ORGANIC SOILS TOUR

Alberta Soil Survey

1967

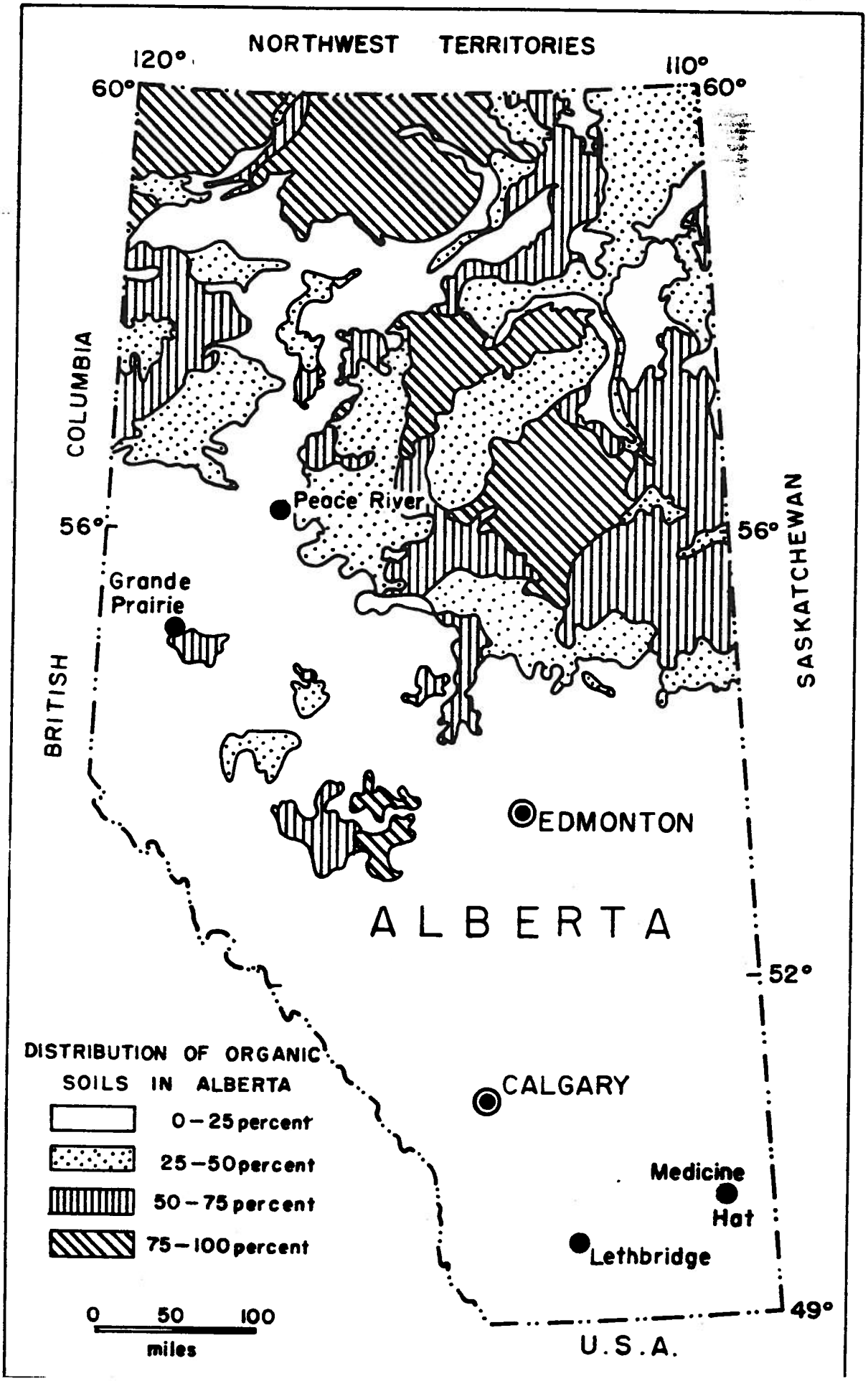
Alberta Research Council
Open File Report 1967-1

ORGANIC SOILS TOUR

Organic soils comprise a significant proportion of the landscape in central and northern Alberta. The Alberta Soil Survey has estimated that roughly 25,000,000 acres of Organic soils (Muskeg) occur in Alberta. The classification of these soils to date has not received the attention or study that has been given to mineral soils. For mapping purposes, these soils have simply been classified as being derived from sedges (Eaglesham series) or from sphagnum moss (Kenzie series).

Between 1957 and 1962 a study was made in Alberta of the distribution and some of the characteristics of a frozen layer in the Organic soils of northern and central Alberta. The results indicate that in the more northerly areas of the Caribou and Birch Mountains and the Cameron Hills the Organic soils are permanently frozen. The depth of the active layer or the depth of annual thaw in these soils is about 22 inches. In the Peace River and Fort McMurray areas the Organic soils in about 60 per cent of the sites examined were permanently frozen with the depth of the active layer averaging 24 inches. In a third area, in the vicinity of Fox Creek, Whitecourt and Cold Lake, the Organic soils thawed at a fairly rapid rate and the frozen layer usually disappeared by mid or late July.

It would appear that in Alberta little agronomic use is being made of the peat lands. So far as is known no major reclamation projects have been undertaken with a view to bringing any

