be suitable for coarse grains or forages.

Map Units:

Yc1 - Dominantly Orthic Eutric Brunisols

Soil Associations and Complexes

of the

Faro-Ross River Area

Drury Creek Complex

Series Present: Gleysolic Static Cryosols - peaty phase and Orthic Regosols

Surface Texture: Sandy loam to loam.

Parent Material: Mixed stony morainal and sandy fluvial deposits.

Drainage: Well to very poorly drained.

Landform: Nearly level to ridged fluvial

Location: On the Magundy River floodplain near Little Salmon Lake.

Extent: 1291 hectares.

Vegetation: The ridges have white spruce and willow while the low areas are black spruce and white spruce. The shrub layer consisted of labrador tea, alpine bearberry, and willow. There were some open wet areas of dominantly sedges.

Agricultural Capability: These soils are rated as Class 5 and 6 due to wetness and excessive stones.

Map Units:

Dy - Dominantly Gleysolic Static Cryosols - peaty phase and significant Orthic Regosols.

Exposure Complex

General Description: The Exposure Complex is used for hard bedrock exposures. They are usually devoid of soil and are generally steeply sloping.

Extent: 4,746 hectares

Agricultural Capability: Class 7R, not suitable for agriculture.

Fisheye Lake Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Sandy loam to loam.

Parent Material: Stony gravelly loam to loam morainal deposits usually with 10 - 20 cm of volcanic ash on the surface.

Drainage: Well drained.

Landform: Ridged morainal deposits with very steep slopes.

Location: Between the Pelly River and the Pelly Mountains from Faro to Horton Creek.

Extent: 42,078 hectares.

Vegetation: Mixed forests of aspen, spruce and lodgepole pine. The north-facing slopes are covered with black spruce and moss while the south-facing slopes have aspen and white spruce with significant grass cover on the steeper portions.

Agricultural Capability: Due to their occurrence on steep slopes these soils are rated as Class 6 or 7 depending on the grass cover.

Map Units:

Fk1 - Dominantly Orthic Eutric Brunisols

Glenlyon Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Sandy loam to gravelly loamy sand.

Parent Material: 10 - 30 cm volcanic ash over gravelly fluvial deposits.

Drainage: Well drained.

Landform: Nearly level to undulating fluvial

Location: High terrace deposits of the Magundy and Pelly Rivers.

Extent: 7360 hectares.

Vegetation: Mixedwood forests of aspen, white spruce, and pine.

Agricultural Capability: Due to the droughty nature of the coarse-textured subsoil, these soils are rated as Class 6 or 7.

Map Units:

Gn1 - Dominantly Orthic Eutric Brunisols

Hillwash Complex

Series Present: Regosols and Brunisols

Surface Texture: Variable

Parent Material: Colluvial deposits

Drainage: Well drained

Landform: Usually strongly sloping

Location: Includes the steep eroded slopes along major streams and escarpments.

Extent: 1,930 hectares

Vegetation: Depends on the texture of the material and aspect of the slope. South-facing slopes are devoid of trees and have a grass cover. North-facing slopes often have a cover of black spruce.

Map Units:

Hw - Dominantly Regosols and Brunisols

Hoole River Association

Series Present: Orthic Eutric Brunisols, Gleyed Eutric Brunisols and Gleysols.

Surface Texture: Sandy loam to loam.

Parent Material: Moderately stony, brownish grey loam morainal deposits.

Drainage: Well to poorly drained.

Landform: Hummocky to ridged morainal

Location: Upland morainal deposits east of the Hoole River.

Extent: 9020 hectares.

Vegetation: The dominant tree vegetation is black spruce with occasional white spruce. The groundcover is mainly labrador tea, alpine and common bearberry, and moss.

Agricultural Capability: These soils occur at high elevations and are too cold for most crops except perhaps forages. The steep slopes and surface stones are added limitations.

Map Units:

Hol - Dominantly Orthic Eutric Brunisols and Gleyed Eutric Brunisols and significant Gleysols.

Lapie River Association

Series Present: Orthic Eutric Brunisols, Gleysols, and Orthic Black Chernozems

Surface Texture: Gravelly sandy loam to sandy loam.

Parent Material: 5 - 15 cm volcanic ash over gravelly fluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level outwash plain.

Location: On the upland areas upstream from Ross River.

Extent: 19,780 hectares.

Vegetation: The recently burnt areas have dominantly willow, shrub-birch, and fireweed. Other areas were mostly aspen with occasional white spruce.

Agricultural Capability: Due to the very coarse-textured nature of the subsoil, these soils are rated as Class 6 or suitable only for native grazing.

Map Units:

Lp1 - Dominantly Orthic Eutric Brunisols

Lp2 - Dominantly Orthic Eutric Brunisols and significant Gleysols

Magundy River Association

Series Present: Orthic Regosols, Cumulic Regosols, Gleyed Regosols, and Rego Gleysols - peaty phase.

Surface Texture: Fine sandy loam to loamy sand.

Parent Material: Black-colored sandy alluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level to channelled alluvial

Location: The floodplain of the Magundy River and the Pelly River floodplain near Faro.

Extent: 8184 hectares.

Vegetation: Some of the well to imperfectly drained sites were growing tall stands of white spruce and balsam poplar. Other areas of imperfect drainage back from the river were covered with short (1 - 2 m) stands of willow, with a groundcover of bearberry, strawberry and grass. Some areas had sufficient grass to supply up to 100 kg/ha grazable forages.

Agricultural Capability: The Magundy River soils will be rated as Class 5 due to the low moisture holding capacity of the sandy substrate. It is highly probable that cool summer temperatures would restrict the growth of cereals on the finer textured soils.

Profile Description

Horizon	Depth (cm)	
AC	0 - 21	Dark greyish brown (10YR 4/2 dry) fine sandy loam.
Ck1	21 - 48	Very dark greyish brown (2.5Y 3/2 dry) loamy sand.
Ck2	48 - 70	Dark greyish brown (2.5Y 4/2 dry) loamy sand.

Map Units:

Mg1 - Dominantly Orthic Regosols and significant Gleyed Regosols

Mg2 - Dominantly Gleyed Regosols and significant Rego Gleysols - peaty phase.

Ross River Association

Series Present: Orthic Eutric Brunisols, Gleyed Regosols, and Rego Gleysols - peaty phase.

Surface Texture: Fine sandy loamy to gravelly sandy loam.

Parent Material: Dark colored sandy and gravelly fluvial deposits. These soils also a 5 - 15 cm layer of volcanic ash on the surface.

Drainage: Well to poorly drained.

Landform: Nearly level fluvial

Location: Low terrace of the Pelly River upstream from Ross River.

Extent: 11,876 hectares.

Vegetation: Mixedwood forest of aspen and white spruce. Grass was a fair component (50 - 100 kg/ha) of the groundcover on the well drained sites.

Agricultural Capability: The soils with a fine sandy loam to loamy sand texture were rated as Class 5 and suitable for forages. The soils that were gravelly near the surface were Class 6 and 7 depending on the amount of grass present.

Map Units:

Rs1 - Dominantly Orthic Eutric Brunisols

Rs2 - Dominantly Gleyed Regosols and significant Rego Gleysols - peaty phase

Tributary Floodplain Complex

Series Present: Rego Gleysols and Orthic Regosols

Surface Texture: Variable, ranging from gravel to clay.

Parent Material: Mixed alluvial, lacustrine, and morainal.

Drainage: Poorly to well drained.

Landform: Variable, ranging from channelled to strongly sloping.

Location: Includes the floodplain and eroding banks of small streams.

Extent: 391 hectares.

Vegetation: Variable, ranging from riparian shrubs on the floodplain to aspen or white spruce on the well drained steeper slopes.

Agricultural Capability: Usually a class 7 due to wetness and steep slopes.

Map Units:

Tp - Dominantly Gleysols and Regosols and significant Brunisols.

Van Gorder Complex

Series Present: Orthic Eutric Brunisols and Gleysolic Static Cryosols - peaty phase.

Surface Texture: Sandy loam to gravelly loamy sand.

Parent Material: Gravelly fluvial deposits.

Drainage: Well to poorly drained.

Landform: Steep hummocky and pitted fluvial

Location: On the upland area but associated with the Pelly River.

Extent: 5905 hectares.

Vegetation: Mixedwood forest of aspen and white spruce.

Agricultural Capability: These soils are rated as Class 7 due to steep slopes and low moisture holding capacity of the gravels.

Map Units:

Vg1 - Dominantly Orthic Eutric Brunisols and significant Gleysolic Static Cryosols - peaty phase.

Soil Associations and Complexes of the Whitehorse Area

Aishihik Association

Series Present: Orthic Eutric Brunisols, Gleyed Eutric Brunisols, and Rego Gleysols - peaty phase.

Surface Texture: Loamy sand to sandy loam.

Parent Material: Loamy sand fluvial deposits.

Drainage: Well to poorly drained.

Landform: Level to hummocky fluvial

Location: Occurs throughout the area.

Extent: 39,000 hectares.

Vegetation: Lodgepole pine, buffalo berry, cranberry, bearberry and reindeer moss on the well drained sites, with white spruce, willow and labrador tea on the poorly drained sites.

Agricultural Capability: These soils are coarse-textured and droughty and therefore rated as 5M, suitable only for forages.

Map Units:

As1 - Dominantly Orthic Eutric Brunisols

As2 - Dominantly Gleyed Regosols

As3 - Dominantly Rego Gleysols - peaty phase

Alluvium Complex

Series Present: Orthic and Cumulic Regosols and Rego Gleysols.

Surface Texture: Variable, ranges from gravel to clay.

Parent Material: Variable textured alluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level to undulating channelled.

Location: The recent floodplains of major streams.

Extent: 3,306 hectares.

Vegetation: Dominantly willow on the most recent portions grading to alder and balsam poplar on the higher portions.

Agricultural Capability: Usually 5I or 7I due to annual flooding hazard.

Map Units:

Av - Dominantly Orthic and Cumulic Regosols and significant Gleysols

Bear Creek Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Fine sandy loam.

Parent Material: Fine sandy loam fluvial material over clay loam morainal deposits.

Drainage: Well drained.

Landform: Fluvial veneer over nearly level to hummocky morainal

Location: Near the Yukon River in the central portion of the area.

Extent: 2,040 hectares.

Vegetation: Lodgepole pine with a shrub layer of buffalo berry, rose, labrador tea, cranberry, and bearberry and groundcover of reindeer moss.

Agricultural Capability: Since the area has an overall climate rating of 5CH, these soils are suited only for forages.

Map Units:

Brl - Dominantly Orthic Eutric Brunisols

Bennett Lake Association

Series Present: Orthic Eutric Brunisols and Orthic Regosols.

Surface Texture: Silt loam.

Parent Material: Silt loam lacustrine deposits.

Drainage: Well drained.

Landform: Level to hummocky lacustrine.

Location: Between Cowley Lakes and Carcross.

Extent: 3,917 hectares.

Vegetation: Dominantly white spruce and aspen.

Agricultural Capability: Since the area has a climatic rating of 5CH due to a cool growing season, these soils are best suited for improved forages.

Map Units:

Bk1 - Dominantly Orthic Eutric Brunisols

Bk2 - Dominantly Orthic Eutric Brunisols and significant Orthic Regosols

Canyon Association

Series Present: Orthic Eutric Brunisols and Gleyed Regosols.

Surface Texture: Gravelly loamy sand to sandy loam.

Parent Material: Gravelly fluvial deposits.

Drainage: Well to imperfectly drained.

Landform: Level to hummocky fluvial.

Location: Occurs throughout the area.

Extent: 16,047 hectares.

Vegetation: Dominant tree vegetation of lodgepole pine with a shrub layer of buffalo berry and cranberry and a herb layer of lupine, twin flower, and rough fescue.

Agricultural Capability: Due to their very low moisture holding capacity, these soils are not suitable for improved forages. They are rated as Class 6M if some native grazing is present and Class 7M if none is present.

Map Units:

Cn1 - Dominantly Orthic Eutric Brunisols

Cn2 - Dominantly Orthic Eutric Brunisols and significant Gleyed Regosols

Champagne Association

Series Present: Orthic Eutric Brunisols, Orthic Gray Luvisols, Orthic Regosols - saline phase, Gleyed Regosols, and Rego Gleysols - peaty phase.

Surface Texture: Clay loam to silty clay loam.

Parent Material: Silty clay lacustrine deposits.

Drainage: Well to poorly drained.

Landform: Nearly level to undulating lacustrine.

Location: In the Tagish - Marsh Lake area with small amounts mapped in the Cowley Lakes and Takhini areas.

Extent: 6,709 hectares.

Vegetation: The well drained sites supported stands of white spruce and aspen while the imperfectly drained soils supported growth of willow and white spruce. The saline sites had scattered willow and a cover of mixed grasses and sedges. The poorly drained areas supported a solid growth of sedges.

Agricultural Capability: Since the Whitehorse area has a climatic rating of 5CH or cool growing season temperatures, these soils can do no better than grow seeded forages. Some of the areas have fair native grazing (100-200 kg/ha) while the Gleysols can be utilized for native hay production.

Map Units:

Ch1 - Dominantly Orthic Eutric Brunisols

Ch2 - Dominantly Orthic Gray Luvisols and significant Orthic Regosols - saline phase.

Ch3 - Dominantly Orthic Gray Luvisols and significant Gleyed Regosols

Ch4 - Dominantly Orthic Gray Luvisols and significant Rego Gleysols - peaty phase.

Croucher Association

Series Present: Eluviated Eutric Brunisols, Orthic Eutric Brunisols, and Orthic Regosols.

Surface Texture: Loamy fine sand to silt loam.

Parent Material: Variable fine sandy to silty over silt loam fluvial deposits. Often loamy fine sand to sandy loam at depth.

Drainage: Well drained.

Landform: Nearly level to hummocky fluvial.

Location: Located throughout the area often near major rivers.

Extent: 3,142 hectares.

Vegetation: Mainly white spruce and aspen with a groundcover of fireweed and lupine.

Agricultural Capability: These soils are rated as 5CH with the cool growing season temperatures as the main limitation. These soils would grow excellent crops of seeded forages.

Map Units:

Cr1 - Dominantly Eluviated Eutric Brunisols

Cr2 - Dominantly Orthic Eutric Brunisols

Cr3 - Dominantly Orthic Regosols and significant Orthic Eutric Brunisols

Exposure Complex

General Description: The Exposure Complex is used for hard bedrock exposures. They are usually devoid of soil and are generally steeply sloping.

Extent: 8,753 hectares.

Agricultural Capability: Class 7R, not suitable for agriculture.

Fox Lake Road Complex

Series Present: Orthic Eutric Brunisols, Rego Gleysols - peaty phase and Rego Gleysols - saline phase.

Surface Texture: Sandy loam to silty clay.

Parent Material: Mixed fluvial and lacustrine deposits.

Drainage: Well to poorly drained.

Landform: Level to hummocky fluvial and lacustrine.

Location: Between Lake Laberge and Fox Lake.

Extent: 4240 hectares:

Vegetation: The well drained sites support a growth of aspen and white spruce. The peaty Rego Gleysols support a thick growth of willow and shrub birch near the edges of the depression with a heavy growth of sedge near the center.

Agricultural Capability: The well drained soils are rated as 5CH and the poorly drained soils as 5W. Both are suitable for seeded forages. The well drained soils have only marginal native grazing (50-100 kg/ha) while the poorly drained soils have very good grazing potential (up to 1000 kg/ha grazable forages). Some of the meadows are suitable for hay harvesting.

Map Units:

Fx1 - Dominantly Orthic Eutric Brunisols

Fx2 - Dominantly Rego Gleysols - peaty phase

Fx3 - Dominantly Orthic Eutric Brunisols and significant Rego Gleysols - saline phase.

Haeckel Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Sandy loam to gravelly sandy loam.

Parent Material: Gravelly sandy loam, moderately stony morainal deposits.

Drainage: Well drained.

Landform: Hummocky to ridged morainal.

Location: All upland areas above the main valleys.

Extent: 39,952 hectares.

Vegetation: Mainly lodgepole pine, aspen, buffalo berry, labrador tea, rose, cranberry, bearberry, fireweed, twinflower, and reindeer moss.

Agricultural Capability: Except for the steep slopes (16 - 45% slopes) these soils are capable of growing seeded forages. The yield expected on these soils is much less than the finer textured fluvial and lacustrine soils.

Map Units:

Hk1 - Dominantly Orthic Eutric Brunisols

Hillwash Complex

Series Present: Regosols and Brunisols

Surface Texture: Variable

Parent Material: Colluvial deposits

Drainage: Well drained

Landform: Usually strongly sloping

Location: Includes the steep eroded slopes along major streams and escarpments.

Extent: 12,248 hectares.

Vegetation: Depends on the texture of the material and aspect of the slope. South-facing slopes are devoid of trees and have a grass cover. North-facing slopes often have a cover of black or white spruce.

Map Units:

Hw - Dominantly Regosols and Brunisols

Klowtaton Association

Series Present: Orthic Eutric Brunisols and Gleyed Regosols.

Surface Texture: Loamy sand to sandy loam.

Parent Material: Sandy fluvial veneer over silty clay lacustrine deposits.

Drainage: Well to imperfectly drained.

Landform: Fluvial veneer over undulating lacustrine.

Location: Scattered locations from Whitehorse to Carcross.

Extent: 1,661 hectares.

Vegetation: Mainly lodgepole pine, aspen, white spruce, buffalo berry, rose, bearberry, cranberry, rough fescue and purple reedgrass.

Agricultural Capability: These soils are rated as 5CH with cool growing season temperatures as the main limitation. They are well suited for growing seeded forages. A portion of the Klowtaton soils has marginal (50-100 kg/ha) native grazing.

Map Units:

Ko1 - Dominantly Orthic Eutric Brunisols

Ko2 - Dominantly Gleyed Regosols

Kusawa Association

Series Present: Orthic Gray Luvisols and Degraded Eutric Brunisols.

Surface Texture: Fine sandy loam.

Parent Material: Fine sandy loam material over silty clay loam B horizon over a loamy sand fluvial deposit.

Drainage: Well drained.

Landform: Nearly level fluvial.

Location: Near the Klondike Highway south of Lake Laberge.

Extent: 669 hectares.

Vegetation: Mainly open stands of aspen, white spruce and lodgepole pine with shrub growth of buffalo berry, rose and bearberry and a herb layer of fireweed, lupine, and purple reedgrass.

Agricultural Capability: These soils are rated as 5CH with cool growing season temperatures as the main limitation. They are well suited for the production of seeded forage crops. They also have a fair capability for native grazing (100 - 300 kg/ha).

Map Units:

Kul - Dominantly Orthic Gray Luvisols and significant Eluviated Eutric Brunisols

Lewes Association

Series Present: Eluviated Eutric Brunisols and Orthic Gray Luvisols.

Surface Texture: Fine sandy loam.

Parent Material: Fine sandy loam fluvial veneer over silty clay lacustrine deposits.

Drainage: Well drained.

Landform: Fluvial veneer over undulating lacustrine.

Location: In the Takhini River area.

Extent: 2,643 hectares.

Vegetation: Aspen-spruce mixedwood forest.

Agricultural Capability: These soils occur in a 5CH climatic area of cool growing season temperatures, thus are best suited to seeded forages. Some of the Lewes soils have marginal grazing 50-100 kg/ha grazable forages).

Map Units:

Lw1 - Dominantly Eluviated Eutric Brunisols and significant Orthic Gray Luvisols.

Lewes Lake Association

Series Present: Orthic Regosols, Gleyed Regosols - peaty phase, and Rego Gleysols - peaty phase.

Surface Texture: Silt loam to sandy loam.

Parent Material: Silty, highly calcareous lacustrine depoists.

Drainage: Well to poorly drained.

Landform: Nearly level lacustrine.

Location: Cowely and Lewes Lakes area.

Extent: 2,241 hectares.

Vegetation: Dense stands of white spruce on the well to imperfectly drained sites with willow grass and sedge on the wetter sites.

Agricultural Capability: These soils are rated as Class 5CH with cool growing season as the main limitation. They are well suited for growing forages. They also have a good capability for native grazing with a potential yield of from 50 - 450 kg/ha grazable forages.

Map Units:

Lkl - Dominantly Orthic Regosols

Porter Creek Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Loamy sand.

Parent Material: Loamy sand fluvial veneer over gravelly loam morainal deposits.

Drainage: Well drained.

Landform: Fluvial veneer over ridged morainal.

Location: In the Porter Creek area.

Extent: 490 hectares.

Vegetation: Dominantly lodgepole pine.

Agricultural Capability: Due to their low moisture holding capacity, these soils are rated as Class 5M and are suitable only for seeded forages.

Map Units:

Pc1 - Dominantly Orthic Eutric Brunisols

Richthofen Complex

Series Present: Orthic Eutric Brunisols.

Surface Texture: Sandy loam to loamy sand.

Parent Material: Mixed fluvial and morainal deposits.

Drainage: Well drained.

Landform: Hummocky fluvial and morainal.

Location: Between Lake Laberge and Fox Lake.

Extent: 3,666 hectares.

Vegetation: Mainly aspen, white spruce, lodgepole pine and grasses.

Agricultural Capability: These soils are rated as Class 5 due to adverse topography and low moisture holding capacity. Part of the area has fair grazing (50 - 200 kg/ha).

Map Units:

Rn1 - Dominantly Orthic Eutric Brunisols

Saline Meadow Complex

Series Present: Orthic Regosols - saline phase and Orthic Eutric Brunisols.

Surface Texture: Sandy loam to clay.

Parent Material: Fluvial deposits.

Drainage: Well to imperfectly drained.

Landform: Level fluvial.

Location: South of Lake Laberge.

Extent: 210 hectares.

Vegetation: Mainly foxtail barley and alkali grass.

Agricultural Capability: These soils are rated as 5N due to a salinity hazard.

Map Units:

Sm - Dominantly Orthic Regosols - saline phase and significant Orthic Eutric Brunisols

Taye Association

Series Present: Orthic Regosol.

Surface Texture: Silt loam.

Parent Material: Silty alluvial deposits.

Drainage: Well drained.

Landform: Nearly level alluvial.

Location: Low terrace of the Yukon River.

Extent: 68 hectares.

Agricultural Capability: This soil occurs in a Class 5CH climatic area but its close proximity to the river suggests a warmer climate locally. This soil would probably be suitable for growing vegetables or cereals.

Map Units:

Ta1 - Dominantly Orthic Regosols

Tributary Floodplain Complex

Series Present: Rego Gleysols and Orthic Regosols

Surface Texture: Variable, ranging from gravel to clay.

Parent Material: Mixed alluvial, lacustrine, and morainal.

Drainage: Poorly to well drained.

Landform: Variable, ranging from channelled to strongly sloping.

Location: Includes the floodplain and eroding banks of small streams.

Extent: 8,426 hectares.

Vegetation: Variable, ranging from riparian shrubs on the floodplain to aspen or white spruce on the well drained steeper slopes.

Agricultural Capability: Usually a class 7 due to wetness and steep slopes.

Map Units:

Tp - Dominantly Gleysols and Regosols and significant Brunisols

<u>Watson River Association</u>

Series Present: Orthic Eutric Brunisols.

Surface Texture: Sandy loam to loam.

Parent Material: Loamy morainal deposits.

Drainage: Well drained.

Landform: Ridged to hummocky morainal.

Location: East of Whitehorse and south of Marsh Lake.

Extent: 3351 hectares.

Vegetation: Dominantly lodgepole pine near Whitehorse with more spruce and aspen near Marsh Lake.

Agricultural Capability: These soils are rated as Class 5CH with cool growing season temperatures as the main limitation. Some areas have the added limitation of steep slopes. Some of the soil areas have marginal native grazing with yields of 50 - 100 kg/ha grazable forages.

Map Units:

Ws1 - Dominantly Orthic Eutric Brunisols

Whitehorse Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Loamy sand.

Parent Material: Sandy fluvial deposits.

Drainage: Well drained.

Landform: Ridged, wind modified fluvial.

Location: North of Whitehorse and near Carcross.

Extent: 5540 hectares.

Vegetation: Mainly lodgepole pine, bearberry, buffalo berry and lichens.

Agricultural Capability: Most of these soils are rated as Class 7 due to a combination of limitations including erosion hazard, topography and low moisture holding capacity. The soils with some native grazing are rated as Class 6.

Map Units:

Wh1 - Dominantly Orthic Eutric Brunisols

Yukon Association

Series Present: Orthic Eutric Brunisols.

Surface Texture: Fine sandy loam.

Parent Material: Fine sandy loam over loamy sand fluvial deposits.

Drainage: Well drained.

Landform: Nearly level fluvial.

Location: Along the Yukon River just south of Lake Laberge.

Extent: 1644 hectares.

Vegetation: Mainly aspen, white spruce, lodgepole pine, willow, buffalo berry, rose, bearberry, fireweed, and purple reedgrass.

Agricultural Capability: These soils are rated as 5CH with cool growing season temperatures as the main limitation. About 866 hectares of the Yukon soils have good native grazing with expected yields of 100 - 450 kg/ha grazable forages.

Map Units:

Yu1 - Dominantly Orthic Eutric Brunisols

Soil Association and Complexes

of the

Watson Lake Area

Alluvium Complex

Series Present: Orthic and Cumulic Regosols and Rego Gleysols.

Surface Texture: Variable, ranges from gravel to clay.

Parent Material: Variable textured alluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level to undulating channelled.

Location: The recent floodplains of major streams.

Extent: 2103 hectares

Vegetation: Dominantly willow on the most recent portions grading to alder and balsam poplar on the higher portions.

Agricultural Capability: Usually 5I or 7I due to annual flooding hazard.

Map Units:

Av - Dominantly Orthic Regosols and significant Gleysols

Dodo Lake Association

Series Present: Orthic Dystric and Eutric Brunisols, Gleyed Dystric and Eutric Brunisols, and Rego Gleysols - peaty phase.

Surface Texture: Loamy sand to sand.

Parent Material: Mixed sandy and gravelly fluvial deposits.

Drainage: Well to poorly drained.

Landform: Pitted and hummocky fluvial

Location: South of the Liard River.

Extent: 20686 hectares

Vegetation: Lodgpole pine is dominant with some white spruce and aspen. The groundcover is composed of labrador tea, cranberry, bearberry and reindeer moss.

Agricultural Capability: These soils are rated as Class 7 because of steep slopes and low moisture holding capacity.

Map Units:

Dd1 - Dominantly Orthic Dystric and Eutric Brunisols and significant Gleyed Dystric and Eutric Brunisols and Rego Gleysols - peaty phase.

False Pass Creek Association

Series Present: Fibric Organic Cryosols and Typic Mesisols

Parent Material: At least 40 cm of mesic or 60 cm of fibric peat over variable mineral material.

Drainage: Very poorly drained.

Landform: Plateau Bogs and horizontal Fens.

Location: In the western part of the survey area.

Extent: 17,494 hectares.

Vegetation: Fens - Mainly tamarack, black spruce, willow, shrub birch, and sedges.

Bogs - Mainly black spruce, shrub birch, labrador tea, crowberry, alpine bearberry and sphagnum mosses.

