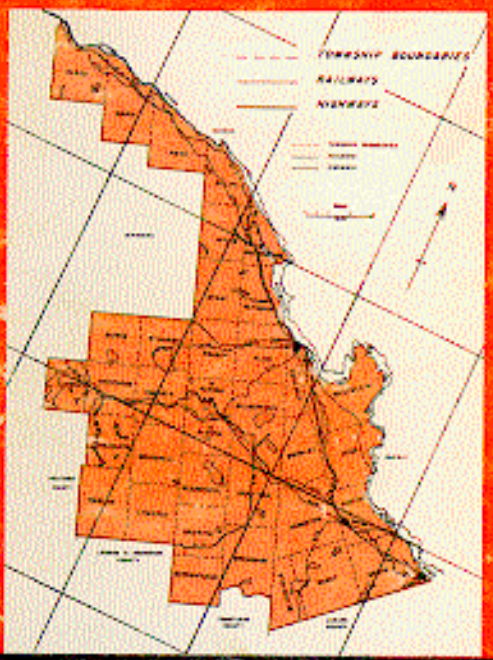
SOIL SURVEY OF

RENFREW COUNTY

Report No. 37 of the Ontario Soil Survey



Prepared jointly by The Research Branch,
Canada Department of Agriculture and the Ontario Agricultural College

ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO
CANADA DEPARTMENT OF AGRICULTURE, OTTAWA

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of

Renfrew County

by

J. E. Gillespie
R. E. Wicklund
Research Branch, Canada Department of Agriculture

and

B. C. Matthews
Ontario Agricultural College
Guelph, Ontario

REPORT No. 37 OF THE ONTARIO SOIL SURVEY
1964

SOIL SURVEY MAPS AND REPORTS
PUBLISHED BY COUNTIES

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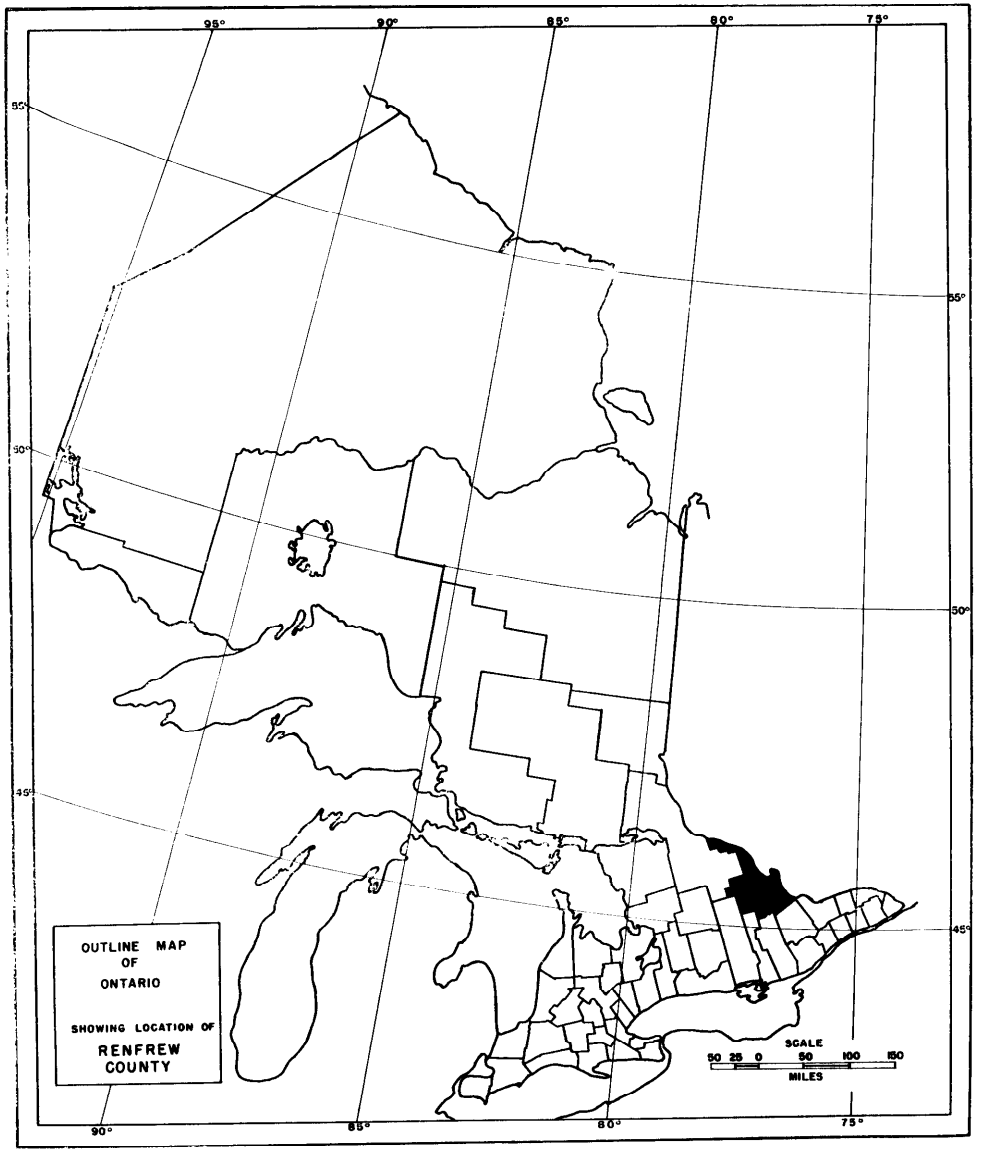


Outline Map Showing Location of County

The Soil Survey

of

Renfrew County

INTRODUCTION

This report on the soils of Renfrew County has been compiled from data gathered from the Reconnaissance soil surveys carried out over a number of years. The field data was recorded on National Topographic map sheets at a scale of one inch to one mile.

The agricultural portions of the county represent a northwestern extension of the Ottawa - St. Lawrence lowland and similarities in soil materials and soil development extend over this entire plain. Some of the clay soils in Renfrew tend to show a more strongly leached appearance than the clays in the lower Ottawa Valley and are classed as Gray Wooded. General farming utilizing both dairy and beef breeds of cattle, is the main enterprise as in the entire lowland section.

Because of their limited occurrence within the county, some of the soil series that are described, and estimates of their agricultural suitability, may be dealt with more fully in the reports of other counties adjacent to Renfrew.

The soil map that accompanies this report shows the distribution of each soil series. The soil areas are shown in greater detail in the Ottawa Valley section of the map than on the Precambrian upland section where the land generally is unsuitable for agricultural enterprises and difficult of access.

Ratings of the individual soil series and of their suitability for agricultural crops are based on the properties of the soil and yield figures from experimental station and farm records. It is concluded that the agricultural potential of the valley portions of this county is greater than present production would indicate.

GENERAL DESCRIPTION OF THE AREA

Location and Extent

Renfrew County is located in the eastern part of Ontario, adjacent to the province of Quebec and separated from it by the Ottawa River. The county is bounded on the north and east by the Ottawa River, on the west by the District of Nipissing and a portion of Hastings County, and on the south by the counties of Lennox and Addington, Frontenac and Lanark.

The main agricultural region of this county is within the upper Ottawa Valley. More than half of the county is within the Precambrian Shield. The county is located between 45° and 46°15′ north latitude and 76°30′ and 78°00′ west longitude.

The county is divided into 25 townships which include a total of 1,925,760 acres.

Geology, Bedrock

The bedrock formations that lie within the boundaries of Renfrew County have been described in some detail in various geological reports. The agricultural sections of the county fall within a region that is designated as the "Ottawa - St. Lawrence Lowland[1]", and in which Renfrew County is a northwestern extension of this large lowland basin.

The Ottawa River flows through a section of rock formations that have been down-faulted in such a way as to produce a triangular-shaped valley with one point of the triangle extending towards Petawawa. Fault zones occur at or near the margin of the Precambrian Shield and occur also within the Palaeozoic deposits which occupy the basin.

In Renfrew County the Precambrian rocks occur principally to the west of the lowland basin, although a few outcrops occur also within the basin. These rock formations consist of crystalline limestones, gneisses, quartzites that have been intruded and metamorphosed by bodies of granite, syenite and other igneous rocks. This rock complex forms the boundary and underlies the Palaeozoic sediments which form the rock strata within the basin and outcrop along the border of the Precambrian in such locations as Eganville and Lake Clear. The Palaeozoic formations consist of limestone beds of considerable thickness. These have been quarried for many years as stone for construction purposes and for making lime.

The Eganville soil series which occurs within the basin of the Ottawa valley is underlain by Palaeozoic limestone rock outliers. Such an outlier occurs in Stafford township, west of the northern part of Muskrat Lake. Several quarries have been opened in this formation for building stone and for road material.

The rock strata that underlie the recent unconsolidated sediments is therefore extremely complex, and is the contributing cause of the complexity of the soil parent materials. The influence of the bedrock on soil materials is most pronounced in the Precambrian Upland and in the upland that adjoins the Precambrian and the Ottawa Valley Lowland. Outliers of Palaeozoic rocks occur in many places in the upland sections of some of the southern and southwestern townships, and alternate with the granite, gneiss and carbonate rocks of the Precambrian complex. Detailed soil surveys would probably show a good correlation between soil and

[1]Geology of the Ottawa - St. Lawrence Lowland, Geol. Surv. Can. Mem. 241, 1946.

rock types, except where the source material has been mixed by glacial action. The influence of carbonated rocks, whether of Precambrian or Palaeozoic origin, are of great importance in soil development and is reflected in the character of the soil body.

Surface Deposits and Soil Parent Materials

The bedrock geology of Renfrew County has been described in a previous section. It was noted that soil parent materials frequently show a good resemblance to the underlying bedrock. The more nearly the soil approaches a residual condition the better is the resemblance. Glacial tills are best in this respect, whereas the connection between water deposited materials and rock sources can only be implied from the nature of the material and its proximity to certain large geological formations.

Sand and gravel deposits that are devoid of carbonates are assumed to be derived from granitic or gneissic sources, whereas those containing carbonates will generally possess carbonate fragments that are large enough to identify with nearby limestone formations. Since carbonate rocks have a very potent influence on soil development, the presence of crystalline fragments or finely disseminated carbonates are carefully examined in every soil parent material. Their presence is readily identified by their effervescence with dilute hydrochloric acid solution.

In the Precambrian section of Renfrew County the presence of limestone outliers associated with gneissic and granitic rocks has added to the complexities of the glacial till deposits. Thus tills carrying limestone fragments may be distributed over areas that are at some distance from the solid limestone rock.

In the Ottawa basin there are a wide textural range of sediments, most of which were deposited during glacial times. Gravel and sand are most abundant in the Deep River, Petawawa and Pembroke areas and represent deltaic sediments laid down either in a lacustrine basin or in the Champlain Sea which was a large gulf of the ocean that extended up the St. Lawrence and Ottawa valleys towards the close of the glacial age. These sandy sediments are non-calcareous and non-basic.

Kames and eskers are abundant in the Westmeath area. The majority of these deposits contain crystalline limestone fragments. Their surfaces were modified by wave action in the lacustrine or marine basin, so that they tend to merge gradually with the surrounding clay plain.

The clay sediments are assumed to have been laid down in the waters of the Champlain Sea. Indications are that the waters of the sea were brackish in the Renfrew area and that they became fresh at Pembroke to the northwest, and normal marine to the east of Arnprior*. In some portions of the valley, the clay beds have been found by well borings to have a maximum thickness of 264 feet and becoming thinner as they approach the Precambrian upland towards the west. The soil development on these clay sediments is the same over the entire basin except where it has been affected by post glacial and recent drainage. The clay has a uniform composition and the general absence of disseminated lime carbonate would seem to indicate that most of it was derived from the glacial sediments of the Precambrian uplands or from other valley basins to the northwest.

There is a general absence of recent deposits such as alluvium. Rivers such as the Ottawa, Bonnechere and Madawaska have cut channels in the clay plain

*Goldring, Winifred: The Champlain Sea; New York State Mus. Bull., Nos. 239-240, 1922.

but have not built alluvial terraces. Organic deposits are fairly abundant in the Westmeath area and in the vicinity of the Snake River in Stafford township and occur in small areas over the entire Precambrian upland.

Relief and Drainage

The physiography of the county is controlled to a major extent by the bedrock. Some variability in local relief is caused by glacial deposits but in general they are too thin to influence the relief over any large area.

Two major physiographic divisions occur in Renfrew County, and are designated as the Precambrian Upland and the Ottawa Lowland. The Lowland constitutes the graben of downfaults within the Precambrian complex and in which marine and lacustrine sediments have accumulated. This lowland consists of extensive and level clay plains that extend intermittently from Arnprior in the south to Pembroke in the north. The plain-like nature of the Lowland is interrupted by rocky promontories which are outliers of Palaeozoic rocks, or isolated segments of the Precambrian complex. In general the level of the clay plain lies at an elevation of 400 feet above sea level. The rock promontories rise suddenly to altitudes of 500 to 600 feet with the exception of the one near the town of Renfrew which has an altitude of 700 feet above sea level.

