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THE APPLICATION OF REMOTE SENSING TO ENVIRONMENTAL MONITORING OF THE AOSERP STUDY AREA

VOLUME II

by

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ALBERTA OIL SANDS ENVIRONMENTAL RESEARCH PROGRAM

PROJECT TF 6.3

October 1978

The Hon. D.J. Russell
Minister of the Environment
222 Legislative Building
Edmonton, Alberta

and

The Hon. L. Marchand
Minister of State for the Environment
Fisheries and Environment Canada
Ottawa, Ontario

Sirs:

Enclosed is the report "The Application of Remote Sensing to Environmental Monitoring of the AOSERP Study Area: Volume II".

This report was prepared for the Alberta Oil Sands Environmental Research Program, through its Terrestrial Fauna Technical Research Committee (now part of the Land System), under the Canada-Alberta Agreement of February 1975 (amended September 1977).

Respectfully,

W. Solodzuk, P.Eng.
Chairman, Steering Committee, AOSERP
Deputy Minister, Alberta Environment

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The Application of Remote Sensing to Environmental Monitoring of the AOSERP Study Area, Volumes I and II

DESCRIPTIVE SUMMARY

ABSTRACT

The purpose of this study was to examine the application of remote sensing to environmental monitoring of the Athabasca Oil Sands region and to demonstrate the way in which field-acquired and remotely-sensed data could be integrated.

Vegetation field data were acquired and sample plots were subjectively divided into community and class groupings.

False color infrared and true color aerial photography were examined. It was concluded that false color infrared aerial photography acquired during the period of maximum foliage development is most valuable for vegetation mapping and the detection of environmental disturbance.

Thermal infrared night time imagery was found to be most valuable in the detection of thermal anomalies related to water features, and in the analysis of oil sands plant sites.

LANDSAT color composite transparencies were studied and found to be valuable in providing an overview of the major ecological communities in the area, and of the progress of land clearing operations. Digital analysis of two summer images was done using the Image-100 system at the Canada Centre for Remote Sensing in Ottawa. Change detection analysis of open water, cleared land, and disturbance vegetation appeared to be the most valuable application of LANDSAT digital data to environmental monitoring of the region.

In an operational environmental monitoring program, remotely sensed data should be acquired at regular intervals. It is suggested that imagery acquisition for different areas within the Oil Sands region be specifically tailored to the current and expected activity in each area.

BACKGROUND AND PERSPECTIVE

This final report summarizes the results of a two-year project designed to examine the application of remote sensing for ecological studies within the AOSERP study area and to demonstrate the integration of field- and remote-sensed data. The project relates to the Land System objectives of reviewing and assessing available information pertaining to terrestrial ecosystems in the area, and to undertake studies which may be used to establish the baseline states for physical, chemical, and biological constituents of these ecosystems. Remote sensing may also play an important role in the establishment of monitoring networks, which is a major Program objective.

ASSESSMENT

The report entitled "The Application of Remote Sensing to Environmental Monitoring of the AOSERP Study Area" which was prepared by S. Aronoff, G.A. Ross, and W.A. Ross (University of Calgary) has been reviewed by Alberta Oil Sands Environmental Research Program and external referees.

In view of the value of the data, the Alberta Oil Sands Environmental Research Program recommends that the report be published and made available.

Although the report does not meet the standards set by AOSERP for publication and wide distribution, it contains a summary of remote sensing techniques and equipment, and an analysis on portions of the study area. The report may be of some value in acquiring or interpreting remote sensed imagery.

The content of this report does not necessarily reflect the views of Alberta Environment, Environment Canada, or the Alberta Oil Sands Environmental Research Program. The mention of trade names for commercial products does not constitute an endorsement or recommendation for use.

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ABSTRACT

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ACKNOWLEDGEMENTS

This research project was funded by the Alberta Oil Sands Environmental Research Program (AOSERP), a joint Alberta Canada research program established to fund , direct and coordinate environmental research in the Athabasca Oil Sands area. Due to the interdisciplinary nature of this study the assistance and co-operation of a large number of individuals and several agencies was required.

The first author of this report (S.A.) served as principal researcher and writer. The other authors (G.A.R. and W.A.R.) served as principal investigators for the study. Other project advisors were Dr. Valerius Geist and Dr. Richard Revel of the Faculty of Environmental Design at the University of Calgary, Dr. Robert T. Ogilvie, Curator of Botany, Provincial Museum of British Columbia, Victoria, B.C. and Dr. Robert A. Ryerson, Canada Centre for Remote Sensing, Ottawa, Ontario.

Thanks are due to Mr. L.O. Sinkey who devoted many hours to writing the computer programs for the vegetation analysis and modifications to the text editor, as well as answering numerous queries. Mr. R.N. Sidebotham provided assistance in using the computer system.

The Alberta Remote Sensing Centre and the Canada Centre for Remote Sensing (CCRS) assisted in imagery acquisition and generously made their facilities available to the authors. CCRS flew the image acquisition missions. Drs. J. Cihlar and R.A. Ryerson of CCRS provided valuable assistance and technical advice during analysis of the imagery, and reviewed drafts of the final report.

The National Air Photo Library in Ottawa produced the color aerial photography and overlays, and their technical advice and efficient service was greatly appreciated. Dr. G.C. Argus of the National Herbarium of Canada identified the willow specimens, Mr. D. Jaques of the Kananaskis Environmental Sciences Centre critiqued the study design, and Mr. Michael Yachnin assisted in the field work.

Finally the authors thank Ms. Muriel Enock for her effective and efficient administration of this project.

FIGURES AND TABLES

FOR

SECTION 4

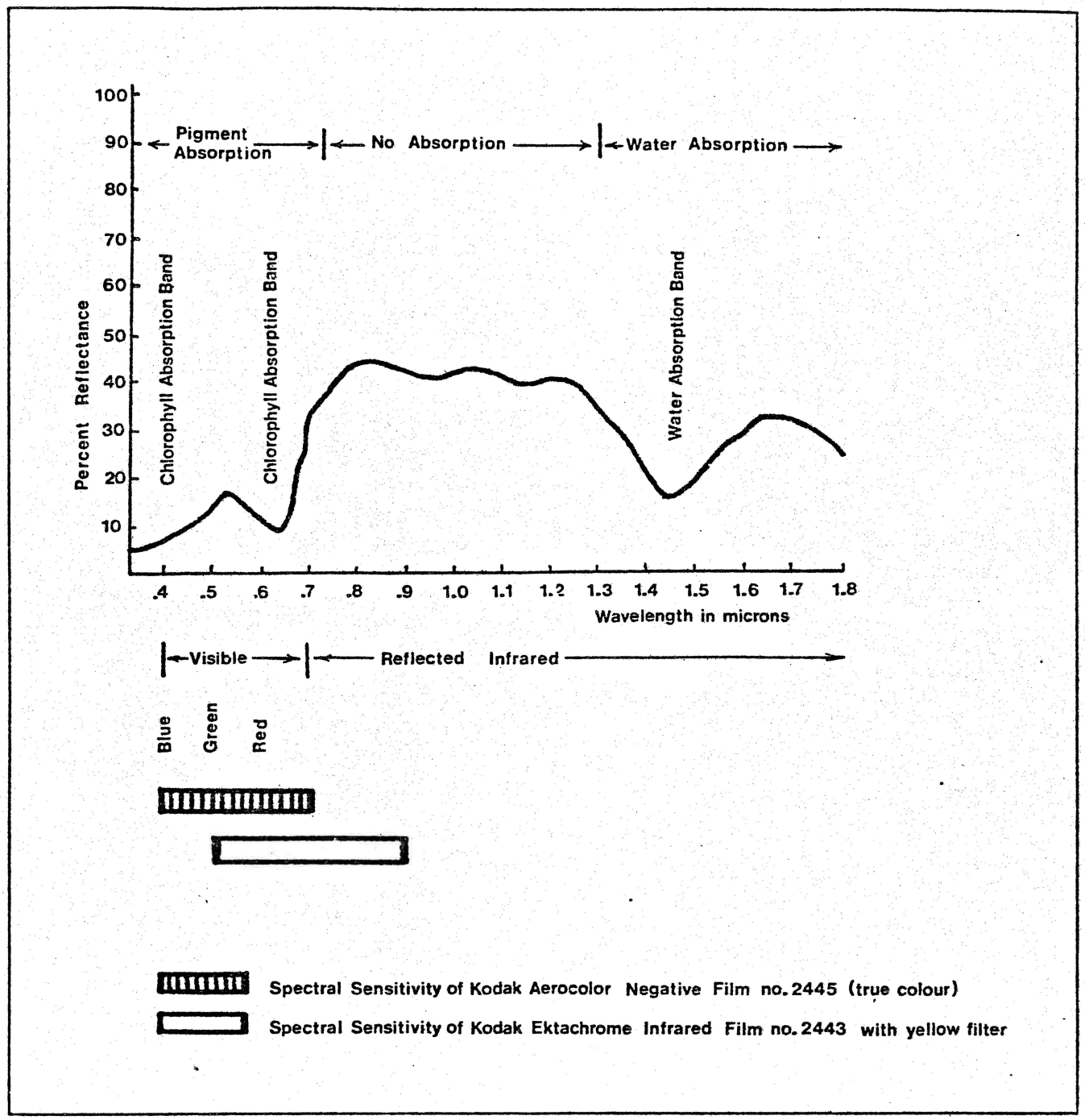
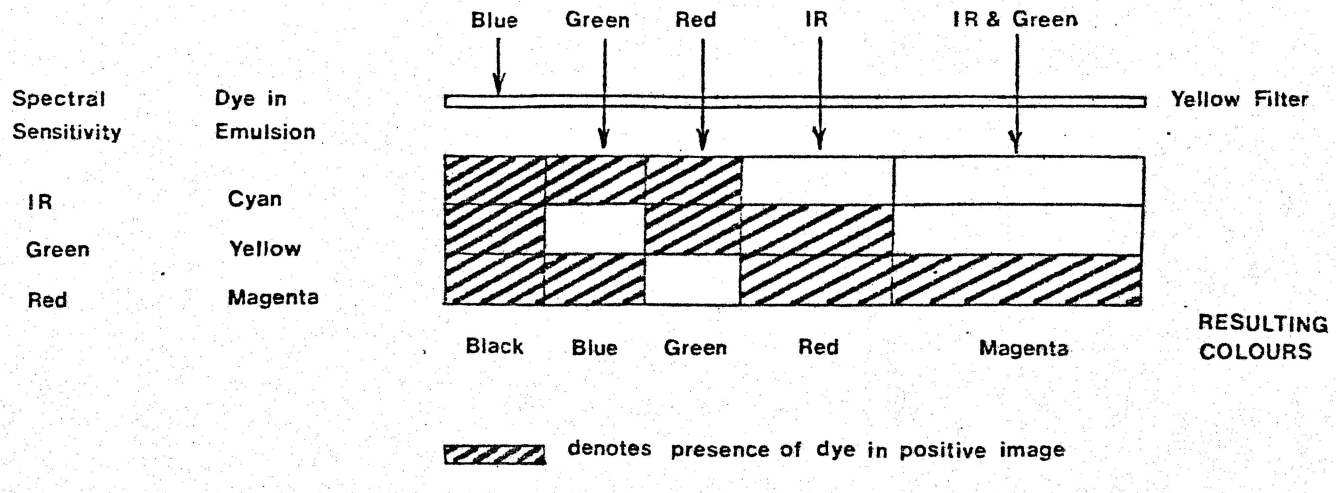
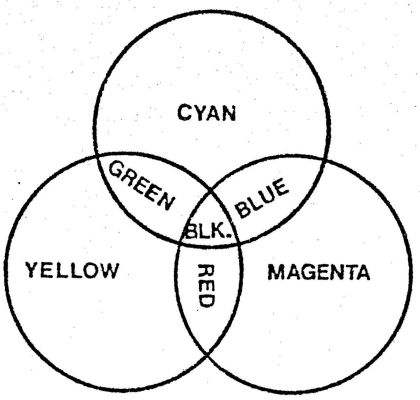


Figure 4-1 Characteristic spectral reflectance of a green leaf and spectral sensitivity of colour aerial photographic films. (After Hoffer and Johansen (1969) and Kodak (1972)).

COLOUR FORMATION IN FALSE COLOUR INFRARED FILM



SUBTRACTIVE COLOUR MIXTURE



Cyan is a bluish green colour and as a filter passes both green and blue light.

Magenta is a bluish red colour and as a filter passes both red and blue light.

Yellow as a filter passes both green and red light.

Figure 4-2 Colour formation in false-colour infrared film (after Knipling 1969).

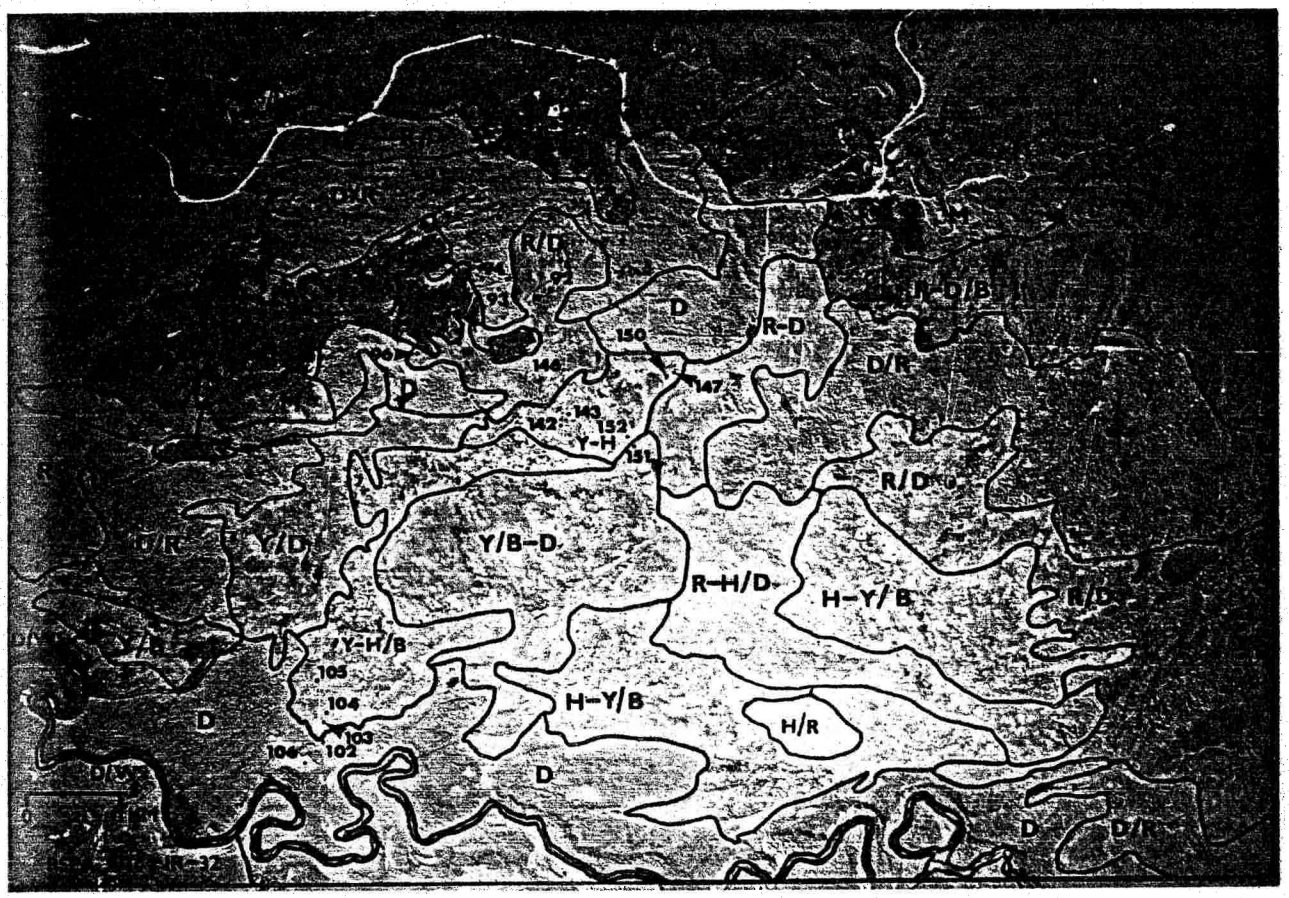


Figure 4-3 Interpretation and mapping of vegetation communities from 1/70,000 scale false-colour infrared aerial photograph (Frame RSPA 30784 IR-32).

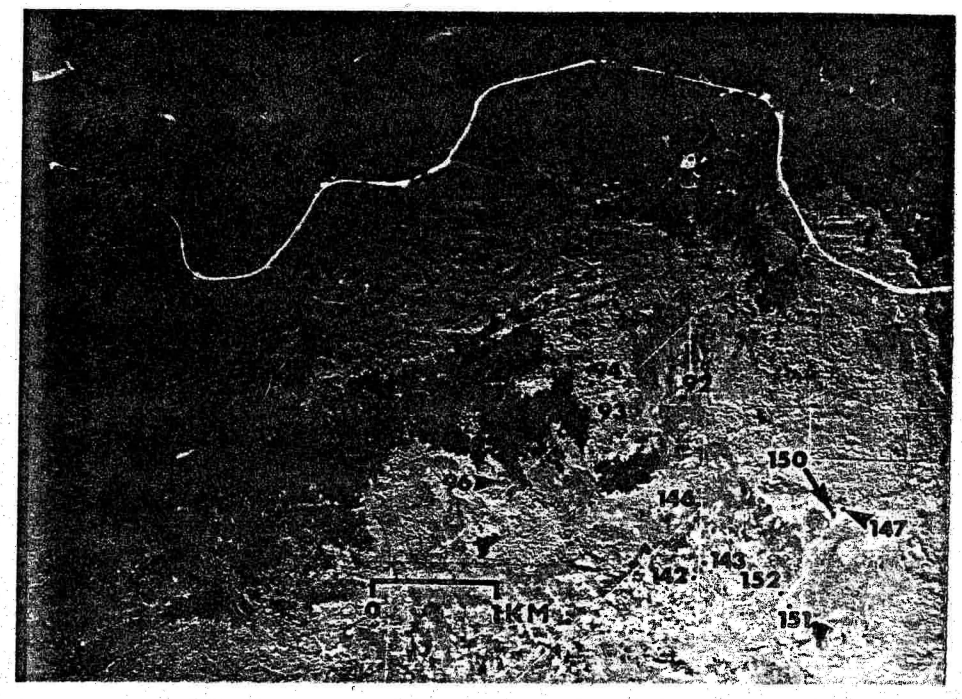


Figure 4-4 Portion of the 1/70,000 false-colour infrared aerial photograph (Frame RSPA 30784 IR-32).



Figure 4-5 Portion of the 1/70,000 false-colour infrared aerial photograph (Frame RSPA 30784 IR-32).



Figure 4-6 Ground photo of Plot 47, the Upland Black Spruce community.

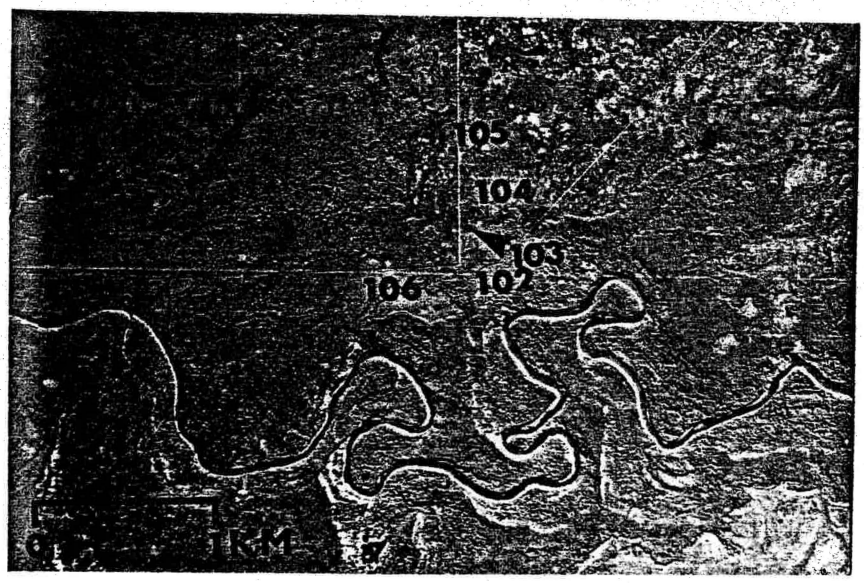


Figure 4-7 Plots 102-106 as they appear on a 1/70,000 scale false-colour infrared aerial photograph, Frame RSPA 30784 IR-32.

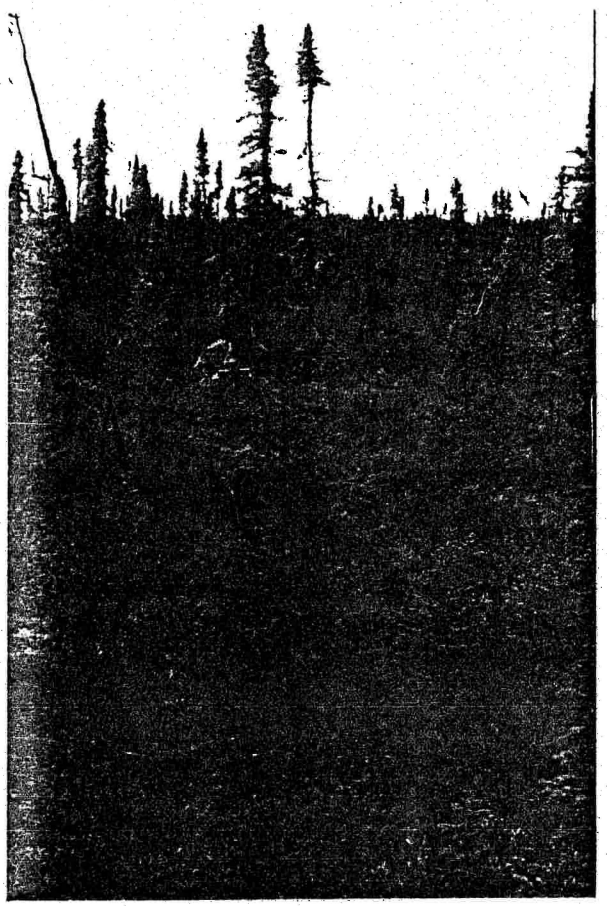


Figure 4-8 Ground photo of Plot 105, the Muskeg community.



Figure 4-9 Close-up of Plot 105 groundcover.



Figure 4-10 Ground photo of Plot 48, the Fire Regeneration class.

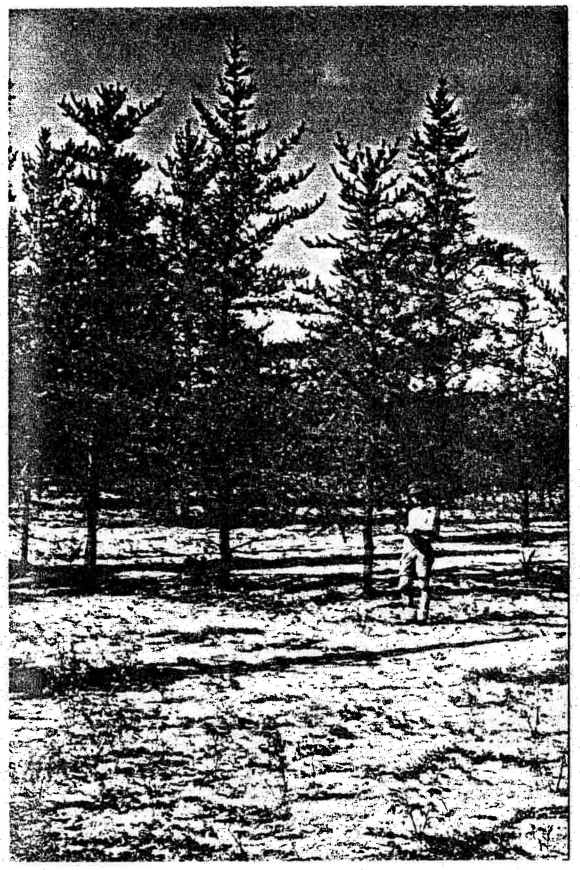


Figure 4-11 Ground photo of Plot 111, the Jackpine-Cladina spp community.

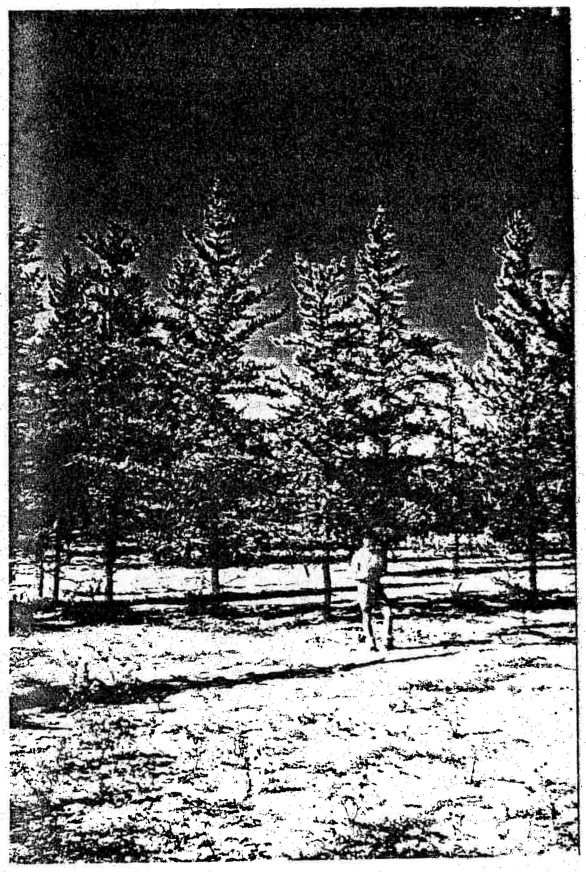


Figure 4-12 False-colour infrared ground photo of Plot 111.



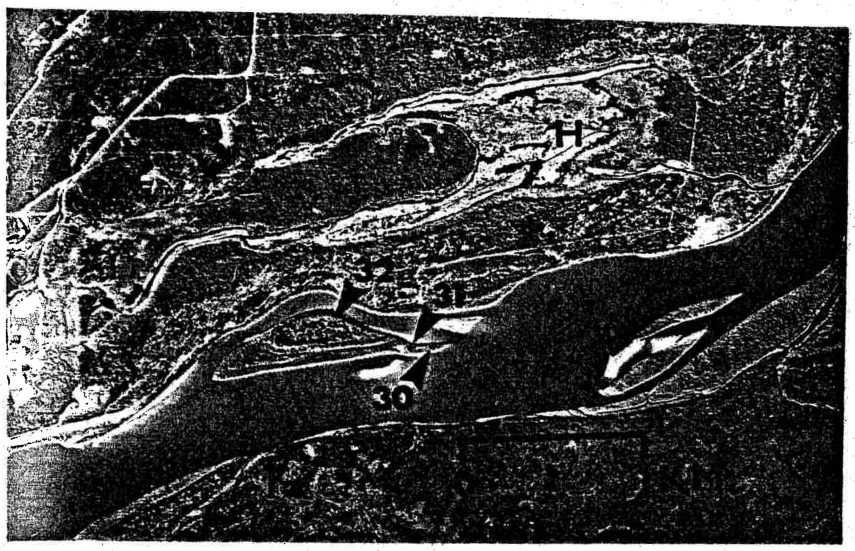
Figure 4-13 Ground photo of Plot 112, the Jackpine-Alder community.



Figure 4-14 Mixing of water from the Clearwater River (C) and Athabasca River (A) (as shown on a 1/70,000 scale false-colour infrared aerial photograph, Frame RSPA 30784 IR-72.)



Figure 4-15 Ground photo of Plot 102, the Aspen community.



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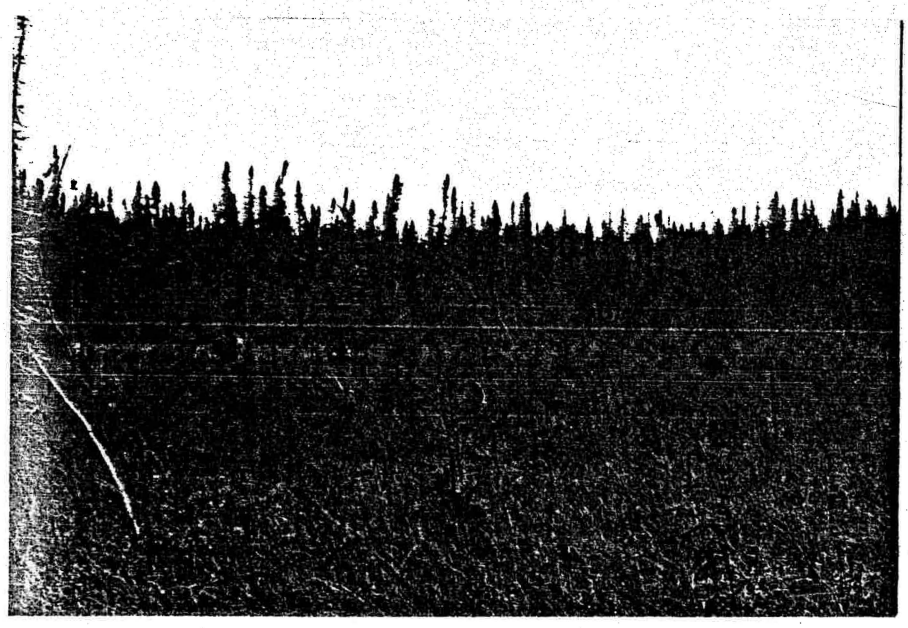


Figure 4-17 Ground photo of Plot 90 (foreground), the Larch Bog, and Plot 91 (background), the Upland Black Spruce community.

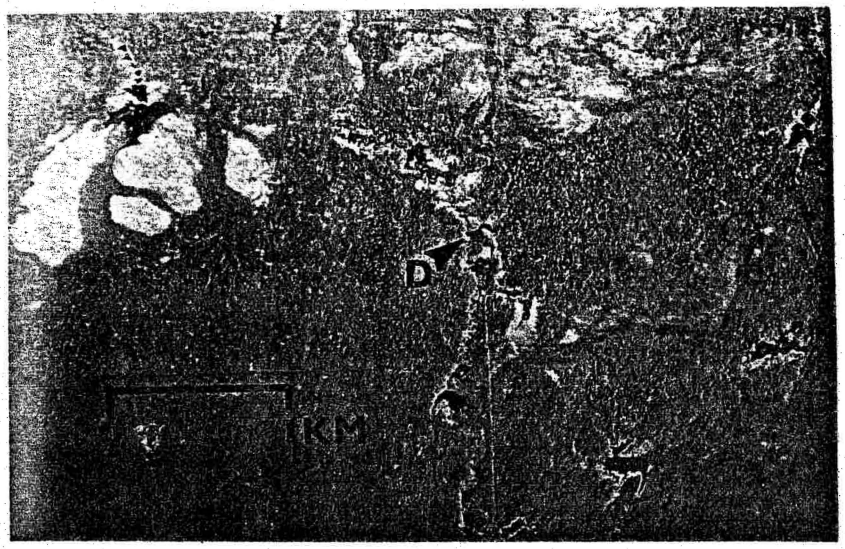


Figure 4-18 Beaver dams (at D), as shown on a 1/70,000 scale false-colour infrared aerial photograph, Frame RSPA 30784 IR-42.



Figure 4-19 Portion of a 1/61,000 scale false-colour infrared aerial photograph, Frame RSA 30574 IR-16. Note the darkened edges of the photograph (vignetting) due largely to the use of a wide-angle lens.

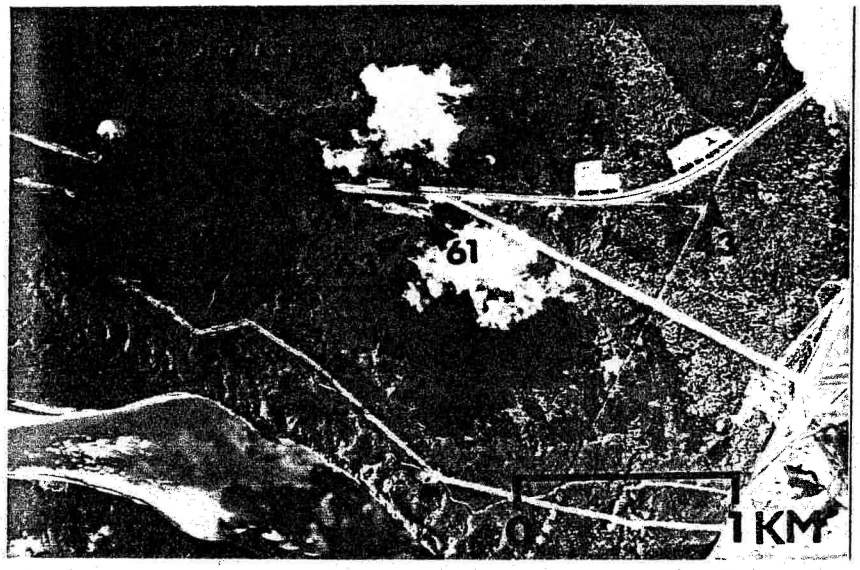


Figure 4-20 Portion of a 1/61,000 scale false-colour infrared aerial photograph, Frame RSA 30574 IR-11.

Figure 4-21 (see back cover pocket) 1/10,000 scale false-colour infrared photograph, Frame A 37403 IR-141 with vegetation interpretation overlay.

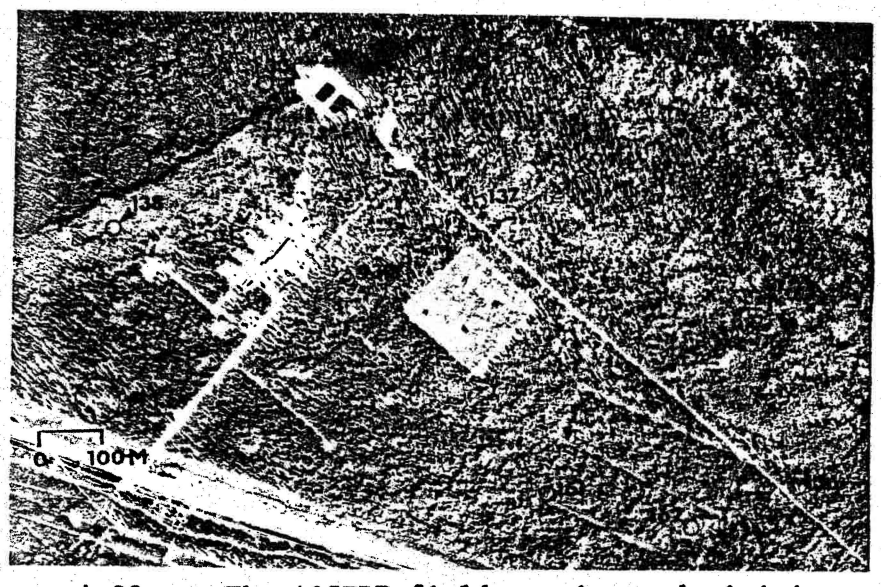


Figure 4-22 The AOSERP field station and vicinity, as shown on a 1/10,000 scale false-colour infrared aerial photograph, Frame A 37403 IR-148.

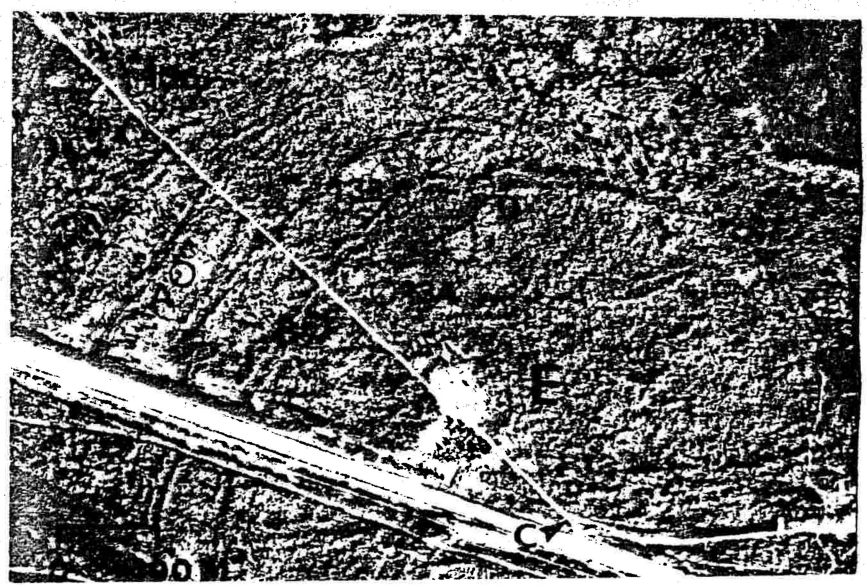


Figure 4-23 Portion of a 1/10,000 scale false-colour infrared aerial photograph, Frame A 37402-150.

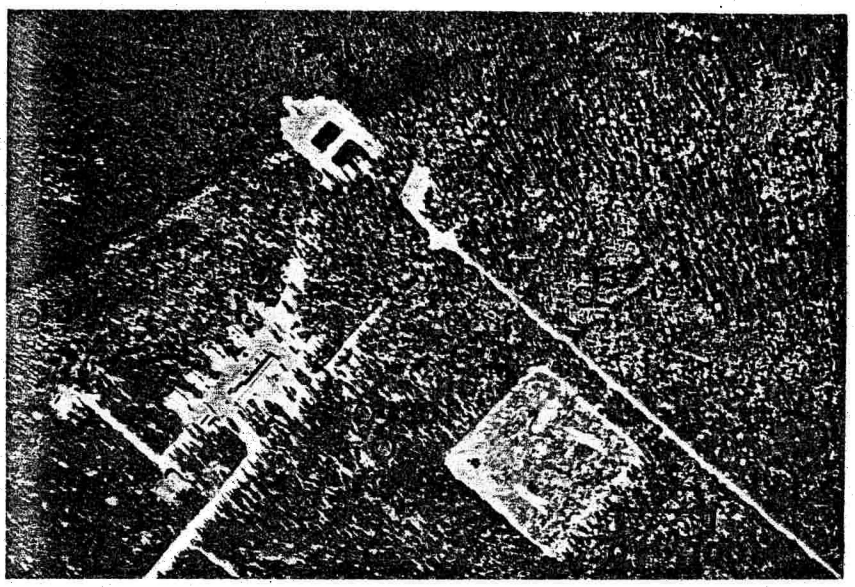


Figure 4-24 The AOSERP field station and vicinity, as shown on a 1/10,000 scale true-colour aerial photograph, Frame A 37402-148.

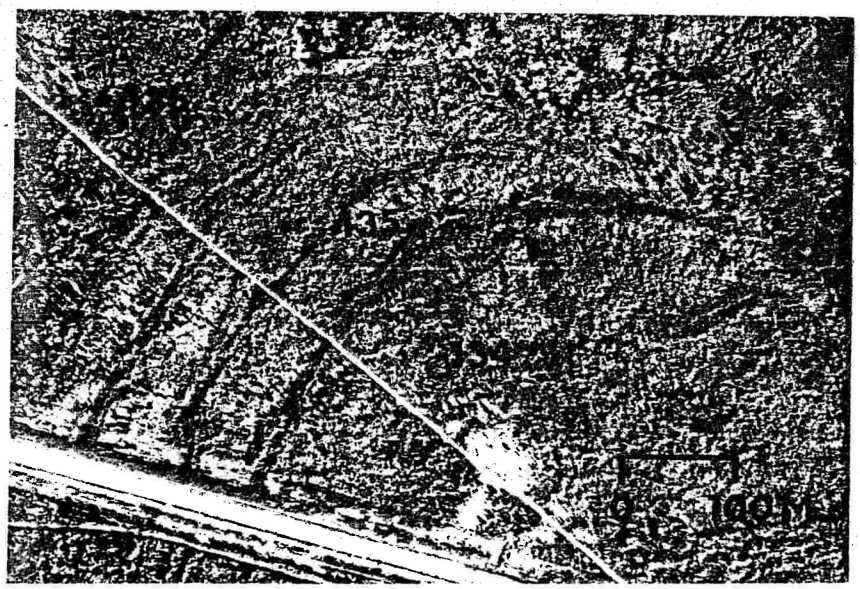


Figure 4-25 Portion of 1/10,000 scale true colour aerial photograph, Frame A 37402-150.

