

Soil Survey of the
Red Pheasant Indian Reserve No. 108

R.G. Button, H.B. Stonehouse

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Location

The Red Pheasant Reserve, located about 20 miles south of the city of North Battleford, includes an area of approximately 24,500 acres. (All or portions of Sections 7 to 11, 14 to 23, and 26 to 35 in Township 40, Range 15, Sections 11 to 14, 23 to 26, 35 and 36 of Township 40, Range 16, Sections 1 and 2 and 11 to 14 of Township 41, Range 16 and Sections 2 to 11 and 15 to 18 of Township 41, Range 15, all west of the 3rd Principal Meridian).

MAP LEGEND

The series of symbols which appear within each area, separated on the map by a soil boundary, are interpreted by means of the map legend.

There may be terms in the legend which are unfamiliar to the reader. The booklet, "A Guide to Understanding Saskatchewan Soils"¹, will familiarize the reader with the terms used. To properly interpret the legend it is essential that the above-mentioned booklet be used as a reference.

Soils

Dominantly Black Chernozemic Soils

- Blaine Lake - Dominant Black Chernozemic soils developed on medium to moderately fine textured, moderately calcareous, silty, glacio-lacustrine deposits.
- B1 - Dominant* Orthic Black.

*Series which are Dominant occupy over 40% of the Map Unit.

- Hamlin - Dominant Black Chernozemic soils developed on medium to moderately fine textured, sandy glacio-lacustrine deposits. Hm/T - shallow deposits (less than 4 feet) overlying glacial till.
- Hml - Dominant Orthic Black.
- Meota - Dominant Black Chernozemic soils developed on coarse to moderately coarse textured, sandy glacio-fluvial and glacio-lacustrine deposits.
- Mel - Dominant Orthic Black.
- Oxbow - Dominant Black Chernozemic soils developed on medium to moderately fine textured, calcareous, glacial till.
- 01 - Dominant Orthic Black.
- 05 - Dominant Orthic Black with a significant** occurrence of undifferentiated Gleysolic soils.
- 09 - Dominant Orthic Black with significant carbonated or saline Chernozemic soils.
- Whitesand - Dominant Black Chernozemic soils developed on coarse to moderately coarse textured glacio-fluvial deposits.
- Wsl - Dominant Orthic Black.

Dominantly Dark Gray Chernozemic Soils

- Whitewood - Dominant Dark Gray Chernozemic soils developed on medium to moderately fine textured, calcareous, glacial till.
- Whl - Dominant Orthic Dark Gray.

** Series which are Significant occupy over 15% of the Map Unit but less than 40%.

- Shellbrook - Dominant Dark Gray Chernozemic soils developed on medium to moderately fine textured, slightly to moderately calcareous, sandy glacio-lacustrine deposits.
- Sb1 - Dominant Orthic Dark Gray.
- Sb2 - Dominant combination of Dark Gray Wooded and Dark Gray Chernozemics.

Dominantly Podzolic Soils

- Waitville - Dominant Podzolic soils developed on medium to moderately fine textured, calcareous, glacial till.
- Wv2 - Dominant Orthic Gray Wooded with a significant occurrence of undifferentiated Gleysolic soils.
- Wv4 - Dominant Orthic Gray Wooded with significant Orthic Dark Gray Wooded.
- Wv5 - Combination of Orthic Dark Gray Wooded and Orthic Gray Wooded with a significant occurrence of undifferentiated Gleysolic soils.
- Wv6 - Dominant Orthic Dark Gray Wooded with a significant occurrence of undifferentiated Gleysolic soils.

Miscellaneous Soils

- Dune Sand - Dominant Regosolic soils developed on coarse textured aeolian or wind-worked fluvial-lacustrine deposits.
- DS1 - Dominant Orthic Regosol.
- Hillwash - Hw - A mapping complex of Regosolic and weakly developed Chernozemic and Podzolic soils developed on variable deposits of valley slopes and eroding escarpments.

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 (gsl) and gravelly loams (gl) are recorded where present.