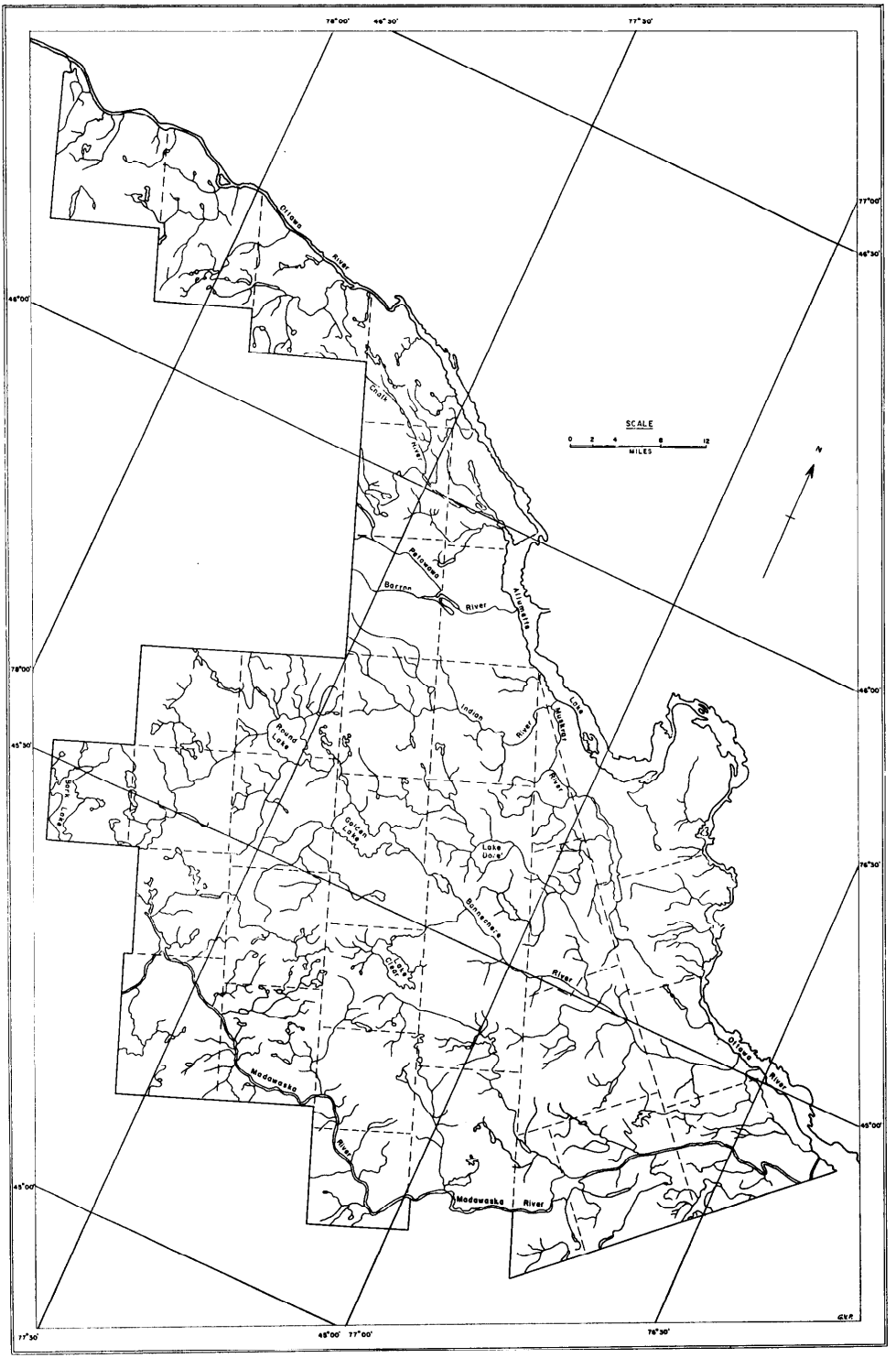
The relief of the Precambrian upland, in its major aspect, is monotonously even, but has a considerably varied local relief. The entire area is dotted with small rock knobs and small lake basins, the latter being connected by narrow stream channels. In the southern portion of the county the elevation of the upland ranges between 500 and 700 feet above sea level and in the north and westerly portions between 1,000 and 1,500 feet. The drop in elevation from the upland to the lowland is gradual and precludes any impressions of mountainous relief.

The surface drainage is provided by a number of rivers, which rise in the Precambrian upland and flow in a southeasterly direction. The Ottawa River is the major stream, which in its course gathers the waters from all the rivers and streams that flow from this region of the Precambrian. The Madawaska River drains the major portion of the southern Upland region. It rises in Algonquin Provincial Park and is connected to the numerous lakes around Barry's Bay. It turns eastward along the southern border of the county, cuts across the clay plain and joins the Ottawa River at Arnprior.

The Bonnechere River is farther north and its direction is roughly parallel to that of the Madawaska. This river drains the Precambrian region that includes the basins of Round Lake and Golden Lake. It traverses a much longer distance within the clay plain than other branches of the Ottawa and joins the Ottawa River east of Renfrew.

The more northerly parts of the county are drained by numerous streams of which the major one is the Petawawa River. This river throughout most of its length parallels the Ottawa River and cuts across the Lowland plain at Petawawa.

Only one major stream has developed within the Ottawa Lowland. This is the Snake River, which rises in Lake Dore and eventually empties into Muskrat Lake. The waters from this lake flow northward and enter the Ottawa River south of Pembroke.



Outline Map Showing Drainage

Climate

Most of the agricultural part of the county lies within a climatic zone that is referred to as the Renfrew climatic region*. The upland is designated as the Algonquin Park Region.

In the Renfrew region the mean annual temperature varies from 39 to 41°. The winters are cold with an average temperature for the season of 13°; summer temperatures range from 64 to 66°. The mean spring season temperature is 39 to 40° while fall temperatures are 44 to 45°. The extremes of temperature are —40 and 103°. The mean daily range is 22°. The growing season begins April 16 or 20 and ends October 21 or 25 for a total of 185 to 190 days.

The range of yearly precipitation is from 26.3 to 33.4 inches. It is much drier near Renfrew than at Pembroke.

The Algonquin Park region is the coldest and latest growing region in Southern Ontario. The average frost-free period is 78 to 120 days with the possibility of killing frost occurring in any month of the year.

TABLE 1

AVERAGE MONTHLY TEMPERATURE AND PRECIPITATION FOR SELECTED STATIONS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average temperatures (°F)													
Pembroke	12	14	26	41	54	64	69	66	59	46	33	17	42
Renfrew	11	12	24	40	54	64	68	65	57	45	32	16	41
Killaloe	11	12	25	40	53	63	66	64	55	46	33	18	40
Ottawa	14	15	28	42	56	65	70	67	59	49	35	18	43
Average precipitation (inches)													
Pembroke	2.3	2.0	2.3	2.2	2.9	3.3	3.5	2.9	3.5	3.0	3.2	2.5	33.4
Renfrew	2.1	1.7	1.9	1.9	2.5	2.8	2.6	2.4	2.6	2.3	2.1	1.8	26.5
Killaloe	1.8	1.6	1.8	1.9	3.1	2.3	3.1	2.6	2.9	2.1	2.2	2.1	27.3
Ottawa	3.2	2.3	3.2	2.9	3.1	2.9	3.3	3.2	3.4	2.3	2.9	4.0	36.7

TABLE 2

FROST DATA FOR SELECTED STATIONS

	Frost-free Period (days)	Last Frost Spring	First Frost Fall
Pembroke	132	May 16	Sept. 25
Renfrew	125	May 18	Sept. 20
Killaloe	103	May 29	Sept. 9
Ottawa	149	May 7	Oct. 3

Agricultural Development

The early settlement of Renfrew County began around the turn of the 19th century. The United Empire Loyalist immigrations did not extend this far north. Scatterings of settlements were established at Golden Lake, Lac des Chats and at Fort Coulonge, composed of fur traders and those employed in the lumber industry.

*Putnam and Chapman, L. J. The Climate of Southern Ontario. Sci. Agr. No. 8. 1938.

Around 1870 or shortly thereafter, the only access to the county was by canoe via the Ottawa River. The Muskrat lakes were used as portage routes to avoid the Calumet rapids and the treacherous portions of the river between Lac des Chats and Coulonge Lake. This inland route led to the establishment of villages such as Beachburg which was founded in 1840 and Cobden in 1849.

In the early days of settlement this region was designated as Bathurst district, which included most of what is now Renfrew and Lanark counties. Renfrew County was organized in 1850 with an area of 400,586 acres, comprising 14,656 acres of cropland and 6,584 acres of pasture. By the middle of the century settlements had become well established along the Bonnechere River in McNab Township and had spread as far north as Pembroke along the navigation route.

Lumbering was the principal industry and most of the population was employed in the lumber trade. The lumber firms acted as a good incentive in opening up the country agriculturally, and as the lumber camps receded from the more settled localities, some of the firms found it advisable to establish farms in these rearward sections, and farmers at all times found ready sale for their produce, particularly oats and hay.

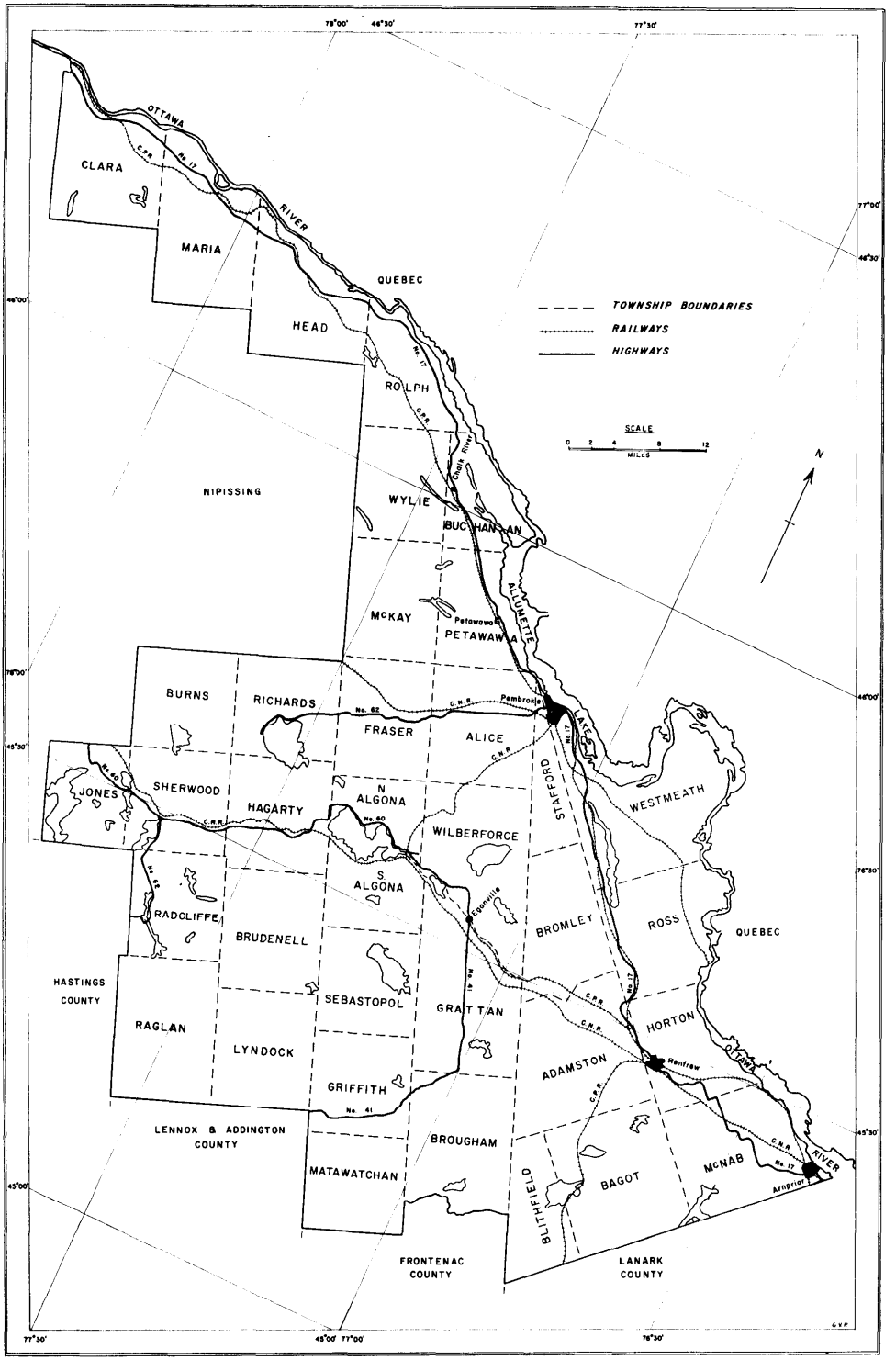
From 1850 settlements increased at a rapid rate. The census of 1851-2 showed a population of 9,415 and ten years later 20,325. Local industries such as breweries, tanneries and some factories had been started.

The country along the Ottawa River west and north of Pembroke was settled after 1840 by Irish settlers. In this locality cultivation was confined to the "intervals" or alluvial lands in the river beds. Here as elsewhere the lumbering industry was the principal source of income. Tree species such as red and white pine, tamarack, birch, maple and elm were commonly used by the building trades. The principal crops raised by farmers were oats and hay and were purchased by the lumber camp operators.

At the present time the agricultural sections of Renfrew County are located mainly in the townships of Admaston, Bromley, McNab, Pembroke, Ross, Stafford, Westmeath and Wilberforce. These township areas all occur within the Ottawa valley lowland between Pembroke and Arnprior. Approximately 20 to 30 per cent of the area in each township is devoted to the production of field crops. Wheat, oats and barley constitute the principal varieties. Hay and pasture acreages are nearly equal, and both equal the area that is devoted to field crops. The township of Horton which lies partly in the Ottawa valley section, has a relatively small area in field crops. Pasture and cultivated hay occupy about the same acreage as that found in adjacent counties.

For Renfrew County as a whole, the income derived from forest products exceeds that from farm crops. In this respect Renfrew ranks first among the counties in the province.