Agricultural Capability: These soils are usually too wet to be useful for agriculture although some of the drier fens may provide some late fall grazing.

Map Units:

Fp - Dominantly Fibric Organic Cryosols and Typic Mesisols

Farm Road Association

Series Present: Orthic Regosols, Cumulic Regosols, Gleyed Orthic and Cumulic Regosols and Rego Gleysols - peaty phase.

Surface Texture: Silt loam to gravelly loamy sand.

Parent Material: Variable silty to sandy material over sandy or gravelly alluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level alluvial

Location: Low terraces of the major rivers.

Extent: 17,093 hectares.

Vegetation: The tree vegetation is mainly white spruce and balsam poplar.

Agricultural Capability: The soils with a very fine sandy loam or silt loam surface texture are Class 3 with the main limitation the short growing season. The sandy loam soils are Class 4 and the loamy sand soils are Class 5, in both cases due to a low moisture holding capacity.

Map Units:

Fm1 - Dominantly Orthic Regosols and significant Gleyed Regosols and Cumulic Regosols

Fm2 - Dominantly Gleyed Regosols and Cumulic Regosols

Fm3 - Dominantly Cumulic Regosols

Fm4 - Dominantly Cumulic Regosols and significant Gleyed Regosols

Fm5 - Dominantly Gleyed Regosols and significant Rego Gleysols - peaty phase

Hillwash Complex

Series Present: Regosols and Brunisols

Surface Texture: Variable

Parent Material: Colluvial deposits

Drainage: Well drained

Landform: Usually strongly sloping

Location: Includes the steep eroded slopes along major streams and escarpments.

Extent: 11676 hectares

Vegetation: Depends on the texture of the material and aspect of the slope. South-facing slopes are covered with white spruce or aspen. North-facing slopes often have a cover of black spruce.

Map Units:

Hw - Dominantly Regosols and Brunisols

Sawmill Road Association

Series Present: Orthic Dystric and Eutric Brunisols, Gleyed Dystric and Eutric Brunisols, and Rego Gleysols - peaty phase.

Surface Texture: Loamy sand to gravelly loamy sand.

Parent Material: Mixed loamy sand and gravelly sand.

Drainage: Well to poorly drained.

Landform: Nearly level to undulating fluvial

Location: High terraces of the major rivers.

Extent: 48,942 hectares.

Vegetation: Mainly lodgepole pine with a groundcover of cranberry, labrador tea, and reindeer moss.

Agricultural Capability: Most of the area is rated as Class 7M due to the very low moisture holding capacity of the gravels and sand. About 400 hectares have some native grazing potential.

Profile Description: Orthic Dystric Brunisol

Horzion	Depth (cm)	
Bm 1	0 - 10	Yellowish red (5YR 5/8 dry) pH 4.4.
Bm 2	10 - 20	Reddish yellow (7.5YR 6/8 dry) pH 5.4.

Sr1 - Dominantly Orthic Dystric and Eutric Brunisols

Sr2 - Dominantly Gleyed Dystric and Eutric Brunisols and significant Rego Gleysols - peaty phase.

Tributary Floodplain Complex

Series Present: Rego Gleysols and Orthic Regosols

Surface Texture: Variable, ranging from gravel to clay.

Parent Material: Mixed alluvial, lacustrine, and morainal.

Drainage: Poorly to well drained.

Landform: Variable, ranging from channelled to strongly sloping.

Location: Includes the floodplain and eroding banks of small streams.

Extent: 15622 hectares

Vegetation: Variable, ranging from riparian shrubs on the floodplain to aspen or white spruce on the well drained steeper slopes.

Agricultural Capability: Usually a class 7 due to wetness and steep slopes.

Map Units:

Tp - Dominantly Gleysols and Regosols and significant Brunisols

Tom Creek Association

Series Present: Gleyed Dystric and Eutric Brunisols, Rego Gleysols - peaty phase and Orthic Dystric and Eutric Brunisols.

Surface Texture: Gravelly sandy loam to gravelly loam.

Parent Material: Gravelly sandy loam morainal deposits.

Drainage: Imperfectly to poorly drained.

Landform: Hummocky to ridged morainal

Location: The northern part of the survey area.

Extent: 90,217 hectares.

Vegetation: A mixture of lodgepole pine and black spruce.

Agricultural Capability: These soils are Class 5 and suitable only for forages. Some are too wet (5W) some are too droughty (5M) while others have steep slopes (6T or 7T).

Map Units:

Tc1 - Dominantly Gleyed Dystric and Eutric Brunisols and significant Rego Gleysols - peaty phase and Orthic Dystric and Eutric Brunisols.

Tc2 - Dominantly Rego Gleysols - peaty phase and significant Gleyed Dystric and Eutric Brunisols.

Upper Liard Association

Series Present: Orthic Dystric and Eutric Brunisols, Gleyed Dystric and Eutric Brunisols, and Orthic Gleysols.

Surface Texture: Gravelly loamy sand to silt loam.

Parent Material: Mixed sandy and gravelly fluvial deposits.

Drainage: Well to poorly drained.

Landform: Nearly level fluvial .

Location: Middle terraces of the major rivers.

Extent: 20,980 hectares.

Vegetation: Mainly lodgepole pine with some white and black spruce in the wetter areas.

Agricultural Capability: The majority of the soils are Class 7 or non-agricultural although the wet areas or those with finer surface layers could be seeded to forages.

Map Units:

Up1 - Dominantly Orthic Dystric and Eutric Brunisols

Up2 - Dominantly Orthic Dystric and Eutric Brunisols and significant Gleyed Dystric and Eutric Brunisols

Up3 - Dominantly Orthic Dystric and Eutric Brunisols and significant Gleysols

Up4 - Dominantly Orthic Gleysols and significant Orthic Dystric and Eutric Brunisols

Watson Lake Association

Series Present: Orthic Dystric and Eutric Brunisols and Gleyed Dystric and Eutric Brunisols.

Surface Texture: Silt loam to sand.

Parent Material: Gravelly fluvial deposits.

Drainage: Well to imperfectly drained.

Landform: Hummocky fluvial

Location: The upland area around the town of Watson Lake.

Extent: 3,468 hectares.

Vegetation: Open stands of lodgpole pine with occasional white spruce and aspen. The groundcover is cranberry, bearberry, labrador tea, and reindeer moss. There is very little grass present.

Agricultural Capability: Due to the coarse textured nature of the solum these soils are rated mostly as 7M or non-agricultural. Some areas with thicker surface layers (15 - 30 cm) of fine sandy loam to silt loam material would be 5M and could be used to grow forages.

Profile Description: Orthic Dystric Brunisol

Horizon	Depth (cm)	
Bm 1	0 - 10	Reddish brown (5YR 4/3 dry) fine sandy loam, pH 5.7.
Bm 2	10 - 14	Gravelly fine sandy loam.
IIBC	14 - 30	Pale brown (10YR 6/3 dry) Gravelly sand, pH 5.5.

Map Units:

Wk1 - Dominantly Orthic Dystric and Eutric Brunisols and Gleyed Dystric and Eutric Brunisols.

Wk2 - Dominantly Rego Gleysols - peaty phase and significant Gleyed Dystric and Eutric Brunisols

Windid Lake Association

Series Present: Rego Gleysols - peaty phase.

Surface Texture: Silt loam.

Parent Material: Silty lacustrine deposits.

Drainage: Poorly to imperfectly drained.

Landform: Undulating lacustrine

Location: Along the Robert Campbell highway north of the Frances River.

Extent: 1438 hectares in complex with the Sawmill Road Association.

Vegetation: Black spruce and white spruce.

Agricultural Capability: These soils are usually wet and occur at higher elevations, thus are rated as Class 5 and suitable only for forages.

Map Units:

Wil - Dominantly Rego Gleysol - peaty phase

Wye Junction Association

Series Present: Orthic Dystric and Eutric Brunisols, Gleyed Dystric and Eutric Brunisols, and Rego Gleysols - peaty phase.

Surface Texture: Gravelly sandy loam to silt loam.

Parent Material: Gravelly sandy loam morainal deposits.

Drainage: Well to poorly drained.

Landform: Hummocky to ridged morainal

Location: The southern part of the survey area.

Extent: 69,438 hectares.

Vegetation: Mixed lodgepole pine, aspen, and white spruce with a groundcover of cranberry, bearberry, rose, labrador tea, and reindeer and feather moss.

Agricultural Capability: Most of the Wye soils are rated as 5M and suitable for forages due to the gravelly nature of the surface horizon.

Profile Description: Orthic Dystric Brunisol

Horizon	Depth (cm)	
Bm 1	0 - 10	Reddish brown (5YR 4/4 moist) silt loam, pH 5.5
Bm 2	10 - 18	Yellowish brown (10YR 5/4 moist) silt loam, pH 5.4.
IIBm	18 - 35	Yellowish brown (10YR 5/4 moist) gravelly sandy loam, pH 5.3.

Map Units:

Wy1 - Dominantly Orthic Dystric and Eutric Brunisols

Wy3 - Dominantly Orthic Dystric and Eutric Brunisols and Gleyed Dystric and Eutric Brunisols

Wy4 - Dominantly Orthic Dystric and Eutric Brunisols and significant Gleyed Dystric and Eutric Brunisols and Rego Gleysols - peaty phase.

Wy5 - Dominantly Rego Gleysols - peaty phase.

Soil Associations and Complexes
of the
Snag Area

Alluvium Complex

Series Present: Orthic and Cumulic Regosols and Gleysols.

Surface Texture: Variable, ranging from gravel to silty clay loam.

Parent Material: Variable textured alluvial deposits.

Landform: Nearly level to channelled alluvial.

Drainage: Poorly to well drained.

Location: The recent floodplains of the White River.

Extent: 3,562 hectares.

Vegetation: The vegetation is quite variable, ranging from riparian shrubs on the most recent alluvial deposits to balsam poplar and/or black and white spruce on the more stable alluvial deposits. The shrub layer or understory may consist of willow, Labrador tea, bog birch, shrubby cinquefoil, bog cranberry, sedges, sphagnum, and feather moss.

Agricultural Capability: These soils have an Agricultural Capability rating of Class 7I due to periodic flooding.

Map Units:

Av - Dominantly Orthic and Cumulic Regosols and significant Gleysols.

Beaver Creek

Series Present: Orthic Regosol, Cumulic Regosol, Gleyed Orthic Regosol, Regosolic Static Cryosol, Regosolic Static Cryosol - peaty phase, and Gleysolic Static Cryosol - peaty phase.

Surface Texture: Variable, usually loamy sand to silt loam.

Parent Material: Sandy and silty, fluvial and alluvial deposits over coarser sands or gravels.

Landform: Level to undulating or channelled fluvial terraces and alluvial floodplains along Beaver Creek and the White River.

Drainage: Well to very poorly drained.

Location: Low terraces and floodplains associated with Sang Creek, Beaver Creek, and the White River in the vicinity of Beaver Creek and Snag.

Extent: 6,129 hectares.

Vegetation: The well drained areas are usually comprised of pure or mixed stands of aspen and white spruce with willow, fireweed, equisetum, labrador tea, and feather moss in the understory.

The very poorly drained soils are quire extensive, they're usually peat covered and frozen. The have a few small black spruce present and a rather dense low shrub layer of willow, bog birch, labrador tea, shrubby cinquefoil, bog cranberry, and blueberry. The ground cover generally consists of reindeer moss, feather moss, sphagnum, and sedges. There are also some substantial sedge meadows in the very wet areas.

Agricultural Capability: The majority of the Beaver Creek soils have a severe frost free period limitation and/or a growing degree day limitation. They have an Agricultural Capability rating of Class 5. This limits the agricultural potential of these areas to forage production. The sedge meadows could provide some grazing but these areas are generally too wet to be of much value. There are some good stands of white spruce on the floodplain along Beaver Creek and these areas should be left in forest production.

Map Units:

Bv1 - Dominantly Regosolic Static Cryosols and Gleysolic Static Cryosols - peaty phase.

Bv2 - Dominantly Gleysolic Static Cryosols - peaty phase and significant Regosolic Static Cryosols - peaty phase.

Bv3 - Dominantly Orthic Regosols and significant Gleysolic Static Cryosols - peaty phase

Bv4 - Dominantly Cumulic Regosols and significant Gleyed Orthic Regosols

Enger Lakes Association

Series Present: Orthic Eutric Brunisol, Brunisolic Static Cryosol - peaty phase, Gleysolic Static Cryosols, and Gleysolic Static Cryosol - peaty phase.

Surface Texture: Very fine sand loam to loam.

Parent Material: Moderately calcareous, loam to clay loam textured morainal deposits.

Landform: Hummocky to undulating and rolling morainal.

Drainage: Well to poorly drained.

Location: Generally occurs east and southeast of the Macauley Ridged on either side of the White River.

Extent: 11,690 hectares

Vegetation: The predominant trees on the well drained sites are aspen and lesser amounts of white and black spruce. The understory generally consists of willow, labrador tea, lupine, alpine bearberry, fireweed, crowberry, cranberry, feather moss, and leaf lichen. The low poorly drained areas generally contain black spruce, willow, labrador tea, cranberry, alpine bearberry, lupine, crowberry, and feather moss.

Agricultural Capability: These soils have an agricultural capability rating of Class 5, with cool summer temperatures as the main limitation. The well drained and imperfectly drained sites could be used for forage production. Many of the poorly drained and imperfectly drained soils are frozen at shallow depths. There is no native grazing on any of these soils.

Map Units:

Es1 - Dominantly Orthic Eutric Brunisols

Es2 - Dominantly Orthic Eutric Brunisols and significant Gleysolic Static Cryosols

Es3 - Dominantly Orthic Eutric Brunisols and significant Brunisolic Static Cryosols - peaty phase

Es4 - Dominantly Brunisolic Static Cryosols - peaty phase and significant Gleysolic Static Cryosols - peaty phase

Mirror Creek Association

Series Present: Orthic Eutric Brunisol, Brunisolic Static Cryosol, Regosolic Static Cryosol - peaty phase, and Gleysolic Static Cryosol - peaty phase.

Surface Texture: Fine sandy loam to silt loam.

Parent Material: Fine sandy to coarse silty fluvial or eolian veneer over morainal deposits.

Landform: Fluvial or eolian veneer over undulating morainal.

Drainage: Well to very poorly drained.

Location: Occurs in the valley between Snag Creek and the Macauley Ridge.

Extent: 2,139 hectares.

Vegetation: The trees on the well drained areas are usually white spruce and aspen with some paper birch. The understory is rose, twinflower, cranberry and moss. The low areas contain small black and white spruce, willow, bog birch, and some grasses and sedges.

Agricultural Capability: These soils have an Agricultural Capability of Class 5. The main limitation is the cool climate which restricts agricultural development to forage production and some natural grazing.

Map Units:

Mi1 - Dominantly Orthic Eutric Brunisols and significant Brunisolic Static Cryosols

Mi2 - Dominantly Regosolic Static Cryosols - peaty phase and significant Brunisolic Static Cryosols.

Mi3 - Dominantly Regosolic Static Cryosols - peaty phase and significant Gleysolic Static Cryosols - peaty phase.

Snag Creek Association

Series Present: Orthic Eutric Brunisol, Gleyed Eutric Brunisol, Brunisolic Static Cryosol, and Gleysolic Static Cryosol - peaty phase.

Surface Texture: Very fine sandy loam to silt loam.

Parent Material: 15 - 25 cm of coarse silty eolian material over fluvial gravels. Frequently a layer of stones is encountered between the silty veneer and gravel.

Landform: Undulating to hummocky fluvial terraces along Beaver Creek and the White River.

Drainage: Well to poorly drained.

Location: Upper terraces between Beaver Creek and Sang Creek and on either side of the White River in the vicinity of the Snag airfield.

Extent: 22,502 hectares.

Vegetation: Dominantly aspen with some white and black spruce on the well drained sites. Here the shrubs usually consist of willow, soapberry, rose, and labrador tea. The ground cover is generally some combination of alpine bearberry, lupine, twinflower, crowberry, cranberry, fireweed, and purple reed grass. The poorly drained sites on the other hand generally consist of black spruce, willow, bog birch, cinquefoil, alpine bearberry, labrador tea, sedges, and feather moss.

Agricultural Capability: The Snag Creek soils are quite droughtly and also have a severe growing degree days limitation, however, most of the well drained sites could be used for forage production. These soils have an agricultural capability rating of Class 5. The only Snag Creek soils with some grazing potential are found along James Trail but the palatable forage production is only about 100 kg/ha. Some of the lower areas contained sedge meadows with a better grazing potential but these are quite limited and often wet.

Map Units:

Sn1 - Dominantly Orthic Eutric Brunisols

Sn2 - Dominantly Orthic Eutric Brunisols and significant Gleysolic Static Cryosols

Sn3 - Dominantly Orthic Eutric Brunisols and significant Gleyed Eutric Brunisols

Sn4 - Dominantly Orthic Eutric Brunisols and significant Brunisolic Static Cryosols

Sn5 - Dominantly Gleysolic Static Cryosols and significant Orthic Eutric Brunisols

Tributary Floodplain Complex

Series Present: Orthic Regosols, Gleysols, and Gleyed Regosols.

Surface Texture: Variable, ranging from gravel to silty clay loam.

Parent Material: Mixed alluvial, fluvial, and morainal.

Landform: Channelled alluvial and strongly sloping valley sides associated with small streams.

Drainage: Poorly to well drained.

Location: The floodplains and valley sides of small streams.

Extent: 6,911 hectares.

Vegetation: The vegetation can be quite variable. Some areas are treed while others are shrubby. The trees, if present, are usually aspen, black spruce and white spruce. The shrubs may consist of willow, shrubby cinquefoil, Labrador tea, rose, bog birch, bog cranberry, and blueberry. The understory is often made up of fireweed, alpine bearberry, crowberry, sedge, reindeer moss, and grass.

Agricultural Capability: These soils usually have an Agricultural Capability rating of 5W for wetness or 7I for inundation.

Map Units:

Tp - Dominantly Orthic Regosols and Gleysols and significant Gleyed Regosols.

Wolf Creek Association

Series Present: Eutric Brunisol and Brunisolic Static Cryosol.

Surface Texture: Very fine sandy loam to silt loam.

Parent Material: Coarse silty fluvial or eolian deposits.

Landform: Hummocky fluvial or eolian material on the uplands along the White River.

Drainage: Well to imperfectly drained.

Location: Occurs on the uplands along the White River northeast of Snag.

Extent: 2,672 hectares.

Vegetation: The predominant tree cover was white spruce and aspen. On the few sites observed the understory consisted of rose, twinflower, cranberry and feather moss.

Agricultural Capability: The Wolf Creek soils are in a climatic Class 5 area but due to the steep slopes the Wolf Creek soils in the Snag area have an Agricultural Capability rating of 5T or 7T. Forage production may be feasible in small areas with suitable aspect and relief.

Map Units:

Wr1 - Dominantly Orthic Eutric Brunisols and significant Brunisolic Static Cryosols

Appendix II

Physiography and Geology of Yukon

II. PHYSIOGRAPHY AND GEOLOGY OF YUKON

A. Introduction

Yukon Territory lies within the Cordilleran Physiographic Province (Bostock, 1948). This province can be divided longitudinally into three main belts, namely, the Eastern System, the Interior System, and the Western System.

The Interior System is composed of folded sedimentary and volcanic strata, metamorphic rocks, and some flat-lying volcanic rocks. The folded rocks and metamorphic rocks are intruded by igneous rocks.

The Yukon Plateau and Liard Plain are two of nine primary subdivisions of the Interior System. All of the survey areas are located in the Yukon Plateau with the exception of Watson Lake, which occurs in the Liard Plain (Fig. 35).

The Yukon Plateau has a general elevation of 1300m; it is not a topographically flat area but exhibits a relief often exceeding 1000 m. It is bounded by the Ogilvie Mountains and Selwyn Mountains to the north and northeast, the Liard Plain, Cassiar Mountains, and Stikine Plateau to the east and southeast, the Boundary and Kluane Ranges to the southwest, and the Alaska Border to the west.

The Liard Plain is an extensive plain with a general elevation of 670 to 910 m. It is bordered by the Pelly Mountains and Hyland Plateau to the north, the Liard Plateau to the east, the Rocky Mountains and Cassiar Mountains to the south, and by the Dease and Nisutlin Plateaus to the west.

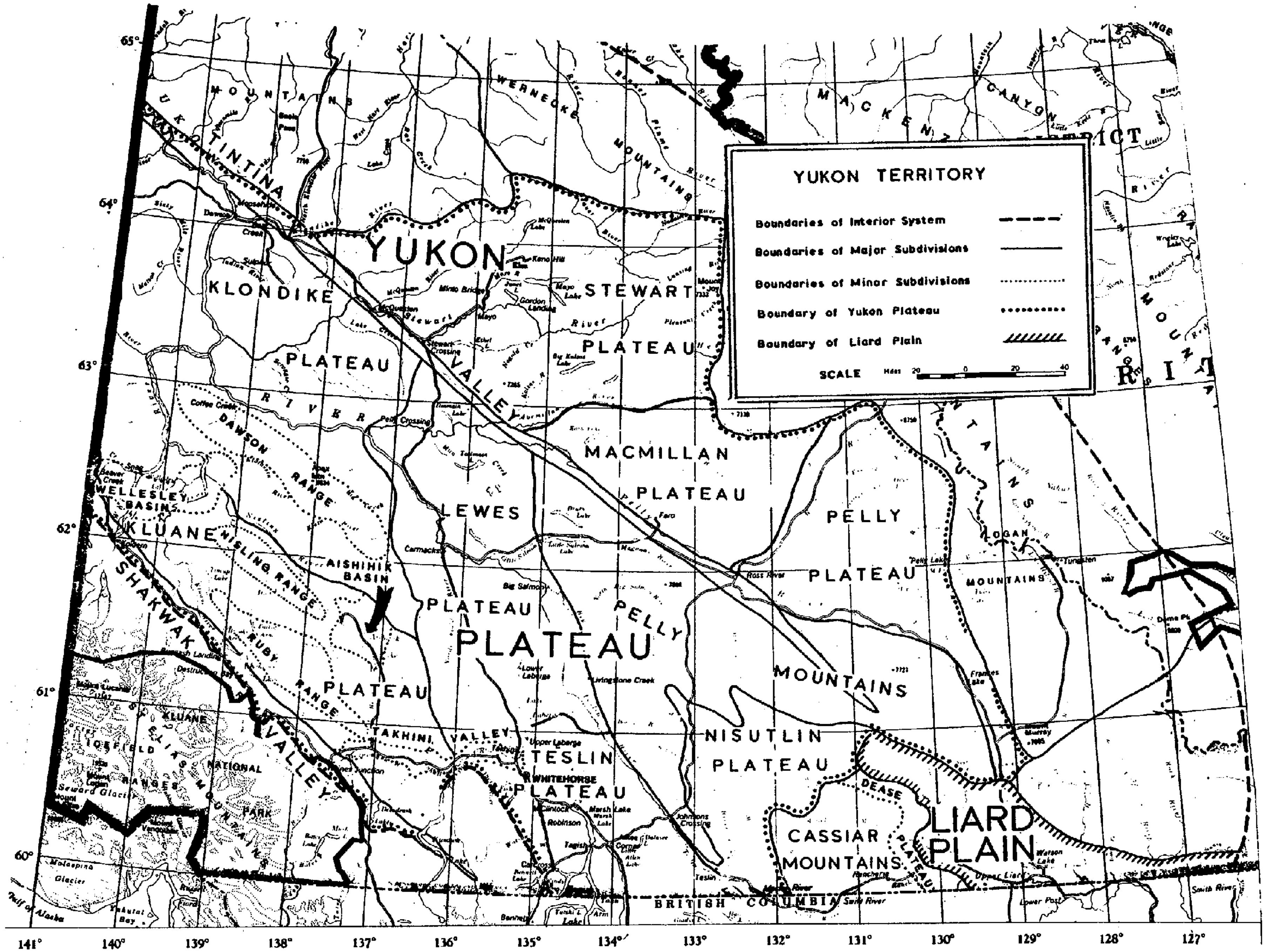

Fig. 35 Physiographic Subdivisions of Yukon Territory (Adapted from Bostock, 1948).

B. General Glaciation Patterns

Bostock (1966) found evidence for four glacial advances in the central Yukon region. These glaciations were referred to as the Nansen (oldest), Klaza, Reid, and McConnell (youngest).

During the McConnell advance the main Cordilleran ice sheet in central Yukon had two major source areas; one was along the Selwyn and Northern Logan Mountains from latitude 61°30' to 64°00'N, the other was farther south in the Cassiar Mountains extending from about latitude 60°30'N southward into British Columbia. Older glacial advances were thought to have had the same source areas (Hughes et al., 1968).

Ice from the more northerly source flowed mainly westward forming the Selwyn Lobe (Campbell, 1967). Some ice from the Selwyn Lobe flowed southward, then southeastward across the Liard Plain. The flow of ice from the Cassiar Mountains was dominantly northwestward. East from longitude 132°00'W the ice flowed northwestward and was deflected northeastward and eastward by the topographic barriers of the Pelly Mountains.

At higher levels of the Cassiar Lobe, there are indications that ice moved westward and west-northwestward across the Whitehorse and Teslin Map Areas: here the ice movement was parallel with the trend of the Teslin and Yukon River valleys (Hughes et al., 1968).

C. General Physiography and Geology

1. Yukon Plateau

Physiographic irregularities facillitate division of the Yukon Plateau into five areas; soil survey was carried out in only four of these areas: the Tintina Valley, and the Eastern, Western, and Southern

Yukon Plateaus. These four areas are also subdivided. The following discussion will be restricted to only those subdivisions that contain part of the total surveyed area covered in this report.

a. Tintina Valley The Tintina Valley extends across the Yukon Territory for approximately 635 km from the Liard Plain on the northern British Columbia border to the Yukon-Alaska border.

The floor of the valley varies in elevation from approximately 300 m near the Yukon River to approximately 1200 m at the head of the Hoole River: adjacent summits in most places range from 1200 to 2100 m (Roddick, 1966).

All of the large streams, the Pelly, Macmillan, Stewart, Klondike, and Chandindu rivers enter the valley from the northeast and all depart from the valley through the southwest wall. No major stream originates in or near the valley.

Unconsolidated alluvial deposits cover the floor of the Tintina Valley throughout its length. Glacial deposits generally occur in the valley south of 64°00'N. Outcrops of Tertiary coal-bearing sediments and consolidated beds of sandstone, shale, and conglomerate were found in the valley (Roddick, 1966).

Hughes, Rampton, and Rutter (1972) indicated that successive advances of valley glaciers emerged from the mountains along the valleys of the North Klondike, Chandindu and Fifteen Mile rivers in the southern Ogilvie Ranges, but these generally failed to reach the Tintina Valley.

b. Eastern Yukon Plateau This plateau area lies between the Selwyn Mountains to the northeast, Pelly Mountains to the southwest, and Ogilvie Mountains to the north.

(ii) Stewart Plateau The Stewart Plateau exhibits a deeply dissected surface. Two and three distinct old erosion surfaces are revealed in various locations on the plateau.

This plateau is drained by the McQuesten, Stewart, Kalzas, and Macmillan rivers.

