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MACKENZIE VALLEY PERMANENT MONITORING PLOT NETWORK: A DATABASE OF STAND CHARACTERISTICS

R.C. Errington, J.S. Bhatti, and E.H.Y. Li

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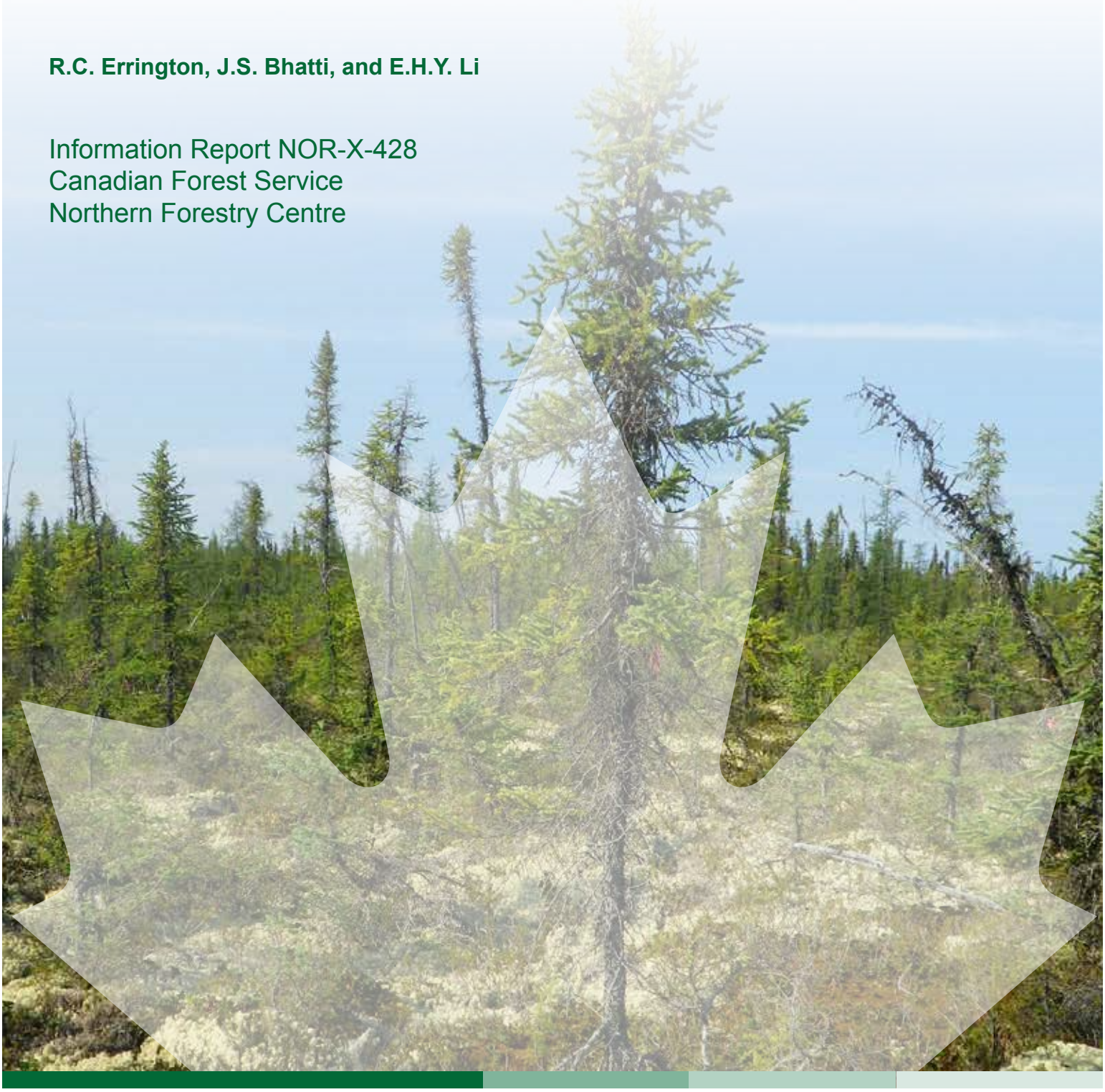

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Mackenzie Valley Permanent Monitoring Plot Network: Site Locations and Descriptions

R.C Errington, J.S. Bhatti, and E.H.Y. Li

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Northern Forestry Centre
Canadian Forest Service

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Cover image: photograph showing a stand of black spruce (*Picea mariana*) trees growing on a peat plateau in the High Subarctic Ecoclimatic Region of the northern Mackenzie Valley.