Landforms

| Name | Symbol | Description |
|------------------------------------|--------|---|
| <u>Glacial Till Landforms</u> | | |
| Moraine | Ma | Gently to strongly rolling moraine with a knob and kettle pattern having no external drainage. |
| Ground Moraine | Ga | Gently to roughly undulating ground moraine with a pattern of knoll and depression without external drainage. |
| <u>Glacio-Fluvial Landforms</u> | | |
| Outwash Plain | Fa | Moderately rolling, kettled or pitted plain without external drainage. |
| | Fd | Strongly sloping plain with external drainage or glacial drainage channels. |
| <u>Glacio-Lacustrine Landforms</u> | | |
| Glacial Lake Plain | La | Undulating or rolling plain of knolls and depressions without external drainage. |
| <u>Glacio-Alluvial Landforms</u> | | |
| Glacial Lake Delta | Ae | Gently rolling to strongly rolling aeolian plain having no external drainage. |

Topography

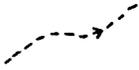
| Description | Symbol | Percentage Slope |
|--|--------|------------------|
| Gently sloping or roughly undulating | 3 | 2-5%* |
| Moderately sloping or gently rolling | 4 | 6-9% |
| Strongly sloping or moderately rolling | 5 | 10-15% |
| Steeply sloping or strongly rolling | 6 | 16-30% |

* A 2% slope means a rise or fall of 2 feet for every 100 feet of horizontal distance.

Other Map Symbols



Slough or depressional area which is periodically flooded.



Drainage way indicating direction of flow.



Soil boundary.



Township corner.

Tp

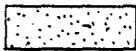
Township.

Rg

Range.



Not suitable for grain production.



Marginal for grain production.

SOIL CAPABILITY FOR AGRICULTURE

| Class | Soil Capability for Agriculture |
|-------|--|
| 1 | No significant limitations. |
| 2 | Moderate limitations. |
| 3 | Moderately severe limitations. |
| 4 | Severe limitations. |
| 5 | Serious limitations - not suitable for annual crops but suitable for improved pasture. |
| 6 | Very serious limitations - suited only for permanent pasture. |

Kind of Limitations

Soil limitations - caused by unfavorable soil characteristics.

m - insufficient soil moisture holding capacity.

d - poor structure and/or permeability.

n - excessive soil salinity.

s - unfavorable soil characteristics. This subclass is used in a collective sense in place of subclasses m, d, f, and n where more than two of them are present or where two of these limitations are present in addition to some other limitation.

Landscape limitations

t - unfavorable topography.

w - excess water - applied to soils where excess water, apart from inundation, is a limitation in their use for agriculture.

e - erosion damage.

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 affect 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. | | 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. | | Soils in this class are not responsive to improvement practice. |
| 7 | Prevent agricultural use. | Unsuited for agricultural use. | | 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.

THE SOILS OF THE RED PHEASANT INDIAN RESERVE NO. 108

Interpretation of the Soil Symbol Sequence

The sequence of the soil symbols given for each area reported on the map is always arranged in the following order: Soil Association and Map Unit:Texture:Landform:Percentage Slope. An illustration of this is the symbol sequence 09:1:Ga3 which occurs in Section 17, Township 40, Range 15.

The letter O represents the abbreviation for the Oxbow Association described in the legend as "Dominant Black Chernozemic soils developed on medium to moderately fine textured calcareous glacial till deposits". Medium to moderately fine textural groups are dominantly loam and clay loam textural classes. The number 9 indicates a Map Unit in the Oxbow Association, namely 09, which is described as "Dominant Orthic Black with significant carbonated or saline Chernozemic soils". The letter 1 represents the specific textural class of the surface soil, namely loam. The letters Ga described under the heading "Landforms", signify a gently to roughly undulating ground moraine with a pattern of knoll and depression without external drainage. The topography in the area is indicated by the number 3, defined in the legend as slopes ranging from 2-5%.

It will be noted that the soil symbol sequence in certain areas contains two or more Associations and their Map Units, as in Section 30, Township 40, Range 15 where the symbols 01:1-Ws1:s1-Wv2:f1 represent Oxbow, Whitesand and Waitville Associations and their Map Units. Where two or more Associations and their Map Units occur in the one sequence, the first mentioned Association is dominant. The reason that some areas are indicated as a complex, 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.

