

BOReal Ecosystem-Atmosphere Study (BOREAS) biometry and auxillary sites: locations and descriptions

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Abstract

As part of Boreal Forest Transect Case Study (BFTCS) and BOREal Ecosystems–Atmosphere Study (BOREAS), close to 100 sites were established across a transect spanning the boreal forest of Manitoba and Saskatchewan. Most of the sites were concentrated in two major study areas near the boreal forest's northern (Nelson House, Manitoba) and southern (Prince Albert, Saskatchewan) limits. Additional sites were established to extend the transect as far southwest as Rosthern, Saskatchewan, and as far northeast as Gillam, Manitoba. This report, the first of a series of three, provides details regarding site and sample plot locations, and information on reference material such as forest inventory maps and aerial photographs. Maps of each site, usually based on provincial forest inventory maps, show the relationship of sample plots with surrounding geographical features and forest stands. The purpose of this report is to document the sites for assistance in interpreting data collected at the sites, and to enable further investigation of the sites by others.

Preface

As a contribution to the Boreal Forest Transect Case Study (BFTCS) and the BOREal Ecosystem–Atmosphere Study (BOREAS), the Canadian Forest Service (CFS) has prepared three reports describing basic forest characteristics at close to 100 sites in a transect spanning the boreal forest from Northern Manitoba to southern Saskatchewan. The purpose of the work carried out by CFS is two-fold. The first objective was to collect data relevant to ongoing CFS work in ecological monitoring and carbon budget modeling. The second objective was to provide information on basic forest characteristics, for use by other project scientists in BFTCS and BOREAS. The information collected includes basic stand data for comparison with remotely sensed data, and input data for various forms of modeling (e.g. distributed hydrological modeling, forest growth, etc.). As a result, the reports reflect these two goals: analysis of data for a specific CFS research project, and provision of a detailed data base.

The CFS work has been divided into three basic reports. This first document, *Biometry and auxiliary sites: locations and descriptions*, provides information on the site locations and gives descriptions of the sites, which ensures that future researchers will be able to locate the sites for comparative studies.

The second report, *Biometry and auxiliary sites: overstory and understory*, summarizes the data collected on the vegetation at each of the study sites. The overstory section provides information on individual trees (species, height, DBH, and evidence of poor tree health) as well as values calculated at the stand level, such as the basal area, stem density, total stem volume, and total biomass density. The understory section lists species by percentage cover on each of the plots within a site, as well as the average cover for all plots at a site.

The last report in the series is *Biometry and auxiliary sites: soils and detritus data*. It provides more detailed information on two sets of data collected at the study sites: soils descriptions (both landform and horizon characteristics), and duff and woody debris (distribution by size and species, as well as mass estimates). The soil descriptions include the results of various laboratory tests, such as carbon, particle size, density, and nutrients. Estimates of total soil carbon are provided. Duff measurements include mean depths, densities, and organic content. Both duff and woody debris measurements are used to estimate carbon totals.

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Introduction

The Boreal Forest Transect Case Study (BFTCS) is a multi-disciplinary ecological study that focuses on a 1000-km transect crossing the climatically sensitive boreal forest biome.¹ The transect is oriented along an ecoclimatic gradient, ranging from agricultural grasslands in southern Saskatchewan through the boreal forest to tundra in northern Manitoba. The BFTCS has been selected as one of a number of transect studies in various global ecosystems, under the guidance of the Global Change and Terrestrial Ecosystems (GCTE) Core Project of the International Geosphere-Biosphere Programme (IGBP) (Koch et al., 1995).

The BFTCS was originally proposed by the Canadian Forest Service (CFS) as an extension to the BOREal Ecosystem-Atmospheric Study (BOREAS) to address longer-term issues of global change in the boreal zone. BOREAS is a major international field experiment integrating land surface climatology, tropospheric chemistry, and terrestrial ecology. For BOREAS, two large study areas have been established near the boreal forest's northern (Nelson House, Manitoba) and southern (Prince Albert, Saskatchewan) limits. The BFTCS transect extends beyond these core regions, to the grasslands southwest of Prince Albert and the tundra north of Gillam, Manitoba. Observation of the BOREAS sites is being performed from the ground, from the air, and from space, and combined with an extensive modeling program. The aim of the project is to improve the understanding of biological and physical processes and states that govern the exchanges of energy, water, heat, carbon, and trace gases between boreal forest ecosystems and the atmosphere. Particular reference is given to those processes and states that can be sensitive to global change. Extensive field work occurred in the summer of 1994; an overview of the project and preliminary results of the 1994 work are described in Sellers, Hall, Margolis, Kelly, Baldocchi, den Hartog, Cihlar, Ryan, Goodison, Crill, Ranson, Lettenmaier, and Wickland (1995).

Members of BOREAS conducted measurements at a variety of temporal and spatial scales. Within the project, sites were selected to meet varying data needs, and they were organized in a hierarchical fashion based on the type of observations made. Three distinct site classes can be described. The first class comprises sites with detailed mass and energy exchange observations carried out using instrumented towers. These sites are categorized as tower flux (TF) sites. The second class of sites provide less sophisticated tower access to the forest canopy, for biophysical measurements and sampling. These sites are labelled terrestrial ecology (TE) sites. The third class of sites represent the lowest level of ground-based observation, with no special provision for instrumentation. This last class is intended to provide additional sites for verification of various remote sensing data. These sites are described as auxiliary sites (focused within the limits of the major study areas) or transect sites (more generally spread across the boreal forest, following the BFTCS transect from southwest of Prince Albert, Saskatchewan, to Gillam, Manitoba).

Every reasonable effort was made to locate stand types that reflected the varied objectives of the BFTCS and BOREAS projects. The criteria for site selection included the following attributes:

- relatively homogeneous tree species.
- relatively even-aged stand: young (or recently disturbed), immature, or mature.
- stand size no less than 100 (100 m (approximately).

Initially, sites were selected based upon air photos and forest cover maps. Many of the sites were examined from the air to ensure homogeneity and suitability of location, access and general environment. Subsequently, on-the-ground visits were performed to confirm the data from the maps, air photos, and air examination comments. At the selected sites, detailed measurements were then performed by the field teams.

The Canadian Forest Service collected data on a variety of biotic and abiotic characteristics during 1993 and 1994. These included:

- 1) tree inventories, including DBH, estimated age, and height;
- 2) evidence of tree health (e.g., diseases, insect infestations, etc.);
- 3) understory vegetation descriptions of species present and percentage cover;
- 4) the size and distribution of debris on the ground;
- 5) depth of the moss or litter layer along a transect within the site;
- 6) soil characteristics, including depth of horizons, color, texture, and pH;
- 7) moisture conditions, including depth to water table.

This report documents the site locations where these data were collected. Two other reports provide detailed analysis of the data collected: Halliwell and Apps (1997a) covers items 1–3, and Halliwell and Apps (1997b) covers items 4–7.

Using this Report

This report is broken into two sections. This first section discusses the information presented for each site, along with general information about the sites and data collection methods. The second section provides detailed information on individual sites. The second section is broken into four parts: tower sites, auxiliary sites in the Northern Study Area (NSA), near Nelson House, Manitoba, auxiliary sites in the Southern Study Area (SSA), north of Prince Albert, Saskatchewan, and transect sites, spread across the transect, outside the main study areas. Within each group, the sites are listed alphabetically by site code.

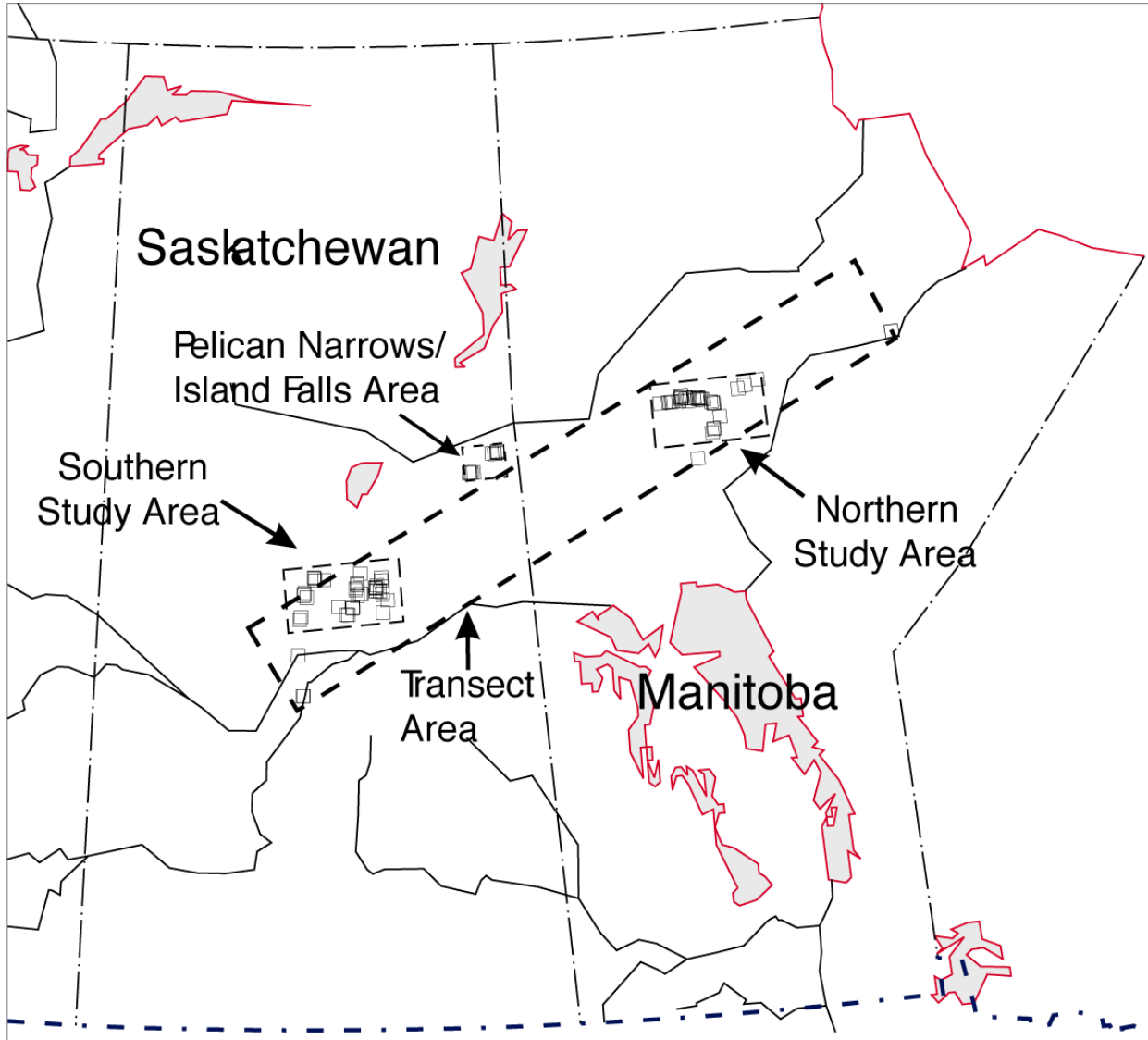


Figure 1. BOREAS site and study area locations.

Figure 1 shows the locations of the sites and study areas within Manitoba and Saskatchewan. Most of the sites are clustered in three areas: the NSA, the SSA, and the Pelican Narrows/Island Falls, Saskatchewan, area on the north side of the transect area near the Manitoba border. (Detailed maps of these areas are provided later in the report.)

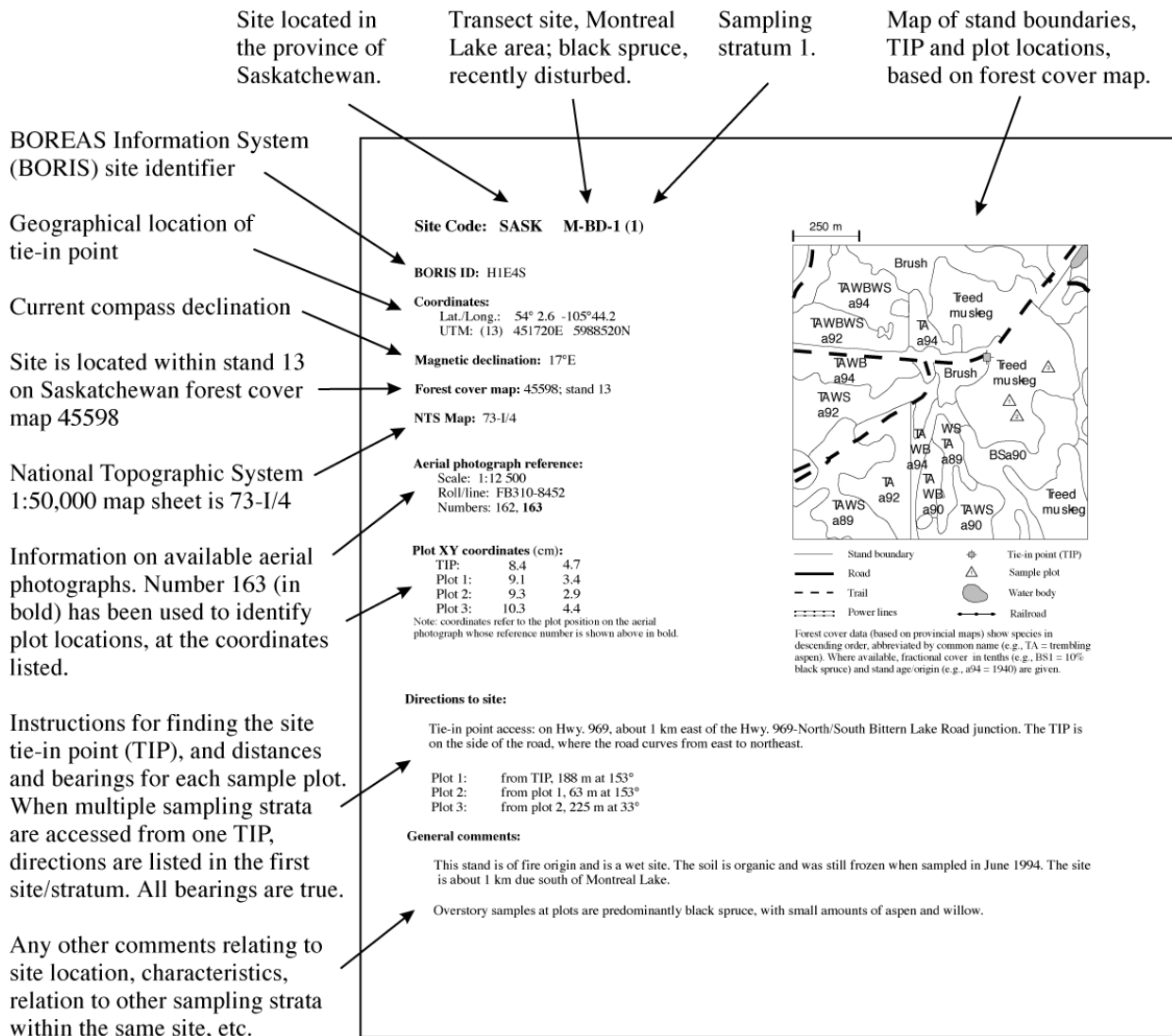


Figure2: Example page layout of site information.

Figure 2 provides an example of the format used to present site information in this report. Each site is displayed on a single page, in the format shown. Within each of the four groupings, sites are arranged alphabetically by site code (explained below).

During preliminary reconnaissance, each stand selected for observation was assigned a site code, based on a rough classification of overstory species, productivity, and maturity. If a particular site exhibited increased likelihood of variability (e.g. an uneven-aged mixedwood stand), then the stand was subdivided into strata. This was denoted by appending suffixes of a, b, etc., to the site code. While generally this was done based on information from air photographs, occasionally it was done in the field when it was observed that conditions had changed since the air photograph had been taken. Within each stand, one or more points were selected in the field. These points provided a center for overstory and understory sample plot placement, with various measurements being carried out over a 15- to 20-m radius of the central point. Generally, the different sampling points were located within 100–200 m of each other, but distances can range from less than 100 m to more than 500 m.

In this report, the following terminology is used to describe the site sampling hierarchy:

Site: a stand or group of stands identified and selected for sampling purposes.

Stratum: a sampling stratification. This usually coincides with the usage of suffixes a, b, etc.: stratum 1 of site MW-1 is called MW-1a; stratum 2 is called MW-1b, etc. Multiple strata occur when the initially identified stand was subdivided, as discussed above. This should not be confused with the use of stratum to indicate layers within a plant community, which is the common meaning in ecology (as opposed to forestry). Cauboue et al. (1996) list both meanings.

Plot: fixed geographical sampling point within a stratum or stand, where measurements of overstory and understory characteristics, soils, etc., are taken. Plot numbers were assigned within each site. If a site has more than one stratum, plot numbers may be spread across strata, for example, plots 1 and 3 in stratum 1 (site XXX-Na), and plot 2 in stratum 2 (site XXX-Nb). A sample plot can be a variable area (e.g., an overstory sample using point-sampling methods), or a fixed area (e.g., a 5 (5 m grid for understory vegetation).

The following information describes the fields listed for each site:

Site Code

The site code consists of three parts. The first part lists the province in which the site is located: either MAN (Manitoba) or SASK (Saskatchewan). The second part of the site code lists the site identifier in the Canadian Forest Service (CFS) data base. This identifier is an alphanumeric string of up to 14 characters, generally giving information about the type of site. Interpretation of the identifier depends on whether the site is an auxiliary site, a transect site, or a tower site.

Auxiliary sites:

Typically, the site identifier starts with a three letter code. The code describes the dominant species, the stand maturity, and the productivity of the stand. This code is followed by a number designating the stand, and optionally followed by a letter indicating a sampling stratum within a site.

Species code:	A	Aspen
	B	Black spruce
	J	Jack pine
Maturity code:	D	Recently disturbed (young)
	I	Immature
	M	Mature
Productivity code:	L	Low
	M	Medium
	H	High

Exceptions: Sites with no single dominant species are designated as mixed-wood stands, and are assigned the two letter site code MW. These stands have not been graded for maturity or productivity. One mixed-wood site in the Soutehrn Study Area (SSA) has been given the name Jail House, due to its location near a correctional facility. Another SSA site is of undetermined maturity, and is named B?L as a result.

Examples: JIH-5 refers to stand 5 of immature, high productivity jack pine.
MW-1b refers to mixed-wood site 1, stratum b.

Transect sites:

Transect site identifiers begin with a one- or two- letter code indicating the general geographic location of the site. The abbreviations are as follows:

B	Batoche	P	Paint Lake
F	Flin Flon	PA	Prince Albert National Park
G	Gillam	S	Sapochi River
M	Montreal Lake	SO	Soab Creek
N	Nelson House	T	Thompson
NI	Nisbet		

The location code is then followed by a two-letter code indicating the dominant species and maturity class, following the abbreviations used for the transect sites. Mixed- wood sites are given the single letter M, with no maturity class.

Examples: B-AM-1 refers to mature aspen site 1 near Batoche, Saskatchewan.
PA-M-1 refers to mixed-wood site 1 near Prince Albert National Park.
P-AM-1 refers to mature aspen site 1 near Paint Lake, Manitoba.

Tower sites:

Tower site identifiers begin with a two or three-letter code indicating the character of the tower measurements carried out at the site, as follows:

TE	Terrestrial ecology tower (BOREAS)
TF	Flux tower (BOREAS)
POM	Hydrological sites (John Pomeroy, NHRI) ²

The site code is then completed by a two or three-letter code indicating the species and maturity, using the following abbreviations:

MW	Mixed wood	OJP	Old Jack Pine
OA	Old Aspen	YA	Young Aspen
OBS	Old Black Spruce	YJP	Young Jack Pine

Examples: TE-OA is a terrestrial ecology tower in an old aspen site.
POM-YJP is a hydrological tower in a young jack pine site.

For all sites, the site code is completed with a number (in brackets) indicating the sampling stratum. Most sites consist of a single sampling stratum; presence of multiple strata are the result of variability within a site. In most cases, the presence of sampling strata within a site is also indicated by the use of a, b, or c suffixes in the site identifier, as discussed earlier. The example site identifier MW-1b also has a stratum number of 2. Some sampling strata, however, are not keyed as a, b, etc.: for example SASK BIH and SASK BMH are two strata within one site. At one time, this site had been classified as an immature site of high productivity, but closer examination revealed significant age differences and the second stratum was relabelled as a mature site.

BORIS ID

This is the site identifier within the BOREAS Operational Grid, used in the BOREAS Information System (BORIS) data base. These identifiers are listed in Table 3.5.3.6 of the BOREAS Experimental Plan, version 3 (Sellers, Hall, Baldocchi, Cihlar, Crill, den Hartog, Goodison, Kelly, Lettenmeier, Margolis, Ranson, and Ryan, 1995). Not all sites within the CFS database are contained within the BORIS database. Such sites have the entry "none" in this field.

Table 1 provides a cross-reference of BORIS ID to CFS site identifiers, for sites that have an assigned BORIS ID.

The BOREAS Operational Grid divides the study areas into 10- (10-km grid cells designated by letters, with positions designated in Y,X order. Each grid cell is further subdivided into 1 km (1 km cells indicated by the numbers 0–9. The letters indicate position as follows:

A	sites south or west of the SSA
B–N	SSA grid cells, starting in the southwest corner
O	sites falling between the SSA and NSA
P–Y	NSA grid cells, starting in the southwest corner
Z	sites falling east or north of the NSA

A fifth character is added to defining vegetation or site type:

A	Aspen	C	Clearing	F	Fen
M	Mixed wood	P	Pine	S	Spruce
T	tower site	W	Water	0-9	Multiple sites in cell

Examples:

S9P3A is an aspen site in the NSA, row S (9 km north), column P (3 km east).

A1A is an aspen site south or west of the SSA

Coordinates

Geographic coordinates of the site tie-in point (TIP) are given in latitude and longitude and Universal Transverse Mercator (UTM) grids, using North American Datum 1983 (NAD83).

Latitude and longitude are given in degrees, minutes, and tenths of minutes, with north latitude being positive and west longitude being negative. For example, 55°53.1' -98°52.8'.

UTM coordinates are given in the form (zone) easting northing.

TIP locations were identified on aerial photographs and forest cover maps in the field. Coordinates were taken from either forest cover maps or National Topographic System (NTS) maps. Saskatchewan sites used the forest cover maps, which provide NAD27 UTM grids. In Manitoba, the forest cover maps do not provide UTM or latitude and longitude grids, so NTS maps were used. When necessary, NAD27 coordinates were transformed to NAD83 coordinates using a program developed by BOREAS staff at National Aeronautical and Space Administration Goddard Space Flight Center.

Coordinates are believed to be accurate to within 100 m.

Table 1: Cross-reference from BORIS ID to Canadian Forest Service (CFS) site identifiers

Northern study area tower and auxiliary sites (MAN)		Southern study area tower and auxiliary sites (SASK)		Transect sites	
<u>BORIS ID</u>	<u>CFS code</u>	<u>BORIS ID</u>	<u>CFS code</u>	<u>BORIS ID</u>	<u>CFS code</u>
Q1V2M	MW-2	B9B7A	AIM-13	(SASK)	
S9P3A	AIH-14	C3B7X	TE-OA		
T0P5M	MW-1	D0H4X	TF-YA	A1A	B-AM-1
T0P7S	BMM-8	D0H6S	BMM-1	A2P	NI-J-1
T0P8S	BMH-7	D6L9A	ADH-2	H1E4S	M-BD-1
T2Q6A	TE-OA	D9G4A	AMH-16	H2D1M	PA-M-1
T3R8X	TE-OBS	D9I1A	AIH-3	H2D1S	PA-BM-1
T3U9S	BIM-12	D9I1M	TE-MW	H3D1M	PA-M-2
T4U5A	AIM-1	E7C3A	AMM-12	O1P	F-JM-1
T4U91-S	BIM-1	F1N0M	Jail House	O2S	F-BM-1
T4U92-S	BIH-1	F5I6P	JIH-4	O3S	F-BD-1
T5Q7S	BMH-6	F7J0P	JMH-5	O5P	F-JM-2
T6R5S	BIH-9	F7J1P	JMH-A2	O6P	F-JD-1
T6T6S	BIL-2	F7J1P	JMH-A1	O7S	F-BM-2
T7Q8X	TE-OJP	F8L6X	TF-YJP		
T7R9S	BDH-3	G1K9P	JMM-6	(MAN)	
T7S9P	JIM-4	G2I4S	BMH		
T7T3S	BML-21	G2I4S	BIH	O8M	SO-M-1
T8Q9P	JIH-2	G2L3X	TE-OJP	O9P	N-JM-1
T8S9P	JDH-3	G2L7S	B?L	P7V1A	P-AM-1
T8T1P	JDM-1	G4I3M	MW-1	Q3V3P	P-JM-1
T9Q8P	JIL-1	G4K8P	JMM-5	R8V8A	T-AM-1
V5X7A	AIH-30	G6K8S	BMH-9	T8S4A	S-AD-1
W0Y5A	AIM-20	G7K8P	JMM-8a		
		G8I4X	TE-OBS		
		G8K8P	JMM-8b		
		G8L6P	JDM-8		
		G9I4S	BDL-20		
		G9L0P	JMH-10		
		I2I8P	JIH-7		

Magnetic declination

The compass declination in degrees from true north. This value is based on National Topographic System map information of magnetic declination and drift, adjusted to give a value appropriate to the year 1994. In some cases, map information can be 20 or more years old. Changes in drift rate over the relevant time periods is unknown.

Information used at the time of field measurements often listed magnetic declinations that were either not adjusted for drift, or given as zero where no information was available at the time. All compass bearings used in the field for plot locations (listed in the Directions to Site field) have been adjusted to use the 1994 declination listed in this report.

Forest cover map

This field indicates map and stand information for available forest or vegetation maps. Three basic sources of maps were used:

Manitoba Department of Natural Resources, Provincial Forest Inventory Maps

These maps are compiled from aerial photographs at a scale of 1:15,840. Each map covers a township, which is 6 (6 miles, giving an area of 36 square miles (about 93 km²). Maps identify stands by numbers, assigned within each map; a separate legend sheet for each map provides details about each stand. Stand numbers 1–699 are productive forested land; 700–799 are non-productive forested land; 800–899 are non-forested land; 900 is water.

Maps are identified by township and range numbers, and whether they are east or west of the Prime Meridian. For example, map T79R10W1 is township 79, range 10, west of the Prime Meridian.

Stand numbers are obtained from maps on file at CFS. At the time these maps were obtained, the Manitoba Department of Natural Resources was still implementing their Geographical Information System, and some maps contained incomplete data. Occasionally, stand information is missing, indicated by the entry "no stand number".

Saskatchewan Department of Tourism and Renewable Resources, Inventory Maintenance Maps

These maps are compiled from aerial photographs at a scale of 1:12,500. Each map covers a 10- by 10-km area, based on the UTM grid (NAD27). Stand information coded on the map includes a stand number, species, age, height, and canopy information.

Map numbers are based on the UTM coordinates of the lower left corner, in easting/northing order. For example, map 51597 has a lower-left coordinate of 510000E 5970000N.

Stand numbers are obtained from the map sheets.

Parks Canada

Within Prince Albert National Park (PANP) and Batoche National Historic Park (BNHP), no provincial forest inventory maps are compiled. Alternate sources of vegetation maps were used. Prince Albert National Park is covered by a series of maps based on 1968 data. Within the CFS database, the map designation PANPSE indicates the southeast map sheet of the PANP series. Site B-AM-1 is within BNHP, and vegetation information is derived from a map included in Hooper (1988).

NTS map

This field provides the 1:50,000 scale map number within the National Topographic System of Canada series available from Energy, Mines and Resources (Natural Resources Canada).

Aerial photograph reference

Details regarding aerial photographs used in site examination and analysis. Three fields provide the scale of the photograph, the roll and/or line number, and the photograph number. Whenever possible, multiple photograph numbers are indicated that provide stereo coverage of the site. The number in bold indicates the photograph that has been used to locate the site tie-in point (TIP) and plot locations (listed in the Plot XY coordinates field).

Three sources of aerial photographs have been used:

Province of Manitoba

- roll or line numbers begin MB, typically followed by a five-digit number

Province of Saskatchewan, Forests and Land Branch, Natural Resources

- roll numbers indicated by FB and a three-digit number, plus a four-digit line number

Government of Canada, National Air Photo Library (NAPL)

- roll or line numbers begin A, followed by a five-digit number.

Scales are nominal: exact scales depend on aircraft and terrain altitude, and are usually not constant even within a single photograph.

In many cases, a site will be located on other aerial photographs as well. If another aerial photograph is known to show the site, the information will be included in the General comments field.

Plot XY coordinates

Coordinates (X,Y) indicate pairs of distances, in centimetres, from the fiducial mark in the lower left corner (southwest) of the aerial photograph to the TIP and sample plots for the site. Figure 3 shows a portion of the aerial photograph for site SASK M-BD-1 (1), showing the fiducial mark, with the site TIP and plot locations overlaid.

The TIP location was identified visually on the aerial photograph, and the X and Y distances measured using a ruler. Sample plot coordinates were then calculated from the TIP coordinate using the compass bearings and distances given in the Directions to site field. The nominal scale of the aerial photograph was used, and the calculations assumed that the photograph was aligned with true north.

Errors in sample plot coordinates will depend on three sources: aerial photograph alignment, variations from the nominal scale, and field navigation errors. Random checks of alignment showed errors of less than 3 degrees from true north. Field navigation errors result from incorrect bearing or distance; success in returning to plots for further sampling or measurement indicates that most positions are likely accurate to within 20 m in the field. Errors should be small with short distances between plots, and increase as distance increases.

XY coordinates are only listed for sample plots within the current sampling stratum. With multiple sampling strata, navigation from plot to plot usually uses a single TIP and plots can alternate between strata.

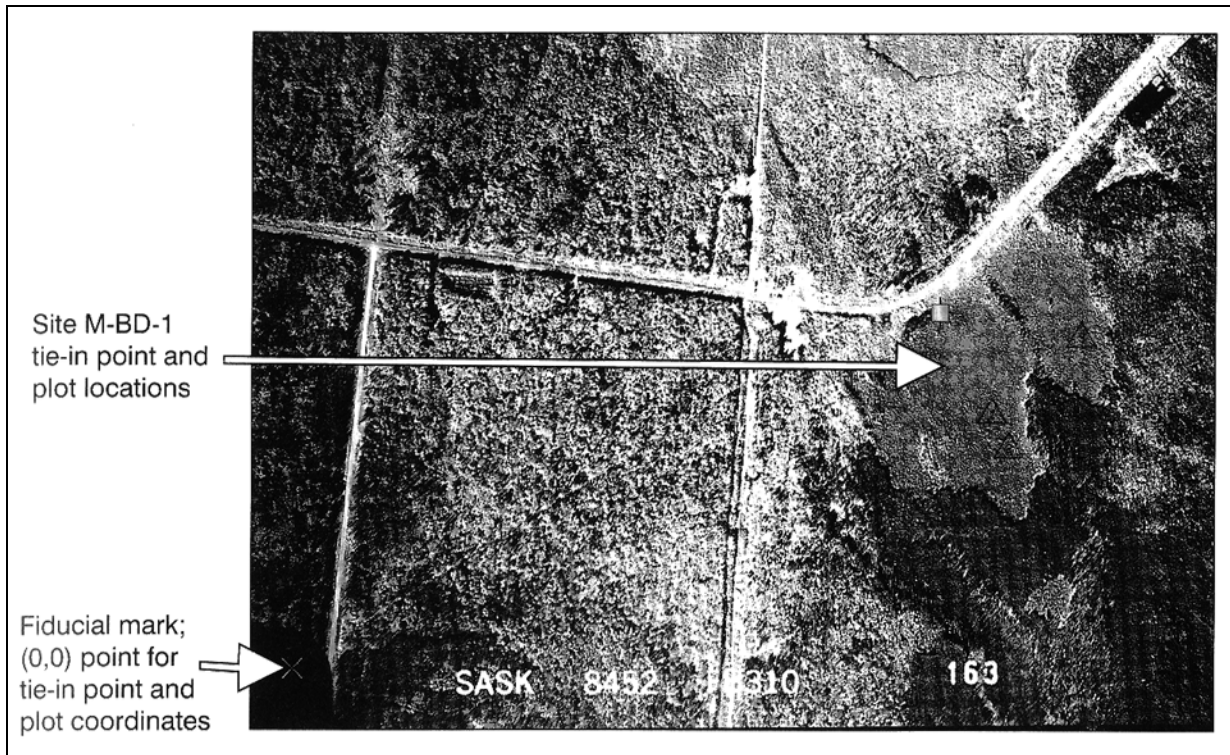


Figure 3: A portion of the aerial photograph for site SASK M-BD-1.

Directions to site

Information is provided in two sections. The first section gives a verbal description of how to find the site TIP. The instructions start with a general location, followed by distances and directions for vehicle access from major identifiable features (e.g., road intersections, rivers, landmarks, etc.) The second section provides a plot-by-plot listing of distances and bearings between plots.

The origin of all sample plot navigation is the site TIP. Sample plots are typically accessed sequentially, so that finding plot 3 will usually mean navigating via plots 1 and 2. This was not always the case, however, since extra sample plots added after the initial site visit could originate from plots in non-sequential order. The directions explicitly state which point (TIP or plot number) is the origin for navigation to the current plot.

All bearings are given in degrees from true north. Field navigation should adjust compass bearings using the value in the Magnetic declination field. All bearings provided in this report have been adjusted from field values so that they match the given compass declination, as previously discussed.

Multiple sampling strata (catalogued as individual sites, usually with a, b, etc. suffixes) are often accessed from a single TIP. In this case, directions to all plots are repeated within each site listing. The listing indicates which stratum each plot is in.

General comments

Miscellaneous information about the stand or site. This field may contain information on additional aerial photographs, or revisions of site codes. An indication is given of the dominant species encountered at each plot, based on the sample data collected on overstory characteristics. Detailed data and analysis of overstory characteristics are provided in Hallwiell and Apps (1997a).

Site map

The upper right corner of each page provides a map of each site, showing stand information, major features, and TIP and sample plot locations. These maps have been based on the available forest cover maps. Scale varies, depending on the source of the data. These maps are not intended for navigation purposes, but serve to indicate the general positioning of sample plots with respect to stand boundaries and other geographical features. Each map is oriented with north at the top of the figure.

The forest cover information provided has been adapted from the sources listed in the Forest cover map field, and varies with the source. Table 2 lists the species abbreviations used on the maps, with an indication of the common names and tree species.

Table 2: Tree species abbreviations used in the site maps

<u>Abbreviation</u>	<u>Species</u>	<u>Common Name</u>
BF	<i>Abies balsamea</i> (L.) Mill.	Balsam fir
BP	<i>Populus balsamifera</i> L.	Balsam poplar
BS	<i>Picea mariana</i> (Mill.) BSP	Black spruce
JP	<i>Pinus banksiana</i> Lamb.	Jack pine
TA	<i>Populus tremuloides</i> Michx.	Trembling aspen
TL	<i>Larix laricina</i> (Du Roi) K. Koch	Tamarack (larch)
WB	<i>Betula papyrifera</i> Marsh	Paper (white) birch
WS	<i>Picea glauca</i> (Moench) Voss	White spruce

Manitoba and Saskatchewan have varying degrees of identification of non-productive forested land. The site maps provided in this report have used a simplified scheme of terms, such as Muskeg, Treed rock, etc.

Maps based on Saskatchewan forest inventory maps show species in descending order, with an indication of the age of origin of the stand. A stand typed as JPWS is predominantly jack pine, followed by white spruce. Where the age of a stand is known, it is indicated in 10-year increments, using a two-digit number prefixed with the letter a: the number is the middle two digits of the 4-digit year, e.g., a89 indicates a stand originating in 1890 (± 5 years). Some stands are not aged on the forest inventory maps (e.g., in the Pelican Narrows area), and some maps use 20-year age classes.

Maps based on Manitoba forest show species in descending order. Productive stands usually give an indication of the fraction (in tenths) of the total basal area attributable to each species. For example, TA8BS2 indicates a stand with 80% Trembling Aspen and 20% Black Spruce. Non-productive stands (stand numbers 700–799) only provide limited species information, e.g., number 701 indicates at least 51% black spruce, and is denoted BS on the site maps.

Maps based on other sources have been adapted to fit generally into the previously discussed scheme as closely as possible: species in descending order, with fractions if available. Where forest cover or vegetation maps are not available, stand boundaries have been identified using available aerial photography, with no attempt to identify species composition.

In all cases, the maps presented here represent a summary of other map sources, and do not include any analysis of data collected at these sites within the BOREAS field program. Analysis of Canadian Forest Service data is contained in Halliwell and Apps (1997a and 1997b). All sources of map information contain many additional items: the original sources should be consulted for more details.

Site Data Groupings

Within the site information section of this report, sites are grouped into four sections: tower sites, northern study area auxiliary sites, southern study area auxiliary sites, and transect sites. Geographically, there are three major regions where sites are located: the NSA, the SSA, and the Pelican Narrows/Islands Falls area northwest of Flin-Flon. Of the 27 transect sites, about half are located within the SSA or NSA, and 12 are near Pelican Narrows. The three major geographical areas are shown in Figures 4-6.

