

GENERAL DESCRIPTION OF THE LESSER SLAVE LAKE MAP SHEET AREA, 83O

LOCATION AND DEVELOPMENT

The area covered by the Lesser Slave Lake map sheet is located in central Alberta between 114° and 116° west longitude and 55° and 56° north latitude.

Trading posts were built in the area in the early 1800s. The Northern Alberta Railway was built in 1917 and agricultural settlement followed. The southern shore of Lesser Slave Lake is fairly well settled.

Transportation facilities are limited, but considering the amount of settlement, the area is fairly well serviced. The main line of the Northern Alberta Railway from Edmonton to Peace River extends through the area from Smith to Joussard along the southern shore of Lesser Slave Lake. Paved Highway 2, recently relocated between Hondo and Slave Lake, follows about the same route. Gravelled roads in the area are from Slave Lake northeast to North Wabasca Lake with a branch road just north of the Marten River crossing, extending northward toward Nipisi and Utikuma lakes. Other gravelled roads run from Kinuso south to Swan Hills, and from Grouard northeast to Utikuma Lake and Peerless Lake outside the area.

The economy of the area is based mainly on gas and oil production, mixed farming, lumbering, mink ranching, and commercial fishing. Exploration for oil and gas has resulted in three oil fields, Swan Hills, Mitsue, and Nipisi Lake, and one gas field at Marten Mountain. All the oil fields are connected with Edmonton refineries by pipeline. Mixed farming is confined mainly to a region along the southern shore of Lesser Slave Lake and the Swan River valley. Lumbering is carried on in the Swan Hills and on Marten Mountain. The area has been one of the largest producers of forest products for many years, and supplies lumber, railway ties, telephone poles, and plywood bolts for a thriving forest industry. Presently this industry is declining because of a lack of mature and overmature timber. Commercial fishing is confined to Lesser Slave and Utikuma lakes. Mink ranching and outfitting big game hunters also contribute to the economy. The area is important to wildlife and recreation. It has a fair population of moose, deer, and black bear and some grizzly bear occur in the Swan Hills. Hunting potential, particularly for moose, is widespread throughout the area. Sport fishing is confined mainly to smaller lakes such as Utikuma, Mitsue, and Fawcett and to many rivers and creeks. The size of Lesser Slave Lake and its rough waters limit sport fishing. Lesser Slave Lake has good potential for intensive recreation. The eastern shore has nearly 6 miles of sandy beaches. Several sandy beaches also occur along the southern and northern shores of this lake. A provincial park has been established on the eastern shore of Lesser Slave Lake. Seven Indian Reserves and one Metis Colony are located in the area.

PHYSIOGRAPHY

The area lies in the Alberta Plateau division of the Interior Plains physiographic region. It borders on the Alberta Plain division in the southeast and the Peace River Lowland in the west.

The topography of the area is level and undulating to hilly. The elevations range from less than 1900 feet in regions adjacent to Lesser Slave Lake and in the northeast to nearly 4000 feet in the Swan Hills. The area shows many contrasting physiographic features. On the basis of the general topography and landscape pattern, the area may be subdivided into four local physiographic units.

The first physiographic unit comprises the Swan Hills and Marten Mountain highlands, south and east of Lesser Slave Lake respectively. This region is sharply defined, flat topped, and deeply dissected, which is the result of preglacial erosion. The elevations range from about 2000 to 4000 feet.

The Utikuma upland physiographic unit in the northwestern part of the area is characterized by broken rolling topography and ice disintegration features with many depressions, discontinuous small ridges, and plateaus. The elevations range from about 2000 to 2500 feet.

The Lesser Slave lowland, which extends through the southeastern and central parts of the area, gently slopes toward Lesser Slave Lake. It occupies a glacial spillway channel in a fault zone between the well-drained Swan Hills and Marten Mountain. The elevations range from about 2000 feet to less than 1900 feet near the lake.