Interpretation of Soil Capability² Symbol Sequence

Each area separated on the map (by a soil boundary), contains not only the soil symbol sequence already described, but also a capability sequence. In the area containing the symbols 09:1:Ga3 the symbols $2_m^8 5_n^2$ occur and are interpreted as follows. The lower numbers indicate the capability class, the small letters indicate the "limitations" or adverse soil features which relegate the soil to its particular capability class. The upper numbers indicate the percentage of the soil area designated to a specific capability class. By referring to the heading in the legend designated as "Soil Capability for Agriculture", it can be seen that $2_m^8 5_n^2$ describes an area of 80% Class 2 soil, which has moderate limitations due to insufficient moisture holding capacity (m), and 20% Class 5 soil which has limitations due to excessive soil salinity (n). It can, therefore, be concluded that this area of gently sloping Oxbow loam, except for some low lying areas which may contain saline soils, is suitable for the production of annual crops.

EVALUATION OF THE AGRICULTURAL POTENTIAL OF THE RED PHEASANT INDIAN RESERVE

An evaluation of the agricultural potential may be made of any portion of the map area by interpreting the map symbols by means of the legend.

The area of the best potential is the small area of Oxbow-Blaine Lake (O-B) which occurs in Sections 7, 8, 17 and 18 of Township 40, Range 15. This is an area of 375 acres of Class 2 soils which are well suited to the production of annual crops. An area of slightly lower potential is an area of Oxbow (O) which occurs in Sections 17 and 20 in Township 40, Range 15. This is an area of approximately 250 acres of dominantly Class 2 soils containing small areas of Class 5 soils, the latter being suited to adapted grasses and legumes.

Other areas which are also suited to the production of cereal crops are areas containing one or more of the following: Waitville (Wv), Whitewood (Wh),

Oxbow (O), Shellbrook (Sb), Hamlin (Hm), Whitesand (Ws) or Blaine Lake (B), located in Sections 18, 19, 22, 23, 26 to 29 and 31 to 35 in Township 40, Range 15, Sections 2 to 8 in Township 41, Range 15, and Sections 11 to 14, 23, 25 and 36 in Township 40, Range 16. These areas cover a total of approximately 8,000 acres and are rated as dominantly Class 3 soils with some areas containing approximately 20 percent Class 5 soils due to excess wetness. These soils while not as good as the Class 2 soils previously mentioned are still suitable for grain production.

Other areas which could be utilized for grain production but which do not have as high a potential as the ones previously mentioned are the areas of Oxbow-Whitesand (O-Ws) and Oxbow-Whitesand-Waitville (O-Ws-Wv) located in Sections 8 to 10, 15 to 22 and 28 to 31 in Township 40, Range 15 and Sections 13, 23 to 26, 35 and 36 in Township 40, Range 16. These areas cover approximately 8,200 acres of which approximately 60 percent is Class 3 soil and suitable for grain production. The remainder is approximately half Class 4 and half Class 5, of which the Class 4 soils probably could be developed for forage production.

The area of Waitville-Whitewood-Oxbow (Wv-Wh-O) located along the bottom of Township 41, Range 6 is an area of about 1,000 acres in extent and is composed of dominantly Class 4 soils. This area should not be considered for grain production as it is better suited to the production of forage crops.

The remainder of the reserve, which is all the shaded areas on the map, is made up of various soils on generally very rough topography. These soils are rated as Class 5 and 6 soils and as such should be left as pasture.