Recycled paper

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ABSTRACT

As part of the International Polar Year, a series of 69 permanent monitoring plots was established in forests and permafrost-affected peatlands in the Mackenzie Valley region of Canada's Northwest Territories. Extending from the Mid-Boreal, through the High Boreal, Low Subarctic and High Subarctic Ecoclimatic Regions, this plot network provides opportunities to examine the effects of changing climatic conditions across both current climatic and local topographic gradients. This network, which incorporates lower productivity upland forests and peatland ecosystems, is a valuable resource within the sparsely sampled northern regions of Canada and is complementary to forest management datasets typically collected in more productive upland forest environments. This report, the second in a series of three, provides a summary and details about overstory tree vegetation at the sites. The first section of the report discusses field data collection and analysis methods. The second section presents plot level summaries of the stand characteristics including species-level basal area, stem density by height class, mean, median, and biomass-weighted mean tree height, as well as estimates of stand biomass. Tree-level measurements, including breast height diameter, height, and age for representative trees cored from the surrounding stand are also included. The accompanying database provides individual tree measurements collected at each plot, along with plot-level summary data presented in the report.

RÉSUMÉ

Dans le cadre de l'Année polaire internationale, un ensemble de 69 parcelles de surveillance ont été mises en place dans les forêts et les tourbières touchées par le pergélisol de la région de la vallée du Mackenzie des Territoires du Nord-Ouest, au Canada. Ce réseau, qui débute dans la région écoclimatique boréale moyenne, s'étend jusqu'à la région du haut-subarctique, en passant par les régions boréales supérieures et du bas-subarctique. Il permet d'examiner les incidences des conditions climatiques changeantes dans les gradients climatiques actuels et les pentes topographiques locales. Ce réseau, qui inclut les forêts des hautes terres à faible productivité et les écosystèmes de tourbières, est une ressource précieuse dans les régions peu échantillonnées du nord du Canada, et il est complémentaire aux ensembles de données sur la gestion forestière qui sont typiquement recueillis dans des environnements forestiers plus productifs des hautes terres. Le présent rapport, le deuxième d'une série de trois, fournit un résumé et des détails sur la végétation arborée de l'étage dominant aux différents sites. La première partie du rapport abordait la collecte de données sur le terrain et les méthodes d'analyse. La deuxième partie présente un aperçu des caractéristiques du peuplement forestier au niveau des parcelles, y compris le niveau d'espèces à la surface terrière, la densité de la tige en fonction de la catégorie de hauteur, de la valeur moyenne ou médiane et de la hauteur moyenne des arbres pondérée en fonction de la biomasse, de même que des estimations de la biomasse du peuplement. Les mesures à la hauteur de l'arbre, incluant le diamètre à hauteur de poitrine, et l'âge des arbres représentatifs desquels des carottes ont été extraites sont également incluses. La base de données qui accompagne le rapport fournit des mesures individuelles des arbres recueillies à chaque parcelle, de même que les données à l'échelle de la parcelle présentées dans le rapport.

PREFACE

As a contribution to the International Polar Year (IPY) research program, the Canadian Forest Service (CFS) is in the process of preparing a series of three reports describing basic ecosystem characteristics for a network of 69 permanent monitoring plots established in forests and peatlands of the Mackenzie Valley, Northwest Territories (the Mackenzie Valley Permanent Monitoring Plot Network, MVPMPN). Representative of eleven forested ecoregions along the Mackenzie Valley, from the Alberta border to the Mackenzie delta, the MVPMPN spans a climatic gradient of 5.9°C (from -8.8 to -2.9°C) of mean annual temperature and 121 mm (from 248 to 369 mm) of annual precipitation, with colder and drier conditions towards the north. The purpose of this network is twofold. The first objective is to provide baseline vegetation and soils data for future comparison with respect to anthropogenic disturbances and climate change. The second objective is to support the more detailed IPY research by placing the small number of more intensively monitored research sites into regional and ecological context and to support carbon cycle modeling and assessment research.