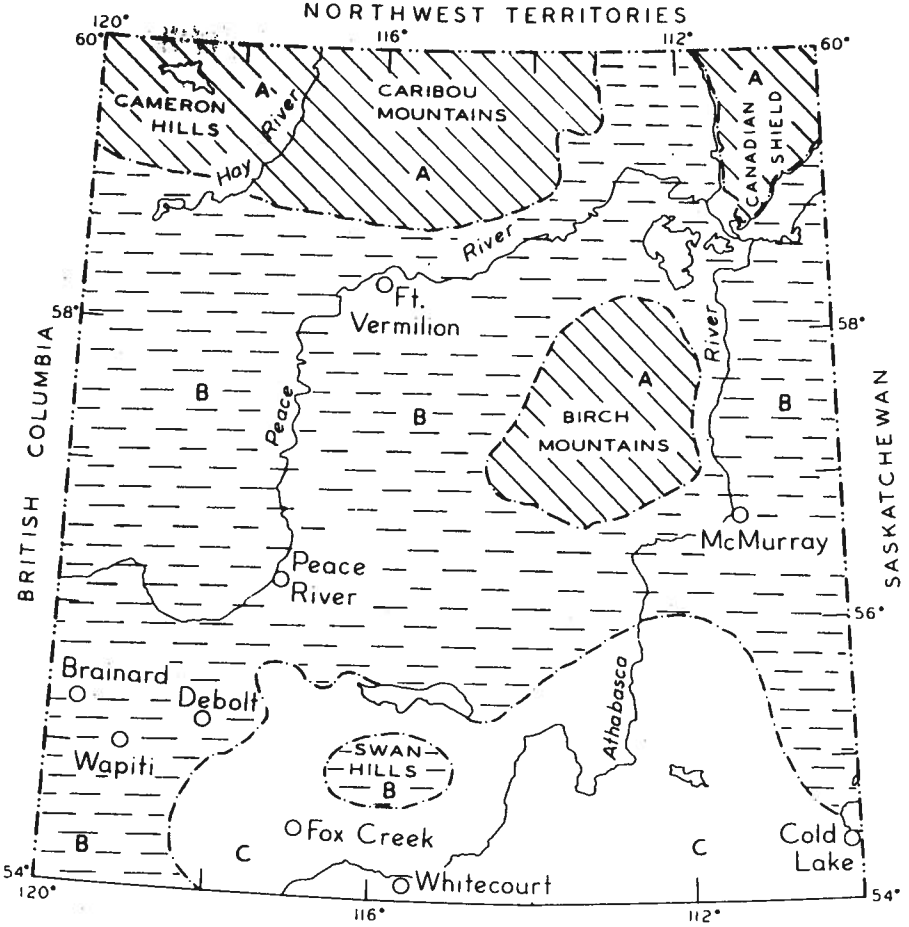

NORTHWEST TERRITORIES
120°
110°
60°
60°
COLUMBIA
BRITISH
SASKATCHEWAN
Peace River
56°
56°
Grande Prairie
EDMONTON
ALBERTA
52°
DISTRIBUTION OF ORGANIC SOILS IN ALBERTA
0 – 25 percent
25 – 50 percent
50 – 75 percent
75 – 100 percent
CALGARY
Medicine Hat
Lethbridge
0 50 100
miles
49°
U.S.A.

extensive area of peat under cultivation. This may be due, in part at least, to the fact that extensive areas of mineral soils are still available for agricultural development and therefore the utilization of peat land for cultivation has not been necessary. Similarly, possibly because of the lack of demand, little experimental or research work has been undertaken on peat lands in Alberta. There has been an indication, however, that crops grown on Organic soils in this area show response to potassium as well as nitrogen and phosphorus. The deficiency in potassium may not show up in the first year or two after initial cropping but may become very pronounced after a few crops have been removed.

In recent years the development of a "Peat Moss" Industry in Alberta has been initiated. "Peat Moss" plants are in operation at Westlock and Evansburg in Alberta. The products from these plants are believed to be marketed principally in California for horticultural uses. For this purpose, the moss is air-dried to 35 per cent moisture or less by weight and is broken down and screened to a size not exceeding one-quarter inch. Horticultural peat should have a water holding capacity (W.H.C.) greater than 12, an ash content of less than 5 per cent and a pH of 3.5 to 6 according to the specifications indicated by the Department of Industry and Development.

The following are descriptions and analyses of some peat profiles common to Alberta:

DISTRIBUTION AND OCCURRENCE OF A FROZEN LAYER IN THE ORGANIC SOILS OF NORTHERN ALBERTA



ZONE A	Permafrost - frozen layer persists all year.
ZONE B	Climafrost - frozen layer temporary or in shaded locations.
ZONE C	Active frost - frozen layer usually disappears in latter part of summer.

from Lindsay, J.D. and Odynsky, Wm. Can. J. Soil Sci. 45,265-269 (1965)

Profile Site #1 — Ardmore Bog

Location — NW 17-62-3-W4

Vegetation — Pasture

Classification (Tentative) — Terric Stratic Humic Mesisol or Limno Terric Stratic Humic Mesisol

Horizon	Depth (inches)	Description
L	0 - 16	Brown (10YR 3/4), relatively undecomposed fibric peat, pH 6.7
F/H	16 - 22	Black (10YR 2/1), fairly well decomposed peat, pH 7.4
II Ckg_1	22 - 40	Gray to light gray (10YR 5/1 to 10YR 6/1), sandy loam, marly, pH 7.7
II Ckg_2	40 +	Dark grayish brown (10YR 4/2), sandy loam, pH 7.5

Analyses

ARDMORE

Horizon	Depth (inches)	% Fibre	Color Ash	Color Dry	W.H.C.	% Ash	H.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind	Pyrophosphate Moist
L	0-16	52.7	10YR 8/1	5YR 2/2	5.9	8.6	12.3	6.7	6.4	109	6	94	2.92	46.61	16.0	1	10YR 8/1
F/H	16-22	17.0	10YR 6/3	10YR 3/1	1.5	87.5	3.3	7.4	7.0	29	1	96	.68	6.42	9.4	1	10YR 5/3
IIk_1	22-40	5.1	10YR 6/3	10YR 6/1	0.6	97.6	1.0	7.7	7.3	6	0	100	.04	2.34	58.5	2	Mineral
IIk_2	40+	0.3	5YR 7/8	5YR 6/4	0.8	96.1	1.6	7.5	7.4	13	1	92	.04	.98	24.5	4	Mineral

Profile Site #2 — Vilna Bog

Location — NW 17-59-13-W4

Vegetation — Rough Pasture

Classification (Tentative) — Unic Mesisol

Horizon	Depth (inches)	Description
F_1	0 - 10	Very dark grayish brown (10YR 3/2 moist), slightly decomposed peat, pH 6.8
F_2	10 - 20	Very dark grayish brown (10YR 3/2 moist), slightly decomposed peat, pH 6.6
F_3	20 - 30	Very dark grayish brown (10YR 3/2 moist), slightly decomposed peat, pH 6.4
F_4	30 - 40	Very dark grayish brown (10YR 3/2 moist), slightly decomposed peat, pH 6.0
F/H	40 - 50	Black (10YR 2/1 moist), fairly well decomposed peat, pH 6.1
II Cg	@ 79 from surface	Gleyed sandy clay loam

Analyses

VILNA

Horizon	Depth (inches)	% Fibre	Color Ash	Color Dry	W.H.C.	% Ash	H.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind	Pyrophosphate Moist
F_1	0-10	32.1	10YR 7/4	5YR 2/2	6.6	8.6	13.6	6.8	6.7	116	6	94	3.15	44.02	14.0	3	10YR 6/4
F_2	10-20	38.6	10YR 7/1	10YR 3/4	6.3	11.3	11.2	6.6	6.2	98	12	86	2.93	48.91	16.7	2	10YR 8/3
F_3	20-30	39.1	10YR 7/1	10YR 3/2	5.9	10.3	12.3	6.4	6.2	108	12	87	2.90	48.56	16.7	2	10YR 7/2
F_4	30-40	42.4	10YR 7/1	10YR 3/2	6.0	13.2	12.7	6.0	5.8	133	19	84	2.78	50.33	18.1	2	10YR 6/3
F/H	40-30	33.2	10YR 8/3	10YR 3/2	5.1	15.0	12.6	6.1	6.0	118	16	84	2.84	47.21	16.6	2	10YR 7/2

Profile Site #3	Winterburn Bog
Location	NE 6-53-25-W4
Vegetation	Black Spruce, Tamarack, Dwarf Willow and Birch, Ledum, Fireweed, Sedges, Cowberry, Feathermoss
Classification (Tentative)	Terric Stratic Mesic Fibrisol

Horizon	Depth (inches)	Description
L	0 - 4	5YR 3/2 and 5YR 4/2. Medium to coarse fibres. Undecomposed feathermoss with some sedges, lichen, etc. (This sample taken 30 yds. west of road cut.)
L	4 - 12	5YR 4/8. Medium to coarse fibres. Undecomposed mosses VP-clear.
F	12 - 14	5YR 3/4 and 10YR 2/1. Medium and fine fibres, Mesic, mainly mucinic. VP-cloudy, greasy.
L	14 - 18	5YR 3/4. Medium fibres. Mucinic with some fennic fibres. Some roots. VP-almost clear.
L/F	18 - 24	5YR 3/3. Medium with some fine fibres. Mainly mucinic. 1/2" inclusion of mesic material (5YR 3/2), with evidence of burning. VP-cloudy.
L/F	24 - 28	5YR 3/4 and 5YR 3/3. Variable stratified material. Dominantly medium to fine fibres, mucinic with some fennic.
L/F	28 - 38	Pockets also present of coarse fibred. Undecomposed feathermoss (probably Rhytidiadelphus Loreus). VP-slightly cloudy.
Fk_1	38 - 40	10YR 6/3 and 10YR 3/1. Fine fibres, fennic. Limnic with shells and

Horizon	Depth (inches)	Description
		diatomaceous earth, calcareous. Some wood, no detectable mucinic material.
Fk_2	40 - 48	10YR 3/1. A heterogeneous woody layer with shells and other mineral material. Fine fibres, sulphureous smell.
II Cg	@ 48	Loam to clay-loam.