The rocks of the Stewart Plateau are mainly metamorphosed sediments and are believed to be Precambrian. These sediments are overlain by Upper Paleozoic sediments along the Macmillan River (Bostock, 1948).

Pleistocene ice movement was westward across the plateau, and subsequent glaciation occurred below 1500 m. The Mayo area, for instance, was extensively glaciated.

c. Western Yukon Plateau This plateau is bounded on the northeast by the Tintina Valley, on the southwest by the Shakwak Valley, on the west by the Alaska-Yukon border, and on the east by the Southern Yukon Plateau.

(i) Klondike Plateau The Klondike Plateau is characterized by long, narrow, v-shaped valleys, all of very similar character. Tops of ridges are rounded and often culminate in dome shaped monadnocks or smooth-sloped mountains.

The Yukon River flows across the Klondike Plateau to be joined by the White, Stewart, Sixty Mile, Indian, Klondike, and Forty Mile rivers before crossing into Alaska.

The Klondike Plateau is composed mainly of metamorphosed sedimentary and igneous rocks of Precambrian and Paleozoic ages, and large areas of later granitic intrusions. All of the above rocks are overlain by Tertiary volcanic and sedimentary materials. Late Tertiary to Recent volcanics occur in the Fort Selkirk area (Bostock, 1948).

Most of the Klondike Plateau has escaped glaciation. Evidence for glaciation has been found at the southeast end of the Dawson Range and in cirques in valley heads around Apex Mountain in the Dawson Range. The latter example has been correlated as Pleistocene in age.

(ii) Kluane Plateau The Kluane Plateau is characteristic of an old upland surface. The Takhini Valley to the southeast cuts off a small portion of the plateau: this cut-off portion rises to 1675 m.

Northwest of the Takhini Valley, the Kluane Plateau consists of two topographic basins, Aishihik and Wellesley, separated by the Nisling and Ruby Ranges. The Aishihik Basin lies at 1200 to 1500 m, with minor exception. The Wellesley Basin has an elevation of 600 m. Both basins are drift covered from deposition by Pleistocene ice.

Kluane Plateau is dominantly drained by the White, Donjek and Kluane rivers.

Rock types occurring in the Kluane Plateau are granitic intrusives and volcanics as well as quartzites, schists, and limestones.

(iii) Shakwak Valley This valley extends over 320 km in a northwesterly direction from the Primrose River to beyond the White River. Kluane Lake is situated within this valley approximately midway between Primrose River and the Alaska border. The valley is approximately 16 km wide at its maximum. The southwest side of the valley rises in a wall to the Kluane Ranges.

The valley exhibits areas of scouring and deposition from ice that occupied the valley in Pleistocene time.

d. Southern Yukon Plateau This plateau is bounded on the south and southeast by the Stikine Plateau, the Cassiar Mountains, and the Liard

Plain, on the northeast by the Pelly Plateau and the Tintina Valley, and on the west by the Coast Mountains and the Western Yukon Plateau.

(i) Lewes Plateau The Lewes Plateau forms a depression between the Pelly Mountains on the east and the higher plateau areas on the other side.

The Lewes Plateau exhibits a highly variable topography with elevations ranging from 760 to 1370 m. The plateau may be divided into two parts by a line between Little Salmon River and Tatchun Lake. The southern part is an irregular depression containing Mesozoic sediments and Mesozoic volcanics. The northern part rises to tableland areas that then begin to lower into two hollows, one on each side of Ptarmigan Mountain (Bostock, 1948).

The Lewes Plateau has a rather extensive dendritic drainage network. The Yukon River is joined by its major tributaries, the Nordenskiold, Teslin, Little Salmon, Big Salmon, and Pelly Rivers to effectuate the drainage of the plateau.

Rock types that occur in the plateau are metamorphic and Mesozoic rocks, granitic intrusions, and Tertiary volcanics.

Only very minor areas of the plateau escaped glaciation.

(ii) Teslin Plateau This plateau is an elevated area on the north side of the divide between the Yukon and the Taku rivers. It is an area of high and partly dissected tablelands separated by a network of large valleys. Elevations in the valleys of the Yukon and Teslin rivers are between 640 and 700 m; adjacent tablelands rise to between 1370 and 1525 m (Bostock, 1948).

Marsh, Tagish, Atlin, and Teslin lakes are the primary receptors of drainage within this plateau area. Teslin Lake is drained by Teslin River, while the other three above-mentioned lakes are drained by the Yukon River.

The plateau is composed primarily of Palaeozoic rocks. The southern portion of this plateau also contains extensive areas of limestone. In the north, these Palaeozoic rocks are overlain by Mesozoic sedimentary and Mesozoic volcanic rocks.

Ice movement on the plateau was generally northward and covered all but the highest peaks.

2. Liard Plain

The Liard Plain is an isolated unit of the Cordillera and cannot be associated directly with adjacent systems or areas. Bostock (1948) describes this plain as a large basin. The central part of this basin lies at an elevation of 670 m. It is drained by the Liard River and its major tributaries, the Moose, Frances, Rancheria, Dease, Hyland, Coal, Red, Kechika, and Rabbit rivers.

The Liard Plain is underlain by Palaeozoic sedimentary rocks on which lie basins of Tertiary lavas and coal-bearing strata (Bostock, 1948). Lower regions of the plain tend to be covered with thick deposits of glacial drift. Eskers, abandoned canyons, and gravel beds extend across the Liard Plain towards the Liard River.

Appendix III

Description of Vegetation

Vegetation in the Dawson - Stewart Crossing - Mayo Area

The majority of the forest habitat in the Dawson - Stewart Crossing - Mayo area is found on the valley slopes (Rowe, 1972). There is some heavier forest growth present, but this is generally restricted to the valley floor (Green, 1972). The tree line in the area occurs at about 1050 m. White spruce stands occur extensively throughout the area but black spruce, aspen, and willow are also common. Alpine fir is present but at higher elevations.

Hardwood species such as white birch and aspen are best suited to the warmer aspects such as south facing slopes. These stands are frequently maintained by fires. The north facing slopes are often underlain by permafrost, particularly where there is a heavy moss cover. This results in stands of scattered and stunted black spruce.

Alluvial flats are rare and thus typical balsam poplar - white spruce mixtures are seldom encountered in this area. Where they do occur, white spruce growth is good even though there are dense growths of willow and alder.

Tamarack is absent in this region and lodgepole pine is very rare.

1. Dawson - Klondike Area.

a. Uplands

The soil material in the uplands is basically well drained glacial till, fluvial gravels, or colluvial material.

(1) Mixed conifer forests

Trees: black spruce, white spruce

Medium shrubs: labrador tea, willow

Mosses: feather moss

Lichens: reindeer moss.

This association of vegetation is found most commonly in the hills surrounding the Indian River where the soil is fairly moist. Black spruce dominantes the stand but white spruce is common. The trees are about 7 - 9 m high.

(2) <u>Black spruce forest</u>

Trees: black spruce, aspen

Short shrubs: bearberry, cranberry

Mosses: feather moss

Lichens: reindeer moss.

This vegetation can be seen growing on glacial till soils along the Dempster highway. These soils are quite gravelly and frequently dry. Black spruce forms extensive pure stands throughout this area but aspen groves may be found occasionally. Due to poor moisture conditions the stands of black spruce are fairly open and easily walked through. The trees are about 7 - 10 m high. Lichens dominate the forest floor.

(3) <u>Aspen forest</u>

Trees: Aspen, black spruce

Medium shrubs: labrador tea, willow, blueberry

Short shrubs: cranberry, bearberry

Lichens: reindeer moss, leaf lichen.

This association is found on the glacial till of the eastern part of the region. Closed stands of aspen dominate the area with blueberry, labrador tea, and bearberry common in the understory. Black spruce forms stands on the imperfectly drained till.

On the soils that are imperfectly drained, black spruce and feather moss grow together while sedges are dominant in the wettest areas.

b. Lowlands

The soils in these areas are typically very moist and poorly drained. If there has been an accumulation of peat the subsoil is often frozen.

(1) Permafrost areas

Trees: black spruce

Medium shrubs: willow, shrub birch, labrador tea

Short shrubs: cranberry

Mosses: sphagnum, feather moss.

In general, the black spruce is stunted, 2 to 3 m in height, and widely spaced. They may grow much taller on the edges of permafrost where the frost table is much lower. Tall hummocks of sedges and cotton grass are common. Through the area grass was most common in the Indian River region while nearly absent in the Dawson region.

Black spruce and feather moss stands form a transition zone between poorly drained and permafrost sites, and the well drained soils in the uplands.

(2) Floodplains

Trees: white spruce, balsam poplar

Tall shrubs: willow

Medium shrubs: rose

Herbs: grasses and horsetail.

Floodplains are less common in this area then in other areas of Yukon since the rivers often occupy narrow valleys. Where they are present white spruce and balsam poplar grow tall, 18 to 24 m in height. Willow form a dense understory.

(3) Dredge tailings

Trees: Balsam poplar

Shrubs: willow

Due to the activities of the gold dredges in the Dawson area many of the stream beds and floodplains have been turned into large piles of rock and gravel. Since all the finer materials have been washed away the tailings are very dry and lack vegetation over much of their surface. Among the piles of gravel, water has accumulated and it is just above the water line where willow and balsam poplar grow.

2. Stewart Crossing - Mayo area.

The forest vegetation is signficantly influenced by aspect (Rowe, 1972). White spruce, aspen and birch favor the south and west slopes. Lower slopes and terraces are vegetated by white spruce and aspen. Bogs and permafrost areas are occupied by black spruce. Aspen is most common on dry grassy hilltops and steep south facing slopes where ground frost is not present. Sage grassland is common on the warm, dry sites.

Well formed stands of white spruce and balsam poplar occur on alluvium materials. The higher terraces are occupied by white spruce and white birch. The tree line in this area occurs between 1350 and 1500 m.

a. High river terraces

Trees: aspen, white spruce

Medium shrubs: buffalo berry

Short shrubs: bearberry, cranberry

Herbs: purple reedgrass, lupine, twinflower

Mosses: feather moss.

These soils are generally gravelly, often having a thin veneer of very fine sand or silt. Mixed wood forest is dominant over the area though pure stands of aspen or white spruce do occur. The black spruce that was so common on the upland soils of the Dawson area are now absent. The dryness of the habitat is indicated by the extensive mat of bearberry. Shrubs and herbs are now common under the open canopy of aspen. Feather moss is dominant under the spruce along with prostrate shrubs and herbs. Tree growth on these sites is often limited. The aspen are usually between 4 and 8 m in height.

b. <u>Low terraces and floodplains</u>

Trees: balsam poplar, white spruce, aspen, white birch, black spruce

Tall shrubs: willow

Medium shrubs: buffalo berry, labrador tea, rose

Herbs: sedges, horsetail, grasses

Mosses: feather moss.

The composition of the tree stands are variable. White spruce and willow are found throughout the area. Balsam poplar grow very tall on some sites near the river. Aspen are present further back on the floodplain or terraces. White birch is found occasionally intermixed with the other species. Shrubs and herbs are more common further away from the river. Where soils are poorly drained such as in abandoned channels, black spruce is present. Willows, sedges and mosses also grow well in these poorly drained areas.

c. <u>Lowlands</u>

Trees: black spruce, white spruce

Medium shrubs: willow, labrador tea

Short shrubs: bearberry, cranberry, crowberry

Mosses: feather moss, sphagnum

The distribution of perennially frozen ground is limited in this area and is not nearly as extensive as in the Dawson area. Large trees are absent. Black spruce dominates though white spruce may be present. Overstory height ranges from 2 to 5 m depending on the depth of thawing, the taller heights being where the frost table is lower. Willow is the commonest shrub and mosses act as an insulating blanket.

d. Fluvial sands

Trees: white spruce, aspen, lodgepole pine

Short shrubs: bearberry, cranberry

Lichens: reindeer moss.

Very open stands of white spruce and lodgepole pine form on these sandy soils. Some aspen is generally present. Shrubs if present are rare and widely scattered. Dryland species dominate the understory, with reindear moss forming a mat.

Vegetation in the Pelly Crossing - Carmacks Area

The Carmacks area is widely forested to an elevation of 1350 to 1500 m. Trees grow everywhere below the treeline except for the southern exposure of hills and river terraces (Bostock 1938). These non-forested areas are covered with grasses and forbs characteristic of northern arid regions. Aspen and spruce grow in the hollows on these slopes.

North facing slopes are often perennially frozen, heavily moss covered, and usually growing stunted black spruce, willow, and labrador tea (Bostock, 1938; Campbell 1967). Poorly drained flats and depressions are also usually frozen year round. Black spruce is generally found on these soils where the frost or soil texture creates a high water table (Rowe, 1972).

White spruce is dominant on the south facing slopes and areas where the ground is thawed to some depth. Aspen, grasses and shrubs are commonly found in these areas. In the southern part of the Carmacks area, lodgepole pine is common.

Recently burned areas are frequently covered with stands of small aspen, spruce and lodgepole pine. Balsam poplar and white spruce to 30 m tall are restricted to river banks.

1. Pelly River Area

This area extends from the northern limit of the Carmacks survey area southward to Minto.

a. Burned river terraces

Trees: aspen

Medium shrubs: alder, willow, raspberry

Short shrubs: bearberry

Herbs: lupine, bluebell, yarrow, northern bedstraw, fireweed, vetch, gentian, delphinium, slender wheat grass, northern brome grass, purple reed grass.

A large portion of these terraces have been burned and are regnerating to aspen. The variety of species present in these burns is rich. Grass growth is very good on these sites but it is regenerating rapidly so grasses are likely to be dominated by willows in a few years.

b. Aspen forests on river terraces

Trees: aspen

Medium shrubs: rose, willow, buffalo berry

Short shrubs: bearberry, cranberry

Herbs: reed grass, twinflower, fireweed, lupine.

These stands of aspen have not been burned for a long time. The aspen are often very scrubby in appearence especially on gravelly subsoil. Areas that have a veneer of finer material underlain by sand have much better growth due to the more favourable moisture status of these soils.

c. Uplands

The majority of these areas were mapped in the Diamain Lake Association.

1) Aspen forest

Trees: aspen

Medium shrubs: rose,buffalo berry

Short shrubs: bearberry, cranberry

Herbs: reed grass

The aspen stands on these soils respond well to the more favourable moisture conditions of these soils. The stands are relatively productive, with aspen growing large, often over 12 m in height, and in dense stands. Grass growth may be good on some of these sites.

2) Mixed wood forest

Trees: aspen, white spruce

Medium shrubs: buffalo berry, high bush cranberry, rose, willow

Short shrubs: cranberry

Herbs: lupine, lousewort, wintergreen, yarrow, fireweed, hedysarum, northern brome, purple reed grass, foxtail barley.

The understory is fairly diverse and productive. The diameter at breast height (DBH) of many of these aspen and spruce were 12 to 23 cm. The spruce in the absence of fires will likely take over the stand at the expense of the aspen. Grasses are common but their growth is not as good as in the pure aspen stands or burned areas. Mosses are common under the spruce.

3) White spruce forest

Trees: white spruce

Short shrubs: cranberry

Herbs: purple reed grass, twinflower

Mosses: feather moss

Lichens: reindeer moss.

White spruce occasionally forms pure stands on the Diamain Lake soils. These forests are fairly productive, with tree diameter measurements ranging up to 60 cm, although 30 cm is the average. The 30 cm trees are 100 to 130 years old while the 60 cm trees are in excess of 200 years old. Some of these stands have been logged. Low light penetration due to a dense canopy limits the understory mainly to feather moss.

4) Burned uplands

Trees: Aspen

Medium shrubs: willow, alder, buffalo berry, raspberry

Short shrubs: bearberry

Herbs: lupine, bluebell, yarrow, northern bedstraw, fireweed, grasses.

A large portion of the area was burned recently; in fact, many of charred trees are still standing. Grasses are common in these areas.

d. Floodplains

Trees: white spruce, balsam poplar, aspen

Medium shrubs: willow

Herbs: grasses and sedges.

Floodplains occur extensively all along the Pelly River. The soils on these floodplains are usually moister than the adjacent soils on higher terraces and are visibly more productive. Willows are frequently found on the active parts of the floodplain. Balsam poplar is found higher up on the floodplain. The aspen on these floodplains are being replaced by white spruce. These stands of balsam poplar and white spruce are some of the most productive in the entire area. Aspen may be found on the well drained terraces. Some of the burned areas on the floodplain have good grass growth. Willows, grasses and sedges dominate in the poorly drained channels.

2. Minto-Carmacks area

The soils of this area are unique, in that they are covered with a thick layer of volcanic ash (10 ~ 30 cm thick).

a. Upper terraces

1) Aspen stands

Trees: aspen, white spruce, balsam poplar

Medium shrubs: rose, buffalo berry

Short shrubs: bearberry

Herbs: fireweed, lupine, northern bedstraw, purple reed grass.

The aspen stands are usually found on the gravelly river terraces. These stands are generally present in two forms. The first form of stand is made up of aspen under 3 m in height that are regenerating from past fires. These trees are scrubby rather than being tall and straight like those found in areas with more suitable soil conditions. The stands are open and the understory is sparse. Bearberry and purple reed grass are common. Grass growth is fair under these stands.

The second type of stand is made up of trees 12 to 15 m in height. The stands are open, though the canopy is fairly closed. Balsam poplar are present, though rare. White spruce are usually under 6 m in height. Several species of understory plants are present. Rose often forms large patches.

2) White spruce stands

Trees: white spruce

Herbs: bastard toadflax, twinflower

Mosses: feather moss

Lichens: reindeer moss.

White spruce stands tend to be found on the sandy terraces. They dominate over the area forming the climax. These stands are fairly productive. The trees average 12 to 18 m in height. Herbaceous and shrub growth is very restricted. Reindeer moss grows on the tops of small knolls while feather moss dominates the hollows.

3) Mixed woods

Trees: white spruce, aspen, lodgepole pine

Medium shrubs: willow, buffalo berry, rose

Herbs: fireweed, purple reed grass, lupine

Mosses: feather moss

Lichens: reindeer moss.

Mixed woods are common throughout the area. Aspen and white spruce mixtures occur more frequently in the north. Where all three trees are found growing together there are usually signs of a disturbance, generally fire. Pine is more common in the southern part of the area. They seldom dominate the stand although they are rather abundant on sandy soils.

Some 100 year old pine had DBH of 32 cm.

4) Grasslands

Herbs: purple reed grass, pasture sage.

Grasslands are found on the south facing hillslopes and escarpments. Bunch grasses dominate these slopes. Since these slopes are usually steep extensive grazing could cause serious erosion problems.

b. Alluvium and low terraces

Trees: balsam poplar, white spruce, aspen

Medium shrubs: willow, rose

Herbs: grasses.

The most productive forests in the Carmacks area are found on the lowest terraces and alluvium deposits of the Yukon River. These areas however, are not very extensive. Willow generally forms dense stands in the lower areas near the river. In the transition zone between the active portion of the floodplain and the higher terraces, mixtures of white spruce, balsam poplar and willows are found. The white spruce often reaches heights of 20 m or more. Rose, aspen and grasses are common on the low terraces where drainage is good.

c. Depressions

Trees: black spruce

Medium shrubs: willow

Short shrubs: alpine bearberry, dwarf willow

Mosses: feather moss.

These areas are poorly drained and may contain permafrost. Black spruce is common near the lows but they give way to white spruce as drainage improves farther away from the depression.

Vegetation in the Faro - Ross River Area

1. River terraces and fluvial outwash

   a. Aspen stands

      Trees: aspen, white spruce, lodgepole pine

      Medium shrubs: buffalo berry, labrador tea, rose

      Short shrubs: bearberry

      Herbs: lupine, rough fescue, purple reed grass

      Mosses: feather moss.

Aspen stands usually dominate these areas. White spruce may form stands on the moist sites. Lodgepole pine is common in certain locations in the central part of the region where it is drier. The aspen stands are often fairly open. Shrubs are common and grass growth is fair.

   b. White spruce stands

      Trees: white spruce, black spruce

      Medium shrubs: labrador tea

      Short shrubs: alpine bearberry

      Mosses: feather moss.

White spruce stands, although common throughout the area only occupy a minor part of the total landscape. Spruce is most common on the sandy soils or in low areas where the soil is moist.

   c. Burned areas

      Trees: aspen, white spruce

      Medium shrubs: willow, labrador tea

      Short shrubs: bearberry

      Herbs: fireweed, rough fescue, purple reed grass.

Aspen usually dominates the burned areas. White spruce are often present but are not as abundant as the aspen. Willow growth in some areas is good. Grass growth is often poor.

d. Grassland areas

Medium shrubs: willow, aspen

Short shrubs: bearberry

Herbs: pasture sage, bearded wheat grass, sheep fescue, northern awnless brome.

Steep south facing slopes are mainly vegetated by grasses. Small aspen may be present, particularly in the hollows. On grasslands on level areas, shrubs and small aspen are common but grasses dominate these areas.

2. Morainal

a. Black spruce stand

Trees: black spruce, white spruce

Medium shrubs: labrador tea, willow, blueberry

Short shrubs: bearberry, alpine bearberry

North facing slopes are generally dominated by black spruce. On level areas white spruce may be common. Mosses are the dominant plant on the forest floor. Shrubs are usually rare except where drainage is restricted. Black spruce becomes more common on level areas in the southeastern part of the area where the climate is cooler.

b. Mixed wood stands

Trees: aspen, white spruce, lodgepole pine

Medium shrubs: buffalo berry

Short shrubs: bearberry

Herbs: lupine, grasses.

This plant community is usually found on the south facing slopes of morainal deposits. Grasses are frequently present. Aspen is usually the dominant tree species on these slopes. The pine and spruce may reach heights of 12 m. Mixtures of lodgepole pine, aspen and spruce are also found on level sites in this area.

3. Floodplain

Trees: white spruce, balsam poplar, aspen

Tall-medium shrubs: alder, willow, labrador tea, blueberry, rose

Short shrubs: bearberry

Herbs: horsetail, fireweed, bastard toadflax, strawberry, grasses, sedges.

Mosses: moss

Wet portions of the floodplain are dominated by willow 1 to 2 m in height. Good growths of balsam poplar and white spruce are found where drainage is slightly better. The mature spruce are 45 to 50 cm DBH. Grass growth is fair. Many of the sites with a good moss cover are frozen. Most of the herbs and shrubs grow under the trees rather than the willow. In the very wet areas of the floodplain sedges are the most common plant species.

Vegetation in the Takhini - Dezadeash Area

The lodgepole pine that is so prevalent in the Whitehorse area gives way to white spruce west of the Takhini River (Nowosad, 1944). White spruce occupies all kinds of forest sites in this area rather than being limited to the well drained to moderately well drained upland and floodplain soils with abundant subsurface running water (Johnson and Raup, 1964). The climax is composed of white spruce, woodland mosses and a few fruticose lichens. Under brush is rare. Balsam poplar, aspen, and white birch are also present (Kindle, 1952).

On some of the well drained soils the area takes on a "park-like" appearance. The prairie is made up of grassy knolls, meadows, and small aspen. In the open aspen stands the ground is covered with a few mosses, fruticose lichens, avens, and mats of bearberry. The common shrubs are shrubby cinquefoil, juniper, and buffalo berry. Herbs are present but rather sparse.

The grasslands on the coarse fluvial deposits are composed of the tufted low growing grasses, blue grass and purple reed grass, as well as xerophytic sedges, pasture sage, and bearberry, and numerous forbs and shrubs.

Forested areas on lacustrine silt deposits are dominated by white spruce 18 to 21 m in height. The common shrubs consist of scattered willow, buffalo berry and rose. The herbs are northern awnless brome, blue grass, sedge, bluebell, and Jacob's ladder (Johnson and Raup, 1964). The ground cover is generally made up of mosses 10 to 15 cm thick.

Grasslands on these lacustrine silt deposits are common. The grasses found here are mainly rhizomatous and turf forming. Slender wheat grass, tickle grass, northern reed grass, red fescue, sweet grass and trisetum grow on the moist sites. Drier sites are dominated by Yukon wheat grass, purple reed grass, blue grass, and sheep fescue. Common forbs are beard-tongue, silver weed, white cinquefoil, Jacob's ladder, hedysarum, cut-leaved anemone, ragwort, and goldenrod.

Black spruce is limited to areas where the water table is high. Depressions contain sedges and rushes and are usually surrounded with shrub birch and willow. Willow are also common on most of the new floodplain. Those floodplains are frequently invaded by balsam poplar. Further back on the floodplain white spruce is common and these may reach heights of 23 to 30 m.

1. Coarse Fluvial Deposits

    1. White spruce forest

        Trees: white spruce, lodgepole pine

        Medium shrubs: rose,

        Short shrubs: bearberry

        Herbs: fireweed, white camass, purple reed grass, fescue

        Mosses: feather moss.

Lodgepole pine may be found mixed with white spruce north of Kusawa Lake, but it is usually absent in most of the Takhini-Dezadeash area. On sandy soils the stands of white spruce are closed and dense, but where the soils are gravelly the stands are usually open, and shrubs and herbs are common. Grass growth may be good on these sites while on others bearberry dominates the ground cover.

b. Aspen stands

Trees: aspen

Medium shrubs: buffalo berry

Short shrubs: bearberry

Herbs: fireweed, locoweed, rough fescue.

Small stands of aspen are common throughout the area but these are not extensive. Shrubs and herbs are common where the stands are not very dense. Under dense stands the understory vegetation is usually confined to bearberry.

2. Morainal Uplands

a. White spruce forests

Trees: white spruce

Mosses: feather moss.

Generally closed pure stands of white spruce are formed. The understory is usually limited to feather moss. Occasionally small stands of aspen are found but these are quite rare and in most cases the undergrowth is sparse.

3. Silty Lacustrine deposits

a. White spruce forests

Trees: white spruce

Mosses: feather moss.

Extensive pure stands of white spruce are found on these soils. The forest is relatively productive, with the trees becoming quite large. A large portion of the area was burned over 20 years ago.

b. Burned areas

Trees: aspen

Shrubs: willow

Herbs: fireweed, yarrow, bearded wheat grass, foxtail barley, rough fescue, purple reed grass, blue grass, tickle grass, and sedges.

Aspen and willow form small stands where moisture conditions are favorable. Much of the area, however, is free of shrubs and is covered by grasses and forbs. The ground cover is not very dense, but the grass growth is good. Dead falls of white spruce cover the area making walking very difficult. Some of these trees when growing were probably 15 to 21 m in height indicating that a relatively productive forest was once located here.

c. Grasslands

Herbs: anemone, aster, beard-tongue, tufted hair grass, baltic rush, wheatgrass, blue grass, rough fescue, sheep fescue, trisetum, sweet grass, timber oat grass and sedges.

Pockets of grassland are common throughout the area. They range in size from less than one quarter of a hectare to several hectares. When these areas are in depressions they are surrounded by willow and shrub birch . Forbs are usually common. Tufted hair grass and baltic rush dominate the lower areas of the grassland while the other grasses and sedges dominate the higher areas. Grass growth would be very good if these areas were not grazed so heavily. Small pockets of grassland are found along the Aishihik lake road. In one case a pure stand of Yukon wheat grass was found growing without any competition in an area of black alkali.