The last physiographic unit in the northeastern and north-central parts of the area is covered by another lowland extending from Utikuma Lake to the Wabasca Lakes. It slopes northward from about 2000 feet to less than 1900 feet. It contains extensive regions of organic accumulations, morainic deposits, and coarse textured outwash materials.

The entire area was glaciated during the Pleistocene epoch by the Laurentide (Continental) ice from the north and northeast. The area is underlain by the Early Upper Cretaceous bedrock, mainly sandstone, shale, and conglomerate. The surficial deposits reflect the complex glacial history of the ice advance and the postglacial activities during the ice retreat.

Till is a heterogeneous material, deposited directly from glacial ice constitutes most of the surficial deposits and is evident in various parts of the area. It composes most of the undulating to gently rolling ground moraine and gently rolling to rolling dead-ice moraine, and underlies most other glacial deposits. At higher elevations, the till is found as a thin mantle covering the underlying bedrock.

Alluvial and outwash deposits are found widely scattered throughout the area. These sediments are usually coarse textured, often gravelly, and extremely variable in depth. Extensive depositions of gravelly outwash materials are evident in the eastern fringes of Swan Hills, in the Marten Mountain region, and in the region to the north of Marten Mountain.

The recent alluvium is confined mainly to floodplains of the main streams and rivers. These deposits vary in texture from sandy loam to clay. Alluvial-eolian deposits are evident in the southeast between Hondo, Smith, and Slave Lake. They are coarse textured and occur as U-shaped and longitudinal dunes. Organic soils are usually interspersed between the dunes.

Lacustrine deposits are found to a lesser extent in the southwestern and northern parts of the area. These stone-free deposits range in texture from silty clay loam to heavy clay and vary considerably in depth.

Organic materials cover a very significant part of the area, particularly in the southeast and north. The thickness of the organic material ranges from 18 inches to more than 4 feet.

The area is mainly in the Gray Luvisol soil zone and also includes Organic, Gleysolic, Podzolic, Regosolic, and Brunisolic soils.

Lesser Slave Lake, the second largest lake in Alberta, occupies a central position in the area. About two-thirds of the area drains into this lake and then into the Athabasca River by way of the Lesser Slave River. The Driftpile, Swan, Assinewa, Otauwa, and Saulteaux rivers drain from the south. Main drainages from the north are Shaw and Narrows creeks, and the Marten and Driftwood rivers. Utikuma and some smaller lakes occur in the northern part of the area and drain northward into the Peace River. The Athabasca and Peace rivers flow northward to the Arctic Ocean.

FOREST ECOLOGICAL RELATIONSHIPS

Meteorological information is available from three stations at Wagner, Slave Lake, and High Prairie. The area has a continental climate, characterized by fairly warm summers and cold winters. Annual precipitation varies from 17 to 24 inches, 65 percent of which falls from April to October. June and July are the months of highest precipitation. The higher elevations south and east of Lesser Slave Lake receive greater rainfall than the surrounding lowlands. The highest rainfall of 24 inches occurs in the Swan Hills. The number of frost-free days at Slave Lake, Wagner, and High Prairie is 78, 87, and 96 days respectively.

The area lies in the Mixedwood and Lower Foothills sections of the Boreal Forest Region. The Mixedwood Section occupies most of the area. The characteristic forest association of the well-drained uplands is aspen, balsam poplar, white birch, white spruce, and balsam fir. White spruce and balsam fir are prominent in older stands.

The aspen forest covers extensive regions, because it regenerates readily after disturbances. Besides dominating on sandy sites, jack pine and lodepole pine enter into the forest composition on the drier till soils and mix with black spruce on the plateau sites on the higher hills. Depressions at lower elevations and the upper elevation water-catchment regions develop black spruce and tamarack muskeg. The Mixedwood Section consists predominantly of glacial till, coarse textured outwash materials, alluvial lowlands, and extensive regions of organic accumulations. Gray Luvisol soils predominate in this section.