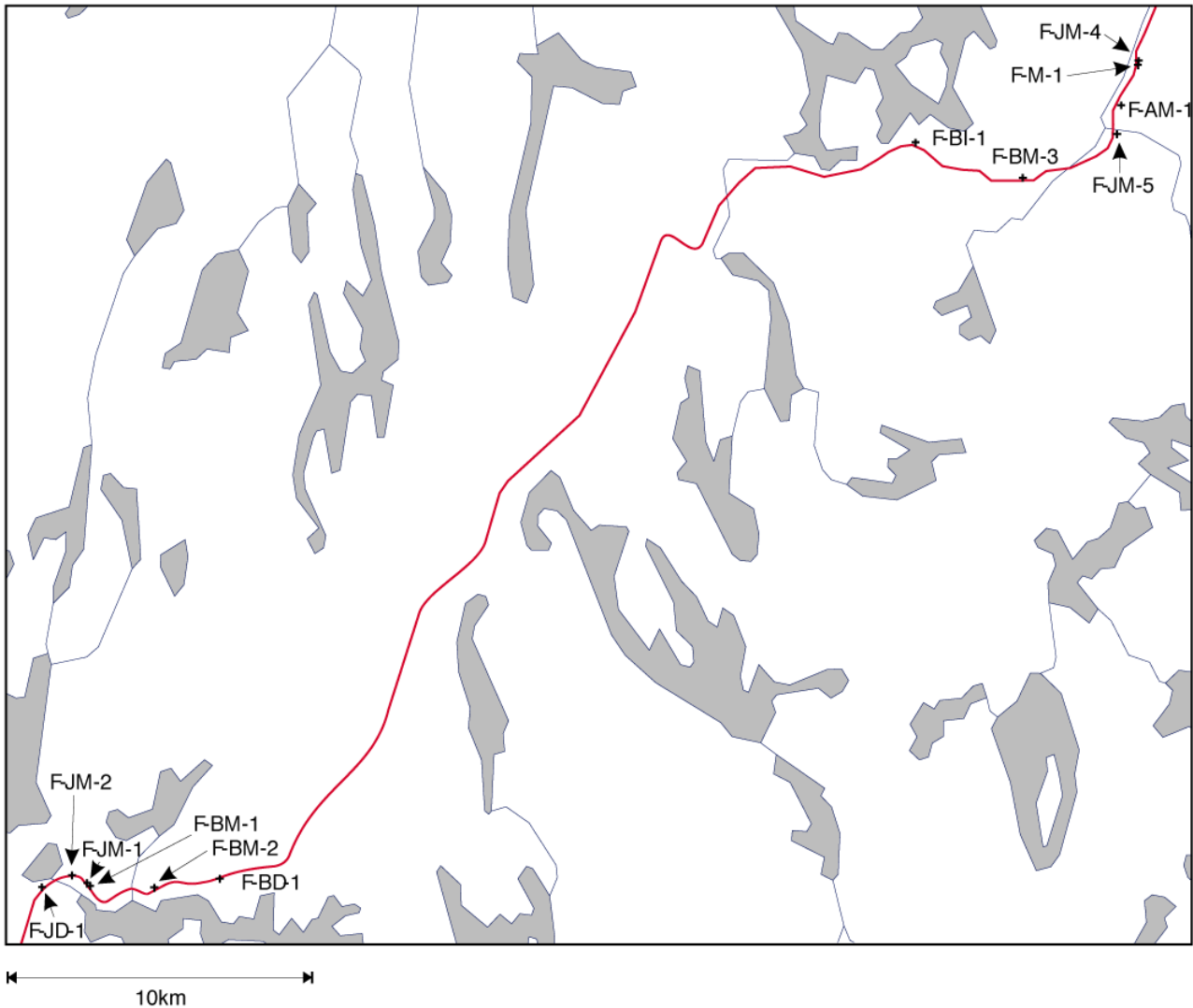
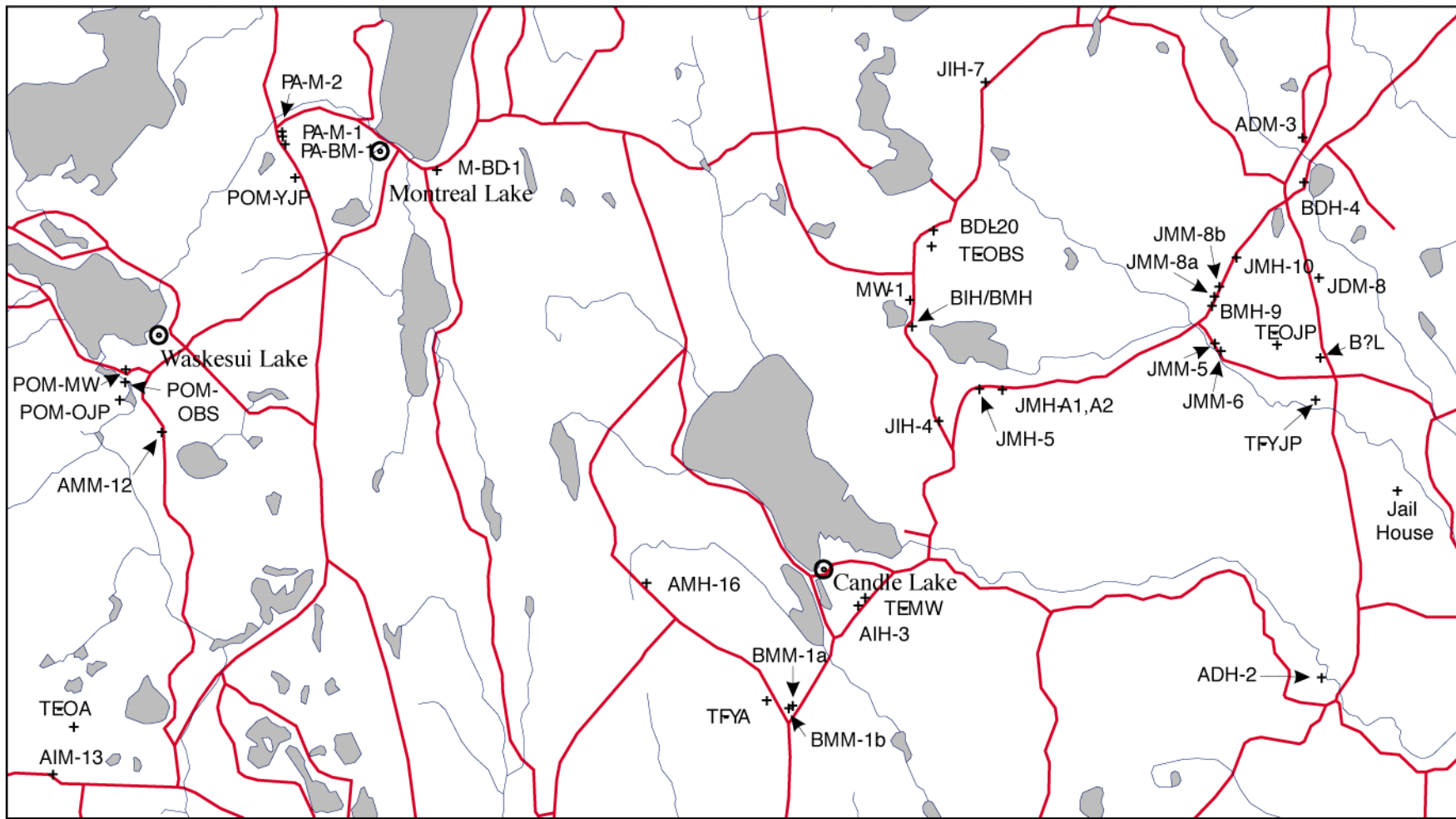


Figure 4. Transect site in the Pelican Narrows-Island Falls area.



20km

Figure 6: Auxillary, transect, and tower sites in the Southern Study Area.

During the site selection process, the sites were divided into classes both by maturity and by level of productivity, according to the dominant tree species. maturity classes were recently disturbed (young), immature, and mature. Productivity levels were low, medium, or high. (This is the classification that provides the basis for the CFS site code, as discussed earlier.) The criteria for assigning species dominance, maturity, or productivity were qualitative. Note that these site codes were assigned prior to detailed field work; for more detailed analysis of site characteristics, the data in Halliwell and Apps (1997a) should be consulted.

Within the site selection process, a concerted effort was made to ensure optimum distribution of stands among the different maturity classes and productivity levels. It was impossible to obtain uniform distribution because certain combinations of maturity classes and productivity levels are quite rare for some species (e.g. young trembling aspen stands generally do not have low productivity).

Tables 3 and 4 show the results of this classification for the NSA and SSA. Mixed-wood stands were not classified by maturity or productivity level because of their mixed species composition. Therefore only the total number of sites appears for this column in all tables. Each sampling stratum is counted as one site: e.g., MW-1a and MW-1b are counted as two mixed-wood sites. Tower sites are not included in the totals.

Tables 3 and 4 clearly show that a number of stand types are missing from the maturity class/productivity level combinations. To attempt to fill in some of these gaps, the transect study area was created and further stands were identified and sampled; however, productivity levels are not available for all of these stand types. The data is summarized by maturity class and species type within the northern and southern areas in Tables 5 and 6.

Some large gaps in the NSA are filled by the transect sites, particularly mature jack pine and young and mature trembling aspen, which were absent before. Likewise, for the SSA a large gap is filled by the transect stands, particularly for black spruce sites.

When examining the species and productivity levels covered by the transect sites, keep in mind that these sites cover a wider geographical and environmental range than the sites within either the NSA or the SSA.

Table 3: Classification of Northern Study Area Auxillary Sites

Productivity	Black Spruce			Jack Pine			Trembling Aspen			Mixed Wood	Total
	High	Med	Low	High	Med	Low	High	Med	Low		
Mature	2	2	1	0	0	0	0	0	0	n/a ^a	
Immature	4	4	1	1	1	1	2	2	0	n/a	
Recently disturbed	2	0	0	1	1	0	0	0	0	n/a	
Totals	8	6	2	2	2	1	2	2	0	4	28

^a n/a = not applicable.

Table 4: Classification of Southern Study Area Auxillary Sites

Productivity	Black Spruce			Jack Pine			Trembling Aspen			Mixed Wood	Total
	High	Med	Low	High	Med	Low	High	Med	Low		
Mature	2	2	0	4	4	0	1	1	0	n/a ^a	
Immature	1	0	0	2	0	0	1	1	0	n/a	
Recently disturbed	1	0	1	0	1	0	1	1	0	n/a	
Totals	4	2	2 ^b	6	5	0	3	3	0	3	28

^a n/a = not applicable.

^b Age not recorded for one site (B?L).

Table 5: Classification of Manitoba Transect Sites

	Black Spruce	Jack Pine	Trembling Aspen	Mixed Wood	Total
Mature	0	2	2	n/a ^a	
Immature	3	0	0	n/a	
Recently disturbed	0	0	1	n/a	
Totals	3	2	3	1	9

^a n/a = not applicable.

Table 6: Classification of Saskatchewan Transect Sites

	Black Spruce	Jack Pine	Trembling Aspen	Mixed Wood	Total
Mature	4	4	2	n/a ^a	
Immature	1	0	0	n/a	
Recently disturbed	2	1	0	n/a	
Totals	7	6	2	3	18

^a n/a = not applicable.

References

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Sellers, P.; Hall, F.; Margolis, H.; Kelly, B.; Baldocchi, D.; den Hartog, G.; Cihlar, J.; Ryan, M.G.; Goodison, B.; Crill, P.; Ranson, K.J.; Lettenmaier, D.; Wickland, D.E. 1995. "The Boreal Ecosystem-Atmosphere Study (BOREAS): An Overview and Early Results from the 1994 Field Year", Bull. Am. Met. Soc., **76**, 1549- 1577.

Tower Sites

Site Code: MAN TE-OA (1) Tower Site

BORIS ID: T2Q6A

Coordinates:

Lat./Long.: 55°53.3' -98°40.6'
UTM: (14) 520242E 6193626N

Magnetic declination: 7°E

Forest cover map: T79R8W1; no stand number

NTS Map: 63-O/15

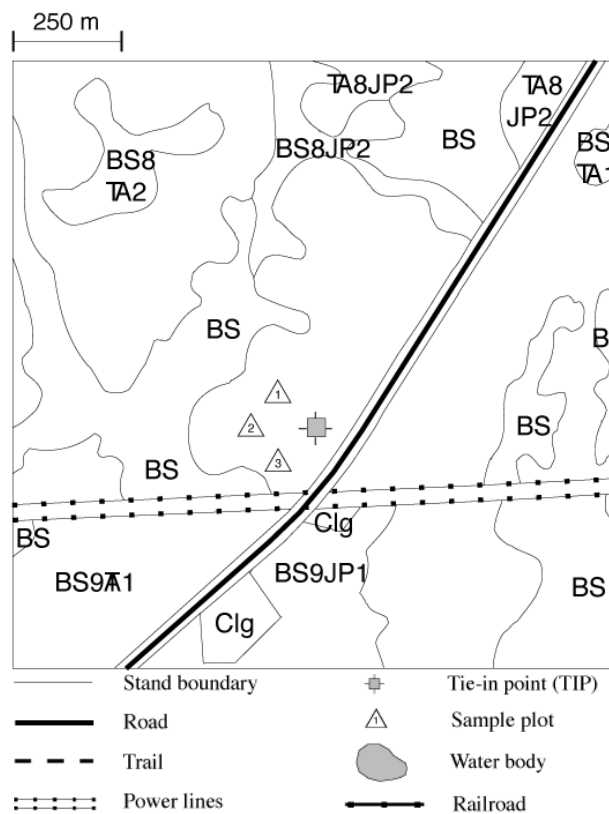
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: 237, **238**

Plot XY coordinates (cm):

TIP:	4.9	7.2
Plot 1:	4.3	7.7
Plot 2:	3.9	7.2
Plot 3:	4.3	6.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Burntwood River bridge, travel about 63.5 km west on Hwy. 391 to the terrestrial ecology tower access trail on the north side of the road (about 200 m east of the powerline). This point is 6.5 km west of the sand/gravel pit entrance for TE-OJP. Follow the trail for 105 m at 317° to a fork in the trail, then proceed 30 m at 28° to the terrestrial ecology tower. The tower is the TIP.

Plot 1: from TIP, 125 m at 306°
Plot 2: from plot 1, 100 m at 216°
Plot 3: from plot 2, 100 m at 136°

General comments:

Overstorey samples at all plots are pure aspen except plot 3, which has a small amount of jack pine.

Site Code: MAN TE-OJP (1) Tower Site

BORIS ID: T7Q8X

Coordinates:

Lat./Long.: 55°55.6' -98°37.5'
UTM: (14) 523482E 6197976N

Magnetic declination: 7°E

Forest cover map: T80R8W1; stand 144

NTS Map: 63-O/15

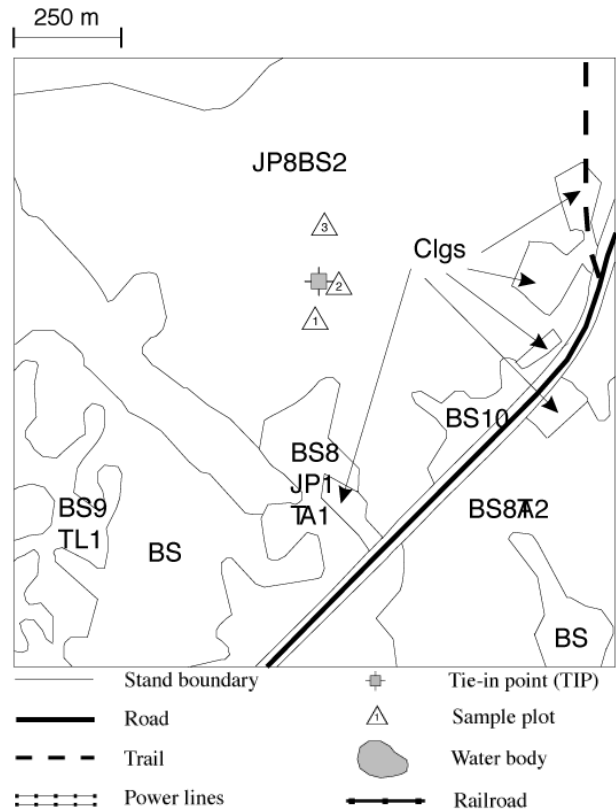
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: **216, 217**

Plot XY coordinates (cm):

TIP:	8.7	7.8
Plot 1:	8.6	7.2
Plot 2:	9.0	7.8
Plot 3:	8.8	8.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Burntwood River bridge, travel 56.8 km east on Hwy. 391 to the large gravel pit on the north side of the highway, then continue another 700 m to the entrance of another sand/gravel pit. Follow the gravel pit road north for 170 m, to a trail heading west. Follow this trail from the edge of the clearing, west for 197 m, then head 40 m at 190° to the terrestrial ecology Tower. The terrestrial ecology tower is the TIP.

Plot 1: from TIP, 100 m at 187°
Plot 2: from TIP, 50 m at 97°
Plot 3: from TIP, 125 m at 7°

General comments:

Overstory samples at all plots are pure jack pine.

Site Code: SASK POM–MW (1) Tower Site

BORIS ID: none

Coordinates:

Lat./Long.: 53°53.6' –106°7.4'
UTM: (13) 426220E 5972170N

Magnetic declination: 17°E

Forest cover map: PANP–SE; no stand number

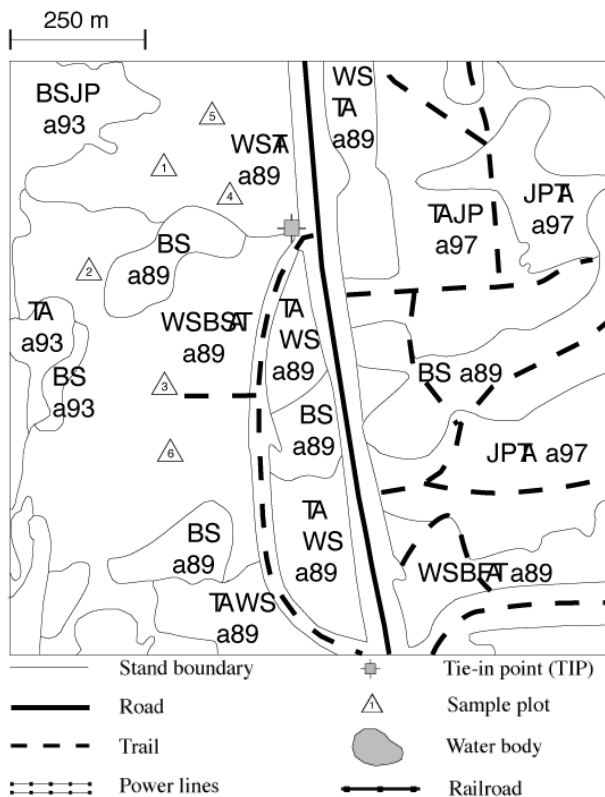
NTS Map: 73–G/16

Aerial photograph reference:

Scale: 1:12 500
Roll/line: A27613
Numbers: 198, 199

Plot XY coordinates (cm):

This photograph has not been examined by CFS staff. Plot coordinates have not been determined.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: head south from the Waskesui Lake town site on the scenic route, and proceed west on the Narrows Road. Park on the Narrows Road, about 400 m west of the junction with the road to the heliport/fire-fighters cabin. Follow the trail on the north side of the road for about 150 m to the tower. The tower is the TIP.

- Plot 1: from the TIP, 30 m at 250°
- Plot 2: from the TIP, 20 m at 130°
- Plot 3: from the TIP, 25 m at 10°

General comments:

Field notes state that the stand is variable; mainly aspen, some white spruce in patchy fashion, occasional jack pine and balsam fir. The tower is on top of a ridge; the ridge slopes down northward, and is fairly level east–west.

On the map, the plots are not marked due to their proximity to the TIP and the small scale of map.

Overstory samples at all plots are predominantly aspen, with small amounts of white spruce.

Site Code: SASK POM-OBS (1) Tower Site

BORIS ID: none

Coordinates:

Lat./Long.: 53°53.0' -106°7.4'
UTM: (13) 426170E 5971120N

Magnetic declination: 17°E

Forest cover map: PANP-SE; no stand number

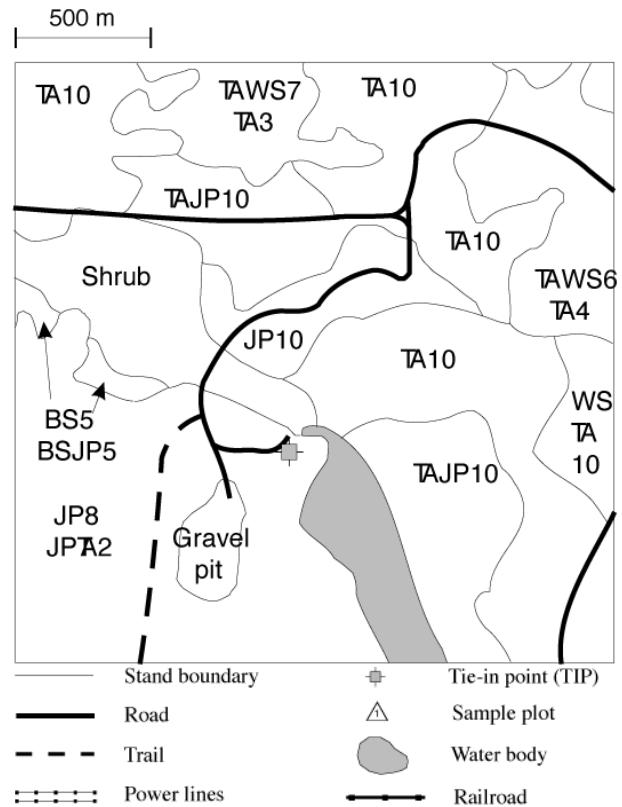
NTS Map: 73-G/16

Aerial photograph reference:

Scale: 1:12 500
Roll/line: A27613
Numbers: 198, 199

Plot XY coordinates (cm):

This photograph has not been examined by CFS staff. Plot coordinates have not been determined.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of the road to the fire-fighters cabins (accessible off the Narrows Road, 400 m east of the access to the POM-MW site), about 100 m south of the cabin area. Follow the path leading down the slope from the road, into the black spruce stand. The TIP is the Nipher snow gauge.

Plot 1: from TIP, 30 m at 77°
Plot 2: from TIP, 30 m at 246°

General comments:

Field notes state that the stand runs northeast-southwest, on the side of a ridge that slopes southeast to a swampy area at the edge of Shady Lake. From plot 1, the stand boundary is 20 m to the north, and 15 m to the south where there is more tamarack and the stand is more open. The land slopes upward 30 m to the east, and more white spruce is seen in a more open stand. From plot 2, the stand boundaries are found 30 m to the west and 15 m to the north. The stand extends well to the south.

On the map, the plots are not marked due to their proximity to the TIP and the small scale of map.

Overstorey sample at plot 1 is predominantly black spruce, with some tamarack. Plot 2 is pure black spruce.

Site Code: SASK POM-OJP (1) Tower Site

BORIS ID: none

Coordinates:

Lat./Long.: 53°52.2' -106°7.8'
UTM: (13) 425720E 5969670N

Magnetic declination: 17°E

Forest cover map: PANP-SE; no stand number

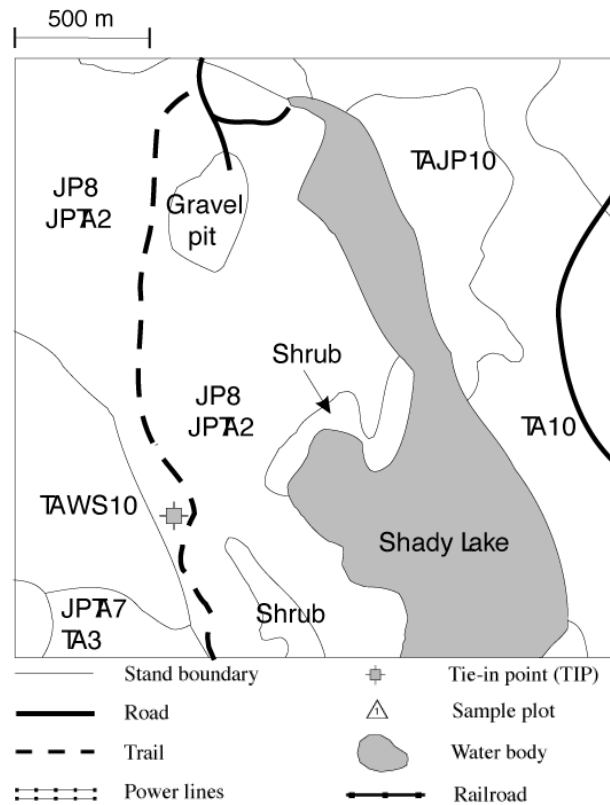
NTS Map: 73-G/16

Aerial photograph reference:

Scale: 1:12 500
Roll/line: A27615
Numbers: 177, 178

Plot XY coordinates (cm):

This photograph has not been examined by CFS staff. Plot coordinates have not been determined.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: park at the north end of the Freight Trail, where it can be accessed from the road to the fire-fighters cabins, on the way to site POM-OBS. Walk 1.7 km south along Freight Trail, to the tower location on the west side of the trail. The main meteorological tower is the TIP.

Plot 1: from TIP, 30 m at 337°
Plot 2: from TIP, 50 m at 220°

General comments:

Field notes state that this is a small stand, elongated north-south. Aspen and balsam poplar to the west and south; aspen to the north; younger aspen to the east and northeast. Stand boundaries from plot 1: 30 m north, 30 m east, and 10 m west. Stand boundaries from plot 2: 70 m south, 60 m east, and 30 m west.

On the map, the plots are not marked due to their proximity to the TIP and the small scale of map.

Overstory samples at both plots are pure jack pine.

Site Code: SASK POM-YJP (1) Tower Site

BORIS ID: none

Coordinates:

Lat./Long.: 54°2.3' -105°54.8'
UTM: (13) 440110E 5987910N

Magnetic declination: 17°E

Forest cover map: 44598; stand 9

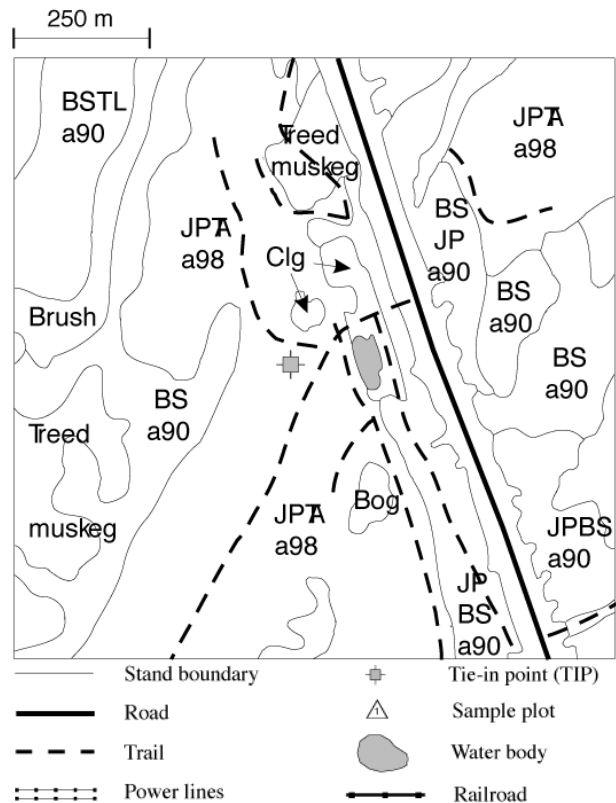
NTS Map: 73-I/4

Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB310-8452
Numbers: 152, 153

Plot XY coordinates (cm):

This photograph has not been examined by CFS staff. Plot coordinates have not been determined.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the west side of Hwy. 2, 8.1 km north of the Hwy. 2/Hwy. 969 (Montreal Lake) junction. Park vehicle on the access road (blocked by a berm), adjacent to the power pole (east side of road) numbered 68 at the top. (Every tenth pole is marked.) Walk west along the access road to the fork (150 m from road). Take the northwest branch for 20 m to a trail leading at 220°. Follow the trail for 65 m to the tower. The tower is the TIP.

From the TIP, proceed 15 m at 180° to the plot reference point. Three fixed area plots, 1 (30 m), were set up on the outside of a 30-m equilateral triangle, with sides oriented at bearings of 180, 60, and 300° (starting at the reference point).

General comments:

Field notes state that the site was logged, trenched, and replanted with jack pine in about 1984. Trenching runs at 30/210°. Mainly jack pine, with some aspen, and occasional young black spruce (<50 cm tall).

On the map, the plots are not marked due to their proximity to the TIP and the small scale of map.

Overstory samples at all plots are almost entirely jack pine, with traces of aspen and balsam poplar.

Site Code: SASK TE-MW (1) Tower Site

BORIS ID: D9I1M

Coordinates:

Lat./Long.: 53°43.8' -105°12.0'
 UTM: (13) 486820E 5953440N

Magnetic declination: 17°E

Forest cover map: 48595; stand 819

NTS Map: 73-H/11

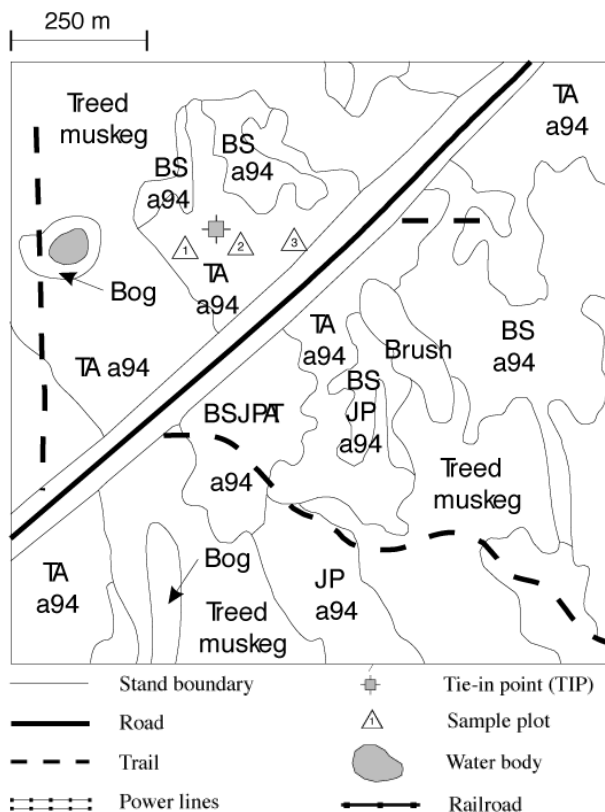
Aerial photograph reference:

Scale: 1:12 500
 Roll/line: FB299-8470
 Numbers: **52, 53**

Plot XY coordinates (cm):

TIP: 14.6 16.1
 Plot 1: 14.2 15.8
 Plot 2: 15.0 15.9
 Plot 3: 15.8 15.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Hwy. 120-Hwy. 265 junction proceed 3.7 km north on Hwy. 120. On the west side of the road is flagging, which leads to the terrestrial ecology tower—mixed wood. This point is 0.9 km north of the AIH-3 TIP. The TIP is the terrestrial ecology tower.

Plot 1: from TIP, 50 m at 268° (along the cutline) and 30 m at 178°
 Plot 2: from plot 1, 100 m at 88°
 Plot 3: from plot 2, 100 m at 88°

General comments:

Overstory samples at plots are mainly aspen. Balsam poplar, white spruce, black spruce, and willow are also present.

Site Code: SASK TE-OA (1) Tower Site

BORIS ID: C3B7X

Coordinates:

Lat./Long.: 53°37.7' -106°10.8'
UTM: (13) 421970E 5942870N

Magnetic declination: 17°E

Forest cover map: PANP-SE; no stand number

NTS Map: 73-G/9

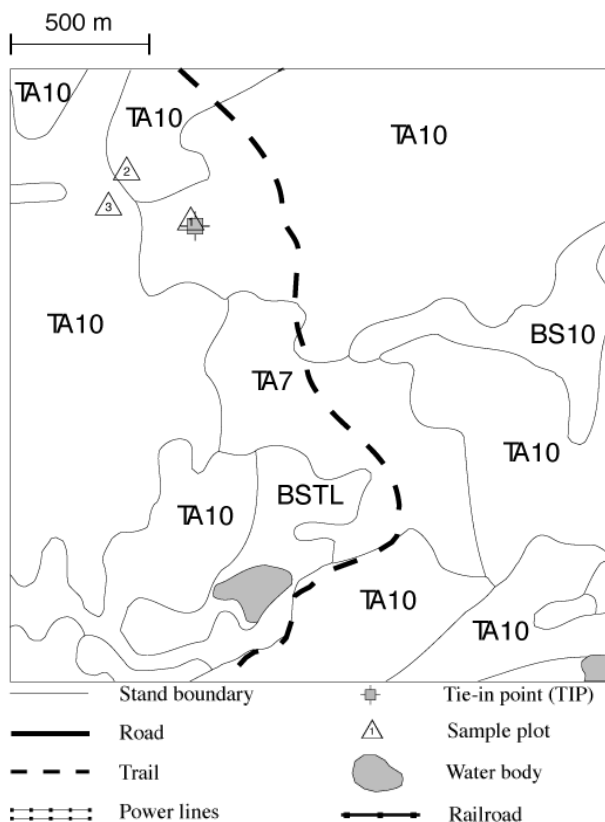
Aerial photograph reference:

Scale: 1:12 500
Roll/line: A27617
Numbers: **80, 81**

Plot XY coordinates (cm):

TIP:	9.3	17.9
Plot 1:	9.3	18.0
Plot 2:	7.4	19.5
Plot 3:	6.8	18.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the East-West South Park Boundary Road (Prince Albert National Park) and the Fish Lake Trail junction, proceed north on the Fish Lake Trail 7.0 km to the Old Aspen flux tower trail heading west. From this junction proceed 150 m west to the terrestrial ecology tower, which is visible from the trail. The terrestrial ecology tower is the TIP.

Plot 1: from TIP, 15 m at 348°
Plot 2: from plot 1, 300 m at 308°
Plot 3: from plot 2, 150 m at 210°

General comments:

Overstory samples at all plots are pure aspen.

Site Code: SASK TE-OBS (1) Tower Site

BORIS ID: G8I4X

Coordinates:

Lat./Long.: 53°59.3' -105°7.1'
UTM: (13) 492270E 5982270N

Magnetic declination: 17°E

Forest cover map: 49598; stand 770, 771

NTS Map: 73-H/14

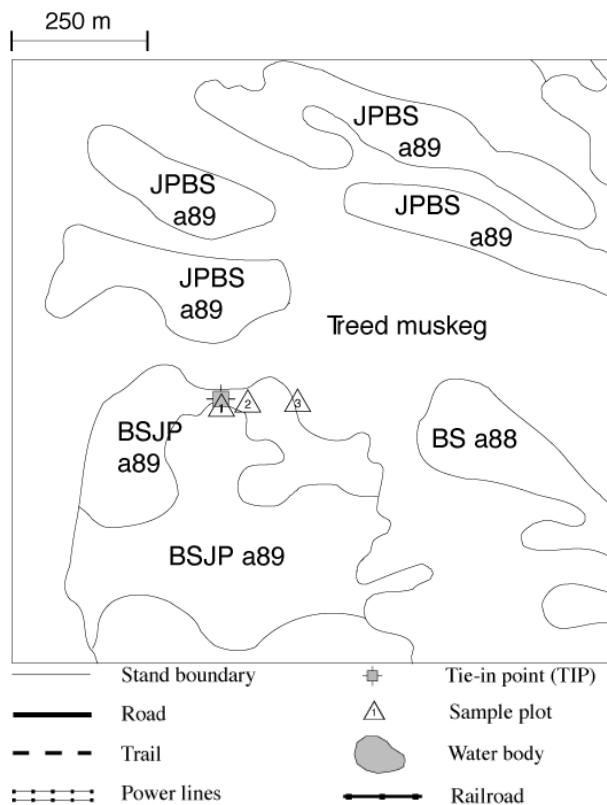
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB309-8455
Numbers: 53, 54

Plot XY coordinates (cm):

TIP:	7.4	2.9
Plot 1:	7.4	2.8
Plot 2:	7.8	2.9
Plot 3:	8.6	2.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: proceed 19.4 km north of the Hwy. 120-Hwy. 913 junction on Hwy. 913 and 9.7 km north of the Heritage Lake picnic area entrance. The TIP is on the east side of the road. Follow the boardwalk for 1.5-2 km, just past the CH₄ Flux Chamber (outhouse). The terrestrial ecology tower is on the left about 50 m in. The TIP is situated at a tower anchor tree.

Plot 1: from TIP, 10 m at 178°
 Plot 2: from plot 1, 50 m at 78°
 Plot 3: from plot 2, 100 m at 88°

General comments:

The terrestrial ecology tower is the TIP and is about 100 m short of the flux tower equipment house.

The site is also covered by aerial photographs FB309-8456, numbers 232 and 233.

Overstorey samples at all plots are predominantly black spruce. Plots 2 and 3 have some tamarack.

Site Code: SASK TE-OJP (1) Tower Site

BORIS ID: G2L3X

Coordinates:

Lat./Long.: 53°54.9' -104°41.2'
UTM: (13) 520600E 5974190N

Magnetic declination: 17°E

Forest cover map: 52597; stand 324

NTS Map: 73-H/15

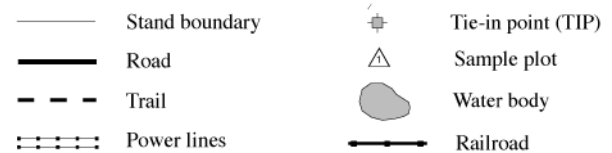
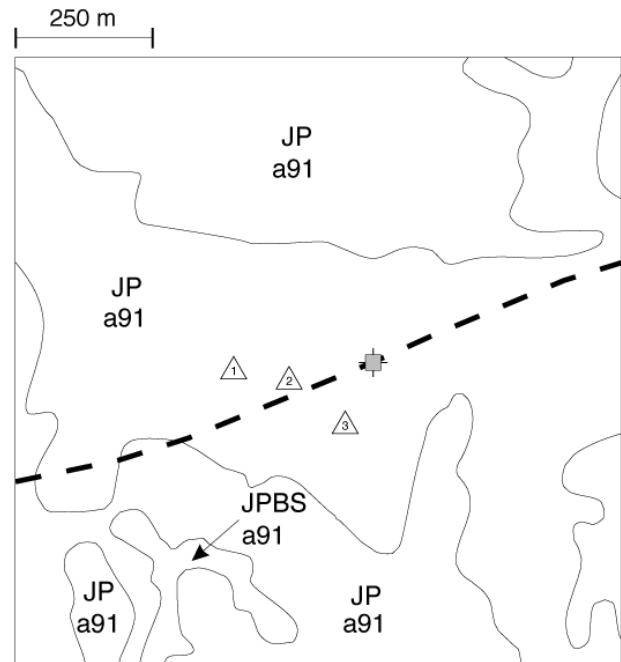
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB307-8459
Numbers: **194, 195**

Plot XY coordinates (cm):

TIP:	7.4	3.4
Plot 1:	5.4	3.3
Plot 2:	6.2	3.2
Plot 3:	7.0	2.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: proceed 2.8 km north of the Harding Road-Hwy. 106 junction on Hwy. 106 to the access road on the west side of Hwy. 106. Follow the trail for about 5 km to the trail-tower road junction (0.7 km past the lake). The junction is the TIP.

Plot 1: from TIP, 250 m at 268°
Plot 2: from plot 1, 100 m at 98°
Plot 3: from plot 2, 150 m at 138°

General comments:

Field notes state that the site is a pure jack pine stand.

Overstorey samples for all plots are pure jack pine.

Site Code: SASK TF-YA (1) Tower Site

BORIS ID: D0H4X

Coordinates:

Lat./Long.: 53°39.2' -105°19.3'
UTM: (13) 478770E 5945022N

Magnetic declination: 17°E

Forest cover map: 47594; stand 407

NTS Map: 73-H/11

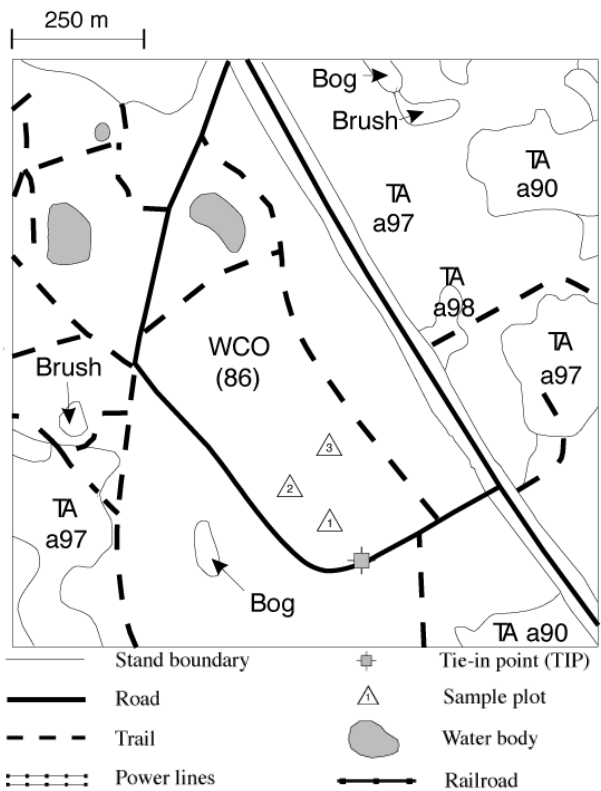
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB301-8474
Numbers: **145, 146**

Plot XY coordinates (cm):

TIP:	8.4	8.5
Plot 1:	7.9	9.1
Plot 2:	7.3	9.7
Plot 3:	7.9	10.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 926, proceed 2.2 km north of the Hwy. 926-Hwy. 120 junction and take the access road on the west side of the highway. Proceed west on the access road for 300 m. The TIP is on the north (right) side of the road at the edge of the forest.