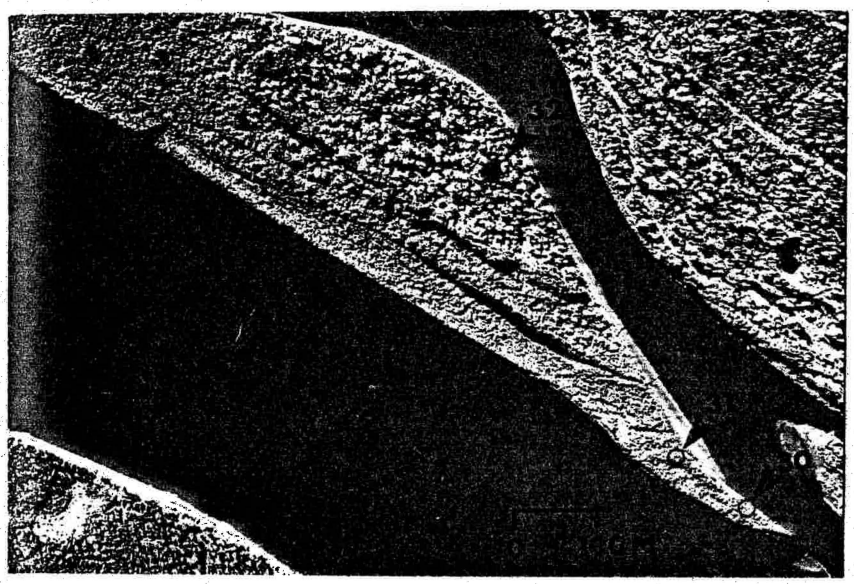


Figure 4-26 Portion of 1/10,000 scale false-colour infrared aerial photograph showing balsam poplar-dominated (Plot 32) and willow-dominated (Plots 31,31,W) communities, Frame A 37403 IR-184.

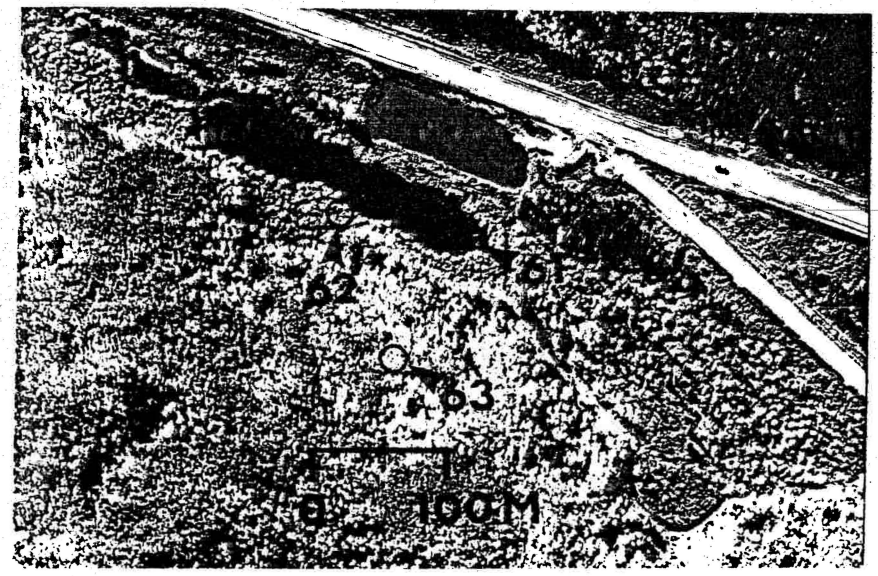


Figure 4-27 Portion of 1/10,000 scale false-colour infrared aerial photograph, Frame A 37403 IR-115.

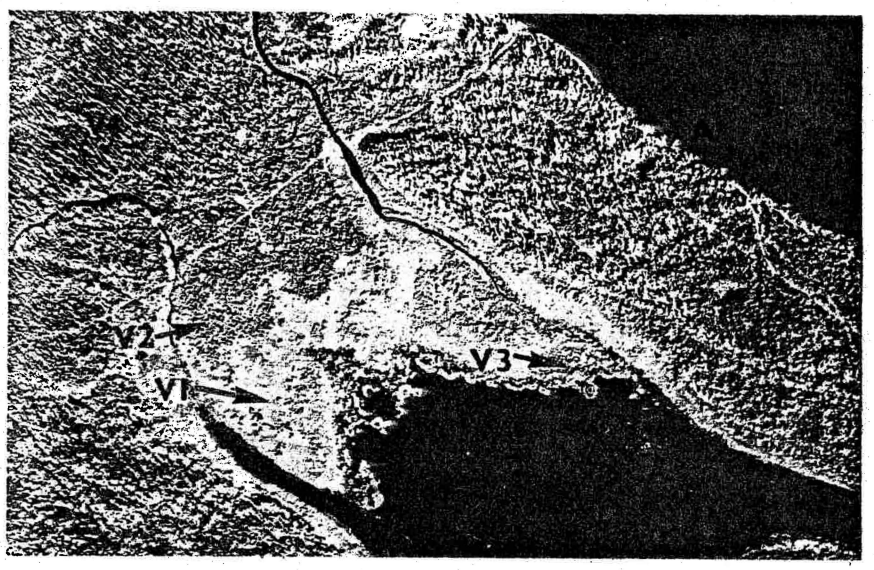


Figure 4-28 Portion of 1/10,000 scale false-colour infrared aerial photograph showing wetland communities at the north end of Horseshoe Lake, Frame A 37403 IR-184.

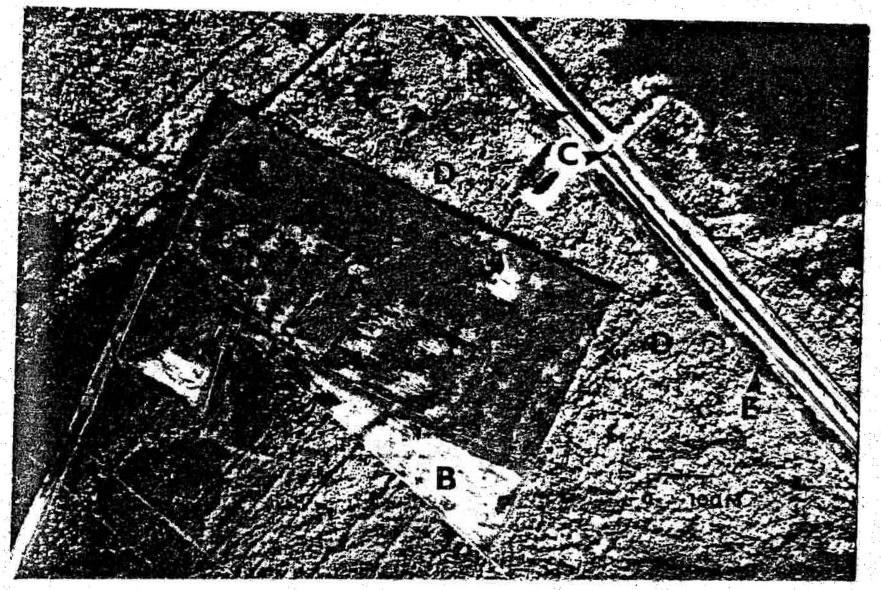


Figure 4-29 Portion of 1/10,000 scale false-colour infrared aerial photograph showing disturbance vegetation at A and E, Frame A 37403 IR-137.

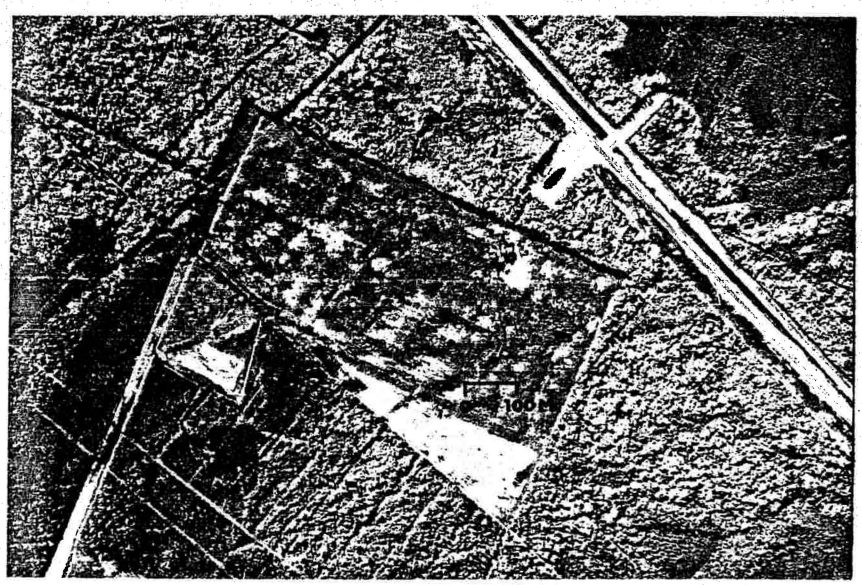


Figure 4-30 Portion of 1/10,000 scale true-colour aerial photograph, Frame A 37402-137.

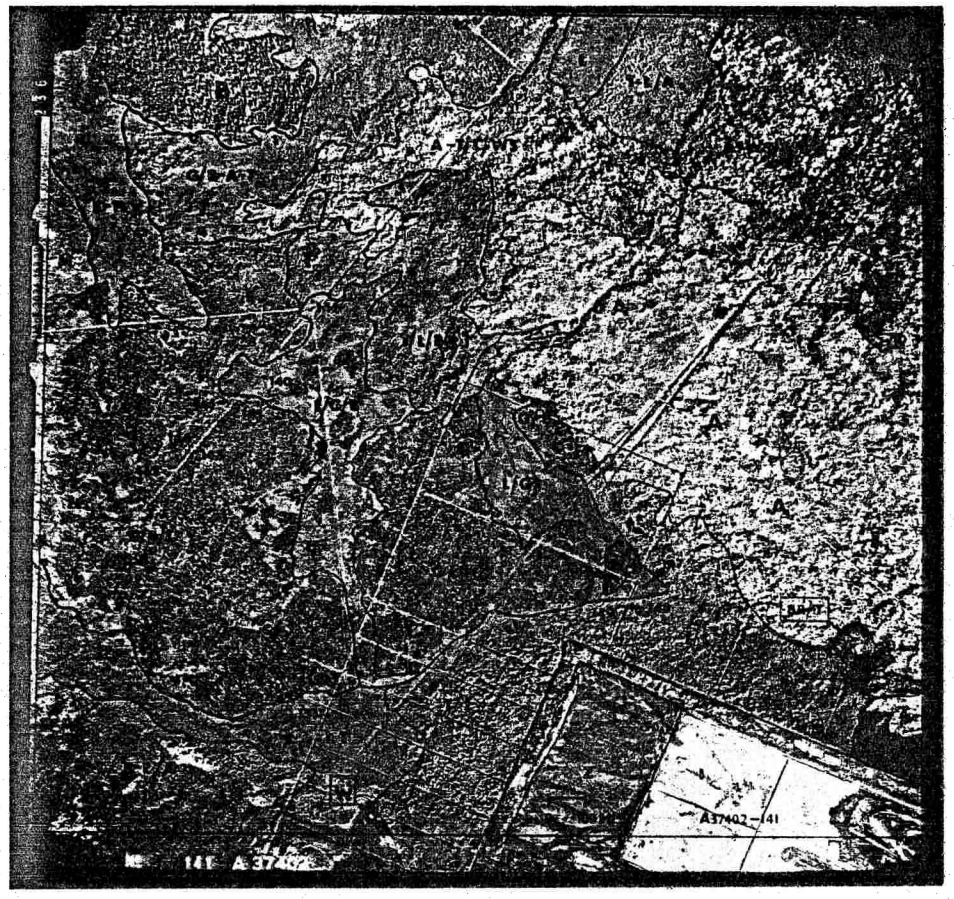


Figure 4-31 Vegetation interpretation of 1/10,000 true-colour aerial photograph, Frame A 37402-141.

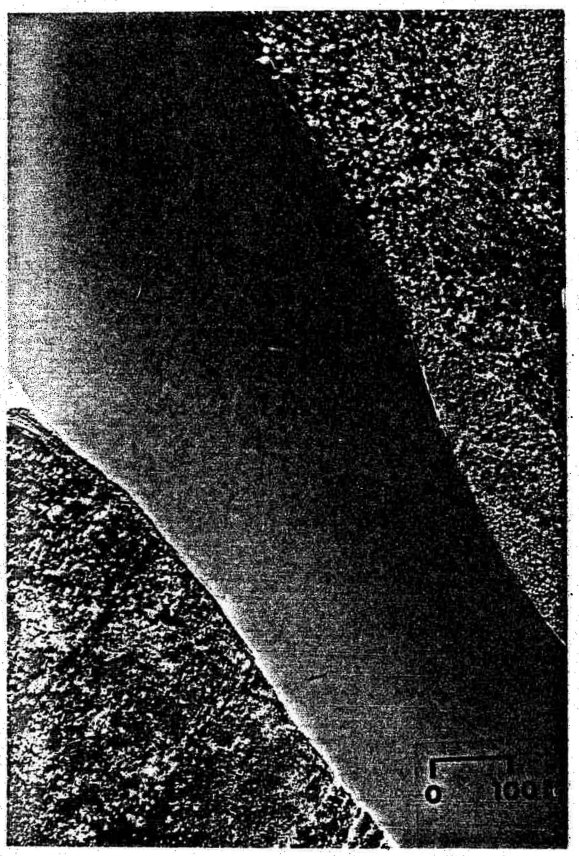


Figure 4-32 Mottling in brown coloured water area (the Athabasca River), as shown on Frame A 37402-163 1/10,000 true-colour aerial photograph.

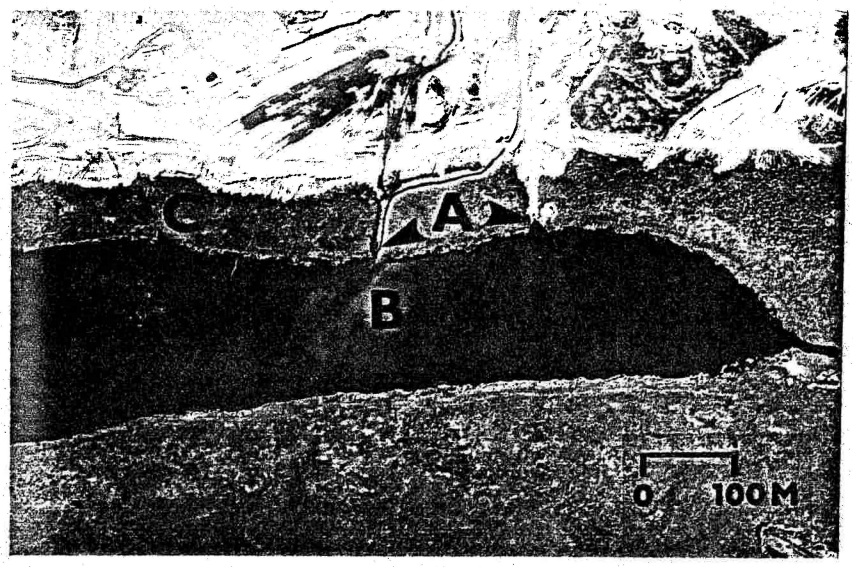


Figure 4-33 Portion of 1/10,000 true-colour aerial photograph showing relation of turbid water area in Mildred Lake (B) to drainage channels (A) from Syncrude Ltd plant site, Frame A 37402-131.



Figure 4-34 Portion of 1/10,000 false-colour infrared aerial photograph showing examples of environmental disturbance on the GCOS lease area, Frame A 37403 IR-158.

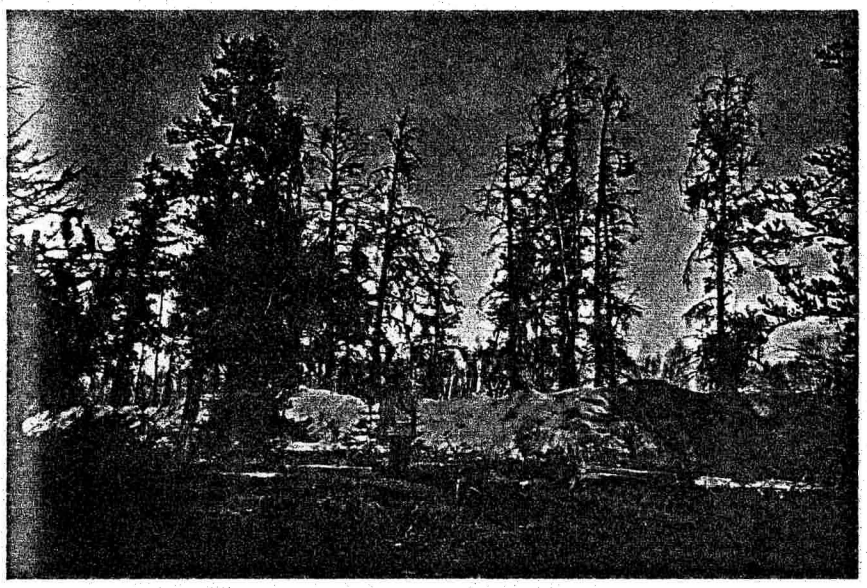


Figure 4-35 Dead Jackpine (behind sand ridge) in Plot 156, a Jackpine community.

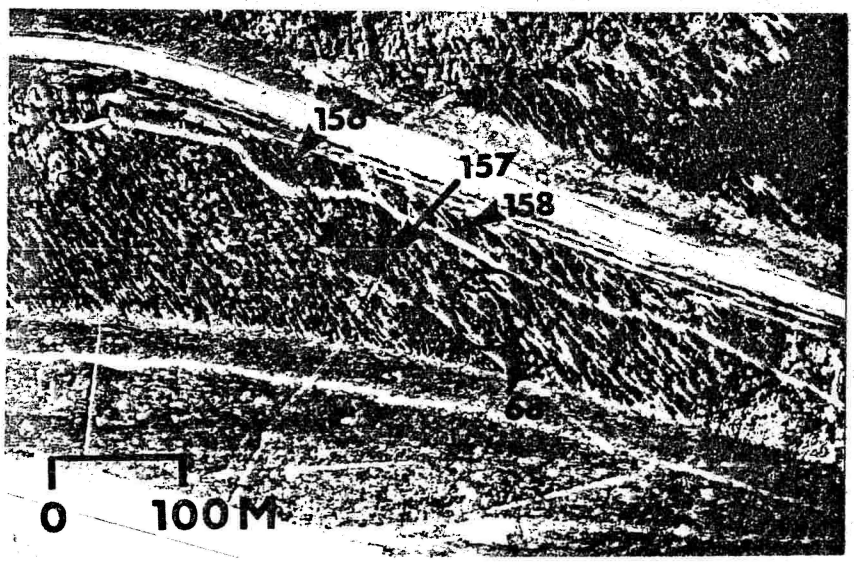


Figure 4-36 Jackpine-dominated communities, as shown on a 1/10,000 false-colour infrared aerial photograph, Frame A 37403 IR-147.

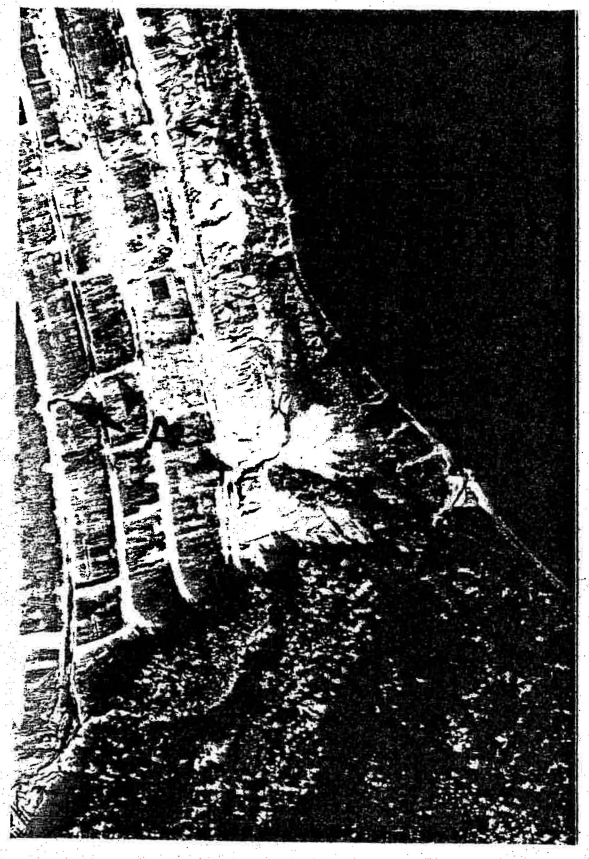


Figure 4-37 Examples of erosion and environmental disturbance on and near the GCOS tailings pond dike. Portion of 1/10,000 false-colour infrared aerial photograph, Frame A 37403 IR-162.

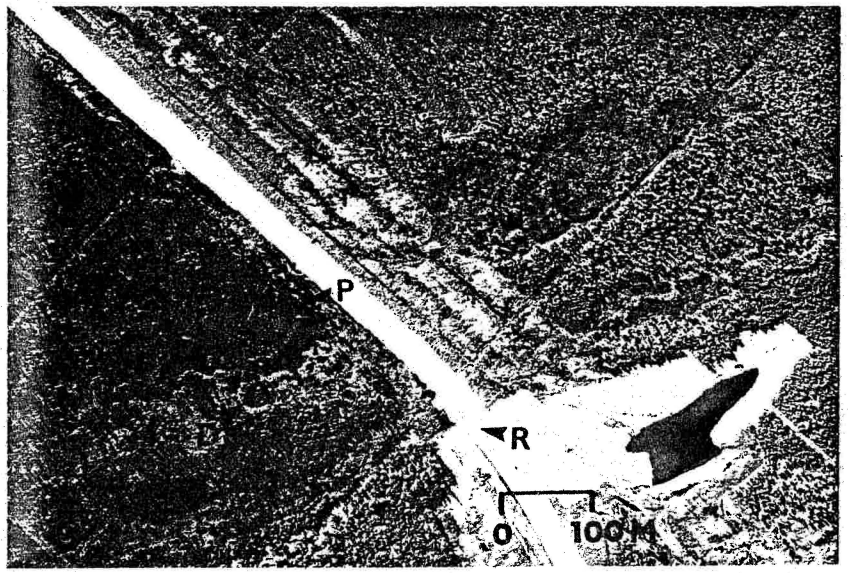


Figure 4-38 Dead trees (D) and flooding (P) next to road (R) on 1/10,000 false-colour infrared aerial photograph, Frame A 37403 IR-126.

TABLE 4-1 COMPARISON OF NAPL REPRODUCTION COSTS (as of December 1977)

Product	Original	
	Positive (eg Ektachrome Infrared 2443)	Negative (eg Aerocolor Negative film 2445)
Continuous contact roll transparencies	$2.25/foot *	$4.00/foot *
Continuous contact roll paper prints	$1.50/foot *	$1.25/foot *
Individual transparencies	$6 each	$5.50 each
Individual paper prints	$3.50 each	$3 each

* For purposes of comparison, a 9" x 9" print or transparency can be considered to require roughly 1 foot of photographic material.

TABLE 4-2a. PHOTO-CLASSES FOR 1/70,000 FCIR IMAGERY

PHOTO-CLASSES	S	VEGETATION CLASSES AND COMMUNITIES *																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aspen	A	.	e	e	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aspen/Balsam Poplar	D	.	e	e	.	e	.	.	.	.	.	.	.	.	.	.	.	.	.
Balsam Poplar	-	.	.	.	.	m	.	.	.	.	.	.	.	.	.	.	.	.	.
Jackpine-Alder	-	.	.	.	.	.	.	.	.	.	v	.	.	.	.	.	.	.	.
Jackpine-Cladina	-	.	.	.	.	.	.	.	.	.	.	d	.	.	.	.	.	.	.
Mixedwood	M	.	e	e	.	e	.	.	.	.	.	.	.	.	.	.	.	.	.
Muskeg	Y	.	.	.	.	.	.	.	.	.	.	.	.	e	.	.	.	.	.
Regeneration	R	.	.	.	.	.	.	.	.	m	.	.	.	.	.	.	.	.	.
Riparian Willow	-	m	.	.	.	.	.	.	.	.	.	.	.	.	m	.	.	.	.
Tall Shrub	S	m	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Upland Black Spruce	B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	d	.
Wetland	H	.	.	.	.	.	.	e	.	.	.	.	e	.	.	e	.	.	.
White Spruce	WS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	m

e -easily identified
m -moderately easy to identify
d -difficult to identify
v -very difficult to identify
* -vegetation classes and communities are listed in table 4-2b

TABLE 4-2b. VEGETATION CLASSIFICATION

GROUP NO.	VEGETATION COMMUNITY OR CLASS	FULL DESCRIPTION
1	Alder-Willow Class	3.4.2.4
2	Aspen Community	3.4.2.1
3	Aspen-Alder Community	3.4.2.1
4	Balsam Fir	3.4.3.3
5	Balsam Poplar Community	3.4.2.2
6	Birch Community	3.4.2.3
7	Cattail Fen Community	3.4.4.2
8	Disturbance Class	3.4.5.2
9	Fire Regeneration Class	3.4.5.1
10	Jackpine-Alder Community	3.4.3.1
11	Jackpine-Cladina Community	3.4.3.1
12	Larch-Bog Community	3.4.4.1
13	Muskeg Community	3.4.3.4
14	Sandbar-Willow Community	3.4.2.5
15	Sedge Fen Community	3.4.4.2
16	Sedge-Sphagnum Community	3.4.4.1
17	Upland Black Spruce Community	3.4.3.4
18	White Spruce Community	3.4.3.2

TABLE 4-3 CLASSIFICATION TABLE FOR 1:70,000 FALSE COLOUR INFRARED AERIAL PHOTOGRAPH Frame RSPA 30784 IR-32

Symbol	Pattern	Texture	Colour	Description
B	uniform	fine	dark cyan	Upland black spruce community
D	uniform	medium to fine	pink	Aspen-dominated communities with a high proportion of balsam poplar - particularly near water courses
H	uniform	very fine	pink	Wetlands
M	mottled to uniform	medium	mottled pink and dark cyan	Mixture of coniferous and deciduous vegetation
R	mottled to stippled	fine	cyan to grey, magenta to pink patches	Burn regeneration class
WS	uniform to stippled	fine to medium	dark cyan with magenta to red stippling	White spruce community
WT	uniform	none	medium blue	Relatively turbid water
Y	stippled	fine	magenta stippling on a grey-green background	Muskeg community

TABLE 4-4. PHOTO-CLASSES FOR 1/10,000 FCIR IMAGERY

PHOTO-CLASSES	S	VEGETATION CLASSES AND COMMUNITIES *																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aspen	A	.	e	e	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Balsam Poplar	-	.	.	.	.	m	.	.	.	.	.	.	.	.	.	.	.	.	.
Cladina	C	.	.	.	.	.	.	.	.	.	.	.	.	e	.	.	.	.	.
Jackpine-Alder	-	.	.	.	.	.	.	.	.	.	m	.	.	.	.	.	.	.	.
Jackpine-Cladina	-	.	.	.	.	.	.	.	.	.	.	e	.	.	.	.	.	.	.
Larch Bog	-	.	.	.	.	.	.	.	.	.	.	.	e	.	.	.	.	.	.
Short Black Spruce	Y	.	.	.	.	.	.	.	.	.	.	.	.	m	.	.	.	.	.
Sphagnum	P	.	.	.	.	.	.	.	.	.	.	.	e	e	.	.	.	.	.
Tall Black Spruce	B	.	.	.	.	.	.	.	.	.	.	.	.	e	.	.	.	.	.
White Spruce	WS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	m

e -easily identified
m -moderately easy to identify
d -difficult to identify
v -very difficult to identify
* -vegetation classes and communities are listed in table 4-2b

TABLE 4-5 CLASSIFICATION TABLE FOR ANNOTATED 1:10,000 FCIR AERIAL PHOTOGRAPH Frame A37403 IR-141

Symbol	Pattern	Texture	Colour	Description
A	mottled	medium to fine	white to red	Aspen-dominated communities
B	stippled	medium	deep magenta to cyan	Tall black spruce in the muskeg community
C	none	none	light grey	Ground cover dominated by *Cladina* sp.
$\overline{E}$	stippled to mottled	medium to coarse	cyan	Relatively high concentrations of dead trees (see text)
I	various, usually with linear borders	fine to coarse	green-white, grey, black	Roads, excavations, cleared land
ID	mottled to stippled	medium to fine	red, brown, green	Industry-related disturbance vegetation
L	uniform	fine	dark green	Low shrubs
M	various	various	various	Mixedwood (see Section 4.6.4)
P	mottled	fine	orange to brown	*Ledum groenlandicum* - *Carex* sp. *Sphagnum* sp. understory vegetat
T	pebble to mottled	coarse	medium to light green	Tall shrubs
W	none	none	black	Relatively clear water
WS	stippled	medium to coarse	magenta	White spruce inferred (see text)
Y	stippled	medium	magenta stippling colour of background dependent on understorey	Short black spruce

TABLE 4-6. PHOTO-CLASSES FOR 1/10,000 TC IMAGERY

PHOTO-CLASSES	S	VEGETATION CLASSES AND COMMUNITIES *																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aspen	A	.	e	e	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Balsam Poplar	-	.	.	.	.	m	.	.	.	.	.	.	.	.	.	.	.	.	.
Jackpine-Alder	-	.	.	.	.	.	.	.	.	.	v	.	.	.	.	.	.	.	.
Jackpine-Cladina	-	.	.	.	.	.	.	.	.	.	.	m	.	.	.	.	.	.	.
Short Black Spruce	G	.	.	.	.	.	.	.	.	.	.	.	.	d	.	.	.	d	.
Tall Black Spruce	B	.	.	.	.	.	.	.	.	.	.	.	.	m	.	.	.	m	.
White Spruce	WS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	d

e -easily identified
m -moderately easy to identify
d -difficult to identify
v -very difficult to identify
* -vegetation classes and communities are listed in table 4-2b

TABLE 4-7 CLASSIFICATION TABLE FOR 1:10,000 TRUE COLOUR AERIAL PHOTOGRAPH Frame A37402-141

Symbol	Pattern	Texture	Colour	Description
A	mottled	medium to fine	yellow to green	Aspen-dominated communities
B	uniform	medium	cyan	Tall black spruce
BR	uniform	medium to coarse	black to dark brown	Burned areas
G	stippled	fine	cyan	Short black spruce
I	variable, usually with linear borders	variable	white, grey, brown	Cleared land
L	uniform to mottled	fine to medium	purple-brown to grey-brown	Low shrub
M	various	various	various	Mixedwood (see Section 4.7.4)
T	pebble	coarse to medium	yellow to dark greyish brown	Tall shrub
W	none	none	black	Relatively clear water
WS	uniform	medium to coarse	cyan	White spruce (see text Sections 4.5.2.3 and 4.7.2.2)

FIGURES AND TABLES

FOR

SECTION 5

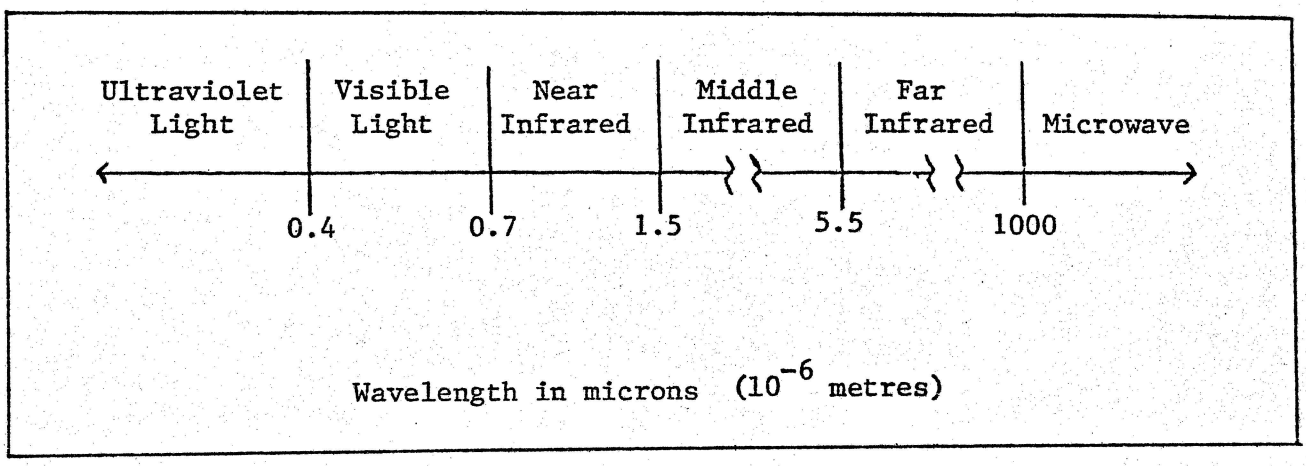


Figure 5-1 The infrared and visible light portions of the electromagnetic spectrum.

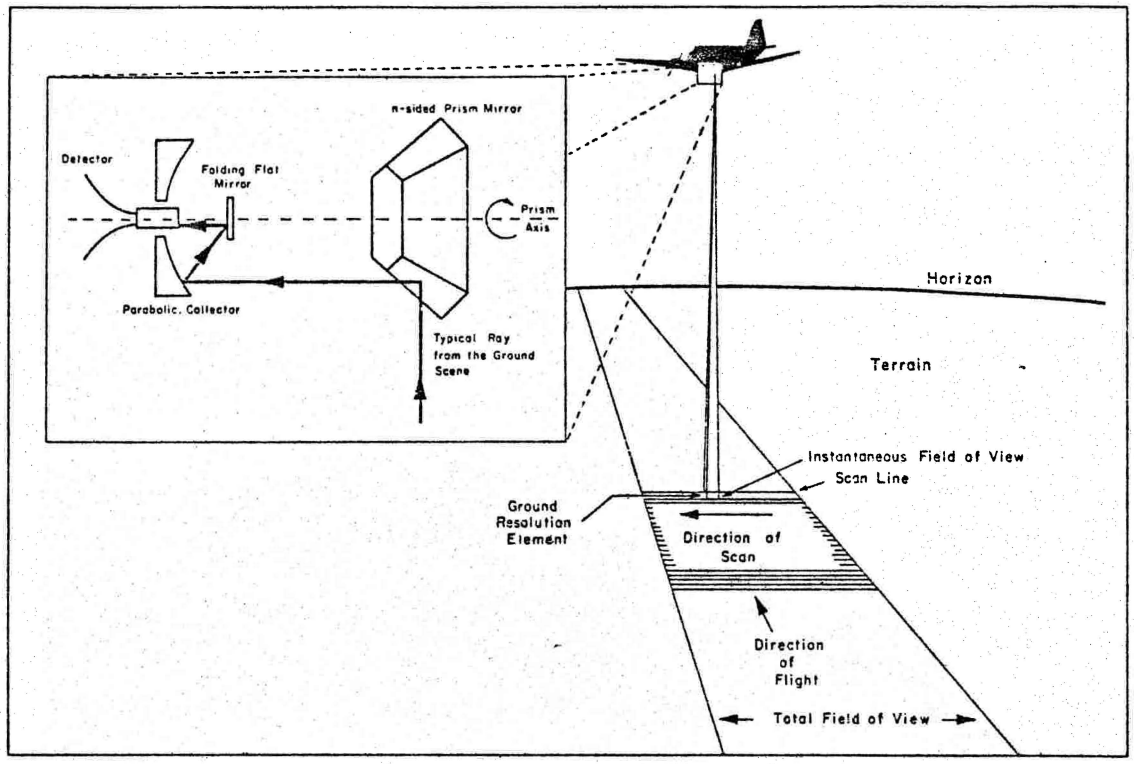
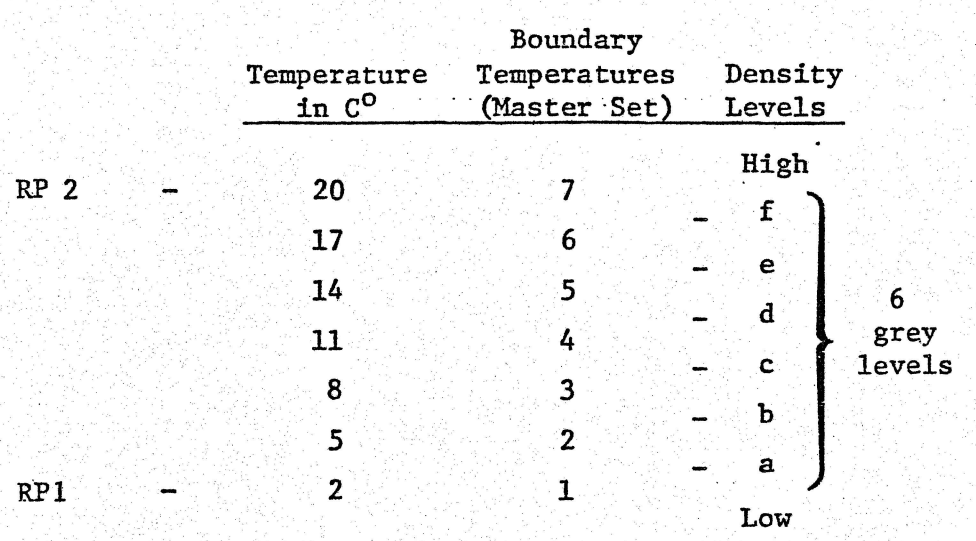
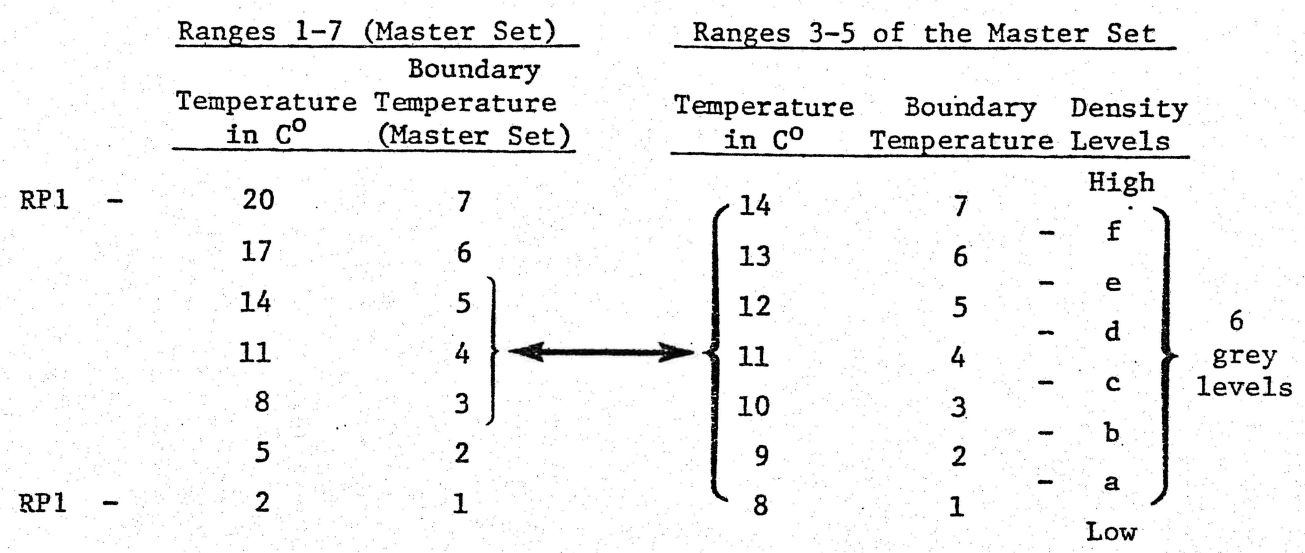


Figure 5-2 Conceptual diagram of a line scanner system (taken from ASP 1975, pp 954).



A master set of temperatures (Range 1 to 7) has been sliced in this example. The $2^{o}C$ to $20^{o}C$ temperature spread between the reference plate settings has been subdivided into six equal levels (a to f). Data which do not fall between the 2 reference plate settings are represented by two additional density levels. White (Low) represents data falling below the RP1 setting and Black (High) represents data above RP2. The reference plate temperatures are set by the instrument operator in flight to provide internal calibration of the IR thermal scanner.

Figure 5-3 Level slicing of a master set of ranges.



The master set (ranges 1-7) of boundary temperatures shown in Figure 5-3 appears on the left. The image data can be more finely divided or sliced by selecting a narrower temperature range from within the master set. Here, ranges 3-5 have been sliced, thereby dividing the 8-14°C range represented by two grey levels, 3°C each (shown on the left), into 6 grey levels, 1°C each (shown on the right). Temperatures above or below the 8-14°C range are represented by black or white respectively.

Figure 5-4 Level slicing of ranges 3-5.