Data from the MVPMPN have been divided into three reports. This report is the second in the series and focuses entirely on the tree mensuration data collected at each of the plots. In addition to individual tree data such as species, height, and diameter (DBH), the stand-level variables of stem density and basal area are also presented.

The first report in the series, ***Site locations and descriptions***[1], provides basic site information, including detailed plot locations and general descriptions. This previous report was designed so that future researchers will be able to precisely relocate these plots for remeasurement purposes.

The third report, ***A database of vegetation, soil and groundwater conditions***, will detail and summarize understory lichen, moss, liverwort, and vascular plant species abundance data, along with soil descriptions, and classifications. Chemical analyses of soil and groundwater samples will also be detailed in the database and summarized in the report.

[1]Errington, R.C.; Bhatti, J.S.; Li, E.H.Y. 2018. Mackenzie Valley Permanent Monitoring Plot Network: site locations and descriptions. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB. Inf. Rep. NOR-X-426.

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INTRODUCTION

The global mean surface temperature has increased since the late 19th century with each of the past three decades successively warmer than any previous in the instrumental record (IPCC 2013). This warming has been particularly pronounced in northern regions (IPCC 2013). In the latter half of the 20th century, the greatest Canadian temperature increases have been seen in the northwest, where an increase of over 3°C was recorded in winter air temperatures of the Mackenzie Valley region of the Northwest Territories (Zhang et al. 2000). From 1948 to 2016, air temperatures in Canada have increased by twice the global average (Zhang et al. 2019). In northern Canada, this rate of warming has been three times the global average and has been greatest in the north-west (Zhang et al. 2019). Northwestern Canada is also projected to be the region most strongly affected by future warming, with a suite of models predicting winter temperature increases from 3.5 to 5.5°C over the 70-year period from 1971–1990 to 2041–2060 (Plummer et al. 2006). This is similar to the projection carried out by Price et al. (2013), who reported that annual mean temperature will increase by as much as 5.5°C (minimum temperature) and 4.5 °C (maximum temperature), with the minimum temperature projected to rise 7.5–8.0°C in winter compared with about 4.0°C in summer. Price et al. (2011) projected that interannual variability in temperatures might decrease throughout the Mackenzie Valley region, although summer temperatures are generally projected to become more variable. These recent and predicted temperature changes, coupled with the presence of large areas of ice-rich permafrost make the Mackenzie Valley one of the most sensitive areas to climate warming in Canada (Kettles and Tarnocai 1999).

Already, this climatic warming is influencing the landscape through collapse of the ground surface as ice-rich permafrost warms and destabilizes (Lantz and Kokelj 2008; Beilman and Robinson 2003) as well as through more subtle increases in thaw penetration and active layer depths (Quinton and Baltzer 2013; Nixon et al. 2003). In the Mackenzie Valley, much of the ice-rich permafrost occurs as peat plateaus, where the aggradation and degradation of permafrost is known to be a cyclic phenomenon (Zoltai 1993). Recent climatic warming has favored processes of degradation over aggradation, particularly in the southern Mackenzie Valley, resulting in 10% to 51% losses in measured permafrost area (Quinton et al. 2011; Beilman and Robinson 2003).

Permafrost thaw within peat plateaus has a dramatic effect on the landscape as the loss of ice volume causes the ground surface to subside approximately 1 meter forming collapse scars (Vitt et al. 1994; Zoltai 1993; Thie 1974). This subsidence affects plant community composition and diversity (Beilman 2001), carbon accumulation (Robinson and Moore 2000), and greenhouse gas dynamics (Startsev et al. 2016; Liblik et al. 1997). These effects can also propagate through the landscape via changes to the regional hydrology given that increasing hydrological connectivity (due to permafrost thaw) can drain landscapes (Quinton et al. 2011; Robinson 2002), and greater active layer depths increase soil water storage and decrease subsurface runoff (Quinton and Baltzer 2013).