The Lower Foothills Section occupies a small part of the area. The distinctive tree species of this section is lodepole pine, which with aspen and balsam poplar, has become dominant as a result of fire. In older forest stands, white spruce is an important constituent and black spruce is also present. At higher elevations, lodepole pine and white spruce are the main species with balsam fir occurring as an understory. The Lower Foothills Section occupies the Swan Hills and Marten Mountain. These hills are capped with preglacial gravels; sandstone and sandstone with a thin mantle of till occur on the upper slopes and glacial till occurs on the lower slopes. Marten Mountain is characterized by rough topography and an extensive bedrock outcrop. The outwash is usually gravelly and quite variable in depth. In general, this region is fairly well drained.

The capability classification is based on sawlog economy, with a one-hundred year rotation and white spruce as the principal species. However, all sites at an elevation of about 3300 feet or higher in the Swan Hills and at 2800 feet or higher on Marten Mountain, which includes most of the upland plateaus, are classified using pine as the indicator species. The combination of higher elevation, greater rainfall than the surrounding region, and imperfect drainage because of the flat uplands, encourages the formation of a moss layer that in turn increases podzolization. High elevation and the insulating effect of the moss layer keep the summer temperature of the soil and atmosphere low and affect the transpiration of trees and the decomposition of organic matter. Under these circumstances, white spruce does not produce as well as pine or black spruce.

Lodgepole pine and jack pine are common in the area. Lodgepole pine was mapped as the indicator species to the south and jack pine to the north of the boundary formed by the Lesser Slave River and Lesser Slave Lake. Exceptions were the Marten and Pelican mountains where lodgepole pine, the natural tree cover of the area, was used as the indicator species.

Because of climatic conditions, the highest capability found throughout the area is Class 3. Gray Luvisol soils that have developed on glacial till are mainly clay loams. Their productive capability is Class 3 on deep, moderately well to imperfectly drained, long, north-facing slopes. Usually well-drained tilts are rated Class 4, and they are rated Classes 5 and 6 where limitations of wetness or dryness lower their capability for forest growth.

The soils that have developed on glacial lake sediments are fine textured clays. Their productive capacity is usually limited by slow drainage and a compact Bt horizon about 12 to 18 inches below the surface. Moist clay deposits are rated Class 3, followed by Class 4, and then Classes 5, 6, and 7 where the degree of wetness increases.

Medium to fine textured soils have developed on alluvial deposits along the main stream courses. The most common limitations are poor drainage and periodic inundation. Some well-drained sites on alluvial soils are rated Classes 3 and 4, followed by Classes 5 and 7 where the degree of wetness increases.

The coarse textured sandy or gravelly soils developed on glaciocluvial deposits are rapidly drained and are limited mainly by moisture deficiency. These sites are occasionally rated Class 4 when they are underlain by fine textured material with a slow drainage rate. Usually, they are rated Classes 5 and 6 for lodepole or jack pine.

Soils developed on sandy eolian deposits have fair to low capability for forestry. Deficiency of soil moisture and lack of nutrients are the common limitations on these soils. They are rated Classes 5 and 6 for jack pine or lodepole pine.

Organic soils, which usually occur in association with extinct lakes, spillways, floodplains, and depressions, are very poorly drained. Because of excessive moisture, high water table, and low soil temperature, the productive capacity of these soils is low, mainly Class 6 for black spruce and Class 7 with no indicator species.

Capability classification by J. R. Prokopchuk and E. Boyacioglu, Alberta Forest Service, Department of Lands and Forests, and Z. J. Nemeth, Canadian Forestry Service, Environment Canada, 1971.

REFERENCES

Bostock, H. S. 1969. Physiographic regions of Canada. Map # 125A. Canada Dep. Energy, Mines and Resources.

Rowe, J. S. 1959. Forest regions of Canada. Bull. 123. Forestry Branch, Canada Dep. Northern Affairs and National Resources. Queen's Printer, Ottawa.

Wynnyk, A., J. D. Lindsay, P. K. Heringa, and W. Odynsky. Exploratory Soil Survey. Rep. 64-1, Research Council of Alberta.