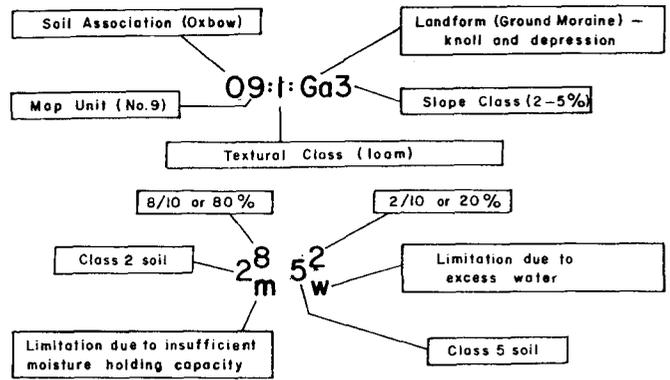
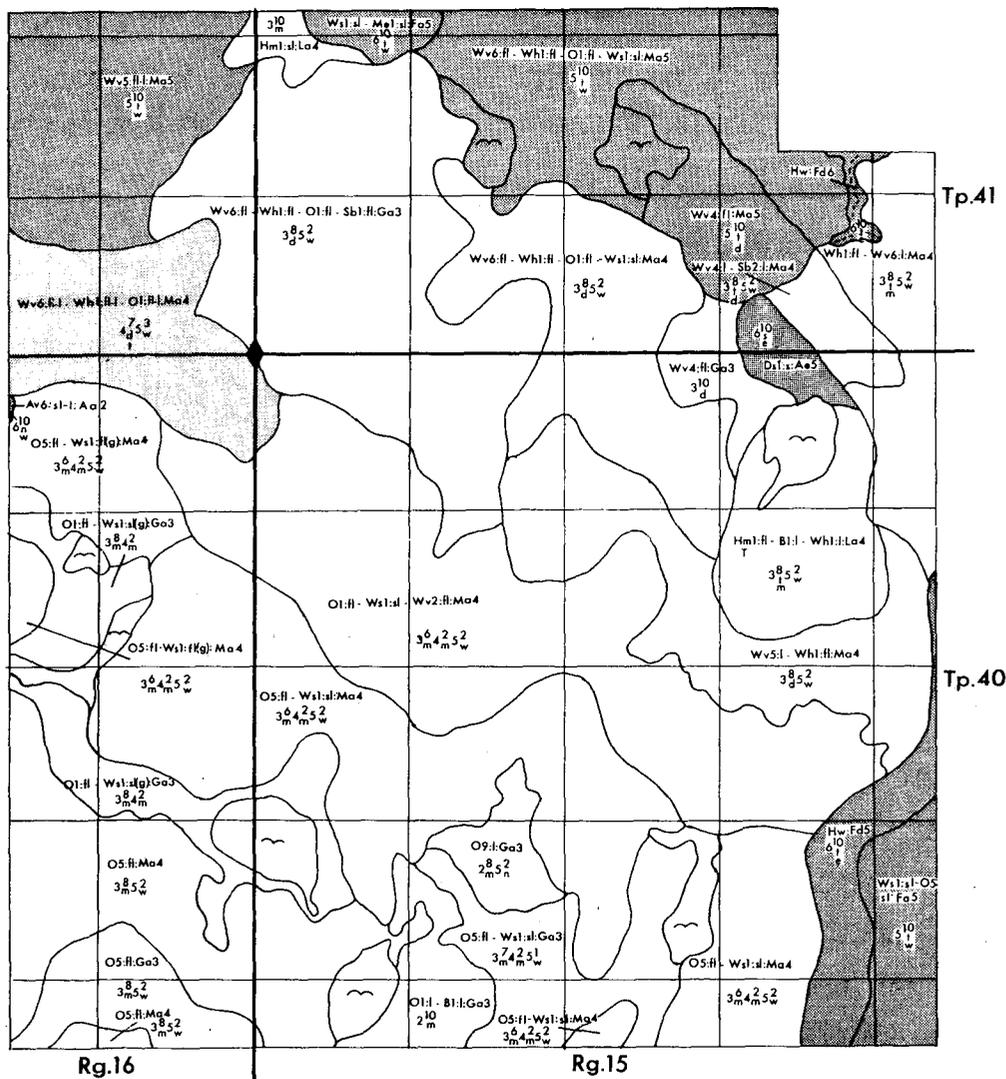
Acknowledgments

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References

1. A Guide to Understanding Saskatchewan Soils. H.C. Moss. 1965.
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2. A Guide to Soil Capability and Land Inventory Maps in Saskatchewan.
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Scale - 1.25 inches to 1 mile or 1:50,000

Saskatchewan Institute of Pedology

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