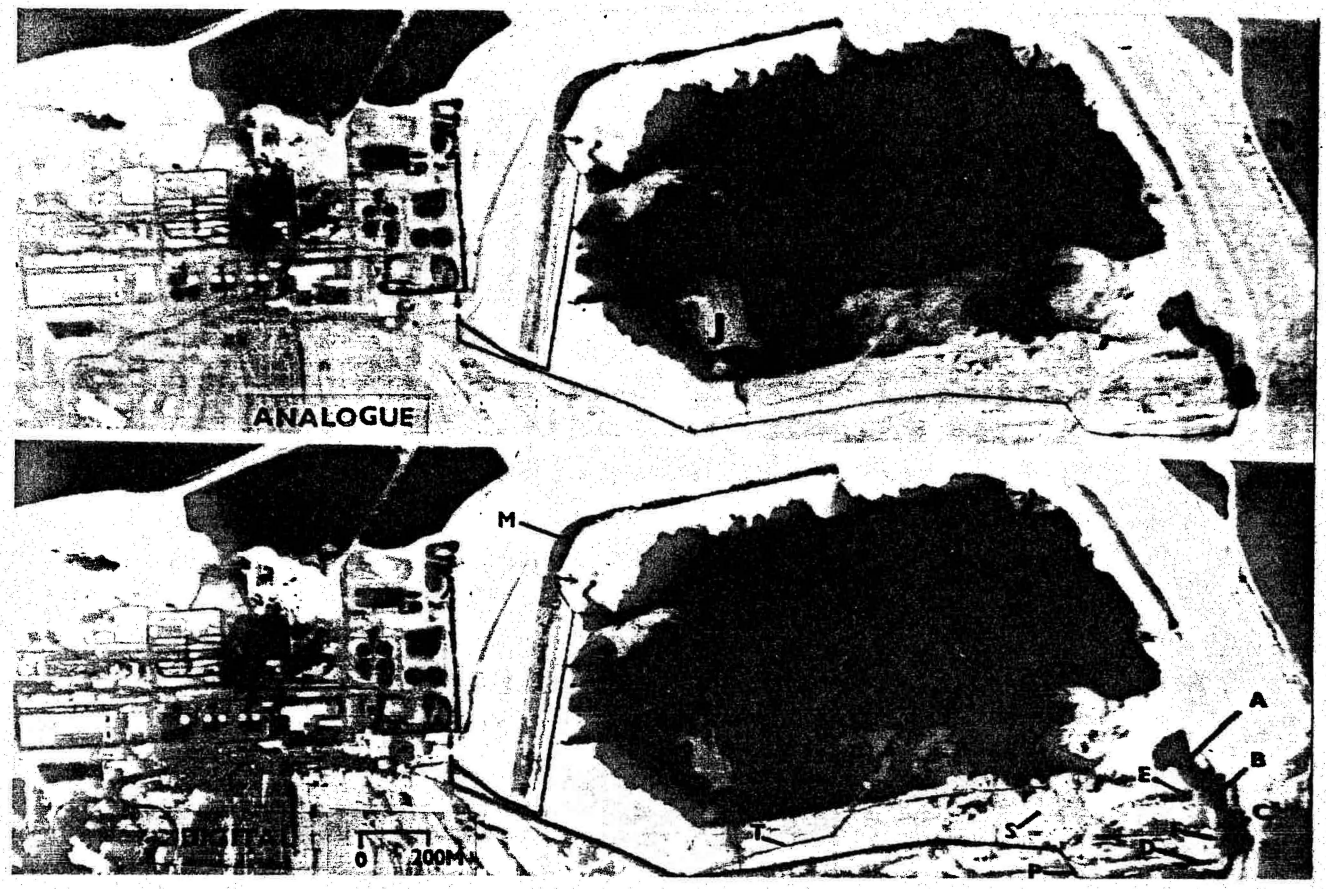


Figure 5-5 Nighttime thermal infrared line-scanner image of the GCOS plant site and tailings pond (G) acquired approximately 7.33 GMT 17 September 1976, line 3SE. Scale of the transparency examined was 1/22,000.

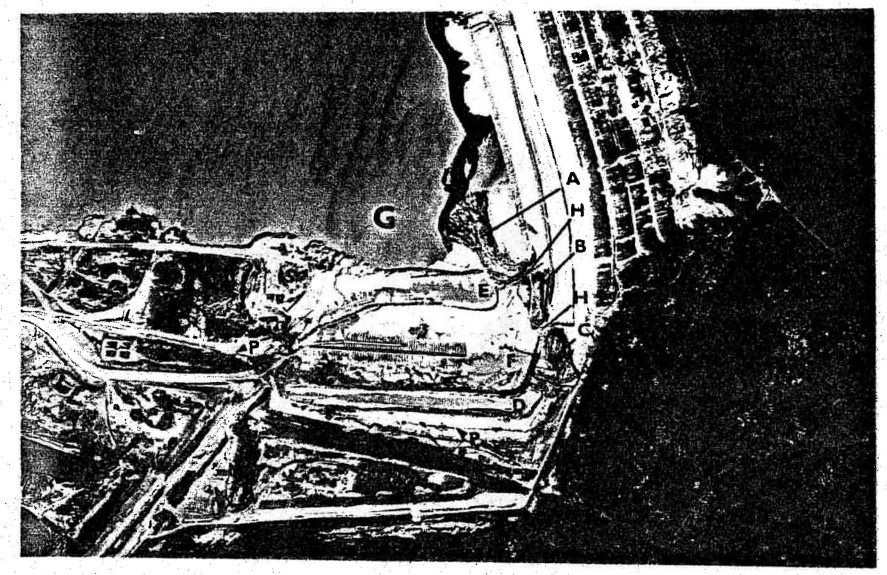


Figure 5-6 Southwest corner of GCOS tailings pond (G), as shown on 1/10,000 scale true-colour aerial photograph, Frame A 37402-142, acquired 16 September 1976 at approximately 19.45 GMT.

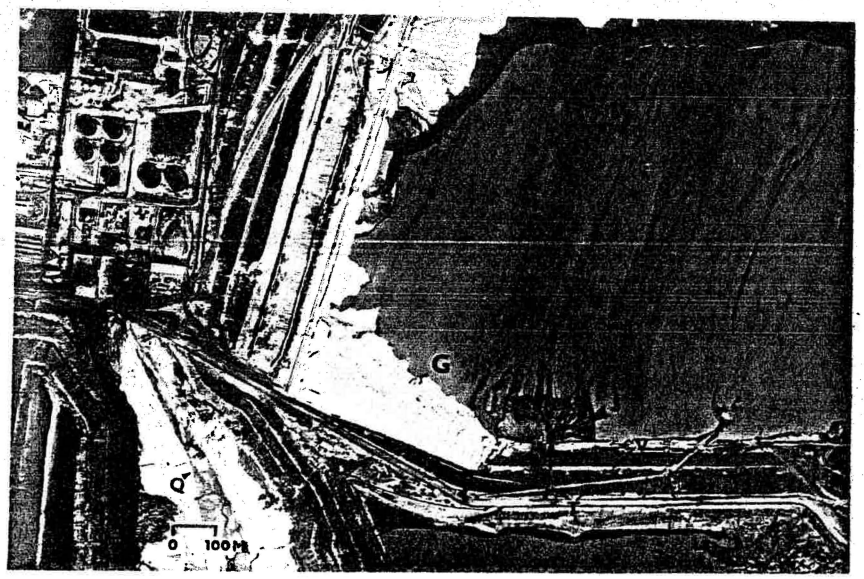


Figure 5-7 Northwest corner of GCOS tailings pond (G), as shown on 1/10,000 scale true-colour aerial photograph, Frame A 37402-160, acquired 16 September 1976 at approximately 19.45 GMT.

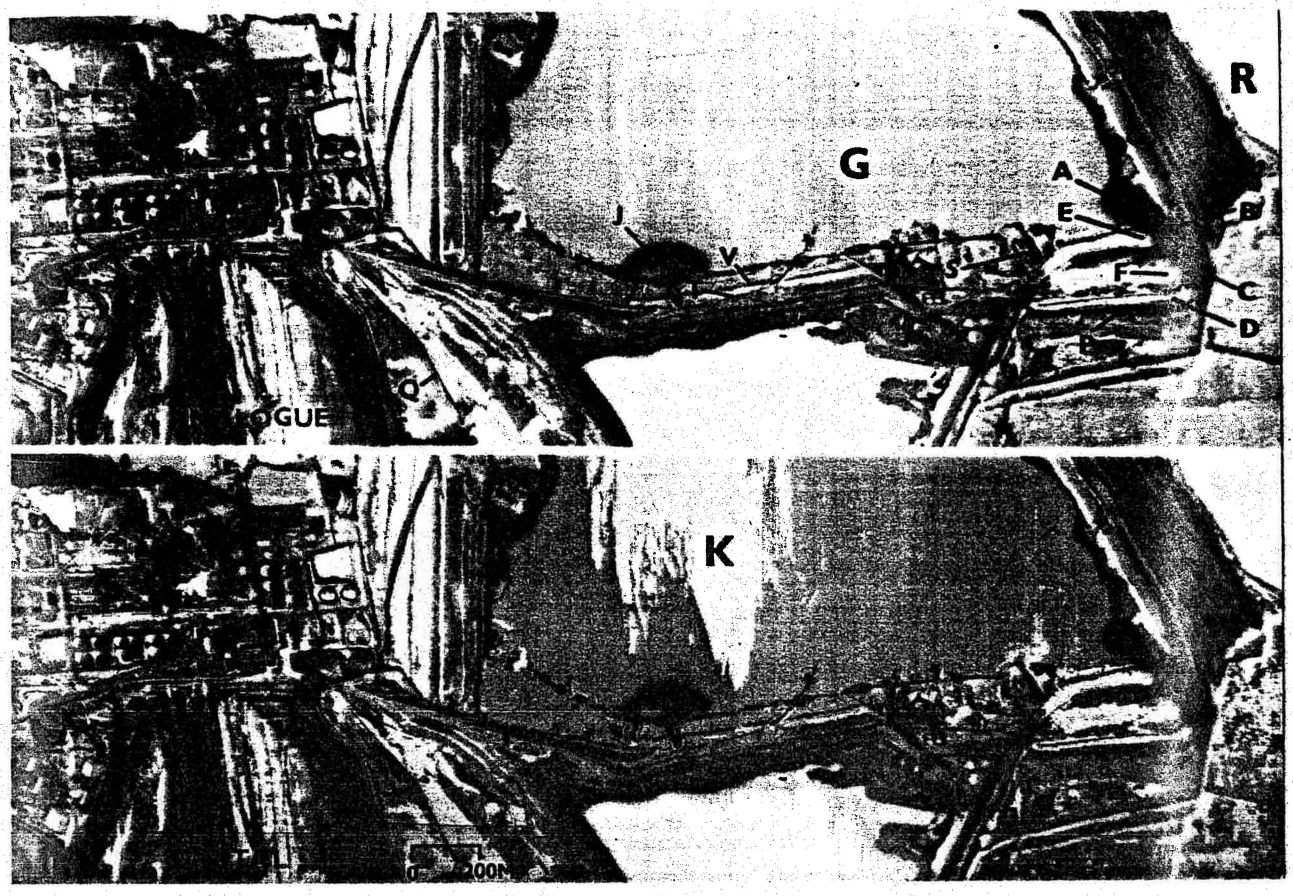


Figure 5-8 Daytime thermal infrared line-scanner image of the GCOS plant site and tailings pond (G), acquired at approximately 19.13 GMT 16 September 1976, line 5SE. Scale of the transparency examined was 1/22,000.

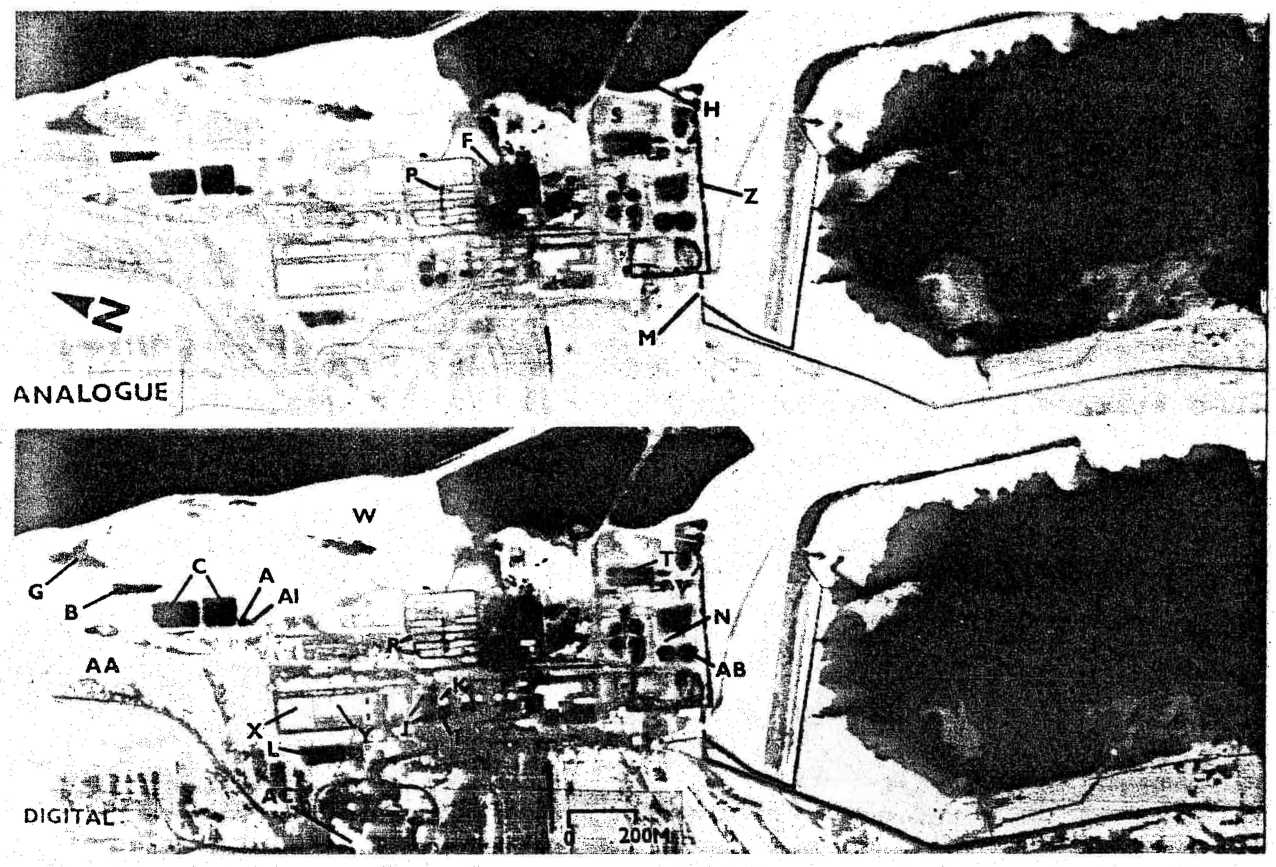


Figure 5-9 Nighttime thermal infrared line-scanner image of the GCOS plant site and tailings pond, acquired at approximately 7.33 GMT 17 September 1976, line 3SE. Scale of the transparency examined was 1/22,000.

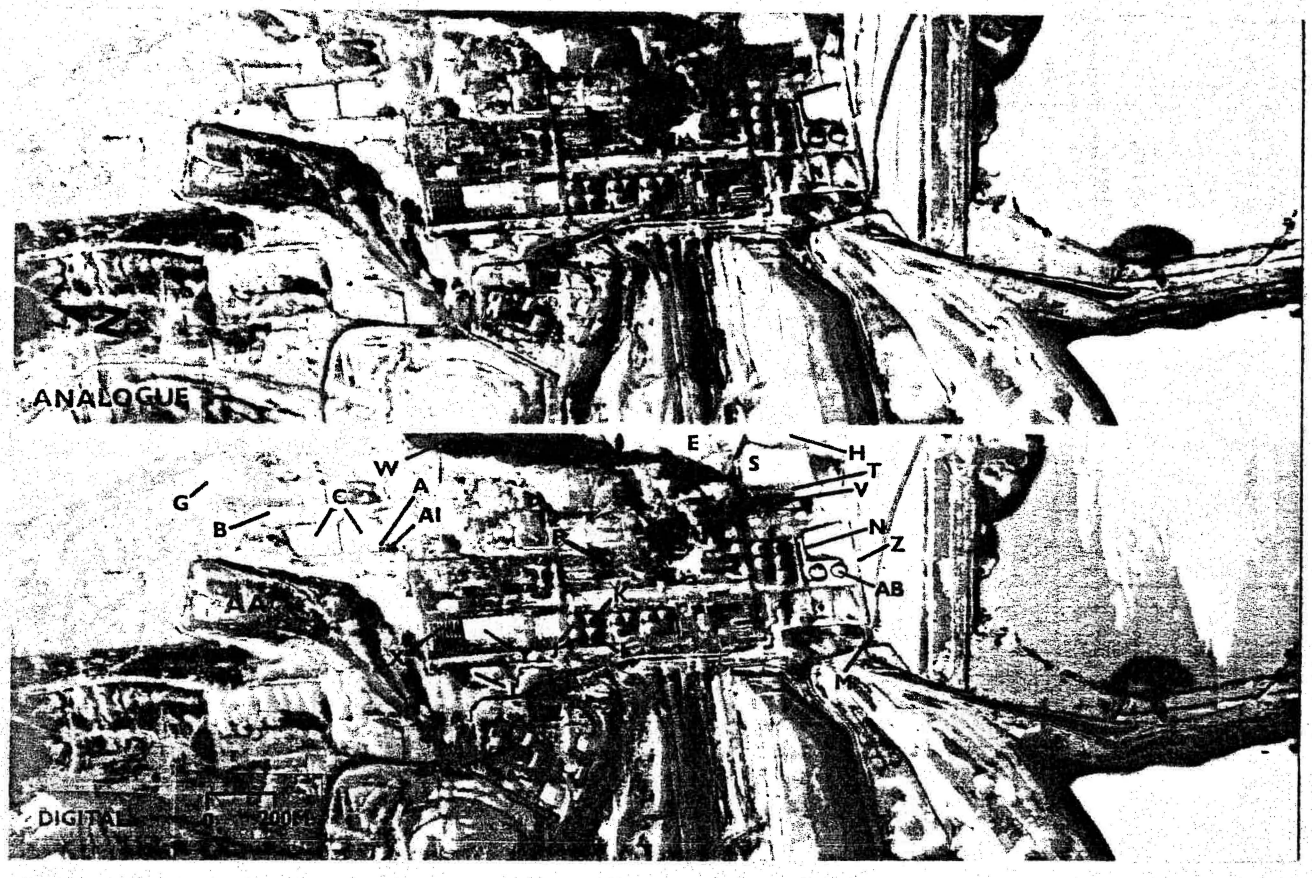


Figure 5-10 Daytime thermal infrared line-scanner image of the GCOS plant site, acquired at approximately 19.13 GMT 16 September 1976, line 5SE. Scale of the transparency examined was 1/22,000.

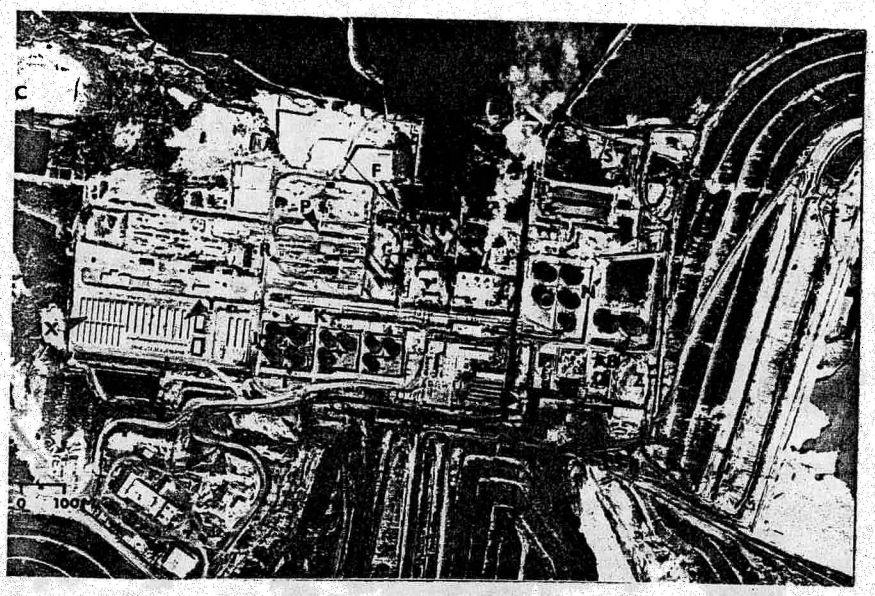


Figure 5-11 GCOS plant site as it appears on a 1/10,000 scale true-colour aerial photograph, Frame A 37402-159 acquired at approximately 19.45 GMT 16 September 1976.

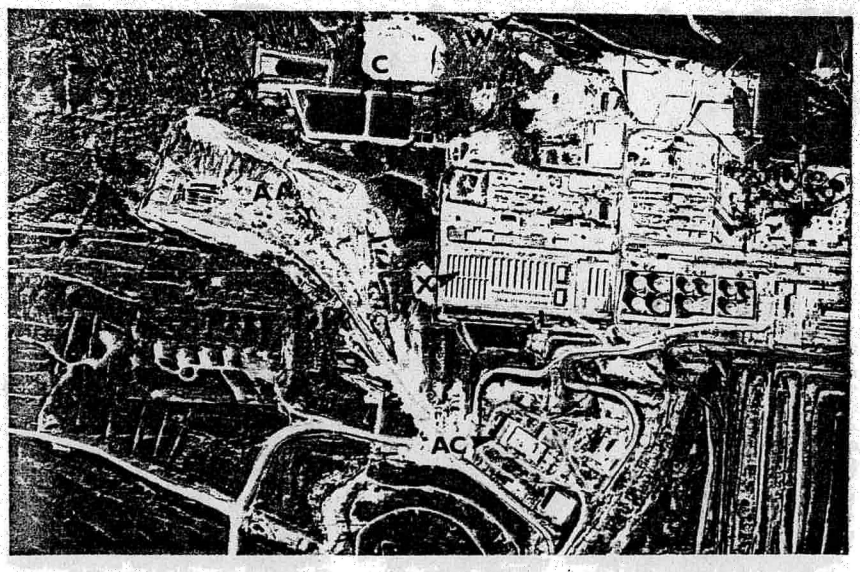


Figure 5-12 GCOS plant site and area to the north, as shown on 1/10,000 scale true-colour aerial photograph Frame A 37402-158, acquired at approximately 19.45 GMT 16 September 1976.

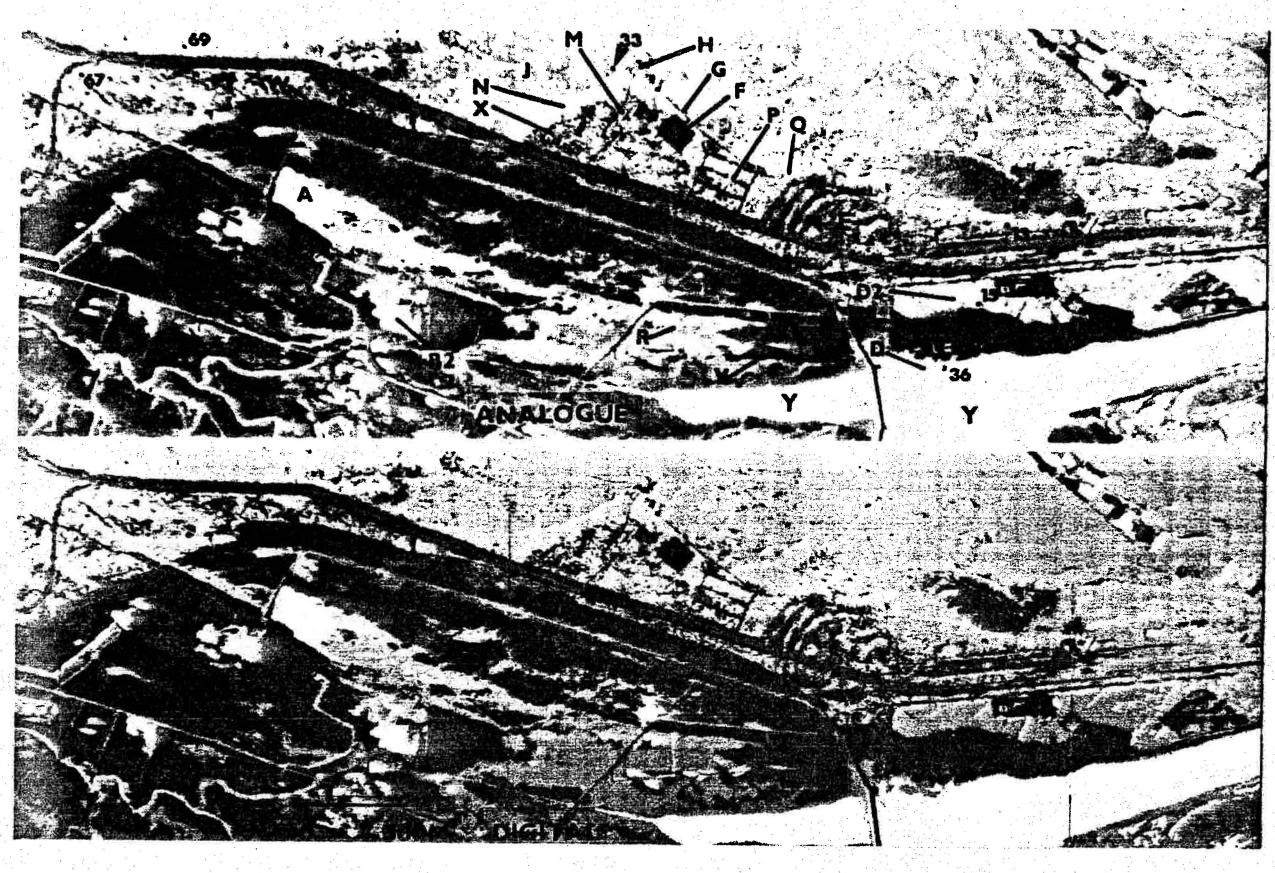


Figure 5-13 Daytime thermal infrared image of Mildred Lake (Y), the AOSERP field station (M) and cleared portion of the Syncrude lease, acquired at approximately 19.43 GMT 16 September 1976, line 8SE. Scale of the image examined was 1/36,000.

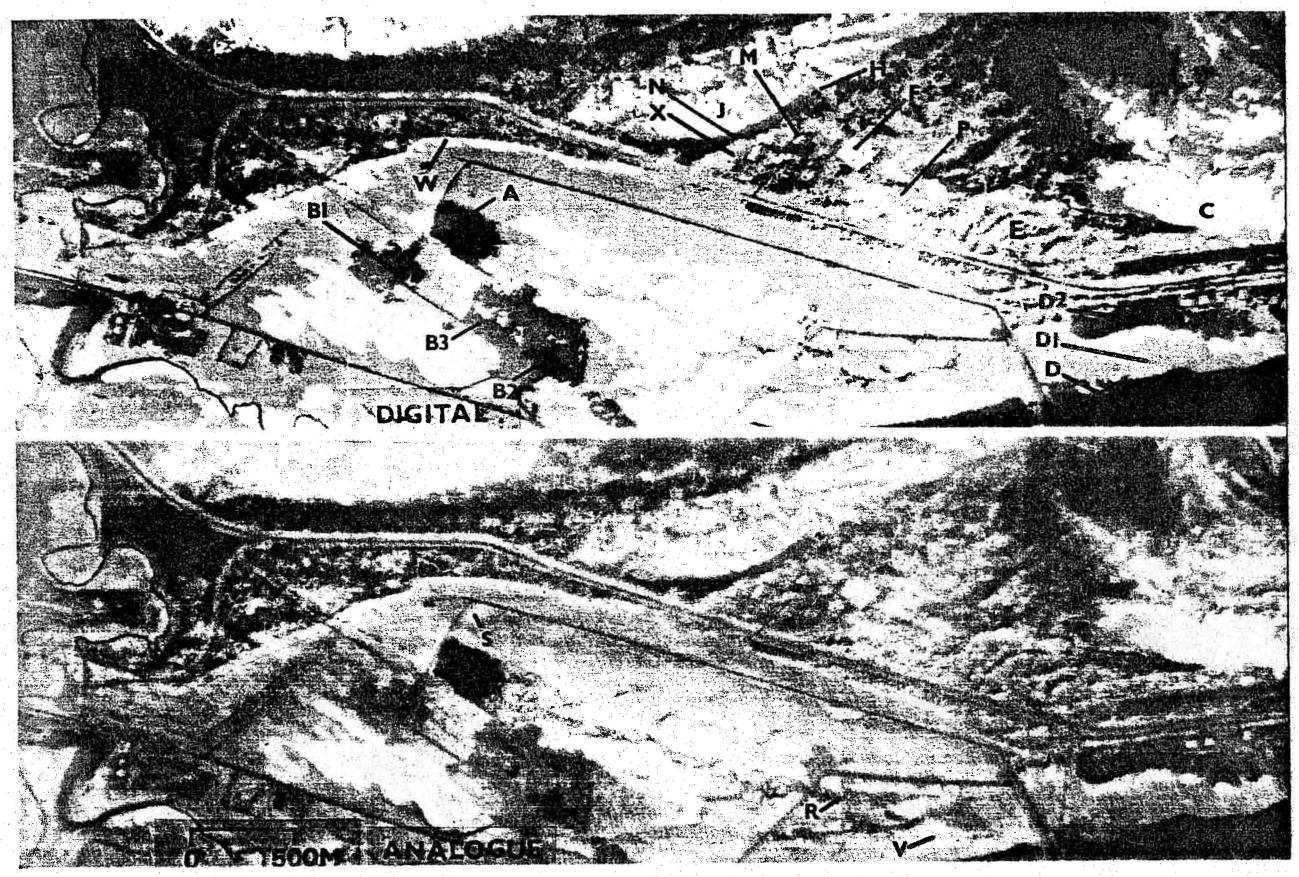


Figure 5-14 Nighttime thermal infrared image of Mildred Lake (Y), the AOSERP field station (M) and a cleared portion of the Syncrude lease, acquired at approximately 8.12 GMT 17 September 1976, line 8NW. Scale of the image was 1/36,000.

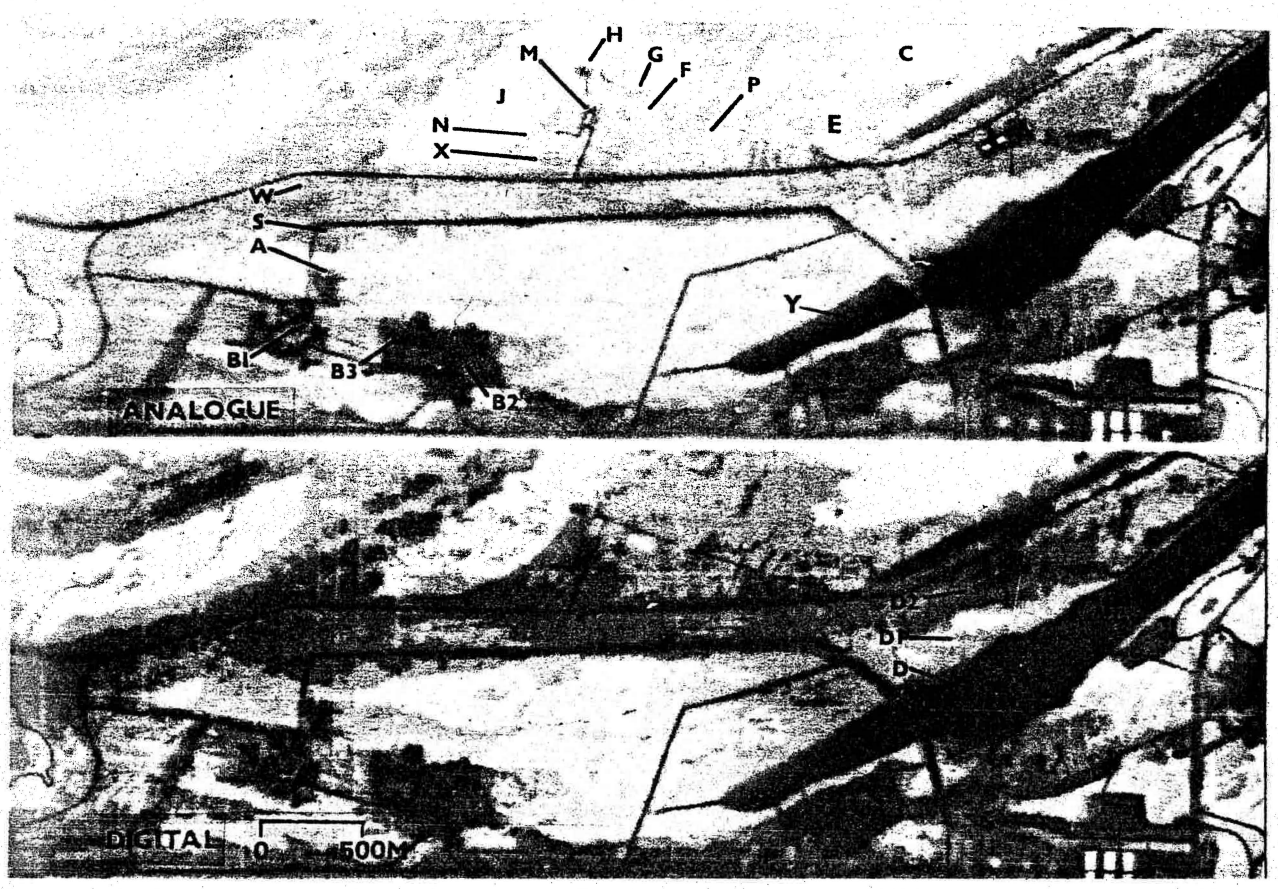


Figure 5-15 Predawn thermal infrared image of Mildred Lake (Y), the AOSERP field station (M) and a cleared portion of the Syncrude lease, acquired at about 11.07 GMT 20 August 1976, line 25S. The image analyzed was at a scale of 1/40,000.

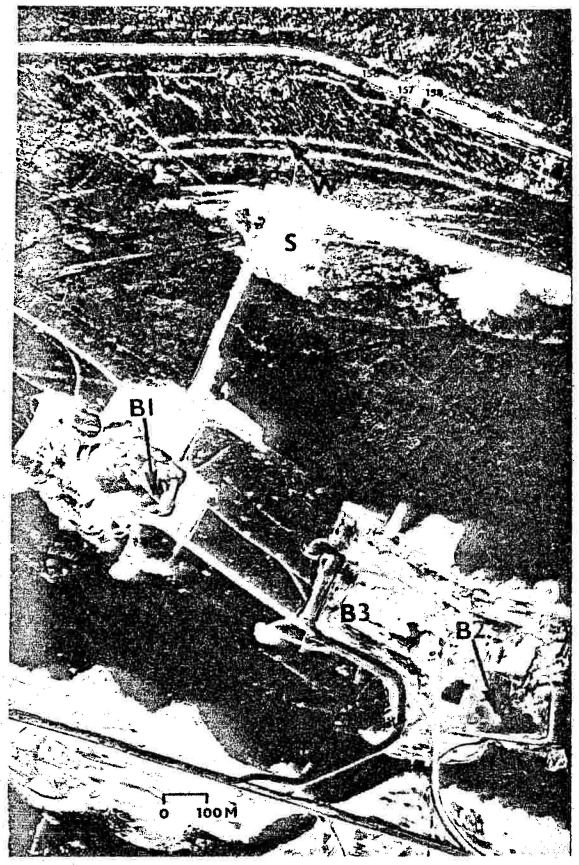


Figure 5-16 A cleared portion of the Syncrude lease as it appears on 1/10,000 scale false-colour infrared aerial photography, Frame A 37403 IR-147, acquired at approximately 19.45 GMT 16 September 1976.



Figure 5-17 Ground photo of Plot 35 (foreground), a shrub-height community dominated by aspen, balsam poplar and willow, and Plot 36 (background) dominated by alder, willow and various herb species. Mildred Lake is in the far background.

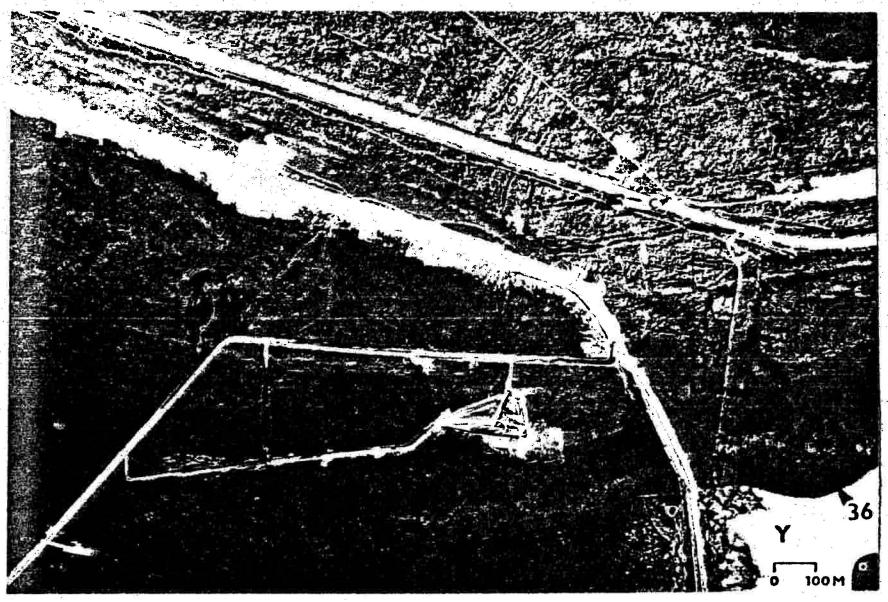


Figure 5-18 A cleared portion of the Syncrude lease west of Mildred Lake (Y), as shown on a 1/10,000 false-colour infrared aerial photograph acquired at about 19.45 GMT 16 September 1976, Frame A 37403 IR-149.



Figure 5-19 Nighttime thermal infrared image of Horseshoe Lake on the Syncrude lease showing differentiation of vegetation (V1-V4) and water temperature levels (W1-W4). The image was acquired at approximately 7.33 GMT 17 September 1976, line 3SE and the transparency examined was at a scale of 1/22,000.

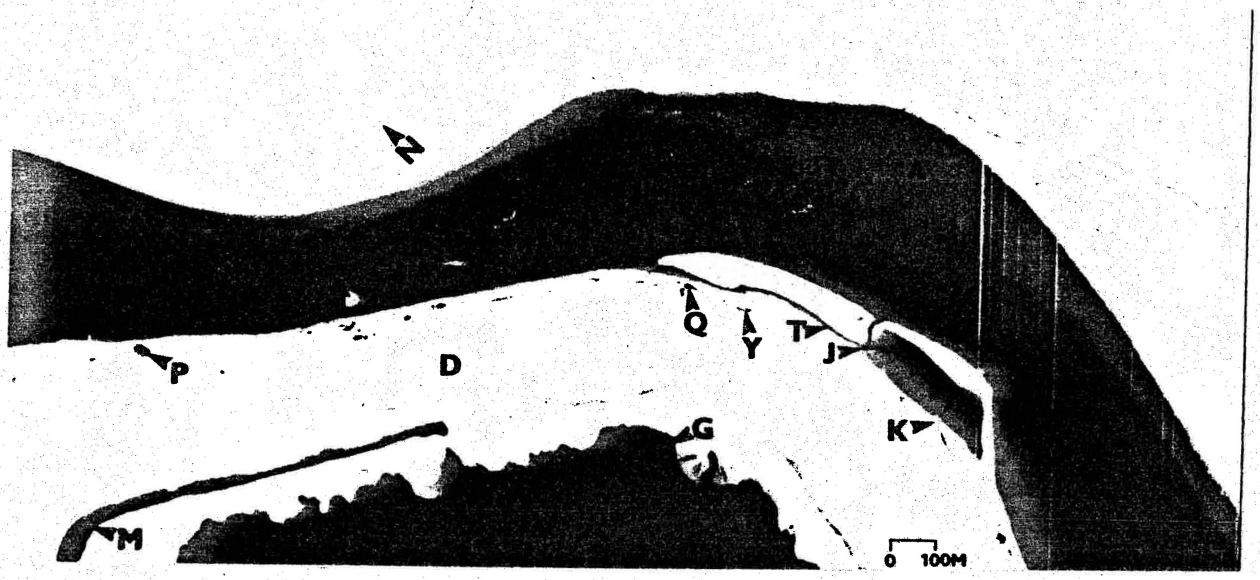


Figure 5-20 Thermal infrared night image of a portion of the GCOS tailings pond (G), dike (D) and the Athabasca River. Temperature patterns in the water areas have been enhanced by representing levels 5-7 as six grey levels (0.67°C per level). The Athabasca River is shown with three distinct grey levels (A,B,C). This image was acquired at approximately 7.25 GMT 17 September 1976, line 4NW, and was processed to a 1/11,000 scale transparency for analysis.

