Soil Survey of the

Muskeg Lake Indian Reserve No. 102

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Saskatchewan Institute of Pedology Publication S113
University of Saskatchewan,
Saskatoon, Saskatchewan.

1966.

Muskeg Lake Indian Reserve No. 102

Map Legend

Soils

Black Soils

Blaine Lake - B - A group of dominantly Black Chernozemic soils developed on medium to moderately fine textured, calcareous, silty, glacio-lacustrine deposits. B/T - Shallow deposits (less than 4 feet) overlying glacial till.

B1 - Dominant Orthic Black.

B5 - Dominant Orthic Black with significant Gleysolics.

B6 - Dominant Orthic Black with significant Eluviated Gleysolics.

Haralowka - Hk - A group of dominantly shallow and eroded Black Chernozemic soils developed on coarse to moderately coarse textured glacio-fluvial and glacio-lacustrine deposits associated with rolling morainic landforms.

Hk5 - Dominant Orthic Black with significant eroded Orthic Black and significant Gleysolics.

Hamlin - Hm - A group of dominantly Black Chernozemic soils developed on medium to moderately fine textured sandy glacio-lacustrine deposits.

Hm1 - Dominant Orthic Black.

Hm6 - Dominant Orthic Black with significant Eluviated Gleysolics.

Krydor - Kr - A group of dominantly shallow and eroded Black Chernozemic soils developed on medium to moderately fine textured, moderately calcareous silty glacio-lacustrine deposits.

Kr1 - Dominant Orthic Black with a significant combination of eroded Rego, Calcareous and Orthic Black.

Meota - Me - A group of dominantly Black Chernozemic soils developed on coarse to medium textured sandy glacio-fluvial and glacio-lacustrine deposits.

Me1 - Dominant Orthic Black.

Me2 - Dominant Orthic Black with significant eroded Orthic Black.

Oxbow - O - A group of dominantly Black Chernozemic soils developed on medium textured, calcareous glacial till.

02 - Dominant Orthic Black with a significant combination of eroded Rego and Calcareous Black and Orthic Regosols and significant Gleysolics.

07 - A combination of Orthic Black and Calcareous Black.

Azonal Complexes

Alluvium - Av - A group of soils developed on variable textured alluvium deposits.

Av10 - Dominant carbonated or saline Rego Chernozemic.

Dune Sand - DS - A group of dominantly Regosolic soils developed on coarse textured, wind-worked glacio-fluvial deposits.

DS1 - Dominant Orthic Regosol.

Meadow-Bog Complex - MBx - A complex of sedge peat varying from one to three feet in thickness and peaty Gleysolic soils.

Textural Groupings and Classes

Textural Group	Textural Class
Coarse textured	Sand (s), loamy sand (ls)
Moderately coarse textured	Sandy loam (sl), fine sandy loam (fl)
Medium textured	Very fine sandy loam (vl), loam (l), silt loam (sil)
Moderately fine textured	Sandy clay loam (scl), clay loam (cl), silty clay loam (sicl)
Fine textured	Sandy clay (sc), clay (c), silty clay (sic), heavy clay (hc)

Gravelly sandy loam (gsl) and gravelly loam (gl) are modifiers of textural classes.

Landforms

Name	Symbol	Description
Glacial Till Landforms		
Moraine	Ma	Gently to strongly rolling, with slopes of 6% to over 16%. Pattern of knob and kettle with frequent to many sloughs and ponds.
Glacio-lacustrine Landforms		
Glacial Lake Bed or Basin	La	Level or very gently sloping or low mound and depressions or low ridge and swale without external drainage.
	Ld	As above with external drainage.
Glacial Lake Delta and Post Glacial Alluvium Deposits	Aa	Very gently sloping or smooth to undulating without external drainage.
	Ad	As above with external drainage.

Topography

Description	Symbol	Slope Class
Very gently sloping or gently undulating	2	0.5-2%
Gently sloping or roughly undulating	3	2-5%
Moderately sloping or gently rolling	4	6-9%
Strongly sloping or moderately rolling	5	10-15%

Soil Capability for Agriculture

Class	Limitations for Agricultural Use
1	None to slight.
2	Moderate.
3	Moderately severe.
4	Severe.
5	Serious - not suitable for annual crops but suitable for improved pasture.
6	Very serious - suited only for permanent pasture.

0 - Unimproved or virgin organic soils including muskeg and peat which are not included in the classes above.