Vegetation in the Whitehorse Area

Lodgepole pine is the dominant tree in the Whitehorse area (Rowe, 1972). Extensive pure stands are common on the sandy soils throughout the region. Aridity and the occurrence of fires probably contribute to this abundance of lodgepole pine. Mixtures of aspen, pine, and white spruce are also common, whereas, white spruce and lodgepole pine may codominate on sandy morainal deposits. White spruce may be the dominant species where moisture is more abundant (Nowosad, 1944). The tree line is approximately 1200 to 1350 meters above sea level in this map area.

Black spruce is usually present on the small muskeg areas that are scatterd throughout the region. These muskegs are also covered with a thick mat of moss and are fringed by alder, willow, shrub birch, and labrador tea. Tamarack and white birch seldom occur in the Whitehorse area.

Sand and gravel ridges lack tree vegetation. These are covered with rough fescue, cinquefoil, bearberry, sweetgrass, and reed grass. South facing hillslopes on the other hand are often covered by bunchgrass and sage (Bostock et al., 1938).

1. Sand and gravel deposits

   a. Lodgepole pine forest

      Trees: lodgepole pine, aspen, white spruce

      Medium shrubs: buffalo berry, rose

      Short shrubs: bearberry, cranberry

      Herbs: twinflower, purple reed grass, lupine

      Lichens: reindeer moss.

Pure stands of pine are the commonest forest type in the area. Aspen and white spruce may be present and usually dominate on sites where there is a veneer of fine material overlying the coarser subsoil. In some cases, particularly south of Whitehorse, grass growth may be very good under the open pine stands. More often though, reindeer moss dominates the forest floor with herbs and shrubs being less common. Young stands tend to be very dense while older ones are often open and widely spaced.

b. Grasslands

Short shrubs: horizontal juniper, bearberry

Herbs: purple reed grass, rough fescue, sheep fescue, bearded wheat grass, Yukon wheat grass, locoweed, white camas, larkspur, pasture sage.

Small areas of grasslands are found on south facing slopes, terrace edges and crests. Several of the forbs present in these areas are poisonous. This may be important in that these areas are generally grazed extensively.

2. Morainal Deposits

a. Lodgepole pine forest

Trees: lodgepole pine, aspen, white spruce

Medium shrubs: buffalo berry, labrador tea, rose

Short shrubs: bearberry, cranberry

Herbs: twinflower, lupine rough fescue, purple reed grass

Lichens: reindeer moss.

These morainal deposits are often fairly gravelly and therefore fairly well drained. Several sites appear to be more mesic in nature because aspen and white spruce are common though not usually dominant.

Soils with a veneer of fine material tend to produce more aspen and spruce even though sand my be present below the veneer.

3. Lacustrine silt deposits

a. White spruce stands

Trees: white spruce, aspen

Mosses: feather moss.

White spruce is dominant on these areas though aspen may be present or forming small stands. These spruce stands tend to have closed canopies and as a result herbs and shrubs are rare, with mosses making up most of the ground cover.

b. Saline grasslands

Herbs: salicornia, alkali grass, mat muhly, foxtail barley.

Foxtail barley and alkali grass were common on most saline soils. In some areas where salts were present at the surface salicorina was found along with dense stands of mat muhly.

4. Depressional Areas

Trees: black spruce, white spruce

Medium shrubs: willow, shrub birch, labrador tea

Short shrubs: alpine bearberry

Herbs: sedges.

Poorly drained soils only occupy a small portion of the Whitehorse area. They are usually confined to valley bottoms and stream edges. They are generally very wet and often frozen.

Vegetation in the Watson Lake Area

1. Upland Marinal Soils

   a. Lodgepole pine stands

      Trees: lodgepole pine, white spruce, aspen and birch

      Medium shrubs: willow, alder, labrador tea

      Short shrubs: cranberry, bearberry, crowberry

      Herbs: bunchberry, lupine

      Mosses: feather moss

      Lichens: reindeer moss.

Extensive stands of lodgepole pine are frequently found on these upland tills, however, mixtures of lodgepole pine, with white spruce, aspen and birch are also common. The older stands are fairly open though a dense growth of alder is often present. Reindeer moss is the dominant plant species on the soil surface but feather moss can also be abundant on moist sites.

   b. Black spruce stands

      Trees: black spruce

      Medium shrubs: willow, labrador tea, alder, shrub birch

      Short shrubs: crowberry, cranberry

      Herbs: bunchberry

      Mosses: feather moss.

Extensive stands of pure black spruce are found in the uplands where drainage is poor. A thick carpet of peat 10 to 20 cm covers the soil surface. The trees are often less than 8 m in height. North facing slopes or areas where the water table is high are often frozen.

2. Fluvial terraces

a. Lodgepole pine stands

Trees: lodgepole pine

Medium shrubs: buffalo berry, juniper, labrador tea

Short shrubs: bearberry, cranberry

Herbs: grasses, lupine

Lichens: reindeer moss

Pure stands of lodgepole pine have formed on many of these terraces. In many areas herbs are rare and shrubs are widely scattered. Reindeer moss usually carpets the soil surface forming an extensive white mat. Due to the dryness of the soil the stands are generally open, but regenerating stands can be dense.

3. Floodplains and low terraces

Trees: balsam poplar, white spruce, aspen, white birch

Medium shrubs: willow, river alder, labrador tea, rose, dogwood

Herbs: bunchberry, sedges

Mosses: feathermoss

Lichens: reindeer moss

Newly exposed point bars are first invaded by willow and river alder and then by balsam poplar. White spruce, however, is the dominant species on the older alluvial deposits. White spruce seedlings can be found growing with the balsam poplar, and will eventually dominate the stand (Reid, 1975). Rose and mosses are common on these older alluvial deposits.

Levees on the floodplain have highly productive balsam poplar - alder forests. The level terraces behind these levees have the most productive forests in the Yukon. White spruce are closely spaced and over

30 m tall.

After a fire the vegetation on these floodplains and low terraces regenerates to aspen, white birch, and numerous shrubs and herbs.

4. Backswamps

Trees: black spruce, tamarack

Medium shrubs: labrador tea

Herbs: sweet coltsfoot, sedges

Mosses: mosses

In many instances the flooded channels of these backswamps are partly covered by sedge fens.

5. Organic Soils

a. Fens

Trees: tamarack, black spruce

Medium shrubs: willow shrub birch

Herbs: sedges

There are minerotrophic fens found in depressions and around lakes. The drainage is usually very poor with free standing water being common in these fen areas.

b. Bogs

Trees: black spruce

Medium shrubs: willow, shrub birch, labrador tea, shrubby cinquefoil

Short shrubs: crowberry, alpine bearberry

Herbs: baked apple berry, grass-of-Parnassus

Mosses: sphagnum

The drainage is very poor on these sites and the subsoil is often frozen due to the insulating properties of the sphagnum moss.

Vegetation in the Snag Area

Snag is located in southwestern Yukon in the zone of widespread permafrost. Although white and black spruce are common throughout this zone, black spruce appears to be the dominant forest type in the Snag area (Rampton, 1971). The tree line is at 1050 m.

The benchlands throughout this area frequently contain aspen, white spruce and birch (Rowe, 1972). In many cases good stands of white spruce, balsam poplar and aspen can be found along the rivers. In some areas the better stands of white spruce have been logged.

1. Upland areas

The vegetation in these areas have developed on either medium textured calcareous morainal deposits or silty eolian deposits.

a. Aspen stands

Trees: aspen, black spruce, white spruce

Medium shrubs: willow, bearberry, rose, labrador tea

Short shrubs: cranberry, crowberry

Herbs: lupine, twinflower, fireweed, purple reed grass

Lichens: leaf lichen

Mosses: feather moss.

Aspen stands generally dominate this area. Small stands of black spruce do occur throughout the area and some tall white spruce are found on the silty eolian deposits northeast of Snag. The aspen stands are usually fairly open and often contain an abundant undergrowth.

2. High Terraces

These terraces located north of Beaver Creek and south and east of Snag consist of a thin veneer of coarse silts over gravel.

a. Aspen stands

Trees: aspen, white spruce, black spruce, white birch

Medium shrubs: willow, buffalo berry, rose, labrador tea

Short shrubs: cranberry, crowberry

Herbs: lupine, fireweed, twinflower, purple reed grass.

Aspen dominates the stands throughout the area. The other trees are usually present but not as numerous. The understory is diverse. Grass growth on some sites is good while on others it is poor. The stands are usually fairly open. The trees are not tall, probably less than 9 m.

b. Black spruce stands

Trees: black spruce, white spruce

Medium shrubs: labrador tea

Short shrubs: cranberry

Mosses: feather moss.

Almost pure stands of black spruce were found in the areas north and south of Beaver Creek. These are not very common but do tend to occur in areas that have significant Gleyed Eutric Brunisols or Brunisolic Static Cryosols.

3. Floodplain and low terraces

a. White spruce stands

Trees: white spruce, balsam poplar

Medium shrubs: willow, labrador tea

Short shrubs: cranberry

Herbs: twinflower, horsetail

Mosses: feather moss.

Areas of the floodplain that are regularly flooded are covered by a dense growth of willows. Alluvium above the influence of flooding may have white spruce in excess of 24 m in height. Feather moss usually forms a dense mat over the soil surface.

b. Black spruce stands

Trees: black spruce, aspen, white spruce

Medium shrubs: willow, labrador tea

Short shrubs: alpine bearberry

Mosses: feather moss.

Black spruce forests are common on the lower terraces. Some tall stands of black spruce and sometimes white spruce or aspen may occur in scattered patches usually on ridges corresponding to old point bars. The soil under this type of vegetation are usually frozen due to the dense tree and moss cover.

4. Depressional areas

Trees: black spruce, white spruce

Medium shrubs: willow, shrub birch, labrador tea, shrubby cinquefoil, blueberry

Short shrubs: cranberry, alpine bearberry

Herbs: baked apple berry, sedge, cotton grass, polar grass.

Lichens: reindeer moss

Mosses: sphagnum.

The largest depressional area occurs along Snag Creek but substantial areas of poorly drained soil also occur scattered throughout the morainal deposits and gravel terraces. The black spruce are often stunted and quite sparse. The shrub layer is rather dense and is usually dominated by willow and bog birch. The ground cover generally consists of an insulating layer of sphagnum moss. Permafrost is very common. In wetter areas hummocks of sedge and cotton grass may be present. In areas where there is free standing water grasses and sedges dominate providing the water is not too deep.

Most of the poorly drained areas along Snag Creek are quite level but on the morainal deposits the poorly drained areas can have a hummocky topography.

Appendix IV

Regional Grazing Potential

Regional Grazing Potential

Indian River: The Indian River valley is a small area approximately 32 km southeast of Dawson (Sheet 1 of map set). There appears to be more than normal available moisture due to seepage downslope. The useable slope is north facing and its soils are affected by excess water. The soils vary from Gleyed Regosols to Rego Gleysols. The bottom land area contains a mixture of soil drainage types. The McNiel farmstead is located on an alluvial fan emanating from the hills to the south. These fans tend to be well drained. The fields were growing smooth brome and the crop was past flowering on July 27. It was about 50 cm high and would have yielded less than 1000 kg/ha of hay. On the lower side of the field, weeds were prevalent in the stand. Monkshood (*Aconitim delphinifolium*), a plant poisonous to livestock made up a significant percentage of the ground cover. The brome forage was collected and its analysis is listed in Table 33. A very low phosphorus content was recorded. From the light green color of the grass it was also evident that nitrogen levels in the soil were inadequate (see Fertility Section, sample no. S0537).

In the western part of the survey area, the flats next to the river are mainly dense willow about 4 m tall. In small meadow areas at slightly higher elevations, there is water sedge (*Carex aquatilis*) and manna grass (*Glyceria* sp.), along with bluejoint (*Calamagrostis canadensis*). These areas would offer good fall forage. The whole north facing, rather gentle slope is a pattern of aspen clumps, patches of white spruce, and open areas on which willow and shrub birch predominated. These, for the most part, were browsed to about 1.5 m by moose.

Two locations, one on the east and one on the west end of the valley, were studied. In both locations the area had been burned and is regenerating to black and white spruce that are from 1 to 2 m high and spaced 6 to 9 m apart. The ground is hummocky and in the spaces between the shrub birch (*Betula glandulosa*) and willow clumps there is a mixture of alpine bearberry (*Arctostaphylos rubra*), shrubby cinquefoil (*Potentilla palmatus*), rough fescue (*Festuca altaica*), and northern reedgrass (*Calamagrostis inexpansa*). Along a roadway near Austrailia Creek, slender wheatgrass (*Agropyron trachycaulum*), foxtail barley (*Hordeum jubatum*), and ticklegrass (*Agrostis scabra*), in conjunction with fireweed produced a grazeable forage stand. The area as a whole has a III-IV grazing capability. Forage production could be increased by burning or by brush clearing. Monkshood may present a grazing hazard if the range were used heavily. Mr. McNiel mentioned that wolves are present and as this area lies adjacent to an extensive wilderness, predation will be a factor should open ranging of cattle be conducted. Since roads to the area are unimproved and generally impassable most of the year, the Indian River Valley is in effect isolated from Dawson.

French Creek: The French Creek Association is typified by the landscape along French Creek in the northeast part of Sheet 1 of the map set. It occurs generally as a series of low lying depressions and channels forming drainageways throughout the Two Sisters till area. The valleys are a few hundred metres to over 2 km wide. They are generally flat bottomed to slightly inclined. They appear to be former glacial meltwater channels but the present streams are little more than small seepageways through the boggy channels.

The soils are dominantly Rego Gleysols (peaty phase) and Gleyed Regosols developed on sandy fluvial or modified till deposits. Generally the peat layer is thinner then would be expected from landscape position and presence of fen-like vegetation. Frequent fires may act to burn off excess peat as most of the area shows evidence of fires. The soils are frozen at shallow depths.

The flats along French Creek have a dominant shrub vegetation made up of willow and shrub birch. Between the 2 - 3 m high willows there are scattered plants of tall Arcticgrass (*Arctagrostis latifolia*), rough fescue (*Festuca altaica*), fireweed (*Epilobium angustifolium*), sweet coltsfoot (*Petasites palmatus*), grass-of-parnassus (*Parnassia palustris*), and trailing raspberry (*Rubus arcticus*).

The area has ample moisture, therefore the production of forage will probably exceed 300 kg/ha, however, because it was also producing ample palatable browse its best use would probably be as moose range.

Stewart Crossing: The Stewart Crossing area lies in the Stewart River valley in the central part of Sheet 2 of the map set. The highest grazing capability in this area is class V. Most of this grazing occurs on the well drained Dry Creek and McQuesten soils. There was also some grazing V on sandy loam textured Stewart Crossing soils.

There appears to be 20 - 30% grass cover (class V) in areas of regenerating aspen. Areas of white spruce on the better soils often have no grass, just bearberry, lingonberry (*Vaccinium vitis-idaea*), and lichen or reindeer moss.

At Stewart Crossing a pasture had been cleared and was being grazed by horses. This particular area showed the effects of heavy, continuous grazing. It is a relatively dry site and the vegetation when observed on July 28 had dried up and turned brown. The main grasses are slender wheatgrass (*Agropyron trachycaulum*) and foxtail barley (*Hordeum jubatum*). In addition, the field has a high percentage of unpalatable weeds, namely, blue burr (*Lappula myosotis*), yarrow (*Achillea borealis*), and lesser amounts of fireweed (*Epilobium angustifolium*) and larkspure (*Delphinium glaucum*).

Fig.28. A typical young spruce forest site near Stewart Crossing producing approximately 200 kg/ha of palatable forage.

A forested site south of Stewart Crossing was examined. The spruce at this site has a diameter breast height (DBH) or 7-10 cm. There is a sparse understory of soapberry *(Shepherdia canadensis)* and willow. The predominant grasses are purple reedgrass *(Calamagrostis purpurascens)* and rough fescue. The ground cover is lingonberry *(Vaccinium vitis-idaea)*, lousewort *(Pedicularis labradorica)*, lupine *(Lupinus arcticus)*, toadflax *(Geocaulon lividum)*, and fireweed. Present, but not prevalent, is white camas *(zygadenus elegans)*, a reputably poisonous lily. This area is producing about 200 kg/ha of palatable forage so could be considered as a minimal livestock range (Fig. 28).

This part of the country, from Clear Creek through McQuesten to Stewart Crossing and south, appears somewhat drier than areas at higher elevation. It was noticeable that grasses through this section, particularly on the gravelly soils, had matured and set seed by July 28, notwithstanding the fact that it had rained heavily the week before. In general, there is not a good potential for native grazing in the Stewart Crossing area.

Pelly Crossing: The area along the Pelly River between the Pelly River Ranch and Granite Canyon represents some of the best grazing found on Sheet 3 of the map set. There are primarily two soil associations that occur along the Pelly River in this area. The Pelly Crossing Association is a variable textured (sl-sil) fluvial deposit occurring on the lower terraces of the Pelly River. The Fort Selkirk Association occurs on a higher terrace and is always gravelly at depth. Much of the area was burned severely in 1958 and is now revegetating to aspen.

An unburned area on the upland north of the Pelly River between Pelly Crossing and Granite Canyon was observed. The soil in this area is mapped in the Diamain Lake Association which consists of silty loess 30-60 cm thick over till. The tree cover is spruce and aspen with a DBH of 12-23 cm. The understory soapberry, high bush cranberry *(Viburnum edule)*, rose *(Rosa acicularis)*, and willow. The grasses are mainly northern brome *(Bromus pumpellianus)*, purple reedgrass, and foxtail barley. In addition, lupine, lousewort, wintergreen *(Pyrola* sp.), aster, yarrow, lingonberry, bearberry, fireweed and purple loments *(Hedysarum mackenzii)* occur under the trees. Forage grasses are more vigorous in disturbed ground at the side of the road. A sample of grass from this area indicated a low protein level and very low copper level (Table 33). Forage in the unburned forest would provide 100+ kg/ha which would allow for minimal range use class V.

Two locations in an old burn on the Pelly River terrace, mapped in the Fort Selkirk Association, were observed in the vicinity of Pelly Crossing. The aspen is growing up between the blackened trees, many of which had fallen. Along with the aspen there are vigorous willow bushes and many roses. The grass component is made up of purple reedgrass, northern brome, slender wheatgrass, and bluegrasses. The forb growth consists of lupine, fireweed, aster, vetch, gentian, yarrow, northern bedstraw *(Galium boreale)*, and scattered plants of larkspur. Forage is plentiful in the burn, particularly in the areas that had been salvage-logged (Fig. 29). The grazing is class III but would be affected adversely by the fallen snags which prevent animal access. This area is rapidly regenerating to forest so the burn can be regarded as only a temporary range.

A meadow on the north end of Von Wilczek Lake, 15 km south of Pelly Crossing, is being cut for hay. The soil is a peaty Gleysol. The main plant species near the edge of the meadow are fowl meadowgrass (*Poa palustris*), slender wheatgrass, foxtail barley, and Arctic rush *(Juncus arcticus)*. In the wetter portions of the meadow, water sedge *(Carex aquatilis)* is dominant. The grass that was being cut for hay was collected and analyzed (Table 33).

Fig. 29. A burn near Pelly Crossing showing aspen regeneration and ample forage.

It showed a very low crude protein (CP) content and a low P content. The hay is being used by an outfitter to winter horses.

Fox Lake: In the Richthofen Valley between Fox Lake and the south end of Lake Laberge (sheet 8 of map set) there are a number of poorly drained areas. When observed these meadows were found to be quite dry with 15-25 cm of peat over calcareous silt loam. This was surprising as the willow, shrub birch, and sedges would suggest that these meadows would be wet and no doubt they are earlier in the season. On one of the meadows observed, there was a good cover of willow and shrubby cinquefoil *(Potentilla fruticosa)*. There was also some water sedge *(Carex aquatilis)* mixed with northern reedgrass *(Calamagrostic inexpansa)*. On tufted drier hummocks, arrow-leaf coltsfoot *(Petasites sagittatus)*, and alpine bearberry *(Arctostaphylus rubra)* were growing. The amount of graze-able vegetation was between 300-400 kg/ha which would put this type of land in class III grazing. With proper water control, these areas could be used as hayland

The upland area was fairly dry with open stands of aspen and white spruce. The soil is a mixture of fluvial sands, lacustrine silts, and sandy till. There are also bedrock exposures throughout the area. Many of the steeper hills have a grassland cover only, being dominated by purple reedgrass and rough fescue. In general, the amount of forage varies with the tree cover, the depth of soil, and the exposure. Between 200 and 300 kg/ha of usable forage is present on most of the opens in this area. Much of the area showed evidence of having been grazed by horses probably in the fall and winter.

Whitehorse North: An area of Kusawa soil west of the Yukon River and south of Lake Laberge (sheet 8 of map set) was examined. This is a reasonably mature forest of aspen, white spruce, and lodgepole pine. The stand is open with soapberry and creeping juniper *(Juniperus horizontalis)* prevalent in the understory. The palatable grasses consist of purple reedgrass, northern bromegrass, sheep fescue *(Festuca ovina)*, and Yukon wheatgrass *(Agropyron yukonense)*. Bearberry or kinnikinnick *(Arctostaphylos uva-ursi)*, wild strawberry *(Fragaria virginiana)*, and fireweed are prevalent in the ground cover. The yield of palatable forage was estimated at 200 kg/ha. Across the highway to the west is an area that had been burned and brush piled. It had been grazed by horses. Foxtail barley is on the increase. The yield is between 150 and 200 kg/ha.

Closer to the river, a pine burn was observed on which the trees were coming back, with pine being 1-2 m high and aspen 3-4 m high. As well as the species listed above, there is wild flax *(linum lewisii)*, milk vetch *(Astragalus alpinus)*, and purple locoweed *(Oxytropus splendens)*. This rather dry site yielded 150-200 kg/ha. North of this area in the unburned forest the trees are very open and much creeping juniper is in the ground cover. Yukon wheatgrass is dominant with a good mixture of northern brome, wild strawberry, and purple loments. The yield here is 200-300 kg/ha.

It would appear that the area along the Yukon River north of Whitehorse is capable of producing between 100-300 kg/ha of palatable forage. This places it in grazing class IV.

M'Clintock River: The majority of this survey is located on the east side of the M'Clintock River extending from Marsh Lake to just below Cap Creek (sheet 8 of map set). The southern portion of this area is sand and loamy sand deposits while the northern part is sands and sandy till. The sands (Aishihik Association) occurs on hummocky 3-5 topography while the sandy till (Haeckel) occurs on rolling to hummocky topography. The vegetation on the sandy soils is open lodgepole pine with some white spruce and generally only a sparse ground cover.

The area mapped as Croucher is relatively flat with frequent open meadows with fair grazing capability. The profiles in the open meadows are Orthic Regosols and in the trees they are Orthic Eutric Brunisols. The aspen and spruce in the tree areas are small and fairly open. The meadows contain shrub birch, willow, rough fescue, sedges and bearberry (Fig. 30). The willow and birch has been browsed heavily by moose. The amount of palatable vegetation in the open meadows is between 300 and 400 kg/ha while it is only 100-200 kg/ha in the forest areas. The grazing capability for this area is class III.

Aishihik Valley: The lower slopes of the valley along the Aishihik River (sheet 7 of map set) have semi-open stands of white spruce and aspen. Here purple reedgrass predominates with bearberry under the trees. Opens occurred on the south facing slopes and these are at times almost pure stands of Yukon wheatgrass. One such area on a black alkali soil produced 170 kg/ha (19-5, Table 33). Many of these balds contained mixtures of grasses and fringed sage along with willow and scrubby aspen. The valley bottom is a series of small

Fig. 30. An Orthic Regosols meadow in the M'Clintock River area. Rough fescue forms the bulk of forage. The shrub birch and willow was grazed by moose.

Fig. 31. Looking N in the Aishihik Valley. In the foreground is a typical bald where grassland species prevail while near the pond is a productive sedge grass meadow.

lakes and wet sedge meadows probably brought about by beaver damming along the streams. Such areas will provide reasonably good summer range (Fig. 31).

Big Burn in the Takhini Area: Flats along the Takhini River in the vicinity of mile 945 (sheet 7 of map set) were observed. In the burn area some spruce snags are still standing although more than half of the trees have fallen. There are some aspen and willow in the burned area and the ground cover consists largely of purple reedgrass, sheep fescue *(Frestuca ovina)*, Yukon wheatgrass, Canada bluegrass *(Poa compressa)*, fireweed, yarrow, pussytoes *(Antennaria rosea)*, and windflower *(Anemone multifida)*. The yield of forage from the area is 222 kg/ha ODW. On the lower bench a true grassland was sampled. It consists of sheep fescue, Arctic rush, slender wheatgrass, oatgrass *(Danthonia intermedia)*, Canada bluegrass, golden rod *(Solidago* sp.*)*, pussytoes, blue penstemon, and yarrow. The yield was 380 kg/ha ODW. The whole area has been heavily used by horses in the past and all through the burn, near Takhini, ground squirrels are common. The portion along the highway from Mile 935 to Mile 946 has a grazing capability of III-IV. It appears that this area is much drier than the area west of the Takhini bridge.

On a portion of the burn near Mile 959 just north of the Kusawa Lake turnoff, most of the trees had fallen and there was a good growth of forage plants. Slender wheatgrass, northern brome, hairgrass, fowl meadowgrass, rough fescue, and alkali grass along with foxtail barley, fireweed, and yarrow make up the ground cover. Willow and aspen 2-3 m high are found in scattered patches where this is slightly higher available moisture. Yield of palatable vegetation is 370 kg/ha ODW which gives this area a II-III grazing capability. This type extended from the Takhini bridge, Mile 946 to about Mile 960. There are a few small meadows scattered throughout this type and these, for the most part, are solidly hairgrass *(Deschampsia caespitosa)*. It appears that the eastern portion of this burn is probably one of the driest parts of the Yukon.

West Little Atlin Lake: The area west of Little Atlin Lake (sheet 8 of map set) is part of a low area that extends between Marsh Lake and Little Atlin Lake. The soils in this area are developed on fine textured lacustrine deposits. There are several open meadows in this area. The meadows are comprised of natural grasses that are apparently being used for grazing. The trees surrounding these gently sloping meadows are usually aspen with some pine. Near Little Atlin Lake, however, there are good stands of white spruce. The imperfectly drained areas are covered with willow, shrub birch, and some white spruce. The ground cover is fireweed, bearberry, wild strawberry, and the odd grass.

In the valleys next to the stream are broad areas of peaty Gleysols growing willow and shrub birch. Farther upslope there are 200 m wide grassland areas growing a host of true grassland species such as: vanilla grass *(Hierochloe odorata)*, tall bluegrass *(Poa ampla)*, Richardson's needlegrass *(Stipa richardsonii)*, oat grass *(Danthonia intermedia)*, and low fescue *(Festuca brachyphylla)*. The yield of forage on these open grassland meadows is 400 kg/ha which given a grazing capability of III. The grazing capability in the aspen-spruce forest is IV or V. Horses have utilized the area and the wet part has been browsed by moose.