While much work was conducted in relation to vegetation and landscape surveys of the Mackenzie Valley in the early 1970s (Forest Management Institute 1974; Crampton 1973; Strang 1973; Zoltai and Pettapiece 1973), much of that work was intended for mapping and classification at a landscape level. Plots established in the 1970s were not permanently marked, nor were the locations adequately documented to allow for remeasurement and detection of ecological changes. The Mackenzie Valley Permanent Monitoring Plot Network (MVPMPN) was designed not only to collect baseline ecological data, but also to provide a series of permanently marked plots with well-documented locations suitable for future remeasurement in a rapidly changing landscape.

With limited resources, the task of baseline ecological data collection in such a large region necessitated a narrowing of the scope to key ecological sites and variables, resulting in a sampling design that integrated both climatic and local topographic gradients. In practice, this resulted in 25 sites distributed across four regions, named according to the nearest community, or the community where field crews were based (Inuvik, Norman Wells, Wrigley, and Fort Simpson) (Errington et al. 2018). Two or three plots were established at each site, representative of a local topographic gradient encompassing upland forests as well as both peat and

permafrost features. In this manner, each site was selected to contain a series of plots representative of permafrost-containing bogs (peat plateaus), areas of permafrost collapse within the peat plateau matrix (collapse scars), and adjacent upland forest environments occurring on mineral soils (uplands) (Fig. 1). In the northernmost, continuous permafrost region, climatic conditions prevented the formation of true collapse scars and only two plots were established at each site in the Inuvik region. Although not strictly part of the MVPMPN, one additional site, from northern Alberta, has been included in this report. This site, from the Anzac region, represents an area where permafrost is no longer present in the site and, as such, the topographic features in which the individual plots are located represent the legacy of permafrost on the landscape. In this Anzac site an upland forest is represented, along with a bog and an internal lawn. In this case, the internal lawn represents the permafrost collapse feature, and it represents an area in which a relatively small island of permafrost thawed within a permafrost-free bog matrix, causing the surface to subside approximately 50 cm from the surrounding bog (Vitt et al. 1994).

Field work was conducted in the summers of 2007 and 2008, with some preliminary scouting and methods testing in 2006. A collaborative effort between the Canadian Forest Service (CFS) and the Government of the Northwest Territories Forest Management Division (GNWT FMD); field crews were led by CFS employees, with GNWT FMD regional offices supplying additional crew members and logistical support. To keep this cooperative approach, forest inventory data collected as part of this study was designed to be compatible with that collected by the GNWT FMD for operational requirements. Consequently, the plot layout and field methods were heavily influenced by the NWT Inventory Field Sampling Manual (ENR 2006) and the design used for the GNWT Multisource Vegetation Inventory (MVI) Permanent Sample Plot (PSP) network.