The livestock population is not large when compared with that of many other counties in the province. The townships that have the greatest numbers of cattle are Admaston, Bromley, McNab, Ross, and Westmeath. This distribution of livestock is related to the large areas of clay soils such as the Renfrew and Ste. Rosalie soil series which are utilized to a large extent for the production of hay and pasture. Both dairy and beef breeds of cattle are represented. Milk cows constitute about one-third of the total number.



Sketch map showing townships, railways, main towns and villages.

THE CLASSIFICATION AND DESCRIPTION OF THE SOILS OF RENFREW COUNTY

The surface deposits previously described are the parent materials from which the soils have developed. Differences in the kind of soils are due to variations in the parent materials as well as to variations in natural drainage and vegetation.

A cool, humid climate and forest vegetation tend to produce acid soils. The acidity develops as the result of the leaching of bases, particularly calcium, from the surface layers of the soil, by percolating water. Under the weathering process the soil develops layers or horizons which differ from one another in thickness, color, and structure and frequently in texture.

The vertical sequence of horizons in a soil is called the soil profile. In agricultural practice it is customary to refer to the different horizons as surface soil, subsoil and parent material. However, many soils have more than three horizons and it is convenient to use the specific pedological terms A, B, and C. Various letters and numerals are used to name the subdivisions of these major horizons and their definitions are given in the glossary appended to this report.

The A is the horizon of maximum weathering which through leaching has lost the greatest amount of bases. In many soils the A horizon can be subdivided into Ah and Ae. The Ah is a dark colored horizon that contains the highest amount of organic matter, whereas the Ae is the horizon with the lightest color. Some of the constituents (clay, iron, organic matter) leached from the Ah and the Ae accumulate in the B horizon. Hence the B is often finer in texture than other horizons in the profile. The C, sometimes referred to as parent material, is unaltered or only slightly altered by the soil forming processes.

GREAT GROUPS

One of the important units in soil classification is the Great Group. This unit contains a great many different types of soils, or soils that vary in texture and in drainage, but have other characteristics in common such as those that have been produced by the processes in soil development. The following illustrations and descriptions give the characteristics of the soils representing the Great Groups occurring in Renfrew County.

Grey-Brown Podzolic Profile:

Most of the well drained and moderately drained soils in the southern part of the county are classified in the Grey-Brown Podzolic Great Group. These soils have a dark grayish brown Ah horizon three inches thick and relatively high in organic matter. This is underlain by a yellowish brown Ae horizon which becomes lighter in color with depth. The Bt horizon is brown and commonly contains more clay than other horizons in the profile. Grey-Brown Podzolic soils occur exclusively on calcareous materials.

Brown Forest Profile:

The Brown Forest soils have developed in highly calcareous till materials. These soils have a very dark brown Ah horizon high in organic matter, and underlain by a brown B horizon containing some accumulation of sesquioxides and often some clay. Base saturation of the solum is 100 per cent.

Podzol Profile:

Podzol soils when they occur in forested areas have a leaf mat on the surface, but in cultivated areas this is incorporated with the mineral materials so that the surface horizon is similar to that of the Grey-Brown Podzolic. This is underlain by a gray or white Ae horizon 1 or 2 inches thick. The B horizon which contains concentrations of sesquioxides and organic matter, is readily divided into two, a reddish brown horizon followed by a yellowish brown horizon. These soils have developed from non-calcareous parent materials.

Grey Wooded Profile:

The Grey Wooded soils have a thin dark Ah horizon less than two inches thick underlain by a white Ae horizon. The B horizon is subdivided into an AB having white coatings over the brown blocky aggregates, and a Bt horizon. The aggregates in the latter are coated with dark grayish brown clay skins. Soil reaction ranges from a pH of 5.2 in the A horizon to pH 8.2 in the C. These soils have good to moderate drainage, and are developed on calcareous parent materials.

Humic Gleysol Profile:

The Humic Gleysol soils are poorly drained. They have a dark colored surface horizon, high in organic matter, and a gray colored subsoil containing yellow and orange mottling. In calcareous soil materials the free lime has been leached out to a depth of 18 inches or more.

In very poorly drained positions where the F-H horizon is thicker than 12 inches the soils are classified as Muck or Peat and are designated as Organic Soils.

Series, Types, Phases and Complexes

In the following section of the report the soils are described under the headings of series, types, phases, and complexes. They are named by series, for example, Eganville series and to which textural class names are added, for example, Eganville loam. The phase subdivisions are used to designate various classes of topography or stone. The complexes constitute combinations of two or more soil series, the names of the two dominant soil series being used to identify the complex.

CLASSIFICATION OF RENFREW COUNTY SOILS

Soil Key

A. Soils Developed on Glacial Till

I. Stony calcareous loam and sandy loam

	Great Group	Acreage
(a) Well drained		
1. Eganville loam	G.B.P.	57,350
Eganville loam — rocky phase	G.B.P.	10,350
Eganville loam — shallow phase	G.B.P.	5,650
2. Burnstown loam	G.B.P.	4,100
Burnstown loam — rocky phase	G.B.P.	1,400
Burnstown loam — shallow phase	G.B.P.	600
3. Tweed sandy loam	B.F.	17,700
Tweed — rock complex	B.F.	277,750
(b) Imperfectly drained		
1. Stafford loam	G.B.P.	1,000
(c) Poorly drained		
1. Lyons loam	H.G.	1,050

II. Stony non-calcareous sandy loam till

(a) Well drained		
1. Monteagle sandy loam	P.	16,700
Monteagle — rock complex	P.	959,900

B. Soils Developed on Clay Sediments

(a) Imperfectly drained		
1. Renfrew clay	G.W.	63,900
Renfrew clay — rocky phase	G.W.	24,000
Renfrew — sand complex	G.W.	54,400
2. Rideau clay	R.	10,300
Rideau clay — rocky phase	R.	500
Rideau clay — sand complex	R.	8,800
(b) Poorly drained		
1. Ste. Rosalie clay	H.G.	33,500

C. Soil Developed on Non-calcareous Sands

(a) Well drained		
1. Uplands fine sandy loam	P.	69,300
Uplands loamy sand	P.	107,600
Uplands loamy sand — rocky phase	P.	19,650
(b) Imperfectly drained		
1. Rubicon sandy loam	P.	11,500
(c) Poorly drained		
1. St. Samuel fine sandy loam	G.	2,900

D. Soils Developed on Calcareous Sands and Silts

	Great Group	Acreage
(a) Well drained		
1. Westmeath gravelly sandy loam	P.	15,050
(b) Poorly drained		
1. Granby sandy loam	H.G.	1,900
2. Osgoode loam	H.G.	1,900

E. Soils Developed on Sand Over Clay

(a) Well drained		
1. Manotick sandy loam	P.	4,500
(b) Imperfectly drained		
1. Mountain sandy loam	P.	7,500
(c) Poorly drained		
1. Allendale fine sandy loam	G.	500

F. Soils Developed on Coarse Gravelly Materials

I. Calcareous

(a) Well drained		
1. White Lake gravelly sandy loam	P.	20,900
2. Kars gravelly sandy loam	P.	2,200

II. Non-calcareous

(a) Well drained		
1. St. Peters gravelly sandy loam	P.	19,900
2. St. Peters gravelly sandy loam — rocky phase	P.	1,400

G. Soils Developed on Organic Materials

(a) Very poor drainage		
1. Muck	O.	33,100
2. Peat	O.	1,650
3. Marsh	—	6,450

H. Soils Developed on Shallow Calcareous Till Over Limestone Bedrock

(a) Variable drainage		
1. Farmington loam	B.F.	9,000

I. Miscellaneous Mapping Units

1. Rockland	17,000

Abbreviations

G.B.P.	Grey-Brown Podzolic
G.W.	Grey Wooded
P.	Podzol
B.F.	Brown Forest
H.G.	Humic Gleysol
G.	Gleysol
R.	Regosol
O.	Organic

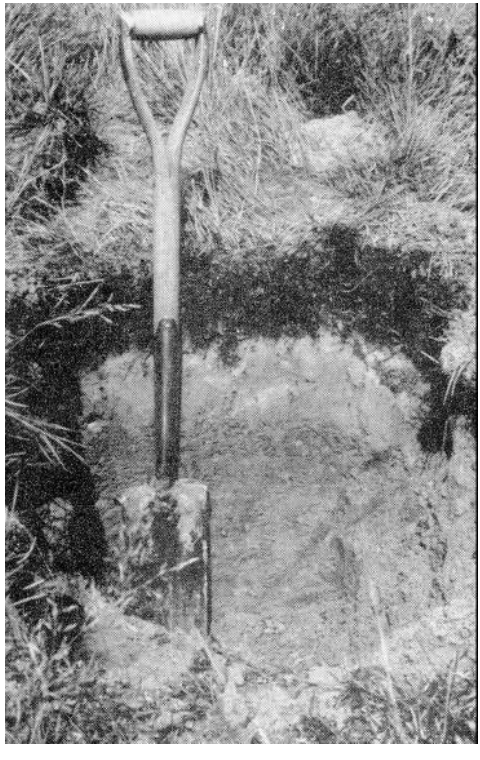
DESCRIPTION OF RENFREW COUNTY SOILS

ALLENDALE SERIES

The Allendale soils are poorly drained and consist of fine or medium sand overlying massive non-calcareous clay. The sands also are non-calcareous. The profile development of the Allendale series is typical of the Gleysols and the series is classified as an orthic Gleysol.

The plowed layer (Ap) is 6 to 8 inches thick and very dark brown in color. Soil reaction is slightly acid. This soil is very friable and easy to cultivate. The underlying subsoil layers are gray and there is generally a strongly mottled horizon (Bg) at a depth of two feet. This represents the position that the water table occupies during the spring and fall seasons. Clay underlies the sand at depths varying from 2 to 3 feet.

The Allendale soils have very limited use as agricultural soils. Buckwheat may be grown but pasture and hay are the main crops.



A typical soil profile of Allendale sandy loam. Note heavier textured material immediately below the gray layer.

BURNSTOWN SERIES

The Burnstown soils are mapped in the general area of the village of Burnstown and two additional areas, one at Germanicus and the other at Augsburg.

Soils of the Burnstown series are well drained Brunisolic Grey-Brown Podzolic soils formed under mixed forest. The parent material is weakly calcareous, loam to sandy loam till.

The soil profile consists of a very dark grayish brown sandy loam to loam surface horizon (Ah) about three inches thick. Below this is a strong brown friable sandy loam or loam horizon (Bf) that is five or six inches thick. The structure of this horizon is weak subangular blocky. This horizon changes gradually into 10 to 18 inches of light brown sandy loam (Ae), over a weakly expressed textural (Btj) horizon two or three inches in thickness. The underlying material (Ck) is slightly calcareous.

The Burnstown soils are used for general farming. They produce fair crops of grass and legume hay and fair crops of fall wheat and oats. In some areas stoniness is a problem and limits the amount of land under cultivation.

The Burnstown sandy loam is moderately acid in the surface and applications of lime are desirable for legumes. The soil has a moderate level of fertility and should receive supplements of nitrogen, phosphorus and potash for all crops.

Burnstown loam — rocky phase:

This soil unit includes small areas of the normal Burnstown soil, associated with outcrops of rock. The largest areas of rock-free soils are cultivated and are producing hay and grain whereas the small areas with frequent rock outcrop are used for pasture.

Burnstown loam — shallow phase:

This soil includes areas with thin till overlying bedrock. The limitation in the rooting zone and in the low moisture-holding capacity of the soil render these soils poor for agriculture.

EGANVILLE SERIES

The Eganville soils are mapped in the Eganville-Douglas region of Renfrew County. The series does not extend into adjacent counties but is confined to an area underlain by Ordovician limestone. The parent material is calcareous till derived from the Ordovician limestone of this area. They are well drained soils.

Eganville soils have slopes mostly between three and nine per cent but range from 2 to 12 per cent. These soils are found on ridge-top and side-slope positions as well as on irregular moderately sloping ground moraine.

The soil profile consists of a dark grayish brown loamy, friable surface horizon (Ah) three inches thick (uncultivated) underlain by an Ae horizon which can generally be spit into Ae_1 and Ae_2 horizons on the basis of colors. The underlying Bt horizon is five inches thick and contains transported clay and sesquioxides from the surface layers.

Eganville soils are among the best soils of the county. The crops grown mainly for livestock feeding are legume hay, oats and ensilage corn.

A landscape showing moderately of Eganville loam.

Eganville loam — rocky phase:

The Eganville soil materials were carried and deposited over rough Precambrian areas filling the spaces between rock knobs and such areas have been mapped as rocky phases of Eganville. Soil characteristics are similar to the Eganville soils but the rocky outcrops restrict cultivation to small, infrequent areas and the phase is utilized chiefly as pasture.

Eganville loam — shallow phase:

The depth of glacial till over limestone bedrock in some areas ranges between one and two feet. These soils have been mapped as shallow phases of the Eganville soils. The shallowness to bedrock is the limiting factor in crop growth and reduced yields result from lack of moisture during dry periods.

FARMINGTON SERIES

The Farmington series is the name applied to those soils that have a thin mantle of glacial till material over limestone bedrock. This loamy material is usually derived from the underlying rock and ranges from 1 to 12 inches in thickness. The Farmington soil area is characterized by rock ledges that alternate with soil at frequent intervals.

The expression of soil development is weak, and the profile when present, consists of a dark colored surface horizon (Ah) followed by a brown subsoil (Bm) that extends to the bedrock (IICk).

Farmington loam is used for pasture

The topography is mainly level. These soils are unsuitable for cultivation because they are shallow and droughty. They do provide some early spring grazing.