Plot 1: from TIP, 100 m at 318°
Plot 2: from plot 1, 100 m at 318°
Plot 3: from plot 2, 100 m at 48°

General comments:

The air photograph is out of date. The site was logged in the winter of 1986. The photograph was taken prior to logging.

Field notes state that the site is a high productivity young aspen stand.

Overstory samples at all plots are predominantly pure aspen. Alder and willow are also present.

Site Code: SASK TF-YJP (1) Tower Site

BORIS ID: F8L6X

Coordinates:

Lat./Long.: 53°52.5' -104°38.3'
UTM: (13) 523750E 5969680N

Magnetic declination: 17°E

Forest cover map: 52596; stand 101

NTS Map: 73-H/15

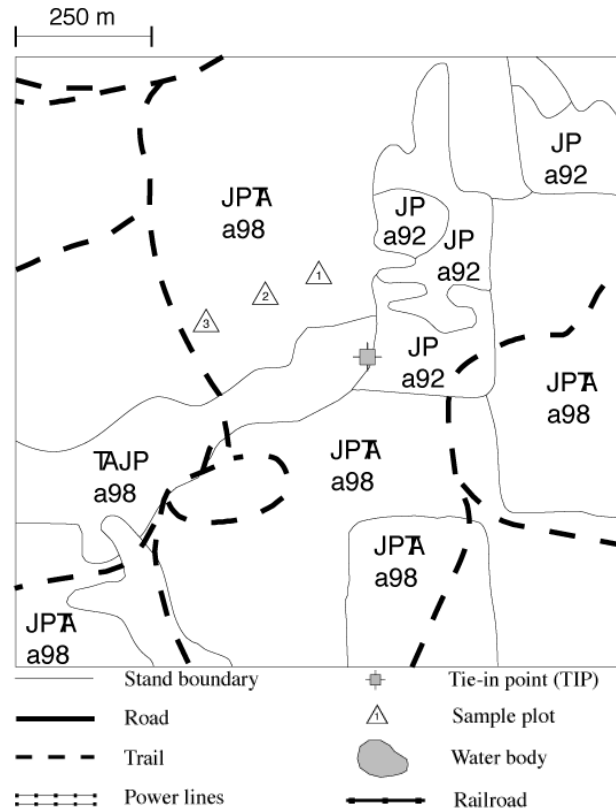
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB307-8462
Numbers: 35, 36

Plot XY coordinates (cm):

TIP:	10.9	15.2
Plot 1:	10.2	16.4
Plot 2:	9.4	16.1
Plot 3:	8.5	15.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: proceed 2.2 km south of the Hwy. 106-Harding Road intersection, on Hwy. 106. Follow the access road on the west side of Hwy. 106 for 0.7 km and take the left fork. Continue down this fork for 1.1 km until you reach the edge of the cutblock and the TIP.

Plot 1: from TIP, 175 m at 328°
Plot 2: from plot 1, 100 m at 248°
Plot 3: from plot 2, 125 m at 248°

General comments:

Overstorey samples at all plots are pure jack pine.

Northern Study Area

Auxiliary Sites

Site Code: MAN AIH-30 (1) Northern Aux. Site

BORIS ID: V5X7A

Coordinates:

Lat./Long.: 55°58.3' -97°28.7'
UTM: (14) 594916E 6204042N

Magnetic declination: 5°E

Forest cover map: T80R1W1; stand 40

NTS Map: 63-P/14

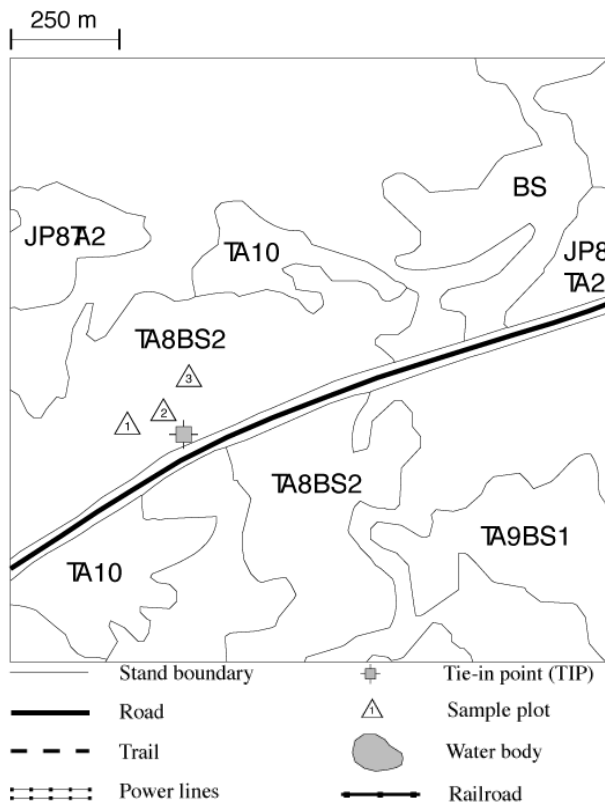
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89012
Numbers: **73**, 74

Plot XY coordinates (cm):

TIP:	12.5	9.3
Plot 1:	11.7	9.4
Plot 2:	12.2	9.6
Plot 3:	12.6	10.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Gillam Road, 36.3 km northeast of the Hwy. 391-Gillam Road junction. The TIP is on the north side of the road on the west end of a small spruce patch.

Plot 1: from plot 2, 87 m at 249°
Plot 2: from TIP, 63 m at 321°
Plot 3: from plot 2, 95 m at 37°

General comments:

Field notes state that plot 3 is flagged as a remote sensing target. Evidence of spruce harvest and small skid trails are present in the stand. Stand breaks and conifers were avoided when plot placement was determined.

Overstory samples at all plots are pure aspen.

Site Code: MAN AIM-1 (1) Northern Aux. Site

BORIS ID: T4U5A

Coordinates:

Lat./Long.: 55°51.0' -98°2.2'
UTM: (14) 560331E 6189846N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 333

NTS Map: 63-O/16

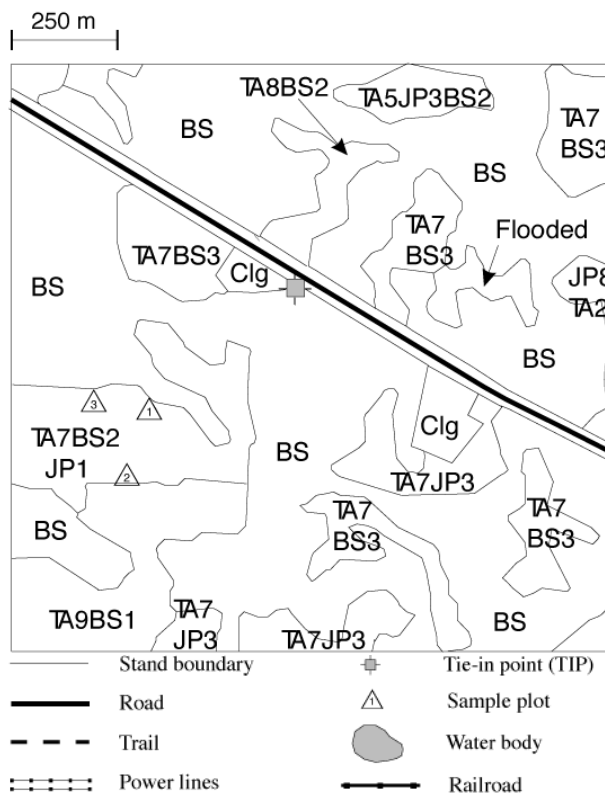
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89015
Numbers: 85, 86

Plot XY coordinates (cm):

TIP:	17.7	14.7
Plot 1:	15.5	12.8
Plot 2:	15.2	11.8
Plot 3:	14.7	12.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on Hwy. 391, 8.6 km west of the Hwy. 391–Gillam Road junction. The TIP is located at the northeast corner of the beehive-shaped clearing, on the south side of the road.

Plot 1: from TIP, 458 m at 230°
Plot 2: from plot 1, 174 m at 197°
Plot 3: from plot 1, 130 m at 277°

General comments:

Field notes state that a broken aspen canopy was avoided when plot placement was determined.

Overstorey sample at plot 1 is mainly white birch, with some aspen. Plots 2 and 3 are predominantly aspen.

Site Code: MAN AIM-20 (1)

Northern Aux. Site

BORIS ID: W0Y5A

Coordinates:

Lat./Long.: 56°0.1' -97°20.0'

UTM: (14) 603931E 6207577N

Magnetic declination: 5°E

Forest cover map: T81R1E1; no stand number

NTS Map: 64-A/3

Aerial photograph reference:

Scale: 1:15 840

Roll/line: MB91023

Numbers: **171**, 172

Plot XY coordinates (cm):

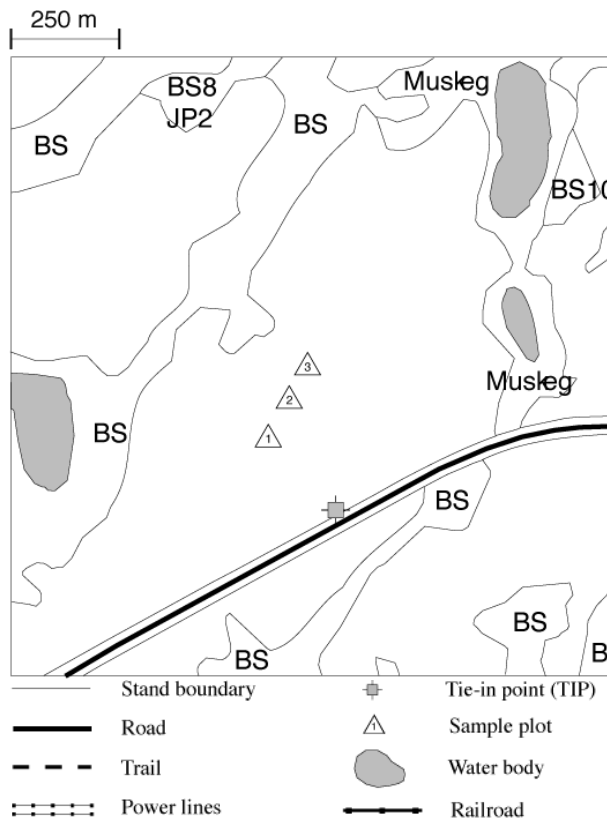
TIP: 14.8 10.2

Plot 1: 13.8 11.3

Plot 2: 14.1 11.9

Plot 3: 14.4 12.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on Gillam road, 46.8 km from the Hwy. 391-Gillam Road junction (1.6 km past Odei River bridge). The TIP is at the northeast edge of the grassy area in the ditch; on the north side of the road, near shrubs on road edge.

Plot 1: from TIP, 237 m at 318°

Plot 2: from plot 1, 111 m at 26°

Plot 3: from plot 2, 95 m at 26°

General comments:

This site was flagged for helicopter remote sensing.

Overstory samples at all plots are pure aspen.

Site Code: MAN BDH-3a (1)

Northern Aux. Site

BORIS ID: T7R9S

Coordinates:

Lat./Long.: 55°55.0' -98°26.9'
UTM: (14) 534532E 6196976N

Magnetic declination: 7°E

Forest cover map: T80R7W1; stand 701

NTS Map: 63-O/16

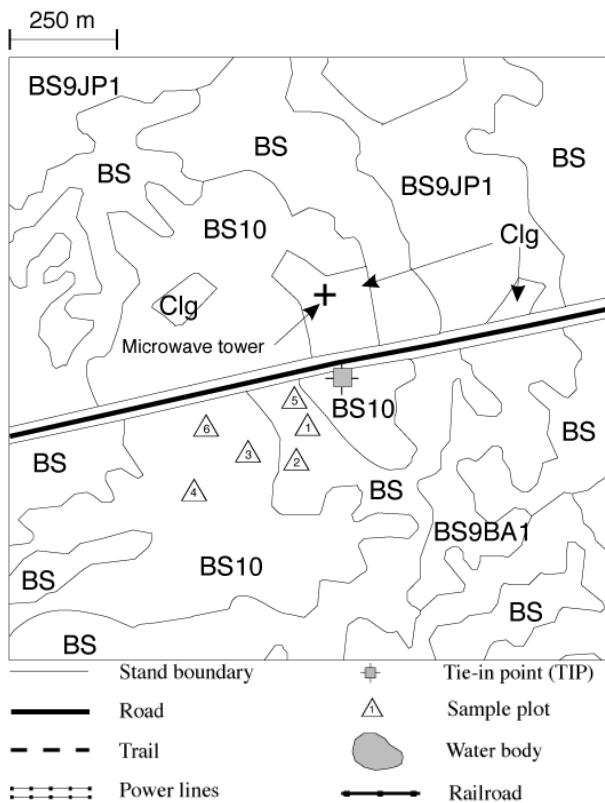
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91024
Numbers: 176, **177**, 178

Plot XY coordinates (cm):

TIP:	20.9	12.4
Plot 1:	20.4	11.7
Plot 2:	20.2	11.2
Plot 5:	20.2	12.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on Hwy. 391, 36.1 km west of the Hwy. 391-Gillam Road junction. The TIP is on the south side of the road, opposite the access road to the microwave tower.

- Plot 1: from TIP, 142 m at 215° (stratum 1, this site)
- Plot 2: from plot 1, 79 m at 201° (stratum 1, this site)
- Plot 3: from plot 2, 111 m at 277° (stratum 2, site BDH-3b)
- Plot 4: from plot 3, 158 m at 233° (stratum 2, site BDH-3b)
- Plot 5: from plot 1, 75 m at 332° (stratum 1, this site)
- Plot 6: from plot 3, 120 m at 304° (stratum 2, site BDH-3b)

General comments:

Field notes state that this site has smaller-sized young black spruce, in comparison to BDH-3b.

Overstory samples at all plots are predominantly black spruce. Plot 2 has small amounts of jack pine and balsam poplar.

Site Code: MAN BDH-3b (2)

Northern Aux. Site

BORIS ID: T7R9S

Coordinates:

Lat./Long.: 55°55.0' -98°26.9'
UTM: (14) 534532E 6196976N

Magnetic declination: 7°E

Forest cover map: T80R7W1; stand 104

NTS Map: 63-O/16

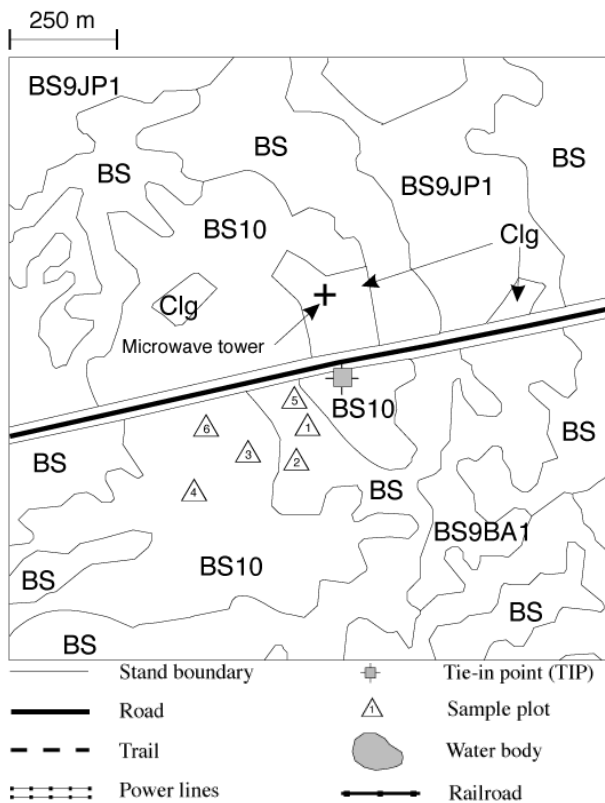
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91024
Numbers: 176, **177**, 178

Plot XY coordinates (cm):

TIP:	20.9	12.4
Plot 3:	19.5	11.3
Plot 4:	18.7	10.7
Plot 6:	18.9	11.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 36.1 km west of the Hwy. 391-Gillam Road junction. The TIP is on the south side of the road, opposite the access road to the microwave tower.

- Plot 1: from TIP, 142 m at 215° (stratum 1, site BDH-3a)
- Plot 2: from plot 1, 79 m at 201° (stratum 1, site BDH-3a)
- Plot 3: from plot 2, 111 m at 277° (stratum 2, this site)
- Plot 4: from plot 3, 158 m at 233° (stratum 2, this site)
- Plot 5: from plot 1, 75 m at 332° (stratum 1, site BDH-3a)
- Plot 6: from plot 3, 120 m at 304° (stratum 2, this site)

General comments:

Field notes state that this site has larger spruce and a higher stem density, in comparison to BDH-3a.

Overstorey samples at all plots are predominantly black spruce. Plot 4 has a small amount of white birch.

Site Code: MAN BIH-1a (1)

Northern Aux. Site

BORIS ID: T4U92-S

Coordinates:

Lat./Long.: 55°50.0' -97°59.2'
UTM: (14) 563481E 6188046N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 150

NTS Map: 63-P/13

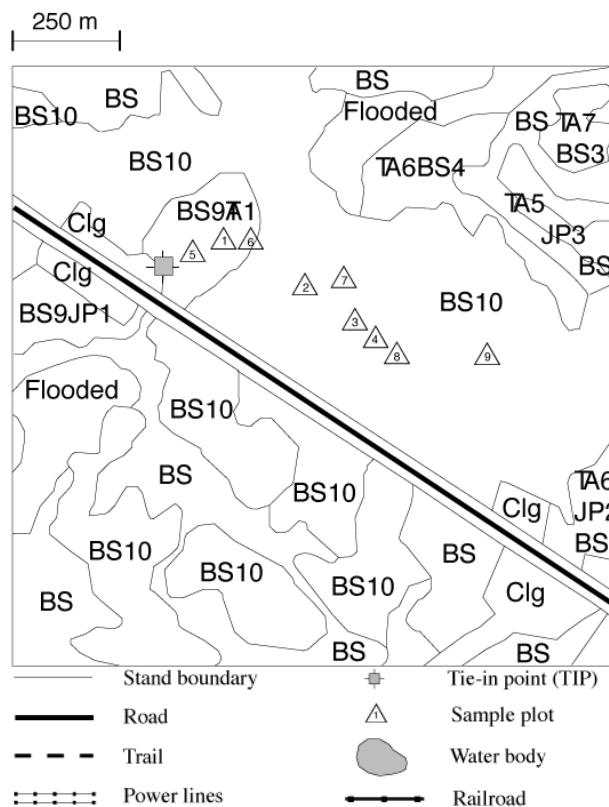
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89014
Numbers: 96, **97**

Plot XY coordinates (cm):

TIP:	6.2	9.7
Plot 1:	7.1	10.1
Plot 5:	6.6	9.9
Plot 6:	7.5	10.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 9.7 km west of Airport Road-Hwy. 391 junction. The TIP is 200 m west of the creek (drainage ditch) crossing that is the TIP for BIM-12. The TIP is at the east bulge of clearing on north side of road.

- Plot 1: from TIP, 147 m at 67° (stratum 1, this site)
- Plot 2: from plot 1, 223 m at 119° (stratum 2, BIH-1b)
- Plot 3: from plot 2, 158 m at 124° (stratum 3, BIH-1c)
- Plot 4: from plot 3, 56 m at 124° (stratum 2, BIH-1b).
- Plot 5: from TIP, 75 m at 67° (stratum 1, this site)
- Plot 6: from plot 1, 76 m at 89° (stratum 1, this site)
- Plot 7: from plot 2, 95 m at 75° (stratum 2, BIH-1b)
- Plot 8: from plot 4, 50 m at 124° (stratum 3, BIH-1c)
- Plot 9: from plot 8, 209 m at 90° (stratum 3, BIH-1c)

General comments:

Overstory samples in all plots are predominantly black spruce. Plot 5 has some jack pine. Plot 6 has some tamarack.

Site Code: MAN BIH-1b (2) Northern Aux. Site

BORIS ID: T4U92-S

Coordinates:

Lat./Long.: 55°50.0' -97°59.2'
UTM: (14) 563481E 6188046N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 155

NTS Map: 63-P/13

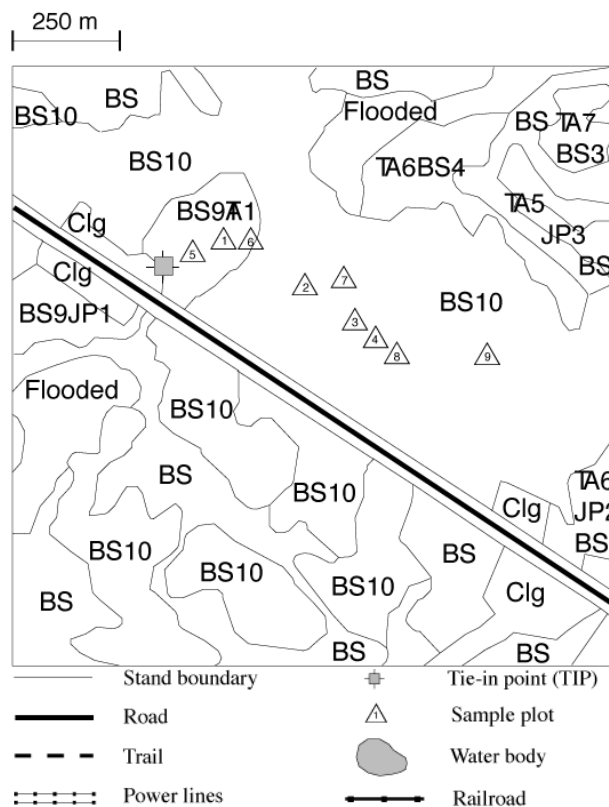
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89014
Numbers: 96, **97**

Plot XY coordinates (cm):

TIP:	6.2	9.7
Plot 2:	8.3	9.4
Plot 4:	9.4	8.6
Plot 7:	8.9	9.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 9.7 km west of Airport Road-Hwy. 391 junction. The TIP is 200 m west of the creek (drainage ditch) crossing that is the TIP for BIM-12. The TIP is at the east bulge of clearing on north side of road.

- Plot 1: from TIP, 147 m at 67° (stratum 1, site BIH-1a)
- Plot 2: from plot 1, 223 m at 119° (stratum 2, this site)
- Plot 3: from plot 2, 158 m at 124° (stratum 3, site BIH-1c)
- Plot 4: from plot 3, 56 m at 124° (stratum 2, this site)
- Plot 5: from TIP, 75 m at 67° (stratum 1, site BIH-1a)
- Plot 6: from plot 1, 76 m at 89° (stratum 1, site BIH-1a)
- Plot 7: from plot 2, 95 m at 75° (stratum 2, this site)
- Plot 8: from plot 4, 50 m at 124° (stratum 3, site BIH-1c)
- Plot 9: from plot 8, 209 m at 90° (stratum 3, site BIH-1c)

General comments:

Field notes state that this site has larger trees and a more variable structure than BIH-1a.

Plots in this stratum alternate with stratum 3 (BIH-1c). Aerial photographs of the site show a very patchy, irregular distribution of canopy characteristics.

Overstory samples at all plots are pure black spruce.

Site Code: MAN BIH-1c (3) Northern Aux. Site

BORIS ID: T4U92-S

Coordinates:

Lat./Long.: 55°50.0' -97°59.2'
UTM: (14) 563481E 6188046N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 155

NTS Map: 63-P/13

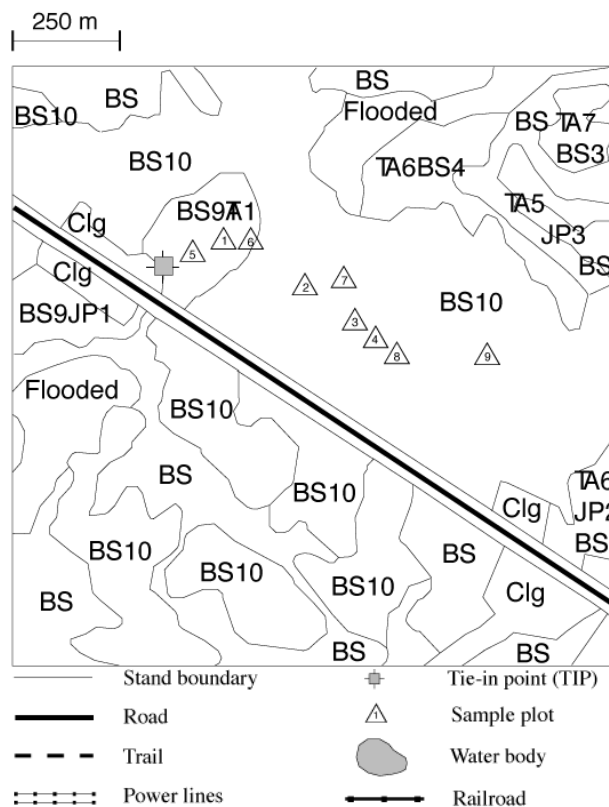
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89014
Numbers: 96, **97**

Plot XY coordinates (cm):

TIP:	6.2	9.7
Plot 3:	9.1	8.8
Plot 8:	9.7	8.4
Plot 9:	11.0	8.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 9.7 km west of Airport Road–Hwy. 391 junction. The TIP is 200 m west of the creek (drainage ditch) crossing that is the TIP for BIM-12. The TIP is at the east bulge of clearing on north side of road.

- Plot 1: from TIP, 147 m at 67° (stratum 1, site BIH-1a)
- Plot 2: from plot 1, 223 m at 119° (stratum 2, site BIH-1b)
- Plot 3: from plot 2, 158 m at 124° (stratum 3, this site)
- Plot 4: from plot 3, 56 m at 124° (stratum 2, site BIH-1b)
- Plot 5: from TIP, 75 m at 67° (stratum 1, site BIH-1a)
- Plot 6: from plot 1, 76 m at 89° (stratum 1, site BIH-1a)
- Plot 7: from plot 2, 95 m at 75° (stratum 2, site BIH-1b)
- Plot 8: from plot 4, 50 m at 124° (stratum 3, this site)
- Plot 9: from plot 8, 209 m at 90° (stratum 3, this site)

General comments:

Field notes state that this site has smaller trees and a lower tree density than BIH-1a/b.

Plots in this stratum alternate with stratum 2 (BIH-1b). Aerial photographs of the site show a very patchy, irregular distribution of canopy characteristics.

Overstory samples at all plots are pure black spruce.

Site Code: MAN BIH-9 (1)

Northern Aux. Site

BORIS ID: T6R5S

Coordinates:

Lat./Long.: 55°54.6' -98°31.2'
UTM: (14) 529982E 6196124N

Magnetic declination: 7°E

Forest cover map: T80R7W1; stand 301

NTS Map: 63-0/15

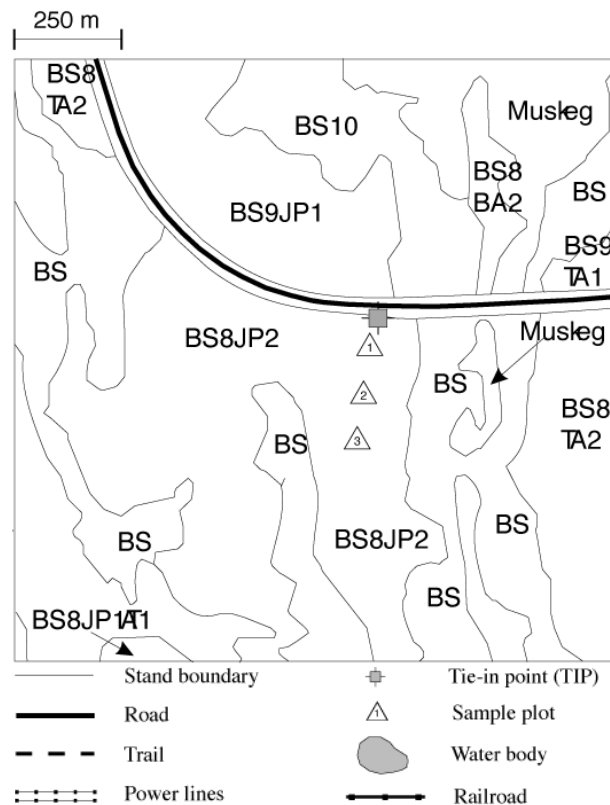
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91024
Numbers: 148, **149**

Plot XY coordinates (cm):

TIP:	8.0	11.4
Plot 1:	7.9	11.0
Plot 2:	7.8	10.3
Plot 3:	7.7	9.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: On Hwy. 391, 41 km west of the Hwy. 391-Gillam Road junction (1.8 km past the Sapochi River). The TIP is 160 m to the east of where the line intersects the road.

Plot 1: from TIP, 63 m at 190°
Plot 2: from plot 1, 111 m at 191°
Plot 3: from plot 2, 111 m at 191°

General comments:

Crown flag erected at plot 2.

Overstory samples at all plots are predominantly black spruce. Plot 1 has a small amount of aspen. Plot 3 has a small amount of jack pine.

Site Code: MAN BIL-2 (1)

Northern Aux. Site

BORIS ID: T6T6S

Coordinates:

Lat./Long.: 55°52.9' -98°11.2'
UTM: (14) 550881E 6193126N

Magnetic declination: 7°E

Forest cover map: T79R5W1; stand 701

NTS Map: 63-O/16

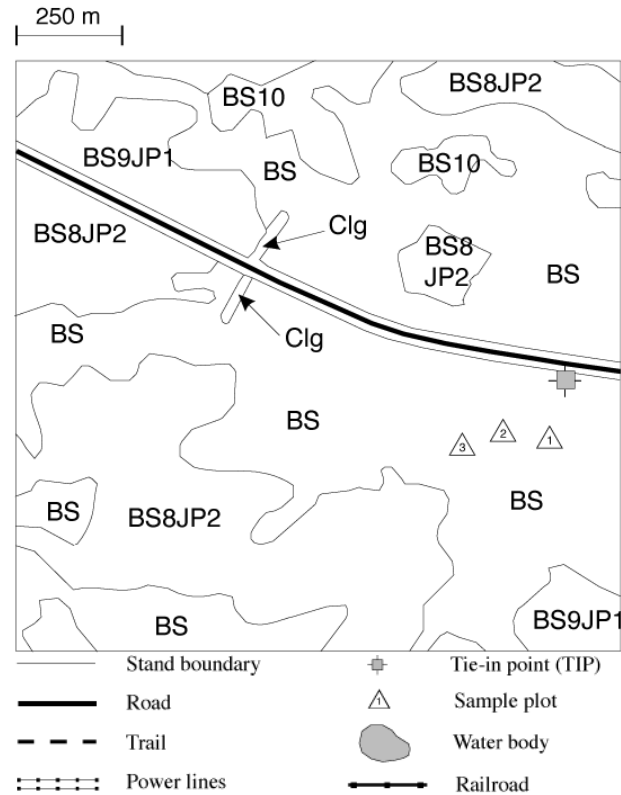
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89015
Numbers: **173, 174**

Plot XY coordinates (cm):

TIP:	4.6	9.1
Plot 1:	4.4	8.2
Plot 2:	3.7	8.3
Plot 3:	3.1	8.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 18.6 km west of the Hwy. 391–Gillam Road junction and 300 m west of drainage ditch (culvert) crossing. Using the aerial photo, the TIP is adjacent to the oblong clearing, which is along north side of Hwy. 391.

Plot 1: from TIP, 142 m at 191°
Plot 2: from plot 1, 111 m at 277°
Plot 3: from plot 2, 111 m at 257°

General comments:

Field notes state that the site is a uniform black spruce stand. A crown flag was installed at plot 2. The TIP is an orange and red flag.

The site is also visible on aerial photographs 263 and 264 (on the same flight roll/line).

Overstory samples at all plots are pure black spruce.

Site Code: MAN BIM-1a (1) Northern Aux. Site

BORIS ID: T4U91-S

Coordinates:

Lat./Long.: 55°50.3' -97°59.9'
UTM: (14) 562721E 6188556N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 147, 148, 149

NTS Map: 63-P/13

Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89014
Numbers: 175, **176**

Plot XY coordinates (cm):

TIP:	16.4	14.9
Plot 1:	19.2	15.0
Plot 2:	19.8	15.2
Plot 3:	20.4	16.0
Plot 4:	19.2	15.5
Plot 5:	19.7	15.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.

Directions to site:

Tie-in point access: on Hwy. 391, 10.6 km west of the Airport Road–Hwy. 391 junction and 1.1 km west of the drainage ditch (creek crossing) that marks the BIM-12 TIP. The TIP is at the bottleneck clearing on the north side of the road.

Plot 1: from TIP, 442 m at 87°. Not sampled.

Plot 2: from plot 1, 95 m at 75° (stratum 1, this site)

Plot 3: from plot 2, 158 m at 37°. Sample point is displaced from center of plot 3. Proceed 100 m at 3°, then 10 m at 267° to the flag at plot 3a. The crown flag is at plot 3a. (stratum 2, site BIM-1b)

Plot 4: from plot 2, 103 m at 297° (stratum 1, this site)

Plot 5: from plot 2, 71 m at 357° (stratum 1, this site)

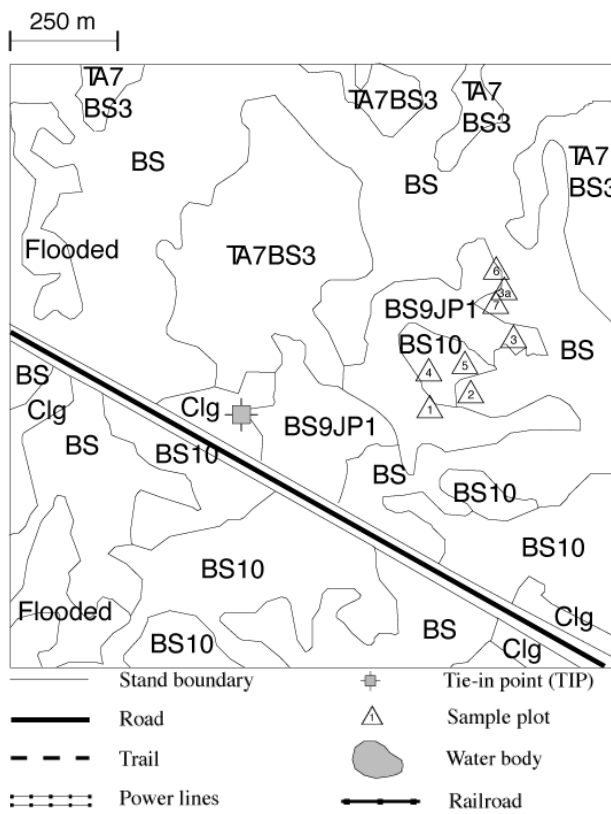
Plot 6: from plot 3a, 57 m at 333° (stratum 2, site BIM-1b)

Plot 7: from plot 3a, 50 m at 217°, then 5 m at 127° (stratum 2, site BIM-1b)

General comments:

Field notes state that broken areas (minority of stand) were avoided when plot placement was determined.

Plot 3 was never sampled. Overstory samples at all plots are predominantly black spruce. Plot 1 has a small amount of jack pine. Plot 2 has a small amount of tamarack.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Site Code: MAN BIM-1b (2) Northern Aux. Site

BORIS ID: T4U91-S

Coordinates:

Lat./Long.: 55°50.3' -97°59.9'
UTM: (14) 562721E 6188556N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 147, 149

NTS Map: 63-P/13

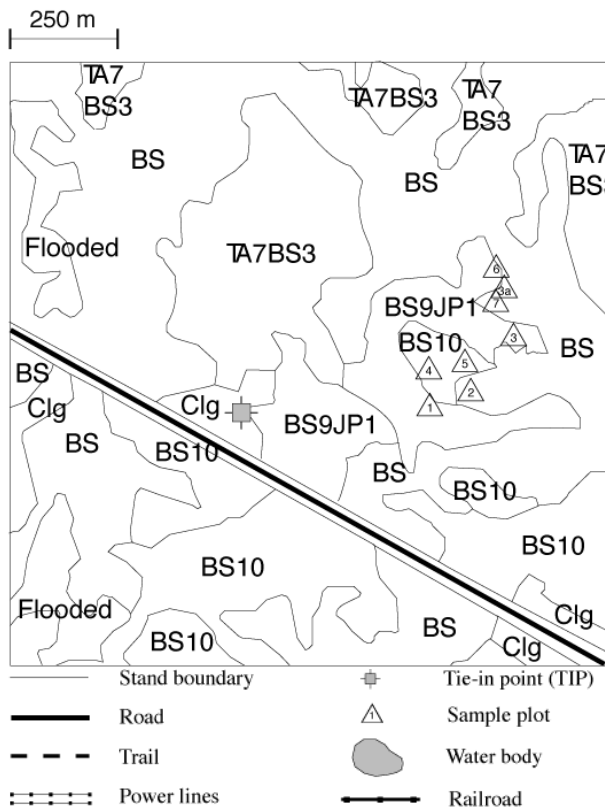
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89014
Numbers: 175, **176**

Plot XY coordinates (cm):

TIP:	16.4	14.9
Plot 3:	20.3	16.6
Plot 6:	20.2	16.9
Plot 7:	20.2	16.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 10.6 km west of the Airport Road–Hwy. 391 junction and 1.1 km west of the drainage ditch (creek crossing) that marks the BIM-12 TIP. The TIP is at the bottleneck clearing on the north side of the road.

Plot 1: from TIP, 442 m at 87°. Not sampled.

Plot 2: from plot 1, 95 m at 75° (stratum 1, site BIM-1a)

Plot 3: from plot 2, 158 m at 37°. Sample point is displaced from center of plot 3. Proceed 100 m at 3°, then 10 m at 267° to the flag at plot 3a. The crown flag is at plot 3a. (stratum 2, this site)

Plot 4: from plot 2, 103 m at 297° (stratum 1, site BIM-1a)

Plot 5: from plot 2, 71 m at 357° (stratum 1, site BIM-1a)

Plot 6: from plot 3a, 57 m at 333° (stratum 2, this site)

Plot 7: from plot 3a, 50 m at 217°, then 5 m at 127° (stratum 2, this site)

General comments:

Field notes state that this site is denser black spruce (compared to BIM-1b) on mineral soil.

Overstorey samples at all plots are predominantly black spruce. Plot 3a has a small amount of white birch.