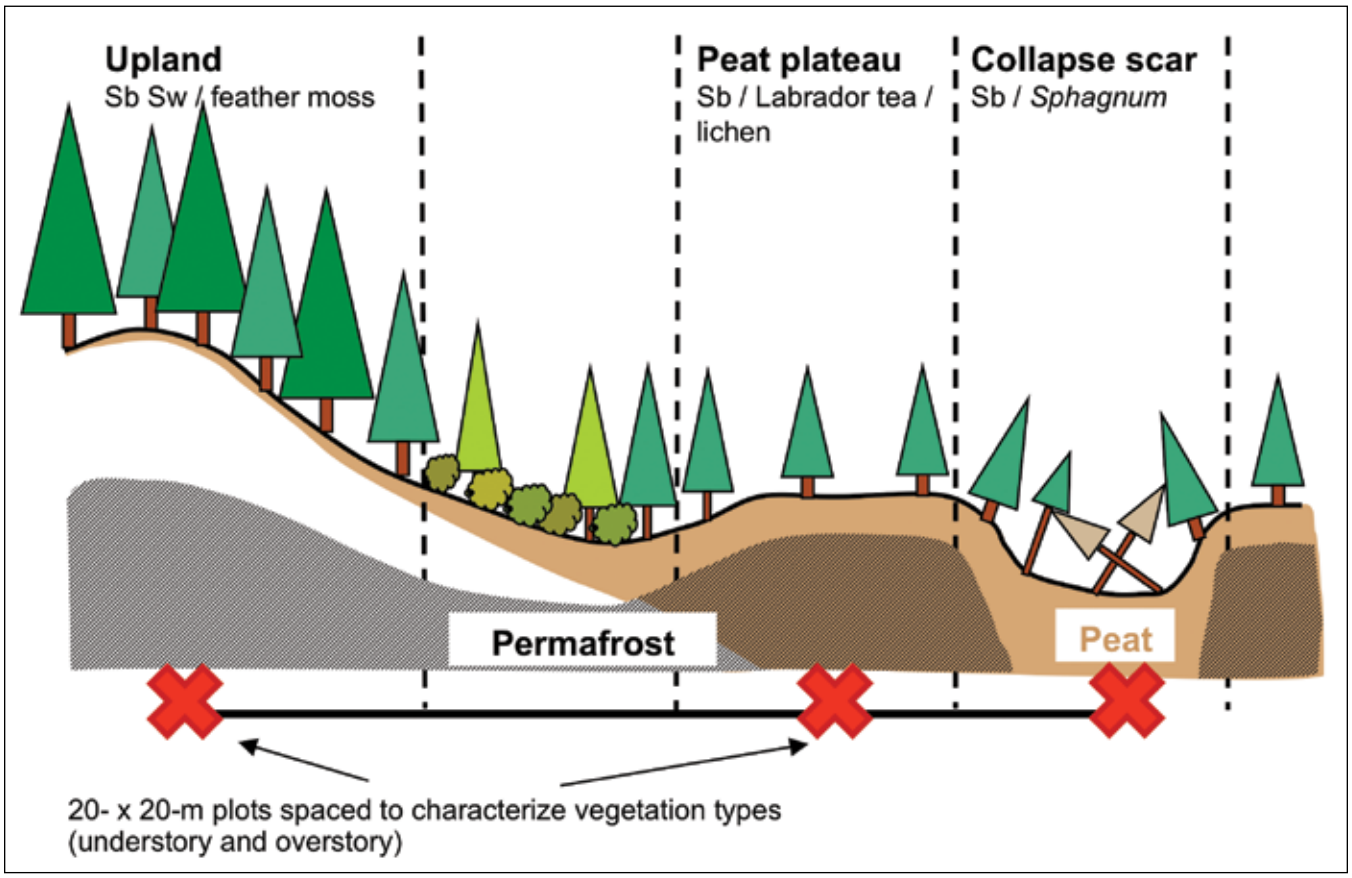


Figure 1. Sample site layout encompassing upland, peat plateau, and collapse scar environments with typical vegetation types along a topographic landscape gradient. Soils and active layer depths vary along this gradient as are evident with a transition from mineral (white) soils, in the upland, to organic (brown) soils in the peat plateau and collapse scar. The shallowest active layer depths are found in the peat plateaus, and permafrost (hatched) is absent from collapse scars. Tree mensuration was conducted within the large 20- x 20-m plots characterizing the main vegetation types.

The primary purpose of this report is to present mensurational data from the MVPMPN with appropriate background information such that it is available for use by any interested parties, in a manner appropriate to the data structure and collection methods. At the time of publishing, we envisioned this data to be most valuable as a baseline dataset from which to monitor changes in sensitive forest and peatland environments of the Mackenzie Valley. However, given the scarcity of data in northern regions, this network also provides a valuable resource, quantifying stand conditions in understudied low-productivity forest environments that could be utilized for a plethora of reporting or research purposes including wildlife habitat assessment, validation and (or) calibration of remote sensing products, as well as carbon budget reporting and modeling.

Errington et al. (2018) provides brief descriptions of all plots in the network, along with detailed information on the site locations. This report provides details on the tree component of the vegetation at these plots:

- tree inventories, including breast height diameter (DBH), species, and height for trees ≥ 1.3 m tall;
- inventories of small trees by species and height class (0–0.49 m; 0.5–0.99 m; 1–1.29 m) for trees < 1.3 m tall;
- tree ages at breast height for representative canopy trees.