Kind of Limitations

m - adverse soil moisture holding capacity due to droughtiness and deficiencies in soil moisture holding capacity as expressed in a combination of textural characteristics of the top 4 feet and the organic characteristics of the surface horizon

n - excessive soil salinity

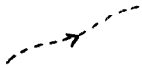
s - accumulative adverse soil characteristics

t - adverse topography

w - excess water

Map Symbols


Slough or depressional areas which are periodically flooded.


Drainage way, indicating direction of flow.

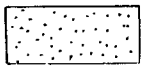

Soil boundary.


Township corner.

Tp Township.

Rg Range.


Not suitable for grain production.


Marginal for grain production.

The Soils of the Muskeg Lake Indian Reserve No. 102

(Shellbrook Agency)

The Muskeg Lake Reserve includes all or portions of Sections 6, 7, 18, 19, 30 and 31 inclusive, Township 46, Range 6; Sections 1 to 4, 9 to 16, 21 to 28 and 33 to 36 inclusive, Township 46, Range 7; Sections 5 to 8 inclusive, Township 47, Range 6; and Sections 1 to 3 and 10 to 12 inclusive, Township 47, Range 7. All this area is west of the 3rd Principal Meridian.

Interpretation of Information on the Soil Map

A map and legend have been prepared and comprises the first portion of this report. The symbols which appear on the map can be interpreted by means of the legend, given on pages 1-4. There are some terms in the legend which perhaps may be unfamiliar to the reader. The booklet, "A Guide to Understanding Saskatchewan Soils", which accompanies this report will familiarize the reader with the terms used to describe soils in this province. To properly interpret the legend it is essential that the above-mentioned booklet be used as a reference.

The following is a guide as to how to interpret the symbols used on the map by means of the legend. An understanding of the procedure will enable the reader to assess any area on the map.

In Section 30, Township 46, Range 6, West of the 3rd Meridian, the symbol sequence B6:1-Hm6:1:La3, is a short hand form for indicating the Soil Associations, the Map Units, the surface texture and the landform[1] respectively, which occur within this area. The extent of the area is delineated by the black solid line which is referred to as the soil boundary.

By referring to the legend, the edit B6:1 is interpreted as follows. The letter B is the symbol for the Blaine Lake Association which is described as a group of dominantly Black Chernozemic soils developed on medium to moderately fine textured, calcareous, silty, glacio-lacustrine deposits. The number 6 indicates the Map Unit in the Blaine Lake Association, namely B6, which is described as dominant Orthic Black with significant Eluviated Gleysolics. The letter 1 is the textural symbol for loam. The symbol 1 is defined in the legend under the section Textural Class. Thus we now understand the sequence B6:1.

The other part of the edit Hm6:1 is interpreted in the same manner.

The letters Hm are the symbol for the Hamlin Association which is described as a group of dominantly Black Chernozemic soils developed on medium to moderately fine textured sandy glacio-lacustrine deposits. The number 6 refers to the Hm6 Map Unit which is described as dominant Orthic Black with significant Eluviated Gleysolics. The letter 1 is the textural symbol for loam.

It will have been noted that the edit B6:1-Hm6:1 consists of two Associations and their Map Units. Where two or more Soil Associations and their Map Units occur in one edit the amount of each different Association decreases from left to right in the edit. For example, in an area edited as above the Blaine Lake soils occupy the largest portion. The reason that some areas are indicated with a complex edit, such as the one above, is that at the present scale of mapping and the expected land use it was not considered practical to separate these soils. They could, however, be separated on the basis of different parent materials in a more detailed soil survey.

The next portion of the sequence is La3. The letters La are a symbol for the landform which in the legend is described as a glacial lake bed or basin having a pattern of mound and depression without external drainage. The number 3 is the symbol for the slope class which is defined under the heading Topography in the legend, and refers to a gently sloping or roughly undulating landform with slopes between 2 and 5%.

The second set of symbols in the area is a series of numbers and letters which describe the Soil Capability of the area. The series sequence is edited as $2^{8}_{m}\ 5^{2}_{w}$ and is interpreted as follows. The lower numbers are the capability class, the small letters indicate the most adverse feature which puts the soils in this class and the upper numbers refer to the percentage of the area which is occupied by the capability class. Thus by reading that portion of the legend under the heading Soil Capability for Agriculture it can be seen

that 2^8_m means that 80% of the area is class 2 soil and has moderate limitations due to adverse soil moisture conditions but is well suited to the production of cereal crops. In the same manner 5^2_w means that 20% of the area is class 5 soil and has serious limitations because these areas are periodically excessively wet or inundated by water and thus their agricultural use is limited to forage crops which are tolerant to periodic wet conditions. The reader will therefore conclude from $2^8_m\ 5^2_w$ that this area, except for the wet areas, is suitable for the production of cereal crops.