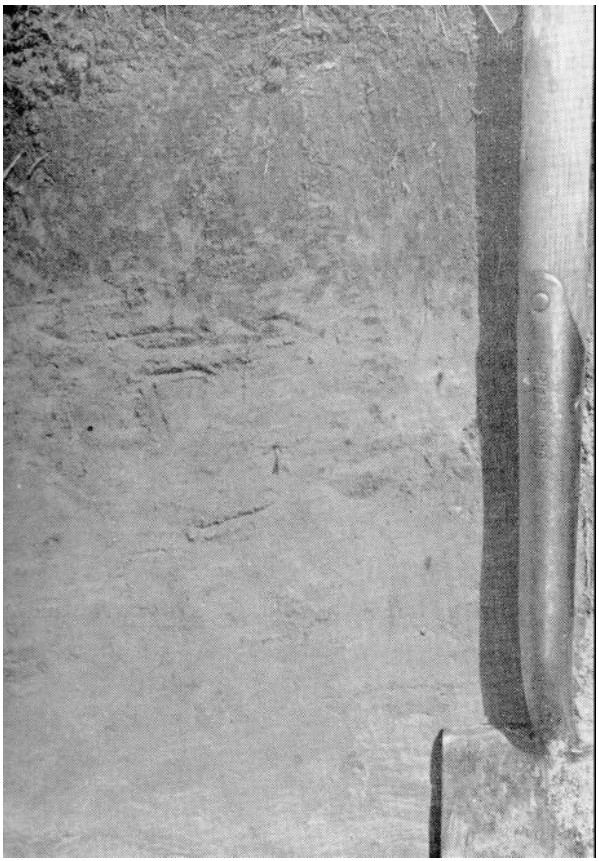
GRANBY SERIES

Granby soils are poorly drained, and have developed on sandy materials similar to that which produced the well drained Westmeath soil series. These are calcareous sands and therefore differ from the more extensive non-calcareous sand deposits such as the Uplands series.

The area occupied by this soil is not extensive; the principal occurrence is near Beachburg. It occurs in depressional areas and is nearly permanently saturated with water. Some streams flow through the depressions and help to drain away some of the excess water.

These soils are not cultivated for hay or grain crops, but occasionally are used for the commercial production of lawn grass sod. They are very suitable for this purpose since the surface soil is sandy loam and contains a good content of organic mater. The surface horizon (Ah) is, on the average, seven inches thick and is underlain by gray mottled sand (Bg). The soil reaction is neutral throughout the upper part of the profile with free carbonates occurring at a depth of 18 inches.

Most of the Granby soil areas are covered with tree vegetation. Development of this land would require drainage.



A profile of Granby sandy loam.

KARS SERIES

The Kars soils are found in the vicinity of Westmeath, and occupy the long, relatively narrow ridge of hills that join the villages of Westmeath and Beachburg. These hills consist of calcareous gravelly esker or moraine deposits.

The hilly topography and the coarse soil texture have produced a well drained soil. Soils on such porous materials are more droughty than adjacent finer textured soils, and are the earliest for spring cultivation.

The soil has weathered to a depth of 17 inches. In cultivated fields the texture is gravelly, sandy loam, the subsoil texture is a gravelly loam. The reaction of the surface soil is slightly acid, that of the subsoil is neutral to alkaline. The sequence of horizons is that of Grey-Brown Podzolic soils. In this climatic region the degree of development is better on coarse textured calcareous material than on fine textured material.

Kars soils are cultivated regularly and used for the production of various crops, mainly hay and grain. Alfalfa survives the winter in better condition on these soils than on the adjacent clay soils. The use of manure to help maintain the organic matter content and to maintain soil structure is very essential in these soils.

LYONS SERIES

The Lyons soils are poorly drained ones that occur in association with the Eganville and Stafford soils. They occupy the level to slightly depressional areas between the hills on which the better drained soils are located.

The soil parent materials consist of calcareous stony till, Since these soils are saturated with water they tend to develop a thick, dark surface (Ah) containing a high percentage of organic matter. The subsoil (Bg) is gray and mottled and lacks the horizon development characteristic of the better drained soils. These are classified as orthic Humic Gleysols.

The surface layer (Ap) in cultivated soils ranges in depth from 7 to 9 inches and is neutral in reaction. Underlying the surface layer is a gray, strongly mottled, loamy horizon (Bg) over the gray, stony, calcareous parent material (Ck). The depth from the surface to the zone of free carbonates varies from 18 to 24 inches.

Lyons loam is rarely used for cultivated crops. Most areas are in permanent pasture or woodlots.

MANOTICK SERIES

The Manotick soils occur around the town of Pembroke, and extend from this point southwards into the main basin of the Ottawa River valley. These soils are

A typical soil profile of Manotick sandy loam.Note occurrence of gray clay toward bottom of pit.

developed on non-calcareous deltaic alluvial sands deposited in the Champlain Sea. The principal deposits in the basin are clay, and the sand is deposited as a thin discontinuous veneer over the clay.

The Manotick series represents the well drained sandy areas in which sand is 10 to 30 inches thick over the clay. These well drained soils occur on slightly rolling topography where both the external and internal drainage is sufficiently good to remove excess water.

The cultivated surface soil (Ap) is a dark gray, sandy loam with a moderately acid reaction and with a low content of organic matter. The subsoil (Bm) is yellowish brown, sandy loam to a depth of 12 inches over loose brown sand (C) that has about the same degree of acidity as the surface soil.

These soils are classified as orthic Podzols, but in the cultivated state lack the bleached Ae horizon that is present in uncultivated soils. Both iron and organic matter concentrations are present in the (Bfh) horizon.

These soils have a diverse land use and are suitable for the production of vegetable crops as well as hay and grain. They are infertile and require the application of manure and commercial fertilizers for satisfactory crop production.

MARSH

Marshes are under water for most of the year and have less than a foot of organic matter over mineral subsoil. They are perhaps more important as wild life habitats than for any potential agricultural development.

MOUNTAIN SERIES

The Mountain soils are imperfectly drained. They have the same origin and the same parent materials as the Manotick series. They occur in the portion of the Ottawa valley that extends south from Pembroke. The causes of the imperfect drainage may be the result of thin sand deposits that overlie clay, or the lack of sufficient slope to drain away the excess water. In either case excess water remains in the soil for several months of the year and is completely removed only in the summer months.

The soil parent materials consist of non-calcareous fine or medium sands that overlie a tough, impervious clay of lacustrine marine origin. The depth of sand ranges from 18 inches to 3 feet, but some cultivated areas may have mounds of sand surrounded by clay.

This soil has the profile features of a Gleyed Orthic Podzol with the exception that in cultivated fields the gray leached horizon is generally absent. Remnants of the Ae horizon can be found at almost any location. The subsoil is gray with yellowish red mottles, and occasionally is cemented.

These are fair agricultural soils. They are easy to cultivate but lack the fertility that is necessary for good crop production. Cereal grains and hay are the regular crops being grown. Good management of these soils would involve some form of artificial drainage, and the use of manures and fertilizers.

MONTEAGLE SERIES

The Monteagle soils are found within the Precambrian Upland and are widely distributed through North Hastings, Renfrew, Haliburton, and Parry Sound. They occupy 59,600 acres or 4 per cent of the county area.

These soils are well drained. The topography is rolling and quite frequently roughened by steeply sloping ravines. Outcrops of solid rock are frequent within this series.

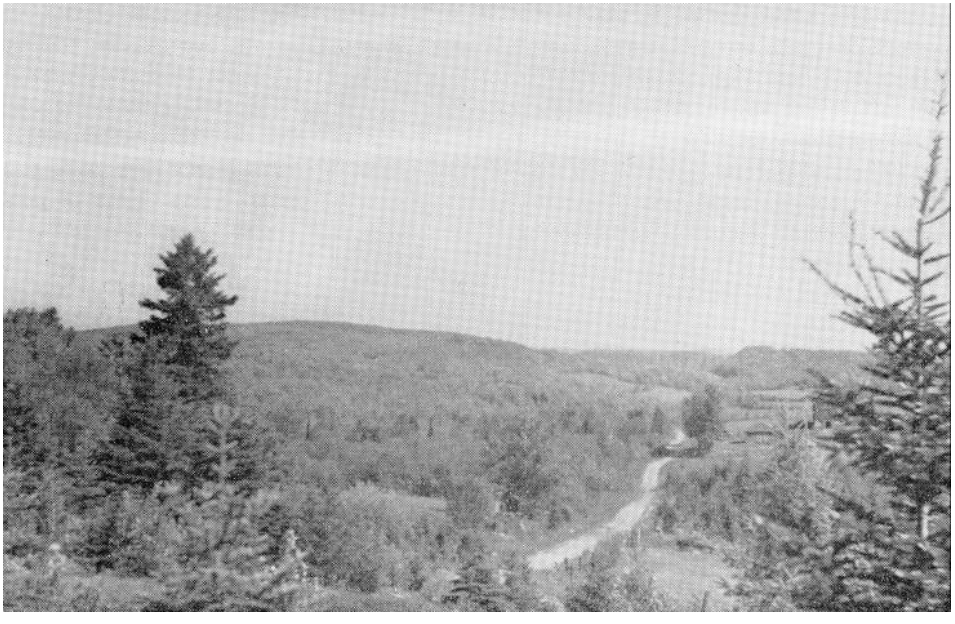
The soil parent material is gravelly sandy loam glacial till derived from the local granitic rocks. The depth of soil over the bedrock is never much more than 2 or 3 feet, is fairly uniform on the smoother topographic areas but is variable in the rougher areas where bedrock is exposed. Stones and boulders are common in all areas and many are too large to be removed.

In the virgin or uncultivated state these soils have an organic layer (L-H), 1 or 2 inches in thickness over a light gray horizon (Ae) 1 to 2 inches in thickness. Under the Ae there is a dark reddish brown horizon (Bf_1) 9 to 10 inches thick over gravelly, sandy loam (Bf_2). The B is crumb-structured, friable, and contains many roots. The olive parent material (C) is stony, gravelly sandy loam.

The areas mapped as Monteagle sandy loam are widely scattered over the large Precambrian Upland and for the most part are presently being farmed. In many cases farm wood products represent a good part of the total farm income. Many farms are handicapped by insufficient arable land, much of which is very stony. If these enterprises are to continue they will have to be forestry-farming combinations and larger holdings will be required.

Monteagle-Rock Complex

The Monteagle-rock complex represents the largest area of land included under one mapping unit in Renfrew County. The Monteagle series described above is a soil with some limited value for agricultural purposes, but the Monteagle-rock complex of the Precambrian in Renfrew County has no potential for agriculture due to the high percentage of rock outcrop.



A Precambrian landscape showing the forest cover and hilly topography of Monteagle — rocky phase.

This complex pattern of soil and bare rock is also interspersed with muck and peat soils in the numerous and small undrained depressions. This combination of the Monteagle sandy loam soil, bare rock, and organic soils not only surround the basin of the Ottawa River valley but there are also some isolated blocks of land within the valley that have the same pattern of soil and rock. Areas adjacent to agricultural soils, such as those of the Ottawa River valley, may be used from time to time as grazing land but the complex as a whole has no value for this puropse.

The land area included in this complex is covered with second growth tree vegetation and with grass where the trees have been cut for pulpwood or destroyed by fire.

MUCK

The muck soils in the county occur in the depressional areas within the Precambrian Upland. These soils consist of black, partially decomposed material (F) derived from marsh vegetation consisting mainly of woody plants. In many instances the profile shows alternating layers of materials that indicate some vegetation sequences, varying between reed-grass and wood-forest.

Muck soils are not used for agricultural purposes in Renfrew County.

OSGOODE SERIES

The Osgoode soils are mapped in two separated areas in Renfrew County. South and west of Pembroke they occur adjacent to the rocky Precambrian Upland and south of Westmeath a smaller area occurs adjacent to a bog.

The Osgoode soils are poorly drained and the topography varies from level to gently sloping. The soil parent materials are alluvial deposits of weakly calcareous fine sands and silt.

This series is classified as a Humic Gleysol. The surface layer has a high level of organic matter and when plowed is intimately mixed with the mineral soil. This layer is friable and easy to cultivate. Underlying the surface are gray gleyed horizons that are mottled and have been leached of their free carbonates.

The Osgoode soils are used for general farming. In normal seasons when flood waters are not a problem, good crops of hay and oats can be obtained. Fall wheat and barley may be grown but risks of crop failure due to flooding prevent a greater utilization of these soils for this purpose. The use of tile drainage would increase the productivity of these soils.

PEAT

The areas designated as peat on the soil map consist of soils with an organic layer made up of fibrous moss or reed peat. This material is more than 12 inches thick and is not as well decomposed as the organic muck soils.

The peat deposits in Renfrew County have not been developed for agriculture.

RENFREW SERIES

The Renfrew soils are the best agricultural soils in Renfrew County. They occupy a large part of the Ottawa River valley between Pembroke in the north and Arnprior in the south. They are bounded on the east by the Ottawa River

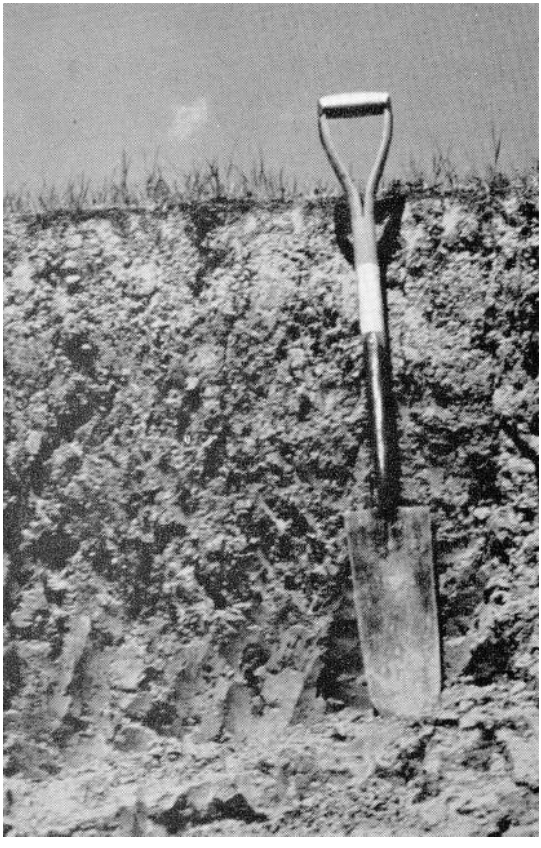
and on the west by the rough, broken hills of the Precambrian Upland.