Analyses

WINTERBURN

Horizon	Depth (inches)	% Fibre	Color Ash	Color Dry	W.H.C.	% Ash	H.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind	Pyrophosphate Moist
L	0-4	81.9	10YR 5/1	7.5YR 4/4	15.8	19.4	9.9	4.3	3.7	90	57	37	0.88	36.43	41.5	2	10YR 7/1
L	4-12	82.6	10YR 8/2	5YR 6/4	15.2	13.6	14.0	7.6	7.5	120	2	98	0.61	37.01	60.7	1	2.5Y 8/0
F	12-14	64.6	10YR 6/1	5YR 3/4	8.7	21.8	15.9	7.5	7.4	151	2	99	1.39	34.76	25.0	3	10YR 6/4
L	14-18	88.8	10YR 8/1	5YR 5/5	15.7	10.3	14.7	7.3	7.4	150	1	99	0.67	36.56	54.9	1	2.5Y 8/0
L/F	18-24	71.9	10YR 6/1	5YR 3/4	6.7	21.5	12.4	7.1	7.1	135	4	97	1.75	37.42	21.4	1	10YR 2/3
L/F	24-28	64.4	10YR 7/2	10YR 5/4	5.6	22.7	14.1	7.4	7.2	134	2	99	1.22	35.58	29.3	1	10YR 6/3
L/F	28-38	75.9	10YR 6/2	10YR 5/8	5.5	10.5	14.4	7.4	7.0	139	3	98	1.79	38.39	21.4	1	10YR 6/4
Fk_1	38-40	37.8	10YR 6/1	10YR 5/4	5.9	26.6	9.3	7.5	7.2	75	1	99	1.17	26.76	22.9	1	10YR 7/3
Fk_2	40-48	49.7	10YR 6/2	7.5YR 4/2	5.5	29.6	13.2	7.1	7.0	126	3	98	1.63	34.41	21.1	2	10YR 6/3

Profile Site #4 Magnolia Bog

Location NE 7-54-6-W5

Vegetation Spruce, Ledum, Cowberry, Sphagnum, Feathermosses, Polytrichum, Lichens, Eriophorum

Classification (Tentative) Stratic Mesic Fibrisol

Horizon	Depth (inches)	Description
L	0 - 12	Loose sphagnum, etc. Feathermosses and Ledum. Dominantly 10YR 5/8 in 6 - 12" section.
L	12 - 19	10YR 5/6 and 10YR 4/3, mixed strata. Medium fibres mucinic, slightly matted, not greasy, VP-cloudy.
L	19 - 24	10YR 6/4. Medium fibres, mucinic with some fennic, VP-cloudy. Some 1/2" inclusions of 10YR 2/1, humic material, VP-muddy.
L/F	24-28	Mainly 10YR 4/3, medium and fine fibres mucinic and fennic, slightly greasy, VP-cloudy, partly decomposed.
L/F	28-35	10YR 5/8 with four thin bands of 10YR 3/3. Coarse to fine fibres, fennic and mucinic, slightly greasy, VP-cloudy. Darker bands had VP-muddy.
L/F	35-42	10YR 5/6, coarse, medium and fine fibres mainly fennic, VP-cloudy, not greasy. Some wood.

Horizon	Depth (inches)	Description
F	42 - 50	10YR 4/4. Coarse to fine fibres, fennic, greasy, matted. Some wood, VP-cloudy.
F	50 - 58	10YR 4/3, coarse to fine fibres, fennic, greasy. Some wood, VP-very cloudy.

Analyses

MAGNOLIA

Horizon	Depth (inches)	% Fibre	Color		W.H.C.	% Ash	H.M.	pH		C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate	
			Ash	Dry				Paste	0.1M $CaCl_2$							Ind	Moist
L	0-12	87.4	10YR 6/4	7.5YR 7/4	12.5	10.7	9.4	4.3	3.3	131	78	40	0.80	39.59	49.7	1	2.5Y 8/0
L	0-12	85.2	10YR 5/2	5YR 5/3	10.9	7.0	9.9	3.7	3.2	91	73	20	0.97	41.88	43.3	1	2.5Y 8/0
L	12-19	76.5	10YR 7/4	5YR 6/4	16.0	3.1	10.6	3.5	3.1	118	92	22	1.16	43.13	37.0	3	2.5Y 8/0
L	19-24	81.7	10YR 8/2	5YR 6/4	11.7	3.0	10.4	3.6	3.0	116	93	21	1.16	44.15	38.0	3	2.5Y 8/1
L/F	24-28	81.7	10YR 8/2	7.5YR 5/4	9.3	3.3	7.4	4.0	3.3	118	87	26	1.19	46.38	39.0	3	2.5Y 8/0
L/F	28-35	80.0	10YR 8/2	7.5YR 5/4	8.2	3.6	10.4	4.0	3.5	119	84	29	1.16	45.36	39.1	3	10YR 8/1
L/F	35-42	81.3	10YR 8/2	5YR 3/4	9.7	4.0	10.6	4.5	3.7	114	80	30	1.26	46.16	36.8	4	10YR 8/1
F	42-50	83.1	10YR 8/3	5YR 3/4	9.1	4.2	10.9	4.7	4.3	111	60	37	1.39	48.17	34.6	4	2.5Y 7/2
F	50-58	70.8	10YR 7.2	5YR 3/4	9.0	5.2	11.1	5.3	4.7	105	44	58	1.37	47.90	34.9	4	2.5Y 7/2

Profile Date 25 — Drayton Valley Bog

Location — NW 9-50-5-W5

Vegetation — Spruce, Swarf Willow, Fireweed, Bog Cranberry, Horse Tail, Ladum, Golden Rod, Feathermosses, Sedge.

Classification (Tentative, — Terric Fibric Humisol

Horizon	Depth (inches)	Description
L	0 - 4	Mainly 10YR 5/4. Loose undecomposed and slightly decomposed feathermoss.
L/F	4 - 8	10YR 3/4 and 10YR 5/6. A heterogeneous layer with wood, roots and medium to fine fibres. Non-greasy, VP-cloudy. Mainly mucinic.
H	8 - 14	10YR 2/1 with pockets of 10YR 3/3. Fine fibres woody, VP-muddy. Mainly humic.
H	14 - 20	10YR 2/1. Medium to fine fibres, greasy, some wood, fennic. Mainly humic, VP-muddy.
II Ahg	20 - 23	10YR 3/1. Clay containing humic material and pockets of disintegrated wood (5YR 4/6).
II Cg	23 - 27	Mineral substratum,(10YR 5/1), lacustrine clay. Some mottling in 23 - 24" layer.