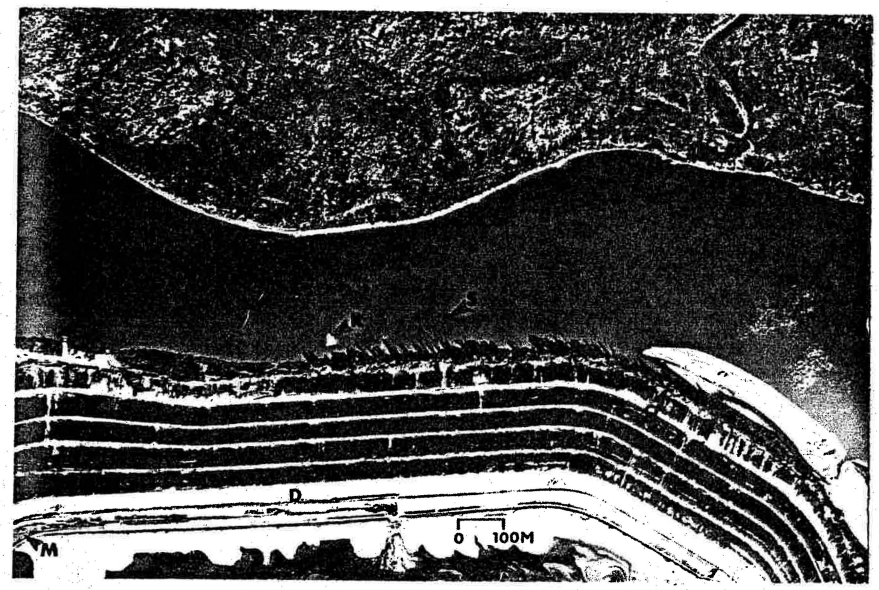


Figure 5-21 The Athabasca River adjacent to the west side of the GCOS tailings pond dike is shown in the 1/10,000 scale true-colour aerial photograph acquired 16 September 1976 at about 19.50 GMT, Frame A 37402-177.

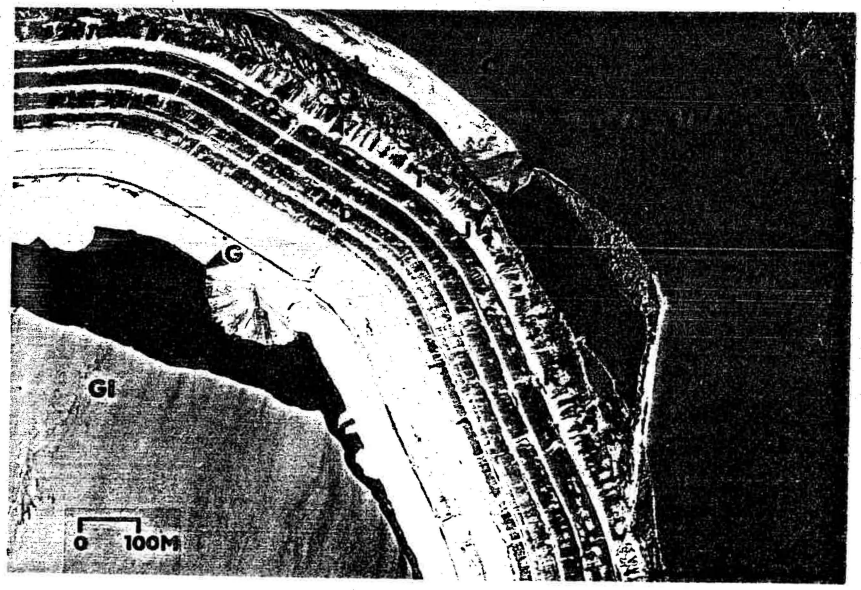


Figure 5-22 The southwest corner of the GCOS tailings pond (G1), dike (D) and Athabasca River (E), as shown in the 1/10,000 true-colour aerial photograph acquired 16 September 1976 at about 19.45 GMT, Frame A 37402-162.

TABLE 5-1 SPECIFICATIONS FOR IMAGERY DISCUSSED IN SECTION 5-6

Figure	I*	Acquisition Date	Time (GMT)+ At Start of Line	Line or Frame	BB1 in C^o	BB2 in C^o	Digital Level Slicing		Original Scale
							Ranges	Temp. Range/ Slice in C^o	
5-5	T	Sept. 17/76	7:33	3 S.E.	3	15	1-7	2	1/22,000
5-6	C	Sept. 16/76	19:45	162	-	-	-	-	1/10,000
5-7	C	Sept. 16/76	19:45	161	-	-	-	-	1/10,000
5-8	T	Sept. 16/76	19:13	5 S.E.	12	36	1-7	4	1/22,000

*Imagery Designation: T is thermal IR, C is true color aerial photography, IR is infrared color aerial photography

+Mountain Standard Time = Greenwich Mean Time - 7 hours

TABLE 5-2 SPECIFICATIONS FOR IMAGERY DISCUSSED IN SECTION 5-7

Figure	I*	Acquisition Date	Time (GMT)+ At Start of Line	Line or Frame	BB1 in C^o	BB2 in C^o	Digital Level Slicing		Original Scale
							Ranges	Temp. Range/ Slice in C^o	
5-9	T	Sept. 17/76	7:33	3 S.E.	3	15	1-7	2	1/22,000
5-10	T	Sept. 16/76	19:13	5 S.E.	12	36	1-7	4	1/22,000
5-11	C	Sept. 16/76	19:45	A37402-159	-	-	-	-	1/10,000
5-12	C	Sept. 16/76	19:45	A37402-158	-	-	-	-	1/10,000

*Imagery Designation: T is thermal IR, C is true color aerial photography, IR is infrared color aerial photography

+Mountain Standard Time = Greenwich Mean Time - 7 hours

TABLE 5-3 SPECIFICATIONS FOR IMAGERY DISCUSSED IN SECTION 5-8

Figure	I*	Acquisition Date	Time (GMT)+ At Start of Line	Line or Frame	BB1 in C^o	BB2 in C^o	Digital Level Slicing		Original Scale
							Ranges	Temp. Range/ Slice in C^o	
5-13	T	Sept. 16/76	19:43	8 S.E.	12	33	1-7	3.5	1/36,000
5-14	T	Sept. 17/76	8:12	8 N.W.	3	15	1-7	2	1/36,000
5-15	T	Aug. 20/76	11:07	25 S.	4	26	1-3	1.22	1/40,000
5-16	IR	Sept. 16/76	19:45	A37403IR 147	-	-	-	-	1/10,000

*Imagery Designation: T is thermal IR, C is true color aerial photography, IR is infrared color aerial photography

+Mountain Standard Time = Greenwich Mean Time - 7 hours

TABLE 5-4 SPECIFICATIONS FOR IMAGERY DISCUSSED IN SECTION 5-9

Figure	I*	Acquisition Date	Time (GMT)+ At Start of Line	Line or Frame	BB1 in C°	BB2 in C°	Digital Level Slicing		Original Scale
							Ranges	Temp. Range/ Slice in C°	
5-19	T	Sept. 17/76	7:33	3 S.E.	3	15	1-7	2	1/22,000
4-28	IR	Sept. 16/76	19:50	A37403IR 184	-	-	-	-	1/10,000

*Imagery Designation: T is thermal IR, C is true color aerial photography, IR is infrared color aerial photography

+Mountain Standard Time = Greenwich Mean Time - 7 hours

TABLE 5-5 SPECIFICATIONS FOR IMAGERY DISCUSSED IN SECTION 5-10

Figure	I*	Acquisition Date	Time (GMT)+ At Start of Line	Line or Frame	BB1 in C^o	BB2 in C^o	Digital Level Slicing		Original Scale
							Ranges	Temp. Range/ Slice in C^o	
5-20	T	Sept. 17/76	7:25	4 N.W.	3	15	5-7	0.67	1/11,000
5-21	C	Sept. 16/76	19:50	A37402 -177	-	-	-	-	1/10,000
5-22	C	Sept. 16/76	19:45	A37402 -162	-	-	-	-	1/10,000

*Imagery Designation: T is thermal IR, C is true color aerial photography, IR is infrared color aerial photography

+Mountain Standard Time = Greenwich Mean Time - 7 hours

FIGURES AND TABLES

FOR

SECTION 6

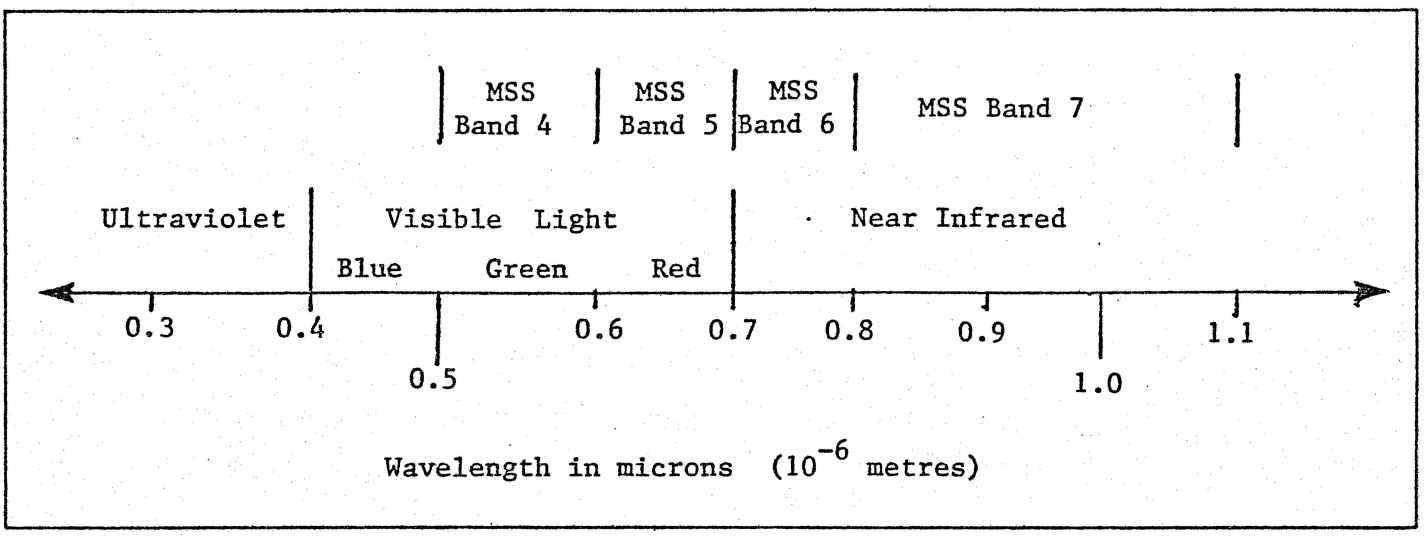


Figure 6-1 The portion of the electromagnetic spectrum detected by the Landsat 1 and 2 Multispectral Scanner Systems (MSS)

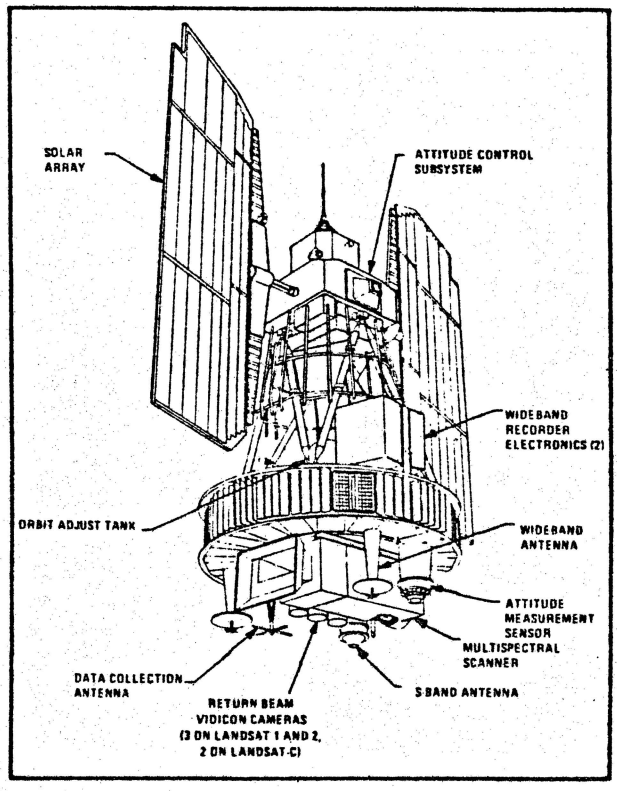


Figure 6-2 Landsat observatory configuration (taken from NASA 1976 p A-1)

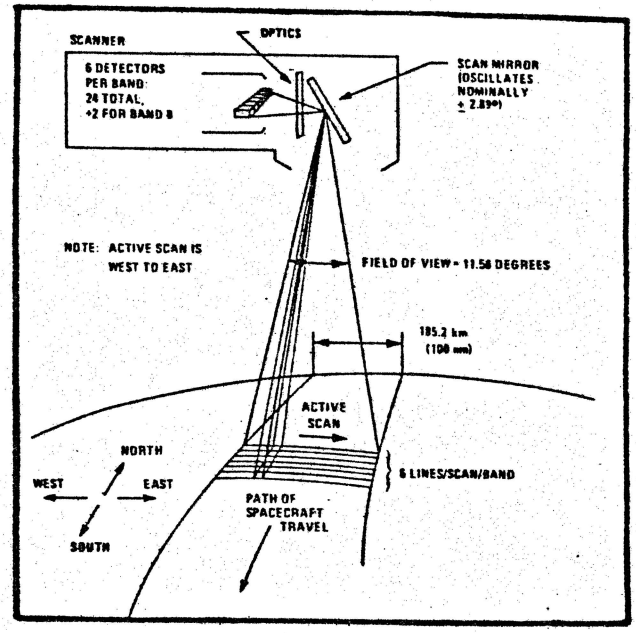


Figure 6-3 Landsat Multispectral Scanner system (taken from NASA 1976 p C-2)



Figure 6-4 Portion of Landsat-1 (frame 1758-17564) product 8 colour composite image, acquired August 20, 1974.

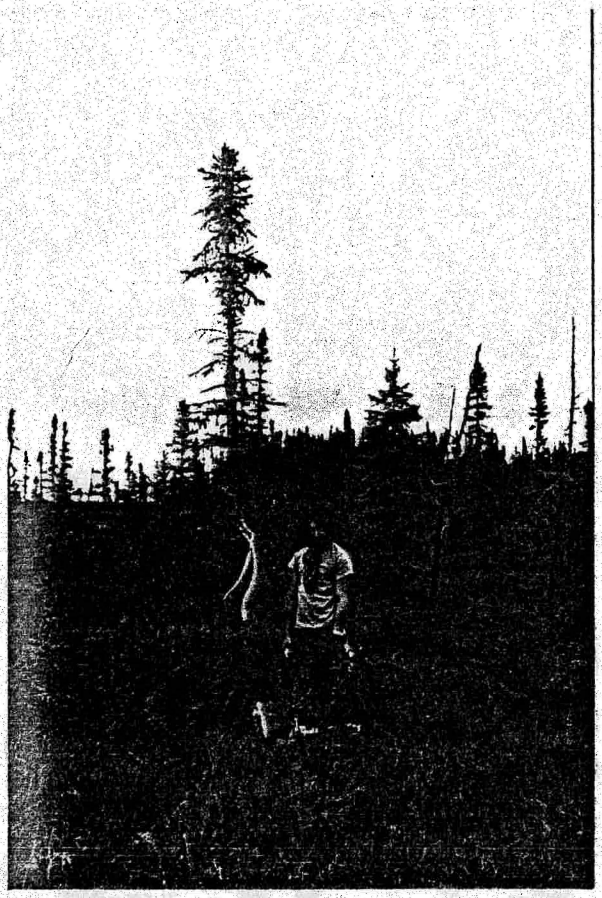


Figure 6-5 Ground photo of Plot 116, the Sedge-Sphagnum community.

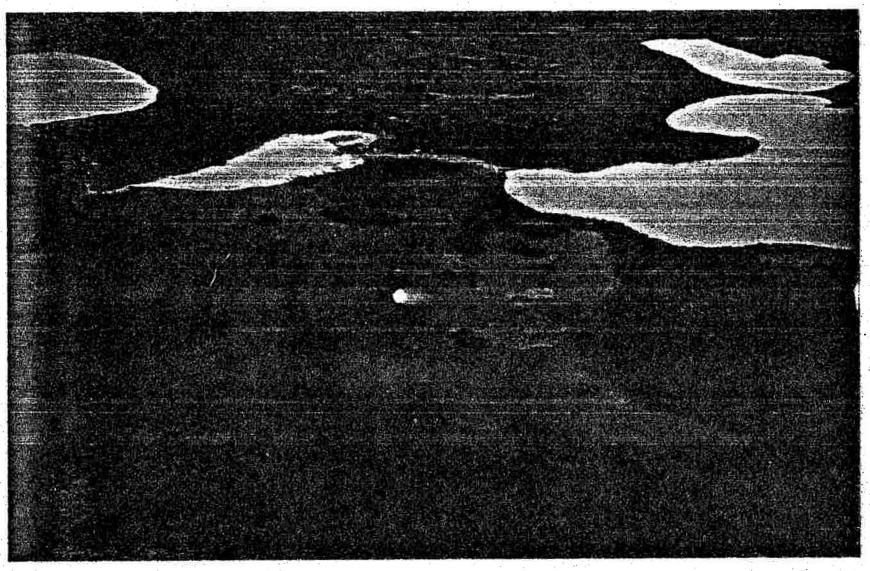


Figure 6-6 Oblique aerial photograph of the lighter green coloured wetland area in which Plot 116 was located.



Figure 6-7 Portion of the 20 July 1973 Landsat-1 Frame (10362-18060) analyzed using the Image-100 system.

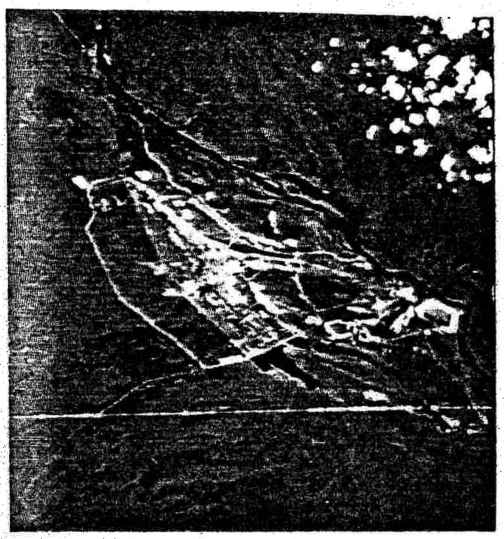


Figure 6-8 Portion of the 31 July 1976 Landsat-2 Frame (20556-17470) analyzed using the Image-100 system.



Figure 6-9 The Disturbed Land-1 class developed for the 20 July 1973 Landsat image.

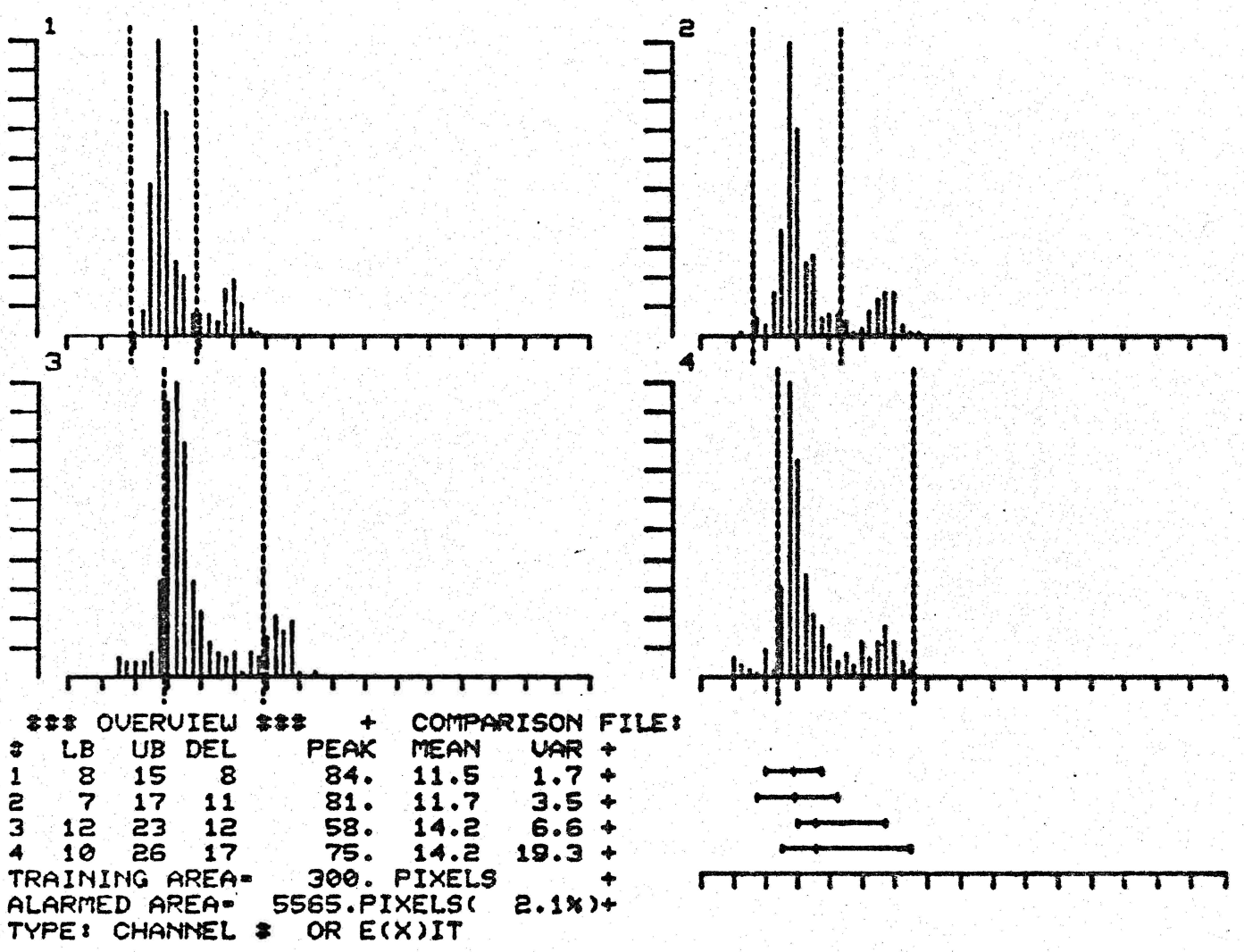


Figure 6-10 1-D histograms and specifications of the Disturbed Land-1 class developed for the 20 July 1973 Landsat image.



Figure 6-11 1/70,000 false-colour infrared aerial photograph (Frame RSPA 305784 IR-44) of the Mildred Lake (M) and vicinity acquired 29 July 1973.

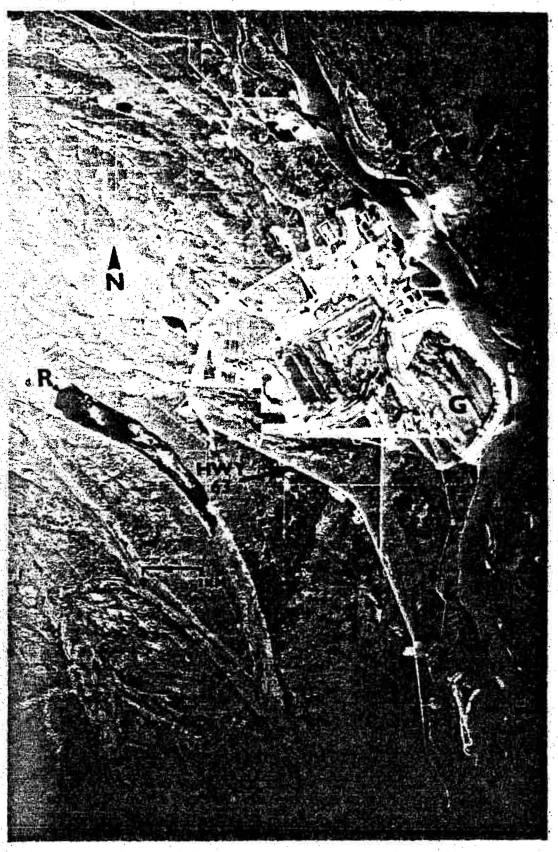


Figure 6-12 1/70,000 false-colour infrared aerial photograph (Frame RSPA 305784 IR-43) of the GCOS plant site and tailings pond (G) and Ruth Lake (R) area, acquired 29 July 1973.



Figure 6-13 Portion of a 1/70,000 false-colour infrared aerial photograph (Frame RSPA 305784 IR-45) of Plots 111-115 acquired 29 July 1973.

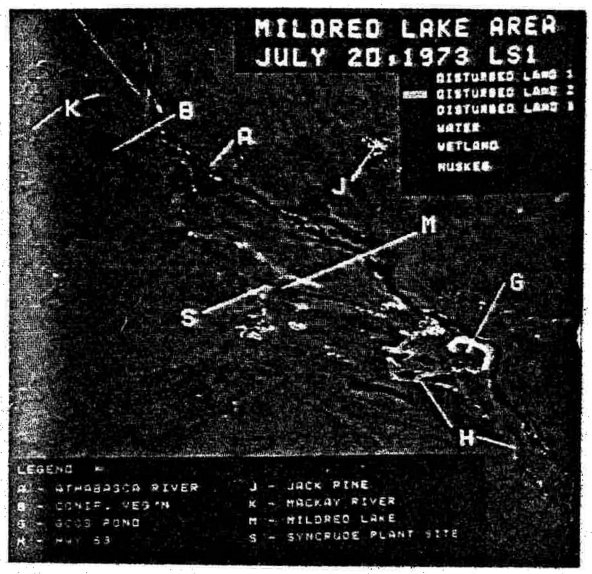
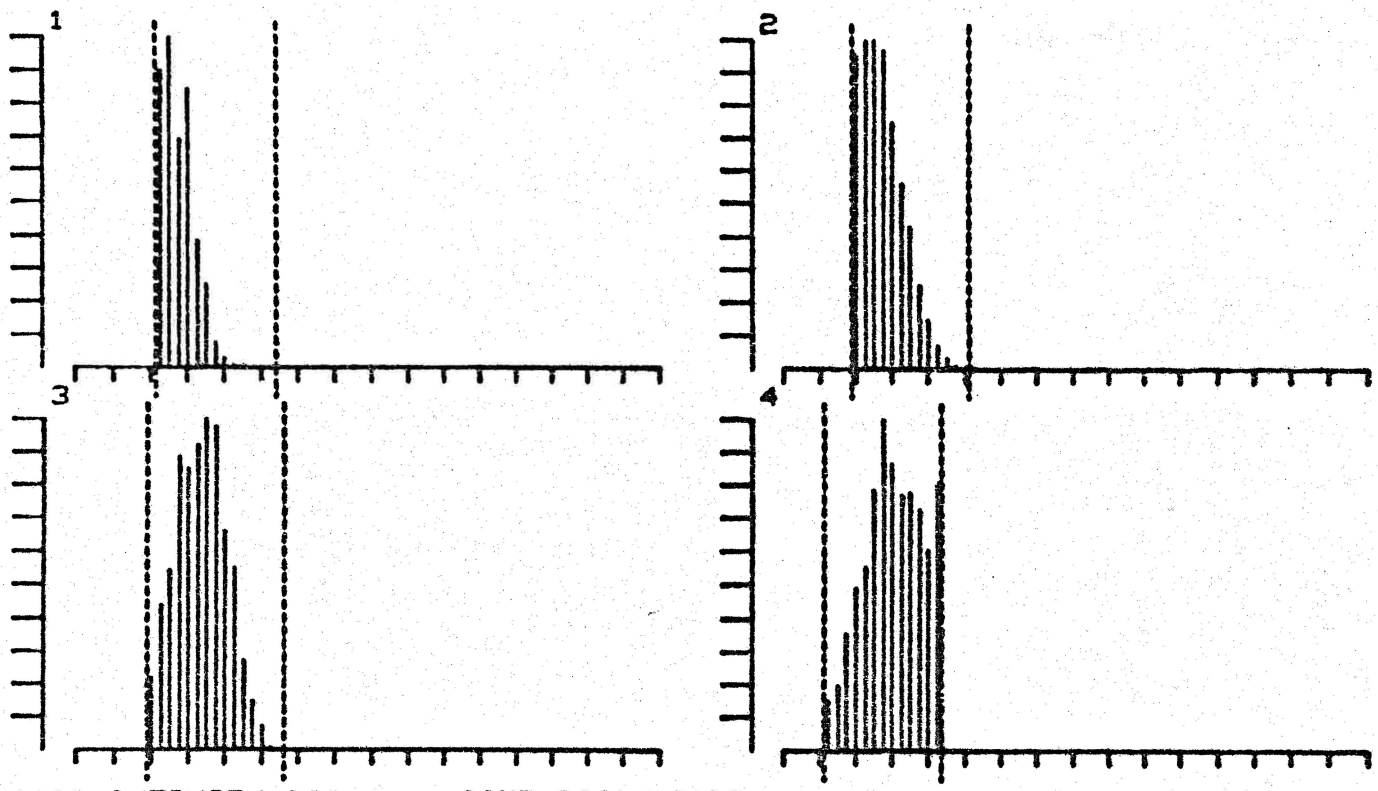


Figure 6-14 Disturbed Land-2 class developed for the 29 July 1973 Landsat image.



*** OVERVIEW *** + COMPARISON FILE:

#	LB	UB	DEL	PEAK	MEAN	VAR	+
1	9	21	13	652.	11.0	2.8	+
2	8	20	13	443.	11.0	5.4	+
3	8	22	15	363.	13.4	7.5	+
4	5	17	13	339.	12.1	9.9	+

TRAINING AREA= 2735. PIXELS +
ALARMED AREA= 2735.PIXELS(1.0%)+
TYPE: CHANNEL # OR E(X)IT

Figure 6-15 1-D histograms and specifications for the Disturbed Land-2 class developed for the 29 July 1973 Landsat image.

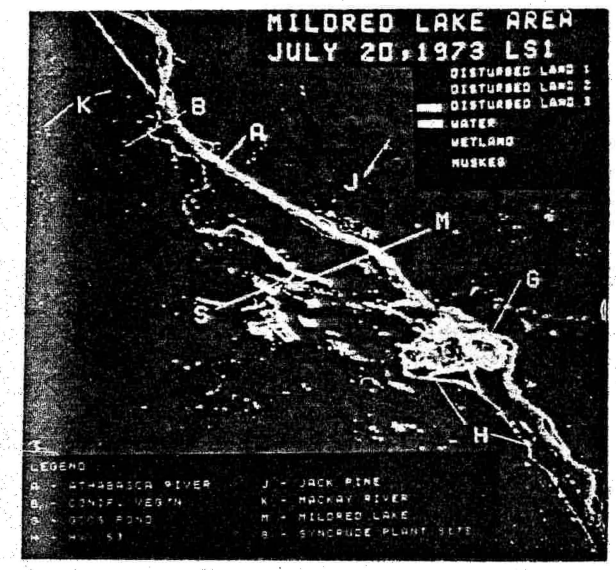


Figure 6-16 Disturbed Land-3 and Water classes developed for the 20 July 1973 Landsat image.

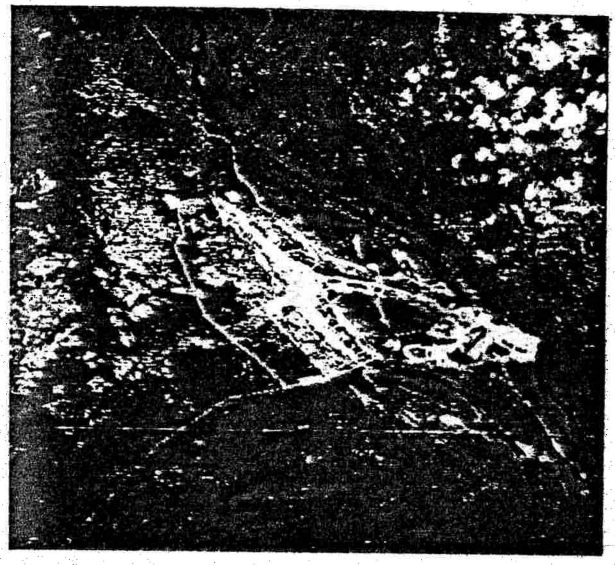


Figure 6-17 Wetland (pink) and Disturbed Land (white) classes developed for the 31 July 1976 Landsat image using 1-D training.



Figure 6-18 Disturbed Land class (white) developed for the 31 July 1976 Landsat image using N-D training.



Figure 6-19 Coniferous (dark blue), Deciduous (tan), Disturbed Land (grey), Muskeg (light blue) and Water (yellow) classes developed for the 31 July 1976 Landsat image.



Figure 6-20 Coniferous, Deciduous and Water classes developed for the 20 July 1973 Landsat image.



Figure 6-21 Muskeg, Water and Wetland classes developed for the 20 July 1973 Landsat image.

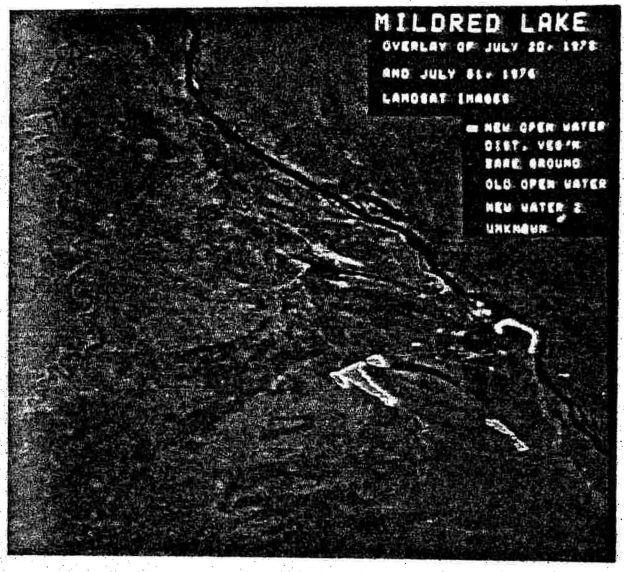


Figure 6-22 New Open Water class developed by overlay analysis of multidate Landsat imagery.

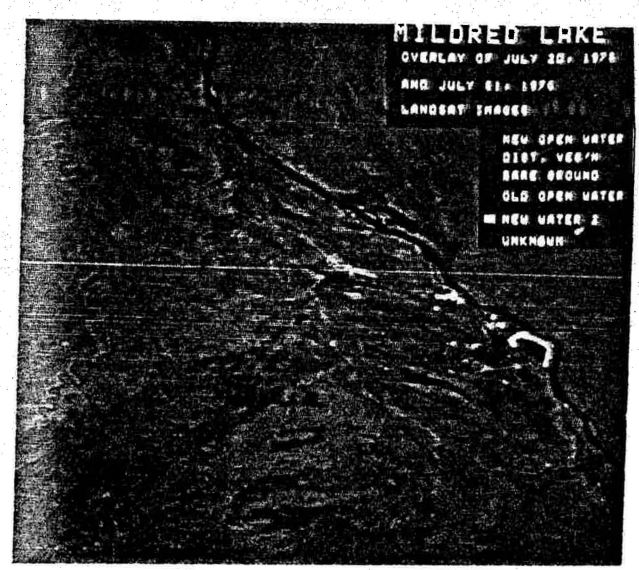


Figure 6-23 New Water-2 class developed by overlay analysis of multidate Landsat imagery.

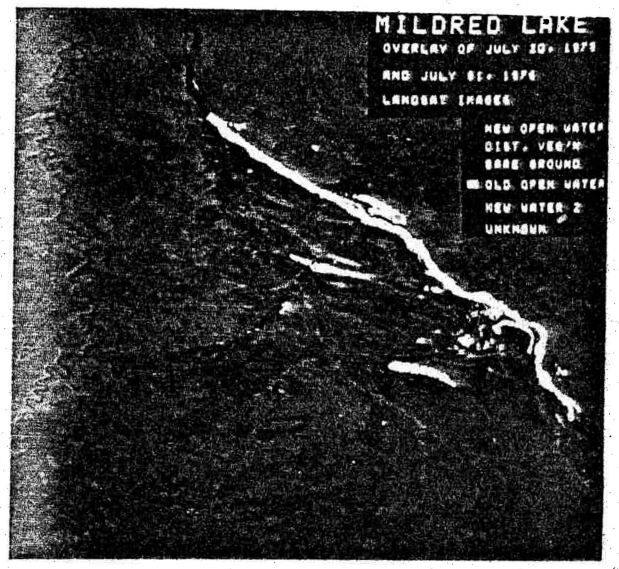


Figure 6-24 Old Open Water class developed by overlay analysis of multidate Landsat imagery.



Figure 6-25 New Disturbance Vegetation class developed by overlay analysis of multidate Landsat imagery.

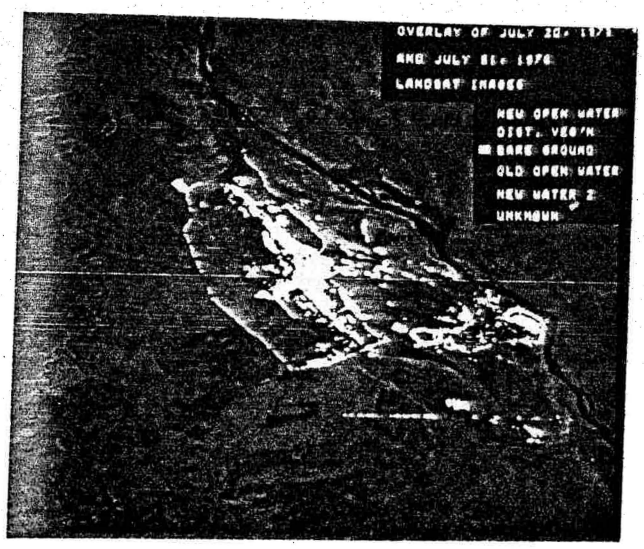


Figure 6-26 New Bare Ground class developed by overlay analysis of multidate Landsat imagery.

TABLE 6-1 CLOUD-FREE LANDSAT PHOTOGRAPHIC PRODUCTS OF THE MILDRED LAKE AREA

Picture Centre	Date	Quality +	ID Number
45-20	Oct. 4/72	EEEE PP	10073-18001
45-20	Dec. 15/72 *	PFGG FP	10145-18005
45-20	Feb. 7/73 *	GGGG --	10199-18010
45-20	July 19/73	GGGG FF	10361-18002
46-20	July 20/73	FGGG --	10362-18060
45-20	Feb. 2/74*	GGGG FG	10559-17562
45-20	April 15/74 *	EEGG FG	10631-17550
46-20	April 16/74	GGGG GG	1632-18004
45-20	May 21/74 *	FGGE PF	10667-17540
45-20	Aug. 1/74	GGGG PF	10739-17514
46-20	Aug. 20/74	GGGG GP	1758-17564
46-20	Dec. 6/74 *	GFGG --	10866-17531
46-20	Feb. 16/75	GGEE FP	1938-17501
45-20	April 10/75 *	GGGF GG	1991-17415
46-20	April 11/75	GGGG FP	1992-17474
46-20	July 1/75	FGGG GF	20160-17544
45-20	July 9/75	EEGE GG	11081-17370
46-20	July 10/75	FG-- --	11082-17424
45-20	Sept. 1/75	--FG --	11135-17335
45-20	Sept. 19/75 *	GGFF FF	11153-17324
46-20	Sept. 20/75	GGGG GE	11154-17382
45-20	Feb. 10/76 *	GGGF FP	11297-17234
46-20	Feb. 20/76	GGGG GG	20394-17513
45-20	May 1/76	GGGG GG	20465-17435
45-20	May 10/76 *	GGGG FG	11387-17174
46-20	May 29/76	FGFG GG	11406-17221
46-20	Oct. 29/76	GGGG FF	20646-17441

* Images listed as cloud-free but not viewed by researcher

\+ Quality of image products is listed as excellent (E), good (G), fair (F), poor (P), not available (-). The six ratings are, from left to right) for the black and white photographic products of bands 4 through 7 and the colour composite products 8 and 9.