West of Tagish River: The majority of the area west of the Tagish River (sheet 8 of map set) consists of fluvial sands and sandy till, however, there is a relatively low area approximately half a kilometer west of Tagish River that appears to be a mixture of fluvial sands and lacustrine silts. The soil profiles in the area are predominantly Orthic Regosols and Gleyed Orthic Regosols. This is a relatively open area being used for forage production (Fig. 32). This area is producing a stand of native grasses consisting of slender wheat, Kentucky bluegrass *(Poa pratensis)*, Canada bluegrass, foxtail barley, and fowl meadow grass. The yield averages about 2500 kg/ha of dry matter. In 1974, the same area was observed in mid-July at which time the field was producing very limited forage and was very dry.

The vegetation in the better drained areas west of the Tagish River is a mixture of white spruce, lodgepole pine, and aspen. The understory is bearberry, rose, toadflax *(Geocaulon lividum)*, soapberry, and fireweed. There are a few isolated areas of grazing capability V.

10 Mile Ranch Area: This area lies between Nares Mountain and Tagish Lake (sheet 8 of map set). It consists primarily of fluvial deposits of sand and gravel with some coarse-textured glacial till and some low lying areas of silty and clayey lacustrine material. Many of the areas contain bedrock outcrops that will pose a serious handicap to agriculture. There is essentially no grazing in the well drained areas.

Fig 32. An improved meadow near Tagish. This area was producing 2500 kg/ha of hay. Note the cropping pattern and the pocked appearance caused by ground squirrels.

The vegetation on the sandy or gravelly sites is predominantly lodgepole pine although there is some white spruce and aspen in certain locations. The understory is generally quite sparse, usually comprised of a few willows, soapberry, rose, lupine, fireweed, lichen, and moss. Where there is only a thin veneer of sand over till or clay the trees are a mixture of aspen, white spruce, and lodgepole pine. The understory is somewhat denser than that on the sandier sites but is still made up of the same plant types. On finer textured sites there are good stands of white spruce and aspen. The shrubs are usually willow and soapberry while the ground cover consists of bearberry, rose and fireweed. The vegetation on the poorly drained sandy sites is black spruce, willow, Labrador tea, and moss.

On the fine textured Champagne soils with imperfect drainage there are some meadows that are being used for hay and grazing. One such meadow (23-2) was sampled. It contained northern reedgrass, Kentucky bluegrass, slender wheatgrass, foxtail barley, beaked sedge, blue penstemon, arnica, pussytoes, and coltsfoot. Average production of this field was 2138 kg/ha. Forage samples from this hayfield showed remarkably good quality with a C.P. of 10.7% and a P content of 0.24% and a copper content of 5.1 ppm (Table 33).

Other Miscellaneous Areas: The foregoing pages describe some of the areas of the Yukon that appear to show the most potential as range for livestock. In addition there are many more places that are growing sufficient forage to allow for some grazing adjacent to centres of habitation.

The Carmacks Valley has a number of low hills on which the south facing slopes produce almost pure stands of purple reedgrass. In addition there is some grazing potential on the low benches along the floodplain of the Yukon River. Such areas are insufficient to support commercial herds but could provide for a few local horses or cattle. The same may be said of the area around Faro and Ross River. In that location the south facing slopes are more extensive. On steep south facing open slopes erosion could be a hazard, therefore any grazing would have to be undertaken with great care and would have to be strictly controlled.

Such areas as the Klondike Valley are heavily treed by spruce and as such offer little in the way of livestock grazing. At elevations above 1200 m the land becomes sub-alpine lichen-heath which is grazed mainly by migratory caribou.

The area around Kluane and Snag lies in the rain shadow of the St. Elias Mountains. The forest stands consist of white spruce, trembling aspen, and balsam poplar. These stands are relatively open with some grassy opens containing slender wheatgrass, poverty oatgrass, purple reedgrass, and hairgrass. Because of the dryness of the area, neither trees nor herbaceous vegetation are overly productive. This area is able to tolerate some local grazing but the amount would fluctuate greatly from year to year because of the annual variability of rainfall.

The Watson Lake area and Liard Plan consists of low, wooded hills separated by broad, timbered flats. This represents one of the most favourable forest growing areas of the Yukon. White spruce and balsam poplar are found on the alluvial flats while white spruce, lodgepole pine, aspen and white birch occupy the benches above the river floodplain. Fires have favoured the occurrence of lodgepole pine on the terraces. Sedge fens are numerous on the many drainage-ways. Grazeable species are not prevalent as most of the understory consists of ericaceous shrubs and lichens.

Sub Alpine: A number of subalpine locations in the Whitehorse area were observed. These included Montana mountain (south of Carcross), Nares Mountain, Lorne Mountain (at 1100 and 1460 m), and Talley Ho Mountain, as well as the head-waters of Two Horse Creek and the Wheaton River.

On the high areas there is rough fescue, alpine timothy *(Phleum alpinum)*, and alpine bluegrass *(Poa alpina)*, along with alpine willow *(Salix arctica)*, crowberry *(Empetrum nigrum)* wind flower *(Anemone parviflora)*, and heath *(Cassiope tetragonia)*. In addition there is monkshood, yellow dryas *(Dryas drummondii)*, Indian paintbrush *(Castilleja* sp.), blue forget-me-not *(Myosotis alpestris)*, stone crop *(Sedum lanceolatum)*, palmate coltsfoot *(Petasites palmatus)*, along with shrub birch *(Betula glandulosa)*, and in spots, blueberry *(Vacinium uliginosum)*. An area just where the alpine fir *(Abies lasiocarpa)* first appears on Lorne Mountain, rough fescue and purple reedgrass predominate between the tall willow and in the small opens. Forage production is 263 kg/ha ODW. Where the land opens out (Fig. 33), the production from the same species is over 300 kg/ha. On areas of alpine range where willow-heath prevail the palatable species grow in favoured locations only, so production will be much reduced.

Fig. 33. Subalpine range on Lorne Mountain. Alpine fir and lodgepole pine make up the forest cover with rough fescue dominating the open areas.

The best subalpine range was observed at the head of Two-Horse Creek (elevation 1160 m) where the land was open and rough fescue was the dominant species (Fig. 34). A good range was seen on Nares Mountain at 1400 - 1460 m and also on Tally Ho Mountain at 1370 m. On the latter, a great variety of grasses and sedges including Canada reedgrass, were present. These subalpine ranges have ample water, are cool, and there are fewer biting flies than in the valleys. Observation on the above mentioned locations indicated very little use of the forage by any animals other than ground squirrels. On some areas moose browsing was evident but not recent. On Talley Ho Mountain, the creek valleys indicated heavy use by moose on large leaf willow (*Salix glauca*). This particular range had been used a few years previous by cows from Lorne Crossing. The subalpine areas mentioned are all within easy riding distance of settled areas and would provide at least two months of good grazing for those who wished to develop this resource.

Fig. 34. Subalpine rangeland at 1160 m near Alligator Lake. The opens are pure stands of rough fescue.

The soils show little profile development. On Nares Mountain, the soil consists of 8 cm of peaty material over a fl-ls type of material extending down to at least 40 cm. There are stones throughout the soil. The soil temperature at 10 cm on July 24, 1976 was 4.4°C (40°F).

The subapline areas from 1035 - 1460 m in southern Yukon offer a considerable range resource that could be utilized safely by cattle. The forage quality is as good or better than that found in the same species at lower elevation (Table 1. 24-3).

Appendix V

Soil Classification and Mapping

Soil Classification and Mapping

Soil classification serves the purpose of organizing the knowledge of soils so that it can be remembered and communicated, and so that relationships may be seen. These relationships involve those among kinds of soils, among soil properties and environmental factors, and among soil properties and suitabilities of soils for various uses. It is the latter, the relationship between soil properties and suitability of soils for agricultural use which is of prime importance to this study.

The Canadian System of Soil Classification

The Canadian System of Soil Classification (Agriculture Canada, in press) has been utilized to classify the soils of the area. This system is categorical in nature, the categories from the highest to lowest level being termed order, great group, subgroup, family, and series, respectively. There is usually a number of classes at every category in the system.

The classes at the order level are based on soil properties that reflect the nature of the soil environment and the effects of the dominant soil forming process. Brunisolic soils represent the major order of soils in the Yukon but nearly every other class at this level in the Canadian system can be found there.

The classes of soils at the second category, the great group, are formed by subdivision of each order. Thus each great group carries with it the differentiating criteria of the order to which it belongs. In addition, classes at the great group level are based on properties that reflect differences in strengths of dominant processes. At the great group level, two classes of Brunisolic soils are present in the Yukon. Eutric Brunisols are soils with a high base status and Dystric Brunisols are those with a low base status. Neither class has thick Ah horizons, characteristic of classes of Brunisolic soils found in other parts of Canada.

At the subgroup level kinds and arrangements of horizons are considered in differentiating soils within one class at the great group level. Using the Eutric Brunisols great group as an example there are three classes of this soil at the subgroup level. They are: the Orthic Eutric Brunisol, soils which conform to the central concept of the great group; Luvic Eutric Brunisol, soils having a gray colored eluvial horizon; and Gleyed Eutric Brunisol, soils having mottles indicative of gleying. In the system of mapping utilized in the field the subgroup is an extremely important category as it was used as a part of the soil name used in mapping.

The family category of the soil taxonomic system enables differentiation of classes of subgroups on the basis of parent material characteristics such as texture and mineralogy, soil climatic factors, and soil reaction. Criteria at this category enabled the separation of Orthic Eutric Brunisols formed in sandy materials from those in silty or clayey materials.

At the lowest category of the system, the series level, all soils belonging to a series have similar kinds and arrangements of horizons whose color, texture, structure, consistence, thickness, reaction and composition fall within a narrow range. It should be realized that, in the first instance, the series is a category in the taxonomic system. It is thus a conceptual class, as are other classes in the system. The series is used extensively in the field classification of soils. It must be realized that the series used in mapping is a name applied to a real body of soils. It will have some of the properties implied by the taxonomic series name but need not necessarily have the full range of properties described thereof.

Classification of Yukon Soils

The categories of the Canadian system of soil classification has been outlined above. The major classes of each category that occur in the Yukon were mentioned briefly. A comprehensive outline of all classes of soils at the order, great group, and subgroup levels that were mapped in this study are presented below.

Brunisolic Order - well to imperfectly drained soils. Soils formed under forest having brownish colored Bm horizons but lacking significant accumulation of clay, organic matter, and amorphous materials.

Dystric Brunisol Great Group - soils with a low base status (pH usually less than 5.5).

Orthic Dystric Brunisol Subgroup - soils with yellowish brown Bm horizons underlying the leaf litter. They lack an Ae horizon and are not gleyed.

Eluviated Dystric Brunisol Subgroup - soils with a gray colored Ae and a yellowish brown Bm horizon beneath the leaf litter. They are not gleyed.

Gleyed Dystric Brunisol Subgroup - imperfectly drained soils having mottles, indicative of gleying, in addition to the diagnostic properties of the Orthic subgroup.

Eutric Brunisol Great Group - soils with a high base status (pH usually greater than 5.5).

The Orthic, Eluviated and Gleyed Eutric Brunisol great groups have the same differentiating features as those described for the Dystric Brunisol great group.

Chernozemic Order - Well to imperfectly drained soils formed under grassland having surface horizons darkened by the accumulation of organic matter.

Black Great Group - have a surface horizon that has a color value darker than 3.5 when dry and a chroma 1.5 or less when moist indicative of the associated subhumid climate and mesophytic grasses and forbs.

Orthic Black Subgroup - soils with very dark surface horizons, at least 10 cm thick, overlying a brownish colored, prismatic structured Bm horizon and light colored horizons of carbonate accumulation.

Dark Brown Great Group - have a surface horizon that has a color value between 3.5 and 4.5 when dry and a chroma usually greater than 1.5 when dry indicative of mesophytic grasses and forbs in a semi-arid climate.

Orthic Dark Brown Subgroup - has the same diagnostic features as the Orthic Black subgroup.

Cryosolic Order - Soils formed in either mineral or organic materials that have permafrost either within 1 m of the surface, or within 2 m of the surface with disrupted, mixed or broken horizons above it. They have a mean annual temperature below $0^{o}C$.

Static Cryosol Great Group - mineral soils without marked disruption of surface horizons and permafrost within 1 m of the surface. They occur most commonly in coarse textured materials.

Brunisolic Static Cryosol Subgroup - have a thick (greater than 10 cm) brownish colored Bm horizon above or extending into the permafrost.

Regosolic Static Cryosol Subgroup - have a C horizon that is not gleyed and do not have a Bm horizon.

Gleysolic Static Cryosol Subgroup - have a C horizon that is gleyed and do not have a Bm horizon.

Organic Cryosol Great Group - organic soils with permafrost within 1 m of the surface. The organic horizons are greater than 40 cm thick and contain greater than 30% organic matter.

Fibric Organic Cryosol Subgroup - have organic layers thicker than 1 m composed dominantly of fibric material between 40 - 100 cm.

Gleysolic Order - Soils with dull-colored or mottled (gleyed) mineral horizons indicative of periodic or prolonged saturation with water and reducing conditions. They have neither permafrost within 1 m nor disrupted horizons and permafrost within 2 m.

Gleysol Great Group - may have a dark-colored Ah horizon which is very thin (less than 10 cm). They may have a yellowish gray B horizon but such an horizon does not have an accumulation of clay.

Orthic Gleysol Subgroup - have a gleyed B horizon which may be overlain by a thin, dark-colored Ah horizon and organic layers less than 40 cm thick. (When an organic layer is present the soils are classified as Orthic Gleysol, peaty phase).

Rego Gleysol Subgroup - have a gleyed C horizon with or without organic surface layers and thin Ah or B horizons. (When an organic layer is present these soils are classified as Rego Gleysol, peaty phase).

Luvisolic Order - Well to imperfectly drained soils formed under forest having light colored eluvial horizons and illuvial horizons in which silicate clay has accumulated.

Gray Luvisol Great Group - soils with well developed Ae and Bt horizons and having a mean annual temperature less than 8^{o}C. They may have a thin Ah horizon.

Orthic Gray Luvisol Subgroup - soils with well developed Ae and Bt horizons. The Ah horizon, if present, is very thin (less than 5 cm).

Brunisolic Gray Luvisol Subgroup - soils with a brownish colored Bm horizon at least 5 cm thick overlying well developed Ae and Bt horizons.

Gleyed Gray Luvisol Subgroup - soils which closely resemble the Orthic Gray Luvisol except for the presence of distinct mottles indicative of gleying within 50 cm of the mineral surface or prominent mottles at depths from 50 - 100 cm.

Organic Order - Soils composed dominantly of organic materials. They are saturated with water throughout the year. They contain greater than 30% organic matter. They organic layer is usually greater than 60 cm thick if the material is essentially undecomposed and greater than 40 cm thick if a limited amount of decomposition has occurred.

Fibrisol Great Group - organic soils composed dominantly of relatively undecomposed organic material. They are common in peat deposits dominated by Sphagnum mosses.

Regosolic Order - Rapidly to imperfectly drained soils occurring under a wide range of vegetation and climates virtually lacking the development of genetic horizons due to the youthfulness of the material, instability of the material, nature of the material, or climate.

Regosol Great Group - soils with a C horizon which may be overlain by thin (less than 5 cm) Ah or Bm horizons. They may have buried mineral-organic layers, and organic surface layers.

Orthic Regosol Subgroup - well drained soils with a C horizon which may be overlain by thin Ah or Bm horizons. They have relatively uniform colors and low content of organic matter.

Cumulic Regosol Subgroup - well drained soils with layers of darker colored material commonly resulting from intermittent flooding and deposition of material.

Gleyed Regosol Subgroup - soils which closely resemble the Orthic Regosol except for faint to distinct mottles indicative of gleying within 50 cm of the mineral surface.

Gleyed Cumulic Regosol Subgroup - soils which closely resemble the Cumulic Regosol subgroup except for having faint to distinct mottles indicative of gleying within 50 cm of the mineral surface.

Field Mapping System

The foregoing has reviewed the concepts of the Canadian system of soil classification and outlined some of the key criteria for distinguishing the classes of soils in the system that were encountered in the study area. First through classification, and then through the use of soil maps, a knowledge of soils can be applied to specific fields and other tracts of land. To follow, very briefly is an outline of the mapping system utilized in the field and its relationships to the soil taxonomy.

Soils are classified in the field by observing the nature and arrangement of layers or horizons and ascertaining which class at the various levels of the taxonomic system describes the properties apparent in the soil under consideration. Generally it is possible to classify most soils at the series level of the taxonomic system. Most soil surveys name the mapped soil series. Those of a detailed nature often employ the soil series as the principal mapping unit. In reconnaissance surveys, such as this one, the map scale and complexity of series distribution in the landscape often precludes the possibility of making separate delineations for all soil series. Consequently the soil association, a group of series occurring in a close topographic relationship and developed within the same material, is utilized to depict on maps this rather complex distribution of series. Map units of an association provide the mechanism for conveying the relative dominance of the various series within an association.

There are occasions when more than one association is required to describe the soils within a mapped area. Areas where two distinct materials occur in very close association are mapped as association complexes, utilizing two association names to describe the area. Still others are so complex that it would be virtually impossible at the scale of mapping to present all of the associations present. Soil Complexes are established for such areas.

Names for soil associations are usually derived from appropriate towns or sites, rivers or lakes. Geologic features are sometimes used as names for soil complexes. The soil series name is derived from the sub group category of the taxonomic system combined with the soil association name.

In some instances it is impossible or impractical to classify all soils to the series level. Utilization of taxonomic classes at the order and great group level in the field classification is in recognition that either a large number of series were present necessitating considering them as a complex by using a class from one of the upper levels or that due to inaccessibility or relevance of the area to the purpose of the survey it was sufficient to classify soils at only the higher levels.

Appendix VI

Chemical and physical analyses of certain soils in the Yukon.

Laboratory Methods for Soil Analyses

Particle size distribution

The pipette method was used following treatment of samples with HCl and H_2O_2. Sodium hexametophosphate was used for dispersion.

Total nitrogen (N)

The micro-Kjeldahl digeston technique using K_2SO_4, concentrated H_2SO_4 and 10% $CuSO_4$ and selenium as catalysts was employed.

Organic Carbon

The dry combustion method was used for total carbon determination. The organic carbon was determined by subtracting inorganic carbon from total carbon values.

$CaCO_3$ equivalent

Inorganic carbon was determined by boiling the soil in dilute HCl. The CO_2 was absorbed in NaOH towers, precipitated with $BaCl_2$, and the excess NaOH titrated with HCl.

Cation exchange capacity

The soils were saturated with barium ions using 0.5N $BaCl_2$. The barium was replaced by 1N NH_4OH and precipitated as $BaCrO_4$ and weighed.

pH

Soil pH was determined on soil-water pastes utilizing a glass electrode pH meter.

Salinity

The electrical conductivity of extracts from saturated soil-water pastes were measured using a conductivity cell and bridge.

Nitrogen (NO_3-N)

This is a measure of the water soluble NO_3-N in the soil.

Phosphorous (P)

The available phosphorous is extracted with 0.5M $NaHCO_3$.

Potassium (K)

The available potassium is extracted with 0.5M $NaHCO_3$.

Sulfur (S)

The sulfur is extracted with 0.01M $CaCl_2$ and determined colorimetrically.

Analyses of Certain Soils in the Yukon

Klondike Association - Gleyed Cumulic Regosol - Dawson Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-72	Ap	0-17	9.5	.30		5.4	0.3	7.4	28.6	4	10	90	13
76-73	C1	17-34	5.2	.21		5.7	0.3	5.9	24.8	3	10	60	13
76-74	C2	34-50		.21		5.6	0.2	4.9	25.1	2	9	45	10
76-75	IIC	50-80		.08		6.3	0.2	1.9	9.6	3	6	35	5

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			Particle Size Distribution: % of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
75-72							3	9	12	64	23	6	52.5	20.0
76-73								3	3	69	28	10	49.0	17.1
76-74							2	14	16	70	14	4	40.0	10.3
76-75					4	15	29	13	71	22	7	1	12.6	5.0

Analyses of Certain Soils in the Yukon

Two Sisters Association - Degraded Dystric Brunisol - Dawson - McQuesten Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-66	L-H	4-0	26.0	.74		5.4	0.3	9.0	12.5	2	41	205	30
76-67	Ae	0-4	1.5	.06		4.8	0.2	4.0	9.2	2	14	25	4
76-68	Bm1	4-25	0.5	.03		5.1	0.1	2.6	5.8	2	6	15	1
76-69	Bm2	25-50		.03		5.6	0.1	2.9	12.4	2	8	20	1
76-70	BC	50-90		.02		5.9	0.2	2.1	11.8	2	10	25	1
76-71	C	90-120		.02		6.1	0.2	1.7	11.1	2	9	30	1

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			Particle Size Distribution: % of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-66				8	2	3	9	11	33	47	20	11	69.3	51.7
76-67		5	3	3	4	10	26	25	68	28	5	2	13.2	4.6
76-68		3	3	3	3	5	16	22	49	41	10	3	12.9	4.2
76-69		5	3	2	2	3	9	13	29	58	12	3	20.4	7.2
76-70		2	2	2	3	5	13	17	39	50	11	5	18.0	6.1
76-71		3	5	4	4	4	10	20	42	46	12	4	16.6	5.7

Analyses of Certain Soils in the Yukon

Two Sisters Association - Orthic Dystric Brunisol - Dawson - McQuesten Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-61	L-H	5-0	43.0	1.06		5.2	0.4	10.8	28.3	2	58	450	55
76-62	Bm1	0-20	0.7	.03		4.9	0.1	4.1	8.1	2	7	30	1
76-63	Bm2	20-51	0.3	.03		5.1	0.1	4.3	11.3	2	9	25	1
76-64	C	51-70		.03		5.2	0.1	4.2	14.6	2	11	30	1
76-65	IIC	70-100		.02		5.6	0.1	1.9	6.2	2	12	25	1

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-61													94.0	65.4
76-62		4	3	4	4	4	9	23	43	46	11	1	18.4	6.2
76-63		3	1	1	1	1	2	14	19	69	12	2	25.6	7.5
76-64		6	3	6	4	3	5	12	31	53	16	4	23.6	9.3
76-65		35	20	53	18	5	4	2	82	13	4	1	9.6	4.9

Analyses of Certain Soils in the Yukon

Stewart Crossing Association - Orthic Regosol - Stewart Crossing Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-53	Ah	0-15	5.0	.24	2.1	7.3	0.8	1.5	30.4	3	5	30	13
76-54	Ck1	15-35	1.7	.08	5.1	7.7	0.4	.3	10.4	1	3	30	13
76-55	Ck2	35-60		.07	5.5	7.6	0.3	.4	6.8	3	2	35	13

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-53				0	0	0	1	16	17	68	15	3	39.6	15.3
76-54				0	0	0	1	18	19	66	14	1	28.0	8.3
76-55				0	0	0	2	25	27	63	9	3	19.3	5.5

Analyses of Certain Soils in the Yukon

Mayo River Association - Orthic Eutric Brunisol - Mayo Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-43	Bm1	0-11	0.9	0.03	0	6.5	0.2	1.1	3.6	2	7	20	2
76-44	Bm2	11-25	0.9	0.03	0	6.8	0.2	1.1	2.9	2	4	15	2
76-56	Bm3	25-43	0.2	0.02	0	6.9	0.2	0.8	2.1	1	2	10	2
76-56	C1	43-57	0.3	0.02	0	6.9	0.2	0.6	2.0	1	2	10	1
76-47	C2	57-70		0.02	0	7.0	0.2	1.0	1.2	2	1	10	1

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-43				1	6	22	53	12	94	4	2	1	3.9	1.9
76-44				1	4	18	54	18	85	3	1	0	2.8	1.9
76-45				1	5	21	52	17	97	2	1	1	2.0	1.2
76-46				3	4	26	42	13	98	1	1	1	2.1	1.2
76-47				2	3	32	47	6	99	0	1	0	1.3	1.1

Analyses of Certain Soils in the Yukon

McQuesten Association - Orthic Dystric Brunisol - Mayo Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-48	L-H	4-0	35.0	.83	0	4.9	0.4	7.6	13.3	3	60	450	13
76-49	Bm1	0-10	1.5	.06	0	4.8	0.1	5.9	10.4	2	9	40	3
76-50	Bm2	10-20	0.5	.04	0	5.1	0.1	3.2	5.8	2	6	30	1
76-51	IIC1	20-45		.01	0	5.3	0.1	1.8	3.1	2	7	25	1
76-52	IIC2	45-60			0	5.4	0.2	1.1	1.8	2	7	15	1

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-48	0	0	0										95.8	63.2
76-49	1	0	0	1	1	2	5	12	21	68	11	1	30.5	8.9
76-50	5	22	3	4	4	5	13	15	40	50	10	2	19.1	6.2
76-51	37	30	13	30	21	9	14	10	84	10	6	1	7.1	3.6
76-52	31	36	12	34	22	10	13	9	88	9	1	0	5.1	1.9

Analyses of Certain Soils in the Yukon

Dry Creek Association - Orthic Dystric Brunisol - Stewart Crossing

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-56	L-H	5-0											
76-57	Bm1	0-10	0.9	0.05		5.0	0.2	4.6	9.2	2	12	76	4
76-58	Bm2	10-21	0.9	0.04		5.1	0.1	4.5	11.2	2	10	60	1
76-59	Bm3	21-33	0.2	0.03		5.3	0.1	2.4	5.1	2	15	30	1
76-60	C	33-50	0	0.02		5.9	0.2	1.0	3.2	1	8	35	1

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-56														
76-57				1	1	2	7	20	32	58	10	2	19.8	6.1
76-58			2	1	1	1	5	14	23	62	16	5	19.4	7.9
76-59			3	2	2	3	16	31	53	41	6	1	10.4	3.6
76-60		13	16	15	12	8	26	26	87	9	5	1	5.0	2.2

Analyses of Certain Soils in the Yukon

Diamain Lake Association - Orthic Eutric Brunisol - Pelly Crossing Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-76	L-H	5-0	2.9	.69		5.8	0.4	6.0	43.2	2	56	295	30
76-77	Bm1	0-14	1.0	.05		6.1	0.2	2.0	11.9	2	28	65	5
76-78	Bm2	14-34	0.5	.04		6.4	0.2	1.9	11.2	2	23	45	2
76-79	IIB1	34-60	0.7	.03		7.3	0.3	0.7	5.6	2	8	25	2
76-80	IIB2	60-80	0.3	.03		6.5	0.2	1.0	4.6	1	5	25	1

Physical Analyses

Sample Number	Particle Size Distribution												Moisture status %	
	% of total soil			% of <2 mm fraction										
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-76													75.8	53.8
76-77							3	25	28	62	10	3	21.2	6.1
76-78							1	20	21	68	12	5	18.5	5.9
76-79		14	5	6	9	14	34	17	80	15	5	1	5.9	3.2
76-80		4	2	5	14	19	30	14	83	13	4	2	4.9	3.5