Analyses

DRAYTON VALLEY

Horizon	Depth (inches)	% Fibre	Colour Ash	Colour Dry	W.H.C.	% Ash	B.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. H.	% base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind	Pyrophosphate Moist
L	0-4	74.7	10YR 6/2	5YR 3/2	5.6	16.9	10.8	5.3	5.0	100	34	66	1.33	41.14	31.0	2	2.5Y 7/2
L/F	4-8	80.3	10YR 6/2	7.5YR 3/2	6.7	9.8	14.2	6.2	5.6	140	21	85	1.10	42.74	25.1	2	2.5Y 7/2
H	8-14	41.9	10YR 6/2	10YR 3/2	4.9	15.1	15.8	6.3	5.6	186	23	88	1.18	40.52	34.3	3	10YR 6/3
H	14-20	44.1	10YR 7/2	10YR 2/2	4.7	19.3	16.6	6.2	5.8	182	20	87	1.15	38.63	33.5	10	10YR 2/2
II Ahg	20-23	10.7	10YR 6/4	10YR 3/2	2.6	66.8	8.4	6.3	6.0	86	8	90	0.74	17.33	23.3	10	10YR 3/2
IICg	23-27	3.9	10YR 6/6	10YR 6/2	0.3	91.4	4.1	6.3	6.2	31	1	97	0.14	1.13	8.2	-	-

Profile Site #6 Evansburg Bog

Location NE 34-53-8-W5

Vegetation Black Spruce, Birch, Ledum, Cottongrass, Sphagnum, Lichen, Vaccinium, Feathermosses

Classification (Tentative) Stratic Fibric Mesisol

Horizon	Depth (inches)	Description
L	0 - 7	10YR 5/6. Medium fibres loose sphagnum. VP-clear.
F	7 - 13	5YR 3/4 and 5YR 2/2. Fine fibres with some medium, mainly mucinic, small woody fragments, some roots, mesic, greasy, VP-cloudy.
L/F	13 - 21	5YR 4/4. Coarse to fine fibres, matted, fennic with some moss remains, partly decomposed and smelly, VP-cloudy. Mesic/fibric.
F	21 - 33	5YR 3/4. Coarse and fine fibres matted, fennic and mucinic, mesic stratified. VP-cloudy, greasy. Some well decomposed inclusions (10YR 2/1).
F	33 - 41	10YR 3/1. Coarse and fine fibres, fennic. Some wood, greasy, VP-cloudy.
F	41 - 47	5YR 3/1. Medium to fine fibres, fennic. Greasy, some wood charcoal present. VP-cloudy.
F	47 - 54	5YR 4/3. Coarse fibres with some very fine, fennic, compact and greasy. Woody, VP-cloudy.

Analyses

EVANSBURG

Horizon	Depth (inches)	% Fibre	Color		W.H.C.	% Ash	H.M.	pH		C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate	
			Ash	Dry				Paste	0.1M $CaCl_2$							Ind	Moist
L	0-7	97.2	10YR 8/4	7.5YR 1/4	15.0	0.9	11.6	3.6	3.2	129	107	18	0.71	41.13	58.2	1	2.5Y 8/0
F	7-13	76.1	10YR 8/3	7.5YR 4/4	9.9	4.7	11.3	3.8	3.5	98	73	26	1.68	43.77	26.0	3	10YR 7/2
L/F	13-21	85.3	10YR 8/3	10YR 6/4	15.5	2.4	11.4	4.0	3.7	102	73	28	0.96	43.27	45.2	2	10YR 7/1
F	21-33	80.1	10YR 8/9	7.5YR 4/4	10.8	3.7	11.2	4.7	3.9	104	62	41	1.69	47.21	28.0	3	10YR 7/1
F	33-41	76.1	10YR 7/4	2.5YR 3/2	7.3	5.6	12.3	5.1	4.7	135	47	64	1.38	47.43	34.4	3	10YR 7/2
F	41-47	80.1	10YR 7/4	7.5YR 3/2	13.6	5.7	11.7	5.1	4.7	129	49	64	0.97	47.54	48.9	3	10YR 7/1.5
F	47-54	84.4	10YR 6/6	2.5YR 3/2	8.1	4.9	10.5	5.3	5.0	124	39	69	1.37	46.80	34.1	3	10YR 7/1.5

Profile Site #7 Granada Bog

Location SE 25-53-10-W5

Vegetation Black Spruce, Tamarack, Dwarf Willow, Ledum, Sedges, Horse Tail, Feather-mosses, Cowberry, Ground Lichens

Classification (Tentative) Terric Stratic Mesic Humisol

Horizon	Depth (inches)	Description
L	0 - 6	10YR 5/6. Coarse fibres, loose feathermoss, VP-cloudy. This sample taken 10 yds. back from road cut.
F/H	6 - 10	10YR 5/8. Medium fibres and 10YR 2/1 medium to fine fibres. Heterogeneous with darker material predominating. Mainly fennic, VP-muddy.
L/F	10 - 13	10YR 3/4 and 10YR 3/1. Medium to fine fibres. Mainly fennic with some moss remains, charcoal present, VP-clear.
H	13 - 21	10YR 2/1. Fine fibres, well decomposed, compact and woody, VP-muddy. Stratified with 1/2" layers of 10YR 4/4 matted, mesic material with medium fibres.
H	21 - 28	10YR 2/1. Fine fibres, fennic, stratified, well decomposed, some wood, VP-muddy. Some lighter colored mesic inclusions.
H	28 - 34	10YR 3/1. Fine fibres, fennic, some woody, VP-cloudy, definitely humic.
H	34 - 40	10YR 2/1. Humic with fine fibres, some woody, some mineral, VP-muddy.
II Cg	@ 40	Gray to dark gray clay loam to clay.

Analyses

GRANADA

Horizon	Depth (inches)	% Fibre	Color		W.E.C.	% Ash	H.M.	pH		C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate	
			Ash	Dry				Paste	0.1M $CaCl_2$							Ind	Moist
L	0-6	86.3	10YR 7/2	10YR 5/6	9.2	5.6	12.0	5.6	5.3	93	29	70	1.28	40.77	31.9	1	2.5Y 8/0
F/H	6-10	62.0	10YR 6/2	5YR 3/2	5.8	11.2	15.5	5.8	5.3	181	31	83	1.17	39.19	33.5	1	2.5Y 8/1
L/F	10-13	84.4	10YR 8/1	2.5YR 5/6	10.3	8.41	14.5	6.3	5.3	173	24	86	1.01	39.08	38.8	1	2.5Y 8/0
H	13-21	80.2	10YR 7/3	7.5YR 4/4	6.9	10.1	15.7	5.8	5.2	194	35	82	0.98	39.53	40.4	2	10YR 8/1
H	21-28	77.7	10YR 6/4	7.5YR 3/2	8.2	11.5	16.1	5.9	5.3	185	46	76	1.10	39.35	35.6	7	10YR 7/2.5
H	28-34	52.6	10YR 7/4	7.5YR 3/2	4.6	18.4	16.4	6.0	5.5	178	26	85	1.17	37.44	32.1	10	10YR 5.5/3
H	34-40	31.8	10YR 6/6	7.5YR 3/2	2.3	29.8	13.4	6.1	5.5	161	26	83	1.24	30.64	24.7	10	10YR 5.5/3