Additional data were collected at the plots to provide information on understory vegetation, soils and groundwater conditions and will be presented in Errington and Bhatti (A database of vegetation, soil and groundwater conditions, in preparation).

This report provides field and laboratory methods for data collected from trees at the sites. Data are summarized by plot in the body of the report with raw data included in the companion database to facilitate tree-level comparison for any future plot remeasurement. Network-level summaries are also presented for some key variables to provide an overview of the dataset and some context for the plot-level summaries.

USING THIS REPORT

The main body of this report consists of five sections and an accompanying database. The first section describes the field and laboratory methods used in collecting tree mensurational data and processing samples. The second section describes the data included and techniques used in developing the plot level summary pages. The third section outlines the database tables and details the specific information included in each table and field of the associated electronic database files, while the fourth section provides a basic summary of how some key stand parameters vary throughout the network. Finally, the fifth section contains the plot-level summaries. Plot summary pages are organized by site, within four geographic regions ordered from north to south.

Details of site selection and plot layout are described by Errington et al. (2018) and are briefly described in this report only where necessary to provide context for the presented data. Throughout this report, the following terminology is used precisely to designate specific components of the sampling hierarchy:

Site,

Plot,

Subplot,

Quadrant.

The term site is used exclusively to refer to a set of 2–3 plots, generally located within 1 km of each other and established along a topographic sequence encompassing upland forest, peat plateau, and collapse scar ecotopes (Fig. 1). Each plot is a fixed area, usually 20 m x 20 m, laid out within a site to represent one of the three target ecotopes. Within each plot, trees were measured within either plot quadrants (Fig 2A), or in subplots (Fig. 2B). Plot quadrants were utilized for most plots in the network while subplots were sampled within the more intensively studied 'IPY' sites to avoid sampling in areas disturbed by the boardwalk infrastructure.