Analyses of Certain Soils in the Yukon

Fort Selkirk Association - Orthic Eutric Brunisol - Pelly Crossing Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-88	Ah	0-15	5.0	0.20		6.6	0.3	4.3	30.4	3	18	115	5
76-89	IIBm	15-30	1.4	0.06		6.2	0.2	3.8	19.7	3	16	45	2
76-90	IIC	30-45	0.5	0.03		6.4	0.2	1.3	3.3	4	9	30	1

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			Particle Size Distribution: % of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-88				3	5	3	2	3	16	59	25	7	33.2	19.7
76-89		8	3	9	13	6	5	5	37	43	20	6	19.6	10.1
76-90.		36	53	12	49	26	8	1	96	1	3	1	3.1	2.3

Analyses of Certain Soils in the Yukon

Pelly Crossing Association - Orthic Eutric Brunisol - Pelly Crossing Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-91	L-H	7-0	36.6	1.16		6.8	0.3	4.6	71.6	5	42	335	25
76-92	Bm	0-20		0.10		7.0	0.2	2.7	14.6	1	48	135	7
76-93	Ck	20-77	1.7	0.10	9.2	7.9	0.3	0.3	13.0	2	7	35	5
76-94	IICk	77-100		0.04	5.7	8.3	0.3	0.2	4.7	1	5	30	5
76-95	IIICk	100-120		0.06	5.9	8.2	0.2	0.6	8.0	1	3	35	13

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-91				2			1	12	15	65	20	16	86.1	60.9
76-92							1	10	11	73	16	8	26.7	9.6
76-93							1	15	16	75	9	4	27.8	8.3
76-94					6	9	29	35	79	19	2	0	7.3	3.1
76-95							5	31	36	54	10	2	20.9	5.1

Analyses of Certain Soils in the Yukon

Midway Lodge - Orthic Eutric Brunisol - Carmacks Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-81	L-H	6-0											
76-82	Ash	0-30	1.0	0.03		6.6	0.1	2.1	20.9	2	17	90	5
76-83	Bm1	30-44	0.5	0.03		7.3	0.2	1.3	10.1	1	16	80	4
76-84	Bm2	44-60	0.5	0.03		7.6	0.3	0.9	8.5	2	21	75	4
76-85	Bm3	60-72	0.5	0.03		7.7	0.3	0.8	7.7	2	16	70	4
76-86	IICk	72-92		0.09	18.7	7.9	0.4	0.2	3.4	3	6	40	6
76-87	IIICk	90-110		0.04	9.2	8.0	0.3	0.3	6.2	3	5	50	3

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-81														
76-82					2	8	22	4	36	60	4	1	39.6	12.3
76-83					2	2	11	32	47	45	8	4	14.3	5.2
76-84				1	2	2	8	44	58	39	3	1	12.5	4.2
76-85				1	2	4	15	33	55	42	3	0	9.5	3.8
76-86				1	4	10	25	26	66	31	3	0	23.4	11.5
76-87				3	9	6	20	29	70	29	1	0	8.2	3.8

Analyses of Certain Soils in the Yukon

Lapie River Association - Ross River Area
(Two Ah horizons)

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulf… SO_4-… ppm
76-96	Ah	0-15	4.1	.30		5.2	0.2	7.5	15.2	1	6	35	5
76-97	Ah	0-24	10.1	.53		6.6	0.2	5.0	27.4	4	6	25	7

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			Particle Size Distribution: % of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM
76-96		3	4	16	22	12	13	7	71	24	5	3	15.5	8.0
76-97			3	10	11	7	11	12	51	41	8	1	34.7	17.1

Analyses of Certain Soils in the Yukon

Wye Junction Association - Orthic Dystric Brunisol - Watson Lake Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-101	L-H	3-0											
76-102	Bm1	0-12	1.9	0.07		5.9	0.2	7.1	12.6	1	40	50	5
76-103	Bm2	12-17											
76-104	C	17-40		0.02		5.8	0.1	1.4	3.7	1	8	30	1

Physical Analyses

Sample Number	Particle Size Distribution: % of total soil			% of <2 mm fraction									Moisture status %	
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-101														
76-102		6	3	4	4	3	6	12	29	63	8	2	23.8	7.8
76-103														
76-104		14	9	7	11	9	15	13	55	43	2	1	10.5	3.7

Analyses of Certain Soils in the Yukon

Wye Junction Association - Orthic Dystric Brunisol - Watson Lake Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-120	Bm1	0-10	1.2	0.06		5.5	0.1			1	55	60	1
76-121	Bm2	10-18	.5	0.03		5.4	0.1			1	32	60	1
76-122	IIBm	18-35	.3	0.02		5.3	0.1			1	22	55	1
76-123	IIC	35-60											

Physical Analyses

Sample Number	Particle Size Distribution												Moisture status %	
	% of total soil			% of <2 mm fraction										
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-120		4	2	3	3	2	5	12	25	65	10	3	23.0	7.3
76-121		6	3	3	2	2	6	19	32	60	8	3	17.6	4.6
76-122		2	6	12	10	9	20	13	64	29	7	2	8.9	3.5
76-123														

Analyses of Certain Soils in the Yukon

Watson Lake Association - Orthic Dystric Brunisol - Watson Lake Area

Chemical Analyses

Sample Number	Horizon	Depth cm	Organic Matter %	Total N %	$CaCO_3$ Equiv. %	pH	Salinity mmhos/cm	Extractable Acidity me/100g	CEC me/100g	Nitrogen NO_3-N ppm	Phosphorus P ppm	Postassium K ppm	Sulfur SO_4-S ppm
76-117	Bm1	0-10	1.5	0.06		5.7	0.2			1	37	85	2
76-118	Bm2	10-14											
76-119	BC	14-30		0.01		5.5	0.2			1	13	25	1

Physical Analyses

Sample Number	Particle Size Distribution												Moisture status %	
	% of total soil			% of <2 mm fraction										
	>19 mm	5-19 mm	2-5 mm	1-2 mm	.5-1 mm	.25-.5 mm	.1-.25 mm	.05-.1 mm	Total Sand	Silt	Total Clay	Fine Clay	1/3 ATM.	15 ATM.
76-117		11	15	21	13	6	9	7	57	37	7	2	15.8	5.7
76-118														
76-119	12	32	11	27	35	18	11	2	93	5	2	1	2.7	1.8

Appendix VII

List of Vegetation

LIST OF VEGETATION

Common and Scientific Names

Scientific Name	Common Name
Trees	
Abies lasiocarpa	alpine fir
Betula papyrifera	white (paper) birch
Larix laricina	tamarack
Picea glauca var. *albertiana*	white spruce
Picea glauca var. *porsildii*	white spruce
Picea mariana	black spruce
Pinus contorta var. *latifolia*	lodgepole pine
Populus balsamifera	balsam poplar
Populus tremuloides	trembling aspen
Tall Shrubs	
Alnus crispa	green alder
Alnus incana	river alder
Cornus stolonifera	red osier dogwood
Salix sp.	willow
Salix alaxensis	Alaska willow
Salix arbusculoides	willow
Salix bebbiana	beaked willow
Salix glauca	gray willow
Salix myrtillifolia	low blueberry willow
Salix padophylla	large leaf willow
Salix pulchra	beautiful willow
Salix scouleriana	scoulers willow

Scientific Name	Common Name	
Medium Shrubs		
Betula glandulosa	shrub (bog, dwarf) birch	
Juniperus communis	juniper	
Ledum groenlandicum	Labrador tea	
Ledum decumbens	northern Labrador tea	
Potentilla fruticosa	shrubby cinquefoil	
Ribes glandulosum	skunk current	
Ribes hudsonianum	black current	
Ribes oxycanthoides	wild gooseberry	
Ribes triste	wild red current	
Rosa acicularis	rose	
Rubus strigosus	raspberry	
Salix sp.	willow	
Shepherdia canadensis	buffalo berry, soapberry	
Viburnum edule	highbush cranberry	
Short Shrubs		
Andromeda polifolia	bog rosemary	(P)*
Arctostaphylos rubra	alpine bearberry	
Arctostaphylos uva-ursi	bearberry, kinnikinnick	
Cassiope tetragona	mountain heath	
Empetrum nigrum	crowberry	
Eurotia lanata	winter fat	
Juniperus horizontalis	horizontal (creeping) juniper	
Kalmia polifolia	swamp laurel	

*Plants with known poisonous properties.

Scientific Name	Common Name	
Phyllodoce empetriformis	mountain heather	
Salix arctica	alpine willow	
Vaccinium caespitosum	dwarf blueberry	
Vaccinium uliginosum	blueberry, alpine blueberry	
Vaccinium vitis-idaea	cranberry, lingonberry	
Forbs		
Achillea borealis	yarrow	
Aconitum delphinifolium	monkshood	(P)
Actaea rubra	baneberry	(P)
Anemone multifida	cut-leafed anemone, windflower	(P)
Antennaria rosea	pussytoes	
Aquilegia brevistyla	colombine	
Artemisia alaskana	white sage	
Artemisia frigida	pasture sage, fringed sage	
Arnica frigida	arnica	
Aster spp.	aster	
Astragalus alpinus	milk vetch	
Castilleja spp.	Indian paintbrush	
Chenopodium capitatum	strawberry blite	
Cornus canadensis	bunchberry	
Delphinium glaucum	larkspur	(P)
Dodecateon frigidum	shooting star	
Dryas drummondii	yellow avens	
Dryas punctata	mountain avens	
Echium vulgare	viper's - bugloss	

Scientific Name	Common Name	
Epilobium angustifolium	fireweed	
Epilobium latifolium	mountain willowherb	
Equisetum sp.	horsetail, scouring rush	
Fragaria virginiana	wild strawberry	
Galium boreale	northern bedstraw	
Galium triflorum	sweet-scented bedstraw	
Geocaulon lividum	bastard toadflax	
Gentiana prostrata	blue gentian	
Geum macrophyllum	avens	
Hedysarum mackenzii	hedysarum, purple loments	
Hedysarum alpinum	mountain loments	
Heracleum lanatum	cow parsnip	
Lappula myosotis	blueburr	
Linnaea borealis	twin flower	
Linum lewissi	wild blue flax	
Lupinus articus	lupine	(P)
Mertensia paniculata	bluebell	
Myosotis alpestris	forget-me-not	
Oxytropis sp.	loco-weed	(P)
Oxytropis campestris var. *gracilis*	yellow locoweed	(P)
Oxytropis splendens	purple locoweed	(P)
Parnassia palustris	grass-of-Parnassus	
Pedicularis labradorica	yellow lousewort	
Pedicularis sudetica	purple lousewort	
Penstemon procerus	blue penstemon, beard-tongue	

Scientific Name	Common Name	
Petasites frigidus	arctic coltsfoot	
Petasites palmatus	palmate coltsfoot	
Petasites sagittatus	arrow-leaf coltsfoot	
Plantago canescens	plantain	
Platanthera hyperborea	bog orchis	
Polemonium pulcherrimum	Jacob's ladder	
Polygonum alaskanum	showy knotweed	
Potentilla anserina	silver weed	
Potentilla arguta	white cinquefoil	
Potentilla palustris	marsh cinquefoil	
Pyrola asarifolia	common pink wintergreen	
Pyrola secunda	one-sided wintergreen	
Ranunculus spp.	butter cup	(P)
Rubus articus	dwarf raspberry, trailing raspberry	
Rubus chamaemorus	baked-appleberry, cloudberry	
Rubus pubescens	dewberry	
Salicornia rubra	salicornia	
Saxifraga spp.	saxifrage	
Sedum lanceolatum	stonecrop	
Sedum rosea	roseroot	
Senecio pauperculus	ragwort, groundsel	
Smilacina stellata	false solomon's seal	
Solidago decumbens var. *oreophila*	golden rod	
Taraxacum officinale	dandelion	
Taraxacum alaskanum	alpine dandelion	

Scientific Name	Common Name	
Thalictrum occidentale	meadow rue	
Thalictrum alpinum	alpine rue	
Triglochin maritima	sea side arrowgrass	(P)
Triglochin palustris	small arrowbrass	(P)
Viola sp.	violet	
Zygadenus elegans	white camas	(P)
Graminoids		
Carex sp.	sedge	
Carex aquatilis	water sedge	
Carex atherodes	awned sedge	
Carex rostrata	beaked sedge	
Eriophorum sp.	cotton grass	
Juncus articus	arctic rush	
Juncus balticus	Baltic rush	
Grasses		
Agropyron sp.	wheat grass	
Agropyron trachycaulum var. *novae-angliae*	slender wheatgrass	
Agropyron trachycaulum var. *unilaterale*	bearded wheatgrass	
Agropyron violaceum	beardless wheatgrass	
Agropyron yukonensis	Yukon wheatgrass	
Agrostis scabra	tickle grass	
Alopercurus aequalis	short-awned water foxtail	
Arctagrostis latifolia	polar grass	
Bromus inermus	smooth brome	

Scientific Name	Common Name
Bromus pumpellianus	arctic brome, northern awnless brome
Calamagrostis spp.	reed grass
Calamagrostis inexpansa	northern reed grass
Calamagrostis neglecta	narrow reed grass
Calamagrostis purpurascens	purple reed grass
Danthonia intermedia	timber oat grass, oat grass
Deschampsia caespitosa	tufted hair grass
Elymus innovatus	hairy wildrye
Festuca sp.	fescue
Festuca altaica	rough fescue
Festuca brachyphylla	low fescue
Festuca ovina	sheep fescue
Festuca rubra	red fescue
Festuca saximontana	bunch fescue
Glyceria grandis	mannagrass
Glyceria striata	mannagrass
Hierochloe odcata	sweet grass, vanilla grass
Hordeum jubatum	foxtail barley, wild barley
Koèleria cristata	June grass
Muhlenbergia richardsonis	mat muhly
Phleum alpinum	alpine timothy
Phleum pratense	timothy
Poa sp.	blue grass
Poa alpina	alpine blue grass
Poa ampla	tall blue grass

Scientific Names	Common Names
Poa compressa	Canada blue grass
Poa glauca	blue grass
Poa palustris	fowl meadowgrass
Poa pratensis	Kentucky blue grass
Puccinellia nuttalliana	alkali grass
Stipa richardsonii	Richardson's needle grass
Trisetum spicatum	trisetum
Mosses	
Hylocomium splendens	feather moss
Sphagnum sp.	sphagnum
Lichens	
Cladonia sp.	reindeer moss
Cladonia alpestris	reindeer moss
Cladonia rangiferina	reindeer moss
Peltigera apthosa	leaf lichen
Stereocaulon sp.	

Appendix VIII

Acreage of all Interpretive Classes for all map sheet areas.

They are listed in sequence from Sheet #1 through to Sheet #10.

Area of Capability for Agriculture Classes and Subclasses in the Dawson-Stewart Crossing - Mayo Area

Classes and Subclasses	Dawson Area Sheet #1		Classes and Subclasses	McQuesten-Mayo Area Sheet #2		Total		% of Total Area
	Acres	Hectares		Acres	Hectares	Acres	Hectares	
3M	423	171	3M	5090	2061			
			3M4M	443	180			
			3M5M	724	293			
Class 3	423	171		6257	2534	6680	2705	0.7
4M	1083	439	4M	37204	15067			
			4M5M	4424	1792			
			4M5W	5245	2124			
			4M7R	479	194			
			4MT	197	80			
			4MT5M	611	247			
			4M6M	4279	1733			
Class 4	1083	439		52439	21236	53522	21675	5.9
5CH	71629	29010	5I	1024	415			
5CH5M	6545	2651	5CH	90545	36671			
5CH5W	8536	3457	5CH5W	6846	2773			
5I	3083	1249	5CH5M	6874	2784			
5W	66212	26816	5M	28148	11400			
5W5CH	16291	6587	5M6M	1042	422			
5W3M	18881	7647	5M5W	4106	1663			
5W7TE	428	173	5M4M	1458	590			
5W7I	4105	1663	5M7M	7031	2848			
5W6E	8982	3638	5M5T	4803	1945			
5W7R	399	162	5W	2936	1189			
5M	4506	1825	5W5M	21701	8789			
5M4M	570	231	5W4M	18713	7579			
5M5W	175	71	5W3M	1883	763			
5P	3447	1396						
5TE	1227	497						
Class 5	215016	87081		197110	79831	412126	166912	45.2

Area of Capability for Agriculture Classes and Sub-classes in the Dawson-Stewart Crossing - Mayo Area Con't

Classes and Subclasses	Dawson Area Sheet #1		Classes and Subclasses	McQuesten-Mayo Area Sheet #2		Total		% of Total Area
	Acres	Hectares		Acres	Hectares	Acres	Hectares	
6TE	7894	3197	6M	15934	6453			
6M	11783	4772	6M4M	1402	568			
			6M5W	3038	1230			
			6W	2514	1018			
Class 6	19677	7969		22888	9269	42565	17238	4.7
7TE	48686	19718	7T	90614	36699			
7M	744	301	7TE	1309	530			
7MT	4097	1659	7M	99406	40259			
7T	426	173	7M5M	3568	1404			
			7MT	40759	16507			
			7M5CH	900	365			
			7M4M	1135	460			
			7I	19087	7730			
			7IT	11788	4774			
			7I5W	1456	590			
			7I7T	6035	2444			
Class 7	53953	21851		275957	111762	329910	133613	36.1
Water	38705	15676		29002	11746	67707	27422	7.4
Total	328857	133187		583653	236378	912510	369565	100.0

Sheet #1 (Insert Map)

5M	26314	10657
5ME	3715	1504
Class 5	30029	12161
7I	639	259
Class 7	639	259
Water	15477	6268
Total	46145	18688

Area of Grazing Capability Classes in the Dawson - Stewart Crossing - Mayo Area.

Dawson Area			McQuesten - Mayo Area					
Sheet 1			Sheet 2					
Class	Acres	Hectares	Class	Acres	Hectares	Total Acres	Hectares	% Total Area
III - V III - VII	1139 4570	461 1851	III III - VII	161 2514	65 1018			
Class III	5709	2312		2675	1083	8384	3395	1.0
IV - V IV - VII	6960 3359	2819 1360						
Class IV	10319	4179				10319	4179	1.1
V V - VII V - IV	4393 11140 478	1779 4512 194	V V - VII	21618 31223	8755 12645			
Class V	16011	6485		52841	21400	68852	27885	7.5
VII VII - V	236215 21896	95667 8868	VII VII - V	419730 79397	169991 32156			
Class VII	258111	104535		499127	202147	757238	306682	83.0
Water	38705	15676		29002	11746	67707	27422	7.4
Total	328855	133187		583645	236376	912500	369563	

Sheet #1 (Insert Map)

VII	30667	12320
[illegible]er	[illegible]178	[illegible]3

Dawson-Stewart Crossing-Mayo Area
Crop Suitability

Dawson Area Sheet #1			McQuesten-Mayo Area Sheet #2		
Class	Acres	Hectares	Class	Acres	Hectares
GM	423	171	GM	25308	10250
GDMP	3065	1241	GMP	2823	1143
GDM	4495	1820	GDMP	3430	1389
MGD	3877	1570	GDM	11373	4606
MGP	337	136	F	182886	74069
F	161831	65542	FP	21910	8874
FP	40646	16462	P	23930	9692
P	7894	3197	N	282984	114609
N	67582	27371	Water	29002	11746
Water	38705	15676	Total	583646	236378
Total	328855	133186			

Sheet #1 (Insert Map)

F	30029	12162
N	639	258
Water	15477	6268
Total	46145	18688

Dawson-Stewart Crossing-Mayo Area
Suitability for Irrigation

Dawson Area Sheet #1

Class	Acres	Hectares
F-T	3344	1354
F-G	13236	5361
P-G	4480	1814
P-T	15570	6306
VP-W	105336	42661
VP-T	143706	58201
VP-TG	4097	1659
VP-G	381	154
Water	38705	15676
Total	328855	133186

Sheet #1 (Insert Map)

Class	Acres	Hectares
P-G	15546	6296
VP-T	15122	6124
Water	15477	6268
Total	46145	18688

McQuesten-Mayo Area Sheet #2

Class	Acres	Hectares
E	982	398
F-T	68057	27563
F-G	26944	10912
F-T+VP-T	479	194
F-T+VP-G	4424	1792
P-G	93323	37796
P-W	527	213
P-G+F-T	4783	1937
P-G+F-G	1135	460
P-G+VP-G	2317	938
P-G+VP-W	4279	1733
VP-W	23566	9544
VP-T	292961	118649
VP-G	29465	11933
VP-G+F-T	1402	568
Water	29002	11746

Total	583646	236376

Dawson-Stewart Crossing-Mayo Area
Suitability as a Source of Topsoil

Dawson Area Sheet #1		
Class	Acres	Hectares
E	15589	6314
F-W	19311	7821
F-S	21399	8667
F-G	66924	27104
P-W	103578	41949
P-T	58557	23716
P-G	4224	1711
P-S	570	231
Water	38705	15676
Total	328857	133189

Sheet #1 (Insert Map)		
P-S	10439	4228
P-W	20229	8192
Water	15477	6268
Total	46145	18688

McQuesten-Mayo Area Sheet #2		
Class	Acres	Hectares
E	123026	49826
F-SG	34843	14111
F-S	8363	3387
F-R	7338	2972
P-W	87136	35290
P-SG	11594	4696
P-T	86360	34976
P-G	85653	34689
P-GT	29331	11879
P-S	59581	24130
P-ST	17928	7261
P-SGT	3492	1414
Water	29002	11746
Total	583647	236377

Dawson-Stewart Crossing-Mayo Area
Surface Texture

Dawson Area Sheet #1			McQuesten-Mayo Area Sheet #2		
Class	Acres	Hectares	Class	Acres	Hectares
SI	85244	34524	SI	62216	25197
SI+O	3316	1343	SI+G	2195	889
L	7306	2959	SI+U	479	194
SL	37453	15168	L	63662	25783
SL+O	9390	3803	SL	47965	19426
S	127	51	SL+O	9582	3881
G	47732	19331	SL+G	1042	422
G+O	255	103	SL+SI	7548	3057
O	44065	17846	SL+S	4890	1980
O+S	4570	1851	S	85652	34688
O+SL	14287	5786	S+SI	1135	460
O+U	15451	6258	S+G	3038	1230
V	4533	1836	G	50709	20537
U	14922	6043	G+S	19505	7900
U+O	1503	609	G+SI	1402	568
Water	38705	15676	U	146239	59227
Total	328859	133187	V	47386	19191
			Water	29002	11746
			Total	583647	236377

Sheet #1 (Insert Map)

S	10439	4228
O+U	19590	7934
V	639	259
Water	15477	6268
Total	46145	18688

Dawson-Stewart Crossing-Mayo Area
Subsoil Texture

Dawson Area Sheet #1

Class	Acres	Hectares
SL	51386	20811
L	66669	27001
S	52177	21132
G	72802	29485
U	42585	17247
V	4533	1836
Water	38705	15676
Total	328857	133188

Sheet #1 (Insert Map)

Class	Acres	Hectares
S	30029	12162
V	639	258
Water	15477	6268
Total	46145	18688

McQuesten-Mayo Area Sheet #2

Class	Acres	Hectares
SI	2668	1081
SI+G	6874	2784
L	93592	37905
L+S	13200	5346
SL	230	93
S	131661	53323
S+L	5704	2310
S+G	36695	14861
G	128835	52178
G+S	20115	8147
G+U	479	194
G+SL	1142	463
U	74062	29995
V	39389	15953
Water	29002	11746
Total	583648	236379

Dawson-Stewart Crossing-Mayo Area
Soil Drainage and Permafrost

Dawson Area Sheet #1

Class	Acres	Hectares
D	82912	33579
D+M	77152	31247
D+W	13268	5374
M	4389	1778
M+WF	7263	2942
W	3083	1249
WF	78672	31862
W+D	23414	9483
Water	38705	15676
Total	328858	133190

Sheet #1 (Insert Map)

Class	Acres	Hectares
D	10439	4228
WF+D	19590	7934
W+D	639	258
Water	15477	6268
Total	46145	18688

McQuesten-Mayo Area Sheet #2

Class	Acres	Hectares
D	270978	109746
D+M	60461	24487
D+W	75172	30445
D+W+WF	6729	2725
D+M+W	49364	19992
D+W+M	4803	1945
W	1024	415
WF	2936	1189
WF+M	6646	2692
WF+W	2514	1018
W+D	74016	29976
Water	29002	11746
Total	583645	236376

Dawson-Stewart Crossing-Mayo Area
Suitability as a Source of Sand or Gravel

Dawson Area Sheet #1			McQuesten-Mayo Area Sheet #2		
Class	Acres	Hectares	Class	Acres	Hectares
E-G	127	51	E-G	138444	56070
E-S	12338	4997	E-GS	20115	8147
E-SG	52607	21306	E-G+P	479	194
F-S	87966	35626	E-S	120965	48991
P	137112	55530	E-S+P	5704	2310
Water	38705	15676	E-SG	32575	13193
Total	328855	133186	F-S	10697	4332
			F-SG	4121	1669
Sheet 1 (Insert Map)			P+E-S	13200	5346
			P	208345	84380
E-S	30029	12162	Water	29002	11746
P	639	258	Total	583647	236378
Water	15477	6268			
Total	46145	18688			

Dawson-Stewart Crossing-Mayo Area
Suitability for Area Type Landfills

Dawson Area Sheet #1			McQuesten-Mayo Area Sheet #2		
Class	Acres	Hectares	Class	Acres	Hectares
E	69454	28129	E	33884	13723
E+P-W	8996	3643	F-P	97680	39560
F-W	26318	10659	F-PT	12299	4981
F-P	7746	3137	F-I	6916	2801
F-T	685	277	P-W	39189	15871
P-I	7616	3084	P-P	248759	100747
P-WT	2874	1164	P-T	55443	22454
P-W	89010	36049	P-PT	22110	8955
P-T	14922	6043	P-I	38365	15538
P-P	16350	6622	Water	29002	11746
P-TP	27664	11204	Total	583647	236376
P-PT	18519	7500			
Water	38705	15676			
Total	328859	133187			

Sheet #1 (Insert Map)

P-P	10439	4228
P-W	19590	7934
P-I	639	258
Water	15477	6268
Total	46145	18688

Dawson-Stewart Crossing-Mayo Area
Suitability for Road Construction

Dawson Area Sheet #1			McQuesten-Mayo Area Sheet #2		
Class	Acres	Hectares	Class	Acres	Hectares
E	13668	5536	E	161601	65448
F-W	11140	4512	F	479	194
F-M	47137	19090	F-T	102043	41327
F-T	21509	8711	F-MT	55300	22397
F-MT	19533	7911	F-M	6614	2679
P-WI	7616	3084	F-I	6916	2801
P-WF	72413	29327	F-R	7338	2972
P-T	29666	12015	P-I	7059	2859
P-W	38351	15532	P-S	1304	528
P-TF	27664	11204	P-W	45233	18319
P-ST	394	160	P-T	125914	50995
P-S	1062	430	P-IT	32330	13094
Water	38705	15676	P-F	2514	1018
Total	328858	133188	Water	29002	11746
			Total	583647	236377

Sheet #1 (Insert Map)

E	10439	4228
P-W	20229	8192
Water	15477	6268
Total	46144	18688

Dawson-Stewart Crossing-Mayo Area
Surficial Material and Topography

Dawson Area Sheet #1		
Class	Acres	Hectares
A1	42016	17016
A1+U4	428	173
C2	426	173
C3+R4	27238	11031
F1	74634	30227
F2	43674	17688
F+R2	399	162
M1	21820	8837
M2	44850	18164
U2	9121	3694
U3	6685	2707
U4	18860	7638
Water	38705	15676
Total	328856	133186

Sheet #1 (Insert Map)		
A2	639	258
F1	15546	6296
F2	14483	5866
Water	15477	6268
Total	46145	18688

McQuesten-Mayo Area Sheet #2		
Class	Acres	Hectares
A1	91569	37085
A1+U2	13068	5292
A1+U3	4754	1925
A+E/F1	4783	1937
A+F1	4279	1733
C3+R4	52845	21402
C+R4	2598	1052
E/F1	20988	8500
E/F+F1	12340	4998
E/F+F3	921	373
E/F+F2	611	247
E/F1+R2	479	194
E/F2	426	173
F1	78355	31734
F2	76102	30821
F3	49600	20088
F+E/F2	2600	1053
F+E/F1	4759	1927
F+E/F3	1151	466
F+M2	5704	2310
L1	1304	528
M1	36645	14841
M2	51003	20656
M+F2	6846	2773
M3+F2	6355	2574
M3	5944	2407
U2	1309	530
U3	1457	590
U4	15853	6420
Water	29002	11746
Total	583650	236375

Acreage of Capability for Agriculture Classes and Subclasses in the Pelly Crossing - Carmacks Area.