Profile Site #8 — Peers Bog

Location — SE 21-54-14-W5

Vegetation — Tamarack, Spruce, Dwarf Birch, Willow, Ledum, Bedstraw, Dwarf Raspberry, Buckbean, Marsh Cinquefoil, Marsh Marigold

Classification (Tentative) — Stratic Humic Mesisol

Horizon	Depth (inches)	Description
L	0 - 2	Loose feathermosses and sedges.
H (F)	2 - 7	10YR 3/2. Fine fibres, fine granular, fennic, VP-muddy. Some wood, well decomposed, many roots.
H (F)	7 - 12	10YR 2/2. Fine fibres, fine granular, well decomposed, fennic, some woody material, VP-muddy.
F	12 - 17	10YR 4/3. Fine fibres, fennic, mesic, matted, slightly greasy, VP-cloudy to muddy.
F	17 - 25	10YR 3/3. Fine fibres, fennic, mesic, matted, VP-cloudy to muddy.
F	25 - 32	10YR 5/4 and 10YR 3/4 stratified. Medium to fine fibres, fennic, matted, occasional roots, greasy, VP-muddy, mesic.
F	32 - 40	10YR 5/2 with thin layer of 10YR 3/4. Medium and fine fibres, fennic matted with woody material, VP-cloudy, mesic.
F	40 - 52	10YR 4/4 with darker pockets. Fine and medium fibres, fennic, matted. Some wood, not greasy, VP-cloudy.
F	52 - 62	10YR 4/4 with pockets of fine sandy loam (10YR 6/3). Fine to medium fibres, semi decomposed but not greasy, fennic. Woody.
F	78 - 88	10YR 3/4 fine fibres, fennic, VP-muddy, well decomposed.
F/H	100 - 105	10YR 3/2. Very fine fibres, fennic, greasy, VP-muddy, well decomposed.

Analyses

Horizon	Depth (inches)	% Fibre	Color Ash	Color Dry	W.H.C.	% Ash	B.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. K	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind	Pyrophosphate Moist
L	0-2	80.7	10YR 6/3	10YR 4/4	5.1	29.7	9.1	5.3	5.2	78	21	73	1.51	28.14	18.7	2	5Y 7.5/1
H	2-7	55.0	10YR 7/3	7.5YR 3/2	6.5	11.9	13.1	5.6	5.3	103	22	82	2.87	38.94	13.5	2	2.5Y 7.5/2
H	7-12	45.3	10YR 6/2	7.5YR 3/2	6.7	11.5	13.6	5.9	5.3	131	22	83	3.11	39.64	12.8	1	2.5Y 7/2
F	12-17	54.4	10YR 6/2	7.5YR 5/6	7.2	7.1	12.2	5.7	5.2	98	23	77	3.20	43.66	13.7	1	2.5Y 8/0
F	17-25	60.6	10YR 8/2	7.5YR 4/4	7.6	7.6	13.0	5.5	5.2	117	30	74	2.73	43.90	16.1	1	2.5Y 8/0
F	25-32	72.5	10YR 8/3	7.5YR 4/4	9.2	6.7	12.4	5.5	5.2	115	32	72	2.49	45.69	18.4	1	2.5Y 8/0
F	32-40	71.4	10YR 8/3	7.5YR 4/4	8.0	6.0	12.2	5.4	5.1	114	31	73	2.17	44.67	20.6	1	2.5Y 8/0
F	40-52	67.8	10YR 8/4	7.5YR 4/4	9.5	5.2	11.7	5.6	5.2	106	32	70	2.21	44.94	20.4	1	2.5Y 8/0
F	52-62	42.7	10YR 7/1		8.5	30.8	9.3	5.6	5.2	72	26	64	1.82	36.56	20.1	2	2.5Y 8/2
F	78-88	59.2	10YR 7/2	7.5YR 7/2	10.5	6.6	11.6	5.7	5.2	104	30	71	2.58	43.31	16.8	1	2.5Y 8/0
F/H	100-105	71.5	10YR 7/2	7.5YR 3/2	9.5	6.4	11.7	5.7	5.1	107	30	71	2.31	45.44	19.6	1	2.5Y 8/0

Florida State [illegible]

Woodhill Bog

Location

SB 8-60-15-N5

Classification (Tentative)

Stratic Humic Mesisol

No description or analyses available

Profile Site #10 — Fox Creek Bog

Location — SW 5-64-20-W5

Vegetation — Black Spruce, Sphagnum

Classification (Tentative) — Stratic Mesic Fibrisol

Horizon	Depth (inches)	Description
L_1	0 - 6	Woody, coarse, loose, dark brown peat.
L_2	6 - 12	Woody, coarse, loose, brown peat.
L/F	12 - 22	Fibrous, layered, medium to fine, brown and black peat.
F	22 - 42	Cores, composite of three cores to mineral substrate. Fibrous, fine, black, peat.

Analyses

FOX CREEK

Horizon	Depth (inches)	Color Moist	Color Dry	pH	% N	% OM Ignition	% C x 1.72	C/N	Ash	W.H.C. %	H.M. %	Pyros. Index	NaOH Index	Micro Exam Index	Van Post Index
L_1	0-6	10YR 3/2	10YR 6/4	3.8	.96	85	80	49	5.6	9.6	9.1	2	6	1	A
L_2	6-12	10YR 4/4	10YR 8/3	3.6	.54				1.0	18	8.5	1	3	1	
L/F	12-22	10YR 2/1	10YR 2/2	3.7	1.60	83	85	31	4.6	4.6	12.8	8	10	1	D
F	22-42	10YR 2/1	10YR 3/2	4.4	1.50				13.1	2.9	11.1	10	10	2	

Profile Site #11	**Valleyview Bog**
Location	**SE 16-69-22-W5**
Classification	**Stratic Humic Fibrisol**

No description or analyses available.

Profile Site #12	Debolt Bog
Location	SW 7-72-26-W5
Vegetation	Black Spruce, Ledum, Lily of the Valley, Currant, Toadstools, Vaccinium, Sphagnum, Yellow lichen.
Classification (Tentative)	Stratic Mesic Fibrisol

Horizon	Depth (inches)	Description
L	0 - 3	Live sphagnum, etc. N.B. Surface cover is variable.
L	3 - 9	5YR 4/6. Stratified, medium fibres, many roots, sphagnic, VP-cloudy. Pockets of mesic material.
L (F)	9 - 16	Stratified, mainly 5YR 4/6. Medium fibres, sphagnic, with roots, VP-cloudy. Smaller bands of 5YR 2/2, fine fibres, mesic, greasy, VP-very cloudy.
L (F)	16 - 24	Stratified. Description same as above but colours 5YR 4/4 for sphagnic material and 5YR 3/3 for fine fibred mesic.
L/F	24 - 33	5YR 4/6 and 5YR 3/3 stratified. Medium fibres, mucinic, non-greasy, VP-cloudy. Thin bands (1/4") of charcoal.
L/F	33 - 41	5YR 4/4 and 5YR 3/2, stratified. Medium fibres, mainly mucinic, non-greasy, VP-very cloudy, matted, some wood. Thin charcoal band, 10YR 2/1.
F	41 - 47	5YR 3/4. Coarse to medium fibres. Woody 5YR 4/8. Matted, VP-very cloudy, dominantly mucinic, slightly greasy.
F	47 - 51	5YR 3/3. Fine fibres, greasy, mucinic, VP-muddy.
F	51 - 61	5YR 3/2. Medium to fine fibres, greasy, VP-muddy, mucinic, some wood.