TABLE 6-2 CLASSIFICATION TABLE FOR AUGUST 20, 1974 (Frame 1758-17564), PRODUCT 8, COLOUR COMPOSITE OF PORTION OF OSERP AREA

Signature	Description	Example Plots	Examples in Fig 6-4
Dark brown, patchy	Coniferous dominated vegetation	47, 77, 95	Next to road at K
Light brown, patchy	Muskeg communities, black spruce regeneration	92, 105, 143	M
Light brown, linear features	Roads, railways		K, Y
Tan	Sphagnum bogs, sparse tree cover	116	W, W1
Dark grey-green, irregular borders	Large jackpine dominated areas	111, 112	J, J1
Dark to light grey-green, sharp borders	Excavations, cleared land, town sites	Ft McMurray town site, GCOS plant Syncrude plt	F G S
Red, patchy	Deciduous dominated vegetation	102, 122, 124	D
White, wispy or billowy	Clouds		CL
Blue	Water with relatively high turbidity	Athabasca River	A
Black	Water with relatively low turbidity	Clearwater River	C

FIGURES AND TABLES

FOR

SECTION 7

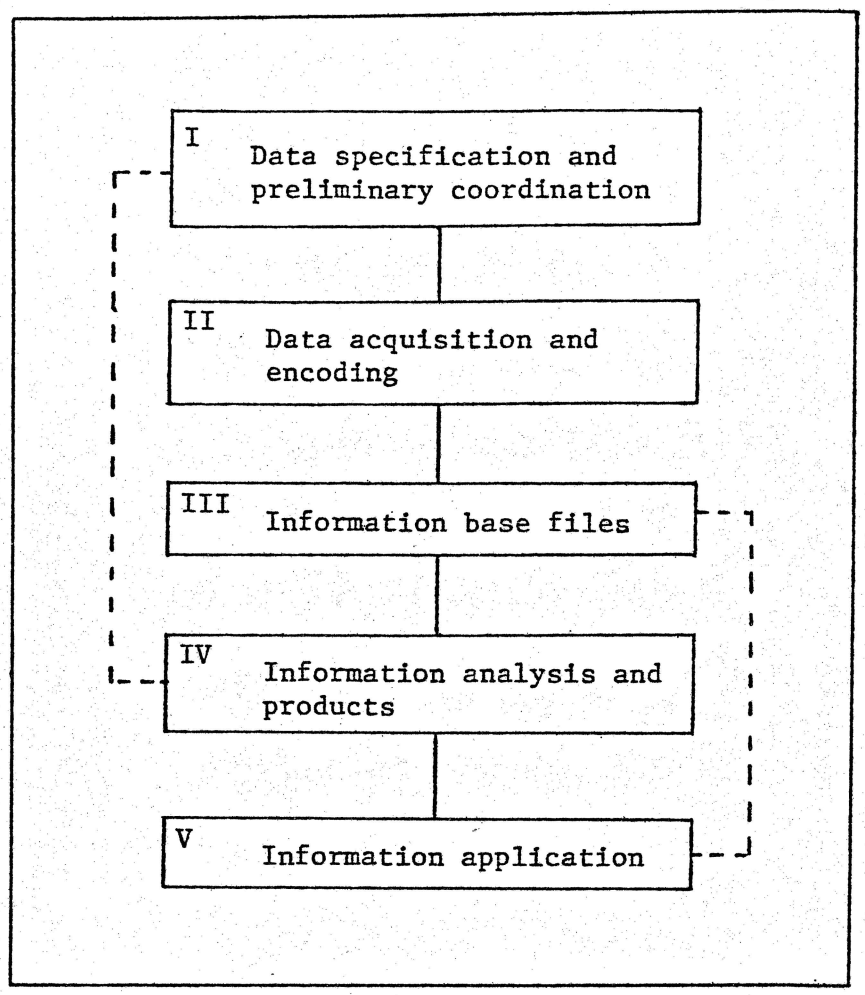


Figure 7-1 Five phases in the development, implementation and maintenance of a spatial information system

(after ASP (1975) and Brooner and Nichols (1972))

TABLE 7-1 PORTION OF A HIERARCHICAL BREAKDOWN OF A VEGETATION CLASS

300 - NATURAL VEGETATION

320 - Shrub-scrub vegetation

324 - Microphyllous salt-tolerant vegetation

324.1 - Saltsage (*Atriplex*) prominent vegetation

324.11 - Shadscale/Budsage (Atco/Arsp) communities

(Taken from Poulton (1972), p 401)

TABLE 7-2 EXAMPLES OF PHYSICAL ENVIRONMENT CLASSES

Examples of Macrorelief Classes

1.0 Flat lands (slopes less than 10 per cent)
- 1.1 Nondissected
- 1.2 Dissected

2.0 Moderately undulating to rolling lands (slopes 10-25 per cent)
- 2.1 Nondissected
- 2.2 Dissected

3.0 Hilly lands

4.0 Mountainous lands

Examples of Landform Classes

1.0 Depressional or wetlands, nonriparian

2.0 Bottom lands, riparian

3.0 Planar surfaces
- 3.1 Fans and bajadas
- 3.2 Terraces
- 3.3 Pediments

5.0 Slope systems

Examples of Surficial Geology Classes

10 Coarse-grained igneous

20 Fine-grained igneous

30 Sedimentary

40 Metamorphic

50 Unconsolidated material

(Taken from Poulton (1972))

APPENDIX A

VEGETATION DATA

TABLE A-1. ASPEN COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER										COVER		CONSTANCY		
	102	63	125	56	108	40	132	137	19	15	%CV	%CCV	|CO|	%CO	%CCO
POPULUS TREMULOIDES	5	5	5	5	5	5	3	5	3	4	75	75	10	100	100
PICEA GLAUCA	0	1	.	1	2	1	1	1	0	0	2	7	6	60	90
POPULUS BALSAMIFERA	2	.	2	1	.	.	3	.	0	.	7	7	4	40	50
BETULA PAPYRIFERA	1	.	1	.	.	.	.	.	.	.	0	0	2	20	20
PINUS BANKSIANA	.	.	.	.	.	.	.	1	0	.	0	1	1	10	20
ABIES BALSAMEA	.	.	1	.	.	.	0	.	.	.	0	1	1	10	20

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER										COVER		CONSTANCY		
	102	63	125	56	108	40	132	137	19	15	%CV	%CCV	|CO|	%CO	%CCO
PICEA GLAUCA	1	1	.	1	1	2	0	2	0	2	5	7	7	70	90
SALIX SPP.	2	.	.	.	.	1	.	1	.	.	2	2	3	30	30
POPULUS TREMULOIDES	0	0	0	0	0	0	0	1	1	2	2	75	3	30	100
PINUS BANKSIANA	.	.	.	.	.	.	.	0	2	.	1	1	1	10	20
ALNUS CRISPA	.	0	.	0	0	.	.	1	.	.	0	9	1	10	40
ABIES BALSAMEA	.	.	1	.	.	.	0	.	.	.	0	1	1	10	20

TABLE A-1. ASPEN COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER										COVER		CONSTANCY		
	102	63	125	56	108	40	132	137	19	15	%CV	%CCV	|CO|	%CO	%CCO
ROSA ACICULARIS	2	3	2	4	3	4	3	2	2	2	31	31	10	100	100
VIBURNUM EDULE	4	4	5	5	2	2	3	.	1	.	37	37	8	80	80
SHEPHERDIA CANADENSIS	2	1	.	1	2	1	.	1	3	3	11	11	8	80	80
AMELANCHIER ALNIFOLIA	1	1	.	1	2	.	.	2	1	2	5	5	7	70	70
VACCINIUM VITIS-IDAEA	1	1	.	.	2	2	.	2	.	1	5	5	6	60	60
VACCINIUM MYRTILLOIDES	.	1	.	.	2	2	.	3	1	2	8	8	6	60	60
POPULUS TREMULOIDES	0	0	0	1	+	1	0	1	1	2	2	75	6	60	100
PICEA GLAUCA	1	1	.	1	1	0	0	1	1	0	1	7	6	60	90
ARCTOSTAPHYLOS UVA-URSI	.	+	.	.	2	3	.	2	.	4	13	13	5	50	50
SYMPHORICARPOS ALBUS	.	.	.	.	1	.	.	1	1	.	0	0	3	30	30
ALNUS CRISPA	.	4	.	2	2	.	.	0	.	.	9	9	3	30	40
LEDUM GROENLANDICUM	.	.	.	1	.	2	.	.	.	.	1	1	2	20	20
CORNUS STOLONIFERA	2	.	.	.	.	.	2	.	.	.	3	3	2	20	20
ABIES BALSAMEA	.	.	2	.	.	.	1	.	.	.	1	1	2	20	20
RIBES TRISTE	.	.	.	1	.	.	.	.	.	.	0	0	1	10	10
RIBES OXYACANTHOIDES	1	.	.	.	.	.	.	.	.	.	0	0	1	10	10
PRUNUS VIRGINIANA	.	.	.	.	1	.	.	.	.	.	0	0	1	10	10
POPULUS BALSAMIFERA	0	.	0	0	.	.	0	.	+	.	0	7	1	10	50
PINUS BANKSIANA	.	.	.	.	.	.	.	0	1	.	0	1	1	10	20
LONICERA INVOLUCRATA	.	1	.	.	.	.	.	.	.	.	0	0	1	10	10
LONICERA DIOICA	.	.	.	.	.	.	.	.	.	1	0	0	1	10	10
BETULA PAPYRIFERA	1	.	0	.	.	.	.	.	.	.	0	0	1	10	20
ALNUS TENUIFOLIA	1	.	.	.	.	.	.	.	.	.	0	0	1	10	10

TABLE A-1. ASPEN COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 102	63	125	56	108	40	132	137	19	15	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
MAIANTHEMUM CANADENSIS	1	1	1	1	1	1	1	1	2	1	3	3	10	100	100
LINNAEA BOREALIS	4	4	2	2	4	5	1	2	3	2	37	37	10	100	100
CORNUS CANADENSIS	3	4	3	3	4	5	4	3	2	1	44	44	10	100	100
ASTER CILIOLATUS	1	1	1	1	1	1	2	1	1	.	3	3	9	90	90
LATHYRUS OCHROLEUCUS	1	2	.	1	1	2	.	1	2	1	5	5	8	80	80
GALIUM BOREALE	1	1	1	1	1	.	1	1	.	1	2	2	8	80	80
FRAGARIA VIRGINIANA	2	2	1	.	1	1	1	.	1	1	4	4	8	80	80
EPILOBIUM ANGUSTIFOLIUM	1	1	.	1	.	2	2	2	1	1	5	5	8	80	80
RUBUS PUBESCENS	5	3	2	3	3	2	.	.	1	.	23	23	7	70	70
PYROLA SECUNDA	1	1	.	1	1	1	.	1	.	1	1	1	7	70	70
PYROLA ASARIFOLIA	.	1	1	1	.	1	2	.	1	1	3	3	7	70	70
PLEUROZIUM SCHREBERI	2	3	1	1	1	.	.	1	.	2	7	7	7	70	70
PETASITES PALMATUS	2	2	1	1	.	1	1	.	1	.	4	4	7	70	70
ELYMUS INNOVATUS	1	4	1	2	2	.	.	3	3	.	17	17	7	70	70
TRIENTALIS BOREALIS	.	.	1	1	1	1	.	.	1	1	1	1	6	60	60
HYLOCOMIUM SPLENDENS	.	3	2	1	2	3	.	2	.	.	12	12	6	60	60
MERTENSIA PANICULATA	2	.	1	1	.	.	1	.	.	.	2	2	4	40	40
ACHILLEA MILLEFOLIUM	1	1	.	.	.	1	.	1	.	.	1	1	4	40	40
VIOLA RENIFOLIA	.	.	1	+	.	+	.	.	.	.	0	0	3	30	30
VICIA AMERICANA	1	.	.	.	1	.	.	.	1	.	0	0	3	30	30
PTILIUM CRISTA-CASTRENSIS	2	1	1	.	.	.	.	.	.	.	2	2	3	30	30
PELTIGERA SPP.	1	1	.	.	.	.	.	1	.	.	0	0	3	30	30
EQUISETUM SYLVATICUM	1	.	1	.	.	1	.	.	.	.	0	0	3	30	30
EQUISETUM PRATENSE	.	.	1	.	.	.	2	.	1	.	2	2	3	30	30
EQUISETUM ARVENSE	2	.	.	.	.	.	2	.	1	.	3	3	3	30	30
DICRANUM SPP.	1	1	.	.	.	.	.	.	.	1	0	0	3	30	30
CALAMAGROSTIS CANADENSIS	1	.	1	.	.	.	.	1	.	.	0	0	3	30	30
ARALIA NUDICAULIS	.	.	2	2	3	.	.	.	.	.	6	6	3	30	30
ACTAEA RUBRA	1	.	1	1	.	.	.	.	.	.	0	0	3	30	30
SCHIZACHNE PURPURASCENS	.	.	.	.	1	.	.	2	.	.	1	1	2	20	20
MITELLA NUDA	2	.	3	.	.	.	.	.	.	.	5	5	2	20	20
MELAMPYRUM LINEARE	.	.	.	.	.	.	.	.	1	1	0	0	2	20	20
LYCOPODIUM OBSCURUM	.	.	1	.	.	.	.	1	.	.	0	0	2	20	20
COMANDRA PALLIDA	.	.	.	.	.	.	.	.	1	1	0	0	2	20	20
VIOLA RUGULOSA	.	.	.	1	.	.	.	.	.	.	0	0	1	10	10
VIOLA ADUNCA	.	.	.	.	.	.	.	.	1	.	0	0	1	10	10
LYCOPODIUM COMPLANATUM	.	.	.	.	.	.	.	1	.	.	0	0	1	10	10
LILIUM PHILADELPHICUM	.	+	.	.	.	.	.	.	.	.	0	0	1	10	10
HIERACIUM UMBELLATUM	.	.	.	.	.	1	.	.	.	.	0	0	1	10	10
GYMNOCARPIUM DRYOPTERIS	.	.	1	.	.	.	.	.	.	.	0	0	1	10	10
GALIUM TRIFLORUM	.	.	1	.	.	.	.	.	.	.	0	0	1	10	10
EQUISETUM SCIRPOIDES	.	1	.	.	.	.	.	.	.	.	0	0	1	10	10
EPILOBIUM GLANDULOSUM	.	.	.	1	.	.	.	.	.	.	0	0	1	10	10
DREPANOCLADUS SPP.	1	.	.	.	.	.	.	.	.	.	0	0	1	10	10
CLADINA SPP.	.	.	.	.	1	.	.	.	.	.	0	0	1	10	10
CIRCAEA ALPINA	.	.	.	.	.	.	.	.	.	1	0	0	1	10	10
CAMPANULA ROTUNDIFOLIA	.	.	.	.	.	.	.	.	.	1	0	0	1	10	10
AULACOMNIUM PALUSTRE	1	.	.	.	.	.	.	.	.	.	0	0	1	10	10
ASTER CONSPICUUS	1	.	.	.	.	.	.	.	.	.	0	0	1	10	10

TABLE A-2. ASPEN-ALDER COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER														COVER		CONSTANCY		
	69	138	67	121	127	122	66	123	83	29	93	16	120	136	%CV	%CCV	|CO|	%CO	%CCO
OPULUS TREMULOIDES	5	5	5	5	5	5	5	4	5	5	5	4	5	4	82	82	14	100	100
ICEA GLAUCA	1	+	1	1	.	1	0	+	2	0	0	2	0	1	3	6	9	64	92
OPULUS BALSAMIFERA	.	.	.	2	.	2	2	2	.	0	.	.	.	.	4	4	4	28	35
INUS BANKSIANA	.	.	1	.	.	.	.	.	.	.	.	+	.	1	0	0	3	21	21
ETULA PAPYRIFERA	.	.	.	0	.	0	1	0	1	0	.	.	0	.	0	3	2	14	50
LNUS TENUIFOLIA	.	.	.	0	.	0	0	0	.	.	1	.	0	.	0	8	1	7	42

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER														COVER		CONSTANCY		
	69	138	67	121	127	122	66	123	83	29	93	16	120	136	%CV	%CCV	|CO|	%CO	%CCO
LNUS CRISPA	5	2	4	4	2	2	2	2	0	.	.	3	.	4	27	30	10	71	78
OPULUS TREMULOIDES	0	1	1	0	2	0	0	0	0	3	0	1	0	2	5	82	6	42	100
ICEA GLAUCA	0	1	+	0	.	0	0	0	0	1	2	+	1	0	1	6	6	42	92
ETULA PAPYRIFERA	.	.	.	1	.	1	0	3	1	1	.	.	1	.	3	3	6	42	50
LNUS TENUIFOLIA	.	.	.	2	.	2	3	1	.	.	3	.	2	.	8	8	6	42	42
ALIX SPP.	.	.	.	.	.	.	0	1	+	.	0	.	1	.	0	1	3	21	35
RUNUS PENSYLVANICA	3	0	0	.	2	.	.	1	.	.	.	0	.	.	3	4	3	21	42
MELANCHIER ALNIFOLIA	0	0	0	.	.	.	0	.	2	1	.	2	.	0	2	10	3	21	57
IBURNUM EDULE	0	0	.	0	0	0	0	0	0	0	0	.	1	.	0	32	1	7	78
OPULUS BALSAMIFERA	.	.	.	0	.	0	0	0	.	1	.	.	.	.	0	4	1	7	35
ORNUS STOLONIFERA	.	.	.	0	.	0	0	.	0	2	.	.	.	.	1	5	1	7	35

TABLE A-2. ASPEN-ALDER COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER														COVER		CONSTANCY		
	69	138	67	121	127	122	66	123	83	29	93	16	120	136	%CV	%CCV	|CO|	%CO	%CCO
ROSA ACICULARIS	2	2	2	4	2	2	3	2	3	3	3	1	3	1	24	24	14	100	100
PICEA GLAUCA	0	1	1	1	.	1	1	1	1	2	2	+	2	1	4	6	12	85	92
VIBURNUM EDULE	3	2	.	3	2	5	3	3	3	5	4	.	1	.	32	32	11	78	78
VACCINIUM VITIS-IDAEA	1	2	2	.	.	.	.	.	.	.	.	2	1	2	4	4	6	42	42
VACCINIUM MYRTILLOIDES	2	3	4	.	.	.	.	.	.	.	.	2	1	4	13	13	6	42	42
POPULUS TREMULOIDES	+	0	1	0	0	0	0	1	0	0	0	1	1	1	0	82	6	42	100
AMELANCHIER ALNIFOLIA	4	3	2	.	.	.	1	.	1	0	.	0	.	1	8	10	6	42	57
RUBUS STRIGOSUS	+	.	.	1	.	1	1	.	.	1	.	.	.	.	0	0	5	35	35
RIBES TRISTE	.	.	.	1	.	1	1	.	.	.	1	.	.	.	0	0	4	28	28
PRUNUS PENSYLVANICA	2	1	1	.	0	.	.	0	.	.	.	1	.	.	1	4	4	28	42
CORNUS STOLONIFERA	.	.	.	2	.	1	3	.	1	0	.	.	.	.	4	5	4	28	35
ARCTOSTAPHYLOS UVA-URSI	.	.	3	.	.	.	.	1	.	.	.	2	.	5	10	10	4	28	28
SYMPHORICARPOS ALBUS	1	1	.	.	.	.	1	.	.	.	.	.	.	.	0	0	3	21	21
SHEPHERDIA CANADENSIS	.	.	.	.	.	.	.	.	.	1	2	.	1	.	1	1	3	21	21
RIBES OXYACANTHOIDES	.	.	.	1	.	.	1	.	1	.	.	.	.	.	0	0	3	21	21
LEDUM GROENLANDICUM	.	1	.	.	.	.	.	.	.	.	.	2	1	.	1	1	3	21	21
ALNUS CRISPA	0	0	0	1	0	1	0	0	3	.	.	0	.	0	3	30	3	21	78
SALIX SPP.	.	.	.	.	.	.	1	0	0	.	2	.	0	.	1	1	2	14	35
RIBES GLANDULOSUM	.	.	.	.	.	.	.	.	.	.	.	.	1	.	0	0	1	7	7
PRUNUS VIRGINIANA	.	.	.	1	.	.	.	.	.	.	.	.	.	.	0	0	1	7	7
LONICERA INVOLUCRATA	.	.	.	.	.	1	.	.	.	.	.	.	.	.	0	0	1	7	7
LONICERA DIOICA	.	1	.	.	.	.	.	.	.	.	.	.	.	.	0	0	1	7	7
ALNUS TENUIFOLIA	.	.	.	0	.	0	0	0	.	.	0	.	1	.	0	8	1	7	42
ABIES BALSAMEA	.	.	.	.	.	.	.	1	.	.	.	.	.	.	0	0	1	7	7

TABLE A-2. ASPEN-ALDER COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER															COVER		CONSTANCY		
	69	138	67	121	127	122	66	123	83	29	93	16	120	136		%CV	%CCV	|CO|	%CO	%CCO
LINNAEA BOREALIS	1	3	3	1	.	1	5	5	3	3	1	2	4	2		30	30	13	92	92
CORNUS CANADENSIS	3	2	2	5	.	3	3	3	2	3	4	1	5	1		33	33	13	92	92
ARALIA NUDICAULIS	4	3	4	4	4	4	4	3	4	4	.	2	2	2		44	44	13	92	92
EPILOBIUM ANGUSTIFOLIUM	1	1	1	.	.	1	1	2	1	1	1	1	2	1		3	3	12	85	85
MAIANTHEMUM CANADENSIS	.	1	2	1	1	.	1	1	1	1	.	1	1	2		3	3	11	78	78
RUBUS PUBESCENS	2	1	.	4	.	2	3	2	3	.	4	1	4	.		22	22	10	71	71
PYROLA SECUNDA	1	1	1	1	.	.	.	1	1	1	1	.	1	1		1	1	10	71	71
GALIUM BOREALE	1	1	.	1	1	1	1	1	1	+	1	.	.	.		1	1	10	71	71
FRAGARIA VIRGINIANA	1	.	1	1	.	.	1	1	1	.	1	1	1	1		1	1	10	71	71
TRIENTALIS BOREALIS	1	1	1	1	.	1	.	1	2	.	.	1	1	.		2	2	9	64	64
PLEUROZIUM SCHREBERI	1	1	1	1	.	1	.	.	.	2	1	2	.	1		3	3	9	64	64
LATHYRUS OCHROLEUCUS	.	.	.	1	.	1	1	1	1	1	1	+	1	.		1	1	9	64	64
ELYMUS INNOVATUS	1	2	2	.	1	.	2	2	.	.	1	.	1	1		5	5	9	64	64
CALAMAGROSTIS CANADENSIS	1	.	.	2	.	2	.	1	2	1	1	1	1	.		4	4	9	64	64
ASTER CILIOLATUS	.	.	.	1	1	1	2	1	1	.	1	.	1	1		2	2	9	64	64
PYROLA ASARIFOLIA	1	1	.	2	.	1	.	1	1	1	.	.	3	.		4	4	8	57	57
MERTENSIA PANICULATA	.	.	.	3	.	2	1	.	2	1	1	.	1	.		5	5	7	50	50
HYLOCOMIUM SPLENDENS	.	1	.	1	.	2	.	2	2	.	.	.	1	1		3	3	7	50	50
PETASITES PALMATUS	.	.	.	1	.	.	2	.	2	3	1	.	1	.		5	5	6	42	42
MITELLA NUDA	.	.	.	3	.	5	2	.	2	.	2	.	2	.		13	13	6	42	42
BRACHYTHECIUM SPP.	1	.	1	1	.	2	.	.	.	.	1	.	1	.		2	2	6	42	42
LYCOPODIUM COMPLANATUM	1	.	.	.	.	.	.	2	.	.	.	1	1	4		6	6	5	35	35
GALIUM TRIFLORUM	.	.	.	1	.	2	1	.	1	.	.	.	1	.		1	1	5	35	35
DICRANUM SPP.	1	1	1	.	.	.	.	.	.	2	.	1	.	.		1	1	5	35	35
VIOLA RENIFOLIA	.	.	.	1	.	1	1	.	.	.	.	.	1	.		0	0	4	28	28
LYCOPODIUM OBSCURUM	.	.	1	.	.	.	.	.	.	1	.	1	1	.		0	0	4	28	28
LYCOPODIUM ANNOTINUM	.	.	+	.	.	.	.	1	.	.	.	+	1	.		0	0	4	28	28
VICIA AMERICANA	.	.	.	.	.	1	.	1	.	.	1	.	.	.		0	0	3	21	21
SCHIZACHNE PURPURASCENS	.	.	+	.	.	.	.	.	1	.	.	.	.	1		0	0	3	21	21
PTILIUM CRISTA-CASTRENSIS	.	1	.	.	.	1	.	1	.	.	.	.	.	.		0	0	3	21	21
ORYZOPSIS SPP.	.	.	1	.	.	.	.	.	.	.	.	1	.	1		0	0	3	21	21
EQUISETUM PRATENSE	.	.	.	.	.	1	1	.	.	.	.	.	1	.		0	0	3	21	21
EQUISETUM SYLVATICUM	.	.	.	1	.	1	.	.	.	.	.	.	.	.		0	0	2	14	14
EQUISETUM SCIRPOIDES	.	.	.	.	.	.	+	.	.	.	1	.	.	.		0	0	2	14	14
DISPORUM TRACHYCARPUM	.	.	.	.	.	1	1	.	.	.	.	.	.	.		0	0	2	14	14
COMANDRA PALLIDA	.	.	.	.	.	.	.	.	.	.	.	1	.	1		0	0	2	14	14
CAMPANULA ROTUNDIFOLIA	.	.	1	.	.	.	.	.	.	.	.	1	.	.		0	0	2	14	14
ASTER CONSPICUUS	.	.	.	.	.	.	1	.	1	.	.	.	.	.		0	0	2	14	14
ACHILLEA MILLEFOLIUM	1	.	.	.	.	.	1	.	.	.	.	.	.	.		0	0	2	14	14
POLYTRICHUM SPP.	.	.	.	.	.	.	.	.	.	.	.	.	.	1		0	0	1	7	7
PELTIGERA SPP.	.	.	.	.	.	.	.	.	.	1	.	.	.	.		0	0	1	7	7
MNIUM SPP.	.	.	.	.	.	2	.	.	.	.	.	.	.	.		1	1	1	7	7
MELAMPYRUM LINEARE	.	.	1	.	.	.	.	.	.	.	.	.	.	.		0	0	1	7	7
GOODYERA REPENS	.	.	.	.	.	.	.	.	.	.	.	+	.	.		0	0	1	7	7
GEOCAULON LIVIDUM	.	.	.	.	.	.	.	.	.	.	.	1	.	.		0	0	1	7	7
EQUISETUM ARVENSE	.	.	.	.	.	.	.	.	.	.	2	.	.	.		1	1	1	7	7
DREPANOCLADUS SPP.	.	.	.	.	.	1	.	.	.	.	.	.	.	.		0	0	1	7	7
CLADINA SPP.	.	.	.	.	.	.	.	.	.	.	.	.	.	2		1	1	1	7	7

TABLE A-2. ASPEN-ALDER COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4 (contd.)

BRYUM SPP.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0	1	7	7
BROMUS CILIATUS	.	.	.	.	.	.	.	.	1	.	.	.	.	.	0	0	1	7	7
ACTAEA RUBRA	.	.	.	.	.	.	1	.	.	.	.	.	.	.	0	0	1	7	7

TABLE A-3. BALSAM POPLAR COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER 27	85	86	32	80	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
POPULUS BALSAMIFERA	5	5	5	5	4	82	82	5	100	100
PICEA GLAUCA	1	.	.	+	.	0	0	2	40	40
BETULA PAPYRIFERA	1	1	.	.	.	1	1	2	40	40
ABIES BALSAMEA	1	.	.	.	0	0	3	1	20	40

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 27	85	86	32	80	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PRUNUS VIRGINIANA	0	1	1	.	.	1	4	2	40	60
POPULUS BALSAMIFERA	2	0	1	0	0	3	82	2	40	100
CORNUS STOLONIFERA	0	0	5	.	4	30	50	2	40	80
ALNUS TENUIFOLIA	.	.	.	4	5	30	30	2	40	40
SALIX SPP.	.	.	1	.	.	0	0	1	20	20
ABIES BALSAMEA	2	.	.	.	0	3	3	1	20	40

TABLE A-3. BALSAM POPLAR COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 27	85	86	32	80	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
RIBES TRISTE	1	1	1	2	.	4	4	4	80	80
RUBUS STRIGOSUS	1	.	3	1	.	8	8	3	60	60
POPULUS BALSAMIFERA	1	1	0	0	1	1	82	3	60	100
VIBURNUM EDULE	4	.	2	.	.	15	15	2	40	40
ROSA ACICULARIS	.	.	3	.	1	8	8	2	40	40
RIBES OXYACANTHOIDES	1	1	.	.	.	1	1	2	40	40
CORNUS STOLONIFERA	4	3	0	.	0	20	50	2	40	80
ABIES BALSAMEA	2	.	.	.	1	3	3	2	40	40
VIBURNUM TRILOBUM	.	2	.	.	.	3	3	1	20	20
RIBES HIRTELLUM	.	1	.	.	.	0	0	1	20	20
PRUNUS VIRGINIANA	2	0	0	.	.	3	4	1	20	60
PICEA GLAUCA	1	.	.	0	.	0	0	1	20	40
AMELANCHIER ALNIFOLIA	.	2	.	.	.	3	3	1	20	20

TABLE A-3. BALSAM POPLAR COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 27	85	86	32	80	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
RUBUS PUBESCENS	3	3	4	.	1	28	28	4	80	80
EQUISETUM PRATENSE	4	1	5	5	.	48	48	4	80	80
ARALIA NUDICAULIS	4	3	2	.	.	23	23	3	60	60
MERTENSIA PANICULATA	2	1	.	.	.	3	3	2	40	40
GALIUM TRIFLORUM	1	.	1	.	.	1	1	2	40	40
EQUISETUM ARVENSE	1	.	.	.	2	3	3	2	40	40
CALAMAGROSTIS CANADENSIS	.	.	2	.	1	3	3	2	40	40
VIOLA RENIFOLIA	+	.	.	.	.	0	0	1	20	20
VICIA AMERICANA	.	.	1	.	.	0	0	1	20	20
URTICA GRACILIS	.	.	2	.	.	3	3	1	20	20
TRIFOLIUM HYBRIDUM	.	1	.	.	.	0	0	1	20	20
THALICTRUM VENULOSUM	.	.	.	.	3	7	7	1	20	20
TARAXACUM OFFICINALE	.	1	.	.	.	0	0	1	20	20
SCUTELLARIA GALERICULATA	.	.	.	.	1	0	0	1	20	20
PYROLA ASARIFOLIA	.	1	.	.	.	0	0	1	20	20
PLEUROZIUM SCHREBERI	.	.	+	.	.	0	0	1	20	20
MNIUM SPP.	1	.	.	.	.	0	0	1	20	20
MITELLA NUDA	2	.	.	.	.	3	3	1	20	20
GALIUM BOREALE	.	1	.	.	.	0	0	1	20	20
FRAGARIA VESCA	1	.	.	.	.	0	0	1	20	20
CORNUS CANADENSIS	.	.	.	2	.	3	3	1	20	20
CIRCAEA ALPINA	1	.	.	.	.	0	0	1	20	20
BROMUS CILIATUS	.	.	.	.	1	0	0	1	20	20
ACTAEA RUBRA	.	.	1	.	.	0	0	1	20	20

TABLE A-4. BIRCH COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER 128	129	126	124	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
BETULA PAPYRIFERA	5	3	4	4	62	62	4	100	100
POPULUS TREMULOIDES	+	3	1	0	10	11	3	75	100
PICEA GLAUCA	1	1	2	.	5	5	3	75	75
POPULUS BALSAMIFERA	.	.	2	2	7	7	2	50	50
ABIES BALSAMEA	0	+	.	0	0	4	1	25	75

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 128	129	126	124	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PICEA GLAUCA	1	1	1	.	1	5	3	75	75
ABIES BALSAMEA	1	0	.	1	1	4	2	50	75
POPULUS TREMULOIDES	1	0	0	0	0	11	1	25	100
ALNUS CRISPA	.	2	.	.	3	3	1	25	25

TABLE A-4. BIRCH COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER				COVER		CONSTANCY		
	128	129	126	124	%CV	%CCV	ICOI	%CO	%CCO
VIBURNUM EDULE	.	2	2	4	23	23	3	75	75
VACCINIUM MYRTILLOIDES	4	2	1	.	20	20	3	75	75
ROSA ACICULARIS	.	2	1	2	8	8	3	75	75
LEDUM GROENLANDICUM	2	1	1	.	5	5	3	75	75
VACCINIUM VITIS-IDAEA	.	1	1	.	1	1	2	50	50
RUBUS STRIGOSUS	.	1	1	.	1	1	2	50	50
RIBES OXYACANTHOIDES	.	.	1	1	1	1	2	50	50
POPULUS TREMULOIDES	0	1	0	1	1	11	2	50	100
PICEA GLAUCA	0	1	1	.	1	5	2	50	75
LONICERA INVOLUCRATA	.	.	1	1	1	1	2	50	50
BETULA PAPYRIFERA	0	1	0	1	1	62	2	50	100
ABIES BALSAMEA	1	0	.	2	4	4	2	50	75
RIBES HIRTELLUM	.	.	1	.	0	0	1	25	25
RIBES GLANDULOSUM	.	.	1	.	0	0	1	25	25
CORNUS STOLONIFERA	.	.	.	1	0	0	1	25	25
AMELANCHIER ALNIFOLIA	.	.	.	1	0	0	1	25	25
ALNUS CRISPA	.	1	.	.	0	3	1	25	25

TABLE A-4. BIRCH COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 128	129	126	124	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCC
TRIENTALIS BOREALIS	1	1	1	1	2	2	4	100	100
PLEUROZIUM SCHREBERI	1	1	1	1	2	2	4	100	100
LINNAEA BOREALIS	3	4	4	1	41	41	4	100	100
VIOLA RENIFOLIA	.	1	1	1	1	1	3	75	75
RUBUS PUBESCENS	.	2	2	2	11	11	3	75	75
PYROLA ASARIFOLIA	.	1	2	2	8	8	3	75	75
PTILIUM CRISTA-CASTRENSIS	1	1	1	.	1	1	3	75	75
POLYTRICHUM SPP.	1	.	1	1	1	1	3	75	75
PETASITES PALMATUS	.	1	1	2	5	5	3	75	75
MITELLA NUDA	.	2	3	3	22	22	3	75	75
MERTENSIA PANICULATA	.	1	2	2	8	8	3	75	75
LYCOPODIUM ANNOTINUM	5	4	1	.	38	38	3	75	75
HYLOCOMIUM SPLENDENS	.	2	2	1	8	8	3	75	75
EQUISETUM SYLVATICUM	1	1	2	.	5	5	3	75	75
CORNUS CANADENSIS	.	4	3	3	34	34	3	75	75
CALAMAGROSTIS CANADENSIS	.	1	1	1	1	1	3	75	75
ASTER CILIOLATUS	.	1	1	1	1	1	3	75	75
MNIUM SPP.	.	1	1	.	1	1	2	50	50
MAIANTHEMUM CANADENSIS	.	1	1	.	1	1	2	50	50
LYCOPODIUM OBSCURUM	1	1	.	.	1	1	2	50	50
LYCOPODIUM COMPLANATUM	1	2	.	.	4	4	2	50	50
LATHYRUS OCHROLEUCUS	.	1	.	1	1	1	2	50	50
GALIUM TRIFLORUM	.	.	1	1	1	1	2	50	50
EQUISETUM PRATENSE	.	.	4	1	16	16	2	50	50
EPILOBIUM ANGUSTIFOLIUM	.	1	1	.	1	1	2	50	50
BRACHYTHECIUM SPP.	.	1	1	.	1	1	2	50	50
ARALIA NUDICAULIS	.	.	2	5	25	25	2	50	50
ACTAEA RUBRA	.	1	.	1	1	1	2	50	50
VICIA AMERICANA	.	.	.	1	0	0	1	25	25
PYROLA SECUNDA	.	1	.	.	0	0	1	25	25
GYMNOCARPIUM DRYOPTERIS	.	.	.	2	3	3	1	25	25
GALIUM BOREALE	.	.	.	1	0	0	1	25	25
EQUISETUM SCIRPOIDES	.	.	+	.	0	0	1	25	25
ELYMUS INNOVATUS	.	.	.	1	0	0	1	25	25

TABLE A-5. ALDER-WILLOW CLASS VEGETATION DATA

PLOT 87

SPECIES	SYNUSIAE A	B1	B2	C
ALNUS TENUIFOLIA	0	3	0	0
ANEMONE CANADENSIS	0	0	0	2
CALAMAGROSTIS CANADENSIS	0	0	0	4
CORNUS STOLONIFERA	0	1	0	0
EQUISETUM ARVENSE	0	0	0	2
GALIUM BOREALE	0	0	0	1
ROSA ACICULARIS	0	0	3	0
SALIX INTERIOR	0	5	0	0
SALIX LASIANDRA	0	2	0	0
THALICTRUM VENULOSUM	0	0	0	2
VICIA AMERICANA	0	0	0	1

PLOT 94

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
ALNUS CRISPA	0	0	3	0
ALNUS TENUIFOLIA	0	5	0	0
ASTER CILIOLATUS	0	0	0	1
ASTER LAEVIS	0	0	0	1
BRACHYTHECIUM SPP.	0	0	0	3
BROMUS CILIATUS	0	0	0	1
CALAMAGROSTIS CANADENSIS	0	0	0	1
CALTHA PALUSTRIS	0	0	0	1
CAREX DISPERMA	0	0	0	3
CAREX PAUPERCULA	0	0	0	5
CICUTA BULBIFERA	0	0	0	+
CIRCAEA ALPINA	0	0	0	2
CORNUS CANADENSIS	0	0	0	3
EQUISETUM ARVENSE	0	0	0	2
EQUISETUM SYLVATICUM	0	0	0	1
GALIUM TRIFLORUM	0	0	0	1
MNIUM SPP.	0	0	0	2
PETASITES SAGITTATUS	0	0	0	1
PICEA GLAUCA	0	0	1	0
RIBES AMERICANUM	0	0	1	0
RIBES HIRTELLUM	0	0	1	0
RUBUS PUBESCENS	0	0	0	3
RUBUS STRIGOSUS	0	0	1	0
SALIX SPP.	0	2	0	0
SMILACINA TRIFOLIA	0	0	0	1
VIOLA RENIFOLIA	0	0	0	1

PLOT 130

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
ACTAEA RUBRA	0	0	0	1
ALNUS CRISPA	0	5	0	0
ASTER CILIOLATUS	0	0	0	3
BETULA PAPYRIFERA	0	1	0	0
CALAMAGROSTIS CANADENSIS	0	0	0	2
CORNUS CANADENSIS	0	0	0	2
EQUISETUM SYLVATICUM	0	0	0	1
LINNAEA BOREALIS	0	0	0	1
MERTENSIA PANICULATA	0	0	0	2
MNIUM SPP.	0	0	0	2
PETASITES PALMATUS	0	0	0	1
PICEA GLAUCA	0	0	+	0
POPULUS BALSAMIFERA	0	1	0	0
ROSA ACICULARIS	0	0	1	0
RUBUS PUBESCENS	0	0	0	3
RUBUS STRIGOSUS	0	0	1	0
SALIX SPP.	0	3	0	0
THALICTRUM SPARSIFLORUM	0	0	0	1

TABLE A-5. ALDER-WILLOW CLASS VEGETATION DATA

PLOT 30

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA SIBIRICA	0	0	0	1
AGROSTIS SCABRA	0	0	0	1
ALNUS TENUIFOLIA	1	0	0	0
ASTER EATONII	0	0	0	1
BECKMANNIA SPP.	0	0	0	1
CALAMAGROSTIS CANADENSIS	0	0	0	1
CORNUS STOLONIFERA	0	4	0	0
EPILOBIUM GLANDULOSUM	0	0	0	1
EQUISETUM ARVENSE	0	0	0	5
EQUISETUM FLUVIATILE	0	0	0	2
LYCOPUS ASPER	0	0	0	1
MELILOTUS ALBA	0	0	0	1
MENTHA ARVENSIS	0	0	0	1
PLANTAGO MAJOR	0	0	0	1
POTENTILLA NORVEGICA	0	0	0	1
SALIX INTERIOR	0	5	0	0
SALIX LASIANDRA	0	3	0	0
SONCHUS ASPER	0	0	0	1
STACHYS PALUSTRIS	0	0	0	1

PLOT 31

SPECIES	SYNUSIAE A	B1	B2	C
ALNUS TENUIFOLIA	5	0	0	0
CALAMAGROSTIS CANADENSIS	0	0	0	2
CORNUS STOLONIFERA	0	4	0	0
EQUISETUM ARVENSE	0	0	0	4
RUBUS STRIGOSUS	0	0	5	0
SALIX INTERIOR	3	0	0	0