An explanation of the entire criteria used to determine the capability of soils would be too voluminous to insert into this report. Suffice it is to report that the Capability Classes placed on the soils mapped on the Muskeg Lake Reserve are a slight modification of the Capability Classes being used in Saskatchewan under the Canada Land Inventory Program[2]. These classes were established by the National Soil Survey Committee and published in the report of the Work Planning Conference[3] which was sponsored by A.R.D.A. (Agricultural Rehabilitation and Development Act).

It will be noted that in a previous section dealing with the interpretation of the Soil Capability for Agriculture that the limitations are listed on the legend but not described. Table 1 is presented to explain these limitations.

TABLE 1. Guiding Criteria for Capability Classes in Saskatchewan

Class	Degree of Limitations	Range of Adaptability	Productivity*	Other Characteristics
1	No significant limitations.	Wide range of field crops.	Moderately high to high, 20-25 bu/acre (30.0 to 35.0 bu/acre)**	Deep, well drained, good water holding capacity. Natural high fertility.
2	Moderate limitations due to climate, soil or landscape.	Fairly wide range of field crops.	Moderately high to high, 15.5-20 bu/acre (24.0 to 30.0 bu/acre)**	Good water holding capacity. Natural high fertility or highly responsive to fertilizer.
3	Moderately severe limitations due to climate, soil or landscape.	Moderate range of field crops.	Medium to moderately high, 11.0 -15.5 bu/acre (19-24 bu/acre)**	Limitations adversely effect the timing and ease of tillage, planting, harvesting, and application of conservation practices.
4	Severe limitations due to climate, soil or landscape.	Narrow range of field crops.	Low to medium 9.0-11.0 bu/acre (13-15 bu/acre)**	The high incidence of low yields or disastrous failures suggests that some of these soils be removed from continued cultivation.
5	Serious soil or landscape limitations make them unsuitable for the production of annual crops.	Suited for the production of adapted grasses and legumes.	Moderately high to high, >160 lbs. T.D.N. per acre or carrying capacity <3 acres per cow month.+	Soils within this class are responsive to improvement practices through the use of farm machinery. Improvement of 25% of an area can double the carrying capacity.
6	Very serious soil or landscape limitations restrict their use to native grazing.	Suited only to native pasture.	Low to moderate <160 lbs. T.D.N. per acre of carrying capacity or >3 acres per cow month.+	Soils in this class are not responsive to improvement practice.
7	Prevent agricultural use.	Unsuited for agricultural use.	Non productive.	Bodies of water, townsites, parks, airports, railroads.

* Estimated productivity of arable Classes 1-4 is expressed in terms of long-time (1932-1961) average wheat yields in bu/acre.

** Estimated potential productivity.

\+ Estimated forage productivity. T.D.N. = Total Digestible Nutrients.

By following the above procedure the reader can interpret any area on the map. He is now in a position to determine the best use which can be made of the land available to him. If the use is to be for agricultural purposes there are many other factors which also must be considered, some of which are the type of farming, e.g. grain, livestock, mixed, etc., economic investment involved to develope the type of farming desired, economic gains expected from this expenditure, costs of preparing uncultivated lands for cultivation, type of seed, type of fertilizer, and so forth. However, every portion of land can be evaluated and every portion has an optimum use.

In summary the Muskeg Lake Reserve has a considerable acreage surrounding Paddling Lake and running north which is covered by muskeg and bog and is unsuitable for agricultural purposes. However, throughout the remainder of the Reserve there is a considerable acreage suitable for agricultural purposes.

Acknowledgments

The authors wish to acknowledge the assistance of firstly, Mr. K. Ayres, who with the assistance of Mr. G. Padbury, mapped the Muskeg Lake Reserve during the course of routine surveys carried out in 1965 and secondly Mr. J.A. Shields who evaluated the soil capability for agriculture.