Site Code: MAN BIM-12a (1) Northern Aux. Site

BORIS ID: T3U9S

Coordinates:

Lat./Long.: 55°49.9' -97°59.1'
UTM: (14) 563611E 6187876N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 153, 154

NTS Map: 63-P/13

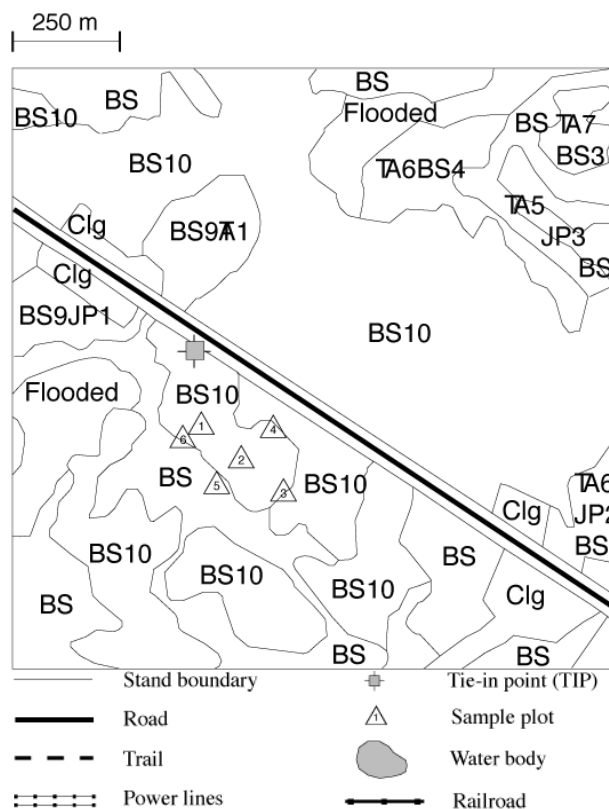
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89014
Numbers: 96, **97**

Plot XY coordinates (cm):

TIP:	7.2	8.5
Plot 1:	7.3	7.4
Plot 3:	8.5	6.4
Plot 6:	7.0	7.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on Hwy. 391, 9.5 km west of the Airport Road–Hwy. 391 junction. The TIP is 200 m east of the BIH-1 TIP. The TIP is on the south side of Hwy. 391, across from where the drainage ditch intersects the north side of Hwy. 391.

- Plot 1: from TIP, 174 m at 176° (stratum 1, this site)
- Plot 2: from plot 1, 126 m at 128° (stratum 2, site BIM-12b)
- Plot 3: from plot 2, 126 m at 128° (stratum 1, this site)
- Plot 4: from plot 2, 100 m at 45° (stratum 2, site BIM-12b)
- Plot 5: from plot 2, 100 m at 225° (stratum 2, site BIM-12b)
- Plot 6: from plot 1, 50 m at 229° (stratum 1, this site)

General comments:

There are two different types in this site (BIM-12a/b). Stand boundaries on the forest cover map do not represent clear boundaries on the air photograph. Both stands are BS10. Stratum divisions (1/2) seem reasonable on the air photograph, even though they appear to cross stands on the map.

Field notes state that this site has a higher tamarack content, larger trees than BIM-12b. Soils at plot 2 (stratum 2) are similar to plot 3 (stratum 1), including high burned wood content. A crown flag was installed at plot 1.

Overstory samples at all plots are predominantly black spruce. Plot 1 has a small amount of balsam poplar.

Site Code: MAN BIM-12b (2) Northern Aux. Site

BORIS ID: T3U9S

Coordinates:

Lat./Long.: 55°49.9' -97°59.1'
UTM: (14) 563611E 6187876N

Magnetic declination: 7°E

Forest cover map: T79R4W1; stand 153, 154

NTS Map: 63-P/13

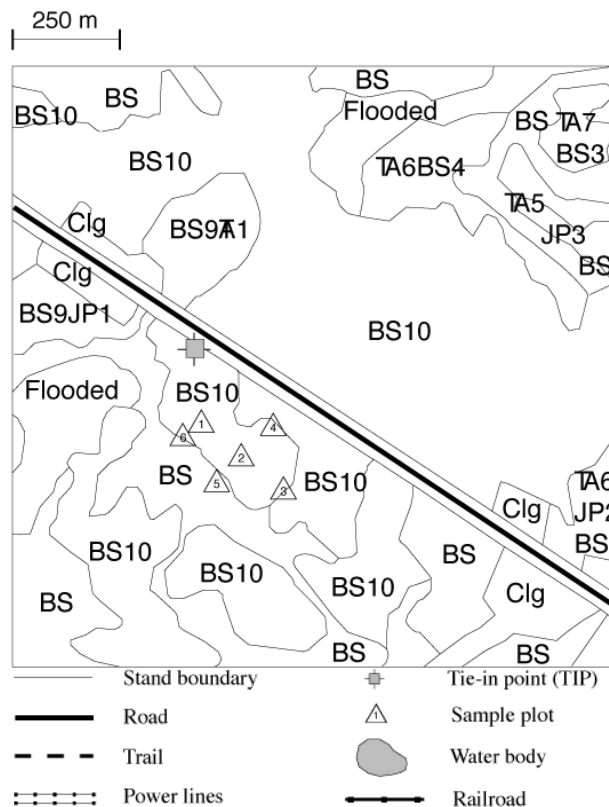
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89014
Numbers: 96, **97**

Plot XY coordinates (cm):

TIP:	7.2	8.5
Plot 2:	7.9	6.9
Plot 4:	8.3	7.4
Plot 5:	7.5	6.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 9.5 km west of the Airport Road–Hwy. 391 junction. The TIP is 200 m east of the BIH-1 TIP. The TIP is on the south side of Hwy. 391, across from where the drainage ditch intersects the north side of Hwy. 391.

Plot 1: from TIP, 174 m at 176° (stratum 1, site BIM-12a)
Plot 2: from plot 1, 126 m at 128° (stratum 2, this site)
Plot 3: from plot 2, 126 m at 128° (stratum 1, site BIM-12a)
Plot 4: from plot 2, 100 m at 45° (stratum 2, this site)
Plot 5: from plot 2, 100 m at 225° (stratum 2, this site)
Plot 6: from plot 1, 50 m at 229° (stratum 1, site BIM-12a)

General comments:

Field notes state that this site has less tamarack and smaller trees than BIM-12a. Soils at plot 2 (stratum 2) are similar to plot 3 (stratum 1), including high burned wood content.

Overstorey samples at all plots are predominantly black spruce. Plot 2 has a small amount of tamarack and white birch.

Site Code: MAN BMH-6 (1) Northern Aux. Site

BORIS ID: T5Q7S

Coordinates:

Lat./Long.: 55°54.9' -98°38.5'
UTM: (14) 522412E 6196626N

Magnetic declination: 7°E

Forest cover map: T80R8W1; stand 143, 395

NTS Map: 63-O/15

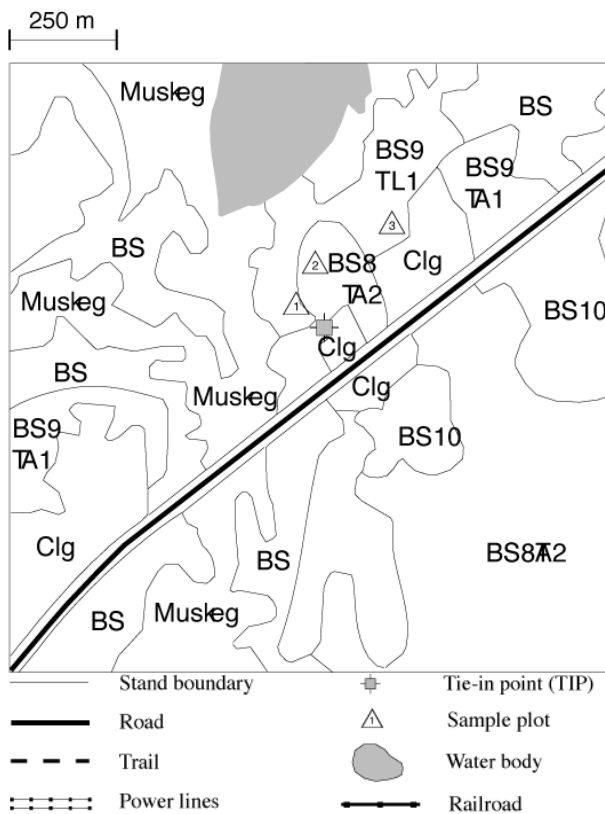
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: 239, **240**

Plot XY coordinates (cm):

TIP: 18.9 8.7
Plot 1: 18.5 9.0
Plot 2: 18.8 9.6
Plot 3: 19.9 10.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 50.4 km west of the Hwy. 391–Gillam Road junction, and 14.3 km west of the microwave tower. The TIP is at the northwest corner of the clearing on the north side of Hwy. 391.

Plot 1: from TIP, 79 m at 307°
Plot 2: from plot 1, 111 m at 27°
Plot 3: from plot 2, 190 m at 61°

General comments:

Field notes state that a small deciduous component was avoided when plot placement was determined. There is a zone of heterogeneity between plots 1 and 2 with sphagnum and sparse spruce. This site consists of 2 stands (395 and 143). Plot 2 contains a crown flag.

Overstory samples at all plots are predominantly black spruce. Plot 1 has a small amount of aspen. Plot 2 has a small amount of jack pine.

Site Code: MAN BMH-7 (1) Northern Aux. Site

BORIS ID: T0P8S

Coordinates:

Lat./Long.: 55°53.1' -98°48.1'
UTM: (14) 512382E 6193310N

Magnetic declination: 7°E

Forest cover map: T79R9W1; stand 231

NTS Map: 63-O/15

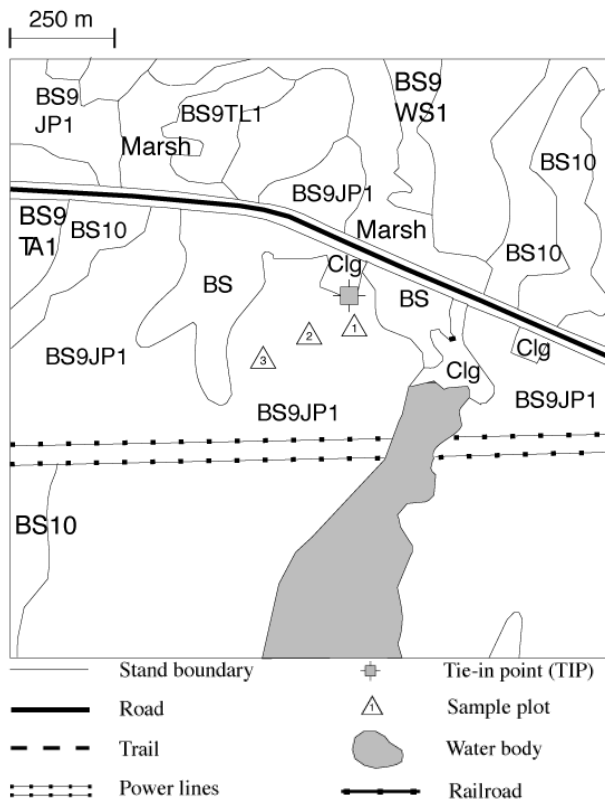
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: **300, 301**

Plot XY coordinates (cm):

TIP:	13.7	13.6
Plot 1:	13.8	13.1
Plot 2:	13.1	13.0
Plot 3:	12.5	12.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 63 km west of the Hwy. 391–Gillam Road junction and about 1.25 km east of the Nelson House turnoff, in a clearing with a circular depression. The TIP is at the southeast corner of the clearing.

Plot 1: from TIP, 79 m at 171°
Plot 2: from plot 1, 111 m at 259°
Plot 3: from plot 2, 111 m at 239°

General comments:

Field notes state that larger deciduous trees in the center were avoided when locating plots. Crowns were flagged near plot 2.

Overstory samples at all plots are pure black spruce.

Site Code: MAN BML-21 (1) Northern Aux. Site

BORIS ID: T7T3S

Coordinates:

Lat./Long.: 55°53.6' -98°13.7'
UTM: (14) 548261E 6194426N

Magnetic declination: 7°E

Forest cover map: T79R5W1; stand 701

NTS Map: 63-O/16

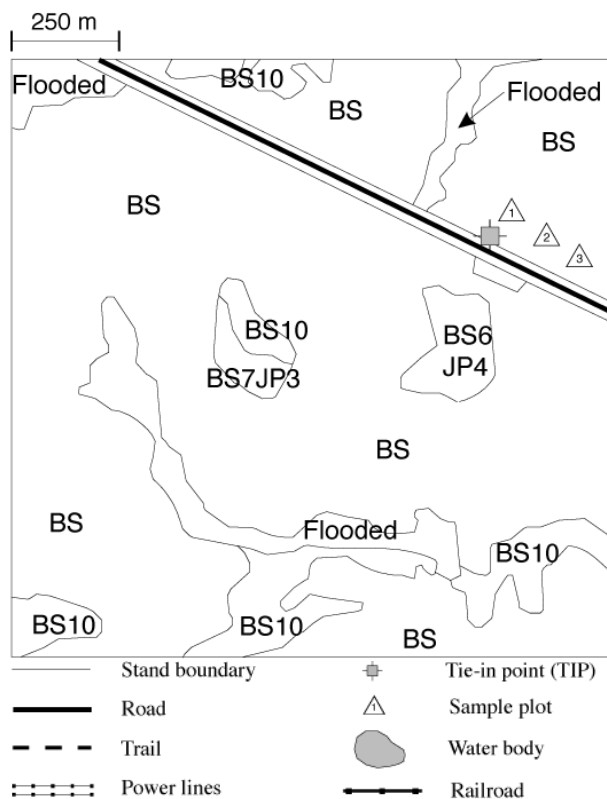
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89015
Numbers: 262, **263**

Plot XY coordinates (cm):

TIP:	3.4	13.7
Plot 1:	3.7	14.1
Plot 2:	4.2	13.7
Plot 3:	4.7	13.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the north side of Hwy. 391, 21.8 km west of the Hwy. 391-Gillam Road junction. The TIP is opposite to where the northwest corner of the oblong, rectangular clearing (on the south side of the road) intersects the road clearance.

Plot 1: from TIP, 79 m at 41°
Plot 2: from plot 1, 95 m at 125°
Plot 3: from plot 2, 95 m at 125°

General comments:

Field notes state that the site is relatively uniform. A crown flag was installed at plot 2.

Overstory samples at all plots are pure black spruce.

Site Code: MAN BMM-8a (1) Northern Aux. Site

BORIS ID: T0P7S

Coordinates:

Lat./Long.: 55°53.0' -98°49.3'
UTM: (14) 511132E 6193126N

Magnetic declination: 7°E

Forest cover map: T79R9W1; stand 236

NTS Map: 63-O/15

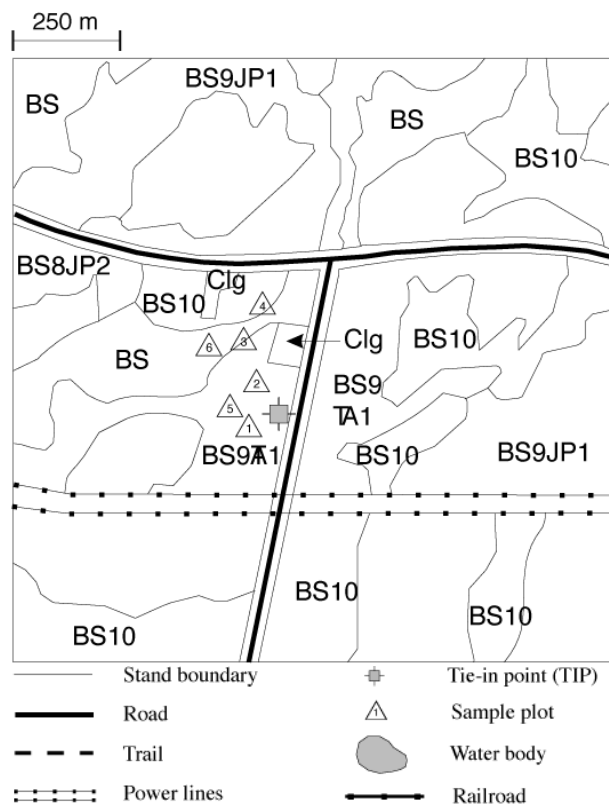
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: **300**, 301

Plot XY coordinates (cm):

TIP:	5.3	12.5
Plot 1:	4.9	12.3
Plot 2:	5.0	13.0
Plot 5:	4.6	12.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the Nelson House Reserve Road, at the southwest corner of the square clearing, 0.3 km south of the Hwy. 391-Nelson House Reserve Road junction (64.2 km from the Hwy. 391-Gillam Road junction).

Plot 1: from TIP, 63 m at 247° (stratum 1, this site)

Plot 2: from plot 1, 111 m at 7° (stratum 1, this site)

Plot 3: from plot 2, 111 m at 350° (stratum 2, site BMM-8b)

Plot 4: from plot 3, 82 m at 29° (stratum 2, site BMM-8b)

Plot 5: use the NW corner of the clearing as a TIP and proceed 115 m at 262° (stratum 1, this site)

Plot 6: from plot 3, 100 m at 244° (stratum 2, site BMM-8b)

General comments:

Field notes state that the trees are larger and more widely spaced than at BMM-8b. Recent blowdown is present at the site.

Overstory sample at plot 1 is mainly black spruce with some aspen. Plots 2 and 5 are pure black spruce.

Site Code: MAN BMM-8b (2) Northern Aux. Site

BORIS ID: T0P7S

Coordinates:

Lat./Long.: 55°53.0' -98°49.3'
UTM: (14) 511132E 6193126N

Magnetic declination: 7°E

Forest cover map: T79R9W1; stand 701

NTS Map: 63-O/15

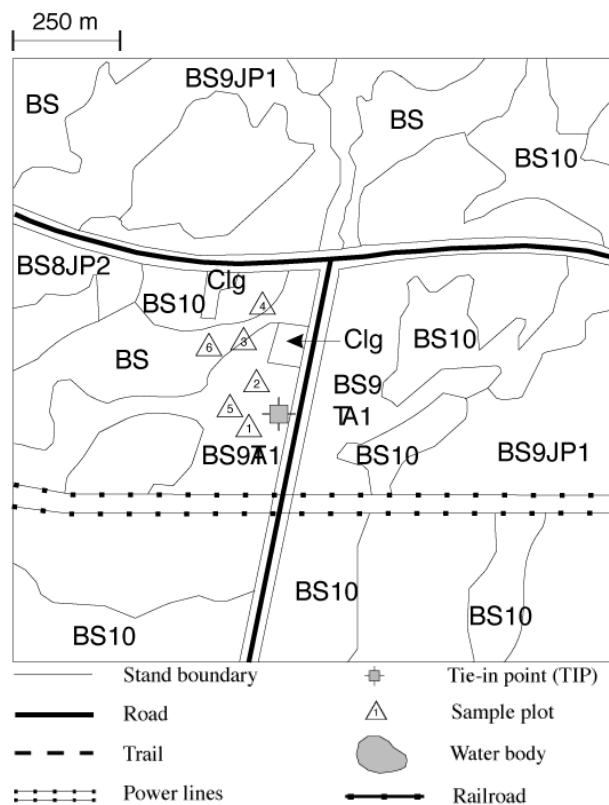
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: **300**, 301

Plot XY coordinates (cm):

TIP:	5.3	12.5
Plot 3:	4.8	13.7
Plot 4:	5.1	14.2
Plot 6:	4.3	13.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the Nelson House Reserve Road, at the southwest corner of the square clearing, 0.3 km south of the Hwy. 391–Nelson House Reserve Road junction (64.2 km from the Hwy. 391–Gillam Road junction).

- Plot 1: from TIP, 63 m at 247° (stratum 1, site BMM-8a)
- Plot 2: from plot 1, 111 m at 7° (stratum 1, site BMM-8a)
- Plot 3: from plot 2, 111 m at 350° (stratum 2, this site)
- Plot 4: from plot 3, 82 m at 29° (stratum 2, this site)
- Plot 5: use the northwest corner of the clearing as a TIP and proceed 115 m at 262° (stratum 1, site BMM-8a)
- Plot 6: from plot 3, 100 m at 244° (stratum 2, this site)

General comments:

Field notes state that the trees are smaller and more closely spaced than at BMM-8a. There has been some harvesting of trees.

Overstory samples at all plots are pure black spruce.

Site Code: MAN JDH-3 (1)

Northern Aux. Site

BORIS ID: T8S9P

Coordinates:

Lat./Long.: 55°54.3' -98°17.3'
UTM: (14) 544531E 6195746N

Magnetic declination: 7°E

Forest cover map: T80R6W1; stand 89

NTS Map: 63-O/16

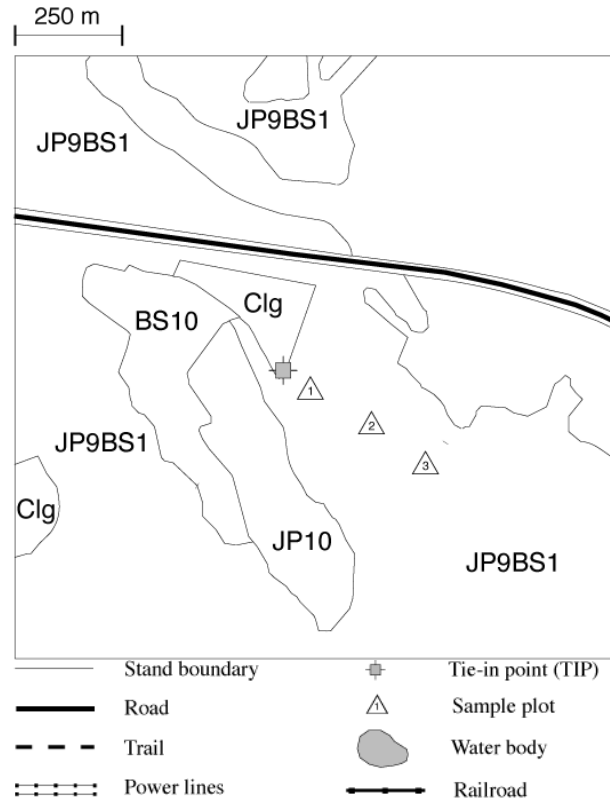
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89026
Numbers: **9, 10**

Plot XY coordinates (cm):

TIP:	7.3	8.1
Plot 1:	7.7	7.8
Plot 2:	8.6	7.3
Plot 3:	9.4	6.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 25.9 km from the Hwy. 391–Gillam Road junction (1.0 km east of the road leading to the spiritual area). The TIP is at the southeast corner of the flask-shaped clearing, on a trail leading to the southeast.

Plot 1: from TIP, 79 m at 123°
Plot 2: from plot 1, 158 m at 123°
Plot 3: from plot 2, 158 m at 123°

General comments:

Overstory samples at all plots are pure jack pine.

Site Code: MAN JDM-1 (1) Northern Aux. Site

BORIS ID: T8T1P

Coordinates:

Lat./Long.: 55°54.2' -98°15.8'
UTM: (14) 546021E 6195576N

Magnetic declination: 7°E

Forest cover map: T80R6W1; stand 13, no number

NTS Map: 63-O/16

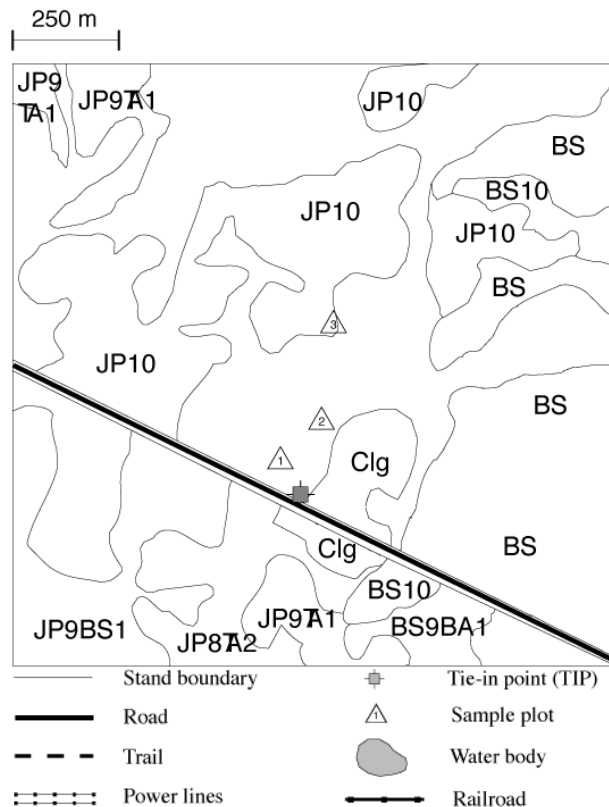
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89026
Numbers: 9, 10

Plot XY coordinates (cm):

TIP:	16.9	6.8
Plot 1:	16.6	7.3
Plot 2:	17.2	7.9
Plot 3:	17.4	9.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 24.2 km west of the Hwy. 391–Gillam Road junction. This point is also 11.9 km east of the microwave tower, and 2.7 km east of the road leading to the spiritual area. The TIP is at the southwest corner of the gravel pit on the north side of the road.

Plot 1: from TIP, 95 m at 329°
Plot 2: from plot 1, 142 m at 47°
Plot 3: from plot 2, 221 m at 7°

General comments:

Field notes state that areas where birch is present were avoided when plot placement was determined, and that these areas are not important spatially over the general stand area.

Overstorey sample at plot 1 is pure jack pine. Plot 1 is the only plot with vegetation taller than 1.3 m.

Site Code: MAN JIH-2 (1) Northern Aux. Site

BORIS ID: T8Q9P

Coordinates:

Lat./Long.: 55°56.1' -98°35.8'
UTM: (14) 525179E 6198896N

Magnetic declination: 7°E

Forest cover map: T80R8W1; stand 76

NTS Map: 63-O/15

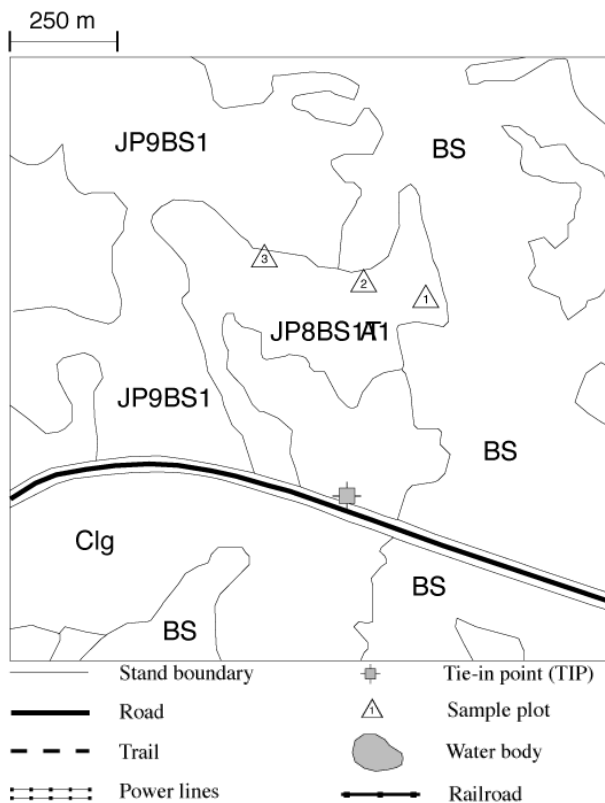
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: 215, **216**

Plot XY coordinates (cm):

TIP:	19.4	12.8
Plot 1:	20.6	15.7
Plot 2:	19.7	15.9
Plot 3:	18.2	16.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on north side of Hwy. 391, 46.6 km west of the Hwy. 391-Gillam Road junction, about 3 km east of the Old Jack Pine tower site.

Plot 1: from TIP, 491 m at 23°
Plot 2: from plot 1, 158 m at 287°
Plot 3: from plot 2, 237 m at 287°

General comments:

Field notes state that the crown flag is about 30 m south of plot 2. The TIP is where the rectangular clearing boundary (northwest side) intersects the road clearance. The stand is more of a low-productivity stand.

Overstory samples at all plots are pure jack pine.

Site Code: MAN JIL-1 (1) Northern Aux. Site

BORIS ID: T9Q8P

Coordinates:

Lat./Long.: 55°56.0' -98°36.7'
UTM: (14) 524212E 6198676N

Magnetic declination: 7°E

Forest cover map: T80R8W1; no stand number

NTS Map: 63-O/15

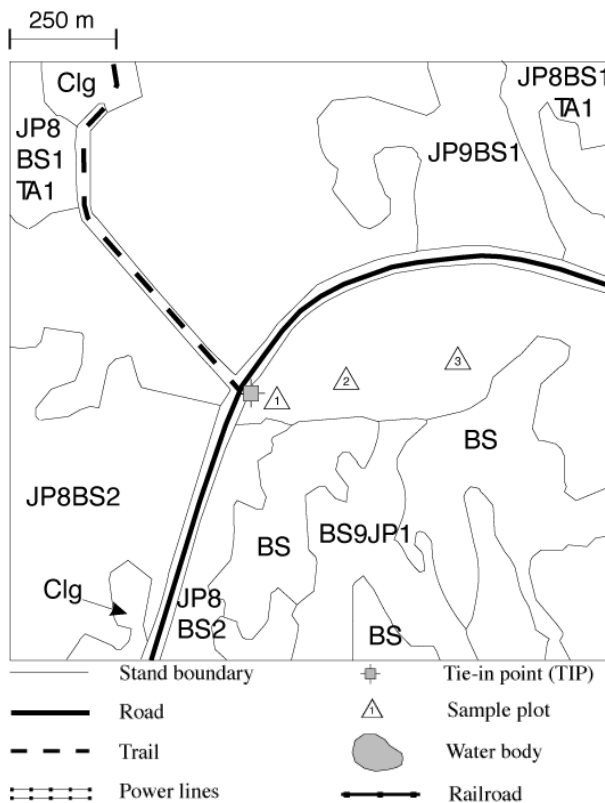
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91025
Numbers: 215, **216**

Plot XY coordinates (cm):

TIP:	13.1	11.8
Plot 1:	13.5	11.7
Plot 2:	14.6	12.0
Plot 3:	16.2	12.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 47.5 km west of the Hwy. 391–Gillam Road junction opposite the gravel pit entrance (about 1 km east of the Old Jack Pine tower site) near the northeast corner of stand 144.

Plot 1: from TIP, 63 m at 111°
Plot 2: from plot 1, 190 m at 71°
Plot 3: from plot 2, 253 m at 82°

General comments:

A crown flag was erected near plot 2.

Overstory samples at all plots are pure jack pine.

Site Code: MAN JIM-4 (1) Northern Aux. Site

BORIS ID: T7S9P

Coordinates:

Lat./Long.: 55°53.7' -98°17.8'
UTM: (14) 544031E 6194676N

Magnetic declination: 7°E

Forest cover map: T79R6W1; stand 51

NTS Map: 63-O/16

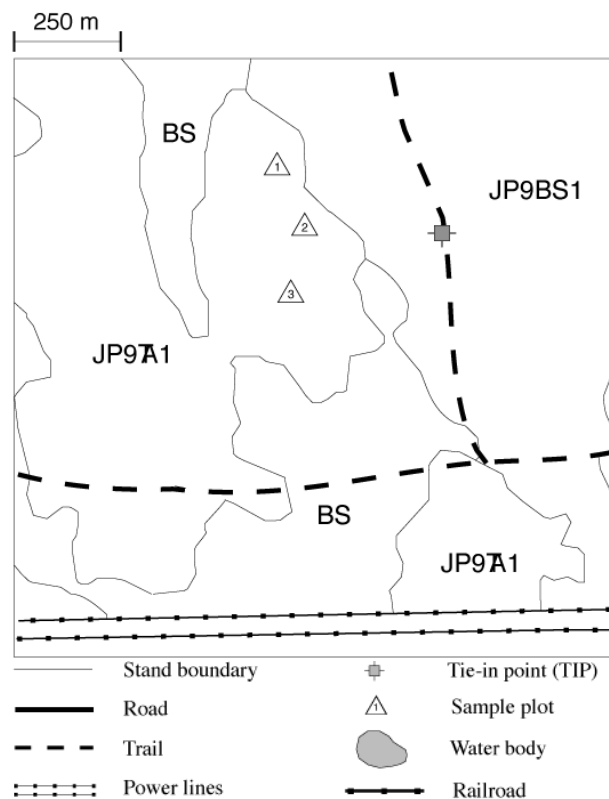
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB89026
Numbers: 8, 9, 10

Plot XY coordinates (cm):

TIP:	4.6	10.7
Plot 1:	2.2	11.7
Plot 2:	2.6	10.8
Plot 3:	2.4	9.8

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: off Hwy. 391. Proceed 26.9 km west of the Hwy. 391-Gillam Road junction to the sand road on the south side of Hwy. 391 (opposite the entrance to the spiritual area). Drive south about 2 km. A four-wheel drive vehicle is needed to cross the sandy culvert at about 1 km from the start of the sand road. The TIP is on the west side of the road at a bend.

Plot 1: from plot 2, 158 m at 337°
Plot 2: from TIP, 316 m at 273°
Plot 3: from plot 2, 158 m at 193°

General comments:

The northern portion of the site extends into forest cover map T80R6W1, stand 93. Plot 1 is in T80R6W1; TIP and plots 2, 3 are in T79R6W1.

Overstory sample at plot 1 is predominantly aspen. Plots 2 and 3 are pure jack pine.

Site Code: MAN MW-1a (1) Northern Aux. Site

BORIS ID: T0P5M

Coordinates:

Lat./Long.: 55°53.3' -98°51.5'
UTM: (14) 508832E 6193676N

Magnetic declination: 7°E

Forest cover map: T79R9W1; stand 273

NTS Map: 63-O/15

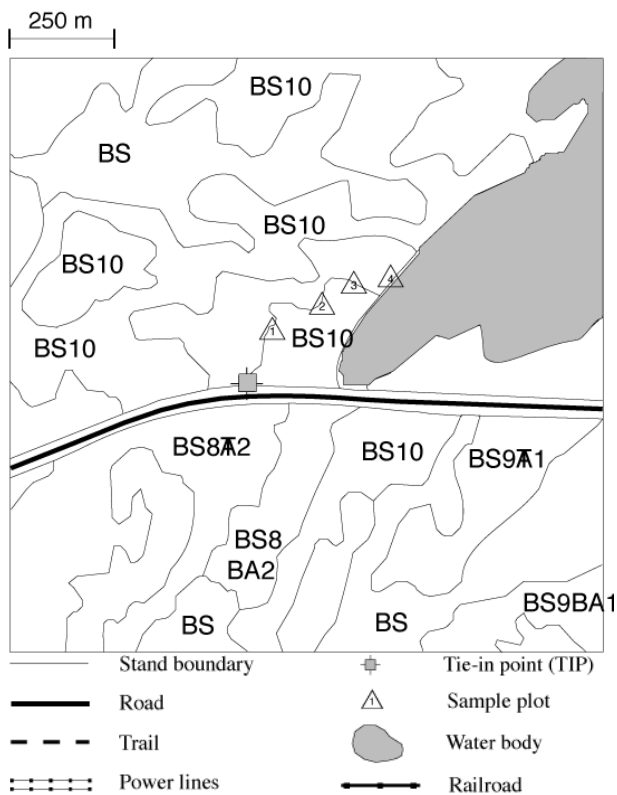
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91026
Numbers: **132**, 133

Plot XY coordinates (cm):

TIP:	7.4	13.8
Plot 1:	7.8	14.6
Plot 3:	9.0	15.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on north side of Hwy. 391, 66.7 km west of the Hwy. 391-Gillam Road junction (2.5 km past Nelson House road) where a small dense black spruce and a larger black spruce/aspen mix boundary meets the road clearance.

Plot 1: from TIP, 142 m at 27° (stratum 1, this site)
Plot 2: from plot 1, 158 m at 64° (stratum 2, site MW-1b)
Plot 3: from plot 2, 71 m at 46° (stratum 1, this site)
Plot 4: from plot 3, 111 m at 86° (stratum 2, site MW-1b)

General comments:

Field notes state that a crown marker is present near plot 2. The site is dominated by black spruce, with smaller-sized trees than MW-1b.

The site was revisited on July 25, 1994. Heavy blowdown of trees was observed throughout the stand. The plots (established in summer of 1993) had 25-50° blowdown of tallied trees.

Overstorey sample at plot 1 is mainly aspen, with some black spruce. Plot 3 is mainly black spruce, with some aspen and white birch.

Site Code: MAN MW-1b (2) Northern Aux. Site

BORIS ID: T0P5M

Coordinates:

Lat./Long.: 55°53.3' -98°51.5'
UTM: (14) 508832E 6193676N

Magnetic declination: 7°E

Forest cover map: T79R9W1; stand 273

NTS Map: 63-O/15

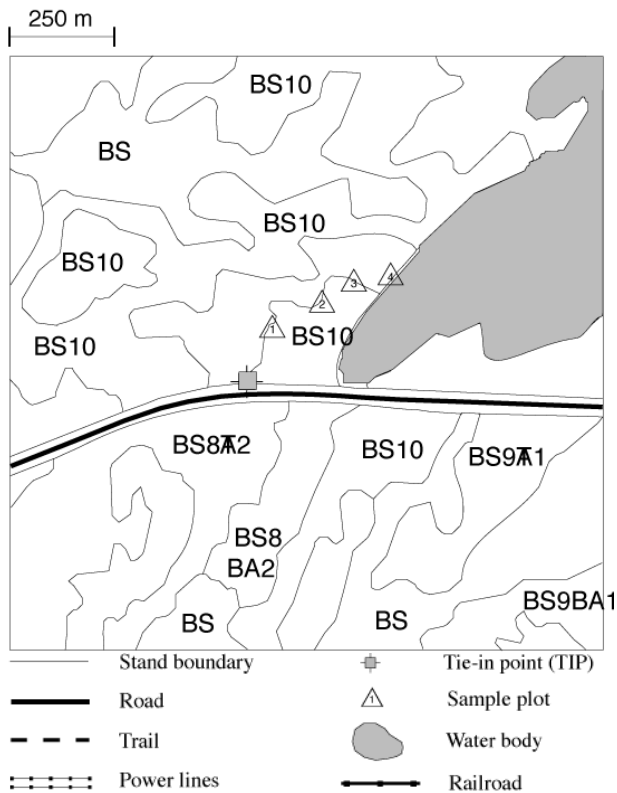
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91026
Numbers: **132, 133**

Plot XY coordinates (cm):

TIP:	7.4	13.8
Plot 2:	8.7	15.0
Plot 4:	9.7	15.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on north side of Hwy. 391, 66.7 km west of the Hwy. 391–Gillam Road junction (2.5 km past Nelson House road) where a small dense black spruce and a larger black spruce–aspen mix boundary meets the road clearance.

Plot 1: from TIP, 142 m at 27° (stratum 1, site MW-1a)
Plot 2: from plot 1, 158 m at 64° (stratum 2, this site)
Plot 3: from plot 2, 71 m at 46° (stratum 1, site MW-1a)
Plot 4: from plot 3, 111 m at 86° (stratum 2, this site)

General comments:

Field notes state that the site is an aspen–black spruce mixture, with larger-sized trees than MW-1a.

Overstory sample at plot 2 is predominantly black spruce, with some white birch. Plot 4 data has been lost. Site first visited in 1993. Return visit on July 25, 1994 noted 25–50° blowdown of tallied trees.