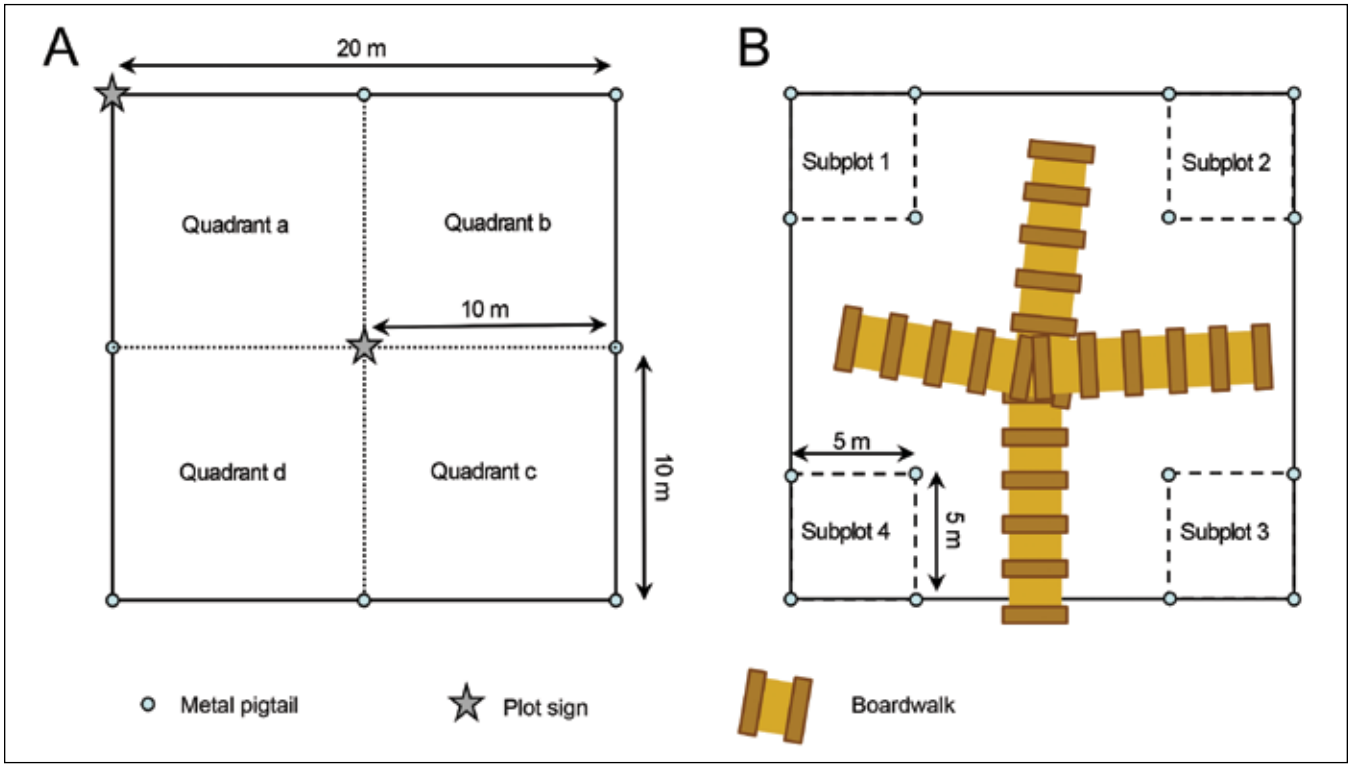


Figure 2. Plot layout for tree mensuration purposes. A) depicts the standard sampling design used for most plots in the network and B) depicts the design used for sampling within the more intensively studied 'IPY' sites.

METHODS

Field Methods

Tree Mensuration

Designed to be compatible with the existing network of GNWT forest inventory plots, and the GNWT MVI PSPs, much of the plot layout and field methods closely follow those outlined in the NWT Inventory Field Sampling Manual (ENR 2006) or the MVI PSP guidelines (Rob Skakun, Remote Sensing Analyst, Northern Forestry Centre, Canadian Forest Service, Edmonton, AB. In-person communication, 8 November 2018; and Tyler Rea, Operations Forester, Forest Resources, with the Forest Management Division of Environment and Natural Resources with the Government of the Northwest Territories, email exchange, 6 November 2019.). However, the network focus towards lower productivity forest types necessitated more detailed data collection on the small tree component, and in the interests of expediency some of the more detailed large tree parameters were excluded and some methods streamlined.

For the purposes of this study, trees were categorized as large, small, or very small (Table 1). The initial intent was for large trees to be measured and tagged in the entire (20 x 20 m) plot, while small trees would be measured and tagged in one random quadrant (10 x 10 m). However, in the interests of expediency and obtaining a representative sample, these sample sizes were commonly modified in the field. In practice, for large trees, field crews started by randomly choosing a plot quadrant (10 x 10 m), measuring and tagging trees in that quadrant first, then adding quadrants clockwise until a minimum of 30 large trees had been measured and tagged. Trees were always measured within a fixed area, even if that fixed area was allowed to vary between plots and size classes, based on the number of quadrants sampled at a particular plot for a particular size class of tree.

Table 1. Tree size classes for the purpose of mensuration procedures

Size class	DBH[a] (cm)	Height (m)
Very small trees	NA[b]	< 1.3
Small trees	< 5	≥ 1.3
Large trees	≥ 5	≥ 1.3

[a]DBH = diameter at breast height (1.3 m).
[b]NA = not applicable.

If small trees were very sparse, or irregularly distributed, and measuring trees in only one quadrant would provide a very small sample size, or otherwise not be representative of the plot as a whole, a subjective decision may have been made to measure trees within the entire plot, or multiple quadrants, for that size class. In the same manner, very small trees were tallied by size class (0–0.49 m; 0.5–0.99 m; 1–1.29 m) and species, within the entire plot, one, or multiple quadrants as was deemed appropriate in the field. Very small trees were not tagged, and tree paint was used to keep track of which trees had been tallied.

To ensure repeatability of measurements, as well as to assist future field crews to relocate individual trees for remeasurement, the dataset includes a record of which plot quadrant each tree was located in, following the standard quadrant labelling of Fig. 2A. In this system, all quadrants are labelled according to their relationship to the northwesternmost plot corner, which is marked in the field by a metal post and plot sign. For the more intensively monitored IPY sites, where much of the plot area was occupied with boardwalks and various sampling equipment, trees were measured in 5- x 5-m subplots, located in the plot corners (Fig. 2B).