PLOT 72

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
ALNUS CRISPA	0	3	0	0
AMELANCHIER ALNIFOLIA	0	0	1	0
ASTER CILIOLATUS	0	0	0	1
BETULA PAPYRIFERA	1	0	0	0
CALAMAGROSTIS CANADENSIS	0	0	0	2
CORNUS CANADENSIS	0	0	0	5
ELYMUS INNOVATUS	0	0	0	4
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
EQUISETUM SYLVATICUM	0	0	0	1
FRAGARIA VIRGINIANA	0	0	0	2
GALIUM BOREALE	0	0	0	1
LATHYRUS OCHROLEUCUS	0	0	0	1
LEDUM GROENLANDICUM	0	0	1	0
LINNAEA BOREALIS	0	0	0	3
LYCOPODIUM OBSCURUM	0	0	0	1
MAIANTHEMUM CANADENSIS	0	0	0	2
PETASITES PALMATUS	0	0	0	3
PICEA GLAUCA	0	0	3	0
POPULUS BALSAMIFERA	0	0	1	0
POPULUS TREMULOIDES	0	0	3	0
PYROLA SECUNDA	0	0	0	1
ROSA ACICULARIS	0	0	2	0
SALIX SPP.	0	2	1	0
SHEPHERDIA CANADENSIS	0	0	2	0
VIBURNUM EDULE	0	0	2	0

PLOT 76

SPECIES	SYNUSIAE A	B1	B2	C
ALNUS TENUIFOLIA	0	4	0	0
BRACHYTHECIUM SPP.	0	0	0	2
CALAMAGROSTIS CANADENSIS	0	0	0	2
CALTHA PALUSTRIS	0	0	0	2
CAREX TENUIFLORA	0	0	0	2
CICUTA BULBIFERA	0	0	0	1
CIRCAEA ALPINA	0	0	0	1
CORNUS STOLONIFERA	0	0	5	0
EPILOBIUM GLANDULOSUM	0	0	0	1
EQUISETUM PRATENSE	0	0	0	3
MNIUM SPP.	0	0	0	4
RIBES AMERICANUM	0	0	1	0
RIBES TRISTE	0	0	2	0
RUBUS PUBESCENS	0	0	0	2
SALIX SPP.	0	1	0	0
SALIX LASIANDPA	0	0	2	0
SCUTELLARIA GALERICULATA	0	0	0	1
THALICTRUM SPARSIFLORUM	0	0	0	1
THALICTRUM VENULOSUM	0	0	0	2
VIOLA RUGULOSA	0	0	0	1

TABLE A-6. SANDBAR-WILLOW COMMUNITY CONSTANCY TABLE

(no character plot was selected)

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 8	28	62	88	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
SALIX INTERIOR	0	5	5	5	65	87	3	75	100
SALIX LASIANDRA	0	4	.	2	19	41	2	50	75
SALIX SPP.	0	.	3	2	13	13	2	50	75

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 8	28	62	88	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
SALIX SPP.	1	.	3	0	10	13	2	50	75
SALIX LASIANDRA	5	0	.	0	21	41	1	25	75
SALIX INTERIOR	5	0	0	0	21	87	1	25	100
ROSA ACICULARIS	.	1	.	.	0	0	1	25	25
LONICERA DIOICA	1	.	.	.	0	0	1	25	25

TABLE A-6. SANDBAR-WILLOW COMMUNITY CONSTANCY TABLE

(no character plot was selected)

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 8	28	62	88	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
VICIA AMERICANA	1	1	.	.	1	1	2	50	50
POTENTILLA ANSERINA	1	2	.	.	4	4	2	50	50
EQUISETUM FLUVIATILE	.	5	.	5	43	43	2	50	50
CALAMAGROSTIS CANADENSIS	.	.	4	5	37	37	2	50	50
STACHYS PALUSTRIS	.	1	.	.	0	0	1	25	25
SOLIDAGO NEMORALIS	.	1	.	.	0	0	1	25	25
SMILACINA STELLATA	.	1	.	.	0	0	1	25	25
SCIRPUS MICROCARPUS	.	.	.	3	9	9	1	25	25
MENTHA ARVENSIS	.	1	.	.	0	0	1	25	25
GLYCYRRHIZA LEPIDOTA	.	1	.	.	0	0	1	25	25
EQUISETUM ARVENSE	3	.	.	.	9	9	1	25	25
CICUTA DOUGLASII	.	.	.	1	0	0	1	25	25
CAREX DIANDRA	.	.	.	2	3	3	1	25	25
BRACHYTHECIUM SPP.	.	.	3	.	9	9	1	25	25
ASTER EATONII	.	.	.	1	0	0	1	25	25

TABLE A-7. JACKPINE-ALDER COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER 112	43	1	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PINUS BANKSIANA	5	4	4	70	70	3	100	100
POPULUS TREMULOIDES	1	+	0	0	2	2	66	100

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 112	43	1	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
ALNUS CRISPA	2	3	3	30	30	3	100	100
POPULUS TREMULOIDES	1	1	0	1	2	2	66	100

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 112	43	1	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
VACCINIUM VITIS-IDAEA	5	4	1	50	50	3	100	100
VACCINIUM MYRTILLOIDES	4	3	4	54	54	3	100	100
PRUNUS PENSYLVANICA	1	2	1	6	6	3	100	100
POPULUS TREMULOIDES	1	1	1	2	2	3	100	100
PINUS BANKSIANA	1	1	0	1	70	2	66	100
LEDUM GROENLANDICUM	1	1	.	1	1	2	66	66
ARCTOSTAPHYLOS UVA-URSI	.	5	4	50	50	2	66	66
AMELANCHIER ALNIFOLIA	1	.	1	1	1	2	66	66
SALIX SPP.	1	.	.	0	0	1	33	33

TABLE A-7. JACKPINE-ALDER COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 112	43	1	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PLEUROZIUM SCHREBERI	1	2	3	18	18	3	100	100
MAIANTHEMUM CANADENSIS	2	3	1	18	18	3	100	100
LYCOPODIUM COMPLANATUM	3	3	1	25	25	3	100	100
DICRANUM SPP.	1	1	1	2	2	3	100	100
ORYZOPSIS SPP.	2	1	.	5	5	2	66	66
GEOCAULON LIVIDUM	2	1	.	5	5	2	66	66
CORNUS CANADENSIS	5	3	.	41	41	2	66	66
COMANDRA PALLIDA	.	2	1	5	5	2	66	66
CLADINA SPP.	.	5	4	50	50	2	66	66
PYROLA VIRENS	.	.	1	0	0	1	33	33
PYROLA SECUNDA	1	.	.	0	0	1	33	33
POLYTRICHUM SPP.	.	.	1	0	0	1	33	33
PELTIGERA SPP.	1	.	.	0	0	1	33	33
MELAMPYRUM LINEARE	.	1	.	0	0	1	33	33
LINNAEA BOREALIS	.	1	.	0	0	1	33	33
HYLOCOMIUM SPLENDENS	1	.	.	0	0	1	33	33
GOODYERA REPENS	.	1	.	0	0	1	33	33
ELYMUS INNOVATUS	1	.	.	0	0	1	33	33
CAREX TENUIFLORA	.	.	1	0	0	1	33	33
CAMPANULA ROTUNDIFOLIA	.	.	1	0	0	1	33	33
ARALIA NUDICAULIS	.	2	.	5	5	1	33	33
APOCYNUM ANDROSAEMIFOLIUM	.	.	1	0	0	1	33	33

TABLE A-8. JACKPINE-CLADINA SPP. COMMUNITY CONSTANCY TABLE

(no character plot was selected)

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER 68	111	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PINUS BANKSIANA	4	4	62	62	2	100	100

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 68	111	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO

(no species recorded)

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 68	111	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
VACCINIUM VITIS-IDAEA	2	2	15	15	2	100	100
VACCINIUM MYRTILLOIDES	3	2	26	26	2	100	100
PRUNUS PENSYLVANICA	1	1	2	2	2	100	100
PINUS BANKSIANA	1	1	2	62	2	100	100
ARCTOSTAPHYLOS UVA-URSI	4	3	50	50	2	100	100
SALIX SPP.	+	.	0	0	1	50	50
ROSA ACICULARIS	.	2	7	7	1	50	50
AMELANCHIER ALNIFOLIA	1	.	1	1	1	50	50

TABLE A-8. JACKPINE-CLADINA SPP. COMMUNITY CONSTANCY TABLE

(no character plot was selected)

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 68	111	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
ORYZOPSIS SPP.	1	1	2	2	2	100	100
MAIANTHEMUM CANADENSIS	3	1	20	20	2	100	100
CLADINA SPP.	5	5	87	87	2	100	100
CAMPANULA ROTUNDIFOLIA	1	1	2	2	2	100	100
APOCYNUM ANDROSAEMIFOLIUM	1	1	2	2	2	100	100
PYROLA VIRENS	1	.	1	1	1	50	50
PELTIGERA SPP.	2	.	7	7	1	50	50
MELAMPYRUM LINEARE	1	.	1	1	1	50	50
LYCOPODIUM COMPLANATUM	.	1	1	1	1	50	50
LINNAEA BOREALIS	1	.	1	1	1	50	50
GALIUM BOREALE	1	.	1	1	1	50	50
COMANDRA PALLIDA	2	.	7	7	1	50	50
ASTER CILIOLATUS	.	1	1	1	1	50	50
ANEMONE MULTIFIDA	1	.	1	1	1	50	50

TABLE A-9. WHITE SPRUCE COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER								COVER		CONSTANCY		
	53	82	75	77	74	81	57	24	%CV	%CCV	|CO|	%CO	%CCO
PICEA GLAUCA	4	4	5	3	4	5	3	3	59	59	8	100	100
POPULUS BALSAMIFERA	2	2	2	1	1	3	.	1	11	12	7	87	87
PICEA MARIANA	.	+	0	1	.	.	3	.	5	9	3	37	50
POPULUS TREMULOIDES	1	0	0	1	.	.	.	.	0	1	2	25	50
PINUS BANKSIANA	.	.	.	3	.	.	.	.	4	4	1	12	12
LARIX LARICINA	.	.	.	.	.	.	2	.	1	1	1	12	12
ABIES BALSAMEA	.	0	.	.	.	0	.	2	1	4	1	12	37

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER								COVER		CONSTANCY		
	53	82	75	77	74	81	57	24	%CV	%CCV	|CO|	%CO	%CCO
PICEA GLAUCA	1	0	1	2	0	0	2	0	4	59	4	50	100
SALIX SPP.	0	.	.	1	1	.	2	.	2	2	3	37	50
POPULUS BALSAMIFERA	0	1	0	0	2	2	.	0	4	12	3	37	87
BETULA PAPYRIFERA	0	0	1	+	.	0	0	.	0	1	2	25	75
POPULUS TREMULOIDES	0	1	0	0	.	.	.	.	0	1	1	12	50
PICEA MARIANA	.	0	0	1	.	.	0	.	0	9	1	12	50
ALNUS TENUIFOLIA	.	.	.	.	.	2	.	0	1	12	1	12	25

TABLE A-9. WHITE SPRUCE COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER								COVER		CONSTANCY		
	53	82	75	77	74	81	57	24	%CV	%CCV	|CO|	%CO	%CCO
VIBURNUM EDULE	2	3	1	1	3	3	.	1	16	16	7	87	87
ROSA ACICULARIS	3	2	2	3	2	1	.	.	15	15	6	75	75
PICEA GLAUCA	1	1	1	2	1	1	0	0	3	59	6	75	100
VACCINIUM VITIS-IDAEA	1	2	2	3	1	.	.	.	9	9	5	62	62
SHEPHERDIA CANADENSIS	2	3	.	3	2	1	.	.	13	13	5	62	62
POPULUS TREMULOIDES	1	1	1	1	.	.	.	.	1	1	4	50	50
CORNUS STOLONIFERA	.	.	2	.	5	2	.	2	16	16	4	50	50
BETULA PAPYRIFERA	1	1	0	0	.	1	1	.	1	1	4	50	75
AMELANCHIER ALNIFOLIA	2	.	1	1	1	.	.	.	2	2	4	50	50
RUBUS STRIGOSUS	.	+	.	.	1	.	+	.	0	0	3	37	37
RIBES TRISTE	.	+	.	.	1	.	.	2	2	2	3	37	37
RIBES OXYACANTHOIDES	.	1	.	.	.	1	1	.	0	0	3	37	37
LONICERA DIOICA	.	1	.	1	.	.	1	.	0	0	3	37	37
LEDUM GROENLANDICUM	2	4	.	4	.	.	.	.	17	17	3	37	37
ABIES BALSAMEA	.	1	.	.	.	2	.	2	4	4	3	37	37
SALIX SPP.	1	.	.	0	0	.	1	.	0	2	2	25	50
POPULUS BALSAMIFERA	0	1	0	0	0	2	.	0	2	12	2	25	87
PICEA MARIANA	.	0	1	3	.	.	0	.	5	9	2	25	50
VACCINIUM MYRTILLOIDES	.	.	.	2	.	.	.	.	1	1	1	12	12
SYMPHORICARPOS ALBUS	1	.	.	.	.	.	.	.	0	0	1	12	12
RIBES HIRTELLUM	.	.	.	.	1	.	.	.	0	0	1	12	12
BETULA PUMILA	.	.	.	.	.	.	1	.	0	0	1	12	12
ARCTOSTAPHYLOS UVA-URSI	.	.	.	+	.	.	.	.	0	0	1	12	12
ALNUS TENUIFOLIA	.	.	.	.	.	0	.	5	10	12	1	12	25

TABLE A-9. WHITE SPRUCE COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER								COVER		CONSTANCY		
	53	82	75	77	74	81	57	24	%CV	%CCV	|CO|	%CO	%CCO
LINNAEA BOREALIS	3	5	4	3	5	1	2	.	41	41	7	87	87
PTILIUM CRISTA-CASTRENSIS	2	1	3	2	1	.	1	.	9	9	6	75	75
PLEUROZIUM SCHREBERI	3	3	3	4	5	.	1	.	33	33	6	75	75
MITELLA NUDA	1	2	3	.	3	.	2	3	18	18	6	75	75
HYLOCOMIUM SPLENDENS	2	3	3	2	2	.	3	.	19	19	6	75	75
EPILOBIUM ANGUSTIFOLIUM	1	1	1	1	1	.	1	.	1	1	6	75	75
CORNUS CANADENSIS	4	3	3	3	5	.	1	.	33	33	6	75	75
RUBUS PUBESCENS	1	3	.	2	2	.	.	4	16	16	5	62	62
MAIANTHEMUM CANADENSIS	1	1	1	1	2	.	.	.	3	3	5	62	62
LATHYRUS OCHROLEUCUS	1	1	1	1	1	.	.	.	1	1	5	62	62
GALIUM BOREALE	1	1	1	1	1	.	.	.	1	1	5	62	62
EQUISETUM ARVENSE	.	2	3	.	1	5	2	.	19	19	5	62	62
ELYMUS INNOVATUS	2	2	2	2	3	.	.	.	12	12	5	62	62
PELTIGERA SPP.	1	1	1	1	.	.	.	.	1	1	4	50	50
MERTENSIA PANICULATA	1	1	1	.	2	.	.	.	2	2	4	50	50
VIOLA RENIFOLIA	.	1	.	.	.	.	1	2	2	2	3	37	37
TRIENTALIS BOREALIS	.	1	1	1	.	.	.	.	0	0	3	37	37
THALICTRUM VENULOSUM	+	.	.	.	1	.	.	1	0	0	3	37	37
PYROLA SECUNDA	1	.	.	.	1	2	.	.	2	2	3	37	37
PYROLA ASARIFOLIA	1	1	.	.	2	.	.	.	2	2	3	37	37
PETASITES PALMATUS	4	2	.	.	.	.	.	1	10	10	3	37	37
FRAGARIA VIRGINIANA	2	1	.	.	1	.	.	.	2	2	3	37	37
EQUISETUM PRATENSE	.	3	.	.	2	.	.	2	8	8	3	37	37
CALAMAGROSTIS CANADENSIS	1	2	.	.	.	.	5	.	13	13	3	37	37
ASTER CILIOLATUS	1	1	.	.	1	.	.	.	0	0	3	37	37
ARALIA NUDICAULIS	.	2	1	.	4	.	.	.	10	10	3	37	37
VIOLA RUGULOSA	1	.	.	.	2	.	.	.	2	2	2	25	25
VICIA AMERICANA	.	1	.	.	1	.	.	.	0	0	2	25	25
MNIUM SPP.	.	.	.	.	.	.	2	2	3	3	2	25	25
LYCOPODIUM COMPLANATUM	1	.	.	1	.	.	.	.	0	0	2	25	25
LYCOPODIUM ANNOTINUM	2	.	.	1	.	.	.	.	2	2	2	25	25
GEOCAULON LIVIDUM	1	.	.	1	.	.	.	.	0	0	2	25	25
GALIUM TRIFLORUM	.	.	.	.	.	.	1	1	0	0	2	25	25
FRAGARIA VESCA	.	.	.	.	2	1	.	.	2	2	2	25	25
EQUISETUM SCIRPOIDES	.	.	.	.	2	.	.	2	3	3	2	25	25
DICRANUM SPP.	.	.	.	1	1	.	.	.	0	0	2	25	25
ACTAEA RUBRA	.	+	.	.	.	1	.	.	0	0	2	25	25
ACHILLEA MILLEFOLIUM	.	1	.	.	1	.	.	.	0	0	2	25	25
SPHAGNUM SPP.	.	.	.	.	.	.	1	.	0	0	1	12	12
SMILACINA TRIFOLIA	.	.	.	.	.	.	1	.	0	0	1	12	12
RUBUS CHAMAEMORUS	.	.	.	.	.	.	1	.	0	0	1	12	12
RUBUS ACAULIS	.	.	.	.	.	.	1	.	0	0	1	12	12
POLYTRICHUM SPP.	.	.	.	.	.	.	1	.	0	0	1	12	12
PETASITES SAGITTATUS	.	.	.	.	.	.	2	.	1	1	1	12	12
OXYCOCCUS MICROCARPUS	.	.	.	.	.	.	1	.	0	0	1	12	12
EPILOBIUM GLANDULOSUM	.	.	.	.	.	.	1	.	0	0	1	12	12
CIRCAEA ALPINA	.	.	1	.	.	.	.	.	0	0	1	12	12
CAREX PAUPERCULA	.	.	.	2	.	.	.	.	1	1	1	12	12

TABLE A-9. WHITE SPRUCE COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4 (contd.)

CAREX GYNOCRATES	.	.	.	.	.	.	3	.	4	4	1	12	12
CAREX DISPERMA	.	.	.	.	.	.	2	.	1	1	1	12	12
CAREX DIANDRA	.	.	.	.	.	.	.	4	7	7	1	12	12
CALTHA PALUSTRIS	.	.	.	.	.	.	.	2	1	1	1	12	12
AULACOMNIUM PALUSTRE	.	.	.	.	.	.	2	.	1	1	1	12	12
ASTRAGALUS FRIGIDUS	1	.	.	.	.	.	.	.	0	0	1	12	12
ASTER FOLIACEUS	.	.	.	.	.	.	.	1	0	0	1	12	12
AGROPYRON SPP.	.	.	.	.	.	1	.	.	0	0	1	12	12

TABLE A-10. BALSAM FIR COMMUNITY CONSTANCY TABLE

(no character plot was selected)

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER 20	25	79	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
ABIES BALSAMEA	4	3	5	62	62	3	100	100
POPULUS BALSAMIFERA	1	.	4	21	21	2	66	66
POPULUS TREMULOIDES	.	1	.	0	0	1	33	33
BETULA PAPYRIFERA	1	.	.	0	0	1	33	33

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 20	25	79	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
ABIES BALSAMEA	3	3	0	25	62	2	66	100

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 20	25	79	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
ABIES BALSAMEA	3	3	2	30	62	3	100	100
VIBURNUM EDULE	3	.	1	13	13	2	66	66
RUBUS STRIGOSUS	1	2	.	5	5	2	66	66
ROSA ACICULARIS	1	.	.	0	0	1	33	33
RIBES TRISTE	1	.	.	0	0	1	33	33
RIBES OXYACANTHOIDES	1	.	.	0	0	1	33	33
POPULUS TREMULOIDES	.	1	.	0	0	1	33	33
CORNUS STOLONIFERA	1	.	.	0	0	1	33	33
ALNUS CRISPA	4	.	.	20	20	1	33	33

TABLE A-10. BALSAM FIR COMMUNITY CONSTANCY TABLE

(no character plot was selected)

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER			COVER		CONSTANCY		
	20	25	79	%CV	%CCV	|CO|	%CO	%CCO
MITELLA NUDA	2	3	2	22	22	3	100	100
TRIENTALIS BOREALIS	1	3	.	13	13	2	66	66
RUBUS PUBESCENS	3	3	.	25	25	2	66	66
PLEUROZIUM SCHREBERI	3	3	.	25	25	2	66	66
MNIUM SPP.	1	.	1	1	1	2	66	66
LINNAEA BOREALIS	3	.	2	17	17	2	66	66
HYLOCOMIUM SPLENDENS	4	4	.	41	41	2	66	66
FRAGARIA VESCA	1	1	.	1	1	2	66	66
CORNUS CANADENSIS	3	3	.	25	25	2	66	66
VIOLA RENIFOLIA	1	.	.	0	0	1	33	33
PYROLA SECUNDA	1	.	.	0	0	1	33	33
PTILIUM CRISTA-CASTRENSIS	3	.	.	12	12	1	33	33
PELTIGERA SPP.	1	.	.	0	0	1	33	33
MERTENSIA PANICULATA	2	.	.	5	5	1	33	33
LYCOPODIUM ANNOTINUM	2	.	.	5	5	1	33	33
HYPNUM SPP.	.	.	1	0	0	1	33	33
GYMNOCARPIUM DRYOPTERIS	1	.	.	0	0	1	33	33
GALIUM BOREALE	1	.	.	0	0	1	33	33
EQUISETUM PRATENSE	1	.	.	0	0	1	33	33
CIRCAEA ALPINA	1	.	.	0	0	1	33	33
ARALIA NUDICAULIS	3	.	.	12	12	1	33	33

TABLE A-11. MUSKEG COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER											COVER		CONSTANCY		
	105	103	119	104	133	100	65	33	55	46	44	%CV	%CCV	|CO|	%CO	%CCO
PICEA MARIANA	2	0	1	1	1	0	1	3	5	5	4	27	67	9	81	100
LARIX LARICINA	0	.	0	0	.	1	.	0	2	+	0	1	3	3	27	72

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER											COVER		CONSTANCY		
	105	103	119	104	133	100	65	33	55	46	44	%CV	%CCV	|CO|	%CO	%CCO
PICEA MARIANA	4	4	3	3	2	5	5	2	2	2	0	39	67	10	90	100
LARIX LARICINA	0	.	0	0	.	0	.	+	1	+	0	0	3	3	27	72
SALIX SPP.	.	.	0	0	0	0	0	0	2	0	0	1	8	1	9	81

TABLE A-11. MUSKEG COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER											COVER		CONSTANCY		
	105	103	119	104	133	100	65	33	55	46	44	%CV	%CCV	|CO|	%CO	%CCO
VACCINIUM VITIS-IDAEA	4	4	5	5	4	4	4	2	4	2	2	54	54	11	100	100
PICEA MARIANA	3	3	3	4	4	3	5	2	1	1	2	36	67	11	100	100
LEDUM GROENLANDICUM	5	5	5	5	5	5	5	5	5	4	4	83	83	11	100	100
SALIX SPP.	.	.	1	1	1	+	3	2	0	1	2	7	8	8	72	81
LARIX LARICINA	1	.	1	1	.	0	.	2	1	0	+	2	3	6	54	72
BETULA PUMILA	.	1	1	1	1	.	.	.	3	.	3	7	7	6	54	54
ARCTOSTAPHYLOS RUBRA	.	.	.	.	.	.	4	3	.	2	2	11	11	4	36	36
VACCINIUM MYRTILLOIDES	.	.	1	.	.	4	.	.	.	.	2	7	7	3	27	27
VACCINIUM CAESPITOSUM	.	.	1	.	2	.	.	.	.	.	2	3	3	3	27	27
CHAMAEDAPHNE CALYCULATA	4	.	2	.	.	.	.	2	.	.	.	8	8	3	27	27
LONICERA VILLOSA	.	.	.	.	.	1	1	.	.	.	.	0	0	2	18	18
BETULA OCCIDENTALIS	.	1	.	1	.	.	.	.	.	.	.	0	0	2	18	18
ROSA ACICULARIS	.	.	.	.	.	.	.	.	.	1	.	0	0	1	9	9
RIBES TRISTE	.	.	.	.	.	.	.	.	.	1	.	0	0	1	9	9
POPULUS TREMULOIDES	.	.	+	.	.	.	.	.	.	.	.	0	0	1	9	9
LEDUM PALUSTRE	.	.	.	.	.	.	.	1	.	.	.	0	0	1	9	9
BETULA PAPYRIFERA	.	.	1	.	.	.	.	.	.	.	.	0	0	1	9	9
BETULA GLANDULOSA	.	.	.	.	.	.	.	2	.	.	.	1	1	1	9	9
ANDROMEDA POLIFOLIA	.	.	.	.	.	.	.	1	.	.	.	0	0	1	9	9
ALNUS CRISPA	.	.	+	.	.	.	.	.	.	.	.	0	0	1	9	9

TABLE A-11. MUSKEG COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER											COVER		CONSTANCY		
	105	103	119	104	133	100	65	33	55	46	44	%CV	%CCV	ICOI	%CO	%CCO
SPHAGNUM SPP.	5	3	5	2	3	1	2	3	1	4	2	36	36	11	100	100
CLADINA SPP.	2	3	2	3	3	3	3	4	1	2	2	28	28	11	100	100
PLEUROZIUM SCHREBERI	1	1	1	3	2	1	3	.	2	2	1	12	12	10	90	90
OXYCOCCUS MICROCARPUS	2	2	.	.	2	1	1	1	1	1	1	5	5	9	81	81
DICRANUM SPP.	1	1	1	1	1	2	.	1	.	1	.	3	3	8	72	72
AULACOMNIUM PALUSTRE	.	.	1	1	1	1	2	3	2	.	1	7	7	8	72	72
RUBUS CHAMAEMORUS	3	3	2	3	1	.	1	.	.	1	.	12	12	7	63	63
HYLOCOMIUM SPLENDENS	.	.	.	2	2	3	1	.	2	3	1	11	11	7	63	63
SMILACINA TRIFOLIA	.	.	1	.	1	.	.	1	2	3	2	6	6	6	54	54
TOMENTHYPNUM NITENS	.	.	1	.	.	2	3	3	.	.	4	14	14	5	45	45
POLYTRICHUM SPP.	.	.	1	.	1	1	.	.	2	.	1	2	2	5	45	45
EQUISETUM SYLVATICUM	.	2	1	1	2	3	.	.	.	.	.	6	6	5	45	45
EQUISETUM SCIRPOIDES	.	.	.	.	1	.	1	1	.	1	1	1	1	5	45	45
CAREX PAUPERCULA	.	1	.	.	1	2	4	.	.	.	1	7	7	5	45	45
EQUISETUM ARVENSE	.	.	.	.	1	3	.	.	.	2	2	6	6	4	36	36
CAREX GYNOCRATES	.	.	.	.	1	2	.	1	.	.	1	2	2	4	36	36
CAREX AQUATILIS	.	.	2	.	.	.	.	2	.	3	2	7	7	4	36	36
SPIRANTHES ROMANZOFFIANA	.	.	.	.	.	.	.	1	.	.	1	0	0	2	18	18
RUBUS ACAULIS	.	.	.	.	.	.	.	1	.	.	1	0	0	2	18	18
PETASITES VITIFOLIUS	.	.	.	.	1	.	.	.	.	1	.	0	0	2	18	18
GEOCAULON LIVIDUM	.	.	.	.	.	.	1	1	.	.	.	0	0	2	18	18
ERIOPHORUM VAGINATUM	1	1	.	.	.	.	.	.	.	.	.	0	0	2	18	18
RANUNCULUS LAPPONICUS	.	.	.	.	.	.	.	+	.	.	.	0	0	1	9	9
PYROLA SECUNDA	.	.	.	.	.	.	.	.	.	.	1	0	0	1	9	9
PETASITES SAGITTATUS	.	.	.	.	.	.	.	.	.	.	1	0	0	1	9	9
PELTIGERA SPP.	.	.	.	.	.	1	.	.	.	.	.	0	0	1	9	9
PARNASSIA PALUSTRIS	.	.	.	.	.	.	1	.	.	.	.	0	0	1	9	9
MYRICA GALE	.	.	.	.	.	.	.	2	.	.	.	1	1	1	9	9
MONESES UNIFLORA	.	.	1	.	.	.	.	.	.	.	.	0	0	1	9	9
MELAMPYRUM LINEARE	.	.	.	.	.	.	.	1	.	.	.	0	0	1	9	9
GALIUM BOREALE	.	.	.	.	.	.	+	.	.	.	.	0	0	1	9	9
EPILOBIUM GLANDULOSUM	.	.	.	.	.	.	.	.	1	.	.	0	0	1	9	9
DROSERA ROTUNDIFOLIA	.	.	.	.	.	.	.	1	.	.	.	0	0	1	9	9
CAREX DISPERMA	.	.	.	.	.	.	.	.	1	.	.	0	0	1	9	9
CALAMAGROSTIS CANADENSIS	.	.	1	.	.	.	.	.	.	.	.	0	0	1	9	9

TABLE A-12. UPLAND BLACK SPRUCE COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER												COVER		CONSTANCY		
	47	51	115	91	95	2	113	97	71	38	52	117	%CV	%CCV	|CO|	%CO	%CCO
PICEA MARIANA	4	4	4	4	5	5	5	4	5	3	4	5	70	70	12	100	100
POPULUS TREMULOIDES	.	.	.	.	.	.	.	.	.	2	.	.	1	1	1	8	8
PINUS BANKSIANA	.	1	.	.	.	.	.	.	.	.	.	.	0	0	1	8	8
PICEA GLAUCA	.	.	.	.	.	.	.	.	1	.	.	.	0	0	1	8	8
LARIX LARICINA	.	.	.	0	.	.	.	.	.	1	0	.	0	0	1	8	25

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER												COVER		CONSTANCY		
	47	51	115	91	95	2	113	97	71	38	52	117	%CV	%CCV	|CO|	%CO	%CCO
PICEA MARIANA	2	1	2	4	2	1	3	2	2	2	3	1	19	70	12	100	100
SALIX SPP.	.	0	0	0	0	0	1	0	.	0	.	.	0	6	1	8	66
PICEA GLAUCA	.	.	.	.	.	.	.	.	1	.	.	.	0	0	1	8	8
LARIX LARICINA	.	.	.	0	.	.	.	.	.	1	0	.	0	0	1	8	25

TABLE A-12. UPLAND BLACK SPRUCE COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER												COVER		CONSTANCY		
	47	51	115	91	95	2	113	97	71	38	52	117	%CV	%CCV	|CO|	%CO	%CCO
PICEA MARIANA	1	2	2	2	2	0	2	2	0	2	3	2	13	70	10	83	100
LEDUM GROENLANDICUM	3	3	5	5	.	.	5	3	1	5	5	5	53	53	10	83	83
VACCINIUM VITIS-IDAEA	1	2	5	.	1	.	4	4	.	3	3	4	30	30	9	75	75
SALIX SPP.	.	+	2	1	2	1	0	3	.	1	.	.	6	6	7	58	66
VACCINIUM MYRTILLOIDES	1	3	.	.	.	.	.	.	.	4	.	.	8	8	3	25	25
BETULA PUMILA	.	.	.	1	.	.	.	1	.	1	.	.	0	0	3	25	25
LARIX LARICINA	.	.	.	1	.	.	.	.	.	0	1	.	0	0	2	16	25
CHAMAEDAPHNE CALYCULATA	.	.	.	.	.	.	.	.	.	.	1	2	1	1	2	16	16
ARCTOSTAPHYLOS RUBRA	.	.	2	.	.	2	.	.	.	.	.	.	2	2	2	16	16
VIBURNUM EDULE	.	.	.	.	.	.	.	.	1	.	.	.	0	0	1	8	8
POPULUS TREMULOIDES	.	.	.	.	.	.	.	.	.	1	.	.	0	1	1	8	8
EMPETRUM NIGRUM	.	.	.	.	.	.	.	1	.	.	.	.	0	0	1	8	8
ALNUS CRISPA	.	.	.	.	.	.	.	.	.	1	.	.	0	0	1	8	8

TABLE A-12. UPLAND BLACK SPRUCE COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER												COVER		CONSTANCY		
	47	51	115	91	95	2	113	97	71	38	52	117	%CV	%CCV	|CO|	%CO	%CCO
PLEUROZIUM SCHREBERI	4	5	4	5	4	5	5	3	.	3	3	4	59	59	11	91	91
HYLOCOMIUM SPLENDENS	3	.	3	1	3	1	2	3	5	3	1	1	25	25	11	91	91
DICRANUM SPP.	1	.	1	1	1	1	.	.	.	1	1	.	1	1	7	58	58
SPHAGNUM SPP.	.	.	1	1	.	.	1	3	.	.	2	2	6	6	6	50	50
SMILACINA TRIFOLIA	.	.	2	+	1	.	.	1	1	.	.	3	5	5	6	50	50
CLADINA SPP.	.	2	2	2	.	2	.	.	.	4	3	.	13	13	6	50	50
RUBUS CHAMAEMORUS	.	.	.	1	.	.	2	1	.	.	3	4	10	10	5	41	41
OXYCOCCUS MICROCARPUS	.	.	1	1	.	.	1	.	.	.	1	1	1	1	5	41	41
PELTIGERA SPP.	2	.	1	1	.	1	.	.	.	.	.	.	1	1	4	33	33
EQUISETUM SCIRPOIDES	.	.	1	.	1	1	.	.	1	.	.	.	0	0	4	33	33
CORNUS CANADENSIS	1	.	.	.	2	.	.	.	1	1	.	.	1	1	4	33	33
POLYTRICHUM SPP.	1	.	1	.	.	.	.	.	.	2	.	.	1	1	3	25	25
PETASITES SAGITTATUS	.	.	1	.	1	.	.	1	.	.	.	.	0	0	3	25	25
PETASITES PALMATUS	.	.	.	.	1	.	.	.	1	2	.	.	1	1	3	25	25
EQUISETUM ARVENSE	.	.	2	.	3	.	.	5	.	.	.	.	11	11	3	25	25
CALAMAGROSTIS CANADENSIS	.	.	.	.	2	.	1	.	.	1	.	.	1	1	3	25	25
PETASITES VITIFOLIUS	.	.	.	.	1	.	.	1	.	.	.	.	0	0	2	16	16
MITELLA NUDA	.	.	.	.	.	.	.	1	1	.	.	.	0	0	2	16	16
GEOCAULON LIVIDUM	1	.	1	.	.	.	.	.	.	.	.	.	0	0	2	16	16
EQUISETUM SYLVATICUM	.	.	.	.	.	.	3	.	.	.	1	.	3	3	2	16	16
CAREX PAUPERCULA	.	.	.	.	3	.	.	.	1	.	.	.	3	3	2	16	16
CAREX GYNOCRATES	.	.	.	.	3	.	.	.	1	.	.	.	3	3	2	16	16
AULACOMNIUM PALUSTRE	.	.	2	.	1	.	.	.	.	.	.	.	1	1	2	16	16
TOMENTHYPNUM NITENS	.	.	.	.	1	.	.	.	.	.	.	.	0	0	1	8	8
SCIRPUS CAESPITOSUS	.	.	1	.	.	.	.	.	.	.	.	.	0	0	1	8	8
RUBUS PUBESCENS	.	.	.	.	.	.	.	.	1	.	.	.	0	0	1	8	8
PYROLA VIRENS	.	.	.	.	.	1	.	.	.	.	.	.	0	0	1	8	8
MONESES UNIFLORA	.	.	.	.	1	.	.	.	.	.	.	.	0	0	1	8	8
MELAMPYRUM LINEARE	.	.	.	.	.	.	.	.	.	1	.	.	0	0	1	8	8
MAIANTHEMUM CANADENSIS	.	1	.	.	.	.	.	.	.	.	.	.	0	0	1	8	8
LYCOPODIUM ANNOTINUM	.	.	.	.	.	.	.	.	.	1	.	.	0	0	1	8	8
DROSERA ROTUNDIFOLIA	.	.	1	.	.	.	.	.	.	.	.	.	0	0	1	8	8
CAREX SPP.	.	.	.	.	.	.	.	3	.	.	.	.	3	3	1	8	8
CALTHA PALUSTRIS	.	.	.	.	.	.	.	1	.	.	.	.	0	0	1	8	8

TABLE A-13. LARCH BOG COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 1

SPECIES	PLOT NUMBER 114	110	90	98	54	109	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
LARIX LARICINA	1	0	0	0	0	0	0	14	1	16	100

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 114	110	90	98	54	109	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
LARIX LARICINA	2	1	1	1	0	0	3	14	4	66	100
PICEA MARIANA	1	1	0	1	0	0	1	6	3	50	100
SALIX SPP.	.	0	0	0	1	3	6	34	2	33	83

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 114	110	90	98	54	109	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PICEA MARIANA	1	1	2	2	1	1	6	6	6	100	100
LARIX LARICINA	3	2	2	2	1	1	14	14	6	100	100
BETULA PUMILA	4	5	1	5	2	2	45	45	6	100	100
SALIX SPP.	.	5	1	3	2	4	34	34	5	83	83
VACCINIUM VITIS-IDAEA	.	.	.	2	1	3	9	9	3	50	50
LEDUM GROENLANDICUM	2	.	.	.	1	3	9	9	3	50	50
ANDROMEDA POLIFOLIA	5	5	.	.	1	.	29	29	3	50	50
CHAMAEDAPHNE CALYCULATA	.	3	1	.	.	.	6	6	2	33	33
ARCTOSTAPHYLOS RUBRA	.	.	.	2	.	1	2	2	2	33	33
POPULUS TREMULOIDES	.	.	.	+	.	.	0	0	1	16	16
POPULUS BALSAMIFERA	.	.	.	+	.	.	0	0	1	16	16
LONICERA VILLOSA	.	.	.	1	.	.	0	0	1	16	16
BETULA OCCIDENTALIS	.	.	.	.	1	.	0	0	1	16	16

TABLE A-13. LARCH BOG COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER						COVER		CONSTANCY		
	114	110	90	98	54	109	%CV	%CCV	|CO|	%CO	%CCO
SPHAGNUM SPP.	4	4	5	1	.	5	50	50	5	83	83
SMILACINA TRIFOLIA	3	1	1	1	2	.	10	10	5	83	83
CAREX AQUATILIS	3	5	5	5	5	.	64	64	5	83	83
POTENTILLA PALUSTRIS	.	2	1	1	3	.	9	9	4	66	66
CAREX PAUPERCULA	3	2	4	.	2	.	21	21	4	66	66
AULACOMNIUM PALUSTRE	2	2	1	3	.	.	11	11	4	66	66
TOMENTHYPNUM NITENS	2	2	.	3	.	.	11	11	3	50	50
OXYCOCCUS MICROCARPUS	2	.	4	2	.	.	15	15	3	50	50
MENYANTHES TRIFOLIATA	1	1	.	.	3	.	7	7	3	50	50
CALTHA PALUSTRIS	1	.	.	1	1	.	1	1	3	50	50
PYROLA VIRENS	1	.	.	2	.	.	2	2	2	33	33
PETASITES SAGITTATUS	.	.	.	2	.	2	5	5	2	33	33
EQUISETUM LAEVIGATUM	.	5	.	.	1	.	15	15	2	33	33
DREPANOCLADUS SPP.	1	.	.	4	.	.	10	10	2	33	33
CAREX GYNOCRATES	.	2	.	.	1	.	2	2	2	33	33
SPIRANTHES ROMANZOFFIANA	.	.	.	.	1	.	0	0	1	16	16
SCIRPUS SPP.	.	.	.	.	2	.	2	2	1	16	16
RUMEX OCCIDENTALIS	.	.	.	.	1	.	0	0	1	16	16
POLYTRICHUM SPP.	.	.	.	.	.	1	0	0	1	16	16
PLEUROZIUM SCHREBERI	.	.	.	2	.	.	2	2	1	16	16
PARNASSIA PALUSTRIS	.	.	.	1	.	.	0	0	1	16	16
MNIUM SPP.	.	.	.	.	1	.	0	0	1	16	16
HABENARIA HYPERBOREA	1	.	.	.	.	.	0	0	1	16	16
GALIUM TRIFIDUM	.	.	.	.	1	.	0	0	1	16	16
EPILOBIUM LEPTOPHYLLUM	.	.	.	.	1	.	0	0	1	16	16
EPILOBIUM GLANDULOSUM	.	.	.	.	1	.	0	0	1	16	16
DROSERA ROTUNDIFOLIA	.	.	.	.	1	.	0	0	1	16	16
CAREX TENUIFLORA	.	.	.	.	2	.	2	2	1	16	16
CAREX DIANDRA	2	.	.	.	.	.	2	2	1	16	16