The topography of the Renfrew soil areas is usually flat but here and there, notably in the area adjacent to the Bonnechere River, streams have incised channels in the flat plain. In flat areas spring melt waters and runoff caused by heavy rains may flood the surface.

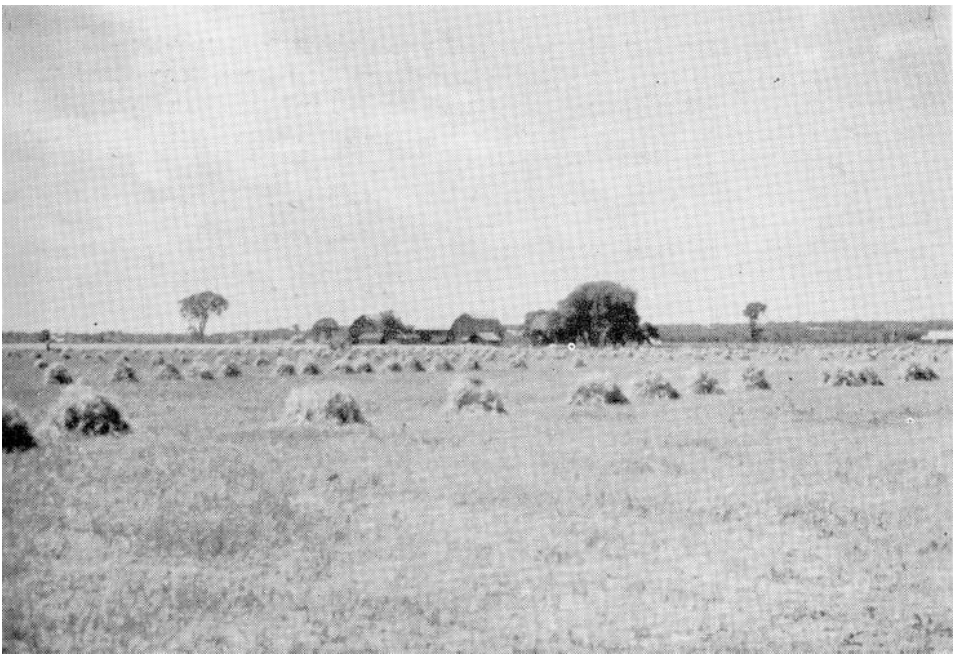
The Renfrew clay represents one of the soil types developed on the clay sediments deposited in the glacial lake basin that extends, in Renfrew County, from Arnprior to Deep River. The Ottawa River now flows through the centre of this large basin. These clay sediments, when deposited, were probably weakly calcareous, but it is now difficult to find free lime in the soil at depths less than four feet.

These clay soils are imperfectly drained and have developed profile characteristics typical of the Grey Wooded Great Group. The cultivated surface soil (Ap) is light gray, an indication that it contains little organic matter. The underlying Ae horizon has platy structure and is light gray to white when dry. The subsoil horizon (Bt) of clay concentration is rarely more than 4 or 5 inches in thickness.

All of the Renfrew clay soils are under cultivation, commonly a rotation of cereal grain, hay and pasture. These are good soils for hay and pasture crops which usually are fed to livestock, particularly beef cattle.



A profile of Renfrew clay.



A crop of oats on Renfrew clay.

Alfalfa on Renfrew clay.

Alfalfa-brome grass hay is popular and yields about 2½ tons per acre. Red clover grows very well but it is difficult to cure and is becoming less important. Oats, the chief feed grain, averages about 45 bushels per acre. Fall wheat, only grown on a very limited acreage, is not a dependable crop on Renfrew clay soils.

Renfrew clay — rocky phase

The areas of Renfrew clay — rocky phase have many rock outcrops and surface stones. The Precambrian rock outcrops are caused by either shallow clay sediments overlying a rough rocky base or stream erosion uncovering the rocky base.

This phase occurs at scattered locations over the entire clay basin. The clay soils are the same as those described previously under the name Renfrew series. In spite of the handicaps that are entailed in the cultivation of these areas, they are cultivated and being used for the production of hay and grain.

Renfrew — sand complex

This soil complex consists of Renfrew soils and the sands deposited over them. The sand varies in depth over short distances from 6 inches to 3 feet. West of Glasgow large knolls of Uplands sandy loam form an important part of the complex. The Uplands sandy loam in this area makes up about 40 per cent and the Manotick, Mountain, Allendale series, account for the remainder. The topography is irregular, gently to moderately sloping.

The sandy overburden, when thin, provides easy surface cultivation. When the clay soils are close to the surface they provide good moisture and nutrient levels. Good yields of hay, grain and ensilage corn are generally obtained. The Uplands soils that occur in the complex are droughty and hay and grain yields are lower on this member.

RIDEAU SERIES

The Rideau soils are found in the southern part of Renfrew County, particularly in McNab Township where they surround the town of Arnprior. They also extend from the Ottawa River west to the rocky Precambrian Upland.

These are imperfectly drained, clay textured soils that lie within the basin of the Ottawa River valley, and constitute a portion of the clay sediments deposited in glacial Lake Champlain.

Although the Madawaska River provides a major outlet for drainage waters, the area occupied by the Rideau soils has little stream development and therefore no effective drainage system. In the early spring months and after heavy rains surface water remains on cultivated fields until it is removed by evaporation or by slow percolation through the clay soil.

In the Rideau soils development is so weakly expressed that horizons can scarcely be detected in cultivated fields. Those that can be differentiated are color horizons. The surface and subsoil are moderately acid but this condition approaches neutrality at a depth of 30 inches. Free carbonates are not present in these parent materials.

These are productive soils capable of producing good hay and grain crops for the livestock industry. The capacity for greater production is a feature that adds to the continuing value of these soils.

Rideau-Sand Complex

The Rideau-Sand complex is a subdivision of the main Rideau soil area. that contains sandy soils in addition to clay soils. This pattern of alternating sand and clay does not have any regular distribution as far as location is concerned, but occurs as scattered blocks of land within McNab township. The sand was deposited on the clay sediments and by wave action or some other agency was formed into more or less rounded mounds of sand that vary from a few to several hundred feet in diameter. The sand mounds vary also in drainage. The centre of the mound usually is well drained, the perimeter poorly drained where the sand is thin. The degree of soil development in the sand varies with the internal drainage. Podzols usually are found at the well drained center and Gleysols at the poorly drained perimeter, sometimes within only a few feet of one another. The sand soils in this complex belong to the Manotick catena.

These complexes of soils are not desirable since they affect not only cultivation but also productivity. The sands are acid and require different fertility treatments than the clay soils. Individual areas of sand or clay are not large enough to be treated separately but are cultivated and cropped as a single body.

ROCKLAND

A miscellaneous mapping unit was established to delineate areas estimated to comprise 75 per cent or more of rock outcrop. Rockland has a low tree-population and is of little value for either forestry or agriculture.

A landscape showing the sparse vegetation on Rockland.

RUBICON SERIES

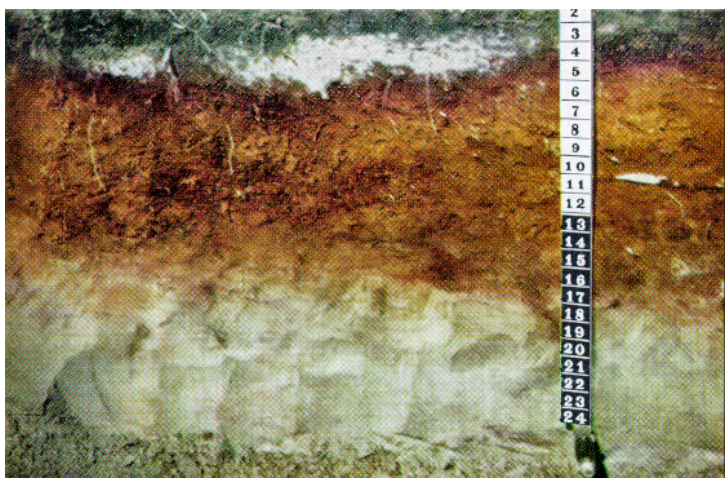
The Rubicon soils occur near the town of Pembroke and south of Westmeath. These sands form a portion of the delta of the glacial river that emptied into the lake basin that stretched south from Pembroke where the Ottawa River now flows.

These imperfectly drained sand deposits are underlain by glacial lake clay. The sand covering the clay is not continuous but occurs at isolated patches. The thickness of the sand ranges from a few inches to several feet. Soils with thin deposits have been described under the Manotick and Mountain series. The Rubicon series includes soils in which the thickness of sand is greater than three feet.

A high water table present in these soils produces the mottling characteristics of imperfect drainage. The water table is a temporary condition prevalent in the fall and spring. In the summer months the water table drops and is not a problem in the management of these soils.

The Rubicon soil is a Podzol developed on sand derived from the granitic rocks of the Precambrian Upland. The white bleached horizon (Ae) that underlies the surface horizon (L-H) in virgin locations is usually missing in cultivated fields, although remnants may be found below the plow layer. The strongly acid subsoil (Bf) is a loose brown or yellowish brown sand.

Many areas of Rubicon soils have been reforested, but most of the soil is still cultivated. Some fair crops of cereal grain and hay can be grown if commercial fertilizers are applied.



A profile of Rubicon sandy loam.

Note the undulating topography of the Rubicon sandy loam. The gray, highly leached podzol layer is showing on the knolls while the surface soil in the depression is very dark gray in color.

STAFFORD SERIES

The Stafford soils occupy gentle slopes and level topographic areas adjacent to the Eganville soil series. Both of these soil series have the same kind of parent material, but variations in drainage have given rise to profiles that differ to some extent in the surface and subsoil as a result of high and low moisture saturation. The imperfectly drained profiles of the Stafford soils are generally not as thick as those of the well drained Eganville soils but they have deeper, darker surface horizons richer in organic matter. The texture of the surface and subsoil is loam whereas the subsoil of the Eganville series is clay loam.

The Stafford soils in addition to the 1,000 acres mapped as such occur in very small parcels of land within the area mapped as Eganville loam near Eganville.

The Stafford soils are suitable for cultivated hay and pasture. They are not very satisfactory for spring grains such as oats and corn because excess moisture in the soil delays seeding.

STE. ROSALIE SERIES

The Ste. Rosalie soils occur principally in Westmeath township, although small and separated areas are fairly widely distributed in other parts of the county. These are poorly drained clay soils that are found in the Ottawa River valley and extend through the lowland section of a number of eastern counties that border along the Ottawa River.

Ste. Rosalie soils have developed olive-gray clay which is often more than 15 feet thick. There is no evidence of varving or layering in the upper section of

the clay beds. This clay resembles the clay of Rideau soil series and no free calcium carbonate is present in the upper five feet of the deposit.

This soil is differentiated from the Rideau series primarily on drainage characteristics. The soil profile is mottled to a depth of 18 inches and lacks the horizon development that is present in better drained clay soils. The moist and wet soil has a dense consistency that is the result of clay swelling and internal drainage is almost completely blocked. In the spring and in the summer following heavy rains the surface of the Ste. Rosalie soils are frequently ponded with water. This ponding and surface accumulation of water is common in all areas since the topography is flat and natural drainage courses are imperfectly developed.

The soil profile is usually quite strongly mottled to a depth of 18 inches. This is the only feature that distinguishes the upper portion of the soil from the clay parent material. The surface plow layer is dark gray in color and is very low in organic matter content. The surface and subsoil therefore possess features that are sufficiently well expressed that the soil can be classified as Humic Gleysol. Some Regosolic soils may also be present where mottling cannot be detected in the subsoil horizon.

The Ste. Rosalie soils are used for the same purpose as other clay soils of the region. Hay and grain are the principal crops grown, although fodder corn may also be produced in small quantities. At the present time and with the drainage facilities these soils possess, there are no alternative crops that can be grown successfully on these soils. Where alfalfa may be grown successfully on the Renfrew soil type, it is much more subject to winterkilling on the Ste. Rosalie soils. These are good hay and pasture crop lands and with adequate fertilizer and manure application these soils will produce the fodder crops necessary for the livestock industry practiced in this region.

ST. SAMUEL SERIES

The St. Samuel soils are the poorly drained sandy soils found in association with the better drained Rubicon and Upland soil series.

These soils occupy the low lying wet depressional areas in the delta portion of the Ottawa River valley plain. Most of these soils occur therefore in scattered locations in the sandy areas southwest and northwest of Pembroke. These poorly drained locations are usually small in size and in some areas alternate frequently with mounds or small hills of well drained sands. A rather marked color difference shows up in cultivated fields; the imperfect and well drained sands are brown and reddish brown while the poorly drained St. Samuel soil areas are light gray and dark gray.

The larger areas of St. Samuel soils occur on flat rather than depressional topography. In these locations it is probable that the high water table is caused by the impermeable clay strata that underlie the sand at depths of 3 to 5 feet. This clay sediment acts as a temporary barrier to water movement through the sandy soil and the water level in the soil may remain high into the early part of the summer.