Site Code: MAN MW-2a (1) Northern Aux. Site

BORIS ID: Q1V2M

Coordinates:

Lat./Long.: 55°32.7' -98°2.6'
UTM: (14) 560381E 6155795N

Magnetic declination: 7°E

Forest cover map: T75R4W1; stand 203, no number

NTS Map: 63-O/9

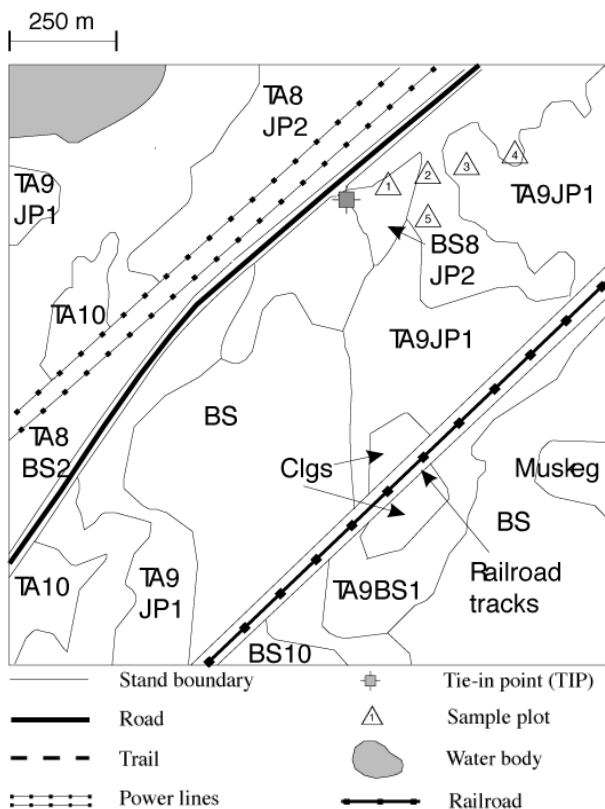
Aerial photograph reference:

Scale: 1:15 840
Roll/line: A26745
Numbers: **123**

Plot XY coordinates (cm):

TIP:	12.2	6.8
Plot 3:	14.0	7.3
Plot 4:	14.7	7.4
Plot 5:	13.4	6.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 6, 24.5 km south of where Hwy. 6 intersects with the high power lines at the southern town limits of Thompson, on the east side of the road. The TIP is 2.0 km from where Opswagon Lake is closest to the road and 4.7 km northeast of the Hwy. 6-Hwy. 375 junction.

- Plot 1: from TIP, 100 m at 76° (stratum 2, site MW-2b)
- Plot 2: from plot 1, 100 m at 76° (stratum 2, site MW-2b)
- Plot 3: from plot 2, 100 m at 76° (stratum 1, this site)
- Plot 4: from plot 3, 100 m at 76° (stratum 1, this site)
- Plot 5: from plot 2, 100 m at 179° (stratum 1, this site)

General comments:

This stand is directly east of Hwy. 375, which is blacktop and has much traffic. Thematic Mapper data (remote sensing) seems to indicate an area with more aspen-pine to the east; the area to the west has more spruce. Crown flags were installed at plot 3.

Overstory samples at plots 3 and 4 are predominantly aspen, with some jack pine. Sample at plot 5 is pure jack pine, but field crews noted poplar and aspen outside the sample plot.

Site Code: MAN MW-2b (2) Northern Aux. Site

BORIS ID: Q1V2M

Coordinates:

Lat./Long.: 55°32.7' -98°2.6'
UTM: (14) 560381E 6155795N

Magnetic declination: 7°E

Forest cover map: T75R4W1; stand 199, no number

NTS Map: 63-O/9

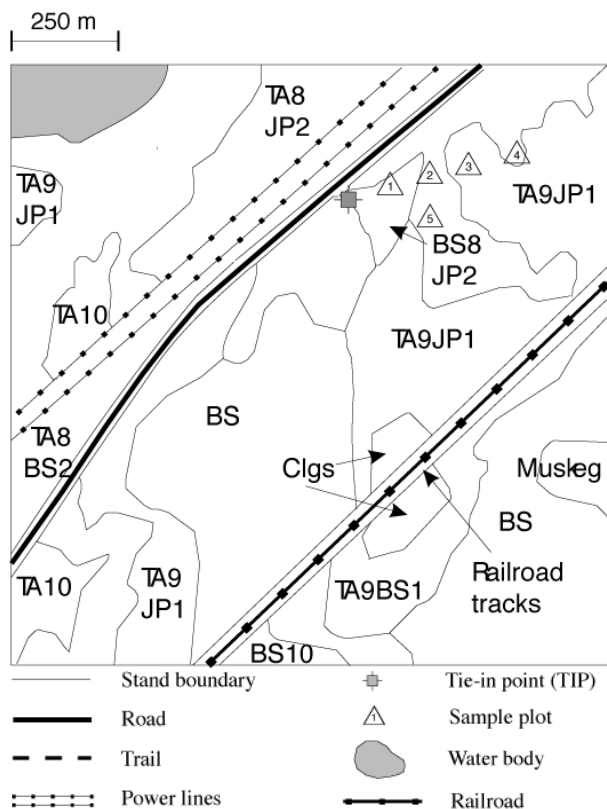
Aerial photograph reference:

Scale: 1:15 840
Roll/line: A26745
Numbers: **123**

Plot XY coordinates (cm):

TIP:	12.2	6.8
Plot 1:	12.8	7.0
Plot 2:	13.4	7.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 6, 24.5 km south of where Hwy. 6 intersects with the high power lines at the southern town limits of Thompson, on the east side of the road. The TIP is 2.0 km from where Opswagon Lake is closest to the road and 4.7 km northeast of the Hwy. 6-Hwy. 375 junction.

- Plot 1: from TIP, 100 m at 76° (stratum 2, this site)
- Plot 2: from plot 1, 100 m at 76° (stratum 2, this site)
- Plot 3: from plot 2, 100 m at 76° (stratum 1, site MW-2a)
- Plot 4: from plot 3, 100 m at 76° (stratum 1, site MW-2a)
- Plot 5: from plot 2, 100 m at 179° (stratum 1, site MW-2a)

General comments:

Overstorey sample at plot 1 is predominantly black spruce, with some jack pine and aspen. Plot 2 is predominantly jack pine, with some black spruce and aspen.

Southern Study Area

Auxiliary Sites

Site Code: SASK ADH-2 (1) Southern Aux. Site

BORIS ID: D6L9A

Coordinates:

Lat./Long.: 53°40.2' -104°38.0'
UTM: (13) 524250E 5946910N

Magnetic declination: 17°E

Forest cover map: 52594; stand 711

NTS Map: 73-H/10

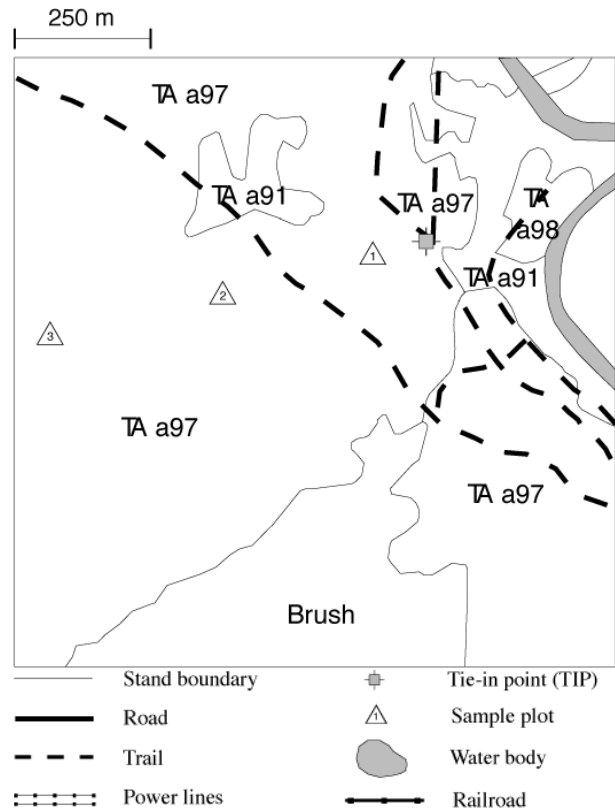
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB300-8473
Numbers: 214, **215**

Plot XY coordinates (cm):

TIP: 9.5 9.5
Plot 1: 8.6 9.2
Plot 2: 6.2 8.4
Plot 3: 3.3 7.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 106, about 24 km north of Smeaton. There is a trail entrance 1.3 km southwest of Torch River on 106 (on the north side of the road). Proceed north 1.4 km along the trail. The TIP is directly west of stand 722, at a junction in the trail.

Plot 1: from TIP, 124 m at 252°
Plot 2: from plot 1, 313 m at 252°
Plot 3: from plot 2, 375 m at 252°

General comments:

The stand appears to be of fire origin.

Overstory samples at plots 1 and 3 are pure aspen. Plot 2 is mainly aspen with some balsam poplar.

Site Code: SASK ADM-3 (1) Southern Aux. Site

BORIS ID: none

Coordinates:

Lat./Long.: 54°4.1' -104°39.2'
UTM: (13) 522690E 5991180N

Magnetic declination: 17°E

Forest cover map: 52599; stand 1018, 829

NTS Map: 73-I/2

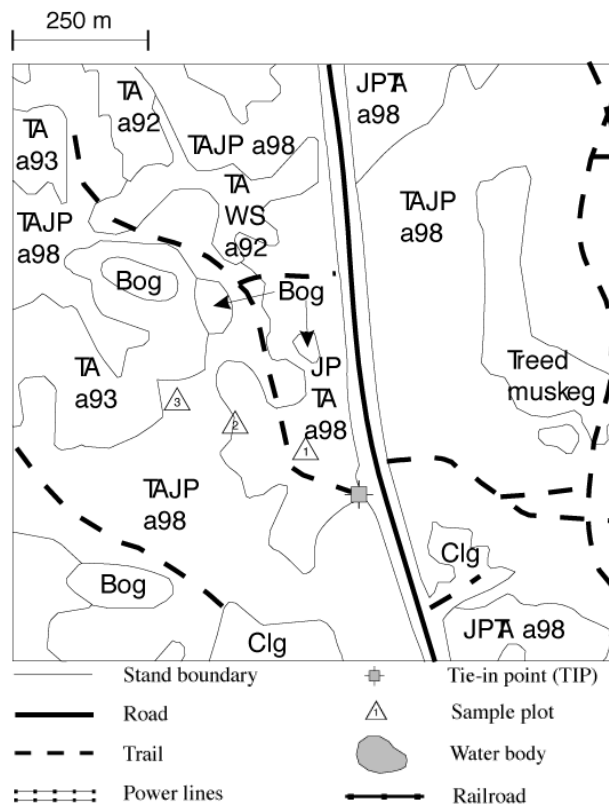
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB311-8451A
Numbers: **107, 108**

Plot XY coordinates (cm):

TIP: 16.5 10.5
Plot 1: 15.6 11.2
Plot 2: 14.6 11.5
Plot 3: 13.5 11.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: off Hwy. 106. Proceed 3.3 km north of the Hwy. 120-Hwy. 106 junction on Hwy. 106 and take the loop road on the west (left) side of the road. The TIP is 1.7 km north along the loop road on the west side of a junction of an old trail and the loop road.

Plot 1: from TIP, 150 m at 308°
Plot 2: from plot 1, 125 m at 288°
Plot 3: from plot 2, 150 m at 288°

General comments:

This is a young aspen stand. Based on field estimates of tree age, the site burned no later than about 1976-1977.

Overstory samples at all plots are pure aspen, except for a trace of white spruce and white birch in plot 1.

Site Code: SASK AIH-3 (1) Southern Aux. Site

BORIS ID: D9I1A

Coordinates:

Lat./Long.: 53°43.4' -105°12.5'
UTM: (13) 486270E 5952800N

Magnetic declination: 17°E

Forest cover map: 48595; stand 923

NTS Map: 73-H/11

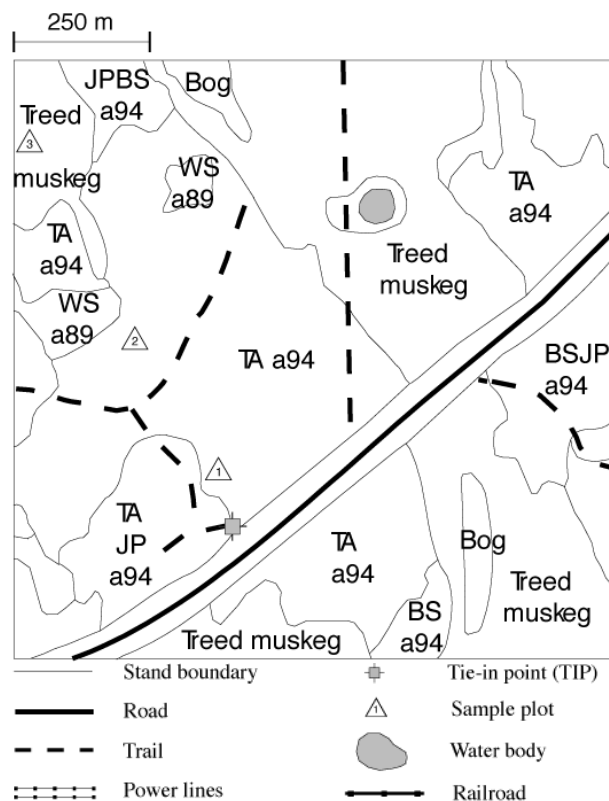
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB299-8470
Numbers: 51, 52

Plot XY coordinates (cm):

TIP:	10.0	11.2
Plot 1:	9.6	12.0
Plot 2:	8.6	14.4
Plot 3:	7.6	16.8

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on Hwy. 120, 2.8 km north of the Hwy. 120-Hwy. 265 junction (the road to Candle Lake) on the northwest (left) side of the road.

Plot 1: from TIP, 113 m at 334°
Plot 2: from plot 1, 325 m at 337°
Plot 3: from plot 2, 325 m at 337°

General comments:

Overstory samples at all plots are predominantly aspen, with a small amount of white spruce.

Site Code: SASK AIM-13 (1) Southern Aux. Site

BORIS ID: B9B7A

Coordinates:

Lat./Long.: 53°35.6' -106°12.3'
UTM: (13) 420240E 5938970N

Magnetic declination: 17°E

Forest cover map: PANP-SE; no stand number

NTS Map: 73-G/9

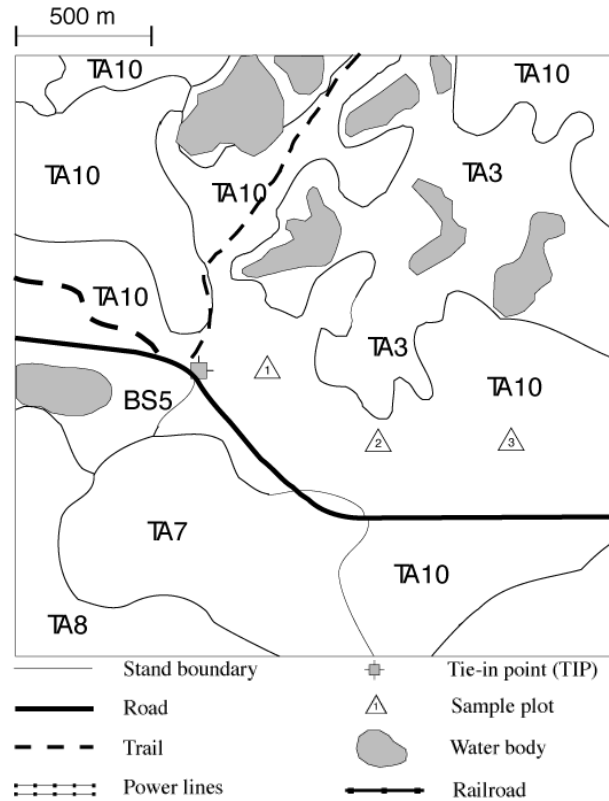
Aerial photograph reference:

Scale: 1:12 500
Roll/line: A27617
Numbers: 13, 14

Plot XY coordinates (cm):

TIP:	11.5	14.2
Plot 1:	13.5	14.3
Plot 2:	16.8	12.0
Plot 3:	20.8	12.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: off Hwy. 263, on the east-west road that forms the southern boundary of Prince Albert National Park. The TIP is at the intersection of the Fish Lake Trail and the boundary road.

Plot 1: from TIP, 250 m at 88°
Plot 2: from plot 1, 500 m at 124°
Plot 3: from plot 2, 500 m at 88°

General comments:

Field notes state that stands in the south end of the park apparently at one time were high-graded for white spruce. One or two white spruce were seen during this visit.

Overstory samples at plots 1 and 3 are predominantly aspen, with a small amount of balsam poplar. Plot 2 is predominantly balsam poplar, with some aspen.

Site Code: SASK AMH-16 (1) Southern Aux. Site

BORIS ID: D9G4A

Coordinates:

Lat./Long.: 53°44.4' -105°28.3'
UTM: (13) 468920E 5954650N

Magnetic declination: 17°E

Forest cover map: 46595; stand 720

NTS Map: 73-H/11

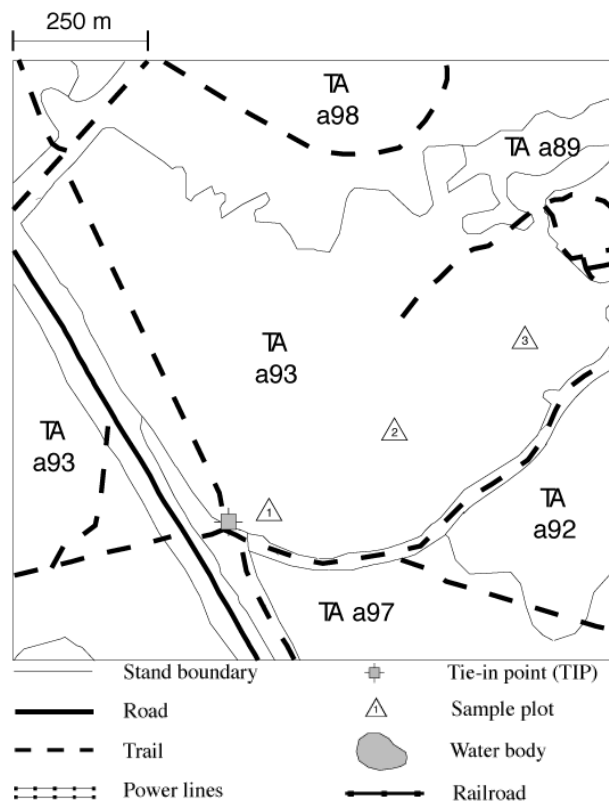
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB299-8469
Numbers: 223, **224**

Plot XY coordinates (cm):

TIP:	12.2	9.1
Plot 1:	12.6	9.3
Plot 2:	14.6	10.7
Plot 3:	16.7	12.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 926, 17.0 km north of the Hwy. 926-Hwy. 120 junction, at the edge of a clearing. The TIP is situated on top of a berm.

Plot 1: from TIP, 50 m at 63°
Plot 2: from plot 1, 312 m at 56°
Plot 3: from plot 2, 312 m at 56°

General comments:

Field notes state that the trails are overgrown and very difficult to identify.

Overstory samples at all plots are pure aspen.

Site Code: SASK AMM-12 (1) Southern Aux. Site

BORIS ID: E7C3A

Coordinates:

Lat./Long.: 53°50.8' -106°4.6'
UTM: (13) 429170E 5967020N

Magnetic declination: 17°E

Forest cover map: PANP-SE; no stand number

NTS Map: 73-G/16

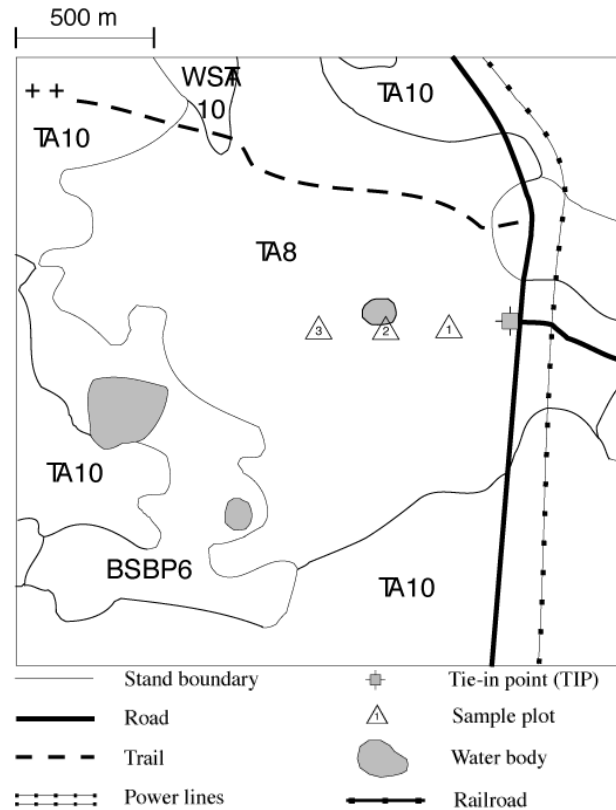
Aerial photograph reference:

Scale: 1:12 500
Roll/line: A27613
Numbers: **180**, 181

Plot XY coordinates (cm):

TIP:	18.2	4.6
Plot 1:	15.9	4.5
Plot 2:	13.9	4.4
Plot 3:	11.9	4.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 263, south of Wasquesui Lake. The TIP is at the intersection of Namekus Lake road and Hwy. 263.

Plot 1: from TIP, 290 m at 268°
Plot 2: from plot 1, 250 m at 268°
Plot 3: from plot 2, 250 m at 268°

General comments:

Overstory samples at all plots are predominantly aspen, with some balsam poplar plus small amounts of other species.

Site Code: SASK B?L (1) Southern Aux. Site

BORIS ID: G2L7S

Coordinates:

Lat./Long.: 53°54.4' -104°37.9'
UTM: (13) 524140E 5973140N

Magnetic declination: 17°E

Forest cover map: 52597; stand 530

NTS Map: 73-H/15

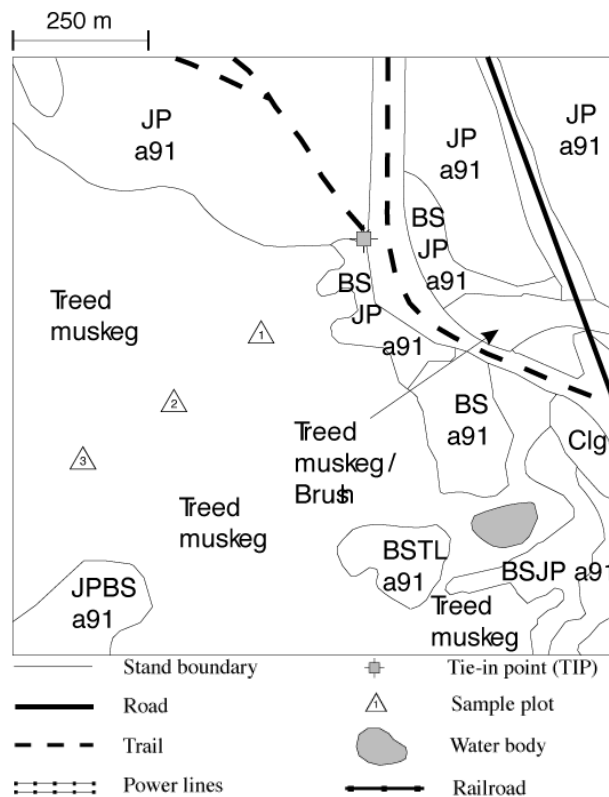
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB305-8460
Numbers: 11, 12

Plot XY coordinates (cm):

TIP:	15.6	10.4
Plot 1:	13.8	8.9
Plot 2:	12.6	8.0
Plot 3:	11.4	7.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: off Hwy. 106. Proceed 0.9 km north of the Hwy. 106-Harding Road junction and west (left) onto the old highway for 0.5 km. The TIP is where the old Hwy. 106 clearance intersects with the trail.

Plot 1: from TIP, 288 m at 230°
Plot 2: from plot 1, 188 m at 234°
Plot 3: from plot 2, 188 m at 234°

General comments:

There is another aerial photo pair available: photoroll XFB53-X85184, photos 116 and 117. The site has not been assigned a maturity class.

Overstorey samples at plots 1 and 2 are mainly black spruce with some tamarack. Plot 3 is predominantly tamarack, with some black spruce. The site is flooded.

Site Code: SASK BDH-4 (1) Southern Aux. Site

BORIS ID: none

Coordinates:

Lat./Long.: 54°2.1' -104°39.1'
UTM: (13) 522800E 5987500N

Magnetic declination: 17°E

Forest cover map: 52598; stand 287

NTS Map: 73-I/2

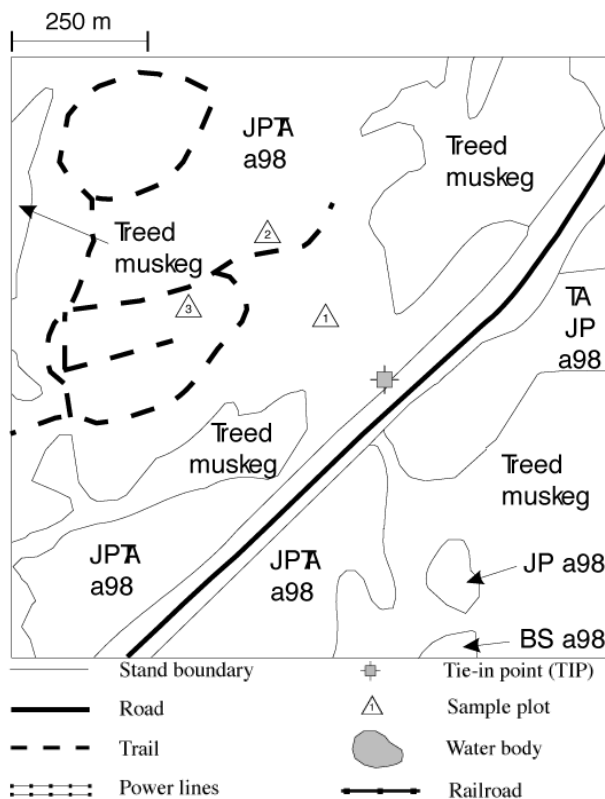
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB310-8453
Numbers: 62, **63**

Plot XY coordinates (cm):

TIP:	13.9	11.8
Plot 1:	13.2	12.5
Plot 2:	12.1	13.5
Plot 3:	11.0	12.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 120, about 1.5 km north of the intersection of Hwy. 106 and Hwy. 120.

Plot 1: from TIP, 125 m at 314°
Plot 2: from plot 1, 188 m at 314°
Plot 3: from plot 2, 188 m at 226°

General comments:

Overstorey samples at all plots are almost entirely young jack pine. Black spruce is only present at plot 1, and then only in small quantities.

Site Code: SASK BDL-20 (1) Southern Aux. Site

BORIS ID: G9I4S

Coordinates:

Lat./Long.: 54°0.0' -105°6.9'
UTM: (13) 492430E 5983570N

Magnetic declination: 17°E

Forest cover map: 49598; stand 585, 586

NTS Map: 73-H/14

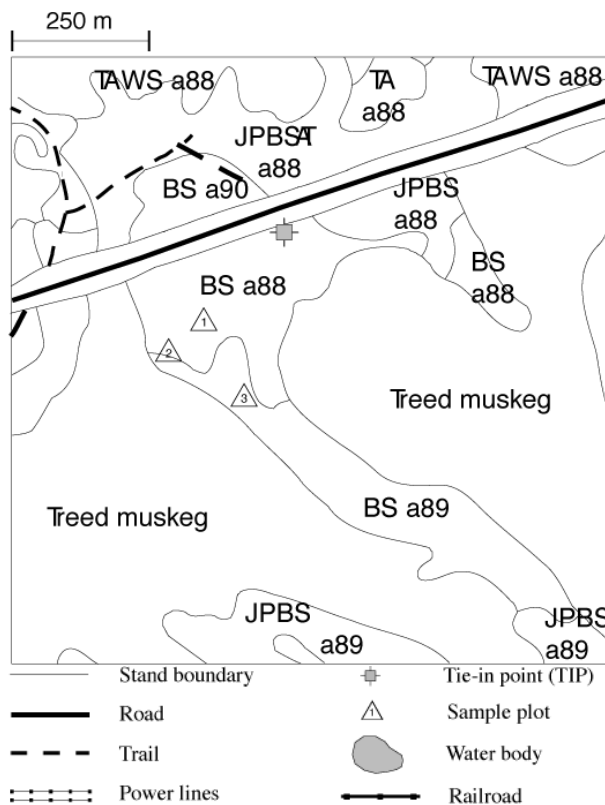
Aerial photograph reference:

Scale: 1:12 500
Roll/line: 1-8455
Numbers: 53, 54

Plot XY coordinates (cm):

TIP:	9.2	13.4
Plot 1:	8.0	12.1
Plot 2:	7.5	11.6
Plot 3:	8.6	11.0

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 913, 19.4 km north of the Hwy. 120-Hwy. 913 junction (9.7 km north of the Heritage Lake picnic area entrance). The TIP is adjacent to the yellow gate marking the entrance to the access road leading to the Old Black Spruce tower site. This point is 0.85 km west of a long, narrow (700 m by 50 m) cutline on the south side of the highway.

Plot 1: from TIP, 225 m at 223°
Plot 2: from plot 1, 88 m at 223°
Plot 3: from plot 2, 150 m at 118°

General comments:

This site is near the Old Black Spruce tower site and the TE-OBS site.

Overstory samples at all plots are pure black spruce.

Site Code: SASK BIH (1) Southern Aux. Site

BORIS ID: G2I4S

Coordinates:

Lat./Long.: 53°55.8' -105°8.5'
UTM: (13) 490680E 5975690N

Magnetic declination: 17°E

Forest cover map: 49597; stand 600

NTS Map: 73-H/14

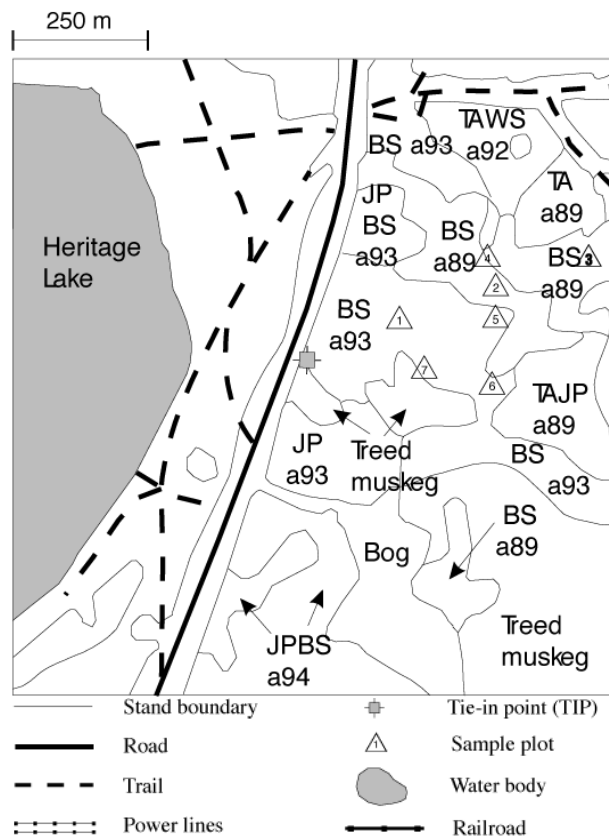
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB307-8459
Numbers: 220, 221

Plot XY coordinates (cm):

TIP:	12.5	13.6
Plot 1:	13.9	14.2
Plot 3:	16.7	15.1
Plot 6:	15.2	13.2
Plot 7:	14.2	13.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the east side of Hwy. 913, 10.0 km north of Hwy. 913-Hwy. 120 junction (0.4 km north of the Heritage Lake recreation site entrance).

- Plot 1: from TIP, 188 m at 67° (stratum 1, this site)
- Plot 2: from plot 1, 188 m at 72° (stratum 2, site BMH)
- Plot 3: from plot 2, 188 m at 72° (not sampled: area logged over)
- Plot 4: from plot 2, 63 m at 343° (stratum 2, site BMH)
- Plot 5: from plot 2, 63 m at 186° (stratum 2, site BMH)
- Plot 6: from plot 5, 125 m at 186° (stratum 1, this site)
- Plot 7: from plot 6, 125 m at 283° (stratum 1, this site)

General comments:

Site BIH was formerly identified as site BIHa. BIH is the first sampling stratum in the pair of sites BIH/BMH. Plot 3 was not sampled; it had been recently logged over. Field notes state that the site is immature and relatively dense.

Overstory samples at all plots are predominantly black spruce. Plot 6 has some jack pine.

Site Code: SASK BMH (2) Southern Aux. Site

BORIS ID: G2I4S

Coordinates:

Lat./Long.: 53°55.8' -105°8.5'
UTM: (13) 490680E 5975690N

Magnetic declination: 17°E

Forest cover map: 49597; stand 297

NTS Map: 73-H/14

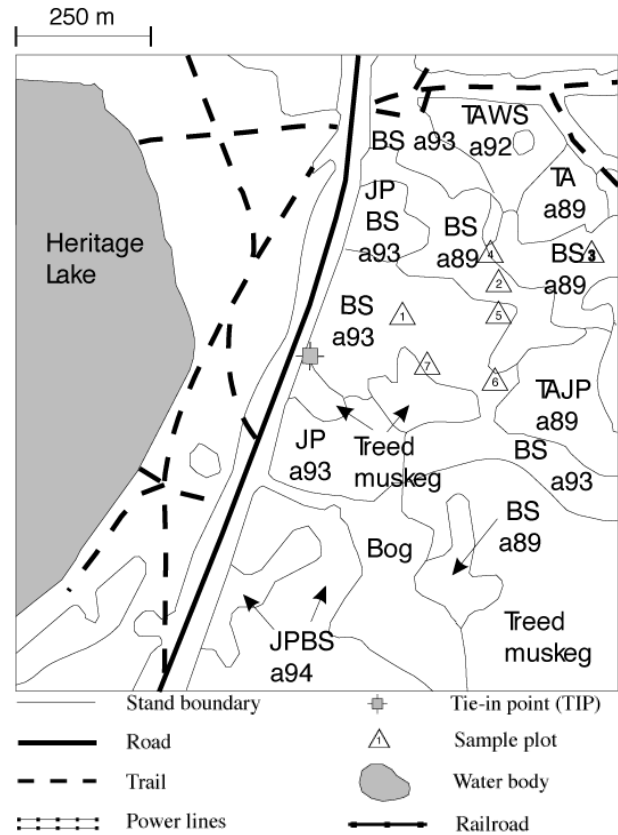
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB307-8459
Numbers: 220, 221

Plot XY coordinates (cm):

TIP:	12.5	13.6
Plot 2:	15.3	14.7
Plot 4:	15.2	15.1
Plot 5:	15.3	14.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the east side of Hwy. 913, 10.0 km north of Hwy. 913-Hwy. 120 junction (0.4 km north of the Heritage Lake recreation site entrance).

- Plot 1: from TIP, 188 m at 67° (stratum 1, site BIH)
- Plot 2: from plot 1, 188 m at 72° (stratum 2, this site)
- Plot 3: from plot 2, 188 m at 72° (not sampled: area logged over)
- Plot 4: from plot 2, 63 m at 343° (stratum 2, this site)
- Plot 5: from plot 2, 63 m at 186° (stratum 2, this site)
- Plot 6: from plot 5, 125 m at 186° (stratum 1, site BIH)
- Plot 7: from plot 6, 125 m at 283° (stratum 1, site BIH)

General comments:

This site is referred to as BMH-6 on Thematic Mapper data and by NASA. The site was formerly identified as BIHb. BMH is the second sampling stratum in the pair of sites BIH/BMH. Field notes state that the site is mature and relatively open.

Overstory sample at plot 2 is mainly black spruce with some jack pine. Plot 4 is mainly jack pine, with some balsam poplar and black spruce. Plot 5 is roughly equal quantities of jack pine and black spruce.

Site Code: SASK BMH-9 (1) Southern Aux. Site

BORIS ID: G6K8S

Coordinates:

Lat./Long.: 53°56.7' -104°46.1'
UTM: (13) 515260E 5977360N

Magnetic declination: 17°E

Forest cover map: 51597; stand 238

NTS Map: 73-H/15

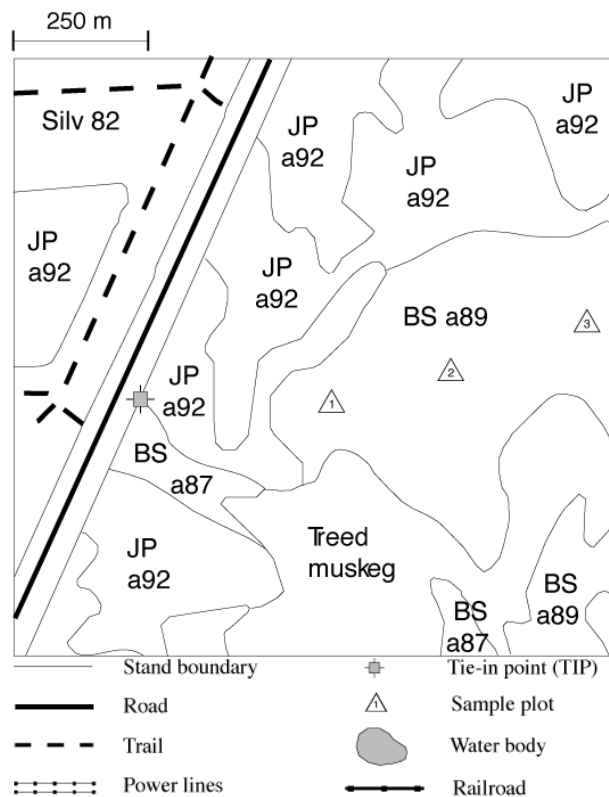
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB308-8458
Numbers: **114, 115**

Plot XY coordinates (cm):

TIP:	10.5	12.9
Plot 1:	13.5	12.8
Plot 2:	15.4	13.5
Plot 3:	17.3	14.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 120, 2.3 km north of the Hwy. 120-Harding Road junction. The TIP is at the boundary of stand 215 and 216 (on the forest cover map), where it intersects the Hwy. 120 road clearance.

Plot 1: from TIP, 375 m at 91°
Plot 2: from plot 1, 250 m at 71°
Plot 3: from plot 2, 250 m at 71°

General comments:

The water table is high at this site, thus depth to water table is given instead of duff depth on the fuels tally form.

Overstorey samples at all plots are predominantly black spruce with some tamarack.