Analyses

DEBOLT

Horizon	Depth (inches)	% Fibre	Color Ash	Color Dry	W.H.C.	% Ash	H.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind	Pyrophosphate Moist
L	0-3	90.8	7.5YR 7/4	10YR 6/3	8.4	9.2	9.5	3.7	3.3	112	78	31	0.70	41.97	59.6	1	2.5Y 8/0
L	3-9	80.8	10YR 8/4	10YR 4/3	8.4	6.9	11.1	3.8	3.1	127	87	32	1.02	45.12	44.2	2	10YR 7/1.5
L	9-16	74.4	10YR 8/2	10YR 5/4	9.6	4.6	11.4	3.8	3.0	135	108	21	0.98	45.95	47.1	5	2.5Y 7/2
L	16-24	66.9	10YR 8/2	10YR 4/4	6.2	4.7	10.4	3.6	3.1	125	104	17	0.93	47.29	50.8	10	2.5Y 7/2
L/F	24-33	70.1	10YR 8/3	10YR 3/4	7.7	5.1	11.6	3.9	3.3	150	109	27	0.88	47.05	53.2	8	2.5Y 7/2
L/F	33-41	75.1	10YR 8/3	10YR 3/4	13.2	7.5	12.2	4.3	3.9	162	95	41	0.83	46.70	56.3	5	2.5Y 7/2
F	41-47	60.3	10YR 8/2	10YR 3/2	8.5	7.8	13.3	4.4	4.3	149	75	50	1.46	45.92	31.5	6	2.5Y 7/2
F	47-51	43.9	10YR 6/3	10YR 3/4	6.0	9.4	12.7	5.3	4.7	170	52	69	2.25	46.68	20.8	3	2.5Y 7/2
F	51-61	47.2	10YR 7/1	5YR 2/2	7.3	8.7	12.5	5.0	4.6	168	60	64	2.12	44.81	21.1	6	2.5Y 7/2

Profile Site #13 — Debolt Bog (2)

Location — SW10-72-1-W6

Vegetation — Willow, Dwarf Birch, Sedges and coarse grasses

Classification (Tentative) — Terric Fennic Mesisol

Horizon	Depth (inches)	Description
F	0 - 12	Dark brown (7.5YR 3/2 moist) slightly decomposed moss. Material strongly held together by numerous small roots.
H	12 - 17	Very dark brown (10YR 2/2 moist), partially decomposed peat.
II Ahg	17 - 18	Black (10YR 2/1 moist), mineral-organic layer. No fibres discernible.
II Cg	18 - 24	Very dark grayish brown (10YR 3/2 moist), loam to clay loam.

Analyses

DEBOLT BOG (2)

Horizon	Depth (inches)	% Fibre	Color Ash	Color Dry	W.H.C.	% Ash	H.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind.	Pyrophosphate Moist
F	0-12	44.9	10YR 7/3	5YR 2/2	6.0	13.7	13.1	5.9	5.7	121	16	85	2.34	39.95	17.1	3	10YR 7/3
H	12-17	31.7	10YR 7/3	5YR 2/2	4.1	28.9	10.7	5.5	5.4	113	22	78	2.49	35.72	14.3	10	10YR 4/3
Ah	17-18	21.5	10YR 6/3	10YR 2/1	1.2	60.7	3.9	5.6	5.4	44	12	68	4.85	7.86	9.2	5	10YR 4/3
Cg	18-24	32.1	10YR 6/3	10YR 3/2	1.2	75.5	4.1	5.6	5.5	44	10	74	0.88	11.10	12.6	3	7.5YR 4/4

Profile Site #14	Grande Prairie Bog
Location	NE7-72-5-W6
Classification (Tentative)	Terric Fennic Mesisol

No description or analyses available.

Profile Site #15	Beaverlodge Bog
Location	SE5-72-8-W6
Vegetation	Black Spruce, Ledum, Vaccinium, Sphagnum, Pleurozium, Lichens
Classification (Tentative)	Terric Stratic Mesic Fibrisol

Horizon	Depth (inches)	Description
L	0 - 6	10YR 7/4 and 10YR 5/3. Live and slightly decomposed sphagnum, many roots, coarse fibres, VP-clear.
L	6 - 12	Stratified with layers of 10YR 6/6, medium fibres, sphagnic, non-greasy, many roots, VP-cloudy, and 10YR 5/3, medium fibres, mucinic, slightly greasy, many roots, VP-cloudy.
L	12 - 21	10YR 6/6. Medium fibres, sphagnic, non-greasy, matted, no roots. Pockets of 10YR 5/3, medium to fine fibres, mucinic and fennic, greasy, VP-very cloudy.
F/H	21 - 31	10YR 3/3, uniform. Mainly fine fibres, probably mucinic, very greasy, some mineral content, VP-muddy.
F-Ahg	31 - 37	10YR 2/2. Fine and medium fibres, some fennic material, high mineral content.
Ahg	37 - 40	10YR 3/1. Mineral substratum, clay-loam, some humic organic matter.

Analyses

BEAVERLODGE

Horizon	Depth (inches)	% Fibre	Color		W.H.C.	% Ash	H.M.	pH		C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate	
			Ash	Dry				Paste	0.1M $CaCl_2$							Ind.	Moist
L	0-6	90.3	10YR 6/3	10YR 6/3	13.2	15.1	8.5	3.9	3.3	113	81	28	0.91	38.09	41.8	1	2.5Y 8/0
L	6-12	90.7	10YR 8/6	10YR 6/4	18.7	1.7	6.9	3.8	3.1	119	90	25	0.84	43.89	52.4	2	2.5Y 8/0
L	12-21	88.8	10YR 6/6	10YR 5/3	8.5	2.2	11.7	4.0	3.1	119	98	18	1.01	45.24	44.8	3	2.5Y 8/2
F/H	21-31	59.7	10YR 7/4	5YR 3/2	7.1	4.6	10.3	3.8	3.5	127	95	26	1.25	48.37	38.8	10	10YR 5.5/4
F-Ahg	31-37	61.0	7.5YR 6/6	10YR 2/2	4.1	89.0	11.1	4.0	3.8	126	80	37	2.10	47.83	22.8	10	10YR 5/4
Ahg	37-41	10.4	10YR 7/2	10YR 5/4	0.5	78.9	4.7	4.7	4.2	46	31	33	0.83	8.96	10.8	10	10YR 4.5/3

Profile Site #16	Brainard Bog
Location	SE14-74-12-W6
Vegetation	Black Spruce, Ledum, Vaccinium, Mosses, Lichens
Classification (Tentative)	Stratic Mesic Fibrisol or Unic Fibrisol

Horizon	Depth (inches)	Description
L	0 - 8	10YR 5/4. Live and slightly decomposed mosses, mostly sphagnic. Medium fibres, loose, VP-clear.
L	8 - 14	10YR 3/4. Coarse fibres, loose, mucinic, partially decomposed, non-greasy, VP-slightly cloudy.
L	14 - 18	10YR. Medium fibres, mucinic, non-greasy, VP-cloudy. Includes 1/2" layer 10YR 2/1 with much charcoal.
L	18 - 28	10YR 5/8. Medium fibres, mucinic, non-greasy, matted, VP-almost clear.
	28 - 29	10YR 2/1. Woody and charcoal layer.
L/F	29 - 39	10YR 5/8. Medium to fine fibres, mucinic, matted, slightly greasy, VP-cloudy.
F	39 - 53	10YR 5/6. Coarse to fine fibres, mucinic with some fennic, matted. (Thread-like fibres - presumably mosses). VP-very cloudy, slightly greasy. Small pockets of 10YR 3/3 medium fibres, some wood.
F	53 - 61	10YR 4/4. Coarse to medium fibres, mucinic, slightly greasy, VP-muddy, some fennic remains.