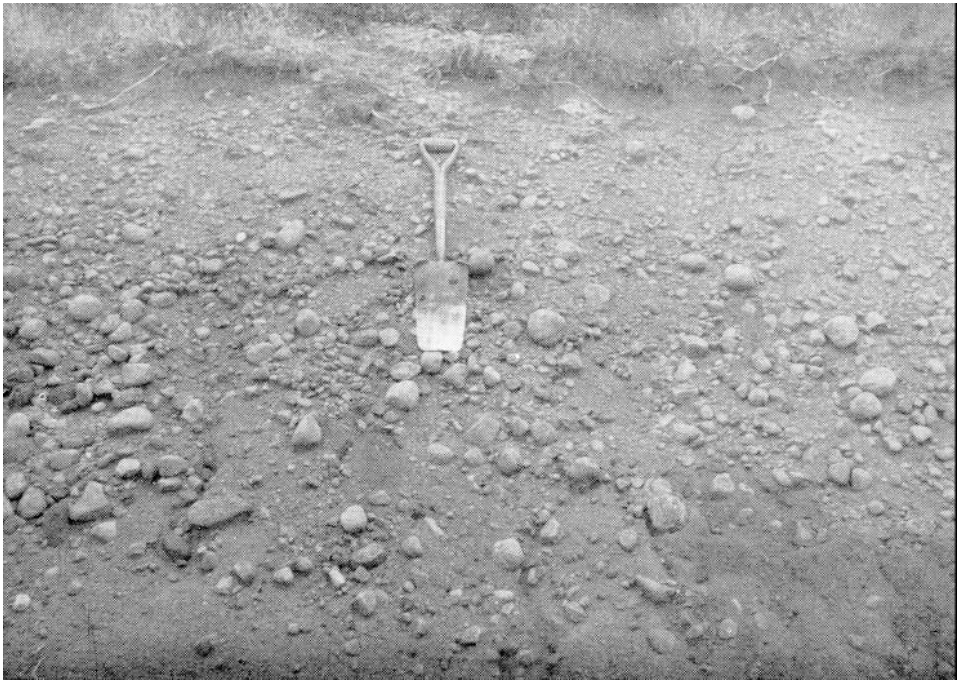
In many fields the soils are cultivated without regard to drainage conditions, but wherever it is possible to cultivate sufficiently large areas of imperfect or well drained sands, the poorly drained soils are left to grow up in native vegetation. In Renfrew County the majority of the St. Samuel soils are uncultivated and when covered with shrub growth they appear as swampy lands.

ST. PETER'S SERIES

The St. Peter's soils are gravelly soils in which the parent materials were deposited principally as outwash. Some of the areas shown on the soil map include river deposited gravels and possibly some gravels of deltaic origin. These gravelly deposits are not uniformly sorted, with the result that sand layers may overlie gravel layers and form the surface horizon.

The sand and gravel in these soils are derived from Precambrian rocks and are therefore mainly of granitic origin. As a consequence the soil is very acid and the Podzol development is well expressed.

These soils are found mainly within the boundaries of the Precambrian shield, but some of the deltaic gravel deposits within the Ottawa River valley have also been included with this soil series. Individual areas are not large and since they occur at some distance from the settled sections of the county they are of little importance as sources of road gravel.



Road cut exposing the St. Peter's gravelLy material.

Some of the most level areas of these soils have been cultivated and sown to hay and grain, but this practice is only in the Precambrian region where gravel soils represent the main arable soils in the district. These soils should be considered as non-agricultural and hence do not justify the expenditure of seed and fertilizer necessary to produce a crop. Considering the physical characteristics of these soils it is reasonable to assume that they would also be of little value as potential pasture land.

TWEED SERIES

The Tweed soils are associated with surface outcrops of crystalline limestone in certain portions of the Precambrian shield in the southern part of Renfrew County. These crystalline limestone outcrops represent remnants of a deposit that in an earlier geologic age was probably quite extensive in the southeastern Canadian section of the Precambrian shield.

The soil parent material is a glacial till that has been derived predominantly from the limestone rock but in addition contains considerable material derived from the adjacent granitic and gneissic rocks. The texture is stony sandy loam; the stones may vary in size from one inch to a foot in diameter. In many areas the stone content may constitute as much as fifty percent of the soil body. Associated with the loose soil are many outcroppings of the limestone bedrock. This material is very hard and coarse grained and on weathering leaves little residue of soil material.

Tweed sandy loam — rocky phase is generally shallow with numerous rock exposures.

The landscape is quite variable as a result of thick soil coverings alternating with bare rock outcrop-and with loose rock and boulder contents that vary from place to place. Where the soil cover is a foot or more in depth and where stones are not a prohibitive factor, these soils are cultivated and used for the general type of farming that is practiced in this region. In general they are not considered arable soils and their most productive use is probably forestry. For this purpose they have many desirable qualities, the most prominent being good drainage-and high base status.

The profile development is typically Brown Forest. The profile has a sandy loam texture and a loose and porous consistency, The basic materials in the soil are provided by the coarse grained limestone fragments that are not wholly

weathered out of the soil profile. The soil profile consists of a very dark gray brown surface and a dark reddish brown subsoil. The gray and leached Ae horizon and the Bt horizon of accumulation that are common to the Grey-Brown Podzolic soils are not recognizable, although it is evident that much leaching has taken place in the brown porous subsoil material, since the base status and the soil reaction invariably increases with depth.

The major portion of the Tweed soils in Renfrew county is covered with some kind of forest vegetation. Open grassy areas also occur, which represent abandoned farmsteads and old pasture fields which have not yet reverted to forest. The use of these soils as possible range lands for livestock should not be recommended.

Tweed-Rock Complex

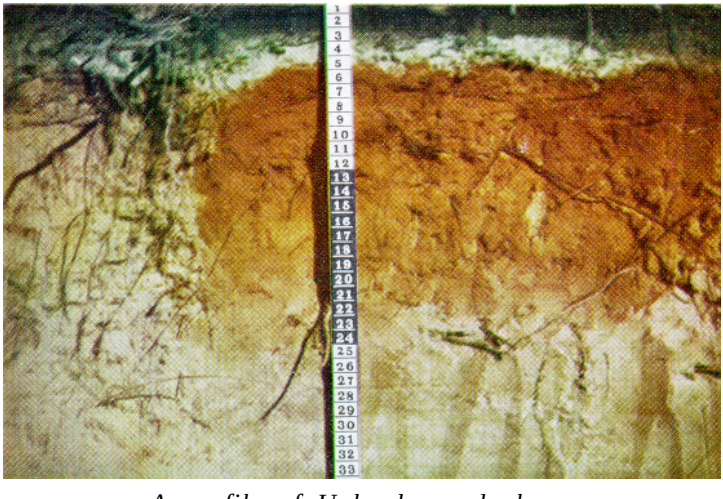
The largest portion of the county in which the Tweed soils occur have less than 75 per cent of soil cover, the remainder being bare rock. These landscapes have been designated as Tweed-Rock complex, and indicate that whatever soil is present, it has the characteristics of the Tweed series as previously described.

The Tweed-Rock complex has no present or potential use as an agricultural soil region. A sparse forest vegetation covers the entire region.

UPLANDS SERIES

The well drained sandy soils that cover a large portion of Renfrew County and extend from Pembroke in the south to Deep River in the north, are designated as the Uplands soil series. In this portion of the county the sand deposits tend to parallel the Ottawa River and extend westward onto the Precambrian Upland. These are deltaic deposits that were laid down in the glacial lake that extended southward into the Ottawa Valley.

In the central part of the county the sands are widely distributed over the Precambrian shield area and occur in large tracts in such widely spaced locations as Killaloe, Latchford Bridge, Lake Dore and Golden Lake. These are, in general, fine and very fine sands, uniformly graded, and have a level or gentle undulating



A profile of Uplands sandy loam.

topographic position. The origin of these deposits are, as in the Ottawa Valley region, in most cases deltaic, and lie adjacent to present lakes or basins that are now drained by rivers and streams. Some deposits such as those west of Killaloe may be partly outwash and therefore less well graded than those adjacent to lacustrine basins.

These sandy soil parent materials have been derived from the gneissic and granitic rocks of the Precambrian shield. Since these are acidic materials they have aided the development of the podzolic process and in the soil profile all the features of the podzol are well expressed. The gray leached horizon is usually two inches thick, rarely more than three inches. The brown subsoil horizons have concentrations of both iron and organic matter but not in sufficient quantity to alter the soil texture nor its consistency. The entire profile therefore has the properties of loose sand with very low water-holding capacity.

The Uplands soils that occur in the vicinity of Pembroke have been utilized in the past and to some extent are presently being used as agricultural crop land. The yields of hay and grain that can be derived from these soils depend upon the kind of management they have received. The low organic matter content and the low nutrient supply needs to be augmented by the use of crop rotations, barnyard manures and commercial fertilizers. These additions are used up by the crop and any excess is readily leached from the soil so that a permanent productivity is never possible. The Uplands soils that extend from Petawawa north to Deep River have no potential as agricultural crop land for crops presently grown.

The areas that are designated on the map as Uplands loamy sand — rocky phase, consist of soils that have the characteristics of the Uplands but are interspersed with rock outcrop and numerous boulders. These masses of rock add another handicap to the use of soil for agricultural purposes and in the case of the Uplands soils make any reclamation impracticable.

Tobacco is grown on the Uplands series in Renfrew County

WHITE LAKE SERIES

The White Lake soils are very similar to the Westmeath soil series, in origin of parent materials and in profile development. The parent material of these soils is calcareous sand and gravel having a glacial origin, such as kame or outwash. No modification of the surface with lake water has taken place with the result that the topography is very rough and uneven and a wide range of sand and gravel textures are present in the surface soil.

The profile development of the upper sola has the characteristics of a podzol underlain by a brown clay enriched horizon corresponding to the Bt of a Grey-Brown Podzolic soil. In this respect the soils are similar to the Westmeath series and the depth of development is the same in all cases.

The primary distinction between the White Lake soils and the Westmeath soils is in their topographic differences, which also give rise to a difference in land use. The much rougher topography of the White Lake soils has restricted its use as arable agricultural land. Many of the areas in the Precambrian shield are under cultivation but are not very productive when compared with many other soil series in the county. In this latter region gravelly outwash plains and ridges often constitute the only arable soils that exist.

Soils with no agricultural possibilities because of an additional hazard caused by stones have been designated as White Lake — rocky phase. A large continuous block of land on the east side of Muskrat Lake consists of gravel mixed wtih loose boulders and rock outcrop. These rocky phase areas are forested and many are difficult of access.

WESTMEATH SERIES

The Westmeath soils have developed on sand and gravel deposits, laid down initially as Kame or Outwash and subsequently modified by the action of lake waters. The action of lake waters has given rise to smooth, gentle slopes and some grading of the surface textures. These soils are confined to Renfrew County and occur both in the Ottawa Valley section and in special topographic locations within the Precambrian shield.

The sand and gravel is calcareous, but the limestone material is present in a coarse crystalline form rather than being finely disseminated. The major part of the gravel and sand is composed of gneissic and granitic materials. The soil profile development that has taken place on these materials gives the appearance of being a combination of the features common to a podzol soil and to a Grey-Brown Podzolic soil.

The upper two feet of the soil have the features of a podzol with a thin but well expressed leached horizon followed by a brown colored horizon similar to that of the podzol B. At a depth of 24 inches there is a very dark brown horizon corresponding to the Bt of the Grey-Brown Podzolic soils. This horizon lies in contact with the calcareous gravels.

In the Ottawa Valley region these soils occur at the upper and lower ends of Olmstead Lake and around the village of Beachburg. Their major occurrence in the Precambrian shield is in the vicinity of Lake Clear. One portion extends westward from the margins of the lake into a fault block valley, and a second large area extends from the lake north to Augsburg. This latter area originated probably as outwash materials that had little if any subsequent modification,

but the soils have been correlated with the Westmeath soil series because of similarity in profile development.

Some cultivated fields can be found on nearly all the Westmeath soil areas. The texture of the surface soil is generally sandy loam and since there is a fairly good supply of lime in the subsoil, these soils are suitable for the production of alfalfa or clover. Drought is a handicap since these soils will not retain sufficient water to supply a heavy crop of cereal or hay. In productivity they are inferior to the Eganville or Burnstown soil series, but they are much superior in most areas to the Uplands series which have about the same texture.

SOIL CAPABILITY CLASSIFICATION FOR AGRICULTURE

This capability classification is one of a number of interpretive groupings for agricultural or other purposes that may be made from Soil Survey data. In this classification the mineral soils are grouped into seven classes on the basis of their suitability and limitations for agricultural use. The first three classes are considered suitable for sustained production of common field crops, the fourth is physically marginal for sustained arable agriculture, the fifth is capable of use only for permanent pasture and hay, and the sixth is capable of use only for wild pasture. While the soil areas in Classes 1 to 4 are suited for cultivated crops they are also suited for permanent pasture. Soil areas in all classes may be suited for forestry, wildlife, and recreational uses. For the purposes of this classification trees, tree fruits, cranberries, blueberries and ornamental plants that require little or no cultivation are not considered as cultivated or common field crops.

Assumptions

This soil capability classification is based on certain assumptions which must be understood by those applying this interpretive classification, if the soils are to be assigned consistently to the various classes; and if those using the soil capability maps and statistical data are to derive full benefit from such information and avoid making erroneous deductions. These assumptions follow.

1. The soil capability classification is an interpretive one based on the effects of combinations of climate and soil characteristics on limitations in use for agriculture, risks of soil damage and general productive capacity for common field crops. Shrubs, trees or stumps are not considered as limitations to use unless it is entirely unfeasible to remove them. While present forest cover is not generally considered a factor in this soil capability system, it may be used in the placement of soil areas in class seven where costly clearing will only result in placing the areas in class six.

2. Good soil management practices that are feasible and practical under a largely mechanized system of agriculture are assumed.