Site Code: SASK BMM-1a (1) Southern Aux. Site

BORIS ID: D0H6S

Coordinates:

Lat./Long.: 53°39.0' -105°17.4'
UTM: (13) 480880E 5944600N

Magnetic declination: 17°E

Forest cover map: 48594; stand 636

NTS Map: 73-H/11

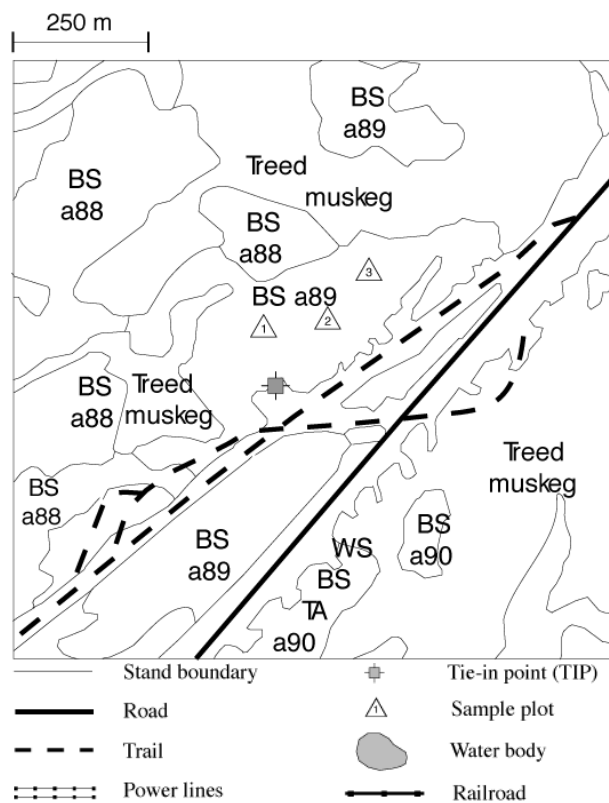
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB301-8474
Numbers: 143, **144**

Plot XY coordinates (cm):

TIP:	16.7	4.3
Plot 1:	16.4	5.2
Plot 2:	17.4	5.3
Plot 3:	17.9	6.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Candle Lake Road (Hwy. 265)–Hwy. 120 junction, proceed south 7.0 km on Hwy. 120 to the old road. Turn right (southwest) onto the road and proceed for 0.7 km to the access point. The TIP is at the north end of the clearing.

Plot 1: from TIP, 125 m at 341°
Plot 2: from plot 1, 125 m at 88°
Plot 3: from plot 2, 125 m at 33°

General comments:

Overstory samples are predominantly black spruce, with small amounts of tamarack.

Site Code: SASK BMM-1b (2) Southern Aux. Site

BORIS ID: D0H6S

Coordinates:

Lat./Long.: 53°38.9' -105°17.6'
UTM: (13) 480580E 5944380N

Magnetic declination: 17°E

Forest cover map: 48594; stand 629, 640

NTS Map: 73-H/11

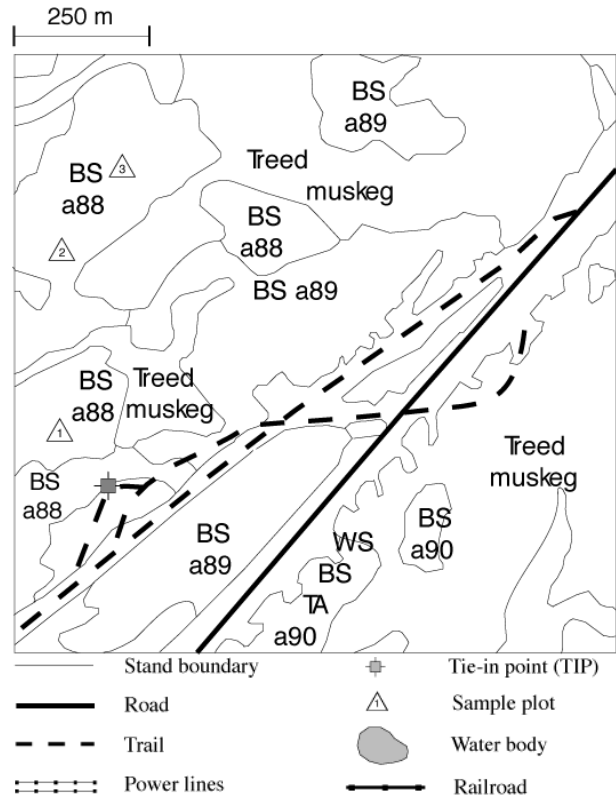
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB301-8474
Numbers: 143, **144**

Plot XY coordinates (cm):

TIP:	13.9	2.6
Plot 1:	13.4	4.0
Plot 2:	13.3	6.6
Plot 3:	14.1	7.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the BMM-1a TIP, continue on the old road for 0.45 km to where it intersects with an old cutline. Follow the old cutline for 130 m at 15° to the TIP.

Plot 1: from TIP, 188 m at 341°
Plot 2: from plot 1, 325 m at 358°
Plot 3: from plot 2, 188 m at 33°

General comments:

Ages, heights, and crown dimensions, etc. were done on trees outside of the plot for stand 640.

Overstory samples for all plots are predominantly black spruce. Plot 2 has only a small amount of tamarack. Plot 3 has some tamarack.

Site Code: SASK Jail House (1)

Southern Aux. Site

BORIS ID: F1N0M

Coordinates:

Lat./Long.: 53°48.5' -104°32.3'
UTM: (13) 530450E 5962230N

Magnetic declination: 17°E

Forest cover map: 53596; stand 1385-7

NTS Map: 73-H/15

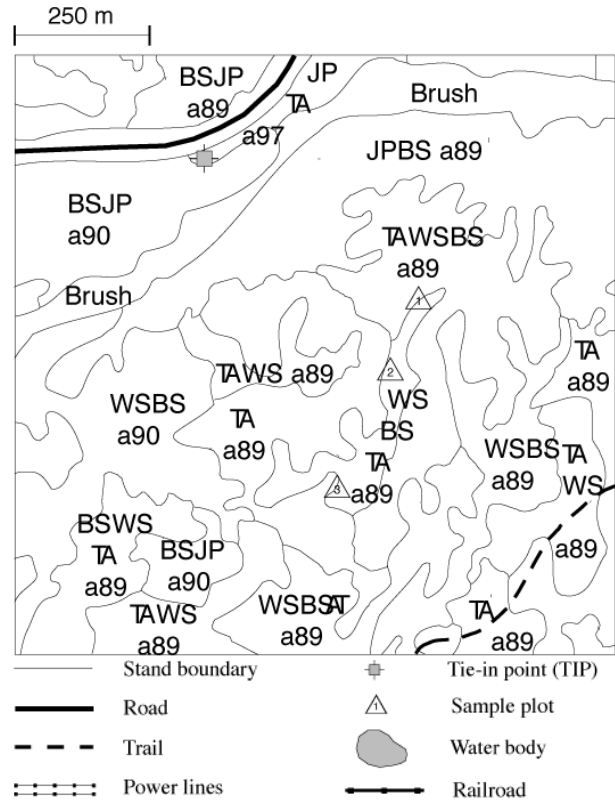
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB303-8466
Numbers: **32, 33**

Plot XY coordinates (cm):

TIP: 13.6 20.0
Plot 1: 16.8 17.9
Plot 2: 16.4 16.8
Plot 3: 15.6 15.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the road into the correctional facility. The entrance to this road is on Hwy. 106 (Hanson Lake road), 9.7 km south of the Harding Road-Hwy. 106 junction. The TIP is on the south side of the road 4.7 km from Hwy. 106.

Plot 1: from TIP, 480 m at 123°
Plot 2: from plot 1, 150 m at 203°
Plot 3: from plot 2, 225 m at 203°

General comments:

Travelling from the TIP to plot 1 requires crossing a creek and beaver pond.

Overstory samples at all plots are predominantly aspen, with some white spruce. Plot 2 also has some balsam fir.

Site Code: SASK JDM-8 (1) Southern Aux. Site

BORIS ID: G8L6P

Coordinates:

Lat./Long.: 53°57.9' -104°38.0'
UTM: (13) 524030E 5979670N

Magnetic declination: 17°E

Forest cover map: 52597; stand 65

NTS Map: 73-H/15

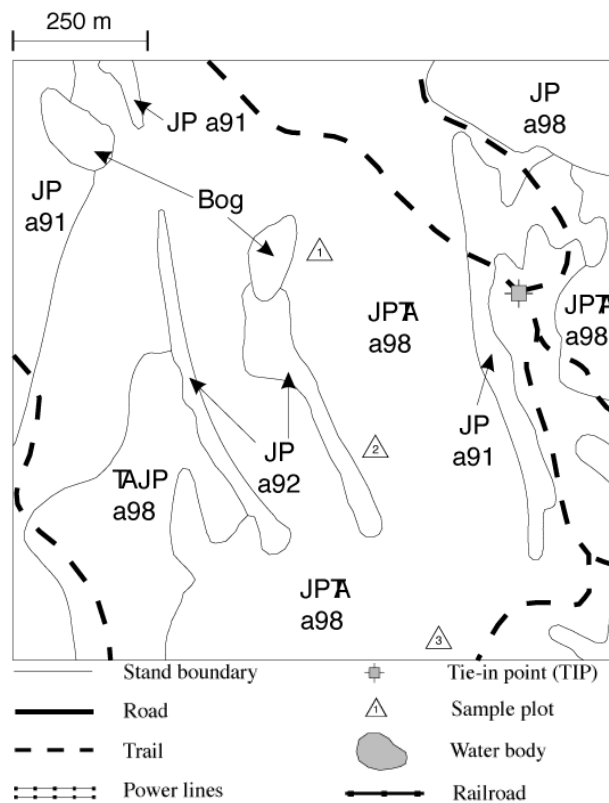
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB309-8457
Numbers: 151, **152**, 153

Plot XY coordinates (cm):

TIP:	11.3	13.6
Plot 1:	8.4	14.2
Plot 2:	9.4	11.3
Plot 3:	10.4	8.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: off Hwy. 106, about 8.6 km north of the Harding Road-Hwy. 106 junction. There is a trail entrance on the east side of the highway. Follow the trail for 1.4 km to the fork. The fork is the TIP.

Plot 1: from TIP, 363 m at 281°
 Plot 2: from plot 1, 375 m at 161°
 Plot 3: from plot 2, 375 m at 161°

General comments:

Field notes state that this stand is of fire origin. Large areas have been altered in some way (i.e., salvage logging or silviculture). An unaltered patch was selected for plot placement.

Overstory samples at plots 1 and 3 are pure jack pine. Plot 2 is mainly jack pine with some aspen.

Site Code: SASK JIH-4 (1) Southern Aux. Site

BORIS ID: F5I6P

Coordinates:

Lat./Long.: 53°51.6' -105°6.5'
 UTM: (13) 492870E 5967940N

Magnetic declination: 17°E

Forest cover map: 49596; stand 190

NTS Map: 73-H/14

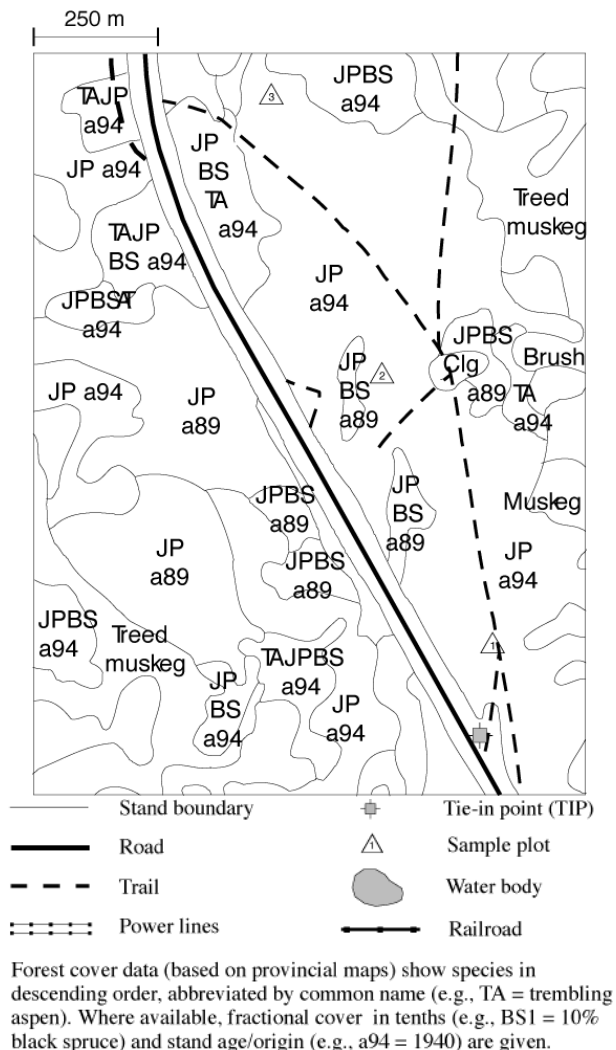
Aerial photograph reference:

Scale: 1:12 500
 Roll/line: FB317-8462
 Numbers: 180, **181**

Plot XY coordinates (cm):

TIP:	6.9	3.2
Plot 1:	7.1	4.7
Plot 2:	5.3	9.1
Plot 3:	3.5	13.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the east side of Hwy. 913, 1.4 km north of the Hwy. 913-Hwy. 120 junction where a trail (running at 7°) intersects the highway. The TIP is directly east of stand 405 on the forest cover map.

Plot 1: from TIP, 183 m at 6°
 Plot 2: from plot 1, 600 m at 338°
 Plot 3: from plot 2, 600 m at 338°

General comments:

Field notes state that this stand is dense jack pine with a white spruce understory.

Overstory samples at plots 1 and 3 are mainly jack pine with some white spruce. Plot 2 is pure jack pine.

Site Code: SASK JIH-7 (1) Southern Aux. Site

BORIS ID: I2I8P

Coordinates:

Lat./Long.: 54°6.6' -105°3.0'
UTM: (13) 496690E 5995720N

Magnetic declination: 17°E

Forest cover map: 49599; stand 924

NTS Map: 73-I/3

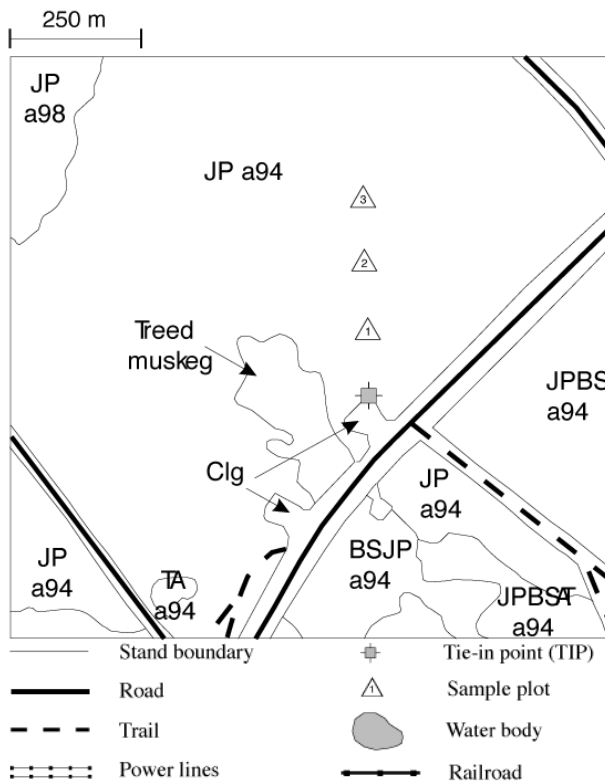
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB319-8449A
Numbers: 60, 61

Plot XY coordinates (cm):

TIP:	9.9	13.6
Plot 1:	9.9	14.6
Plot 2:	9.9	15.6
Plot 3:	9.8	16.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the west side of Hwy. 913, 27.3 km north of the Hwy. 913-Hwy. 120 junction, about 12 km north of the White Swan Recreation site and 0.6 km past the logging road junction. The TIP is at the north corner of the clearing.

Plot 1: from TIP, 125 m at 359°
Plot 2: from plot 1, 125 m at 359°
Plot 3: from plot 2, 125 m at 359°

General comments:

Field notes state that this is a uniform stand with some clear-cutting about 1 km to the north of the stand.

Overstory samples at plots range from mainly jack pine to pure jack pine. Plot 2 has a large amount of black spruce. Plot 3 has a small amount of black spruce.

Site Code: SASK JMH-5 (1)

Southern Aux. Site

BORIS ID: F7J0P

Coordinates:

Lat./Long.: 53°53.0' -105°3.5'
UTM: (13) 496200E 5970550N

Magnetic declination: 17°E

Forest cover map: 49597; stand 1393

NTS Map: 73-H/14

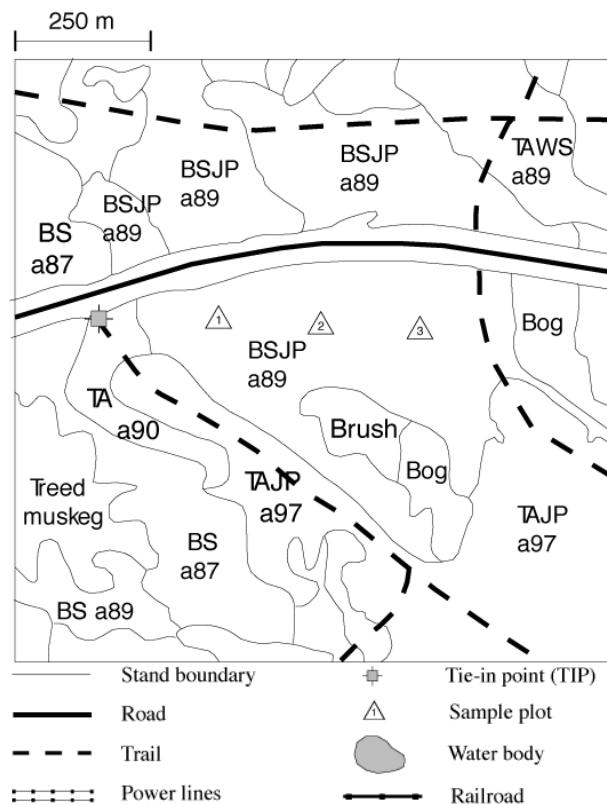
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB303-8461
Numbers: 237, **238**

Plot XY coordinates (cm):

TIP:	3.5	9.4
Plot 1:	5.3	9.4
Plot 2:	6.8	9.4
Plot 3:	8.3	9.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 120 4.9 km north of the Hwy. 913-Hwy. 120 junction where the trail (which runs southeast) intersects the highway.

Plot 1: from TIP, 225 m at 89°
 Plot 2: from plot 1, 188 m at 93°
 Plot 3: from plot 2, 188 m at 93°

General comments:

Overstory samples at all plots are predominantly black spruce. Plot 1 has a small amount of jack pine. Plot 2 has some jack pine and a small amount of aspen. Plot 3 has a small amount of aspen.

Site Code: SASK JMH-10 (1) Southern Aux. Site

BORIS ID: G9L0P

Coordinates:

Lat./Long.: 53°58.8' -104°44.2'
UTM: (13) 517260E 5981340N

Magnetic declination: 17°E

Forest cover map: 51598; stand 843

NTS Map: 73-H/15

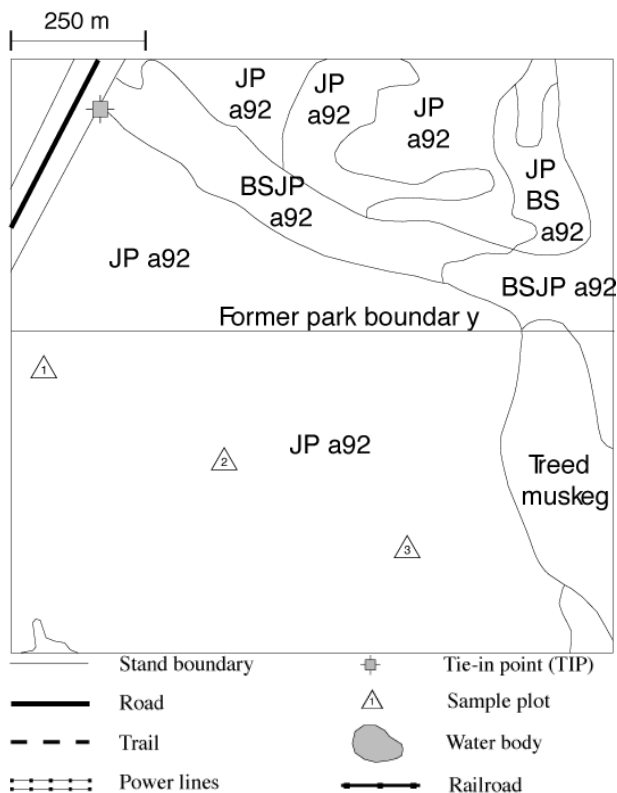
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB308-8456
Numbers: 209, **210**, 211

Plot XY coordinates (cm):

TIP:	8.6	7.0
Plot 1:	7.8	3.1
Plot 2:	10.5	1.8
Plot 3:	13.2	0.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 120, about 6.8 km north of the Harding Road-Hwy. 120 junction. The TIP is where the stand 1174-1176 boundary (on the forest cover map) intersects with the highway clearance.

Plot 1: from TIP, 500 m at 192°
Plot 2: from plot 1, 375 m at 116°
Plot 3: from plot 2, 375 m at 116°

General comments:

Field notes state that this stand generally has a lot of lichen cover. The herbs are not as rich as might be expected for a high productivity site. There are some mistletoe patches present.

Most of the area from the TIP to plot 1 is in stand 1176. The division between stands 843 and 1176 is along a former provincial park boundary and has no apparent physical significance.

Overstorey samples at all plots are pure jack pine.

Site Code: SASK JMH-A1 (1)

Southern Aux. Site

BORIS ID: F7J1P

Coordinates:

Lat./Long.: 53°53.0' -105°1.8'
UTM: (13) 498080E 5970490N

Magnetic declination: 17°E

Forest cover map: 49597; stand 1438

NTS Map: 73-H/14

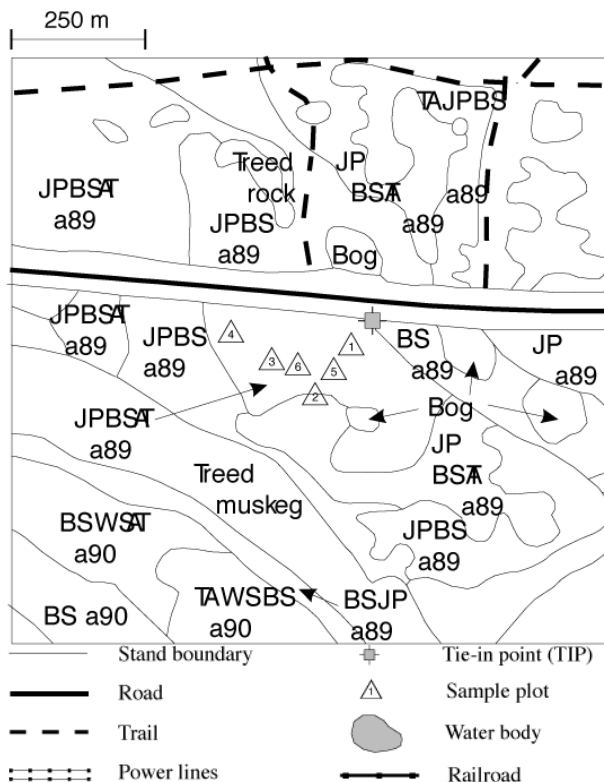
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB303-8461
Numbers: 238, **239**, 240

Plot XY coordinates (cm):

TIP:	10.0	9.9
Plot 3:	8.5	9.3
Plot 4:	7.9	9.7
Plot 6:	8.9	9.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the south side of Hwy. 120, 6.9 km from the Hwy. 120-Hwy. 913 (West Gull Lake road) junction, opposite a clearing.

- Plot 1: from TIP, 62 m at 219° (stratum 2, site JMH-A2)
- Plot 2: from plot 1, 125 m at 219° (stratum 2, site JMH-A2)
- Plot 3: from plot 2, 100 m at 311° (stratum 1, this site)
- Plot 4: from plot 3, 88 m at 305° (stratum 1, this site)
- Plot 5: from plot 1, 63 m at 219° (stratum 2, site JMH-A2)
- Plot 6: from plot 5, 63 m at 279° (stratum 1, this site).

General comments:

Field notes state that this appears to be a high productivity jack pine stand within an aspen-jack pine area. There is some evidence of harvest in the stand (single tree removals).

Overstory sample at plot 3 is predominantly jack pine, with some aspen and black spruce. Plots 4 and 6 are predominantly black spruce, with some jack pine.

Site Code: SASK JMH-A2 (2)

Southern Aux. Site

BORIS ID: F7J1P

Coordinates:

Lat./Long.: 53°53.0' -105°1.8'
UTM: (13) 498080E 5970490N

Magnetic declination: 17°E

Forest cover map: 49597; stand 1438, 1439

NTS Map: 73-H/14

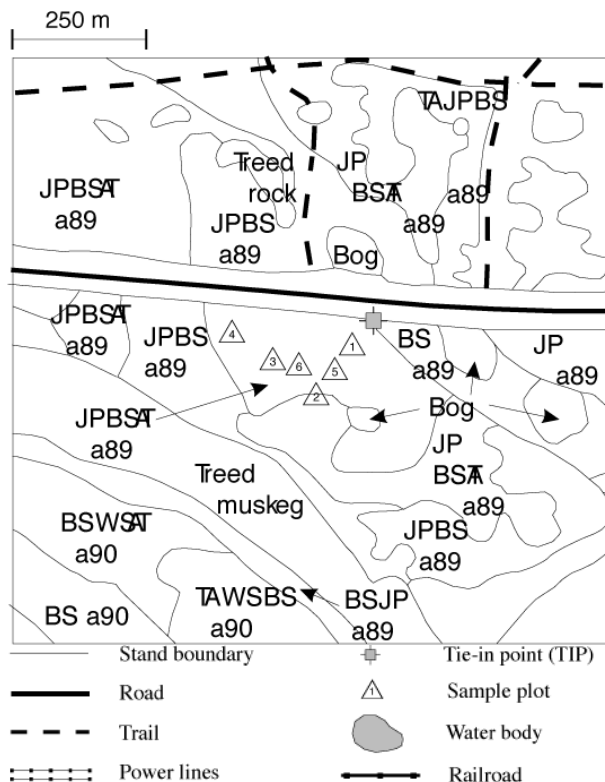
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB303-8461
Numbers: 238, **239**, 240

Plot XY coordinates (cm):

TIP:	10.0	9.9
Plot 1:	9.7	9.5
Plot 2:	9.1	8.7
Plot 5:	9.4	9.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the south side of Hwy. 120, 6.9 km from the Hwy. 120-Hwy. 913 (West Gull Lake road) junction, opposite a clearing.

- Plot 1: from TIP, 62 m at 219° (stratum 2, this site)
- Plot 2: from plot 1, 125 m at 219° (stratum 2, this site)
- Plot 3: from plot 2, 100 m at 311° (stratum 1, site JMH-A1)
- Plot 4: from plot 3, 88 m at 305° (stratum 1, site JMH-A1)
- Plot 5: from plot 1, 63 m at 219° (stratum 2, this site)
- Plot 6: from plot 5, 63 m at 279° (stratum 1, site JMH-A1)

General comments:

Overstorey sample at plot 1 is roughly equal amounts of aspen and jack pine, with a small amount of black spruce. Plot 2 is predominantly jack pine, with small amounts of aspen and black spruce. Plot 5 is pure black spruce.

Site Code: SASK JMM-5 (1) Southern Aux. Site

BORIS ID: G4K8P

Coordinates:

Lat./Long.: 53°55.0' -104°45.8'
UTM: (13) 515500E 5974300N

Magnetic declination: 17°E

Forest cover map: 51597; stand 222

NTS Map: 73-H/15

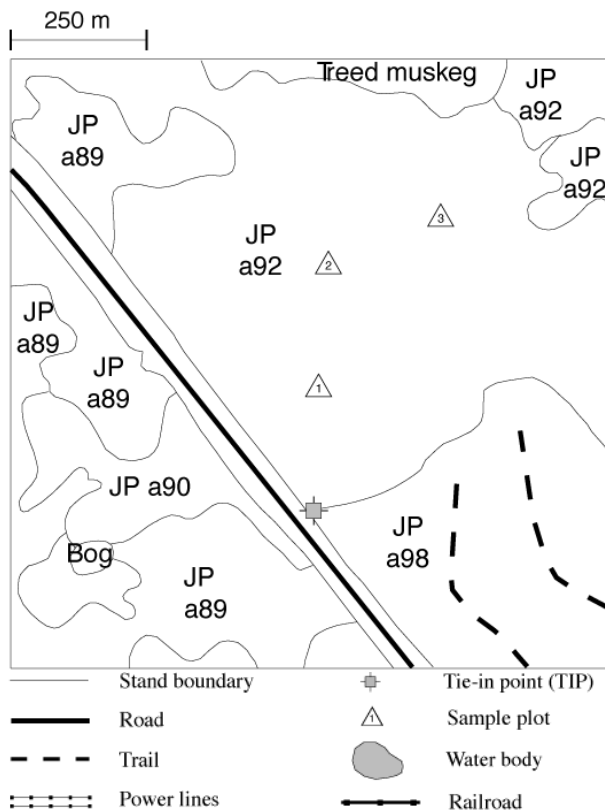
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB307-8459
Numbers: 198, **199**, 200

Plot XY coordinates (cm):

TIP:	11.4	4.6
Plot 1:	11.5	6.4
Plot 2:	11.6	8.2
Plot 3:	13.3	8.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the northeast side of Harding Road, 1.94 km southeast of the Harding Road-Hwy. 120 junction, at the edge of a cutblock, adjacent to the road. The TIP is 0.8 km northwest of the JMM-6 TIP.

Plot 1: from TIP, 225 m at 3°
Plot 2: from plot 1, 225 m at 3°
Plot 3: from plot 2, 225 m at 68°

General comments:

Field notes state that this stand has a relatively uniform species composition, age, and crown closure.

Overstory samples at all plots are pure jack pine.

Site Code: SASK JMM-6 (1) Southern Aux. Site

BORIS ID: G1K9P

Coordinates:

Lat./Long.: 53°54.7' -104°45.4'
UTM: (13) 515990E 5973670N

Magnetic declination: 17°E

Forest cover map: 51597; stand 686

NTS Map: 73-H/15

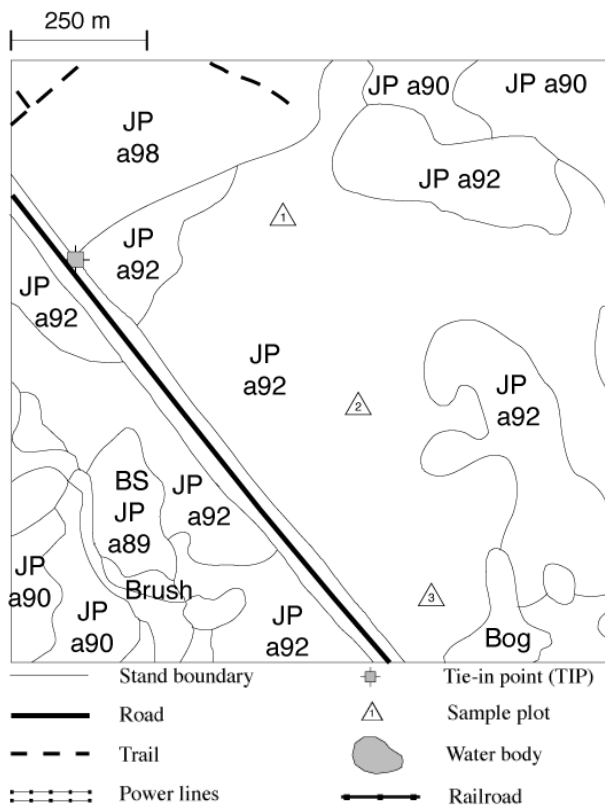
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB305-8460
Numbers: **18, 19**

Plot XY coordinates (cm):

TIP:	2.9	14.3
Plot 1:	6.0	14.9
Plot 2:	7.1	12.1
Plot 3:	8.2	9.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the northeast side of Harding Road, 2.9 km southeast of the Harding Road-Hwy. 120 junction. The TIP is at the south edge of a cutblock. The TIP is 0.8 km southeast of the JMM-5 TIP.

Plot 1: from TIP, 400 m at 79°
Plot 2: from plot 1, 375 m at 159°
Plot 3: from plot 2, 375 m at 159°

General comments:

Field notes state that this site appears to be in a dry jack pine stand.

Overstory samples at all plots are pure jack pine.

Site Code: SASK JMM-8a (1) Southern Aux. Site

BORIS ID: G7K8P

Coordinates:

Lat./Long.: 53°57.1' -104°45.9'
UTM: (13) 515460E 5978130N

Magnetic declination: 17°E

Forest cover map: 51597; stand 87

NTS Map: 73-H/14

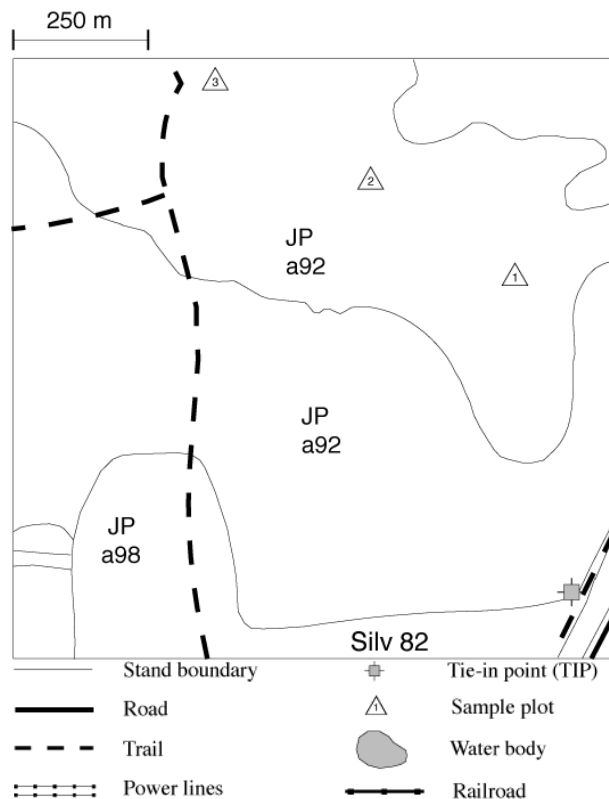
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB309-8457
Numbers: **159, 160**

Plot XY coordinates (cm):

TIP:	8.4	2.3
Plot 1:	7.6	7.0
Plot 2:	5.4	8.5
Plot 3:	3.1	9.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: off Hwy. 120. Proceed 2.9 km north of the Harding Road-Hwy. 120 junction, and take the access road entrance on the left (west). This leads to a logging road, running parallel to the highway (about 100 m away), with a clearing on the west side. Turn north and proceed about 200 m. The TIP is at the south edge of stand 88 on the forest cover map, at the edge of the clearing.

Plot 1: from TIP, 600 m at 351°
Plot 2: from plot 1, 338 m at 302°
Plot 3: from plot 2, 338 m at 302°

General comments:

Overstory samples at all plots are pure jack pine.

Site Code: SASK JMM-8b (2) Southern Aux. Site

BORIS ID: G8K8P

Coordinates:

Lat./Long.: 53°57.5' -104°45.5'
UTM: (13) 515860E 5978950N

Magnetic declination: 17°E

Forest cover map: 51597; stand 88

NTS Map: 73-H/14

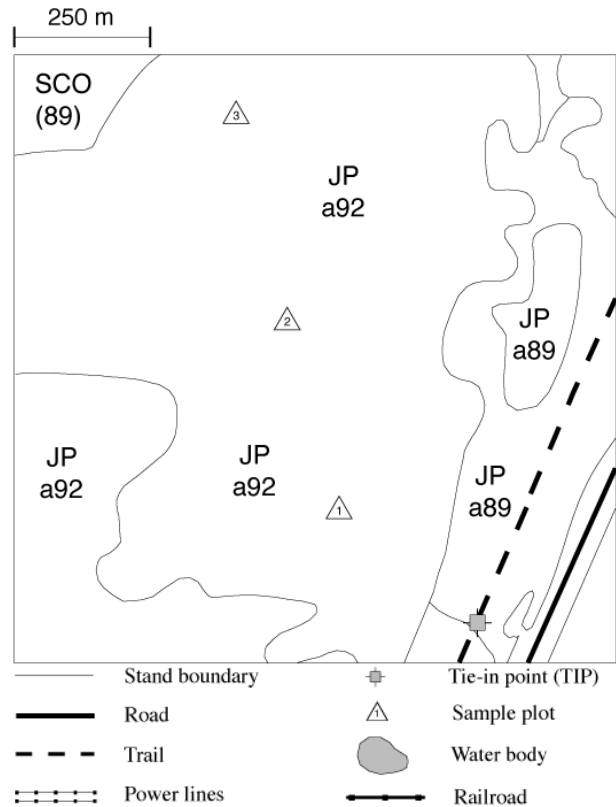
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB309-8457
Numbers: **159, 160**

Plot XY coordinates (cm):

TIP:	12.1	8.6
Plot 1:	10.1	10.3
Plot 2:	9.3	13.2
Plot 3:	8.6	16.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: off Hwy. 120, accessed either from the clearing 4.1 km north of the Harding Road-Hwy. 120 junction, or via the access road 2.9 km from the junction that leads to JMM-8a. The TIP is 25 m from the southwest corner of clearing 99 (on the forest cover map), on the logging trail that runs parallel to the highway. This TIP is about 900 m north of the JMM-8a TIP, which is on the same logging road.

Plot 1: from TIP, 325 m at 310°
Plot 2: from plot 1, 375 m at 345°
Plot 3: from plot 2, 375 m at 345°

General comments:

Overstory samples at all plots are pure jack pine.

Site Code: SASK MW-1a (1) Southern Aux. Site

BORIS ID: G4I3M

Coordinates:

Lat./Long.: 53°56.9' -105°8.7'
 UTM: (13) 490520E 5977860N

Magnetic declination: 17°E

Forest cover map: 49597; stand 255

NTS Map: 73-H/14

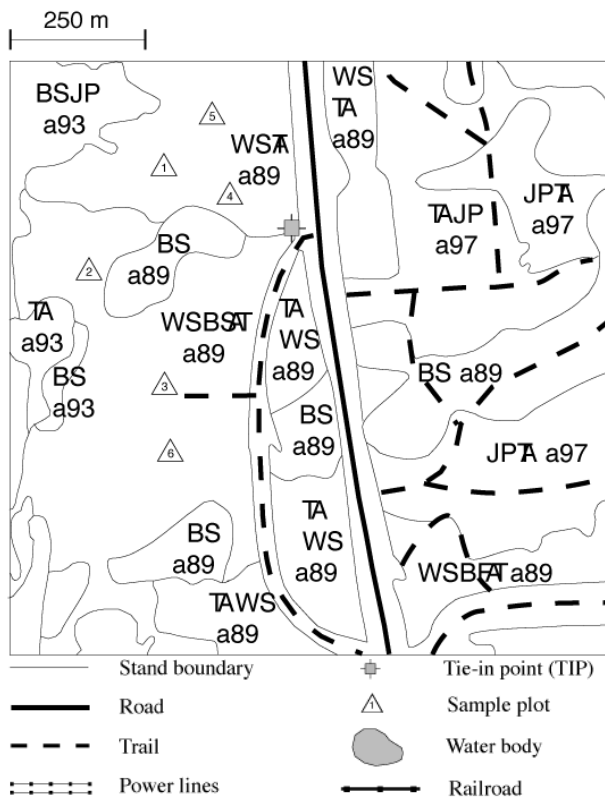
Aerial photograph reference:

Scale: 1:12 500
 Roll/line: FB308-8458
 Numbers: 91, **92**

Plot XY coordinates (cm):

TIP:	7.3	20.2
Plot 1:	5.5	21.1
Plot 4:	6.4	20.6
Plot 5:	6.1	21.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the west side of Hwy. 913, 12 km north of the Hwy. 120-Hwy. 913 junction, and 2.6 km north of the Heritage Lake entrance. The TIP is at the intersection of the old loop road with Hwy. 913 and the southeast corner of stand 255 on the forest cover map.