Classes and Subclasses	Pelly Crossing Area Sheet #3		Carmacks Area Sheet #4			Total		% of Total Area
	Acres	Hectares	Class	Acres	Hectares	Acres	Hectares	
3M	12886	5219	3M	5378	2178			
Class 3	12886	5219		5378	2178	18264	7397	2.6
4M	28362	11487	4M	10306	4174			
4M 5M	7884	3193	4M 5M	1686	683			
			4M 7M	740	300			
			4M 5TM	1226	496			
Class 4	36246	14680		13958	5653	50204	20333	7.3
5M	25726	10419	5M	18367	7439			
5T	91587	37093	5T	1285	520			
5CH	134875	54624	5TM	5432	2200			
5MT	9570	3876	5T 7T	1305	529			
5TE	11526	4668	5CH 5W	11207	4538			
5TM	554	224	5M 3M	321	130			
5M 4CH	2901	1775	5M 4M	442	179			
5M 4M	1374	556	5M 6M	3759	1522			
5T 7R	6943	2812	5M 7M	1176	476			
5T 6T	855	346						
5T 7T	22585	9151						
5T 5W	3070	1243						
Class 5	311576	126188		43294	17533	354870	143721	51.6
6I	2182	884	6M	6352	2473			
6M	7860	3183	6T	587	238			
6T	789	319	6I 5W	1169	473			
6MT	131	53	6T 7R	1627	659			
6TE	1394	565	6M 5M	13167	5333			
			6TM 5T	7030	2847			
Class 6	12356	5004		29932	12123	42288	17127	6.1
7I	7011	2839	7M	30012	12155			
7M	5430	2199	7T	11854	4801			
7R	5056	2060	7TM	7340	2973			
7T	7654	3100	7I 5W	12633	5116			
7IT	1946	788	7T 7R	5180	2098			
7MT	10632	4306	7M 5M	7432	3010			
7TE	34737	14068	7M 6M	1209	490			
7M 5M	772	313						
7M 7R	2093	848						
7R 7TE	2516	1019						

Class and Subclasses	Pelly Crossing Area Sheet #3 Acres	Hectares	Carmacks Area Sheet #4 Class	Acres	Hectares	Total Acres	Hectares	% of Total Area
7T 7R	3675	1488						
7T 5W	9925	4020						
Class 7	91477	37048		75660	30643	167137	67691	24.3
Water	38203	15472		17259	5990	55462	22462	8.1
TOTALS	502744	203611		185481	75120	688225	278731	100.0

Acreage of Grazing Classes in the Pelly Crossing - Carmacks Area.

Pelly Crossing Area Sheet #3 Class	Acres	Hectares	Carmacks Area Sheet #4 Class	Acres	Hectares	Total Acres	Hectares	% of Total Area
3	526	213						
Class 3	526	213				526	213	0.1
4	10463	4238	4-7	11207	4539			
4-7	1875	759						
Class 4	12338	4997		11207	4539	23545	9536	3.4
5	68279	27653	5	27838	11275			
5-6	15159	6139	5-6	2482	1005			
5-7	37579	15219	5-7	7065	2861			
Class 5	121017	49011		37385	15141	158402	64152	23.0
6	10644	4311	6	2590	1049			
6-4	789	320.	6-5	7030	2847			
6-5	131	53						
6-7	987	400						
Class 6	12551	5084		9620	3896	22171	8980	3.2
7	288410	116806	7	98607	39936			
7-4	2087	845	7-5	11403	4618			
7-5	27612	11183						
Class 7	318109	128834		110010	44554	428119	173388	62.2
Water	38203	15472		17259	6990	55462	22462	8.1
Totals	502744	203611		185481	75120	688225	278731	100.0

PELLY CROSSING - CARMACKS AREA

Crop Suitability

Pelly Crossing Area Sheet #3			Carmacks Area Sheet #4		
Class	Acres	Hectares	Class	Acres	Hectares
MG	3600	1458	MG	5589	2264
MGP	5392	2184	GM	8435	3416
GM	14964	6060	GMP	1660	672
GMP	11910	4824	F	18202	7372
GDMP	63506	25720	FP	22860	9258
GDM	55660	22542	P	33691	13645
FP	32714	13249	N	77785	31503
F	121061	49030	Water	17259	6990
P	20566	8329			
N	135168	54743	Totals	185481	75120
Water	38203	15472			
Totals	502744	203611			

PELLY CROSSING - CARMACKS AREA

Suitability for Irrigation

Pelly Crossing Area Sheet #3			Carmacks Area Sheet #4		
Class	Acres	Hectares	Class	Acres	Hectares
E	1219	494	E	3706	1501
Class E	1219	494	Class E	3706	1501
F-T	69774	28258	F-T	11135	4510
F-G	235	95	F-G	926	375
Class F	70009	28353	Class F	12061	4885
P-T	19439	7873	P-T	101	41
P-G	11915	4826	P-G	15331	6209
Class P	31354	12699	Class P	15432	6250
VP-T	331514	134263	VP-T	118242	47888
VP-G	30445	12330	VP-G	18781	7606
Class VP	361959	146593	Class VP	137023	55494
Water	38203	15472	Water	17259	6990
Totals	502744	203611	Totals	185481	75120

Pelly Crossing - Carmacks Area

Surface Texture

Pelly Crossing Area Sheet #3			Carmack Area Sheet #4		
Class	Acres	Hectares	Class	Acres	Hectares
SI	229193	92823	SI	12693	5141
SL	137715	55775	S	71408	28920
S	38222	15480	G	8887	3599
G	736	298	V	13975	5660
V	11139	4511	U	14779	5985
U	47404	19199	SL	11097	4494
S+SI	132	53	SI+O	11208	4539
Water	38203	15472	SI+SL	2530	1025
Total	502744	203611	SI+S	740	300
			SL+S	516	209
			S+SI	7472	3026
			S+SL	1870	757
			S+G	3758	1522
			G+S	6657	2696
			U+S	632	256
			Water	17259	6990
			Total	185481	75120

PELLY CROSSING - CARMACKS AREA

Subsoil Texture

Pelly Crossing Area Sheet #3		
Class	Acres	Hectares
C	6394	2590
L	245333	99360
S	40453	16383
G	34443	13949
V	11139	4511
U	47404	19199
L+S	7971	3228
L+G	5313	2152
L+U	18273	7401
S+L	12210	4945
S+G	3643	1475
G+L	10337	4186
G+S	19535	7912
G+U	2093	848
Water	38203	15472
Totals	502744	203611

Carmacks Area Sheet #4		
Class	Acres	Hectares
L	15114	6121
SI	11207	4539
S	28144	11398
G	51626	20909
V	13975	5660
U	14779	5985
L+G	740	300
S+G	7373	2986
G+L	7030	2847
G+S	17602	7129
U+G	632	256
Water	17259	6990
Totals	185481	75120

PELLY CROSSING - CARMACKS AREA

Soil Drainage and Permafrost

Pelly Crossing Area Sheet #3			Carmacks Area Sheet #4		
Class	Acres	Hectares	Class	Acres	Hectares
D	360119	145849	D	137715	55774
D+M	48438	19617	D+M	5325	2157
D+W	44845	18162	D+W+WF	11207	4539
W+D	11139	4511	W+D	13975	5660
Water	38203	15472	Water	17259	6990
Totals	502744	203611	Totals	185481	75120

PELLY CROSSING - CARMACKS AREA

Suitability as a Source of Topsoil

Pelly Crossing Area Sheet #3			Carmacks Area Sheet #4		
Class	Acres	Hectares	Class	Acres	Hectares
E	106392	43089	E	16570	6711
Class E	106392	43089	Class E	16570	6711
F	4553	1844	F-S	5677	2299
F-S	11960	4844	Class F	5677	2299
F-G	61230	24798	P-G	1737	704
F-T	38411	15556	P-S	74573	30202
F-SG	1464	593	P-T	29913	12115
F-TG	3268	1324	P-W	25182	10199
Class F	120886	48959	P-GS	7000	2835
P	55	22	P-GT	1690	684
P-S	18378	7443	P-SG	5880	2381
P-G	21293	8624	Class P	145975	59120
P-R	5087	2060	Water	17259	6990
P-T	181311	73431	Totals	185481	75120
P-W	11139	4511			
Class P	237263	96091			
Water	38203	15472			
Totals	502744	203611			

PELLY CROSSING - CARMACKS AREA

Suitability as a Source of Sand or Gravel

Pelly Crossing Area Sheet #3			Carmacks Area Sheet #4		
Class	Acres	Hectares	Class	Acres	Hectares
E-G	32557	13186	E-G	48640	19699
E-S	34786	14089	E-S	27787	11254
E-GS	11527	4668	E-GS	20774	8414
E-SG	22495	9110	E-SG	7544	3055
E-S+P	6174	2500	E-G+P	7030	2847
Class E	107539	43553	Class E	111775	45269
F-S	9020	3653	P	55075	22305
Class F	9020	3653	P+E-G	1372	556
			Class P	56447	22861
P	340011	137705			
P+F-S	7971	3228	Water	17259	6990
Class P	347982	140933			
Water	38203	15472	Totals	185481	75120
Totals	502744	203611			

PELLY CROSSING - CARMACKS AREA

Suitability for Road Construction

Pelly Crossing Area Sheet #3

Class	Acres	Hectares
E	91363	37002
Class E	91363	37002
F	750	304
F-T	124148	50290
F-S	16668	6751
F-M	33682	13641
Class F	175247	70986
P-T	186792	75650
P-IT	11139	4511
Class P	197931	80161
Water	38203	15472
Totals	502744	203611

Carmacks Area Sheet #4

Class	Acres	Hectares
E	48601	19683
Class E	48601	19683
F-T	36434	14756
F-SF	11207	4539
Class F	47641	19295
P-T	58178	23562
P-I	13802	5590
Class P	71980	29152
Water	17259	6990
Totals	185481	75120

PELLY CROSSING - CARMACKS AREA

Suitability for Area Type Landfills

Pelly Crossing Area Sheet #3

Class	Acres	Hectares
E	123018	49822
Class E	123018	49822
F-P	40499	16402
F-T	147230	59628
F-PT	212	86
Class F	187941	76116
P-I	11139	4511
P-P	73196	29645
P-T	66596	26971
P-PT	2651	1074
Class P	153382	62201
Water	38203	15472
Totals	502744	203611

Carmacks Area Sheet #4

Class	Acres	Hectares
F-P	15840	6415
F-PT	11400	4617
Class F	27240	11032
P-I	25182	10199
P-P	86432	35005
P-T	26102	10571
P-PT	3266	1323
Class P	140982	57098
Water	17259	6990
Totals	185481	75120

Pelly Crossing-Carmacks Area
Surficial Material and Topography

Pelly Crossing Area
Sheet #3

Classes	Acres	Hectares
A1	26676	10804
A1+U2	1946	788
E/M3+R4	10074	4080
E/M2+M3	41963	16995
E/M2	60314	24427
E/M3	1975	800
E/M1	28865	11690
E/M+M2	3070	1243
E/M2+R3	544	220
E/M+F2	9017	3652
E/M+M3	1908	773
E/M1+M2	3268	1324
E/F1	12574	5092
E/F+F2	1503	609
E/F+F1	8247	3340
E/M3+M4	1463	593
F1	40294	16319
F2	8188	3316
F3	1216	492
F+E/F1	2415	978
F3+E/M2	5123	2075
F2+E/M1	2901	1175
F+E/M2	1005	407
F1+M2	1635	662
F+M1	1545	626
F2+R4	2093	848
F3+M2	10206	4133
F4+E/M2	132	53
M1	9531	3860
M2	50243	20348
M3	9138	3701
M3+R4	4894	1982
M3+E/M2	13765	5575
M3+U4	2761	1118
M+E/M2	18737	7588
M+E/M1	12602	5104
M+E/F2	5313	2152
R3	61	25
R4	5025	2035
R+U4	2517	1019
U2	3671	1487
U3	12032	4873
U4	19804	8021
U+R4	4048	1639
U3+R4	246	100
Water	38203	15472
Total	502751	203613

Pelly Crossing-Carmacks Area
Surficial Material and Topography

Classes	Carmacks Area Sheet #4 Acres	Hectares
A1	22002	8911
A3	173	70
E/M1	3814	1545
E/M2	1285	520
E/M+F2	740	300
E/M2+M3	1305	529
E/M+M2	1226	497
E/F+F2	1686	683
E/F1	1710	693
F1	35512	14382
F2	26736	10828
F3	24641	9980
F4	6262	2536
F4+E/M2	7030	2847
L+F2	11207	4539
M2	3820	1547
M3	3025	1225
M4	639	259
U2	1184	480
U3	3266	1323
U4	10330	4184
U+F4	633	256
Water	17259	6990
	185485	75324

Acreage of Capability for Agriculture Classes and Subclasses in the Faro - Ross River Area.

Class	Faro Area			Ross River Area					
	Sheet #5		% of Total	Sheet #6		% of Total	Total		% of Total Area
	Acres	Hectares		Acres	Hectares		Acres	Hectares	
4M	1180	478	0.9	409	166	0.3	1589	644	0.6
Class 4	1180	478	0.9	409	166	0.3	1589	644	0.6
5M	12723	5152	9.7	13948	5649	9.5	26671	10801	9.6
5M 5W	17541	7104	13.3				17541	7104	6.3
5T	8233	3334	6.3	479	194	0.3	8712	3528	3.1
5CH	71	29	0.1	22271	9020	15.2	22342	9049	8.1
5W 6P	3188	1291	2.4				3188	1291	1.2
5M 6M	342	139	0.3				342	139	0.1
Class 5	42098	17049	32.1	36698	14863	25.0	78796	31912	28.4
6M	10013	4055	7.6	54054	21892	36.9	64067	25947	23.1
6MT	6708	2717	5.1				6708	2717	2.4
6T	44802	18145	34.1	998	404	0.7	45800	18549	16.5
6TE				965	391	0.7	965	391	0.3
6TM				7357	2979	5.0	7357	2979	2.6
6T 7R	7065	2861	5.4	34051	13791	23.2	41116	16652	14.8
Class 6	68588	27778	52.2	97425	39457	66.5	166013	67235	59.7
7M	1712	693	1.3	2004	812	1.3	3715	1505	1.3
7R	11719	4746	8.9				11719	4746	4.2
7T	1517	615	1.2	9808	3972	6.7	11325	4587	4.1
7TE	4497	1821	3.4	269	109	0.2	4766	1930	1.7
Class 7	19445	7875	14.8	12081	4893	8.2	31526	12768	11.3
Totals	131311	53180	100.0	146613	59379	100.0	277924	112559	100.0

Acreage of Grazing Classes in the Faro - Ross River Area.

Class	Faro Area			Ross River Area					
	Sheet #5		% of Total	Sheet #6		% of Total	Total		% of Total Area
	Acres	Hectares		Acres	Hectares		Acres	Hectares	
5	4481	1815	3.4	9526	3858	6.5	14007	5673	5.0
5-7	11791	4775	9.0	26807	10857	18.3	38598	15632	13.9
5-3-7				2913	1180	2.0	2913	1180	1.1
Class 5	16272	6590	12.4	39246	15895	26.8	55518	22485	20.0
7	21428	8678	16.3	34352	13913	23.4	55780	22591	20.1
7-5	93611	37912	71.3	73015	29571	49.8	166626	67483	59.9
Class 7	115039	46590	87.6	107367	43484	73.2	222406	90074	80.0
Totals	131311	53180	100.0	146613	59379	100.0	277924	112559	100.0

CROP SUITABILITY

FARO AREA

Class	Sheet #5 Acres	Hectares
GDM	14864	6020
GDMP	1180	478
F	22449	9092
FP	11249	4556
P	3048	1234
N	78520	31800
Water	11809	4783
Totals	143119	57963

ROSS RIVER AREA

Class	Sheet #6 Acres	Hectares
F	46096	18669
FP	8531	3455
P	30715	12440
N	61271	24815
Water	9825	3979
Totals	156438	63358

SUITABILITY FOR IRRIGATION

FARO AREA

Class	Sheet #5 Acres	Hectares
F-G	1180	478
Class F	1180	478
P-G	19370	7845
Class P	19370	7845
VP-G	21009	8508
VP-T	86563	35058
VP-W	3188	1291
Class VP	110760	44857
Water	11809	4783
Totals	143119	57963

ROSS RIVER AREA

Class	Sheet #6 Acres	Hectares
P-G	14357	5815
Class P	14357	5815
VP-G	34624	14023
VP-T	97632	39541
Class VP	132256	53564
Water	9825	3979
Totals	156438	63358

Surface Texture

Faro Area Sheet #5			Ross River Area Sheet #6		
Class	Acres	Hectares	Class	Acres	Hectares
SL+O	83	34	L	43723	17708
L	55839	22615	SL	39029	15807
SL	9582	3881	SL+O	10900	4415
S	12459	5046	S	2216	897
S+O	23865	9665	S+O	8354	3383
G	13267	5373	G	40541	16419
U	4497	1821	G+O	615	249
U+SL	11719	4746	U	269	109
Water	11809	4783	V	965	391
Total	143120	57964	Water	9825	3979
			Total	155437	63357

Subsoil Texture

Faro Area Sheet #5			Ross River Area Sheet #6		
Class	Acres	Hectares	Class	Acres	Hectares
L	44957	18208	L	43723	17708
L+G	8233	3334	SL	49594	20086
L+U	6981	2827	S	10906	4417
S	20208	8184	G	41156	16668
S+G	8798	3563	V	965	391
G	25918	10497	U	269	109
U	4496	1821	Water	9825	3979
U+L	11719	4746	Total	156438	63358
Water	11809	4783			
Total	143119	57963			

SUITABILITY AS A SOURCE OF TOPSOIL

FARO AREA

Class	Sheet #5 Acres	Sheet #5 Hectares
E	2881	1167
Class E	2881	1167
F-G	71	29
F-S	23349	9456
Class F	23420	9485
P-G	15118	6123
P-GR	2050	830
P-S	6915	2801
P-SG	4840	1960
P-ST	3908	1583
P-T	49299	19966
P-TR	18784	7607
P-TS	907	367
P-W	3188	1291
Class P	105009	42528
Water	11809	4783
Totals	143119	57963

ROSS RIVER AREA

Class	Sheet #6 Acres	Sheet #6 Hectares
E	11327	4587
Class E	11327	4587
F-R	8531	3455
F-S	15431	6250
Class F	23962	9705
P-G	41156	16668
P-RT	3027	1226
P-S	10905	4417
P-T	44478	18014
P-TG	1045	423
P-TR	10713	4339
Class P	111324	45087
Water	9825	3979
Totals	156438	63358

SOIL DRAINAGE AND PERMAFROST

FARO AREA

Class	Sheet #5 Acres	Sheet #5 Hectares
D	102221	41399
D&M	2750	1114
D&WF	5610	2272
M&WF	17541	7104
WF	3188	1291
Water	11809	4783
Totals	143119	57963

ROSS RIVER AREA

Class	Sheet #6 Acres	Sheet #6 Hectares
D	84728	34315
D&W	40288	16317
D&WF	8970	3633
M&WF	11662	4723
W&D	965	391
Water	9825	3979
Totals	156438	63358

SUITABILITY AS A SOURCE OF SAND OR GRAVEL

FARO AREA

Class	Sheet #5 Acres	Sheet #5 Hectares
E-G	66388	26887
E-S	5610	2272
Class E	71998	29159
F-G	7520	3046
F-SG	20208	8184
Class F	27728	11230
P	31584	12791
Class P	31584	12791
Water	11809	4783
Totals	143119	57963

ROSS RIVER AREA

Class	Sheet #6 Acres	Sheet #6 Hectares
E-G	71030	28767
E-SG	7357	2980
Class E	78387	31747
F-GS	998	404
Class F	998	404
P	67228	27228
Class P	67228	27228
Water	9825	3979
Totals	156438	63358

SUITABILITY FOR ROAD CONSTRUCTION

FARO AREA

Class	Sheet #5 Acres	Sheet #5 Hectares
E	22368	9059
Class E	22368	9059
F	4332	1755
F-T	11493	4655
F-W	17541	7104
F-F	1359	550
F-TF	2391	968
Class F	37116	15032
P-WF	3188	1291
P-T	66779	27045
P-TF	1517	614
P-F	342	139
Class P	71826	29089
Water	11809	4783
Totals	143119	57963

ROSS RIVER AREA

Class	Sheet #6 Acres	Sheet #6 Hectares
E	29594	11986
	29594	11986
F-T	50865	20600
F-WF	11661	4723
Class F	62526	25323
P-T	44558	18046
P-TF	9935	4024
Class P	54493	22070
Water	9825	3979
Totals	156438	63358

SUITABILITY FOR AREA TYPE LANDFILLS

FARO AREA

Class	Sheet #5 Acres	Sheet #5 Hectares
E	71	29
Class E	71	29
P-P	30804	12476
P-TP	24284	9835
P-T	52032	21073
P-PT	6578	2664
P-W	17541	7104
Class P	131239	53152
Water	11809	4782
Totals	143119	57963

ROSS RIVER AREA

Class	Sheet #6 Acres	Sheet #6 Hectares
F-PT	43723	17708
Class F	43723	17708
P-PT	3417	1384
P-PW	38210	15475
P-PTW	13740	5565
P-T	269	109
P-P	37319	15114
P-I	965	391
P-TP	8970	3633
Class P	102890	41671
Water	9825	3979
Totals	156438	63358

Surficial Material and Topography
Faro-Ross River Area

	Faro Area Sheet #5			Ross River Area Sheet #6	
Classes	Acres	Hectares	Classes	Acres	Hectares
A1	23396	9475	A1	13878	5621
F1	20043	8117	A3	965	391
F2	4619	1871	F1	27378	11088
F3	3997	1619	F2	34075	13800
F4	819	332	F3	4054	1642
F3+R4	2050	830	M2	22750	9214
M2	71	29	M4	9193	3723
M4	40470	16390	M2+R4	12052	4881
M+F2	8233	3334	M+R4	22000	8910
M+R4	7065	2861	U4	269	109
M3+F2	4332	1754	Water	9825	3979
R4+M3	11719	4746	Total	156439	63358
U4	251	102			
U+R4	4246	1720			
Water	11809	4783			
Total	143120	57963			

Area of Soil Capability for Agriculture Classes and Subclasses in the Takhini-Dezadeash Area (Sheet #7)

Classes and Subclasses	Acres	Hectares	% of Total Area
5CH	193633	78421	
5M	16749	6783	
5W	56047	22699	
5W7W	2525	1023	
5CH5W	3070	1243	
5CH6N	12724	5153	
5W5CH	2082	843	
5CH7M	24815	10050	
Class 5	311645	126215	67.3
6M	13713	5554	
6W6M	300	122	
6M5CH	3344	1354	
6TE	911	369	
6ME	12899	5224	
6T	5277	2137	
6N	314	127	
Class 6	36758	14887	7.9
7T	18029	7302	
7M	14725	5964	
7MT	5457	2210	
7W	5884	2383	
7M7W	212	86	
7TE	13741	5565	
7W6M	1548	627	
7W5M	1334	540	
7W5W	38	15	
7ME	3670	1486	
Class 7	64638	26178	14.0
Water	49969	20237	10.8
Total	463010	187517	

Area of Grazing Capability Classes in the Takhini-Dezadeash Area (Sheet #7)

Classes	Acres	Hectares	% of Total
III-V	5430	2199	
Class III	5430	2199	1.2
IV	1022	414	
IV-V	1359	550	
IV-VII	7515	3044	
Class IV	9896	4008	2.1
V	10180	4123	
V-VII	70161	28415	
V-III-VII	13481	5460	
V-VII-IV	9161	3710	
V-IV	3201	1296	
Class V	106184	43004	22.9
VII	203159	82279	
VII-V	78353	31733	
VII-IV	10007	4053	
Class VII	291519	118065	63.0
Water	49969	20237	10.8
Total	462998	187513	100.0

Takhini-Dezadeash Area
Sheet #7

Suitability for Irrigation

Classes	Acres	Hectares
E	3541	1434
F-T	41237	16701
F-C	129998	52649
F-CT	1051	426
F-C+VP-WS	290	117
F-C+VP-W	290	117
F-C+VP-S	3789	1535
P-G	18451	7473
P-T	3516	1424
VP-W	67074	27165
VP-T	95801	38799
VP-G	21140	8562
VP-GW	4197	1700
VP-TG	8464	3428
VP-S	314	127
VP-GT	7166	2902
VP-CT	1678	680
VP-TS	5037	2040
Water	49969	20237
Total	463003	187516

Crop Suitability

Classes	Acres	Hectares
F	208871	84593
FP	113498	45967
P	21346	8645
N	69316	28073
Water	49969	20237
Total	463000	187515

Takhini-Dezadeash Area
Sheet #7

Surface Texture			Subsoil Texture		
Classes	Acres	Hectares	Classes	Acres	Hectares
C	138662	56158	C	214184	86745
C+L	13943	5647	C+G	1563	633
C+SL	6825	2764	SI+C	5037	2040
L	14374	5821	GM	16891	6841
L+C	12546	5081	GM+G+C	398	161
L+G	1563	633	GM+G	26373	10681
L+SL	1940	786	G+V	1325	537
SL	21906	8872	G+C	5211	2110
SL+C	3335	1351	G+S	7233	2929
SL+S	2778	1125	G	22127	8961
S	37196	15064	S	39050	15815
S+C	3859	1563	S+G	2209	895
S+G	2209	895	S+SI+C	1528	619
S+L+SI	1528	619	S+C	1489	603
G	56685	22957	V	60249	24401
G+S	8642	3500	V+G	300	122
G+L	856	347	V+C	7405	2999
G+C	3344	1354	U	464	188
G+V	1325	537	Water	49969	20237
O	11102	4496	Total	463005	187517
V	57368	23234			
V+G	300	122			
V+C	4197	1700			
V+C+L	3208	1299			
U	3344	1354			
Water	49969	20237			
Total	463004	187516			