3. The soils within a capability class are similar only with respect to degree but not to kind of limitations in soil use for agricultural purposes or hazard to the soil when it is so used. Each class includes many different kinds of soil and many of the soils within any one class require unlike management and treatment. The subclass provides information on the kind of limitation and the class indicates the intensity of the limitation. Capability Class 1 has no subclasses. Information for specific soils is included in soil survey reports and in other sources of information.

4. Soils considered feasible for improvement by draining, by irrigating, by removing stones, by altering soil structure, or by protecting from overflow, are classified according to their continuing limitations or hazards in use after the improvements have been made. The term "feasible" implies that it is within present day economic possibility for the farmer to make such improvements and it does not require a major reclamation project to do so. Where such major projects have been installed, the soils are grouped according to the soil and climatic limitations or risks that continue to exist. A general guide to what is considered a major reclamation project is that such projects require co-operative action among farmers or between farmers and governments. (Minor dams, small dykes, or field conservation measures are not included.)

5. The capability classification of the soils in an area may be changed when major reclamation works are installed that permanently change the limitations in use or reduce the hazards of risks of soil or crop damage for long periods of time.

6. Distance to market, kind of roads, location, size of farms, characteristics of land-ownership and cultural patterns, and the skill or resources of individual operators are not criteria for capability groupings.

7. Capability groupings are subject to change as new information about the behavior and responses of the soils becomes available.

8. Research data, recorded observations and experience are used as the basis for placing soils in capability classes and subclasses. In areas where such information is lacking, soils are placed in capability classes and subclasses by interpretation of soil characteristics in accord with experience gained on similar soils elsewhere.

9. The level of generalization of the soil capability classification is indicated by the scale on which the information is published.

Soil Capability Subclasses

Subclasses are divisions within classes that have the same kind of dominant limitations for agricultural use as a result of soil and climate. Twelve different kinds of limitations have been recognized to date at the subclass level. They are: climate (c); structure and permeability (d); erosion (e); nutrient deficiencies (f); overflow (i); soil moisture deficiencies (m); salinity (n); stoniness (p); lack of depth of soil (r); adverse inherent soil characteristics (s); topography, slope or pattern (t); excess water rather than due to overflow (w).

Class 1

Soils in this class have no significant limitations that restrict their use for crops. All the soils in Renfrew County have at least moderate limitations and thus none of soils of the county were placed in Class 1.

Class 2

Soils in this class have moderate limitations that reduce the choice of crops or require moderate conservation practices.

It has been established by sampling techniques that 40 per cent of the area mapped as Eganville loam is Class 2 land with slopes between five and nine per cent. The remainder falls into a lower class due to stoniness.

Soil Series	Subclass	Acreage
Eganville loam	t	22,940
Manotick sandy loam	f	4,500
Osgoode loam	w	1,900
Renfrew clay	d	63,900
Renfrew — sand complex	d	54,400
Rideau clay	d	10,300
Rideau — sand complex	d	8,800
Stafford loam	p	1,000
		167,740

Class 3

Soils in this class have severe limitations that reduce the choice of crops or require special conservation practices. Some of the better areas of the Burnstown and Monteagle series fit into this class while the remainder in each case drops to a lower class due to stoniness.

Soil Series	Subclass	Acreage
Allendale sandy loam	w	500
Burnstown loam	t	1,230
Monteagle sandy loam	f	6,680
Mountain sandy loam	f	7,500
Rubicon sandy loam	f	11,500
Ste. Rosalie clay	w	33,500
		60,910

Class 4

Soils in this class have severe limitations that restrict the choice of crops and require very special conservation practices or very careful management, or both. Sampling techniques place part of the Eganville, Tweed, and White Lake series in this class, the rest of each series being found in other classes.

Soil Series	Subclass	Acreage
Eganville loam	p	34,410
Renfrew clay — rocky phase	r	24,000
Rideau clay — rocky phase	r	500
Tweed sandy loam	t	7,080
Uplands fine sandy loam	f/m	69,300
Uplands loamy sand	f/m	107,600
White Lake gravelly sandy loam	f/m	6,270
Westmeath gravelly sandy loam	f/m	15,050
		264,210

Class 5

Soils in this class are unsuited for cultivated crops except perennial forage crops and are responsive to improvement practices.

Soil Series	Subclass	Acreage
Burnstown loam	p	2,870
Lyons loam	w	1,050
Granby sandy loam	w	1,900
St. Samuel fine sandy loam	w	2,900
Kars gravelly sandy loam	t/s	1,100
Monteagle sandy loam	p	10,020
St. Peters gravelly sandy loam	f/m	19,900
		39,740

Class 6

Soils in this class are unsuited to cultivation but are capable of uses for improved permanent pasture.

Soil Series	Subclass	Acreage
Tweed sandy loam	p	12,390
White Lake gravelly sandy loam	t	12,540
Eganville loam — rocky phase	r	10,350
Burnstown loam — rocky phase	r	1,400
St. Peters gravelly sandy loam — rocky phase	r	1,400
Burnstown loam — shallow phase	r	600
Eganville loam — shallow phase	r	5,650
Farmington loam	r	9,000
Uplands loamy sand — rocky phase	r	19,650
White Lake gravelly sandy loam — rocky phase	r	12,150
		85,130

Class 7

Lands unsuited for agriculture.

Soil Series	Subclass	Acreage
Tweed sandy loam — rocky phase	p/r	277,750
Monteagle sandy loam — rocky phase	p/r	959,900
Rockland	p/r	17,000
Marsh	w	6,450
		1,261,100

TABLE

SOIL RATINGS FOR PRINCIPAL CROPS

Soil Name	Ratings for						
	Oats	Winter Wheat	Alfalfa	Cultivated Hay	Vegetable Crops	Pasture	Tobacco
Allendale fine sandy loam	F	F-P	F-P	G-F	P	F	U
Burnstown loam	G	G	G-F	G-F	F	F	U
Burnstown loam — shallow phase	F-P	P	F-P	F-P	P	F	U
Burnstown loam — rocky phase	U	U	U	U	U	F	U
Eganville loam	G	G	G-F	G-F	F	F	U
Eganville loam — shallow phase	F-P	P	F-P	F-P	P	F	U
Eganville loam — rocky phase	U	U	U	U	U	F	U
Farmington loam	U	U	U	U	U	F	U
Granby sandy loam	F-P	P	P	F	P	F-P	U
Kars gravelly sandy loam	F	F-P	F	F-P	F	F-P	U
Lyons loam	F-P	P	P	G-F	P	G-F	U
Manotick sandy loam	G-F	F	G-F	G-F	F	F	G
Marsh	U	U	U	U	U	P	U
Mountain sandy loam	G-F	F	F	F	F	F	F
Monteagle sandy loam	F-P	P	P	F	F-P	F-P	U
Monteagle — rock complex	U	U	U	U	U	F-P	U
Muck	U	U	U	U	U	P	U
Osgoode loam	G-F	F-P	F	G	P	G	U
Peat	U	U	U	U	U	P	U
Renfrew clay	G-F	G-F	G	G	P	G-F	U
Renfrew — sand complex	G-F	F	G-F	G-F	F-P	G-F	U
Renfrew clay — rocky phase	F	F-P	F	F	P	G-F	U
Rideau clay	G-F	G-F	G-F	G	P	G-F	U
Rideau — sand complex	G-F	G-F	F	F	P	G-F	U
Rideau clay — rocky phase	F	F-P	F	F	P	G-F	U
Rockland	U	U	U	U	U	P	U
Rubicon sandy loam	P	P	P	F-P	F-P	F-P	F
Stafford loam	G-F	F-P	G-F	G	P	G-F	U
Ste. Rosalie clay	F	F-P	F-P	G	P	G-F	U
St. Samuel fine sandy loam	P	P	P	F-P	P	F-P	U
St. Peters gravelly sandy loam	P	P	P	F-P	P	F-P	U
St. Peters gravelly sandy loam — rocky phase	U	U	U	U	U	F	U
Tweed sandy loam	F-P	U	F	F	F-P	F	U
Tweed — rocky complex	U	U	U	U	U	F	U
Uplands fine sandy loam	F-P	P	P	F-P	F	P	G
Uplands loamy sand	P	P	P	P	P	P	G-F
Uplands loamy sand — rocky phase	U	U	U	U	U	P	U
White Lake gravelly sandy loam	F	F-P	F	F-P	F	F	U
White Lake gravelly sandy loam — rocky phase	U	U	U	U	U	F	U
Westmeath gravelly sandy loam	P	U	F-P	F-P	F	P	U

G — Good F — Fair P — Poor
G-F — Good to Fair F-P — Fair to Poor U — Unsuitable

TAXONOMIC CLASSIFICATION, PROFILE DESCRIPTIONS AND ANALYTICAL DATA

ALLENDALE SERIES

Classification:

Order — Gleysolic
Great Group — Gleysol
Subgroup — Orthic Humic Gleysol
Family — Kenabeek

Description:

Ap —0-6″ very dark brown (10YR2/2) sandy loam; fine granular structure; friable; pH 6.4.

Aejg1 —6-9″ gray (10YR6/1) sand; single grain structure; loose consistency; mottled; pH 6.4.

Aejg2 —9-25″ gray (10YR6/1) sand; single grain structure; loose consistency; strongly mottled; pH 6.5.

Cg —25-32″ gray (10YR6/1) sand; single grain structure; loose consistency; pH 6.8.

IIC —Gray (10YR6/1) clay; amorphous; plastic consistency; pH 7.0.

BURNSTOWN SERIES

Classification:

Order — Podzolic
Great Group — Grey-Brown Podzolic
Subgroup — Brunisolic Grey-Brown Podzolic
Family — Vasey

Description:

Ah —0-3″ very dark grayish brown (10YR3/2) loam; fine to medium granular structure; friable; stony; pH 5.8.

Ae1 —3-8″ strong brown (7.5YR5/6) loam; fine granular structure; very friable; stony; pH 5.5.

Ae2 —8-16″ brown (10YR5/3) sandy loam; fine to medium granular and subangular blocky structure; friable; stony; pH 5.6.

Btj —16-20″ dark yellowish brown (10YR3/4) loam; medium subangular blocky structure; friable; stony; pH 6.8.

Ck —Dark yellowish brown (10YR4/4) sandy loam; stony; calcareous.

EGANVILLE SERIES

Classification:

Order — Podzolic
Great Group — Grey-Brown Podzolic
Subgroup — Brunisolic Grey-Brown Podzolic
Family — Guelph

Description:

Ah —0-3″ dark grayish brown (10YR4/2) loam; medium crumb structure; friable; pH 6.8.

Ae1 —3-9″ brown (10YR5/3) loam; fine to medium subangular blocky structure; friable; moderately stony; pH 7.0.

Ae2 —9-15″ pale brown (10YR6/3) loam; fine to medium subangular blocky structure; friable; moderately stony; pH 7.0.

Bt —15-20″ very dark grayish brown (10YR3/2) clay loam; medium blocky structure; firm when dry; friable when moist; pH 7.4.

Ck —Grayish brown (10YR5/2) loam till; calcareous; stony.

Note: The Ae1 horizon is sometimes absent.

FARMINGTON SERIES

Classification:

Order — Brunisolic
Great Group — Brown Forest
Subgroup — Orthic Brown Forest
Family — Farmington

Description:

Ah —0-3″ dark gray (10YR4/4) loam; crumb structure; friable; pH 6.8.

Bm1 —3-8″ yellowish brown (10YR5/3) loam; subangular blocky structure; friable; pH 6.8.

Bm2 —8-10″ brown (7.5YR5/4) loam; subangular blocky structure; friable; pH 7.0.

IIC —10″+ — limestone bedrock.

GRANBY SERIES

Classification:

Order — Gleysolic
Great Group — Humic Gleysol
Subgroup — Orthic Humic Gleysol
Family — Granby

Description:

Ah —0-9″ very dark brown (10YR2/2) sandy loam; crumb structure; very friable consistency; pH 7.3.

Bmg —9-17″ gray (10YR6/1) sand; mottled; single grain structure; loose consistency; pH 7.4.

Bmk —17-27″ light brownish gray (10YR6/2) sand; mottled; single grain structure; free carbonates; pH 7.6.

Ck —Gray sand; calcareous; pH 8.2.

KARS SERIES

Classification:

Order — Podzolic
Great Group — Grey-Brown Podzolic
Subgroup — Brunisolic Grey-Brown Podzolic
Family — Dumfries

Description:

Ap —0-4″ dark grayish brown (10YR4/2) gravelly sandy loam; fine crumb structure; very friable consistency; pH 6.7.

Ae1 —4-7″ yellowish brown (10YR5/6) gravelly sandy loam; fine granular structure; very friable consistency; pH 6.6.

Ae2 —7-12″ pale brown (10YR6/3) gravelly sandy loam; fine granular structure; very friable consistency; pH 6.6.

Bt —12-17″ brown (10YR4/3) gravelly loam; fine subangular blocky structure; pH 7.0.
Ck —Coarse sand and gravel; calcareous.

LYONS SERIES

Classification:
Order — Gleysol
Great Group — Humic Gleysol
Subgroup — Orthic Humic Gleysol
Family — Lyons

Description:

Ap —0-8″ black (10YR2/1) loam; granular structure; very friable consistency; few stones; pH 7.2.
Bmg —8-13″ gray (10YR5/1) loam; mottled; medium subangular blocky structure; friable; pH 7.2.
Bmkg —13-18″ gray (10YR5/1) loam; mottled; coarse subangular blocky structures; free carbonates present; pH 7.4.
Ck —Gray (10YR5/1) loam; stony; calcareous; pH 8.2.