METRIC CONVERSION

1 cubic foot/acre 0.06997245 cubic metre/hectare

cubic feet/acre/year cubic metres/hectare/year

Class 1d	191 to 210	13.4 to 14.7
Class 1c	171 to 190	12.0 to 13.3
Class 1b	151 to 170	10.6 to 11.9
Class 1a	131 to 150	9.2 to 10.5
Class 1	111 to 130	7.8 to 9.1
Class 2	91 to 110	6.4 to 7.7
Class 3	71 to 90	5.0 to 6.3
Class 4	51 to 70	3.6 to 4.9
Class 5	31 to 50	2.2 to 3.5
Class 6	11 to 30	0.8 to 2.1
Class 7	11	0.8

Class 1d	191 to 210	13.4 to 14.7
Class 1c	171 to 190	12.0 to 13.3
Class 1b	151 to 170	10.6 to 11.9
Class 1a	131 to 150	9.2 to 10.5
Class 1	111 to 130	7.8 to 9.1
Class 2	91 to 110	6.4 to 7.7
Class 3	71 to 90	5.0 to 6.3
Class 4	51 to 70	3.6 to 4.9
Class 5	31 to 50	2.2 to 3.5
Class 6	11 to 30	0.8 to 2.1
Class 7	11	0.8

DESCRIPTION DU TERRITOIRE DE LA FEUILLE DU LAC LESSER SLAVE 83O

Le territoire représenté sur la feuille du lac Lesser Slave se trouve dans le centre de l'Alberta, entre 114° et 116° de longitude ouest et 55° et 56° de latitude nord.

Au début du 19e siècle on établissait des postes de traite. Le chemin de fer de la compagnie Northern Alberta était construit en 1917 et les premières communautés agricoles apparaissent ensuite. La rive méridionale du Petit lac des Esclaves est en bonne partie aménagée.

Les moyens de transport sont limités mais, compte tenu de la densité du peuplement, le territoire est assez bien desservi. La ligne principale de la Northern Alberta Railway reliant Edmonton à Peace River traverse le territoire de Smith à Joussard en longeant la rive méridionale du Petit lac des Esclaves. La route 2, route revêtue dont le tracé a été récemment modifié de manière qu'elle relie Hondo et Slave Lake, suit à peu près le même chemin. Il y a des routes en gravier qui vont de Slave Lake vers le nord-est jusqu'au lac Wabasca-Nord; on trouve un embranchement, juste au nord du pont de la rivière Marten, qui se dirige vers le nord, jusqu'aux lacs Nipisi et Utikuma. D'autres routes en gravier vont de Kinuso à Swan Hills, au sud, et de Grouard au lac Utikuma et au lac Peerless, situé à l'extérieur du territoire, vers le nord-est.

L'économie du territoire repose sur la production de gaz et de pétrole, sur l'agriculture mixte, l'exploitation de la forêt, l'élevage du vison et la pêche commerciale. Les travaux d'exploration pétrolière et gazière ont entraîné la mise en exploitation de trois champs pétroliers, ceux de Swan Hills, de Mitsue et de Nipisi Lake, et celle d'un champ de gaz à Marten Mountain. Tous les champs de pétrole sont reliés à des raffineries d'Edmonton par pipeline. L'agriculture mixte se pratique surtout dans une région qui longe la rive méridionale du Petit lac des Esclaves et la vallée de la rivière Swan.