- Plot 1: from plot 4, 125 m at 296° (stratum 1, this site)
- Plot 2: from plot 1, 250 m at 216° (stratum 2, site MW-1b)
- Plot 3: from plot 2, 250 m at 147° (stratum 2, site MW-1b)
- Plot 4: from TIP, 125 m at 296° (stratum 1, this site)
- Plot 5: from plot 1, 125 m at 36° (stratum 1, this site)
- Plot 6: from plot 3, 125 m at 178° (stratum 2, site MW-1b)

General comments:

Overstorey samples at plots 1 and 5 are half balsam fir, with some aspen and white spruce. Plot 4 is half aspen, with some balsam fir and white spruce.

Site Code: SASK MW-1b (2) Southern Aux. Site

BORIS ID: G4I3M

Coordinates:

Lat./Long.: 53°56.9' -105°8.7'
 UTM: (13) 490520E 5977860N

Magnetic declination: 17°E

Forest cover map: 49597; stand 272

NTS Map: 73-H/14

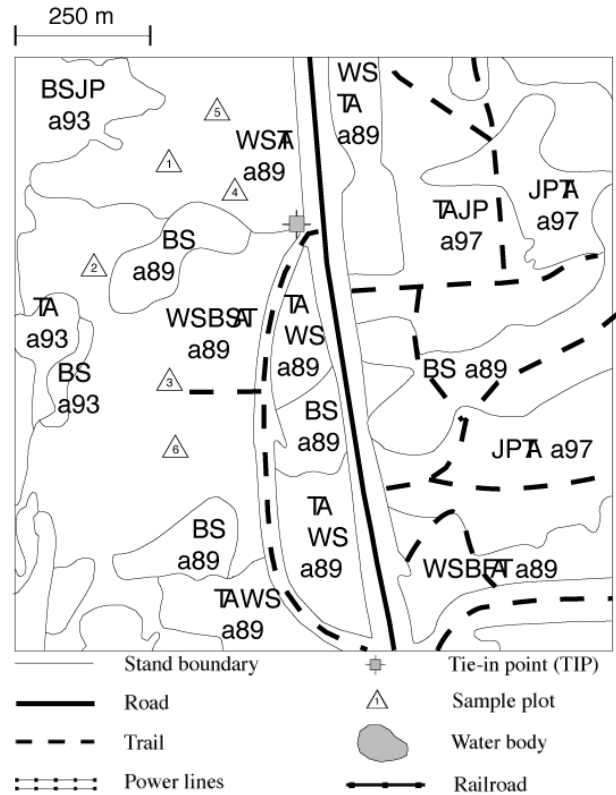
Aerial photograph reference:

Scale: 1:12 500
 Roll/line: FB308-8458
 Numbers: 91, **92**

Plot XY coordinates (cm):

TIP:	7.3	20.2
Plot 2:	4.3	19.5
Plot 3:	5.4	17.8
Plot 6:	5.5	16.8

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the west side of Hwy. 913, 12 km north of the Hwy. 120-Hwy. 913 junction, and 2.6 km north of the Heritage Lake entrance. The TIP is at the intersection of the old loop road with Hwy. 913 and the southeast corner of stand 255 on the forest cover map.

- Plot 1: from plot 4, 125 m at 296° (stratum 1, site MW-1a)
- Plot 2: from plot 1, 250 m at 216° (stratum 2, this site)
- Plot 3: from plot 2, 250 m at 147° (stratum 2, this site)
- Plot 4: from TIP, 125 m at 296° (stratum 1, site MW-1a)
- Plot 5: from plot 1, 125 m at 36° (stratum 1, site MW-1a)
- Plot 6: from plot 3, 125 m at 178° (stratum 2, this site)

General comments:

The road is about 200 m away from plot 6 at 90°.

Overstorey samples at all plots are predominantly white spruce. Plot 2 has some black spruce, with a small amount of balsam fir. Plot 3 has some jack pine, with a small amount of aspen. Plot 6 has some aspen.

Transect Sites

Site Code: MAN G-BI-1 (1) Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 56°25.4' -94°15.7'
UTM: (15) 422146E 6253928N

Magnetic declination: 4°E

Forest cover map: none

NTS Map: 54-D/8

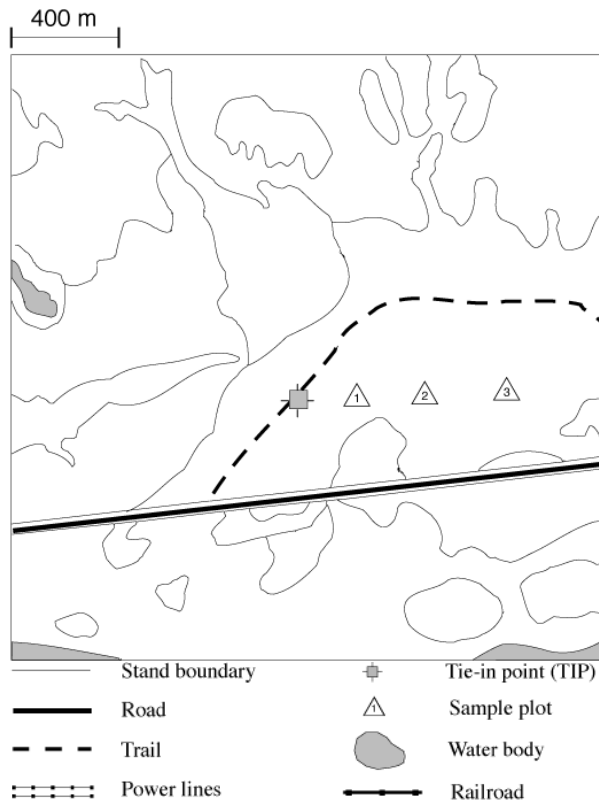
Aerial photograph reference:

Scale: 1:25 000
Roll/line: MH84999401
Numbers: 93, **94**

Plot XY coordinates (cm):

TIP: 12.1 8.2
Plot 1: 13.0 8.3
Plot 2: 14.0 8.4
Plot 3: 14.8 8.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Hwy. 280-Hwy. 290 junction, outside Gillam, proceed about 6 km northeast on Hwy. 290 to the trail on the north side of the road. Follow the trail (at 43°) for 500 m to the TIP.

Plot 1: from TIP, 225 m at 85°
Plot 2: from plot 1, 250 m at 85°
Plot 3: from plot 2, 200 m at 85°

General comments:

There are no forest cover maps for this region. The site is within townships 85 and 86, range 21E1. The map presented here is based on an aerial photograph.

This site is identified on tally sheets as BIM-10.

Overstory samples at all plots are predominantly black spruce. A small amount of willow is present at plot 2.

Site Code: MAN G-BI-2 (1) Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 56°25.2' -94°16.1'
UTM: (15) 421796E 6253578N

Magnetic declination: 4°E

Forest cover map: none

NTS Map: 54-D/8

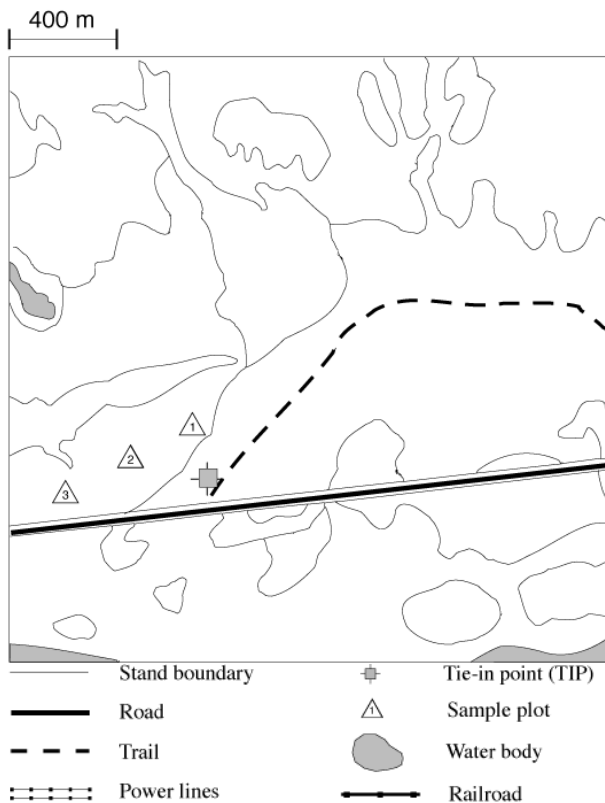
Aerial photograph reference:

Scale: 1:25 000
Roll/line: MH84999401
Numbers: 93, **94**

Plot XY coordinates (cm):

TIP:	10.8	7.0
Plot 1:	10.6	7.9
Plot 2:	9.7	7.4
Plot 3:	8.6	6.8

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Hwy. 280-Hwy. 290 junction, outside Gillam, proceed about 6 km northeast on Hwy. 290 to the trail on the north side of the road. Follow the trail (at 43°) for 80 m to the TIP.

Plot 1: from TIP, 225 m at 344°
Plot 2: from plot 1, 250 m at 241°
Plot 3: from plot 2, 300 m at 241°

General comments:

There are no forest cover maps for this region. The site is within townships 85 and 86, range 21E1. The map presented here is based on an aerial photograph.

This site is identified on tally sheets as BIM-11.

Overstory samples at all plots are pure black spruce.

Site Code: MAN N-JM-1 (1) **Transect Site**

BORIS ID: O9P

Coordinates:

Lat./Long.: 55°53.0' -99°2.4'
UTM: (14) 497532E 6193105N

Magnetic declination: 7°E

Forest cover map: T79R11W1; no stand number

NTS Map: 63-O/14

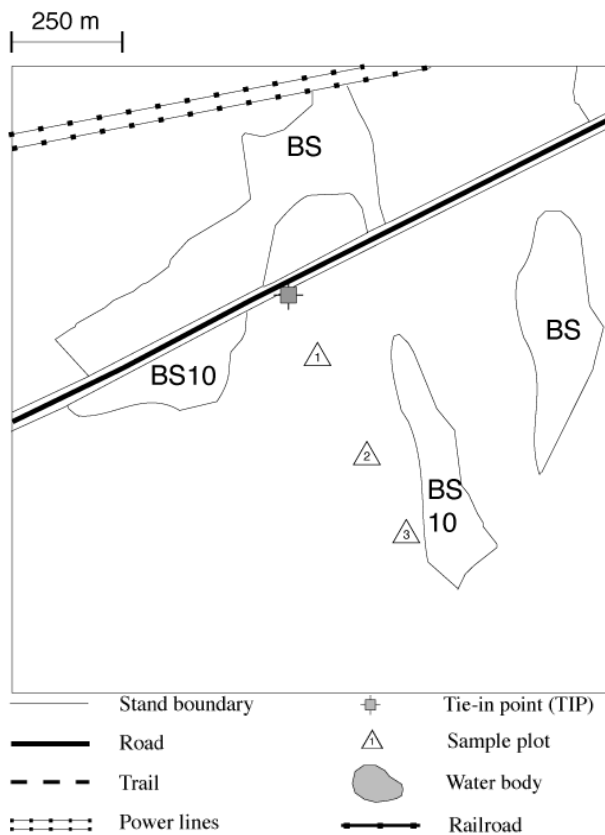
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91024
Numbers: 8, 9

Plot XY coordinates (cm):

TIP:	7.4	9.2
Plot 1:	7.8	8.3
Plot 2:	8.5	6.9
Plot 3:	9.1	5.8

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on south side of Hwy. 391, 79.2 km west of the Hwy. 391-Gillam Road junction (15.1 km past Nelson House Road) and 1.28 km west of a cutline crossing.

Plot 1: from TIP, 150 m at 154°
Plot 2: from plot 1, 250 m at 154°
Plot 3: from plot 2, 200 m at 154°

General comments:

Field notes state that this is a very poor site for pine. Plot 1 is located at the same plot center as NASA Helimark center. This site was scattered jack pine growing on bedrock. Patches of black spruce and alder were present in the moist sites scattered in the pine stand.

Overstory samples at plots 1 and 2 are pure jack pine. Plot 3 is roughly equal quantities of black spruce and jack pine.

Site Code: MAN P-AM-1 (1) Transect Site

BORIS ID: P7V1A

Coordinates:

Lat./Long.: 55°30.2' -98°4.7'
UTM: (14) 558231E 6151225N

Magnetic declination: 7°E

Forest cover map: T75R4W1; stand 231

NTS Map: 63-O/9

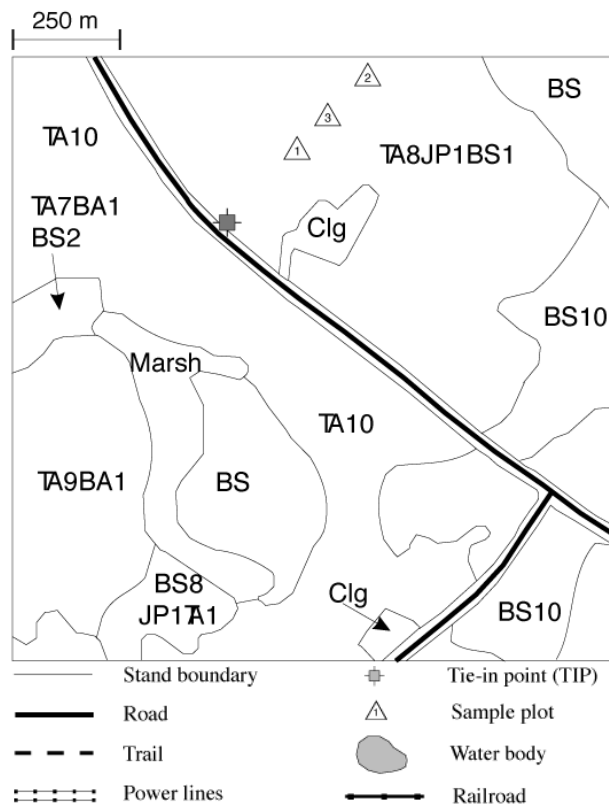
Aerial photograph reference:

Scale: 1:15 840
Roll/line: A26776
Numbers: 186, **187**

Plot XY coordinates (cm):

TIP:	13.4	11.7
Plot 1:	14.5	12.8
Plot 2:	15.5	13.9
Plot 3:	14.9	13.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the north side of Hwy. 375, 1.7 km southeast of the Hwy. 6-Hwy. 375 (Paint Lake Provincial Park Road) junction. The TIP is at a black spruce-aspen boundary.

Plot 1: from TIP, 250 m at 44°
Plot 2: from plot 3, 137 m at 44°
Plot 3: from plot 1, 100 m at 44°

General comments:

The site was originally called AMH-1. Old flagging labelled AMH-1 for plots 1, 2, and 3 was present. The old plots were not spaced 250 m apart. The plot 2 location changed because of an opening and stand type changes. Plot 3 was located at the old AMH-1 plot 2 center.

Overstory samples at plots 1 and 3 are pure aspen. Plot 2 is roughly equal quantities of balsam poplar and aspen.

Site Code: MAN P-JM-1 (1) **Transect Site**

BORIS ID: Q3V3P

Coordinates:

Lat./Long.: 55°33.4' -98°1.5'
UTM: (14) 561551E 6157175N

Magnetic declination: 7°E

Forest cover map: T76R4W1; no stand number

NTS Map: 63-O/9

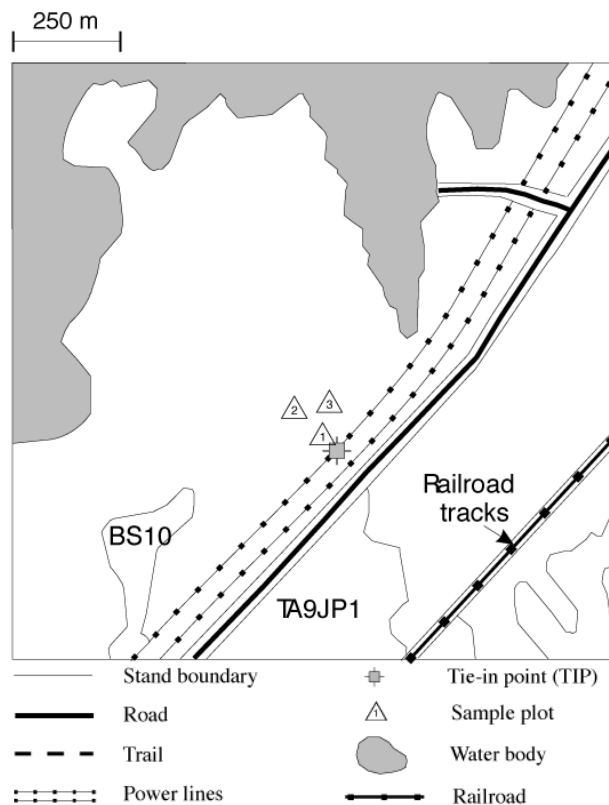
Aerial photograph reference:

Scale: 1:15 840
Roll/line: A26745
Numbers: 122, **123**

Plot XY coordinates (cm):

TIP:	19.4	14.7
Plot 1:	19.2	14.9
Plot 2:	18.8	15.3
Plot 3:	19.3	15.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 6. From the Hwy. 6 junction with the high power lines at the southern town limits of Thompson, proceed 22.4 km south to where Opswagon Lake is closest to the road. Proceed to the power lines on the west side of the road and proceed south 300 m to the TIP (which is north of the second power pole).

Plot 1: from TIP, 50 m at 319°
Plot 2: from plot 1, 100 m at 299°, then 30 m at 77°
Plot 3: from plot 2, 80 m at 77°

General comments:

This is an open, patchy jack pine and trembling aspen stand. There is a heavy alder understory. Plot 2 is offset because there is too much aspen present and therefore it was not representative of the stand. Plot 3 is located 30 m from the edge of the stand type. The NASA azimuth and bearing from the TIP were not used.

Overstory samples at plots 1 and 3 are mainly aspen, with some jack pine. Plot 3 also has a small amount of white spruce. Plot 2 is mainly jack pine, with some aspen and balsam poplar.

Site Code: MAN S-AD-1 (1) Transect Site

BORIS ID: T8S4A

Coordinates:

Lat./Long.: 55°55.0' -98°22.1'
UTM: (14) 539431E 6196906N

Magnetic declination: 7°E

Forest cover map: T80R6W1; no stand number

NTS Map: 63-O/16

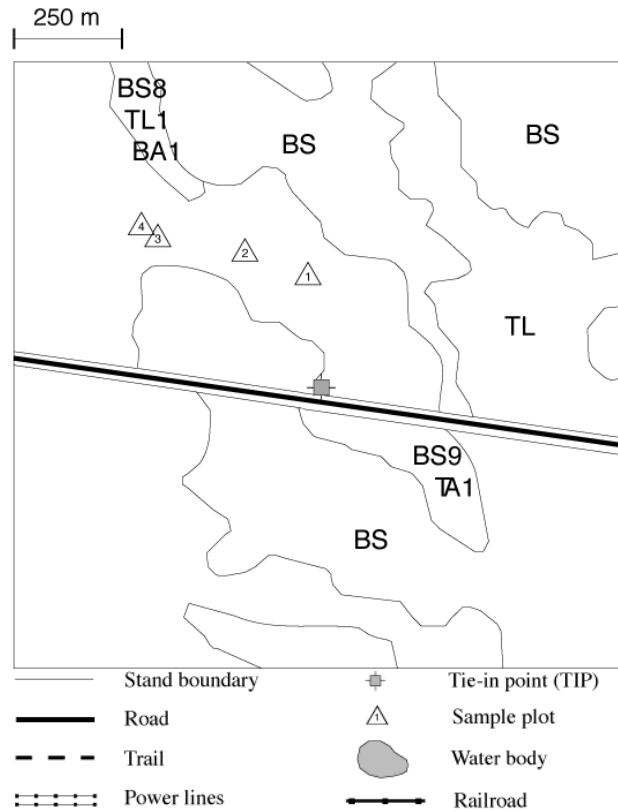
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91024
Numbers: **82, 83**

Plot XY coordinates (cm):

TIP:	21.3	10.3
Plot 1:	21.1	12.0
Plot 2:	20.2	12.3
Plot 3:	18.9	12.5
Plot 4:	18.7	12.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 391, 31 km west of the Hwy. 391–Gillam Road junction, and 5.2 km east of the microwave tower. The TIP is 500 m east of the creek crossing on the north side of the road next to the clearing.

Plot 1: from TIP, 275 m at 352°
 Plot 2: from plot 1, 150 m at 287°
 Plot 3: from plot 2, 200 m at 280°
 Plot 4: from plot 3, 25 m at 280°, then 30 m at 352°

General comments:

Field notes state that this is a young disturbed aspen stand with ingressing pine and a heavy alder understory. Plots 1 and 2 have a mix of jack pine and aspen. Plot 3 is mainly aspen. Plot 4 was established to get more data representative of a poor aspen typing.

Overstory sample at plot 1 is roughly equal jack pine and aspen, with some black spruce. Plot 2 is mainly jack pine with aspen. Plot 3 is pure aspen. Plot 4 is aspen with a small amount of jack pine.

Site Code: MAN SO-M-1 (1) Transect Site

BORIS ID: O8M

Coordinates:

Lat./Long.: 55°13.7' -98°23.9'
UTM: (14) 538281E 6120424N

Magnetic declination: 7°E

Forest cover map: T72R7W1; stand 21

NTS Map: 63-O/1

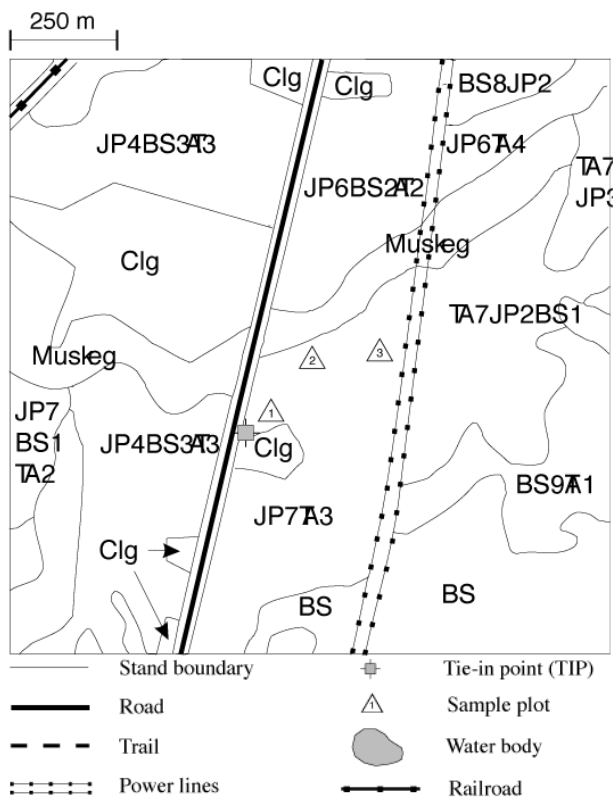
Aerial photograph reference:

Scale: 1:15 840
Roll/line: A26770
Numbers: **31, 32**

Plot XY coordinates (cm):

TIP:	9.3	16.5
Plot 1:	9.7	16.8
Plot 2:	10.3	17.6
Plot 3:	11.3	17.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: from the Hwy. 6-Inco Mine Road intersection (the first set of lights on Hwy. 6 heading south) proceed 70 km south of Thompson on Hwy. 6 to the Soab Creek-Hwy. 6 crossing. From the creek, continue for 200 m to the TIP (on the east side of Hwy. 6).

Plot 1: from TIP, 82 m at 53°
Plot 2: from plot 1, 153 m at 39°
Plot 3: from plot 2, 150 m at 79°

General comments:

Field notes state that this is a young jack pine and aspen site on a hill with a heavy spruce understory. Trees in plot 1 are younger than in plots 2 and 3. The area was burned in 1965.

Overstory samples at the plots range from mainly jack pine to pure jack pine. Plots 2 and 3 have moderate amounts of black spruce. Plot 3 also has a small amount of white birch.

Site Code: MAN T-AM-1 (1) **Transect Site**

BORIS ID: R8V8A

Coordinates:

Lat./Long.: 55°40.8' -97°53.5'
UTM: (14) 569681E 6171026N

Magnetic declination: 6°E

Forest cover map: T77R3W1; stand 368

NTS Map: 63-P/12

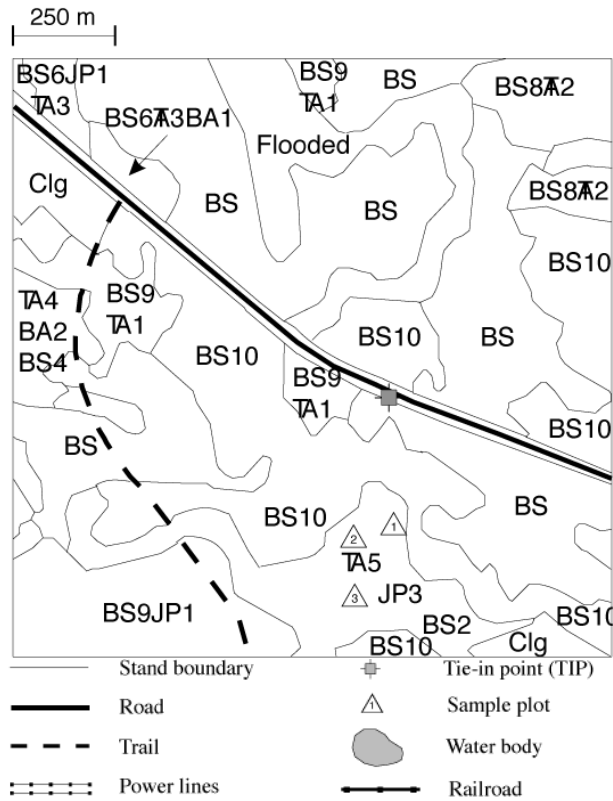
Aerial photograph reference:

Scale: 1:15 840
Roll/line: A26742
Numbers: 162, **163**

Plot XY coordinates (cm):

TIP:	11.5	18.5
Plot 1:	11.6	16.6
Plot 2:	11.0	16.4
Plot 3:	11.0	15.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Hwy. 6-Inco Mine Road intersection (the first set of lights on Hwy. 6 heading south) proceed south on Hwy. 6 for 5.8 km and turn southeast on the road (heading 128°) for 1.3 km to TIP.

Plot 1: from TIP, 300 m at 178°
Plot 2: from plot 1, 100 m at 251°
Plot 3: from plot 2, 150 m at 178°

General comments:

Overstory samples at plots range from predominantly aspen to pure aspen. Plots 2 and 3 have some jack pine. Plot 2 also has some white spruce.

Site Code: MAN T-BI-1 (1) Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 56°3.2' -97°4.0'
UTM: (14) 620431E 6213627N

Magnetic declination: 5°E

Forest cover map: T81R3E1; no stand number

NTS Map: 64-A/3

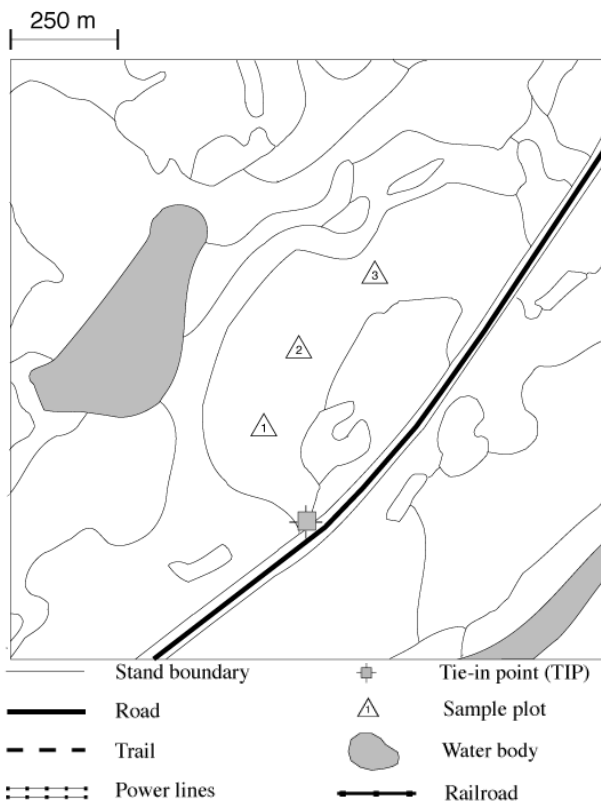
Aerial photograph reference:

Scale: 1:15 840
Roll/line: MB91019
Numbers: 178, **179**

Plot XY coordinates (cm):

TIP:	14.1	6.4
Plot 1:	13.3	7.7
Plot 2:	13.8	9.1
Plot 3:	15.0	10.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: from the Hwy. 391-Gillam Road (Hwy. 280) junction, proceed about 61 km northeast on Hwy. 280 (towards Gillam). The TIP is on the north side of the road, just before a bend to the left. This bend is about 1.2 km past another bend to the left.

Plot 1: from TIP, 238 m at 327°
Plot 2: from plot 1, 238 m at 19°
Plot 3: from plot 2, 253 m at 48°

General comments:

The forest cover map has not been examined at CFS. The map presented here is based on an aerial photograph.

This site is identified on tally sheets as BIH-2/BIH-?.

Overstory samples at all plots are pure black spruce.

Site Code: SASK B-AM-1 (1) Transect Site

BORIS ID: A1A

Coordinates:

Lat./Long.: 52°44.2' -106°8.5'
UTM: (13) 422920E 5843570N

Magnetic declination: 17°E

Forest cover map: PARKS; no stand number

NTS Map: 73-B/9

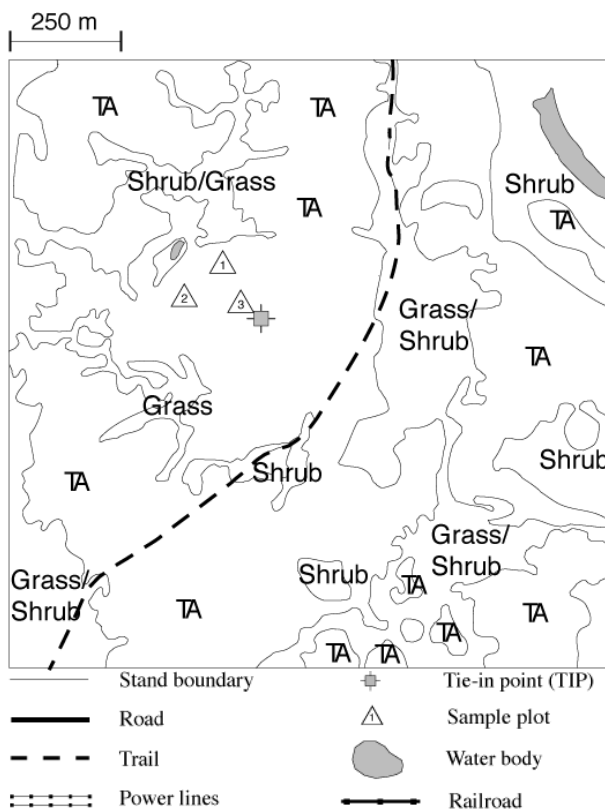
Aerial photograph reference:

Scale: 1:30 000
Roll/line: 780004-19
Numbers: **31**, **32**

Plot XY coordinates (cm):

TIP:	6.8	10.6
Plot 1:	6.6	11.0
Plot 2:	6.3	10.8
Plot 3:	6.7	10.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: site is located in Batoche National Historic Site, on the west side of the South Saskatchewan River. From the Como Service in Duck Lake on Hwy. 11, proceed south on the gravel road for 9.4 km. (Alternatively, from Rosthern proceed east on Hwy. 312 for 6.4 km, then north on the gravel road for 6.6 km.) At this intersection, proceed east on the dirt road for 5.1 km to a small gate marked as the boundary of Batoche National Historic Site. Follow the trail northeast into the site for 1 km to the trail (marked by pink flagging) and parking area. From here proceed northwest on the walking trail for about 250 m to the tower. The tower is the TIP.

Plot 1: from TIP, 125 m at 333°
Plot 2: from plot 1, 125 m at 238°
Plot 3: from plot 2, 125 m at 98°

General comments:

The Batoche area is in general a poor site for aspen, but some variation is present. Photo XY coordinates are from the image edge: photo has no fiducial marks.

Overstorey samples at all plots are pure aspen.

Site Code: SASK F-AM-1 (1) Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 55°26.2' -102°19.9'
UTM: (13) 668800E 6146650N

Magnetic declination: 15°E

Forest cover map: 66614; stand 332

NTS Map: 63-M/8

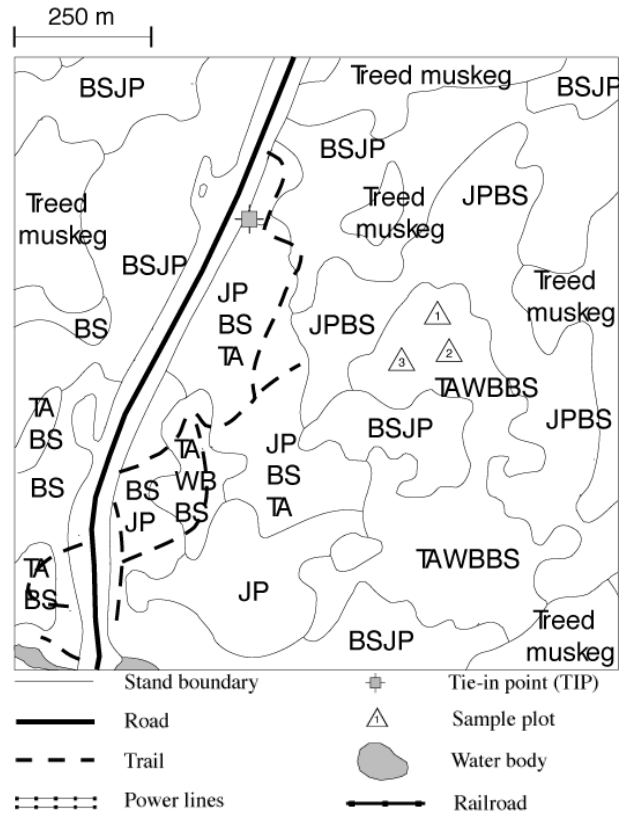
Aerial photograph reference:

Scale: 1:16 500
Roll/line: A22830
Numbers: 193, **194**, 195

Plot XY coordinates (cm):

TIP:	10.1	17.2
Plot 1:	12.2	15.9
Plot 2:	12.3	15.5
Plot 3:	11.8	15.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the east side Hwy. 135, about 0.8 km north of the Nemei River crossing. The TIP is about 20 m east of the road.

Plot 1: from TIP, 401 m at 122°
Plot 2: from plot 1, 70 m at 162°
Plot 3: from plot 2, 80 m at 254°

General comments:

Overstory samples at all plots are pure aspen.

Site Code: SASK F-BD-1 (1) Transect Site

BORIS ID: O3S

Coordinates:

Lat./Long.: 55°13.1' -102°48.7'
UTM: (13) 639220E 6121320N

Magnetic declination: 15°E

Forest cover map: 63612; stand 533

NTS Map: 63-M/2

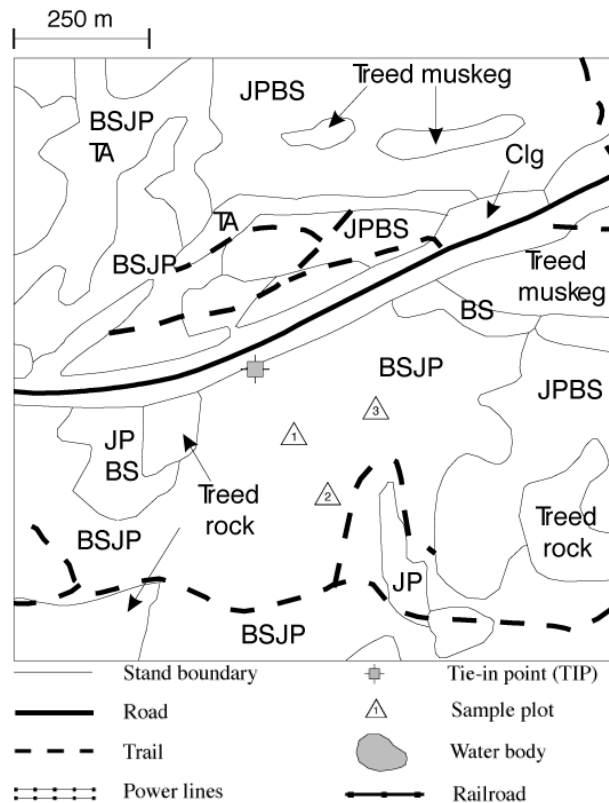
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB290-83-82108
Numbers: **244, 245**

Plot XY coordinates (cm):

TIP: 12.7 13.0
Plot 1: 13.2 12.2
Plot 2: 13.8 11.3
Plot 3: 14.5 12.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the south side of Hwy. 135, 12.7 km north of the main intersection in Pelican Narrows. The TIP is directly opposite the entrance road to the dump/landfill site.

Plot 1: from TIP, 125 m at 148°
Plot 2: from plot 1, 125 m at 148°
Plot 3: from plot 2, 188 m at 30°

General comments:

This stand has a thick duff layer averaging 24 cm. In 1994, the mineral soil was still frozen as of June 14.

Overstorey samples for all plots are predominantly black spruce. Plot 1 has a trace of white birch. Plot 3 has some jack pine.

Site Code: SASK F-BI-1 (1)

Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 55°25.7' -102°26.3'

UTM: (13) 662050E 6145430N

Magnetic declination: 15°E

Forest cover map: 66614; stand 379

NTS Map: 63-M/8

Aerial photograph reference:

Scale: 1:16 500

Roll/line: A22830

Numbers: 198, **199**

Plot XY coordinates (cm):

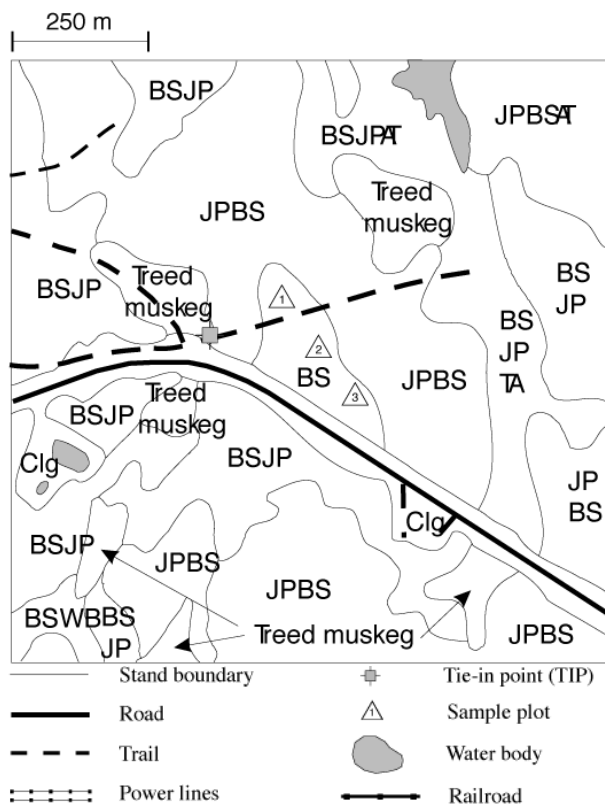
TIP: 12.6 10.3

Plot 1: 13.7 10.7

Plot 2: 14.1 10.1

Plot 3: 14.5 9.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the north side of Hwy. 135, 8.0 km south and west of the Nemei River. This is about 350 m east of the turnoff to Slim's Cabins. The TIP is about 10 m into the forest.