MANOTICK SERIES

Classification:
Order — Podzolic
Great Group — Podzol
Subgroup — Orthic Podzol
Family — Bucke

Description:

L —2-0″ loose leaf litter.
Ah —0-2″ very dark gray (10YR3/1) sandy loam; fine granular structure; friable consistency; pH 6.2.
Ae —2-4″ gray (10YR7/1) sand; single grain structure; loose consistency; pH 5.6.
Bfh —4-12″ yellowish brown (10YR5/6) sandy loam; single grain to fine granular structure; very friable consistency; pH 6.0.
C —12-25″ pale brown (10YR6/3) sand; single grain structure; loose consistency; pH 6.0.
IIC —Gray (10YR6/1) clay; amorphous; plastic consistency; pH 6.6.

MOUNTAIN SERIES

Classification:
Order — Podzolic
Great Group — Podzol
Subgroup — Gleyed Orthic Podzol
Family — Mountain

Description:

Ah —0-2″ very dark gray (10YR3/1) sandy loam; crumb structure; friable; pH 6.0.
Aeg —2-4″ gray (10YR6/1) sand; single grain structure; loose consistency; pH 5.8.

Bfhg —4-9″ yellowish red (10YR5/6) sand; granular structure; very friable; mottled; few ortstein nodules; gradual boundary to the C; pH 6.0.

C —9-20″ very pale brown (10YR7/4) sand; single grain structure; loose consistency; mottled; pH 6.6.

IIC —Gray (10YR6/1) clay; amorphous; plastic; stonefree; pH 7.0.

MONTEAGLE SERIES

Classification:

Order — Podzolic
Great Group — Podzol
Subgroup — Orthic Podzol
Family — Wabi

Description:

F —1-0″ organic layer containing leaves, twigs, and moss.

Ae —0-3″ light gray (10YR6/1) sand; single grain structure; loose consistency; pH 4.6.

Bfh1 —3-12″ dark reddish brown (5YR3/4) sandy loam; granular structure; friable pH 4.8.

Bfh2 —12-22″ yellowish brown (10YR5/6) sandy loam; weak granular structure; friable; stony; pH 5.3.

C —Light olive-brown (2-5YR5/4) sandy loam; very stony; pH 5.4.

Monteagle Sandy Loam

Horizons	Sand %	Silt %	<.002 m.m. Clay %	pH	O.C. %	M.E./100 gms. Soil Ca	Mg	K	H+	B.E.C	% Base Sat.
F	—	—	—	4.5	—	—	—	—	—	—	—
Ae	63	26	11	4.75	1.17	1.0	0.08	0.06	4	4.9	23
Bfh1	64	21	14	4.75	2.40	0.6	0.48	0.04	11	12.0	9
Bfh2	81	8	11	5.3	0.69	0.3	0.24	0.02	4	5.0	11
C	70	19	11	5.4	0.09	0.25	0.16	0.07	2	2.0	20

OSGOODE SERIES

Classification:

Order — Gleysolic
Great Group — Humic Gleysol
Subgroup — Orthic Humic Gleysol
Family — Bainesville

Description:

Ap —0-6″ very dark grayish brown (10YR3/2) loam; fine crumb and granular structure; friable consistency; pH 6.8.

Bmg1 —7-14″ light brownish gray (10YR6/2) loam; coarse granular structure; friable consistency; stonefree; pH 6.6.

Bmg2 —14-26″ light brownish gray (10YR6/2) loam; medium subangular blocky structure; friable consistency; strongly mottled; pH 7.0.

Ck —26″+ gray (10YR6/1) loam and silt loam; calcareous; pH 7.4.

RENFREW SERIES

Classification:

Order	— Podzolic
Great Group	— Grey Wooded
Subgroup	— Gleyed Grey Wooded
Family	— Renfrew

Description:

F —2-0″ leaf mold and partially decomposed woody material.

Ah —0-1½″ grayish brown (10YR5/2) clay; subangular blocky and platy structure; friable consistency; stonefree; pH 4.9.

Ae —1½-4″ gray (10YR6/1) clay; platy and subangular blocky structure; friable consistency; weak to moderate mottling; pH 5.2.

AB —4-7″ light brownish gray (10YR6/2) clay; medium blocky structure; firm consistency; mottled.

Btg —7-11″ grayish brown (10YR5/2) clay; prismatic structure breaking to blocky; hard consistency; clay skins on aggregate faces; mottled; pH 5.7.

BCg —11-19″ grayish brown (10YR5/2) clay; medium blocky structure; hard consistency; mottled; pH 6.5.

C —Gray (10YR5/1) clay; amorphous; plastic consistency; stonefree; pH 6.9.

Analysis of Renfrew Clay*

Horizon	Depth Inches	Sand %	Clay %<.002 mm.	pH	Organic Carbon %	Exch. Cations M.E./100 gms. Soil					Base Saturation %
						Ca	Mg	K	H+	C.E.C.	
Ah	0 - 2	12	46	5.1	3.5	8.8	3.6	.39	13.0	26.0	49
Ae	2 - 6	14	40	5.1	.69	2.9	1.0	.21	6.0	10	41
BCg	6 - 14	6	70	5.7	.45	6.4	7.8	.46	3.0	18	83
Bt	14 - 20	6	72	6.1	.45	9.2	11.6	.66	3.0	25	88
C1	20 - 24	4	78	6.9	.15	8.5	11.2	.56	2.0	22	90
Ck	24 +	4	77	7.2	.15	8.1	9.2	.54	2.0	20	90

* Woodland profile taken under mixed deciduous forest.

RIDEAU SERIES

Classification:

Order	— Regosolic
Great Group	— Regosol
Subgroup	— Gleyed Regosol
Family	— Rideau

Description:

Ah —0-2″ very dark grayish brown (10YR3/2) clay; fine to medium subangular blocky structure; friable consistency; pH 6.0.

Aejg —2-5″ brown (10YR5/3) clay; medium blocky structure; plastic consistency; mottled; pH 6.0.

Bg1 —5-8″ brown (10YR4/3) clay; medium to coarse blocky structure; firm consistency; mottled; pH 6.2.

Bg2 —8-12″ brown (10YR5/3) clay; massive structure; plastic consistency; severely mottled; pH 6.4.

Cg —12-22″ grayish brown (10YR5″2) clay; amorphous; plastic consistency; mottled; pH 6.6.

C —22″+ gray (10YR6/1) clay; amorphous; plastic when moist; pH 6.8.

RUBICON SERIES

Classification:

Order — Podzolic
Great Group — Podzol
Subgroup — Gleyed Orthic Podzol
Family — Rubicon

Description :

H —2-0″ black decomposed organic matter.

Ae —0-2″ gray (10YR6/1) sand, single grain structure; loose; pH 5.0.

Bhf —2-4″ dark reddish brown (5YR2/2) loamy sand; granular structure; friable; pH 5.3.

Bfhg —4-10″ strong brown (7.5YR5/8) loamy sand, granular structure; friable; some dark dusky red ortstein nodules; mottled; pH 5.4.

Bfg1 —10-18″ yellowish brown (10YR5/6) sand; single grain; low contrast mottling; pH 5.5.

Bfg2 —18-24″ olive (5Y5/3) sand; single grain; loose; low contrast mottling; pH 5.8.

C —Light gray (5Y6/1) sand; pH 6.2.

STAFFORD SERIES

Classification:

Order — Podzolic
Great Group — Grey-Brown Podzolic
Subgroup — Gleyed Grey-Brown Podzolic
Family — London

Description :

Ap —0-4″ very dark gray (10YR3/1) loam; granular structure; friable consistency; pH 7.2.

Aeg —4-8″ brown (10YR5/3) loam; granular structure; friable consistency; moderately stony; slight mottling; pH 7.2.

Btg —8-12″ dark brown (10YR4/3) loam; subangular blocky structure; friable consistency; pH 7.3.

Ck —Brown (10YR5/3) loam till; moderately stony; calcareous; pH 8.2.

STE. ROSALIE SERIES

Classification:

Order — Gleysolic
Great Group — Humic Gleysol
Subgroup — Rego Humic Gleysol
Family — Lincoln

Description :

AP —0-5″ very dark gray (10YR3/1) clay; coarse subangular blocky structure; firm consistency; pH 6.5.

Cmg —5-18″ olive-gray (5Y4/2) clay; amorphous; plastic consistency; strong mottling; pH 6.4.

C —18″+ olive-gray (5Y4/2) clay; amorphous; plastic consistency; pH 6.7.

ST. SAMUEL SERIES

Classification:

Order — Gleysolic
Great Group — Gleysol
Subgroup — Humic Gleysol
Family — Kenabeek

Description:

Ap —0-6″ very dark gray (10YR3/1) fine sand; fine granular structure; very friable consistency; pH 5.4.

Aejg —6-14″ gray (10YR5/1) fine sand; weak granular structure; loose consistency; some faint mottling; pH 5.4.

Bfjg —14-18″ gray (10YR6/1) fine sand; many coarse prominent dark reddish brown mottles; granular structure; loose consistency; pH 5.8.

Cg —18″ light olive-gray (5Y6/2) fine sand; single grain structure; mottled; pH 6.0.

ST. PETERS SERIES

Classification:

Order — Podzolic
Great Group — Podzol
Subgroup — Orthic Podzol
Family — Wendigo

Description:

F —1-0″ organic layer of partially decomposed leaves, twigs, etc.

Ae —0-1″ light gray (10YR6/1) sand; single grain structure; loose consistency; pH 4.5.

Bfh —1-8″ reddish brown (5YR3/4) sand; granular structure; very friable; pH 4.8.

Bf —8-18″ yellowish brown (10YR5/8) sand; single grain structure; loose consistency; pH 5.0.

C —Grayish brown gravel; pH 5.4.

TWEED SERIES

Classification:

Order — Brunisolic
Great Group — Brown Forest
Subgroup — Orthic Brown Forest
Family — Tweed

Description:

Ah —0-3″ very dark gray brown (10YR3/2) sandy loam; medium granular structure; very friable consistency; surface boulders and stones; pH 6.0.

Bmj1 —3-9″ yellowish brown (10YR5/8) sandy loam; medium granular structure; friable consistency; some stones; pH 7.0.

Bmj2 —9-27″ yellowish brown (10YR5/6) sandy loam; weak fragmental structure; stony; pH 7.2.

IIC —27″+ precambrian limestone.

UPLANDS SERIES

Classification:

Order — Podzolic
Great Group — Podzol
Subgroup — Orthic Podzol
Family — Wendigo

Description:

F —1-0″ loose covering of needles, moss, twigs.
Ae —0-2″ white (10YR8/1) sand; single grain structure; loose consistency; pH 4.7.
Bfh1 —2-6″ very dark grayish brown (10YR3/2) sandy loam; granular structure; friable; pH 5.0.
Bfh2 —6-11″ dark yellowish brown (10YR4/4) sandy loam; granular structure; very friable; pH 5.4.
BC —11-17″ yellowish brown (10YR5/6) sand; single grain structure; loose consistency; pH 5.6.
C —17″+ pale brown (10YR6/3) sand; pH 5.6.

WHITE LAKE SERIES

Classification:

Order — Podzolic
Great Group — Podzol
Subgroup — Bisequa Podzol
Family — Tioga

Description:

F —2-0″ loose leaf mat mostly coniferous.
Ae —0-2″ light gray (10YR6/1) sand; loose; single grain structure; pH 5.0.
Bfh —2-10″ brown (10YR5/3) sandy loam; weak granular structure; numerous small pebbles; pH 5.8.
Ae —8-21″ pale brown (10YR6/3) loamy sand; granular to single grain structure; some large cobbles; pH 6.4.
Bt —21-24″ very dark brown (10YR2/2) gravelly sandy loam; fine subangular blocky structure; very friable; very stony; pH 7.2.
IIC —Multicolored coarse, cobbly gravel; calcareous.

WESTMEATH SERIES

Classification:

Order — Podzolic
Great Group — Podzol
Subgroup — Bisequa Podzol
Family — Tioga

Description:

Ah —0-2″ very dark gray (10YR3/1) gravelly sandy loam; medium granular structure; very friable; numerous small stones; pH 6.2.
Ae —2-3″ gray (10YR6/1) sand; single grain structure; loose consistency; pH 5.6.
Bfh —3-9″ yellowish brown (10YR5/6) sandy loam; weak granular structure; very friable consistency; small stones; pH 5.8.
Ae —9-25″ light yellowish brown (10YR6/4) sand and fine gravel; loose consistency; pH 6.6.

Bt —25-30″ dark brown (10YR4/3) gravelly sandy loam; small subangular blocky structure; friable; pH 7.4.

C —Multicolored coarse sand and fine gravel; calcareous.

GLOSSARY OF HORIZON DESIGNATION

Organic Horizons:

L — an organic layer in which structures are definable.

F — an organic layer in which structures are definable with difficulty.

H — an organic layer in which structures are undefinable.

Master Mineral Horizons:

A — Horizons formed at or near the surface in the zone of maximum removal of materials in suspension or solution and/or maximum accumulation of organic matter. It includes:

(1) horizons in which organic matter has accumulated (Ah) or which have been cultivated (Ap)

(2) horizons that have been eluviated of clay, iron, aluminum, and/or organic matter (Ae)

(3) horizons transitional to the underlying layer (AB) (AC).

B — A mineral horizon or horizons characterized by one or more of the following:

(1) an enrichment of clay (Bt), iron (Bf), or organic matter (Bh)

(2) a horizon altered by hydrolysis or oxidation to give a change in color and/or structure (Bm) and does not meet the requirements of any of the other B horizons above

(3) horizons transitional to the underlying layer (BC).

C — A mineral horizon comparatively unaffected by the pedogen processes in A and B.

(1) material of lithologic composition similar to that of the solum (C).

(2) material of lithologic composition different to that of the solum (IIC).