Il y a des exploitations forestières dans les collines Swan et sur le mont Marten. Pendant de nombreuses années, le territoire a été un des plus importants producteurs de produits forestiers et il alimente en bois d'œuvre, traverses de chemin de fer, poteaux de téléphone et chevilles de contreplaqué une industrie forestière prospère. Actuellement, cette industrie connaît un flétrissement dû au manque d'arbres suffisamment vieux. L'élevage du vison et la vente de matériel pour la chasse au gros gibier sont d'autres sources de revenus. Le territoire est important pour la faune et la récréation. Il accueille d'assez importantes populations d'originaux, de cerfs et d'ours noirs et on trouve un certain nombre d'ours bruns dans les collines Swan. Il existe des possibilités de chasse et plus particulièrement de chasse à l'original à travers tout le territoire. La pêche sportive se pratique surtout sur les plus petits lacs comme les lacs Utikuma, Mitsue et Fawcett ainsi que sur un grand nombre de rivières et de ruisseaux. Étant donné les dimensions du Petit lac des Esclaves et ses eaux agitées, il présente peu de possibilités pour la pêche sportive. Le Petit lac des Esclaves présente de bonnes possibilités pour des activités de plein air de type intensif. La rive orientale du lac possède des plages de sable qui s'étendent sur une distance de près de 6 milles. Il y a aussi plusieurs plages de sable sur les rives méridionale et septentrionale de ce lac. Un parc provincial a été créé sur la rive orientale du Petit lac des Esclaves. Ce territoire renferme sept réserves indiennes et une colonie de Métis.

Le territoire appartient au plateau de l'Alberta, une subdivision de la région structurale des plaines intérieures. Il est limité au sud-est par la plaine de l'Alberta et, à l'ouest, par les basses terres de la rivière de la Paix.

Le territoire présente tantôt une topographie unie et ondulée, tantôt un relief de collines. L'altitude varie de moins de 1 900 pi dans les régions voisines du Petit lac des Esclaves et dans le nord-est à près de 4 000 dans les collines Swan. Sur le plan structural, le territoire présente de nombreux contrastes. A partir des caractères topographiques et de l'allure des paysages naturels, on distingue quatre unités structurales locales.

La première unité comprend les collines Swan et les hautes terres du mont Marten respectivement situées au sud et à l'est du Petit lac des Esclaves. Les limites de cette région sont bien nettes, sa surface est unie et elle porte des entailles profondes résultant de l'érosion préglaciaire. L'altitude y varie d'environ 2 000 à 4 000 p.

L'unité du bas-plateau d'Utikuma, dans le nord-ouest du territoire, présente une topographie vallonnée irrégulière, des dépôts abandonnés par les glaciers en fusion, ainsi qu'un grand nombre de dépressions, de petits bourelles discontinus et de plateaux. L'altitude varie à peu près de 2 000 à 2 500 pieds.

Les basses terres du Petit lac des Esclaves, dans le sud-est et le centre du territoire, s'abaisse doucement en direction du lac. Elles occupent un chenal d'écoulement glaciaire correspondant à une zone de faille entre les collines Swan et le mont Marten, deux régions bien drainées. L'altitude varie de 2 000 pi environ à moins de 1 000 à proximité du lac.

La dernière unité structurale se trouve dans le nord-est et le centre-nord du territoire; c'est une autre région de basses terres s'étendant du lac Utikuma aux lacs Wabasca. Elles s'abaisse vers le nord, passant de 2 000 pi environ d'altitude à moins de 1 000. Cette unité renferme de vastes secteurs de matériaux organiques, de dépôts morainiques et d'épandages de texture grossière.

Tout le territoire a subi le pléistocène la glaciation du Laurentien (d'origine continentale) venue du nord et du nord-est. Le territoire repose sur une assise datant du début du cratère supérieur et composée surtout de grès, de shales et de congolérats. Les formations meubles indiquent les divers mouvements des glacières et l'évolution post-glaciaire du territoire.

Le till, matériau hétérogène mis en place par le glacier, est le principal type de formation meuble et on trouve en divers points du territoire. C'est l'élément le plus important qui entre dans la composition de la moraine de fond au relief onduleux ou légèrement vallonné et de la moraine d'ablation au relief légèrement vallonné et vallonné; la plupart des autres dépôts glaciaires reposent aussi sur du till. En altitude, une mince couche de till masque la roche mère.

Il y a des alluvions et des épandages à travers tout le territoire. Ces matériaux sont habituellement de texture grossière et souvent graveleux et d'une épaisseur très variable. De vastes dépôts d'épandages graveleux sont vis