TABLE A-14. SEDGE-SPHAGNUM COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 2

SPECIES	PLOT NUMBER 116	139	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PICEA MARIANA	2	0	7	20	1	50	100

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 116	139	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
PICEA MARIANA	3	1	20	20	2	100	100
LARIX LARICINA	2	1	8	8	2	100	100
CHAMAEDAPHNE CALYCULATA	1	1	2	2	2	100	100
ANDROMEDA POLIFOLIA	3	5	62	62	2	100	100

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 116	139	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
SPHAGNUM SPP.	5	5	87	87	2	100	100
OXYCOCCUS MICROCARPUS	2	1	8	8	2	100	100
ERIOPHORUM SPP.	2	3	26	26	2	100	100
CAREX SPP.	5	5	87	87	2	100	100
SMILACINA TRIFOLIA	2	.	7	7	1	50	50
RUBUS CHAMAEMORUS	2	.	7	7	1	50	50
CAREX AQUATILIS	4	.	31	31	1	50	50

TABLE A-15. SEDGE FEN COMMUNITY CONSTANCY TABLE

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 37	22	14	23	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
SALIX SPP.	1	.	2	.	4	4	2	50	50
SALIX LASIANDRA	2	.	.	.	3	3	1	25	25
BETULA PUMILA	1	.	.	.	0	0	1	25	25

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 37	22	14	23	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
CAREX AQUATILIS	5	5	5	4	81	81	4	100	100
SCUTELLARIA GALERICULATA	1	1	.	1	1	1	3	75	75
GALIUM TRIFIDUM	2	1	.	1	5	5	3	75	75
CICUTA BULBIFERA	1	1	.	2	5	5	3	75	75
EPILOBIUM LEPTOPHYLLUM	1	1	.	.	1	1	2	50	50
ASTER JUNCIFORMIS	1	.	1	.	1	1	2	50	50
SCIRPUS VALIDUS	.	.	.	4	15	15	1	25	25
RUMEX OCCIDENTALIS	.	1	.	.	0	0	1	25	25
POTENTILLA PALUSTRIS	.	.	2	.	3	3	1	25	25
MYRIOPHYLLUM VERTICELLATUM	.	.	.	3	9	9	1	25	25
MYRIOPHYLLUM SPP.	1	.	.	.	0	0	1	25	25
LYSIMACHIA THYRSIFLORA	.	1	.	.	0	0	1	25	25
LEMNA MINOR	.	.	.	3	9	9	1	25	25
DREPANOCLADUS SPP.	.	.	3	.	9	9	1	25	25
CALTHA PALUSTRIS	2	.	.	.	3	3	1	25	25
CALAMAGROSTIS CANADENSIS	.	3	.	.	9	9	1	25	25
AULACOMNIUM PALUSTRE	2	.	.	.	3	3	1	25	25

TABLE A-16. CATTAIL FEN COMMUNITY CONSTANCY TABLE

(no character plot was selected)

VEGETATION LEVEL 3

SPECIES	PLOT NUMBER 41	59	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
SALIX SPP.	1	.	1	1	1	50	50

VEGETATION LEVEL 4

SPECIES	PLOT NUMBER 41	59	COVER %CV	%CCV	CONSTANCY |CO|	%CO	%CCO
TYPHA LATIFOLIA	5	5	87	87	2	100	100
CALAMAGROSTIS CANADENSIS	3	2	26	26	2	100	100
SCIRPUS SPP.	.	1	1	1	1	50	50
RANUNCULUS LAPPONICUS	.	1	1	1	1	50	50
PETASITES VITIFOLIUS	.	2	7	7	1	50	50
PETASITES SAGITTATUS	.	2	7	7	1	50	50
EQUISETUM ARVENSE	5	.	43	43	1	50	50
EPILOBIUM LEPTOPHYLLUM	.	1	1	1	1	50	50
EPILOBIUM GLANDULOSUM	.	1	1	1	1	50	50
ELEOCHARIS SPP.	.	4	31	31	1	50	50
DREPANOCLADUS SPP.	5	.	43	43	1	50	50
CAREX DIANDRA	5	.	43	43	1	50	50
CAREX AQUATILIS	.	3	18	18	1	50	50
AGROSTIS SCABRA	3	.	18	18	1	50	50

TABLE A-17. FIRE REGENERATION CLASS VEGETATION DATA

PLOT 34

SPECIES	SYNUSIAE A	B1	B2	C
CAREX AQUATILIS	0	0	0	1
EQUISETUM ARVENSE	0	0	0	2
EQUISETUM SCIRPOIDES	0	0	0	1
EQUISETUM SYLVATICUM	0	0	0	2
GEOCAULON LIVIDUM	0	0	0	1
LEDUM GROENLANDICUM	0	0	2	0
RIBES AMERICANUM	0	0	+	0
SALIX SPP.	0	0	2	0
SMILACINA TRIFOLIA	0	0	0	1
VACCINIUM VITIS-IDAEA	0	0	1	0

PLOT 48

SPECIES	SYNUSIAE A	B1	B2	C
AULACOMNIUM PALUSTRE	0	0	0	3
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX BRUNNESCENS	0	0	0	+
EQUISETUM SYLVATICUM	0	0	0	1
LARIX LARICINA	0	0	2	0
LATHYRUS OCHROLEUCUS	0	0	0	1
LEDUM GROENLANDICUM	0	0	3	0
PETASITES PALMATUS	0	0	0	1
PICEA MARIANA	0	0	3	0
PINUS BANKSIANA	+	0	0	0
POLYTRICHUM SPP.	0	0	0	2
POPULUS TREMULOIDES	0	0	1	0
SALIX SPP.	0	0	2	0
SPHAGNUM SPP.	0	0	0	2
VACCINIUM MYRTILLOIDES	0	0	1	0
VACCINIUM VITIS-IDAEA	0	0	2	0

PLOT 49

SPECIES	SYNUSIAE A	B1	B2	C
BETULA PAPYRIFERA	0	1	1	0
CORNUS CANADENSIS	0	0	0	2
LEDUM GROENLANDICUM	0	0	3	0
MAIANTHEMUM CANADENSIS	0	0	0	1
PICEA GLAUCA	0	0	2	0
PICEA MARIANA	0	0	3	0
PINUS BANKSIANA	0	0	1	0
POPULUS TREMULOIDES	1	2	1	0
SALIX SPP.	0	1	1	0
VACCINIUM MYRTILLOIDES	0	0	4	0
VACCINIUM VITIS-IDAEA	0	0	2	0

PLOT 73

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
ALNUS CRISPA	0	0	1	0
BETULA PAPYRIFERA	0	1	1	0
CALAMAGROSTIS CANADENSIS	0	0	0	4
CAREX AQUATILIS	0	0	0	4
CAREX BRUNNESCENS	0	0	0	2
CAREX GYNOCRATES	0	0	0	1
CAREX TENUIFLORA	0	0	0	3
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
EQUISETUM ARVENSE	0	0	0	1
EQUISETUM SCIRPOIDES	0	0	0	1
LARIX LARICINA	0	1	2	0
LATHYRUS OCHROLEUCUS	0	0	0	1
LEDUM GROENLANDICUM	0	0	2	0
OXYCOCCUS MICROCARPUS	0	0	0	1
PARNASSIA PALUSTRIS	0	0	0	1
PETASITES SAGITTATUS	0	0	0	1
PETASITES VITIFOLIUS	0	0	0	1
PICEA MARIANA	0	1	4	0
PINUS BANKSIANA	0	0	1	0
POLYTRICHUM SPP.	0	0	0	1
POPULUS BALSAMIFERA	0	0	1	0
POPULUS TREMULOIDES	0	0	1	0
RIBES TRISTE	0	0	1	0
RUBUS ACAULIS	0	0	0	1
RUBUS CHAMAEMORUS	0	0	0	1
SALIX SPP.	0	1	5	0
SHEPHERDIA CANADENSIS	0	0	2	0
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	2
SPIRANTHES ROMANZOFFIANA	0	0	0	1
TOMENTHYPNUM NITENS	0	0	0	5
VACCINIUM VITIS-IDAEA	0	0	2	0

TABLE A-17. FIRE REGENERATION CLASS VEGETATION DATA

PLOT 92

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
AGROPYRON SPP.	0	0	0	1
ALNUS CRISPA	0	0	1	0
ARCTOSTAPHYLOS RUBRA	0	0	4	0
ASTER CILIOLATUS	0	0	0	1
AULACOMNIUM PALUSTRE	0	0	0	3
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX GYNOCRATES	0	0	0	4
CAREX PAUPERCULA	0	0	0	4
CLADINA SPP.	0	0	0	2
DICRANUM SPP.	0	0	0	1
DREPANOCLADUS SPP.	0	0	0	1
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
EQUISETUM SCIRPOIDES	0	0	0	3
FRAGARIA VIRGINIANA	0	0	0	1
GALIUM BOREALE	0	0	0	1
LEDUM GROENLANDICUM	0	0	2	0
LINNAEA BOREALIS	0	0	0	2
LONICERA VILLOSA	0	0	2	0
MITELLA NUDA	0	0	0	1
PARNASSIA PALUSTRIS	0	0	0	1
PELTIGERA SPP.	0	0	0	1
PETASITES PALMATUS	0	0	0	1
PETASITES VITIFOLIUS	0	0	0	1
PICEA MARIANA	4	3	3	0
PLEUROZIUM SCHREBERI	0	0	0	1
POPULUS TREMULOIDES	+	0	0	0
POTENTILLA FRUTICOSA	0	0	5	0
ROSA ACICULARIS	0	0	2	0
RUBUS ACAULIS	0	0	0	1
RUBUS PUBESCENS	0	0	0	1
SALIX SPP.	0	0	3	0
SMILACINA TRIFOLIA	0	0	0	1
TOMENTHYPNUM NITENS	0	0	0	3
VACCINIUM VITIS-IDAEA	0	0	4	0

PLOT 101

SPECIES	SYNUSIAE A	B1	B2	C
BETULA PUMILA	0	0	4	0
CAREX AQUATILIS	0	0	0	3
CLADINA SPP.	0	0	0	1
ELEOCHARIS SPP.	0	0	0	2
EQUISETUM SYLVATICUM	0	0	0	1
LEDUM GROENLANDICUM	0	0	2	0
PICEA MARIANA	0	0	1	0
POLYTRICHUM SPP.	0	0	0	5
RUBUS CHAMAEMORUS	0	0	0	3
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	2
VACCINIUM VITIS-IDAEA	0	0	5	0

PLOT 106

SPECIES	SYNUSIAE A	B1	B2	C
CHAMAEDAPHNE CALYCULATA	0	0	1	0
CLADINA SPP.	0	0	0	4
DICRANUM SPP.	0	0	0	1
HYLOCOMIUM SPLENDENS	0	0	0	1
LEDUM GROENLANDICUM	0	0	5	0
OXYCOCCUS MICROCARPUS	0	0	0	1
PICEA MARIANA	1	4	4	0
PLEUROZIUM SCHREBERI	0	0	0	1
POLYTRICHUM SPP.	0	0	0	1
RUBUS CHAMAEMORUS	0	0	0	3
SPHAGNUM SPP.	0	0	0	2
VACCINIUM VITIS-IDAEA	0	0	4	0

TABLE A-18. DISTURBANCE CLASS VEGETATION DATA

PLOT 35

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
ACHILLEA SIBIRICA	0	0	0	1
AGROPYRON SPP.	0	0	0	1
AMELANCHIER ALNIFOLIA	0	0	1	0
ASTER CILIOLATUS	0	0	0	1
CALAMAGROSTIS CANADENSIS	0	0	0	2
CORNUS CANADENSIS	0	0	0	2
ELYMUS INNOVATUS	0	0	0	2
EPILOBIUM ANGUSTIFOLIUM	0	0	0	3
EQUISETUM HYEMALE	0	0	0	1
EQUISETUM PRATENSE	0	0	0	3
FRAGARIA VIRGINIANA	0	0	0	1
GALIUM BOREALE	0	0	0	1
LEDUM GROENLANDICUM	0	0	3	0
MERTENSIA PANICULATA	0	0	0	1
MITELLA NUDA	0	0	0	1
ORYZOPSIS SPP.	0	0	0	2
PETASITES PALMATUS	0	0	0	1
POPULUS BALSAMIFERA	0	0	2	0
POPULUS TREMULOIDES	0	0	4	0
RIBES TRISTE	0	0	1	0
ROSA ACICULARIS	0	0	3	0
RUBUS PUBESCENS	0	0	0	3
SALIX SPP.	0	0	2	0
SHEPHERDIA CANADENSIS	0	0	1	0
TRIENTALIS BOREALIS	0	0	0	1
VACCINIUM MYRTILLOIDES	0	0	2	0
VIBURNUM EDULE	0	0	1	0

PLOT 36

SPECIES	SYNUSIAE A	B1	B2	C
ALNUS TENUIFOLIA	0	0	2	0
ARCTOSTAPHYLOS RUBRA	0	0	1	0
BETULA PAPYRIFERA	0	0	1	0
BETULA PUMILA	0	0	1	0
CALAMAGROSTIS CANADENSIS	0	0	0	1
EMPETRUM NIGRUM	0	0	1	0
EQUISETUM ARVENSE	0	0	0	2
EQUISETUM LAEVIGATUM	0	0	0	2
EQUISETUM PRATENSE	0	0	0	+
LEDUM GROENLANDICUM	0	0	2	0
PICEA GLAUCA	0	0	+	0
RIBES TRISTE	0	0	1	0
SALIX SPP.	0	0	1	0
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	1

PLOT 45

SPECIES	SYNUSIAE A	B1	B2	C
ASTER JUNCIFORMIS	0	0	0	1
BETULA PUMILA	0	0	2	0
CAREX GYNOCRATES	0	0	0	1
CLADINA SPP.	0	0	0	2
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
EPILOBIUM GLANDULOSUM	0	0	0	2
EQUISETUM SCIRPOIDES	0	0	0	1
EQUISETUM SYLVATICUM	0	0	0	1
GALIUM TRIFLORUM	0	0	0	1
LEDUM GROENLANDICUM	0	0	2	0
PARNASSIA PALUSTRIS	0	0	0	1
PETASITES SAGITTATUS	0	0	0	1
PETASITES VITIFOLIUS	0	0	0	1
POLYTRICHUM SPP.	0	0	0	1
RIBES HIRTELLUM	0	0	1	0
SALIX SPP.	0	0	3	0
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	2

PLOT 78

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
AGROPYRON SPP.	0	0	0	1
ASTER EATONII	0	0	0	1
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX PAUPERCULA	0	0	0	2
ELYMUS INNOVATUS	0	0	0	2
EQUISETUM ARVENSE	0	0	0	4
HIERACIUM UMBELLATUM	0	0	0	2
MENTHA ARVENSIS	0	0	0	1
PARNASSIA PALUSTRIS	0	0	0	1
PLANTAGO MAJOR	0	0	0	2
SALIX INTERIOR	0	5	0	0
SALIX LASIANDRA	0	0	1	0
SOLIDAGO LEPIDA	0	0	0	2
STACHYS PALUSTRIS	0	0	0	1
TARAXACUM OFFICINALE	0	0	0	1
THALICTRUM VENULOSUM	0	0	0	1
VICIA AMERICANA	0	0	0	1

TABLE A-19. VEGETATION DATA FOR UNCLASSIFIED PLOTS

PLOT 18

SPECIES	SYNUSIAE A	B1	B2	C
ACTAEA RUBRA	0	0	0	1
ALNUS TENUIFOLIA	0	3	0	0
AULACOMNIUM PALUSTRE	0	0	0	2
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX DIANDRA	0	0	0	2
CAREX PAUPERCULA	0	0	0	2
CORNUS CANADENSIS	0	0	0	1
DREPANOCLADUS SPP.	0	0	0	5
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
EQUISETUM PRATENSE	0	0	0	1
EQUISETUM SCIRPOIDES	0	0	0	2
EQUISETUM SYLVATICUM	0	0	0	1
FRAGARIA VIRGINIANA	0	0	0	1
GEOCAULON LIVIDUM	0	0	0	1
HYLOCOMIUM SPLENDENS	0	0	0	2
LINNAEA BOREALIS	0	0	0	2
MITELLA NUDA	0	0	0	1
PETASITES PALMATUS	0	0	0	2
PETASITES VITIFOLIUS	0	0	0	2
PICEA MARIANA	3	0	1	0
PLEUROZIUM SCHREBERI	0	0	0	2
POPULUS TREMULOIDES	1	0	+	0
PYROLA SECUNDA	0	0	0	1
RIBES AMERICANUM	0	0	1	0
RIBES OXYACANTHOIDES	0	0	+	0
ROSA ACICULARIS	0	0	1	0
RUBUS PUBESCENS	0	0	0	1
SALIX SPP.	0	1	0	0
SHEPHERDIA CANADENSIS	0	0	1	0
SYMPHORICARPOS ALBUS	0	0	1	0
VIBURNUM EDULE	0	0	1	0
VIOLA RUGULOSA	0	0	0	1

PLOT 39

SPECIES	SYNUSIAE A	B1	B2	C
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX SPP.	0	0	0	5
EQUISETUM SYLVATICUM	0	0	0	1
MAIANTHEMUM CANADENSIS	0	0	0	2
PARNASSIA PALUSTRIS	0	0	0	2
POLYTRICHUM SPP.	0	0	0	2
POTENTILLA TRIDENTATA	0	0	0	2
SALIX SPP.	0	0	1	0
SCIRPUS SPP.	0	0	0	1
SPHAGNUM SPP.	0	0	0	1

PLOT 58

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
ASTER CILIOLATUS	0	0	0	2
AULACOMNIUM PALUSTRE	0	0	0	2
BETULA PUMILA	0	0	5	0
CALAMAGROSTIS CANADENSIS	0	0	0	1
CAREX PAUPERCULA	0	0	0	5
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
FRAGARIA VIRGINIANA	0	0	0	1
GALIUM BOREALE	0	0	0	1
LARIX LARICINA	0	0	1	0
LONICERA VILLOSA	0	0	1	0
MITELLA NUDA	0	0	0	2
PARNASSIA PALUSTRIS	0	0	0	1
PICEA GLAUCA	0	1	0	0
PICEA MARIANA	0	1	1	0
POTENTILLA FRUTICOSA	0	0	5	0
PYROLA VIRENS	0	0	0	1
RUBUS ACAULIS	0	0	0	2
SALIX SPP.	0	3	2	0
SCIRPUS SPP.	0	0	0	5
TOMENTHYPNUM NITENS	0	0	0	4

PLOT 64

SPECIES	SYNUSIAE A	B1	B2	C
ARCTOSTAPHYLOS RUBRA	0	0	4	0
AULACOMNIUM PALUSTRE	0	0	0	1
CAREX DISPERMA	0	0	0	2
CAREX GYNOCRATES	0	0	0	1
CAREX PAUPERCULA	0	0	0	2
CLADINA SPP.	0	0	0	1
CORNUS CANADENSIS	0	0	0	2
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
EQUISETUM ARVENSE	0	0	0	5
GEOCAULON LIVIDUM	0	0	0	1
HYLOCOMIUM SPLENDENS	0	0	0	3
LEDUM GROENLANDICUM	0	0	5	0
LINNAEA BOREALIS	0	0	0	3
LONICERA VILLOSA	0	0	1	0
MITELLA NUDA	0	0	0	3
PELTIGERA SPP.	0	0	0	1
PETASITES SAGITTATUS	0	0	0	3
PETASITES VITIFOLIUS	0	0	0	1
PICEA MARIANA	3	3	2	0
PLEUROZIUM SCHREBERI	0	0	0	3
RIBES AMERICANUM	0	0	1	0
RIBES OXYACANTHOIDES	0	0	1	0
RUBUS ACAULIS	0	0	0	1
SALIX SPP.	0	0	2	0
SPHAGNUM SPP.	0	0	0	3
TOMENTHYPNUM NITENS	0	0	0	1
VACCINIUM VITIS-IDAEA	0	0	1	0

TABLE A-19. VEGETATION DATA FOR UNCLASSIFIED PLOTS

PLOT 89

SPECIES	SYNUSIAE A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
AGROPYRON SPP.	0	0	0	1
ALNUS CRISPA	0	0	1	0
ARCTOSTAPHYLOS RUBRA	0	0	2	0
ARCTOSTAPHYLOS UVA-URSI	0	0	4	0
AULACOMNIUM PALUSTRE	0	0	0	2
BETULA PUMILA	0	0	1	0
CORNUS CANADENSIS	0	0	0	1
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
EQUISETUM SCIRPOIDES	0	0	0	1
FRAGARIA VIRGINIANA	0	0	0	3
GALIUM BOREALE	0	0	0	1
LARIX LARICINA	0	1	0	0
LATHYRUS OCHROLEUCUS	0	0	0	1
LEDUM GROENLANDICUM	0	0	2	0
LINNAEA BOREALIS	0	0	0	2
LONICERA DIOICA	0	0	1	0
LONICERA VILLOSA	0	0	1	0
MERTENSIA PANICULATA	0	0	0	1
ORYZOPSIS SPP.	0	0	0	1
PARNASSIA PALUSTRIS	0	0	0	1
PELTIGERA SPP.	0	0	0	1
PETASITES PALMATUS	0	0	0	1
PICEA MARIANA	1	0	3	0
PINUS BANKSIANA	0	1	2	0
POLYTRICHUM SPP.	0	0	0	1
POPULUS BALSAMIFERA	0	0	1	0
POPULUS TREMULOIDES	0	0	1	0
POTENTILLA FRUTICOSA	0	0	4	0
PYROLA ASARIFOLIA	0	0	0	1
ROSA ACICULARIS	0	0	1	0
RUBUS ACAULIS	0	0	0	1
SALIX SPP.	0	0	3	0
SHEPHERDIA CANADENSIS	0	0	2	0
TOMENTHYPNUM NITENS	0	0	0	1
VACCINIUM CAESPITOSUM	0	0	2	0
VACCINIUM MYRTILLOIDES	0	0	1	0
VACCINIUM VITIS-IDAEA	0	0	2	0

PLOT 99

SPECIES	SYNUSIAE A	B1	B2	C
AULACOMNIUM PALUSTRE	0	0	0	3
BETULA PUMILA	0	0	1	0
CAREX AQUATILIS	0	0	0	3
CHAMAEDAPHNE CALYCULATA	0	0	1	0
CLADINA SPP.	0	0	0	4
DICRANUM SPP.	0	0	0	2
EQUISETUM SYLVATICUM	0	0	0	1
LARIX LARICINA	0	0	2	0
LEDUM GROENLANDICUM	0	0	5	0
MNIUM SPP.	0	0	0	2
OXYCOCCUS MICROCARPUS	0	0	0	1
PELTIGERA SPP.	0	0	0	1
PICEA MARIANA	1	1	2	0
PINUS BANKSIANA	0	1	1	0
POLYTRICHUM SPP.	0	0	0	2
POPULUS TREMULOIDES	0	0	1	0
RUBUS CHAMAEMORUS	0	0	0	1
SALIX SPP.	0	2	3	0
SPHAGNUM SPP.	0	0	0	2
TOMENTHYPNUM NITENS	0	0	0	2
VACCINIUM MYRTILLOIDES	0	0	2	0
VACCINIUM VITIS-IDAEA	0	0	4	0

PLOT 107

SPECIES	SYNUSIAE A	B1	B2	C
BETULA PAPYRIFERA	0	1	1	0
CALAMAGROSTIS CANADENSIS	0	0	0	1
CLADINA SPP.	0	0	0	5
CORNUS CANADENSIS	0	0	0	2
DICRANUM SPP.	0	0	0	1
LEDUM GROENLANDICUM	0	0	3	0
PICEA MARIANA	0	5	3	0
PINUS BANKSIANA	3	0	0	0
PLEUROZIUM SCHREBERI	0	0	0	1
POLYTRICHUM SPP.	0	0	0	1
POPULUS TREMULOIDES	0	1	0	0
VACCINIUM MYRTILLOIDES	0	0	4	0
VACCINIUM VITIS-IDAEA	0	0	5	0

TABLE A-19. VEGETATION DATA FOR UNCLASSIFIED PLOTS

PLOT 134

SPECIES	SYNUSIAE A	B1	B2	C
ALNUS CRISPA	0	2	0	0
AMELANCHIER ALNIFOLIA	0	0	1	0
ARALIA NUDICAULIS	0	0	0	1
ARCTOSTAPHYLOS UVA-URSI	0	0	5	0
ASTER CILIOLATUS	0	0	0	1
CLADINA SPP.	0	0	0	1
COMANDRA PALLIDA	0	0	0	1
EPILOBIUM ANGUSTIFOLIUM	0	0	0	1
FRAGARIA VIRGINIANA	0	0	0	1
MAIANTHEMUM CANADENSIS	0	0	0	2
ORYZOPSIS SPP.	0	0	0	2
PINUS BANKSIANA	0	1	1	0
POLYTRICHUM SPP.	0	0	0	1
POPULUS TREMULOIDES	1	4	2	0
PRUNUS PENSYLVANICA	0	0	1	0
ROSA ACICULARIS	0	0	1	0
SCHIZACHNE PURPURASCENS	0	0	0	1
VACCINIUM MYRTILLOIDES	0	0	2	0

PLOT 135

SPECIES	SYNUSIAE A	B1	B2	C
ARALIA NUDICAULIS	0	0	0	1
EPILOBIUM ANGUSTIFOLIUM	0	0	0	2
POPULUS TREMULOIDES	2	2	1	0
PRUNUS PENSYLVANICA	0	3	0	0
RUBUS STRIGOSUS	0	0	5	0

APPENDIX B

VEGETATION COMMON NAMES

AND

LIST OF WILLOW SPECIMENS

APPENDIX B

Scientific Designations for Common Plant Species Names Used in this Report

COMMON NAME	SCIENTIFIC NAME
Alder	Alnus spp.
Aspen	Populus tremuloides
Balsam Fir	Abies balsamea
Balsam Poplar	Populus balsamifera
Birch (Paper Birch)	Betula papyrifera
Black Spruce	Picea mariana
Cattail	Scirpus spp.
Jackpine	Pinus banksiana
Larch	Larix laricina
Pin Cherry	Prunus pennsylvanica
Reindeer Moss	Cladina spp.
Sandbar Willow	Salix interior
Sedge	Carex spp.
White Spruce	Picea glauca
Willow	Salix spp.

Willow Specimens Identified By Dr. G.W. Argus of the National Museum of Canada

Salix arbusculoides Anderss.
Salix athabascensis Raup.
Salix bebbiana Sarg.
Salix lasiandra Benth.
Salix maccalliana Rowlee.
Salix myrtillifolia Anderss.
Salix pedicellaris Pursh.
Salix planifolia ssp. planifolia Pursh.
Salix pseudomonticola Ball
Salix pyrifolia Anderss.
Salix scouleriana Barr
Salix serissima (Bailey) Fern.

APPENDIX C

FALL PLOT DATA

PLOT 140

SPECIES	SYNUSIAS A	B1	B2	C
BETULA PUMILA	0	0	0	2
CAREX AQUATILIS	0	0	0	4
LEDUM GROENLANDICUM	0	0	0	4
OXYCOCCUS MICROCARPUS	0	0	0	1
PICEA MARIANA	0	1	1	1
RUBUS CHAMAEMORUS	0	0	0	1
SALIX SPP.	0	0	4	0
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	5
VACCINIUM VITIS-IDAEA	0	0	0	3

PLOT 141

SPECIES	SYNUSIAS A	B1	B2	C
BETULA PUMILA	0	0	0	2
CAREX SPP.	0	0	0	3
CHAMAEDAPHNE CALYCULATA	0	0	0	1
LEDUM GROENLANDICUM	0	0	0	4
OXYCOCCUS MICROCARPUS	0	0	0	1
PICEA MARIANA	0	1	1	1
RUBUS CHAMAEMORUS	0	0	0	1
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	5

PLOT 142

SPECIES	SYNUSIAS A	B1	B2	C
BETULA PUMILA	0	0	1	0
CAREX SPP.	0	0	0	4
CLADINA SPP.	0	0	0	1
LEDUM GROENLANDICUM	0	0	0	4
OXYCOCCUS MICROCARPUS	0	0	0	1
PICEA MARIANA	0	0	1	1
RUBUS CHAMAEMORUS	0	0	0	1
SPHAGNUM SPP.	0	0	0	5
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 143

SPECIES	SYNUSIAS A	B1	B2	C
CHAMAEDAPHNE CALYCULATA	0	0	0	2
CLADINA SPP.	0	0	0	2
LEDUM GROENLANDICUM	0	0	0	5
PICEA MARIANA	1	3	1	1
PLEUROZIUM SCHREBERI	0	0	0	1
RUBUS CHAMAEMORUS	0	0	0	1
SPHAGNUM SPP.	0	0	0	4
VACCINIUM VITIS-IDAEA	0	0	0	3

PLOT 144

SPECIES	SYNUSIAS A	B1	B2	C
CHAMAEDAPHNE CALYCULATA	0	0	0	2
CLADINA SPP.	0	0	0	2
HYLOCOMIUM SPLENDENS	0	0	0	1
LARIX LARICINA	0	1	0	0
LEDUM GROENLANDICUM	0	0	0	5
PICEA MARIANA	2	3	2	1
PLEUROZIUM SCHREBERI	0	0	0	1
RUBUS CHAMAEMORUS	0	0	0	2
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	4
VACCINIUM VITIS-IDAEA	0	0	0	3

PLOT 145

SPECIES	SYNUSIAS A	B1	B2	C
CAREX SPP.	0	0	0	3
CHAMAEDAPHNE CALYCULATA	0	0	0	2
CLADINA SPP.	0	0	0	2
LEDUM GROENLANDICUM	0	0	0	5
OXYCOCCUS MICROCARPUS	0	0	0	1
PICEA MARIANA	0	4	3	1
PLEUROZIUM SCHREBERI	0	0	0	1
RUBUS CHAMAEMORUS	0	0	0	1
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	4
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 146

SPECIES	SYNUSIAS A	B1	B2	C
AGROSTIS SCABRA	0	0	0	1
CAREX AQUATILIS	0	0	0	4
EQUISETUM SCIRPOIDES	0	0	0	1
LEDUM GROENLANDICUM	0	0	0	1
PARNASSIA PALUSTRIS	0	0	0	1
PELTIGERA SPP.	0	0	0	1
PICEA MARIANA	0	0	1	2
PYROLA SECUNDA	0	0	0	1
SALIX SPP.	0	0	4	0
SPHAGNUM SPP.	0	0	0	2
TOMENTHYPNUM NITENS	0	0	0	4

PLOT 147

SPECIES	SYNUSIAS A	B1	B2	C
CAREX SPP.	0	0	0	4
LEDUM GROENLANDICUM	0	0	0	4
MNIUM SPP.	0	0	0	1
PICEA MARIANA	0	1	2	2
POLYTRICHUM SPP.	0	0	0	1
RUBUS CHAMAEMORUS	0	0	0	3
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	5
VACCINIUM VITIS-IDAEA	0	0	0	3

PLOT 148

SPECIES	SYNUSIAS A	B1	B2	C
CAREX AQUATILIS	0	0	0	5

PLOT 149

SPECIES	SYNUSIAS A	B1	B2	C
BETULA PAPYRIFERA	0	1	0	0
BETULA PUMILA	0	0	0	3
CAREX AQUATILIS	0	0	0	3
CHAMAEDAPHNE CALYCULATA	0	0	0	2
LEDUM GROENLANDICUM	0	0	0	4
MYRICA GALE	0	0	0	2
PETASITES SAGITTATUS	0	0	0	1
SALIX SPP.	0	0	0	3
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	5

PLOT 150

SPECIES	SYNUSIAS A	B1	B2	C
CAREX SPP.	0	0	0	1
CAREX GYNOCRATES	0	0	0	1
CLADINA SPP.	0	0	0	3
LEDUM GROENLANDICUM	0	0	0	5
OXYCOCCUS MICROCARPUS	0	0	0	1
PICEA MARIANA	1	4	2	1
RUBUS CHAMAEMORUS	0	0	0	2
SPHAGNUM SPP.	0	0	0	3
VACCINIUM VITIS-IDAEA	0	0	0	3

PLOT 151

SPECIES	SYNUSIAS A	B1	B2	C
BETULA PUMILA	0	0	0	2
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX AQUATILIS	0	0	0	4
DREPANOCLADUS SPP.	0	0	0	3
LEDUM GROENLANDICUM	0	0	0	1
PICEA MARIANA	0	1	0	0
SALIX SPP.	0	0	5	2
TOMENTHYPNUM NITENS	0	0	0	1

PLOT 152

SPECIES	SYNUSIAS A	B1	B2	C
CAREX AQUATILIS	0	0	0	1
CAREX AQUATILIS	0	0	0	1
CLADINA SPP.	0	0	0	2
DICRANUM SPP.	0	0	0	1
LEDUM GROENLANDICUM	0	0	0	5
OXYCOCCUS MICROCARPUS	0	0	0	1
PICEA MARIANA	2	4	2	1
POLYTRICHUM SPP.	0	0	0	1
SMILACINA TRIFOLIA	0	0	0	1
SPHAGNUM SPP.	0	0	0	4
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 153

SPECIES	SYNUSIAS A	B1	B2	C
ACHILLEA MILLEFOLIUM	0	0	0	1
AULACOMNIUM PALUSTRE	0	0	0	3
BETULA PUMILA	0	0	0	2
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX AQUATILIS	0	0	0	4
CHAMAEDAPHNE CALYCULATA	0	0	0	1
CLADINA SPP.	0	0	0	1
GALIUM TRIFLORUM	0	0	0	1
HYLOCOMIUM SPLENDENS	0	0	0	1
LEDUM GROENLANDICUM	0	0	0	2
LONICERA VILLOSA	0	0	0	1
MITELLA NUDA	0	0	0	1
PICEA MARIANA	1	1	1	1
PYROLA ASARIFOLIA	0	0	0	1
SALIX SPP.	0	0	4	0
TOMENTHYPNUM NITENS	0	0	0	3
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 154

SPECIES	SYNUSIAS A	B1	B2	C
CALAMAGROSTIS CANADENSIS	0	0	0	1
CAREX SPP.	0	0	0	1
CHAMAEDAPHNE CALYCULATA	0	0	0	2
DICRANUM SPP.	0	0	0	1
EQUISETUM ARVENSE	0	0	0	1
LARIX LARICINA	0	0	0	1
LEDUM GROENLANDICUM	0	0	0	3
PICEA MARIANA	5	1	1	1
PLEUROZIUM SCHREBERI	0	0	0	1
SALIX SPP.	0	0	2	0
SPHAGNUM SPP.	0	0	0	5
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 155

SPECIES	SYNUSIAS A	B1	B2	C
AULACOMNIUM PALUSTRE	0	0	0	2
CALAMAGROSTIS CANADENSIS	0	0	0	2
CAREX GYNOCRATES	0	0	0	1
CAREX PAUPERCULA	0	0	0	2
CLADINA SPP.	0	0	0	3
EQUISETUM SCIRPOIDES	0	0	0	1
HYLOCOMIUM SPLENDENS	0	0	0	1
LEDUM GROENLANDICUM	0	0	0	2
LINNAEA BOREALIS	0	0	0	1
MITELLA NUDA	0	0	0	2
PELTIGERA SPP.	0	0	0	1
PETASITES VITIFOLIUS	0	0	0	1
PICEA MARIANA	0	4	2	1
POTENTILLA FRUTICOSA	0	0	3	0
ROSA ACICULARIS	0	0	0	1
SOLIDAGO NEMORALIS	0	0	0	1
TOMENTHYPNUM NITENS	0	0	0	3
VACCINIUM VITIS-IDAEA	0	0	0	3

PLOT 160

SPECIES	SYNUSIAS A	B1	B2	C
CLADINA SPP.	0	0	0	2
LEDUM GROENLANDICUM	0	0	0	5
PICEA MARIANA	2	4	3	1
PINUS BANKSIANA	1	0	0	0
PLEUROZIUM SCHREBERI	0	0	0	4
RUBUS CHAMAEMORUS	0	0	0	1
SPHAGNUM SPP.	0	0	0	2
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 161

SPECIES	SYNUSIAS A	B1	B2	C
ALNUS CRISPA	0	3	0	0
ARCTOSTAPHYLOS UVA-URSI	0	0	0	5
CLADINA SPP.	0	0	0	1
LYCOPODIUM COMPLANATUM	0	0	0	2
ORYZOPSIS SPP.	0	0	0	3
POPULUS TREMULOIDES	1	2	1	1
ROSA ACICULARIS	0	0	1	0
VACCINIUM MYRTILLOIDES	0	0	0	3

PLOT 162

SPECIES	SYNUSIAS A	B1	B2	C
ARCTOSTAPHYLOS UVA-URSI	0	0	0	4
DICRANUM SPP.	0	0	0	1
HYLOCOMIUM SPLENDENS	0	0	0	1
PLEUROZIUM SCHREBERI	0	0	0	3
POPULUS TREMULOIDES	5	2	1	1
ROSA ACICULARIS	0	0	0	1
VACCINIUM MYRTILLOIDES	0	0	0	2
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 163

SPECIES	SYNUSIAS A	B1	B2	C
HYLOCOMIUM SPLENDENS	0	0	0	3
LINNAEA BOREALIS	0	0	0	2
PICEA GLAUCA	4	0	0	1
PINUS BANKSIANA	2	0	0	0
PLEUROZIUM SCHREBERI	0	0	0	3
PYROLA SECUNDA	0	0	0	1
VACCINIUM VITIS-IDAEA	0	0	0	2

PLOT 164

SPECIES	SYNUSIAS A	B1	B2	C
HYLOCOMIUM SPLENDENS	0	0	0	5
LEDUM GROENLANDICUM	0	0	0	2
PICEA MARIANA	5	1	1	0
PLEUROZIUM SCHREBERI	0	0	0	1
VACCINIUM VITIS-IDAEA	0	0	0	1

PLOT 166

SPECIES	SYNUSIAS A	B1	B2	C
ALNUS CRISPA	0	0	2	0
CORNUS CANADENSIS	0	0	0	2
HYLOCOMIUM SPLENDENS	0	0	0	3
LEDUM GROENLANDICUM	0	0	0	2
LINNAEA BOREALIS	0	0	0	1
LYCOPODIUM ANNOTINUM	0	0	0	2
LYCOPODIUM COMPLANATUM	0	0	0	1
PICEA GLAUCA	4	2	1	1
PINUS BANKSIANA	1	0	0	0
PLEUROZIUM SCHREBERI	0	0	0	3
POPULUS BALSAMIFERA	1	0	0	0
ROSA ACICULARIS	0	0	2	0
SALIX SPP.	0	0	1	0

PLOT 167

SPECIES	SYNUSIAS A	B1	B2	C
CLADINA SPP.	0	0	0	4
CORNUS CANADENSIS	0	0	0	1
LARIX LARICINA	0	0	1	0
LEDUM GROENLANDICUM	0	0	0	5
PICEA MARIANA	4	2	1	0
PINUS BANKSIANA	2	0	0	0
PLEUROZIUM SCHREBERI	0	0	0	2
VACCINIUM MYRTILLOIDES	0	0	0	2
VACCINIUM VITIS-IDAEA	0	0	0	1

APPENDIX D

TREE DATA

PLOT 15

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	016	07.0	08.2
	018	05.0	08.6
	015	04.0	07.8
	008	04.5	05.5
POPULUS TREMULOIDES		13.5	13.7
		16.0	10.4
		22.0	19.2
		24.0	15.1
		24.0	12.6

PLOT 16

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	038	33.0	31.1
	033	33.0	33.2
	014	05.5	05.4
	011	05.5	05.9
POPULUS TREMULOIDES		15.0	06.1
		18.0	07.6
		14.5	08.1
		16.0	08.7

PLOT 17

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS TREMULOIDES		03.5	04.9
		02.5	05.3
		03.0	04.9
		04.5	04.1

PLOT 18

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	045	20.0	24.2
	045	15.0	21.6
	045	16.0	25.1

PLOT 19

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS TREMULOIDES		09.0	16.1
		11.0	14.3
		14.0	11.6
		11.0	15.4
		13.0	12.8

PLOT 20

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ABIES BALSAMEA	050	22.0	33.1
	051	28.0	18.8
	050	21.0	26.5
	050	27.0	32.1
	050	31.0	31.6
BETULA PAPYRIFERA		09.5	09.7
		09.5	10.7
		07.0	07.6
POPULUS TREMULOIDES		09.5	08.2
		11.0	10.4
		14.0	11.2

PLOT 21

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS TREMULOIDES		13.5	14.7
		14.0	18.4
		14.0	14.7
		17.0	13.7
		14.5	07.9