Plot 1: from TIP, 170 m at 80° (along cutline), then 48 m at 319°

Plot 2: from plot 1, 112 m at 147°

Plot 3: from plot 2, 112 m at 147°

General comments:

Overstorey samples at the plots range from mainly black spruce to pure black spruce. Plot 1 has a small amount of jack pine. Plot 2 has some jack pine.

Site Code: SASK F-BM-1 (1) Transect Site

BORIS ID: O2S

Coordinates:

Lat./Long.: 55°13.1' -102°52.7'
 UTM: (13) 634970E 6121070N

Magnetic declination: 15°E

Forest cover map: 63612; stand 483

NTS Map: 63-M/2

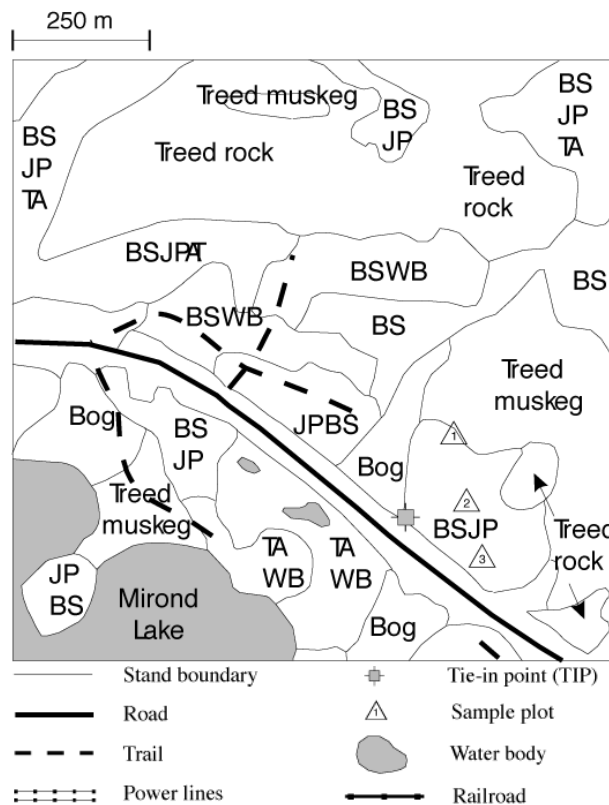
Aerial photograph reference:

Scale: 1:12 500
 Roll/line: FB290-83-82108
 Numbers: **240, 241**

Plot XY coordinates (cm):

TIP: 14.4 10.8
 Plot 1: 15.2 12.0
 Plot 2: 15.3 11.0
 Plot 3: 15.5 10.2

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trebling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the north side of Hwy. 135, 7.9 km north from the main intersection in Pelican Narrows (about 150 m east of F-JM-1 TIP).

Plot 1: from TIP, 175 m at 33°
 Plot 2: from plot 1, 125 m at 170°
 Plot 3: from plot 2, 100 m at 170°

General comments:

Black spruce is the dominant species represented. Overstory sample at plot 1 has a small amount of jack pine. Plot 3 has some aspen.

Site Code: SASK F-BM-2 (1) Transect Site

BORIS ID: O7S

Coordinates:

Lat./Long.: 55°13.0' -102°50.7'
UTM: (13) 637070E 6121020N

Magnetic declination: 15°E

Forest cover map: 63612; stand 496

NTS Map: 63-M/2

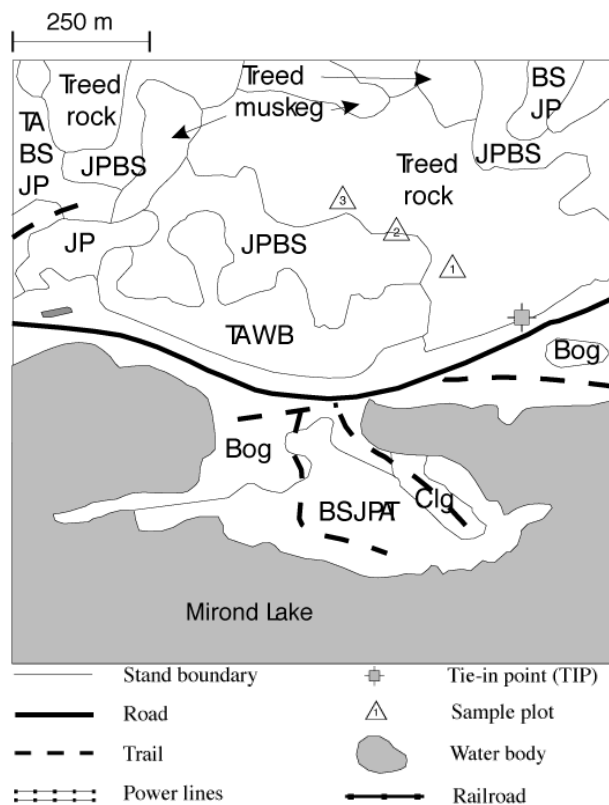
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB290-83-82108
Numbers: **242, 243**

Plot XY coordinates (cm):

TIP:	13.6	10.3
Plot 1:	12.6	11.0
Plot 2:	11.8	11.6
Plot 3:	11.0	12.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the north side of Hwy. 135, 10.4 km north of the main junction in Pelican Narrows. The TIP is 325 m east of where the arm of the lake is close to the road.

Plot 1: from TIP, 150 m at 305°
Plot 2: from plot 1, 125 m at 305°
Plot 3: from plot 2, 125 m at 305°

General comments:

Field notes state that this stand is a black spruce, jack pine mix, with black spruce predominating. Overstory sample at plot 1 is mainly black spruce, with some jack pine. Plots 2 and 3 are mainly jack pine, with some black spruce.

The plots were intended to be located in the jack pine-black spruce stand (JPBS) on the map. An error in declination setting meant that the plot navigation was 15° to the right of the intended path.

Site Code: SASK F-BM-3 (1) Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 55°25.0' -102°23.1'
UTM: (13) 665570E 6144270N

Magnetic declination: 15°E

Forest cover map: 66614; stand 426

NTS Map: 63-M/8

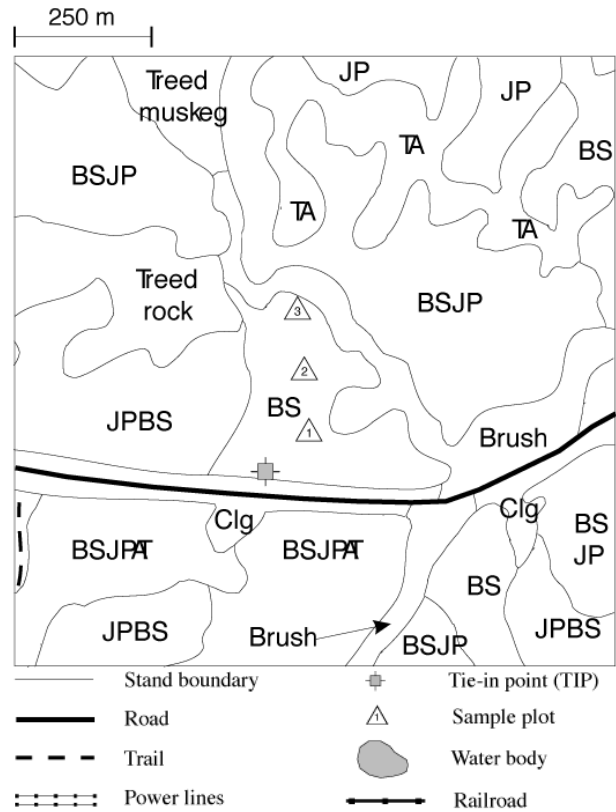
Aerial photograph reference:

Scale: 1:16 500
Roll/line: A22830
Numbers: 196, **197**

Plot XY coordinates (cm):

TIP:	16.6	2.7
Plot 1:	17.1	3.1
Plot 2:	17.1	3.8
Plot 3:	17.0	4.5

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the north side of Hwy. 135, about 3.7 km south and west of the Nemei River, 300 m west of a creek. The TIP is located at a small pull-off, about 15 m into the forest.

Plot 1: from TIP, 112 m at 49°
 Plot 2: from plot 1, 112 m at 357°
 Plot 3: from plot 2, 112 m at 357°

General comments:

Overstory samples at plots are mainly to predominantly black spruce. Plot 1 has some tamarack. Plots 2 and 3 have some jack pine.

Site Code: SASK F-JD-1 (1) Transect Site

BORIS ID: O6P

Coordinates:

Lat./Long.: 55°13.1' -102°54.2'
UTM: (13) 633390E 6121040N

Magnetic declination: 15°E

Forest cover map: 63612; stand 375

NTS Map: 63-M/2

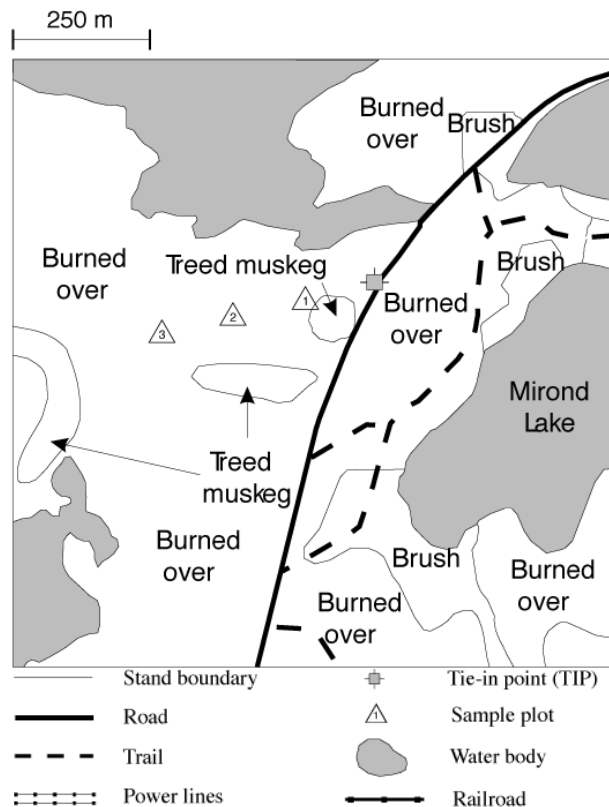
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB290-83-82108
Numbers: 238, **239**

Plot XY coordinates (cm):

TIP:	10.5	10.3
Plot 1:	9.5	10.1
Plot 2:	8.4	9.8
Plot 3:	7.4	9.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the west side of Hwy. 135, 5.9 km north of the main intersection in Pelican narrows. The TIP is at the intersection of an old trail and Hwy. 135.

Plot 1: from TIP, 125 m at 257°
Plot 2: from plot 1, 150 m at 257°
Plot 3: from plot 2, 125 m at 257°

General comments:

Field notes state that this stand is of fire origin. Based on ages estimated by counting whorls, the fire occurred no later than the mid-1970s. The site is young jack pine over rock.

Overstorey samples at plots 1 and 3 are predominantly jack pine. Plot 2 is mainly jack pine, with the remainder being a combination of alder, white birch, aspen, and willow.

Site Code: SASK F-JM-1 (1)

Transect Site

BORIS ID: O1P

Coordinates:

Lat./Long.: 55°13.1' -102°52.8'
UTM: (13) 634870E 6121170N

Magnetic declination: 15°E

Forest cover map: 63612; stand 479

NTS Map: 63-M/2

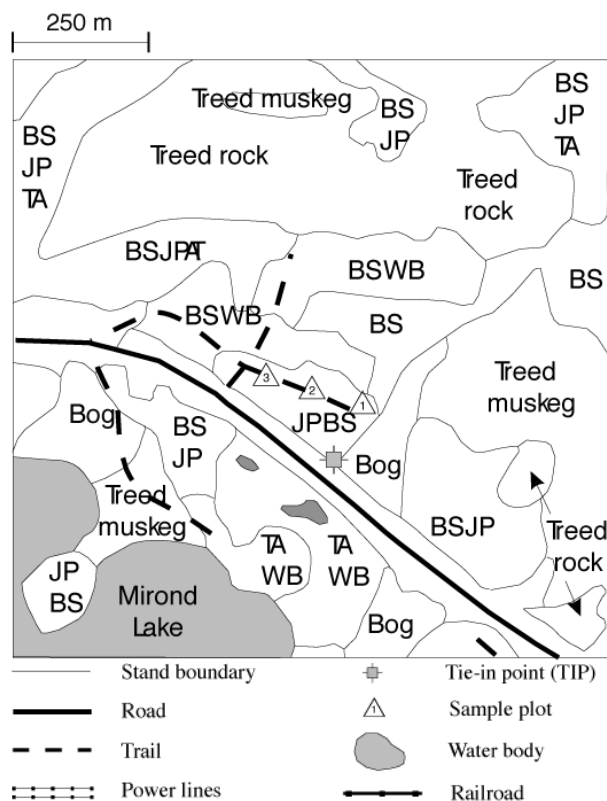
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB290-83-82108
Numbers: **240, 241**

Plot XY coordinates (cm):

TIP:	13.6	11.5
Plot 1:	14.0	12.3
Plot 2:	13.2	12.6
Plot 3:	12.5	13.0

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the north side of Hwy. 135, 7.8 km north of the main intersection in Pelican Narrows. The TIP is at the southeast corner of stand 479 on the forest cover map.

Plot 1: from TIP, 110 m at 25°
Plot 2: from plot 1, 100 m at 295°
Plot 3: from plot 2, 100 m at 295°

General comments:

Field notes state that this site is mixed jack pine and black spruce. There is a minor disturbance throughout the site with post-pole selection (logging).

Overstory sample at plot 1 is mainly black spruce, with jack pine, aspen, and other species present. Plots 2 and 3 are mainly jack pine, with some black spruce. Plot 2 also has a small amount of aspen.

Site Code: SASK F-JM-2 (1)

Transect Site

BORIS ID: O5P

Coordinates:

Lat./Long.: 55°13.3' -102°53.3'
UTM: (13) 634370E 6121420N

Magnetic declination: 15°E

Forest cover map: 63612; no stand number

NTS Map: 63-M/2

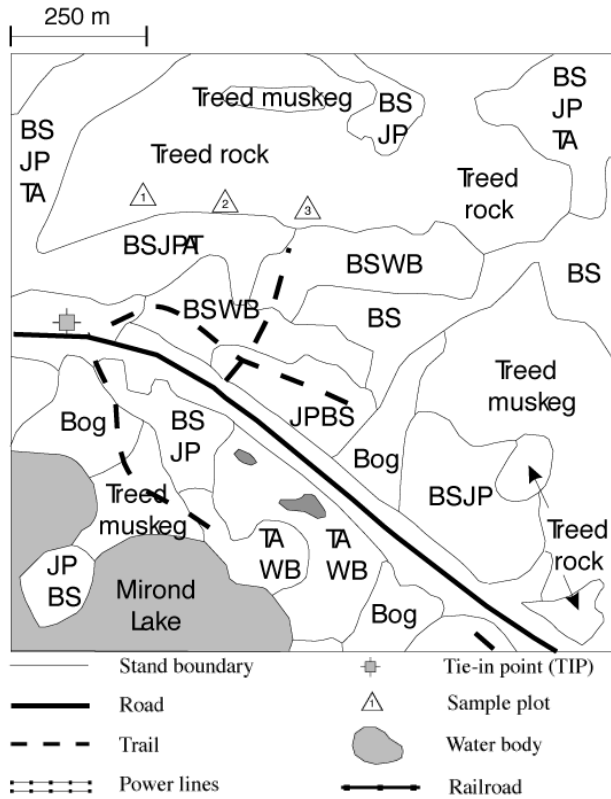
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB290-83-82108
Numbers: 239, **240**, 241

Plot XY coordinates (cm):

TIP:	10.0	13.7
Plot 1:	11.2	15.5
Plot 2:	12.4	15.3
Plot 3:	13.6	15.1

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: on the north side of Hwy. 135, 7.3 km north of the main intersection in Pelican Narrows and 0.5 km west of F-JM-1 TIP.

Plot 1: from TIP, 275 m at 33°
Plot 2: from plot 1, 150 m at 100°
Plot 3: from plot 2, 150 m at 100°

General comments:

This stand is treed rock on the forest inventory maps; field notes state that it is predominantly mature jack pine on rock.

Overstorey samples at plots are predominantly jack pine. Plot 1 has a small amount of black spruce. Plot 2 has some black spruce.

Site Code: SASK F-JM-4 (1)

Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 55°27.0' -102°19.3'
UTM: (13) 669370E 6148100N

Magnetic declination: 15°E

Forest cover map: 66614; stand 202

NTS Map: 63-M/8

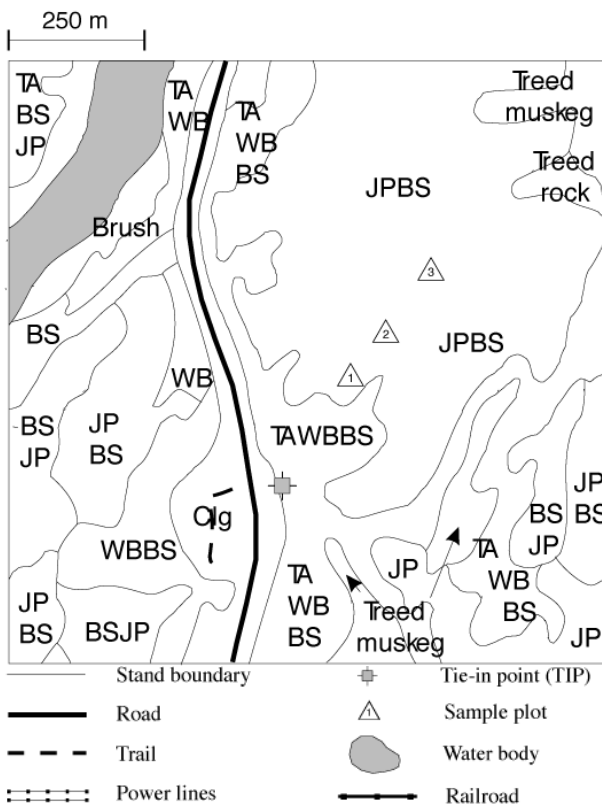
Aerial photograph reference:

Scale: 1:16 500
Roll/line: A22866
Numbers: 4, 5

Plot XY coordinates (cm):

TIP:	6.9	12.6
Plot 1:	7.7	13.8
Plot 2:	8.1	14.3
Plot 3:	8.6	15.0

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trebling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 135, 2.5 km north of the Nemei River. The TIP is opposite the north end of the large borrow pit on the west side of the road, and is located about 10 m from the road. It is about 125 m north of the TIP for F-M-1.

Plot 1: from TIP, 241 m at 35°
 Plot 2: from plot 1, 96 m at 35°
 Plot 3: from plot 2, 144 m at 35°

General comments:

Overstorey samples at plots 1 and 2 are pure jack pine. Plot 3 is mainly black spruce, with a small amount of jack pine.

Site Code: SASK F-JM-5 (1)

BORIS ID: none

Coordinates:

Lat./Long.: 55°25.7' -102°20.1'
UTM: (13) 668660E 6145700N

Magnetic declination: 15°E

Forest cover map: 66614; stand 455

NTS Map: 63-M/8

Aerial photograph reference:

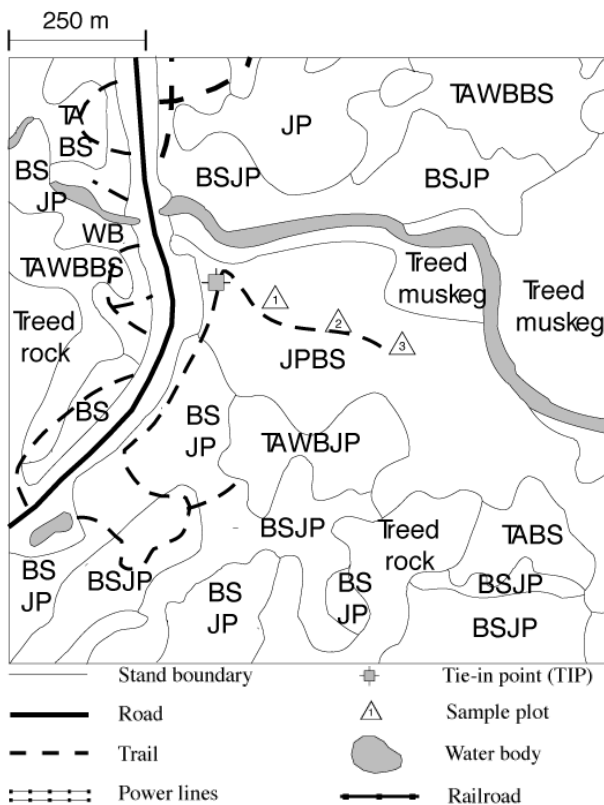
Scale: 1:16 500
Roll/line: A22830
Numbers: 193, **194**, 195

Plot XY coordinates (cm):

TIP:	9.0	11.4
Plot 1:	9.7	11.2
Plot 2:	10.4	10.9
Plot 3:	11.1	10.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.

Transect Site



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 135, about 100 m south of the Nemei River and 100 m east of the highway. It is located along a short road leading from the clearing to the river.

Plot 1: from TIP, 125 m at 109°
Plot 2: from plot 1, 125 m at 109°
Plot 3: from plot 2, 125 m at 109°

General comments:

Overstory samples at plots 1 and 3 are mainly black spruce. Plot 1 has some tamarack. Plot 3 has some jack pine. Plot 2 is mainly jack pine, with some black spruce.

Site Code: SASK F-M-1 (1)

Transect Site

BORIS ID: none

Coordinates:

Lat./Long.: 55°26.9' -102°19.3'
UTM: (13) 669350E 6147970N

Magnetic declination: 15°E

Forest cover map: 66614; stand 201

NTS Map: 63-M/8

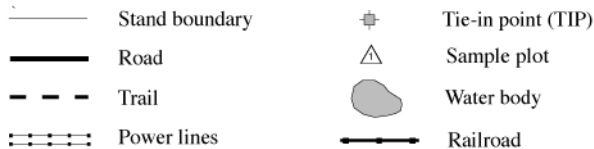
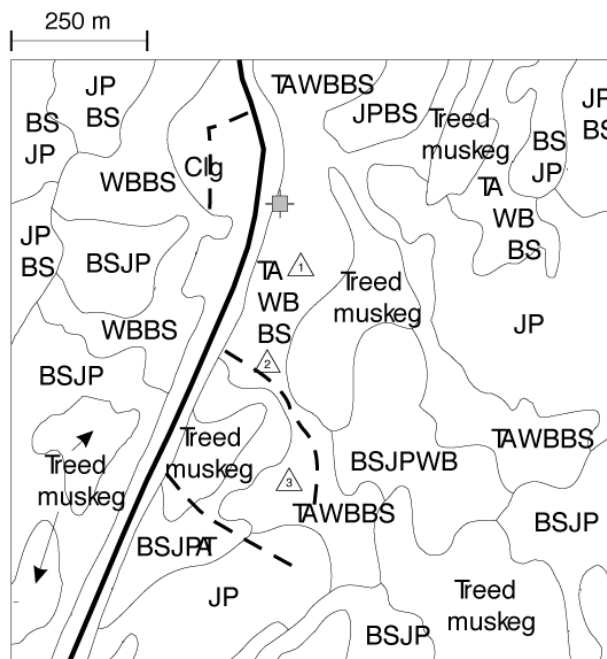
Aerial photograph reference:

Scale: 1:16 500
Roll/line: A22866
Numbers: 4, 5

Plot XY coordinates (cm):

TIP:	7.1	11.7
Plot 1:	7.3	11.0
Plot 2:	6.7	9.9
Plot 3:	6.9	8.6

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 135, 2.4 km north of the Nemei River, opposite the south end of a large borrow pit on the west side of the road. The TIP is 125 m south of the TIP for F-JM-1, and is about 20 m from the road.

Plot 1: from TIP, 128 m at 165°
 Plot 2: from plot 1, 193 m at 209°
 Plot 3: from plot 2, 225 m at 174°

General comments:

Overstory sample at plot 1 is pure jack pine. Plot 2 is mixed, with black spruce, jack pine, and white birch dominating. Plot 3 is mainly jack pine, with some white birch and a small amount of black spruce.

Site Code: SASK M-BD-1 (1) Transect Site

BORIS ID: H1E4S

Coordinates:

Lat./Long.: 54°2.6' -105°44.2'
UTM: (13) 451720E 5988520N

Magnetic declination: 17°E

Forest cover map: 45598; stand 13

NTS Map: 73-I/4

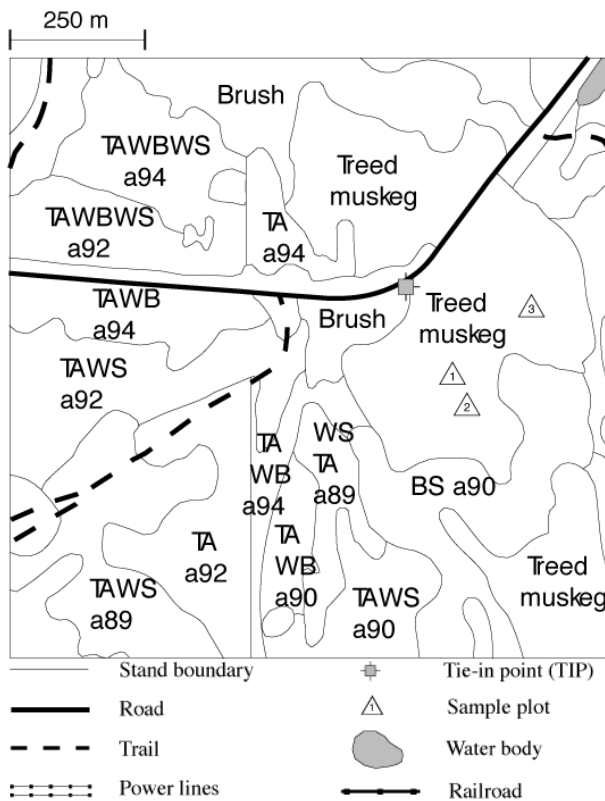
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB310-8452
Numbers: 162, **163**

Plot XY coordinates (cm):

TIP:	8.4	4.7
Plot 1:	9.1	3.4
Plot 2:	9.3	2.9
Plot 3:	10.3	4.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on Hwy. 969, about 1 km east of the Hwy. 969-North/South Bittern Lake Road junction. The TIP is on the southeast side of the road, where the road curves from east to northeast.

Plot 1: from TIP, 188 m at 153°
Plot 2: from plot 1, 63 m at 153°
Plot 3: from plot 2, 225 m at 33°

General comments:

Field notes state that this stand is of fire origin and is a wet site. The soil is organic and was still frozen when sampled in June 1994. The site is about 1 km due south of Montreal Lake.

Overstory samples at plots are predominantly black spruce, with small amounts of aspen and willow.

Site Code: SASK NI-J-1 (1) Transect Site

BORIS ID: A2P

Coordinates:

Lat./Long.: 53°11.7' -106°13.9'
UTM: (13) 417730E 5894670N

Magnetic declination: 17°E

Forest cover map: 41589; stand 40, 41

NTS Map: 73-G/1

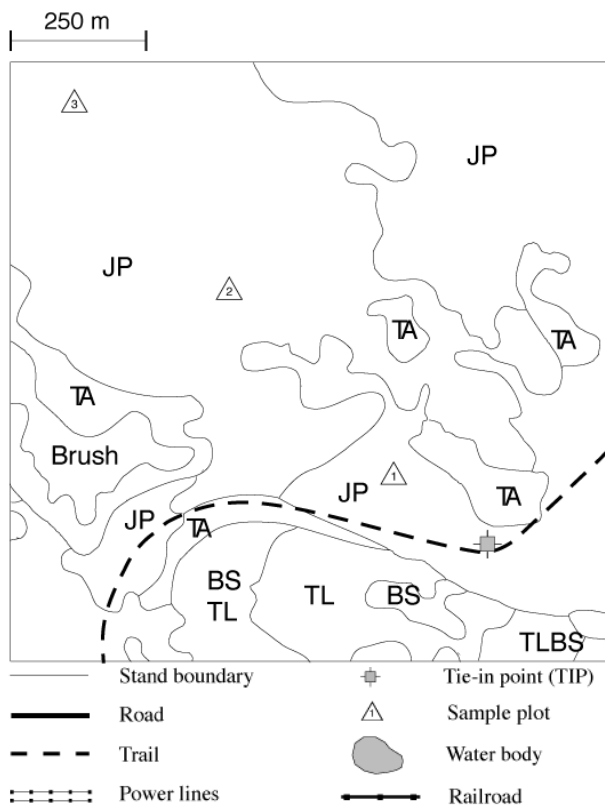
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB47-7890
Numbers: **18, 19**

Plot XY coordinates (cm):

TIP:	13.8	10.7
Plot 1:	12.4	11.8
Plot 2:	10.0	14.5
Plot 3:	7.7	17.3

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Directions to site:

Tie-in point access: travel west about 31 km on Hwy. 3 from Prince Albert to Holbein, and an additional 1.6 km west from Holbein to the access road. Turn south and proceed past the railroad tracks and travel 3.2 km (measured from Hwy. 3) due south until the road turns in a southwest direction. Continue for another 0.9 km to where the road turns in a west-northwest direction. The TIP is at this last turn, about 4.1 km from Hwy. 3. There is a small detour around an intermittent stream at 2.4 km.

Plot 1: from TIP, 225 m at 309°
Plot 2: from plot 1, 450 m at 319°
Plot 3: from plot 2, 450 m at 319°

General comments:

Field notes state that the site is a low-crown closure pine stand.

Overstory samples at all plots are pure jack pine.

Site Code: SASK PA-BM-1 (1) Transect Site

BORIS ID: H2D1S

Coordinates:

Lat./Long.: 54°3.6' -105°55.7'
UTM: (13) 439290E 5990640N

Magnetic declination: 17°E

Forest cover map: 43599; stand 424

NTS Map: 73-I/4

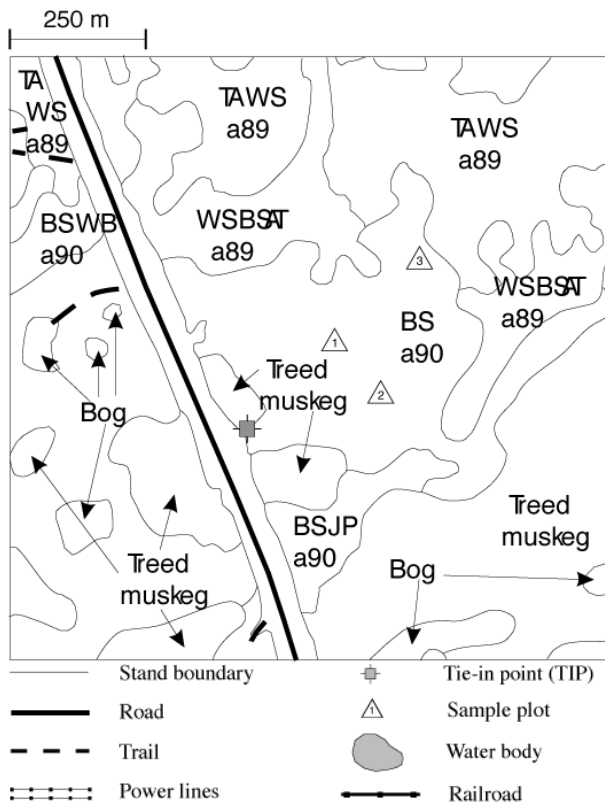
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB317-8451
Numbers: 101, **102**, 103

Plot XY coordinates (cm):

TIP:	10.2	2.8
Plot 1:	11.5	3.5
Plot 2:	12.2	2.7
Plot 3:	12.8	4.7

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 2, 2.0 km south of the Hwy. 2-Waskesiu River Road junction, or 10.5 km north of the Hwy. 2/Hwy. 969 (Montreal Lake) junction. The TIP is at the south edge of a small fen-black spruce forest cover type.

Plot 1: from TIP, 225 m at 46°
 Plot 2: from plot 1, 125 m at 139°
 Plot 3: from plot 1, 225 m at 46°

General comments:

Field notes state that this is an homogeneous stand on a level site.

Overstory samples at plots 1 and 2 are pure black spruce. Plot 3 is mainly black spruce with some aspen.

Site Code: SASK PA-M-1 (1) Transect Site

BORIS ID: H2D1M

Coordinates:

Lat./Long.: 54°4.0' -105°55.9'
UTM: (13) 439070E 5991280N

Magnetic declination: 17°E

Forest cover map: 43599; stand 420, 421, 422

NTS Map: 73-I/4

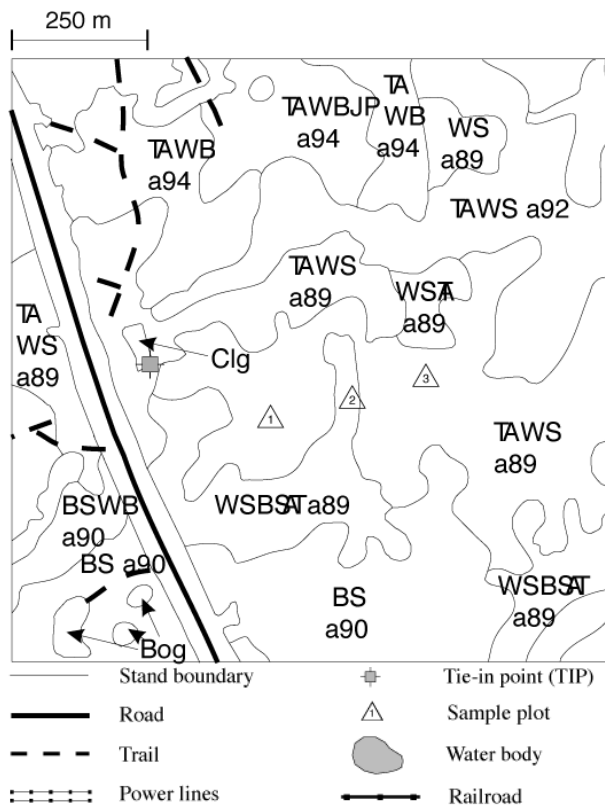
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB317-8451
Numbers: 101, **102**, 103

Plot XY coordinates (cm):

TIP:	8.3	8.1
Plot 1:	10.1	7.3
Plot 2:	11.3	7.6
Plot 3:	12.4	7.9

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 2, 1.2 km south of the Hwy. 2–Waskesiu River Road junction, or 11.3 km north of the Hwy. 2–Hwy. 969 (Montreal Lake) junction. There is flagging on the highway that leads to the TIP at the southeast corner of the clearing, about 100 m from the road. The TIP is 0.8 km north of the PA–BM–1 TIP.

Plot 1: from TIP, 250 m at 114°
Plot 2: from plot 1, 150 m at 74°
Plot 3: from plot 2, 150 m at 74°

General comments:

Field notes state that there is generally a consistent coniferous–deciduous mix throughout the site.

Plots are located in stand 422, but stand 421 is crossed between plots 1 and 2, and stand 420 is only a short distance northwest of plot 3.

Overstorey samples at all plots are roughly equal amounts of white spruce and aspen. Plot 3 has a small amount of white birch.

Site Code: SASK PA-M-2 (1) Transect Site

BORIS ID: H3D1M

Coordinates:

Lat./Long.: 54°4.2' -105°55.9'
UTM: (13) 439020E 5991670N

Magnetic declination: 17°E

Forest cover map: 43599; stand 407, 408, 410

NTS Map: 73-I/4

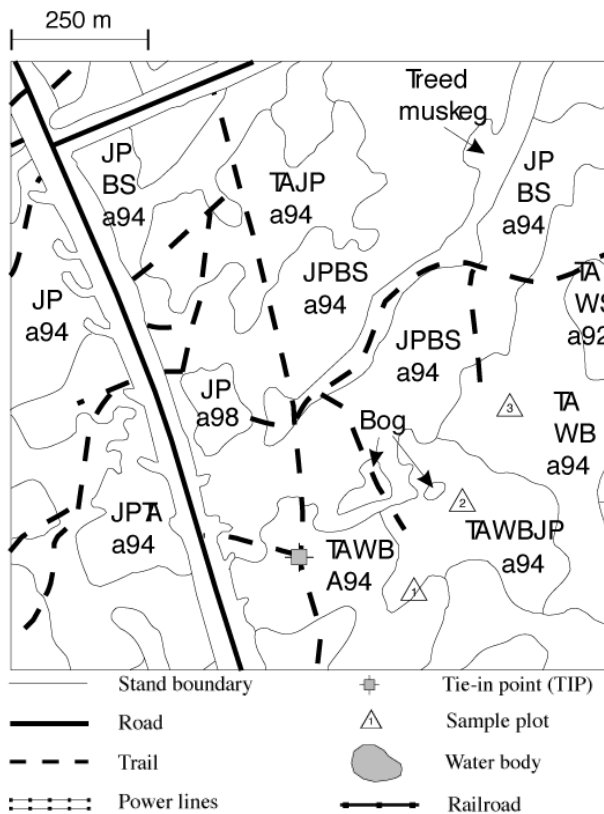
Aerial photograph reference:

Scale: 1:12 500
Roll/line: FB317-8451
Numbers: 101, **102**, 103

Plot XY coordinates (cm):

TIP: 7.7 11.2
Plot 1: 9.4 10.7
Plot 2: 10.1 12.0
Plot 3: 10.8 13.4

Note: coordinates refer to the plot position on the aerial photograph whose reference number is shown above in bold.



Forest cover data (based on provincial maps) show species in descending order, abbreviated by common name (e.g., TA = trembling aspen). Where available, fractional cover in tenths (e.g., BS1 = 10% black spruce) and stand age/origin (e.g., a94 = 1940) are given.

Directions to site:

Tie-in point access: on the east side of Hwy. 2, 0.7 km south of the Hwy. 2–Waskesiu River Road junction, or 11.8 km north of the Hwy. 2–Hwy. 969 (Montreal Lake) junction. The TIP is ribboned in from the highway on the old trail at 116° for about 190 m. The access point is 0.5 km north of the access to PA-M-1.

Plot 1: from TIP, 225 m at 107°
Plot 2: from plot 1, 188 m at 27°
Plot 3: from plot 2, 188 m at 27°

General comments:

Field notes state that the deciduous component of the stand is strongly dominant throughout the site. The stand is an early-to-intermediate aspen–spruce stand, possibly with some pine.

Overstory samples at plots 1 and 3 are pure aspen. Plot 2 has white birch, jack pine, and aspen.