

Soil Survey of the
Little Black Bear Reserve No. 84
H.B. Stonehouse, J.G. Ellis

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Little Black Bear Indian Reserve No. 84

Map Legend

Soils

Black Soils

- Oxbow - O - A group of dominantly Black Chernozemic soils developed on medium textured, calcareous glacial till.
- O5 - Dominant Orthic Black with significant Gleysolics.
- O8 - Dominant Orthic Black with a significant combination of Rego and Calcareous Black with significant Gleysolics.
- Oxbow-Whitewood - OWh - A group of dominantly Black Chernozemic soils, with significant Dark Gray Chernozemic soils, developed on medium textured, calcareous glacial till.
- OWh5 - Dominant Orthic Black with significant Orthic and Eluviated Dark Gray and significant Gleysolics.
- Whitesand - Ws - A group of dominantly Black Chernozemic soils developed on coarse to moderately coarse textured glacio-fluvial deposits.
- Wsl - Dominant Orthic Black.

Azonal Complexes

- Runway - Rw - A mapping complex of soils developed on variable deposits of glacial melt-water channels.

Textural Groupings and Classes

Textural Group	Textural Class
Coarse textured	Sands (s), loamy sands (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 (gs1) and gravelly loam (gl) are modifiers of textural classes.

Landforms

Name	Symbol	Description
Glacial Till Landforms		
Ground Moraine	Ga	Associated with glacial till deposits. Slopes near 0% to 5% with a pattern of knoll and depression without external drainage.
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-fluvial Landforms		
Outwash Plain	Fa	Nearly level or pitted (with kettles) without external drainage.
	Fd	As above with external drainage or glacial drainage channels.

Topography

Description	Symbol	Slope Class
Gently sloping or roughly undulating	3	2-5%
Moderately sloping or gently rolling	4	6-9%

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.

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

- s - accumulative adverse soil characteristics
- t - adverse topography
- w - excess water
- p - excess stoniness

Stone Classes

- St0 - Non-stony land.
- St1 - Slightly stony land - some stones which offer only slight to no hinderance to cultivation.
- St2 - Moderately stony land - enough stones to cause some interference with cultivation.
- St3 - Very stony land - sufficient stones to constitute a serious handicap to cultivation, some clearing required.
- St4 - Exceedingly stony land - sufficient stones to prevent cultivation until considerable clearing is done.
- St5 - Excessively stony land - too stony to permit any cultivation (boulder or stone pavement).

Map Symbols

-  Slough or depressional areas which are periodically flooded.
-  Drainage way, indicating direction of flow.
-  Soil boundary.

The Soils of the Little Black Bear Indian Reserve No. 84

(File Hills - Qu'Appelle Agency)

The Little Black Bear Reserve includes all or portions of Sections 13 to 30 inclusive, Township 23, Range 10; and Sections 13 to 16, and 21 to 28 inclusive, Township 23, Range 11. All this area is west of the 2nd Meridian.

Interpretation of Information on the Soils Map

A map and legend has been prepared and is incorporated into this report. The symbols which appear on the map can be interpreted by means of the legend, given on pages 1-3. 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 translate the symbols used on the map by means of the legend. An understanding of this procedure will enable the reader to interpret any area on the map.

In Section 22, Township 23, Range 10, West of the 2nd Meridian, the symbol sequence 05:l-sl-Wsl:s1:Ma4 is a short hand form for indicating the Soil Associations, the Map Units, the surface textures and the landform¹ respectively, 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 05:l-sl is interpreted as follows. The letter, O, is the symbol for the Oxbow Association which is described as a group of dominantly Black Chernozemic soils developed on medium textured, calcareous glacial till. The number 5 indicates the Map Unit in the Oxbow Association, namely 05, which is described as dominant Orthic Black with significant Gleysolics. The letter l is the textural symbol for loam and

the letters sl are the textural symbol for sandy loam. The combination of the two symbols indicates that the surface texture for the Oxbow soils in this area ranges from loam to sandy loam. The symbols l and sl are defined in the legend under the section Textural Class. Thus we now understand the sequence 05:l-sl.

In the same manner Wsl:sl is interpreted as follows. The letters, Ws, are the symbol for the Whitesand Association which is described as a group of dominantly Black Chernozemic soils developed on coarse to moderately coarse textured glacio-fluvial deposits. The number l indicates the Wsl Map Unit which is described as dominant Orthic Black. The letters sl are the textural symbol for sandy loam.

It will have been noted that the edit 05:l-sl-Wsl:sl 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 Oxbow 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 Ma4. The letters Ma are a symbol for the landform which in the legend is described as glacial till moraine having a knob and kettle pattern with frequent to many sloughs and ponds. The number 4 is the symbol for the slope class which is defined under the heading Topography in the legend, and refers to a moderately sloping or gently rolling landform with slopes between 6 and 9%.

Another set of symbols in the 05:l-sl-Wsl:sl:Ma4 area is St4-5. This is an edit to describe the presence of stones where they are in excess of amounts

normally associated with glacial till areas. By referring to the Stone Classes in the legend we conclude that this area is exceedingly to excessively stony, and parts of the area cannot be cultivated without considerable clearing of stones; other portions are too stony to permit cultivation.

The third 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 $5^4 p^4 m^4 5^2 w$ 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 number is 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 $5^4 p$ means that 40% of the area has serious limitations due to stones and is suited only to permanent pasture. Likewise $4^4 m$ means that 40% of the area has severe limitations due to the droughty characteristics of the soils or their lack of ability to store or hold moisture for crop growth. Finally $5^2 w$ means that 20% of the area 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 $5^4 p^4 m^4 5^2 w$ that this area, due to the large number of stones, is probably best left as permanent pasture. It is quite likely, however, that this area could be improved to make better pasture.

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 Little Black Bear Reserve are a slight modification of the Capability Classes being used in Saskatchewan under the Canada Land Inventory Program². These classes were established by the National Soil Survey Committee and published in the

report of the Work Planning Conference³ 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. The following table is presented to explain what is meant by the degree of limitations. The reader will appreciate that this table is too large to include in the legend.

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 develop 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 Little Black Bear Reserve has considerable acreage which if cleared and broken could be developed for the production of cereal crops or forage.

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References

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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.