Takhini-Dezadeash Area
Sheet #7
Suitability as a Source of Topsoil

Classes	Acres	Hectares
E	12579	5095
E+P-C	3335	1351
E+P-S	2778	1125
F-CS	1481	600
F-C+P-G	1353	550
F-C+P-WC	5037	2040
F-C+P-C	532	215
F-C	13159	5329
P-SWC	42176	17081
P-SW	431	175
P-SW+F-C	3899	1579
P-G	22923	9284
P-GC	6558	2656
P-GS	58147	23550
P-S	35748	14478
P-SF	361	146
P-SG	1770	717
P-SC	2885	1168
P-CW	19367	7844
P-WCS	2562	1038
P-CWS	2525	1023
P-CWT	13156	5328
P-C	123383	49970
P-C+E	6825	2764
P-CG	541	219
P-C+F-C	2780	1126
P-T	14651	5934
P-WC	6048	2449
P-GW	212	86
P-GWC	458	186
P-GS+F-C	398	161
P-GSW	404	164
P-W	4576	1853
Water	49969	20237
Total	463007	187521

Takhini-Dezadeash Area
Sheet #7

Suitability for Road Construction		
Classes	Acres	Hectares
E	59775	24209
E+P-S	3017	1222
F-S	13436	5442
F-M	20619	8351
F-T	18400	7452
F-ST	7168	2903
P-I	43357	17560
P-T	46304	18753
P-S	163232	66109
P-IW	7405	2999
P-ST	9089	3681
P-W	17855	7231
P-WT	3381	1369
Water	49969	20237
Total	463007	187518

Suitability as a Source of Sand or Gravel		
Classes	Acres	Hectares
E-SG	2209	895
E-GS	8238	3336
E-G	13210	5350
E-G+P	5743	2326
E-S	38247	15490
E-S+P	3017	1222
P+E-G	28633	11596
F-S	803	325
P	312925	126735
Water	49969	20237
Total	462994	187512

Takhini-Dezadeash Area
Sheet #7

Suitability for Area Type Landfills

Classes	Acres	Hectares
E	182955	74097
E+F-W	290	118
E+P-W	3884	1573
F-T	17094	6923
F-P	29896	12108
F-PT	18803	7615
P-I	50420	20420
P-P	70246	28450
P-T	17794	7207
P-W	21235	8600
P-PT	416	169
Water	49969	20237
Total	463002	187517

Soil Drainage and Permafrost

Classes	Acres	Hectares
D	324157	131284
D+W	15223	6165
M	1991	806
W	71356	28899
W+D	300	122
Water	49969	20237
Total	462996	187513

Takhini-Dezadeash Area
Sheet # 7
Surficial Material and Topography

Classes	Acres	Hectares
A+L2	5037	2040
F1	66401	26892
F2	16882	6837
F+F/M+L1	2370	960
F3	16654	6745
F+A1	1528	619
F+L2	1489	603
F+U1	7791	3155
F+U2	366	148
F+L1	7010	2839
F+U+L2	4197	1700
F/L+L1	2068	838
F/L1	8746	3542
F/L2	3833	1552
F/L+L2	1799	729
F/L+F1	3382	1370
F/L+F2	1336	541
F/M1	2975	1205
F/M2	398	161
F/M+M1	1353	548
M1	14032	5683
M2	12963	5250
M+L1	3215	1302
M+F2	1563	633
M3	11213	4541
M+F+F/L1	398	161
M+F1	18783	7607
M+F3	7590	3074
L1	124428	50393
L2	31761	12863
L3	3111	1260
L+F/L1	7112	2880
L+F/L2	1970	798
L+F/L3	524	212
L+M1	541	219
L+U1	184	75
U2	3333	1350
U3	7330	2969
U4	3729	1510
U1	724	293
U+L1	38	15
U+F1	2881	1167
Water	49969	20237
Total	463007	187516

Area of Capability for Agriculture Classes
and Subclasses in the Whitehorse Area (Sheet #8)

Classes and Subclasses	Acres	Hectares	% of Total
5T	1 202	487	
5M	37 040	15 001	
5M 5Ch	10 166	4 117	
5M 7M	3 674	1 488	
5M 7R	11 483	4 651	
5MT	8 747	3 543	
5W	9 909	4 013	
5W7I	8 162	3 306	
5CH	58 298	23 611	
5CH 5M	14 179	5 742	
5CH 7R	6 914	2 800	
5CH 5N	4 874	1 974	
5CH 5W	3 123	1 265	
5CH 5WN	1 487	602	
5CH 7M	246	100	
5W 5M	816	330	
5N	518	210	
Class 5	180 838	73 240	43.1
6M	10 310	4 176	
6M 5M	1 393	564	
6M 5CH	592	240	
6M 5MT	1 071	434	
6ME 5CH	1 667	675	
6M 6CH	3 269	1 324	
6CH	9 606	3 890	
6CH 7T	1 963	795	
6CH 5M	8 389	3 398	
6CH 7R	1 693	686	
6CH 6M	1 200	486	
6ME	1 985	804	
Class 6	43 138	17 472	10.3
7T	38 746	15 692	
7MT	488	198	
7M	8 099	3 280	
7ME	10 083	4 084	
7TE	12 283	4 975	
7T 7R	17 958	7 273	
7R 7T	7 371	2 985	
7R 5CH	6 262	2 536	
7R	836	339	
7M 7CH	997	404	

7CH	34 151	13 831	
7CH 7M	14 818	6 001	
7CH 5MT	4 045	1 638	
7CH 7R	6 097	2 469	
7CH 5M	6 311	2 556	
7I 5W	20 059	8 124	
7R 6CH	7 143	2 893	
Class 7	195 747	79 278	46.6
Total	419 723	169 990	100.0
Water	109 119	44 193	
Total	528 842	214 183	

Area of Grazing Capability Classes in the Whitehorse Area (Sheet #8)

Classes	Acres	Hectares	% of Total Area
II - IV	2 144	868	
Class II	2 144	868	0.5
III	4 128	1 672	
III - IV	2 646	1 072	
III - VII	2 980	1 207	
III - V	4 257	1 724	
Class III	14 011	5 675	3.3
IV	3 284	1 330	
IV - VII	1 286	521	
Class IV	4 570	1 851	1.1
V	77 198	31 265	
V - VII	43 488	17 613	
V - VI	3 900	1 580	
V - IV	695	281	
Class V	125 281	50 739	29.9
VI	2 084	844	
VI - VII	4 488	1 818	
Class VI	6 572	2 662	1.6
VII	236 726	95 874	
VII - IV	13 329	5 398	
VII - V	13 493	5 465	
VII - VI	3 584	1 452	
Class VII	267 132	108 189	63.6
Total	419 710	169 984	100.0
Water	109 119	44 193	
Total	528 829	214 177	

Whitehorse Area
Sheet #8

Suitability for Irrigation			Crop Suitability		
Classes	Acres	Hectares	Classes	Acres	Hectares
E	5507	2230	F	98522	39901
E+P-G	2594	1051	FP	81952	33191
F-T	14049	5690	P	40370	16350
F-T+VP-T	682	276	N	198868	80542
F-G+P-G	778	315	Water	109119	44193
F-G	1412	572	Total	528831	214177
F-T+P-G	3210	1300			
F-G+VP-T	787	319			
P-G	38056	15413			
P-G+F-G	5166	2092			
P-G+F-T	965	391			
P-G+VP-T	425	172			
P-G+VP-G	1108	449			
P-T	2360	956			
VP-GT	3067	1242			
VP-T+F-T	1350	547			
VP-W+P-G	899	364			
VP-S	6878	2786			
VP-T+P-G	12865	5210			
VP-W	36177	14652			
VP-G	5765	2335			
VP-T	275615	111624			
Water	109119	44193			
Total	528834	214179			

Whitehorse Area
Sheet #8

Surface Texture			Soil Drainage and Permafrost		
Classes	Acres	Hectares	Classes	Acres	Hectares
C	10608	4296	D	350941	142131
C+S	319	158	D+M	11263	4562
C+SI	1044	423	D+WF	7075	2865
C+U	1070	433	M	6627	2684
C+SL	387	157	M+D	1677	679
C+O	3123	1265	W	9855	3991
SI	11318	4584	WF	9751	3949
SI+SL	6702	2714	WF+D	1715	695
SI+U	279	113	W+D	20059	8124
SI+S	8882	3597	M+W	747	303
L	781	316	Water	109119	44193
L+S	579	235	Total	528829	214176
SL	65079	26357			
SL+SI	5072	2054			
SL+S	26326	10662			
SL+G	3371	1365			
SL+U	7053	2856			
S	90580	36685			
S+SL	5619	2276			
S+U	11483	4651			
S+SI	1787	724			
G	10196	4129			
G+S	13182	5339			
G+U	3584	1452			
G+SL	706	286			
O	2833	1147			
O+S	1715	695			
U	97495	39485			
V	28474	11532			
Water	109119	44193			
Total	528838	214179			

Whitehorse Area
Sheet #8
Subsoil Texture

Classes	Acres	Hectares
C	23684	9592
C+SL	1138	461
C+U	1679	680
C+S	2861	1159
SI	14093	5708
SI+S	5292	2134
SI+U	279	113
SI+SL	6963	2820
L	7060	2859
L+S	579	234
L+U	635	257
L+G	246	100
L+GM	965	391
SL	11542	4675
SL+S	6096	2469
SL+L	382	155
SL+U	4322	1750
S	82138	33266
S+SL	7439	3013
S+C	6949	2814
S+G	4487	1817
S+U	11483	4651
S+L	317	128
G	17025	6895
G+S	17738	7184
G+C	592	240
G+GM	4266	1728
GM	49183	19919
GM+G	16018	6487
GM+S	24055	9742
GM+U	9393	3804
U	37386	15141
U+SL	6262	2536
U+GM	8205	3323
V	28969	11732
Water	109119	44193
Total	528840	214179

Whitehorse Area
Sheet #8

Suitability as a Source of Sand or Gravel

Classes	Acres	Hectares
E-S	81543	33025
E-S+P	18417	7459
E-SG	5540	2244
E-S+F-S	7510	3042
E-G+P	4858	1967
E-GS	17738	7184
E-G	16828	6815
F-S	10002	4051
F-S+E-S	3706	1501
F-S+P	1084	439
P	196542	79600
P+E-S	36378	14733
P+F-S	3304	1338
P+E-G	16264	6587
Water	109119	44193
Total	528833	214178

Suitability as a Source of Topsoil

Classes	Acres	Hectares
E	41729	16900
F-S	14533	5886
F-T	9897	4008
F-ST	246	100
P-S	76820	31112
P-ST	28918	11712
P-RST	9316	3773
P-RS	1126	456
P-W	20375	8252
P-SG	35627	14429
P-SGR	29178	11817
P-SGT	53113	21511
P-TR	1062	430
P-T	63314	25642
P-G	9022	3654
P	518	210
P-I	20059	8124
P-GT	4863	1970
Water	109119	44193
Total	528835	214179

Whitehorse Area
Sheet #8

Suitability for Area Type Landfills

Classes	Acres	Hectares
E	40215	16287
F	609	247
F-T	5179	2098
F-P	17337	7022
P-P	201785	81723
P-PT	62301	25232
P-W	20375	8252
P-T	51852	21000
P-I	20059	8124
Water	109119	44193
Total	528831	214178

Suitability for Road Construction

Classes	Acres	Hectares
E	42324	17141
F-T	57012	23090
F-S	9273	3756
F-M	9189	3722
F-MT	32586	13197
F-MTR	21706	8791
P-W	10725	4344
P-I	25777	10440
P-S	46859	18978
P-ST	1957	793
P-R	1959	794
P-SR	787	319
P-IT	2445	990
P-TR	1821	738
P-T	155297	62895
Water	109119	44193
Total	528836	214181

Whitehorse Area
Sheet #8
Surficial Material and Topography

Classes	Acres	Hectares
A1	26426	10703
A2	98	40
A1+U3	1784	723
A1+U4	660	267
F1	43775	17729
F2	45485	18421
F3	19298	7816
F4	8365	3388
F2+R3	10357	4195
F+F/L1	5721	2317
F+F/L2	461	187
F+F/L3	1972	799
F+R2	1126	456
F+L1	10494	4250
F/M2	2945	1193
F2+F/L1	592	240
F+M2	5779	2340
F+F/M2	382	155
F+L+F+M2	4870	1972
F+L2	1869	757
F/L2+F1	787	319
F/L2	2404	974
F/L+F1	1878	761
F/L1	2331	944
F/L+R2	609	247
F/L+L1	94	38
F/L+F2	325	132
F/L4	961	389
F/L+F4	306	124
F/L+F3	934	378
F/M+F2	2338	947
F/M+M1	965	391
F+M2+R3	4322	1750
F+M3	4730	1916
L1	18340	7428
L2	435	176
L2+F1	4476	1813
L1+R2	279	113
L+F/L1	1431	580
L1+F/L2	404	164
L+F/L2	640	259
L+R2	1070	433
L+F1	3492	1414
L1+F2	1202	487
M1	4387	1777
M2	46304	18753

Whitehorse Area
Sheet #8
Surficial Material and Topography
Continued

Classes	Acres	Hectares
M3	2245	909
M+F2	11807	4782
M3+F2	11036	4470
M2+F3	360	146
M2+R4	1007	408
M2+R3	2184	885
M3+R4	3093	1253
M+F3	4951	2005
M2+F1	14700	5954
M+R2	1716	695
M2+U3	1603	649
M+F1	1108	449
M1+R2	425	172
R4+M3	1062	430
R3+U2	724	293
R+U4	5379	2178
R4+U3	206	83
R3+F+M2	6262	2536
R3	97	39
R4	739	299
R3+M2	7143	2893
E2	12068	4888
E2+F1	1350	547
E+F/M2	317	128
U2	314	127
U3	6472	2621
U4	5497	2226
U+R4	189	77
U3+R4	9637	3903
U+R3	5098	2065
U2+R4	3034	1229
Water	109119	44193
Total	528845	214187

Acreage of Capability Classes and Subclasses in the Watson Lake Area.

Classes and Subclasses	Acres	Hectares	% of total
3CH	9733	3942	
3CH 5M	1156	468	
Total Class 3	10889	4410	1.3
4M	7568	3065	
4M 7M	7338	2972	
Total Class 4	14906	6037	1.8
5CH	154888	62730	
5CH 5W	124077	50251	
5TE	4323	1751	
5TE 5W	10741	4350	
5TP	549	222	
5M	89248	36145	
5M 5W	4380	1774	
5M 7M	11976	4850	
5M 7W	573	232	
5MP	20049	8120	
5W	62257	25214	
5W 7W	17823	7218	
5W 7T	1270	514	
5W 7I	5741	2325	
5W 5M	3159	1279	
5I 7T	5659	2292	
Total Class 5	516713	209267	63.1
6MP	659	267	
Total Class 6	659	267	0.1
7M	102258	41414	
7M 7W	1057	428	
7M 5M	2821	1143	
7MT	8005	3242	
7MT 7W	5214	2112	
7MP	10552	4274	
7W	21841	8846	
7W 7M	4681	1896	
7W 5M	17109	6929	
7T	39485	15991	
7T 7I	3034	1229	
7T 7R	10357	4195	
7TP	646	262	

Classes and Subclasses	Acres	Hectares	% of total
7TE	10843	4391	
7I 7W	2321	940	
7I 7T	1099	445	
Total Class 7	241323	97737	29.4
Water	35109	14219	4.3
Total Area	819599	331937	

Table. Acreage of Grazing Classes in the Watson Lake Area.

Class	Acres	Hectares	% of total
4-7	315	128	.04
5	184	75	.02
5-7	659	267	.08
7-5	624	253	.08
7	782702	316994	95.5
Water	35109	14219	4.3
Total	819583	331936	

Watson Lake Area

Crop Suitability			Suitability for Irrigation		
Class	Acres	Hectares	Class	Acres	Hectares
GM	2564	1038	F-T	15033	6088
MG	15893	6437	F-G	972	394
F	523549	212037	Class F	16005	6482
FP	499	202			
P	659	267	P-G	112001	45360
N	241322	97735	P-G+VP-T	8047	3259
Water	35109	14219	P-G+VP-W	435	176
			Class P	120483	48795
Total	819595	331935			
			VP-W	72217	29248
			VP-T	394369	159719
			VP-G	176733	71577
			VP-W+P-G	4681	1896
			Class VP	648000	262440
			Water	35109	14219
			Total	819597	331936

Watson Lake Area

Surface Texture

Class	Acres	Hectares
SI	56574	22912
SI+O	830	336
SL	57919	23457
SL+O	3905	1582
SL+G	7300	2957
SL+U	435	176
S	153639	62224
S+G	747	303
S+O	5919	2397
G	166027	67241
G+O	157536	63802
O	14324	5801
O+G	75656	30641
O+SL	6946	2813
O+S	2078	842
U	30890	12510
V	41444	16785
V+U	2321	940
Water	35109	14219
Total	819599	331938

Subsoil Texture

Class	Acres	Hectares
GM	376386	152436
GM+O	17823	7218
S	42204	17093
S+G	204846	82963
S+G+O	7279	2948
S+G+SI	3551	1438
S+G+GM	8047	3259
G	8563	3468
O+GM	25572	10357
O+S+G	4681	1896
O	12943	5242
U	28829	11676
V	43765	17725
Water	35109	14219
Total	819598	331938

Watson Lake Area

Suitability as a Source of Topsoil

Class	Acres	Hectares
E	42031	17023
Class E	42031	17023
F-S	1799	729
F-G	7300	2957
F-T	13161	5330
F-R	9054	3667
F-RT	2466	999
F-W	573	232
Class F	34353	13914
P-W	145443	58904
P-S	95757	38782
P-SW	8765	3540
P-ST	35208	14259
P-SG	271275	109866
P-SGR	55472	22466
P-SR	18454	7474
P-SGW	2967	1202
P-SGT	7548	3057
P-R	12986	5259
P-T	42233	17104
P-G	10941	4431
P-GW	1057	428
Class P	708106	286772
Water	35109	14219
Total	819599	331938

Soil Drainage and Permafrost

Class	Acres	Hectares
D	250733	101547
D+M	102034	41324
D+M+W	49168	19913
D+M+W+WF	6271	2540
D+M+WF	50400	20412
D+W	6204	2513
D+W+WF	573	232
M+D	3034	1229
M+WF	12606	5105
M+WF+D	153673	62238
M+WF+D+W	2967	1202
W	5192	2103
W+D+WF	2756	1116
W+D	39872	16148
WF	1381	559
WF+M+W	17823	7218
WF+M	36605	14825
WF+W	16106	6523
WF+W+M	5301	2147
WF+W+D	21790	8825
Water	35109	14219
Total	819598	331938

Watson Lake Area

Suitability as a Source of Sand or Gravel

Class	Acres	Hectares
E-SG	205902	83390
E-S	42204	17093
E-G	8563	3468
E-SG+P	17819	7217
Class E	274488	111168
P+E-SG	4681	1896
P	505318	204654
Class P	509999	206550
Water	35109	14219
Totals	819596	331937

Suitability for Road Construction

Class	Acres	Hectares
E	146326	59262
Class E	146326	59262
F-I	41849	16949
F-R	10562	4278
F-RT	1815	735
F-T	238856	96737
F-TW	1057	428
F-ST	29953	12131
F-W	573	232
F-WT	2967	1202
Class F	327632	132692
P-I	5192	2103
P-IT	36252	14682
P-R	36562	14808
P-ST	796	322
P-T	122158	49474
P-TW	5214	2112
P-W	58838	23829
P-WF	45517	18434
Class P	310529	125764
Water	35109	14219
Totals	819596	331937

Watson Lake Area

Suitability for Area Type Landfill

Class	Acres	Hectares
F-P	277120	112233
F-PT	66878	27086
F-PW	2967	1202
Class F	346965	140521
P-I	78455	31774
P-IW	2321	940
P-P	189456	76730
P-PT	31649	12818
P-PW	1057	428
P-PWT	5214	2112
P-T	21118	8553
P-W	108252	43842
Class P	437522	177197
Water	35109	14219
Totals	819596	331937

Watson Lake Area
Sheet #9
Surficial Material and Topography

Classes	Acres	Hectares
A1	73010	29569
A1+U2	5659	2292
A1+U3	1573	637
A+01	2321	940
F1	130557	52876
F2	40349	16341
F3	33806	13691
F4	9132	3698
F+02	1057	428
F+04	5214	2112
F+M1	7300	2957
F1+M2	747	303
F2+L1	3551	1438
F+01	573	232
M1	113620	46016
M2	195825	79309
M3	23309	9440
M1-2	34976	14165
M2-3	5691	2305
M+02	2967	1202
M+01	17823	7218
01	12943	5242
0+M2	17109	6929
0+M1	8463	3428
0+F1	4681	1896
U2	2695	1091
U3	5386	2181
U4	10761	4358
U+R4	10357	4195
U3+A1	3034	1229
Water	35109	14219
Total	819598	331937

Acreage of Agricultural Capability Classes and Subclasses in the Snag Area

Classes and Subclasses	Acres	Hectares	% of Total
5M	11099	4492	7.5
5CH	7336	2969	5.0
5M//5W	826	334	0.6
5T/5W	4860	1967	3.3
5CH/5W	4150	1680	2.8
5M//7W	37159	15038	25.3
5CH//7W	1109	449	0.8
5T/7W	10272	4157	7.0
5W/7I	1423	576	1.0
5CH/7W	10276	4159	7.0
Total Class 5	88510	35821	60.2
6W//5M	591	239	0.4
6W//5W	4396	1779	3.0
Total Class 6	4987	2018	3.4
7I	24456	9897	16.6
7T	6603	2672	4.5
7W//5M	5925	2398	4.0
7W//5W	6915	2799	4.7
Total Class 7	43899	17766	29.8
Water	9648	3905	6.6
Total Area	147044	59510	100.0

Acreage of Crop Suitability Classes in the Snag Area

Class	Acres	Hectares	% of Total
F	61994	25089	42.2
FP	26825	10856	18.2
P	4987	2018	3.4
N	43591	17641	29.6
Water	9648	3905	6.6
Total Area	147045	59509	100.0

Acreage of Grazing Classes in the Snag Area

Class	Acres	Hectares	% of Total
V	21879	8854	14.9
V-VII	9934	4020	6.7
VII	105585	42730	71.8
Water	9648	3905	6.6
Total Area	147046	59509	100.0

Acreage of classes for Suitability for Irrigation in the Snag Area

Class	Acres	Hectares	% of Total
F-T	23737	9606	16.1
F-G	8889	3597	6.1
Total Class F	32626	13204	22.2
P-G	481	195	0.3
P-W	17827	7215	12.1
Total Class P	18308	7409	12.4
VP-T	60584	24518	41.2
VP-W	25880	10474	17.6
Total Class VP	86464	34992	58.8
Water	9648	3905	6.6
Total Area	147046	59510	100.0

Acreage of classes for Soil Drainage and Permafrost

Class	Acres	Hectares	% of Total
D	4295	1738	2.9
D+M	5211	2109	3.5
D+MF	13767	5572	9.3
D+WF	45879	18567	31.2
D+MF+WF	826	334	0.6
D+WF+MF	1848	748	1.3
DF+MF	1766	715	1.2
DF+WF	2175	880	1.5
MF+WF	17925	7254	12.2
W	8803	3563	6.0
W+D	17077	6911	11.6
WF+D	6516	2637	4.4
WF+MF	11311	4578	7.7
Water	9648	3905	6.6
Total Area	147047	59511	100.0

Acreage of classes for Suitability as a Source of Top-soil in the Snag Area

Class	Acres	Hectares	% of Total
E	5286	2139	3.6
Total Class E	5286	2139	3.6
F-C	13752	5565	9.3
F-T	21734	8796	14.8
Total Class F	35486	14361	24.1
P-W	32395	13110	22.0
P-SG	64229	25994	43.7
Total Class P	96624	39104	65.7
Water	9648	3905	6.6
Total Area	147044	59509	100.0

Acreage of classes for Suitability for Road Construction in the Snag Area

Class	Acres	Hectares	% of Total
E	51883	20997	35.2
Total Class E	51883	20997	35.2
F-M	1455	589	1.0
F-TS	6603	2672	4.5
F-MT	11884	4809	8.1
Total Class F	19942	8070	13.6
P-F	24148	9773	16.4
P-I	25880	10474	17.6
P-FMT	15545	6291	10.6
Total Class P	65573	26538	44.6
Water	9648	3905	6.6
Total Area	147046	59510	100.0

Acreage of classes for Surface Texture in the Snag Area

Class	Acres	Hectares	% of Total
SI	22065	8930	15.0
SI+O	34334	13895	23.4
L	3012	1219	2.0
SL+O	481	195	0.3
O	29031	11749	19.7
O+SI	7860	3181	5.3
U	8901	3602	6.1
U+O	5834	2361	4.0
V	25880	10474	17.6
Water	9648	3904	6.6
Total Area	147046	59510	100.0

Acreage of classes for Subsoil Texture in the Snag Area

Class	Acres	Hectares	% of Total
SI	6603	2672	4.5
L	29494	11936	20.1
S	15144	6129	10.3
G	54774	22167	37.2
V	25880	10474	17.6
L+SI	1848	748	1.2
L+G	2829	1145	1.9
G+L	826	334	0.6
Water	9648	3905	6.6
Total Area	147045	59510	100.0

Acreage of classes for Suitability as a Source of Sand or Gravel in the Snag Area

Class	Acres	Hectares	% of Total
E-G	54774	22167	37.2
E-S	15144	6129	10.3
E-G+P	826	334	0.6
Total Class E	70744	28630	48.1
P	63824	25829	43.4
P+E-G	2829	1145	1.9
Total Class P	66653	26974	45.3
Water	9648	3905	6.6
Total Area	147045	59509	100.0

Acreage of classes for Suitability for Area Type Landfills in the Snag Area

Class	Acres	Hectares	% of Total
E	10924	4421	7.4
Total Class E	10924	4421	7.4
F-P	1345	544	0.9
F-T	24564	9941	16.7
Total Class F	25909	10485	17.6
P-P	50538	20453	34.4
P-W	8803	3563	6.0
P-I	17077	6911	11.6
P-FP	2380	963	1.6
P-FW	21768	8810	14.8
Total Class P	100566	40700	68.4
Water	9648	3905	6.6
Total Area	147047	59511	100.0

Acreage of classes for Surficial Material and Topography in the Snag Area

Class	Acres	Hectares	% of Total
A1	25880	10474	17.6
E3	6603	2672	4.5
E/F1	28222	11421	19.2
E/F1-2	8067	3265	5.5
E/F2	18485	7481	12.6
E/F+M1	826	334	0.6
E/M1	5286	2139	3.6
F1	15144	6129	10.3
M1	1455	589	1.0
M2	22753	9208	15.5
M+E2	1848	748	1.2
M+E/F2	2829	1145	1.9
Water	9648	3905	6.5
Total Area	147046	59510	100.0