PLOT 24

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ABIES BALSAMEA		06.0	09.8
		08.0	05.6
		11.0	07.2
		09.0	05.9
		11.0	10.2
ALNUS TENUIFOLIA	020	.	6.1
PICEA GLAUCA	029	30.0	24.8
	026	34.0	23.1
	050	39.0	48.6
	052	30.0	43.6
	024	25.0	29.2
POPULUS BALSAMIFERA		12.0	16.5

PLOT 27

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ABIES BALSAMEA	028	07.0	07.1
	031	12.0	13.4
	039	18.0	13.9
	034	16.5	10.9
ALNUS TENUIFOLIA	012	03.5	03.0
	018	04.0	05.5
BETULA PAPYRIFERA		22.0	35.9
		18.0	27.5
		20.0	34.6
PICEA GLAUCA	068	29.0	37.5
	072	27.0	42.1
POPULUS BALSAMIFERA		22.0	15.4
		10.0	16.7
		13.0	14.5
		08.0	11.2
		11.0	13.4

PLOT 29

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA	015	12.0	05.8
	019	09.0	09.9
		14.0	09.7
		11.0	06.6
		11.5	10.2
PICEA GLAUCA	018	06.0	11.0
		02.0	02.7
	016	03.0	04.1
	020	04.0	05.3
	021	03.5	04.6
POPULUS TREMULOIDES		12.0	09.2
		12.5	07.2
		13.0	08.5
		09.0	08.8
		10.5	08.6

PLOT 30

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ALNUS TENUIFOLIA	016	11.0	08.8
		09.0	05.4
		16.0	16.4
SALIX INTERIOR	010	02.5	03.3
		02.0	03.0
		03.0	05.5
		02.5	03.3
		03.0	35.
SALIX LASIANDRA	017	07.0	09.3
		07.0	08.2
		06.0	06.3

PLOT 33

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	062	14.0	18.6
	068	11.5	17.4
	089	13.5	18.5
	071	12.5	14.6
	064	13.0	13.4

PLOT 38

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	038	14.5	21.2
	036	10.5	17.9
	048	13.0	16.3
PICEA MARIANA	017	08.0	06.9
	022	06.0	06.0
	024	07.0	09.7
	029	15.5	18.8
	028	12.5	14.3
POPULUS TREMULOIDES	023	09.0	10.4
	022	10.0	11.1
	020	11.5	13.3

PLOT 40

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	020	06.0	06.0
	022	09.0	09.4
	021	08.0	08.7
	022	07.5	07.1
	026	06.5	07.5
POPULUS TREMULOIDES	057	25.0	27.3
	039	21.5	19.3
	049	19.0	25.8
	033	24.0	17.3
		23.0	16.9

PLOT 43

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PINUS BANKSIANA	031	13.0	30.2
	035	15.0	26.9
	037	14.0	22.7
	040	14.0	25.6
	033	15.5	25.8

PLOT 44

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	036	08.5	15.5
	056	12.5	16.7
	035	13.0	17.4
	052	10.5	19.2
	043	13.5	13.3

PLOT 46

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	097	07.0	08.7
	092	09.0	11.5
	090	06.5	08.3
	106	06.0	06.6
	087	07.0	08.2

PLOT 47

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	086	12.0	13.9
	093	12.0	11.8
	104	14.0	14.7
	100	09.5	12.1
	098	13.0	15.2

PLOT 49

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	011	03.0	04.1
PICEA GLAUCA	014	03.6	04.1
		02.0	01.5
POPULUS TREMULOIDES	020	11.5	10.1
	021	12.0	10.7
	027	13.0	12.1
	020	11.0	07.9
	024	11.0	09.1

PLOT 51

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	081	16.5	16.9
	038	13.5	14.9
PINUS BANKSIANA	034	20.5	37.8
	128	24.0	41.4

PLOT 52

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	069	16.5	16.9
	067	13.5	14.9

PLOT 53

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	081	23.0	47.2
	066	23.0	31.4
	047	22.5	40.4
PINUS BANKSIANA	101	25.0	41.1
POPULUS BALSAMIFERA	031	22.0	45.8
	039	22.5	31.6

PLOT 55

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	033	09.5	10.2
	055	11.0	12.3
	047	09.0	14.5
PICEA MARIANA	033	11.0	14.2
	045	11.0	13.1
	028	08.0	13.6

PLOT 56

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	036	23.0	26.4
	034	24.0	21.3
POPULUS TREMULOIDES	037	20.5	17.3
	040	15.0	12.1
	038	17.5	14.2

PLOT 57

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	086	21.0	18.9
	079	20.0	16.9
PICEA GLAUCA	085	23.0	35.7
	073	20.0	29.1
PICEA MARIANA	063	21.0	30.1
	059	17.0	19.1

PLOT 58

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	020	08.0	02.7
	018	06.5	11.1

PLOT 60

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	059	16.5	20.8
	042	13.0	16.5
PICEA MARIANA	058	21.0	23.1
	056	13.0	15.8
POPULUS BALSAMIFERA	078	15.5	11.7
	047	13.5	13.3
	042	18.5	24.0
		16.0	31.2

PLOT 63

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	089	13.0	26.5
POPULUS BALSAMIFERA	057	13.0	31.2
POPULUS TREMULOIDES	041	20.0	22.6

PLOT 64

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	091	16.5	19.2
	051	06.5	07.3

PLOT 65

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	049	08.5	08.7
	055	08.5	09.1

PLOT 66

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS TREMULOIDES	048	21.5	23.4
	038	20.5	22.0

PLOT 67

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	027	11.0	13.6
	026	09.0	11.9
PINUS BANKSIANA	049	16.5	41.4
POPULUS TREMULOIDES	038	11.5	31.1
	041	17.0	22.3

PLOT 68

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PINUS BANKSIANA	048	14.5	22.1
	049	16.0	27.0

PLOT 69

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	039	20.5	31.9
	033	17.0	35.8
POPULUS TREMULOIDES	041	14.0	17.1
	034	12.5	19.6

PLOT 70

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
	083	21.0	29.3
BETULA PAPYRIFERA	011	07.0	05.1
PICEA GLAUCA	082	24.0	31.7
	018	11.5	10.7
PICEA MARIANA	069	22.5	22.6
		14.0	05.1
PINUS BANKSIANA	086	23.5	22.7
POPULUS TREMULOIDES	043	16.0	10.7

PLOT 71

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	128	14.0	12.2

PLOT 72

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS TREMULOIDES	011	07.5	05.5
	017	09.0	06.7

PLOT 73

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	046	11.5	12.5
	011	05.5	04.8
POPULUS TREMULOIDES	013	06.5	10.1

PLOT 74

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	147	36.0	46.4
	055	22.0	34.2

PLOT 75

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	103	23.0	35.9
POPULUS BALSAMIFERA		16.0	12.3

PLOT 77

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	091	17.0	29.3
PICEA MARIANA	086	24.0	19.6
PINUS BANKSIANA	110	27.0	25.6
POPULUS BALSAMIFERA	094	26.0	23.9
POPULUS TREMULOIDES	114	26.5	29.5

PLOT 79

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ABIES BALSAMEA	047	16.0	18.3
POPULUS BALSAMIFERA	061	23.0	38.1
	038	19.0	41.4

PLOT 80

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ALNUS TENUIFOLIA	026	08.5	07.0

PLOT 81

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	119	21.0	32.2
POPULUS BALSAMIFERA	060	32.0	45.2

PLOT 82

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	060	29.0	44.3
	084	23.0	27.0
PICEA MARIANA	059	18.0	19.7
POPULUS BALSAMIFERA	056	28.0	32.5

PLOT 83

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA	030	08.5	10.1
PICEA GLAUCA	076	21.0	36.3
POPULUS TREMULOIDES	042	19.5	22.2

PLOT 84

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA	023	16.5	19.3
PICEA GLAUCA	079	20.5	34.4
POPULUS TREMULOIDES	019	05.5	13.0

PLOT 85

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA	024	17.5	31.4
POPULUS BALSAMIFERA	047	21.0	39.7

PLOT 86

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS BALSAMIFERA	051	17.5	31.7

PLOT 87

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
SALIX INTERIOR	021	04.0	05.3

PLOT 89

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	057	11.5	22.4
PINUS BANKSIANA	019	05.0	06.5

PLOT 90

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	017	04.5	05.3

PLOT 91

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	061	12.5	12.2
PICEA MARIANA	062	12.0	15.0

PLOT 92

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	019	08.0	13.5
LARIX LARICINA		03.5	05.7

PLOT 93

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS TREMULOIDES	038	16.0	11.6

PLOT 95

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	064	16.5	14.2
PICEA MARIANA	071	16.0	20.2

PLOT 96

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	030	08.0	10.2
PICEA GLAUCA	026	07.5	11.5
PICEA MARIANA	024	07.0	09.6

PLOT 97

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	051	17.5	22.3

PLOT 99

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA		06.5	06.2
		07.0	07.8
PINUS BANKSIANA		06.0	11.3

PLOT 100

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA		15.0	16.3
PICEA MARIANA		05.5	06.5

PLOT 102

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA	021	11.0	12.4
PICEA GLAUCA	015	04.5	04.1
POPULUS BALSAMIFERA	032	15.5	17.7
POPULUS TREMULOIDES	037	20.0	22.6

PLOT 103

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	023	04.5	06.2

PLOT 104

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	036	06.5	07.2

PLOT 105

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	038	10.5	06.6
PICEA MARIANA	076	06.0	07.2

PLOT 106

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	024	07.5	07.9

PLOT 107

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA	043	05.5	07.3
PICEA MARIANA	047	09.0	12.4
PINUS BANKSIANA	062	11.5	25.1
POPULUS TREMULOIDES	042	08.0	08.4

PLOT 108

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	045	12.0	23.1
POPULUS TREMULOIDES	051	17.5	17.4

PLOT 109

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	051	06.5	09.4

PLOT 110

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	072	04.5	12.1

PLOT 111

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PINUS BANKSIANA	021	09.5	13.1

PLOT 112

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PINUS BANKSIANA	056	12.5	24.4
POPULUS TREMULOIDES	027	17.0	18.3

PLOT 113

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	055	10.0	11.2

PLOT 114

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
LARIX LARICINA	034	05.5	10.2
PICEA MARIANA	019	04.5	06.7

PLOT 115

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	049	09.5	11.1
		14.0	19.6

PLOT 116

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA		03.0	05.2

PLOT 117

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA		06.5	10.6

PLOT 119

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	034	06.5	08.2

PLOT 120

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ALNUS TENUIFOLIA	017	05.0	07.3
BETULA PAPYRIFERA	024	07.5	07.4
PICEA GLAUCA	018	05.5	08.3
POPULUS TREMULOIDES		17.0	25.0
	037	14.5	15.9

PLOT 121

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	053	14.5	16.1
POPULUS BALSAMIFERA	037	18.0	14.8
POPULUS TREMULOIDES		17.0	11.9
		21.0	27.4

PLOT 122

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ALNUS CRISPA	018	07.0	06.6
PICEA GLAUCA		09.0	16.0
POPULUS BALSAMIFERA		23.0	13.5
POPULUS TREMULOIDES	042	27.0	18.8

PLOT 125

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ABIES BALSAMEA	052	13.0	14.6
BETULA PAPYRIFERA		12.5	13.1
POPULUS BALSAMIFERA		24.0	19.6
POPULUS TREMULOIDES		26.0	20.8

PLOT 126

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA		09.0	16.3
PICEA GLAUCA	063	24.0	24.5
POPULUS BALSAMIFERA		22.5	26.8

PLOT 128

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ABIES BALSAMEA	033	08.0	07.2
BETULA PAPYRIFERA		11.0	18.3
PICEA GLAUCA	044	09.0	13.3
POPULUS TREMULOIDES		04.5	05.5

PLOT 129

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
ABIES BALSAMEA	039	16.0	11.9
BETULA PAPYRIFERA		18.0	23.4
		08.5	12.1
PICEA GLAUCA	047	19.0	12.7
POPULUS BALSAMIFERA		18.0	15.1
POPULUS TREMULOIDES		26.0	28.2

PLOT 130

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
BETULA PAPYRIFERA	022	04.5	07.4

PLOT 131

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
POPULUS BALSAMIFERA		04.0	04.2
BETULA PAPYRIFERA		04.0	03.6
PINUS BANKSIANA	023	06.5	10.4
POPULUS TREMULOIDES		07.5	07.4

PLOT 132

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	060	20.0	19.4
POPULUS BALSAMIFERA		28.0	19.3
POPULUS TREMULOIDES		32.0	36.6

PLOT 133

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA MARIANA	087	08.0	14.0

PLOT 134

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PINUS BANKSIANA	021	06.5	09.3
POPULUS TREMULOIDES	023	08.0	08.8

PLOT 136

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	017	07.0	06.7
PINUS BANKSIANA	029	19.0	14.8
POPULUS TREMULOIDES	052	10.5	14.1

PLOT 137

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	050	25.0	39.6
PINUS BANKSIANA	089	27.0	36.2
POPULUS TREMULOIDES	059	14.0	16.6

PLOT 138

TREE SPECIES	AGE (YRS)	HEIGHT (METRES)	DIAMETER (CM)
PICEA GLAUCA	022	14.5	21.4
POPULUS TREMULOIDES	039	12.0	15.4

APPENDIX E

PLOT LOCATIONS

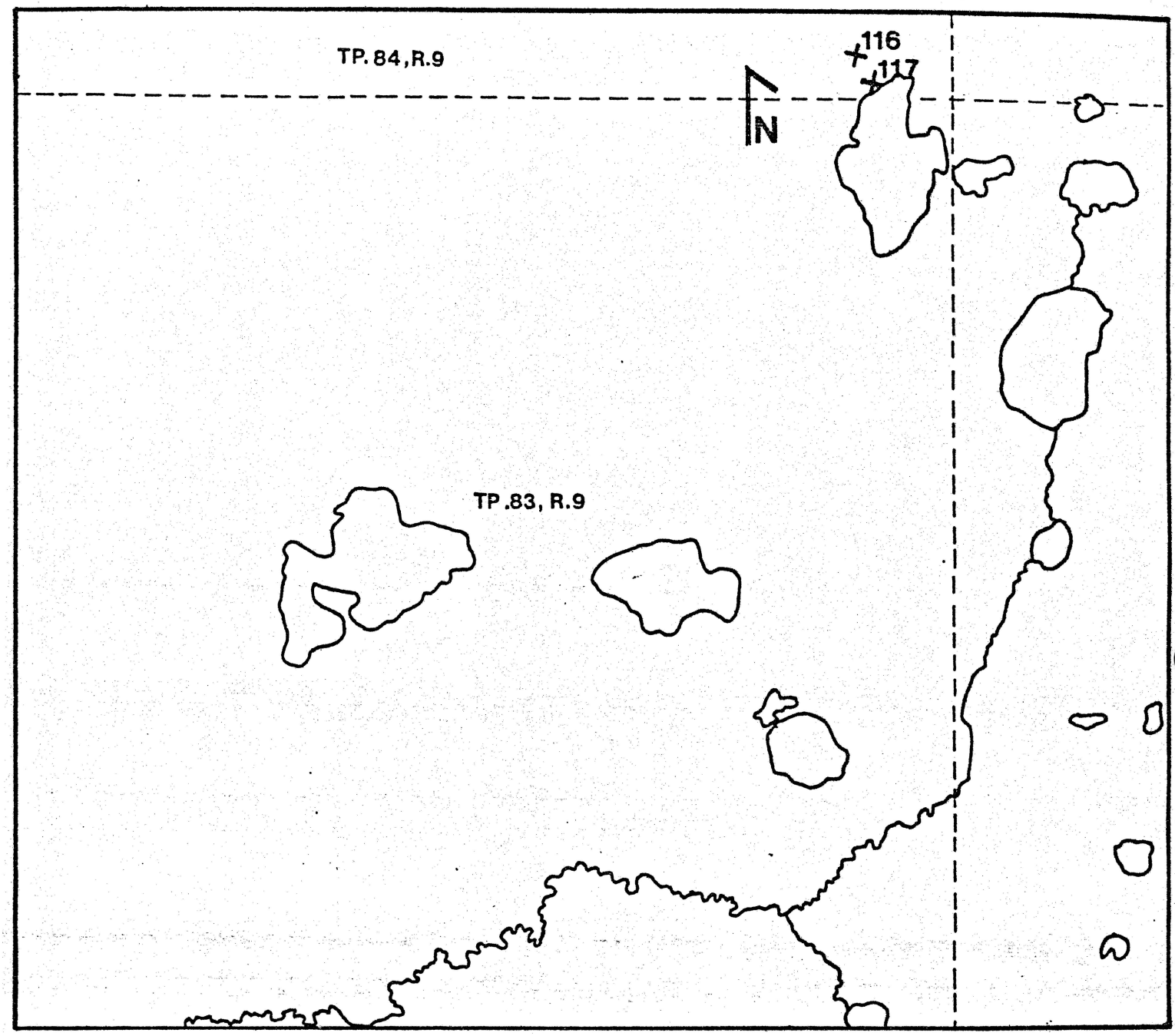


FIGURE E-1

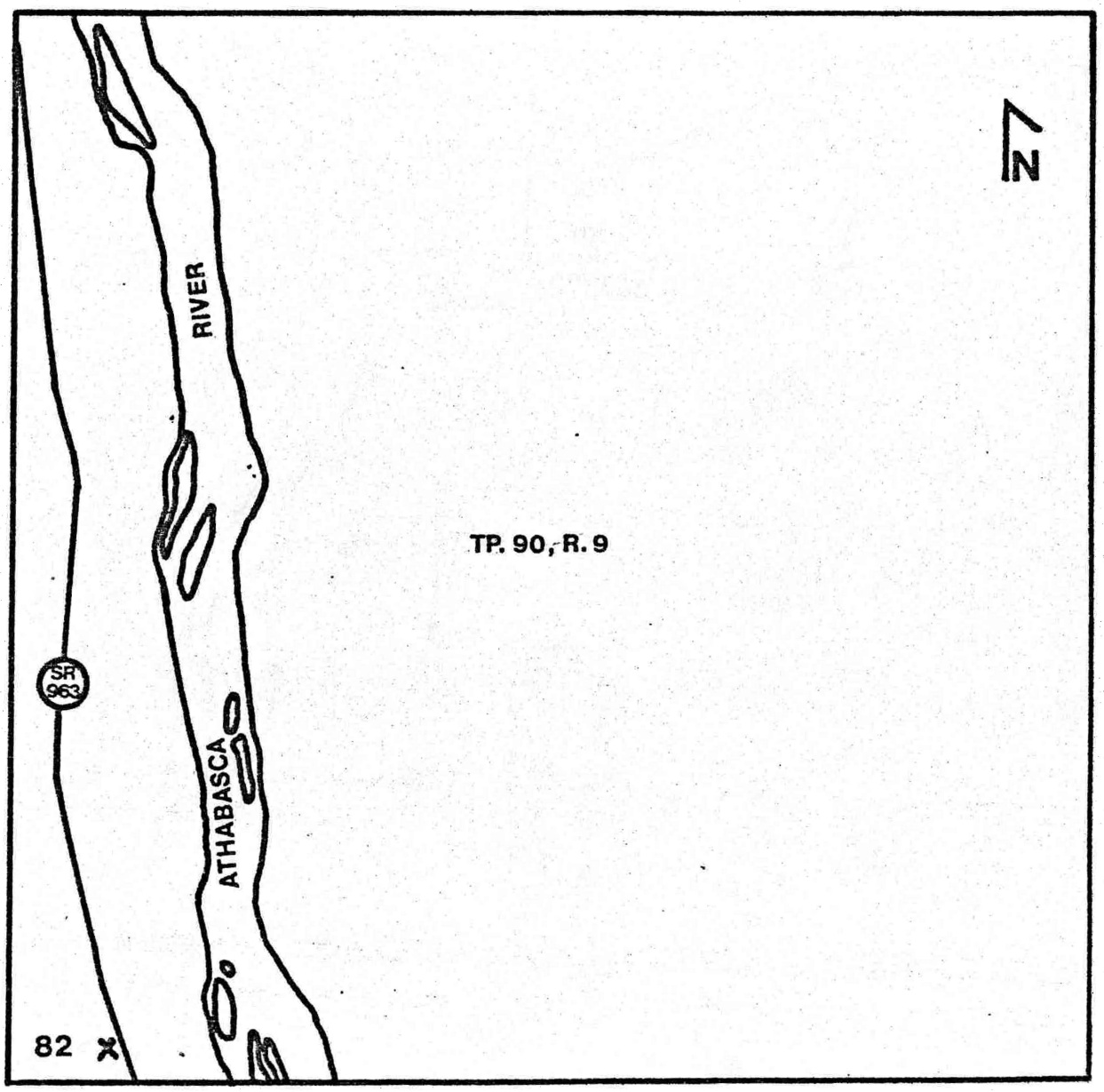


FIGURE E-2

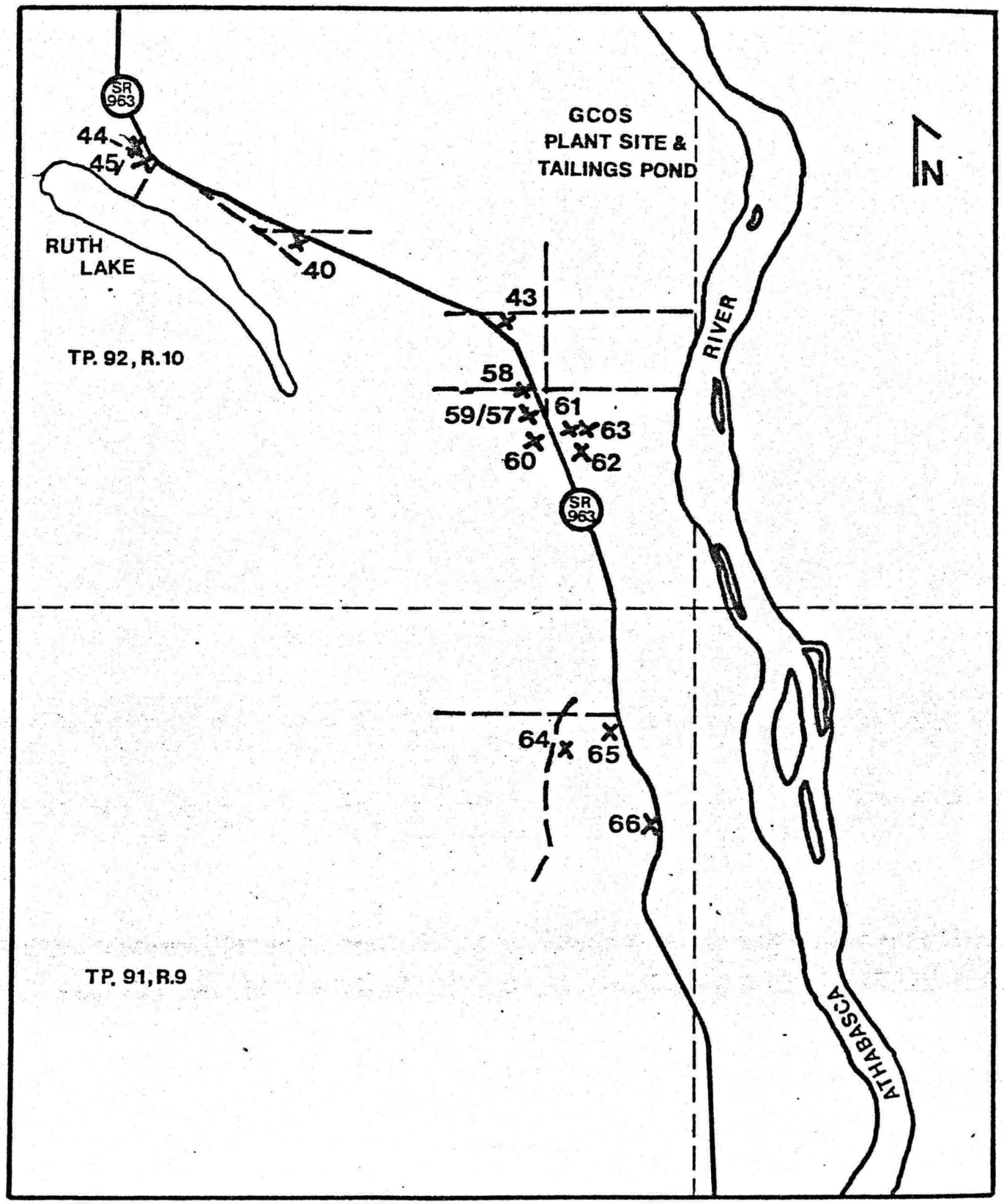

SR 963
44
45
RUTH LAKE
40
GCOS PLANT SITE & TAILINGS POND
N
43
RIVER
TP. 92, R.10
58
59/57
61
63
60
62
SR 963
64
65
66
TP. 91, R.9
ATHABASCA
0 1 2 3 4 5 6 km

FIGURE E-3

Figures E-4 and E-5 in back pocket

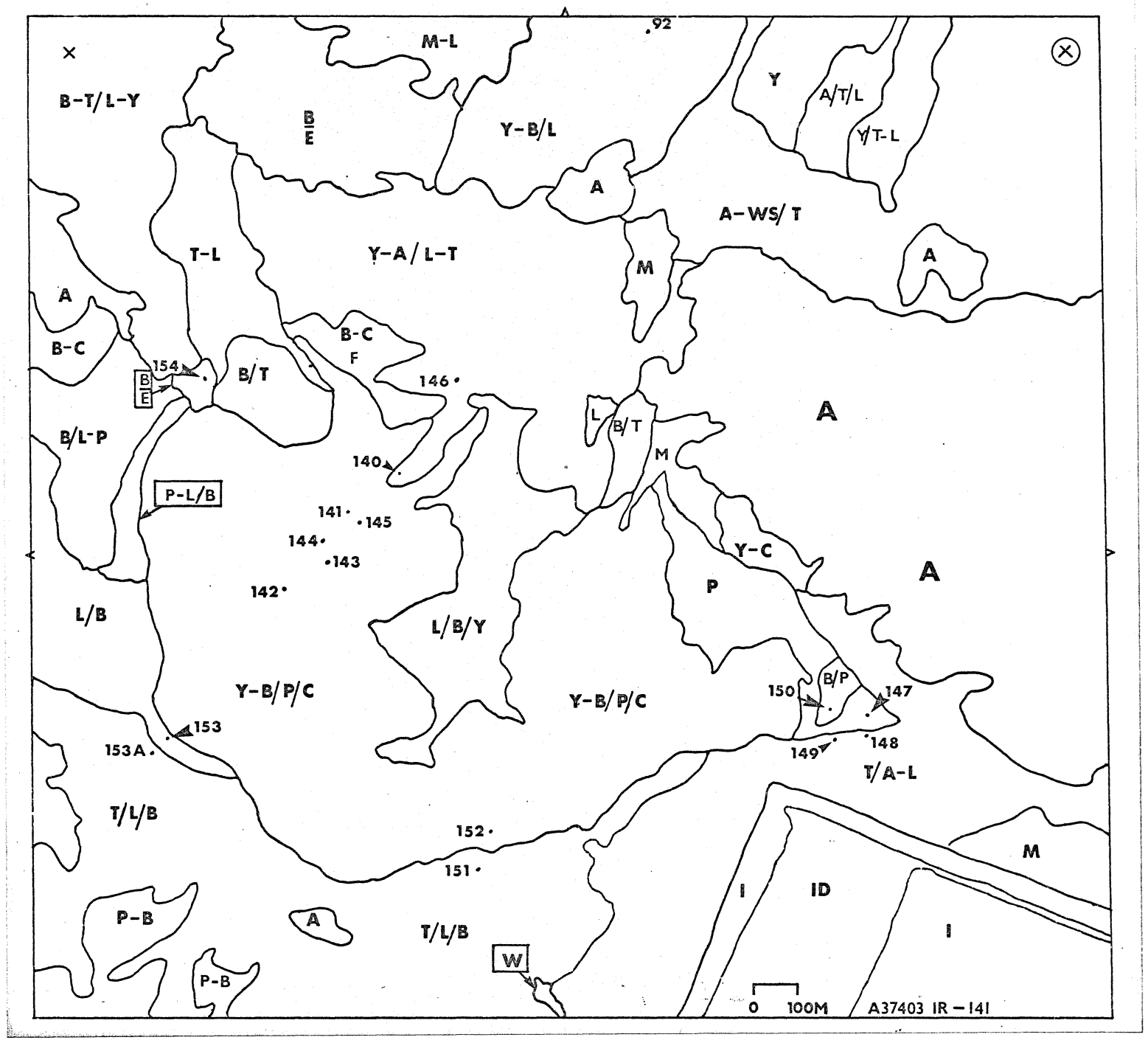
AOSERP RESEARCH REPORTS

1.		AOSERP First Annual Report, 1975
2.	AF 4.1.1	Walleye and Goldeye Fisheries Investigations in the Peace-Athabasca Delta--1975
3.	HE 1.1.1	Structure of a Traditional Baseline Data System
4.	VE 2.2	A Preliminary Vegetation Survey of the Alberta Oil Sands Environmental Research Program Study Area
5.	HY 3.1	The Evaluation of Wastewaters from an Oil Sand Extraction Plant
6.		Housing for the North--The Stackwall System
7.	AF 3.1.1	A Synopsis of the Physical and Biological Limnology and Fisheries Programs within the Alberta Oil Sands Area
8.	AF 1.2.1	The Impact of Saline Waters upon Freshwater Biota (A Literature Review and Bibliography)
9.	ME 3.3	Preliminary Investigations into the Magnitude of Fog Occurrence and Associated Problems in the Oil Sands Area
10.	HE 2.1	Development of a Research Design Related to Archaeological Studies in the Athabasca Oil Sands Area
11.	AF 2.2.1	Life Cycles of Some Common Aquatic Insects of the Athabasca River, Alberta
12.	ME 1.7	Very High Resolution Meteorological Satellite Study of Oil Sands Weather: "a Feasibility Study"
13.	ME 2.3.1	Plume Dispersion Measurements from an Oil Sands Extraction Plant, March 1976
14.	HE 2.4	Athabasca Oil Sands Historical Research Design (3 Volumes)
15.	ME 3.4	A Climatology of Low Level Trajectories in the Alberta Oil Sands Area
16.	ME 1.6	The Feasibility of a Weather Radar near Fort McMurray, Alberta
17.	AF 2.1.1	A Survey of Baseline Levels of Contaminants in Aquatic Biota of the AOSERP Study Area
18.	HY 1.1	Interim Compilation of Stream Gauging Data to December 1976 for the Alberta Oil Sands Environmental Research Program
19.	ME 4.1	Calculations of Annual Averaged Sulphur Dioxide Concentrations at Ground Level in the AOSERP Study Area
20.	HY 3.1.1	Characterization of Organic Constituents in Waters and Wastewaters of the Athabasca Oil Sands Mining Area

21.		AOSERP Second Annual Report, 1976-77
22.	HE 2.3	Maximization of Technical Training and Involvement of Area Manpower
23.	AF 1.1.2	Acute Lethality of Mine Depressurization Water on Trout Perch and Rainbow Trout
24.	ME 4.2.1	Review of Dispersion Models and Possible Applications in the Alberta Oil Sands Area
25.	ME 3.5.1	Review of Pollutant Transformation Processes Relevant to the Alberta Oil Sands Area
26.	AF 4.5.1	Interim Report on an Intensive Study of the Fish Fauna of the Muskeg River Watershed of Northeastern Alberta
27.	ME 1.5.1	Meteorology and Air Quality Winter Field Study in the AOSERP Study Area, March 1976
28.	VE 2.1	Interim Report on a Soils Inventory in the Athabasca Oil Sands Area
29.	ME 2.2	An Inventory System for Atmospheric Emissions in the AOSERP Study Area
30.	ME 2.1	Ambient Air Quality in the AOSERP Study Area, 1977
31.	VE 2.3	Ecological Habitat Mapping of the AOSERP Study Area: Phase I
32.		AOSERP Third Annual Report, 1977-78
33.	TF 1.2	The Relationship Between Habitats, Forages, and Carrying Capacity of Moose Range in the AOSERP Study Area
34.	HY 2.4	Heavy Metals in Bottom Sediments of the Mainstem Athabasca River System in the AOSERP Study Area
35.	AF 4.9.1	The Effects of Sedimentation on the Aquatic Biota
36.	AF 4.8.1	Fall Fisheries Investigations in the Athabasca and Clearwater Rivers Upstream of Fort McMurray: Volume I
37.	HE 2.2.2	Community Studies: Fort McMurray, Anzac, Fort MacKay
38.	VE 7.1.1	Techniques for the Control of Small Mammals: A Review

These reports are not available upon request. For further information about availability and location of depositories, please contact:

Alberta Oil Sands Environmental Research Program
15th Floor, Oxbridge Place
9820 - 106 Street
Edmonton, Alberta
T5K 2J6


M-L
92
B-T/L-Y
B/E
Y-B/L
Y
A/T/L
Y/T-L
A
A-WS/T
T-L
Y-A/L-T
M
A
A
B-C
B-C
F
154
B/E
B/T
146
B/L-P
L
B/T
M
A
140
P-L/B
141
145
144
143
142
Y-C
P
A
L/B
L/B/Y
Y-B/P/C
Y-B/P/C
B/P
150
147
153
153A
149
148
T/A-L
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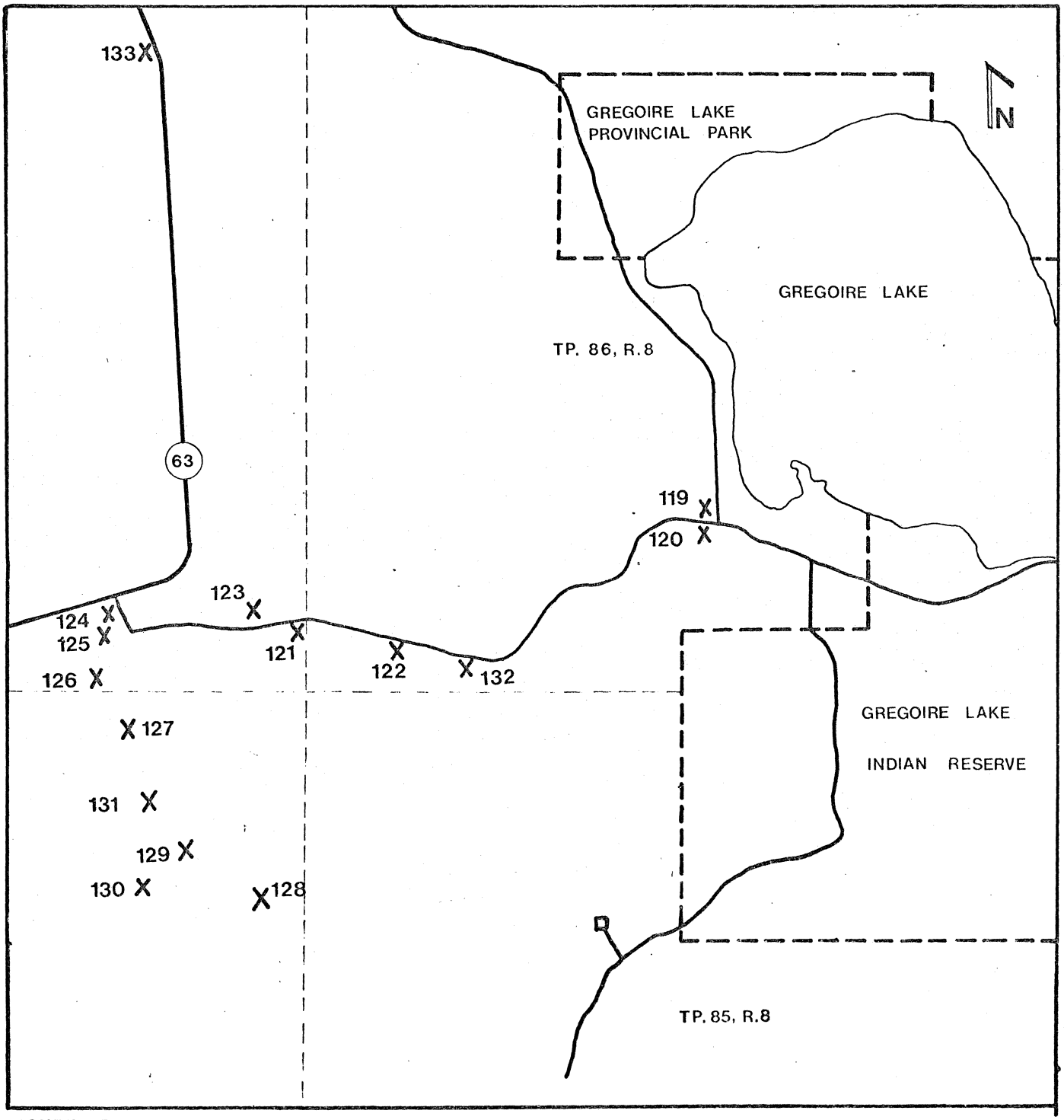

FIGURE E-4

Alberta Department of the Environment
Library
30685

reduced

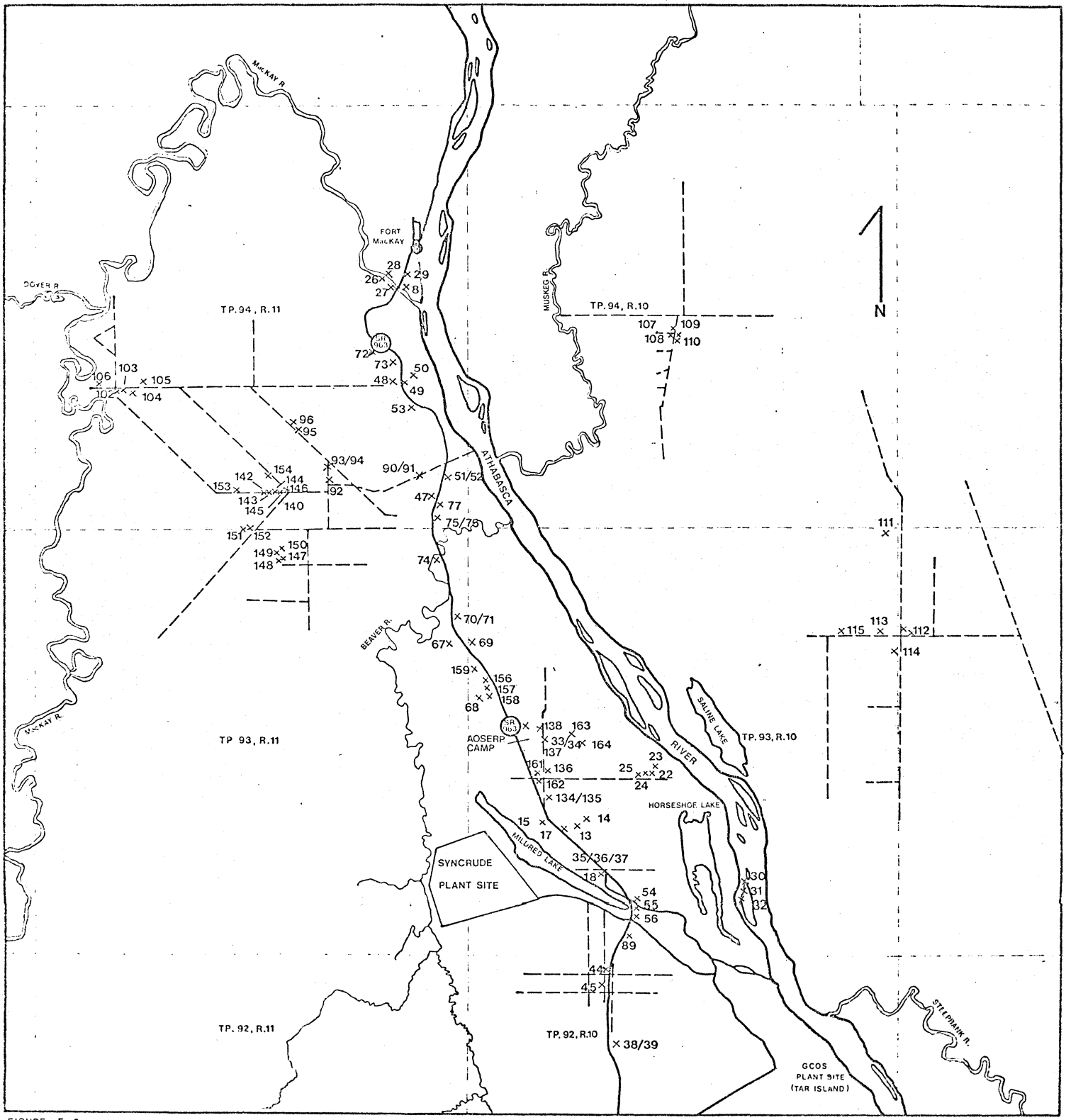

FIGURE E-5

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Library 30685


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