Analyses

BRAINARD

Horizon	Depth (inches)	% Fibre	Color Ash	Color Dry	W.H.C.	% Ash	H.M.	pH Paste	pH 0.1M $CaCl_2$	C.E.C.	Exch. H	% Base Sat.	% N	% C	C/N Ratio	Pyrophosphate Ind.	Pyrophosphate Moist
L	0-8	85.5	10YR 7/3	10YR 5/4	8.2	10.6	9.3	3.5	3.1	117	89	24	0.70	38.80	55.3	2	10YR 8/1
L	8-14	86.2	10YR 8/6	7.5YR 4/2	9.2	2.1	11.9	3.7	3.3	121	87	28	0.50	46.69	93.6	2	10YR 8/1
L	14-18	81.5	10YR 8/4	10YR 4/4	8.8	4.6	11.6	3.5	3.1	170	123	28	0.86	45.91	53.6	2	10YR 8/2
L	18-28	89.7	10YR 8/4	10YR 6/4	15.1	2.0	12.0	3.4	3.2	146	119	18	0.54	43.59	81.0	1	10YR 8/1
H	28-29	81.2	10YR 8/6	10YR 3/4	6.7	3.6	9.9	3.6	3.1	148	102	31	1.04	49.30	47.2	4	10YR 7/3
L/F	29-39	86.8	10YR 7/3	10YR 6/4	12.0	2.5	11.7	3.9	3.2	129	97	25	0.86	45.00	52.1	1	10YR 8/2
F	39-53	78.2	10YR 7/6	10YR 4/3	9.9	3.5	12.4	4.1	3.5	131	93	29	1.12	47.24	42.1	3	10YR 7/3
F	53-61	81.2	10YR 5/3	10YR 3/2	9.6	6.3	14.8	5.2	4.3	169	71	58	0.74	45.05	60.8	2	10YR 7/2

Methods of Analyses

The following methods of analyses were used in the laboratory for characterizing the peat samples obtained at the various profile sites.

1. Percentage Fibre - The sample was dispersed with sodium hexamethaphosphate and passed through a 100 mesh sieve. The residue remaining on the screen was weighed.
2. Color - Munsell soil color charts.
3. Water Holding Capacity (WHC) - The sample was soaked in hot water with shaking for 30 minutes and then drained for one hour in a funnel. A sample was extracted from the mass and the moisture content determined at 105°C.

$$WHC = \frac{\text{weight moisture}}{\text{weight oven dry peat}}$$

4. Percentage Ash - The peat sample was ignited at 450°C for three hours.
5. Hygroscopic Moisture (HM) - The peat sample was dried at 105°C.
6. Soil Reaction (pH) - The pH was determined by the paste method and with .01M calcium chloride.
7. Cation Exchange Capacity (CEC) - Ammonium acetate method.
8. Exchangeable Hydrogen (Exch. H) - Barium acetate method.
9. Percentage Base Saturation (% Base Sat.) - $100 - \left(\frac{\text{Exch. H} \times 100}{\text{C.E.C.}}\right)$

10. Percentage Nitrogen (% N) - Macro Kjeldhal method.

11. Percentage Carbon (% C) - Ignition in Leco induction furnace.

12. Carbon-Nitrogen Ratio (C/N Ratio) - $\frac{\text{percentage carbon}}{\text{percentage nitrogen}}$

13. Pyrophosphate - (a) Index - 0.1 grams of sample were extracted with .1M sodium pyrophosphate, shaken for one hour. Optical density read at 420 mμ in 1 cm. cell. Pyro index is optical density times five.

(b) Test - The color developed on chromatographic paper after extraction with saturated sodium pyrophosphate was compared to Munsell Color Chips.

14. Van Post method - The degree of decomposition by the Van Post method was determined as follows:

(a) Approximately one gram of ground peat was put in a test tube and shaken with water and then allowed to settle for ten minutes.

(b) The characteristics of the supernatant liquid permitted the following groupings:

A - Clear - approximately (H_1 - H_2)

B - Cloudy - approximately (H_3 - H_5)

C - Muddy - approximately (H_6 - H_9)

D - Black - little or no sediment (H_{10})

Significance of Analyses of Peat Samples

The analytical data compiled from the study of the peat samples was subjected to a statistical analysis in the following manner:

(a) All fibric, mesic, and humic horizons were grouped according to the criteria of percentage of fibre as indicated by the N.S.S.C. classification.

(b) Alternately all samples were grouped according to their ash content.

These two criteria were chosen as the independent variables because the first consideration (a) is given prominence in the classification while the second consideration (b) is of prime importance with the peat industry in characterizing their product.

The results, shown in an accompanying table, indicate that although there is generally a gradation of mean values in passing from fibric to humic horizons these values may be meaningless for classification purposes because of the low correlation coefficients. The correlation values are usually higher for the humic horizons. They tend to decrease progressively to the mesic and fibric horizons with the greatest drop between the mesic and fibric.

Although the data appears to be inconclusive with respect to the characterization of peats, the per cent ash, pH, per cent carbon, and exchangeable hydrogen appear to have the greatest potential to serve as diagnostic criteria.

STATISTICAL ANALYSES

Coefficient of Linear Correlation - Based on % Ash (modified by W.H.C./100)

	% Ash	W.H.C. /100	% Fibre	Hyg. H_2O	pH (Paste)	pH ($CaCl_2$)	C.E.C.	% N	% C	C/N	Pyro. Ind.	Exch. H
FIBRIC HORIZONS												
ean	5.48	9.56	74.2	11.67	4.65	4.03	133.97	1.33	45.06	40.59	3.14	72.93
d. Deviation	2.17	3.19	14.0	1.73	0.99	0.95	24.46	0.64	0.86	15.37	2.63	33.27
oeff. of Correlation		-0.25	-0.28	0.29	0.64	0.71	0.13	0.39	0.63	-0.42	-0.15	-0.59
. of Observations	89											
MESIC HORIZONS												
ean	14.2	7.61	61.94	12.92	5.91	5.47	131.59	1.74	40.87	29.40	3.48	29.86
d. Deviation	3.51	2.94	17.68	2.06	1.06	1.16	35.99	0.86	3.64	13.25	3.20	25.80
oeff. of Correlation		0.15	0.10	0.04	0.12	0.17	0.07	0.21	0.57	0.05	0.04	-0.11
. of Observations	43											
HUMIC HORIZONS												
ean	42.23	3.81	33.17	8.63	5.73	5.45	84.90	1.70	26.22	16.81	4.33	21.46
td. Deviation	16.90	1.77	13.89	2.61	0.71	0.77	32.85	0.67	9.10	8.12	3.42	13.28
oeff. of Correlation		-0.66	-0.64	-0.87	0.77	0.66	-0.74	-0.46	-0.93	-0.55	-0.28	-0.70
o. of Observations	15											