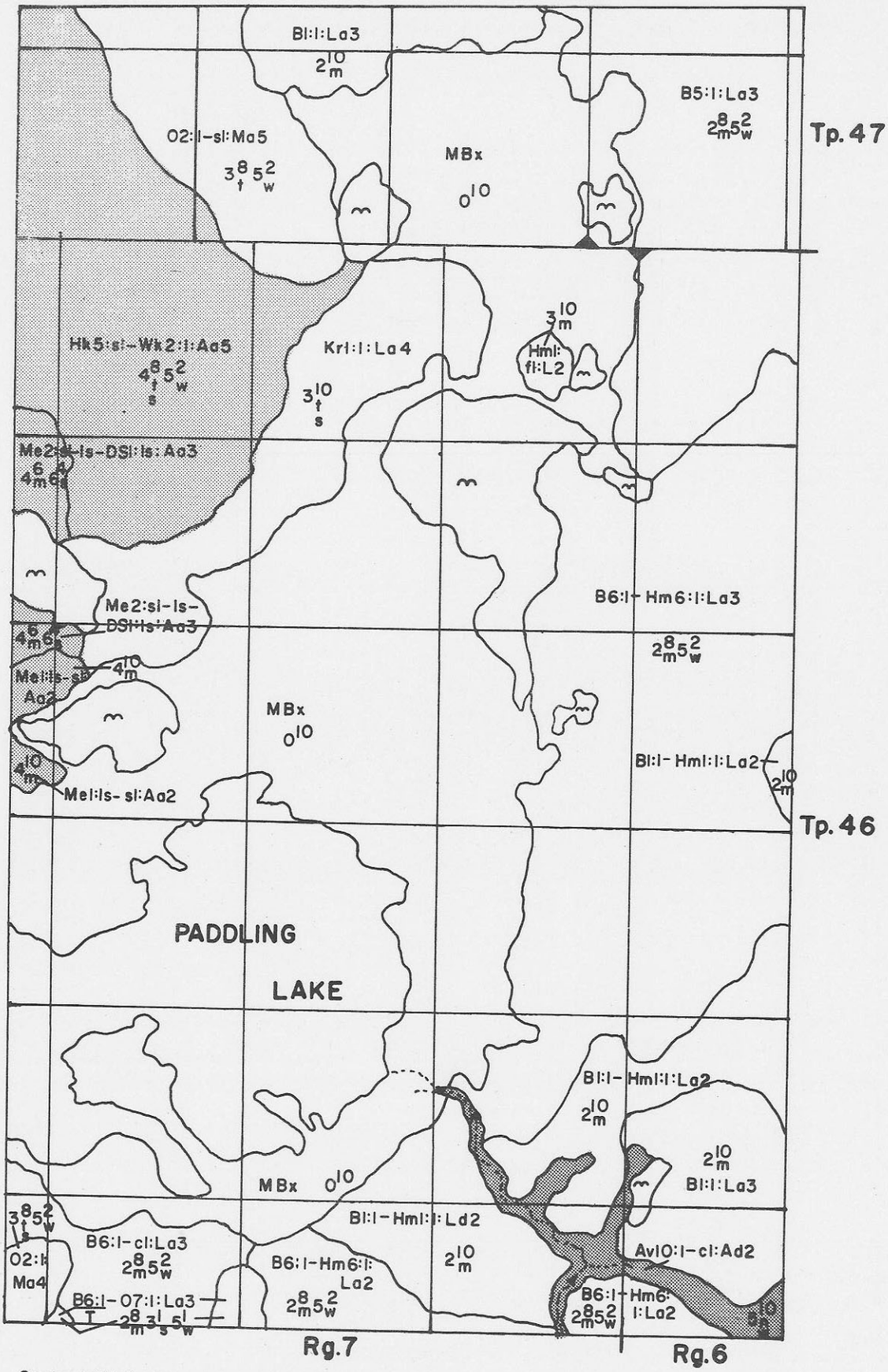
References

1. A Guide to Understanding Saskatchewan Soils. H.C. Moss. 1965. Saskatchewan Institute of Pedology Publication M1. Extension Publication 175. Distributed by Extension Division, University of Saskatchewan, Saskatoon.

2. A Guide to Soil Capability and Land Inventory Maps in Saskatchewan. Saskatchewan Institute of Pedology Publication M2, Department of Soil Science, University of Saskatchewan, Saskatoon, Sask. 1966.

3. Outline of the Canadian Soil Capability Classification for Agriculture. Issued by the National Soil Survey of Canada and Canada Land Inventory, A.R.D.A. June, 1964.

MUSKEG LAKE I.R. NO.102



Scale- 1.25 inches to 1 mile or 1:50,000

Saskatchewan Institute of Pedology 1966

Soil Association (Blaine Lake)

Landform (Glacial Lake Plain)- knoll and depression

Map Unit (No.1)

Bl:l:La3

Slope Class (2-5%

Textural Class (loam)

10 — 10/10 or 100%

Class 2 soil — 2 m

Limitation due to insufficient moisture holding capacity