Coefficients of Linear Correlation - Based on % Fibre

FIBRIC HORIZONS												
ean	7.11	10.07	79.83	11.67	4.76	4.14	134.17	1.13	43.64	43.27	2.92	63.78
td. Deviation	4.68	3.22	7.63	1.65	1.15	1.14	8.37	0.46	3.43	14.03	2.57	36.09
oeff. of Correlation	-0.18	0.53		-0.16	-0.24	-0.18	-0.35	-0.05	-0.40	0.06	-0.34	-0.11
o. of Observations	91											
MESIC HORIZONS												
ean	12.16	6.35	50.61	12.50	5.64	5.23	128.53	2.11	42.71	23.00	3.82	60.45
td. Deviation	6.84	1.40	9.02	2.41	0.92	0.94	34.26	0.72	5.35	8.72	3.16	30.05
oeff. of Correlation	0.02	0.45		-0.07	-0.33	-0.34	-0.01	-0.50	-0.23	0.43	-0.08	0.49
o. of Observations	44											
HUMIC HORIZONS												
ean	43.42	3.39	26.22	8.61	6.0	5.73	82.50	1.96	25.87	13.14	5.17	16.17
td. Deviation	20.05	1.50	5.81	3.76	0.67	0.81	33.00	0.75	10.76	3.82	3.33	10.95
oeff. of Correlation	-0.82	0.57		0.63	-0.43	-0.30	0.71	0.63	0.79	0.52	0.48	0.46
o. of Observations	12											

BULK DENSITY MEASUREMENTS

Bulk density determinations were carried out in early May on 22 block samples obtained using a small axe, hacksaw, knife, and a 40 cubic inch (1016 cc) wooden box (internal measurements 4 x 5 x 2"). The samples were transported and weighed in sealed polythene bags, then spread out on trays and dried at 105°C for 24 hours.

Some difficulty was encountered obtaining uncompressed samples of the loose, rooty L horizons, and it was found impossible to obtain blocks of the deeper frozen horizons. Even so, of three sets of replicates, one was excellent (L) and two good (L, H).

As would be expected the bulk densities are very low compared with mineral soils. There is no general pattern down the profiles examined, the bulk density being directly related to the state of decomposition of each layer, and thus to the Great Group classification.

Average bulk density of L horizons	= 0.44
Average bulk density of L/F + F Horizons	= 0.77
Average bulk density of F/H + H horizons	= 0.93

On analysis of the results, there was found to be no relationship of bulk density to percentage water, or to ash content. However, there is a fairly good negative correlation of bulk density with % fibre (coeff. of correlation -7.03).

Site	Depth	Horizon	O.D. Wt.	% H_2O	Bulk Density	% F...
MAGNOLIA						
Stratic Mesic Fibrisol	1-3	L	30.2	66.5	0.30)	
	1-3	L	40.7	85.7	0.40)	
	6-8	L	24.4	93.2	0.24)	Av. 6...
	6-8	L	26.9	92.5	0.26)	
	7-9	L	29.3	94.3	0.29)	
WINTERBURN						
Terric Stratic Mesic Fibrisol	0-2	L	80.2	64.3	0.79	8...
EVANSBURG						
Stratic Fibric Mesisol	2-4	L	29.4	85.9	0.29)	
	4-6	L	45.0	79.7	0.44)	9
	7-9	F	79.7	80.3	0.78	7...
	12-14	L/F	63.8	84.6	0.63	8...
	20-22	F	67.5	82.5	0.66	8...
DRAYTON VALLEY						
Terric Fibric Humisol	0-2	L	46.7	60.8	0.46)	
	2-4	L	63.0	75.8	0.62)	
	5-7	L/F	71.4	86.4	0.70	8
PEERS						
Stratic Humic Mesisol	3-5	H	91.6	78.7	0.90)	
	3-5	H	100.3	80.0	0.99)	3...
	13-15	F	81.3	82.9	0.80	...
	19-21	F	81.9	85.3	0.81	...
GRANADA						
Terric Stratic Mesic Humisol	1-3	L	72.2	7...2	...	...
	6-8	F/H	1...2	78 9	...09	...
	10-12	L/F	102.5	81.6	...01	
	17-19	H	...9	85.7	...3	

The Microbiology of Alberta Peat Bogs

Recently, a study was completed by Miss P. J. Gardner as a partial requirement for the degree of Master of Science under the supervision of Dr. F. D. Cook. With their kind permission the following is the summary and the conclusions taken from the thesis submitted to the Faculty of Graduate Studies from the Department of Soil Science in April 1967:

" The purpose of this project was to characterise certain Alberta peat bogs pedologically, botanically and microbiologically, in order to discover more about the natural conditions in which the Myxobacterales live.

A few microbiological studies have been carried out on peat bogs in various parts of the world, but this is believed to be the first instance that such a study has been performed in Canada. It is also believed to be one of the first attempts to correlate vegetation, soil and microbiological characteristics of peat areas. This may, therefore be regarded as a preliminary study in the relationships between flora, soil and micro-organisms.

Some of the major conclusions of this study include:

1. Specific associations of mosses and higher plants occur on different types of peat bogs. The seral succession of these plant associations is directly related to the development of a particular peat profile.

2. Modifications to the present classification of Canadian peat bogs, based on both the vegetation and chemical and physical properties have been made, and these result in the following

revised grouping of more significantly related types of peat bogs:

	Vegetation grouping	Soil Survey nomenclature
Group I	Black Spruce - Sphagnum	Fibrisols and Fibric Mesisols
Group II	Black Spruce - "Feathermosses"	Mesisols and Humisols (excluding sedge bogs)
Group III	Sedges	Some Mesisols and Humisols

3. Relatively large numbers of bacteria and fungi occur in the surface horizons presumably due to the proliferation of aerobes. The marked increase of bacterial numbers at depth, similar to that obtained by other workers, is attributed to facultative anaerobes. However, low temperatures considerably depress the counts.

4. Myxobacters, especially members of the Cytophagaceae, are particularly numerous in the more humified horizons, and may comprise up to one tenth of the population surviving on Plate Count in the Humisol.

5. Species of Chromobacterium are also especially abundant in the well-decomposed layers. Their presence here may be correlated with their need to simple proteins and carbohydrates which may only be available when the peat material has been considerably broken down by other microbial action.

6. The only significant transformation of the nitrogen cycle is ammonification, and up to 100 million bacteria per gram oven-dry weight are active in the breakdown of plant protein in Humisols and Mesisols, with far fewer in the Cryic Fibrisol.

7. Iron reducing bacteria are very common in peat bogs, with up to 170 times as many organisms as in mineral A horizons.

The results of this study have enlarged the knowledge and understanding of peat bogs in Alberta. It is now known that these bogs are somewhat similar to more southerly ones, and that frigid temperatures, although significantly lowering the numbers of active micro-organisms, do not guarantee sterility. The results further show the existence in considerable numbers of certain special groups of bacteria. However there is still so much to be learned about these areas, that it is difficult to know which of the innumerable problems to attack first. "