In 2007, categories recorded for each large and small tree followed the NWT Inventory Field Sampling Manual (ENR 2006), including tree species, diameter at breast height (DBH), tree height, height to first branch, height to first live branch, crown class, form, tree class, pathology (conks, blink conks, scars, forks / crooks, rotten branches, dead or broken tops), quality (spiral grain, degree of sweep or lean of the tree). In 2008, field methods were streamlined to prioritize the most critical data and only tree tag number, species, DBH, tree height, crown class were recorded. Data presented in this report incorporates only those fields common to both the 2007 and 2008 measurement campaigns. Only live trees were included in 2007 and 2008, but we recommend that standing dead trees be included in any future remeasurements.

Tree Tags

In 2007 and 2008, all measured small and large trees were tagged within the appropriate plot area. Aluminum tags

were pre-printed with consecutive numbers ranging from 0 to 9999; there were more than enough unique numbers for every tree in the plot network. Tags were affixed to the trees near breast height (1.3 m above the tree base) using either an aluminum nail (where the tree was large enough to support it) or a thin wire looped through the tag and around a branch or the main stem of a smaller tree. Care was taken to tag trees in such a way as to minimize the effect on the tree as it grows. Nails were hammered in so that the head angled downwards, allowing the tag to fall away from the bole and minimize the chance that the tag would over time become encased in the growing bark. Similarly, when wires were used, care was taken to ensure a large loop was created, leaving room for the tree to grow. Where possible, tags were placed on branches, rather than the main stem, so that if the tree were to grow larger than the loop it would be a branch that would be constricted and potentially girdled, rather than the main stem.

Parameters Measured

Species was determined for each tree in the sampled plot area and was recorded in the field using the two letter codes identified in Table 2. It is worth mentioning that distinction between *Pinus contorta* and *Pinus banksiana* was difficult due to hybridization between the species in a few plots in the eastern Dehcho region, near Fort Simpson. It is also likely that there was some confusion between the birch species with many trees identified as *Betua papyrifiera*, when they were likely *Betula neoalaskana*.

Breast Height Diameter (DBH) records the bole diameter as measured to the nearest millimeter at a height of 1.3 m (breast height) above the ground surface. Calipers were used to measure the diameter and represent the average of two perpendicular measurements in cases where boles were noticeably asymmetric. Accurate and consistent determination of breast height is critical to accurate and consistent DBH measurements and as such, breast height was located using a stick marked at 1.3 m and a series of clear rules was used to determine the positioning of this stick. These are standard guidelines used in forest inventory procedures and reflect those specifically outlined by ENR (2006):

- Trees located on slopes were measured from the ground line on the upslope side of the tree. Leaning trees were measured from the ground, on the side of the lean.
- Stilted or perched trees were measured from the point of germination.
- Where trees were deformed at breast height, the diameter was measured immediately above the deformity.
- If there was a fork in a tree below breast height it was considered to be two separate trees, otherwise the diameter was measured, as normal, at breast height.

All of these guidelines serve to provide a conservative estimate of tree volume, and if there was ever any confusion in the field (e.g., a tree was both leaning and on a slope) this conservative principle was applied such that the measurement recorded represents the smaller of the possible options.

Tree Height was measured to the nearest 10 cm, using either a height pole or a Vertex IV hypsometer (Haglöf Sweden). Trees under 3 m were consistently measured using a height pole while trees over 4 m were consistently measured using the

Table 2. Tree species codes

Field code	Scientific name	Common name	Database code
Sw	*Picea glauca* Moench (Voss)	White spruce	Picegla
Sb	*Picea mariana* (Mill.) BSP	Black spruce	Picemar
Lt	*Larix laricina* (Du Roi) K. Koch	Tamarack	Larilar
Pl	*Pinus contorta* Dougl. ex Loud. var. *latifolia* Engelm.	Lodgepole pine	Pinucon
Pj	*Pinus banksiana* Lamb.	Jack pine	Pinuban
At	*Populus tremuloides* Michx.	Trembling aspen	Poputre
Ab	*Populus balsamifera* L.	Balsam poplar	Popubal
Ep	*Betula papyrifera* Marsh.	Paper birch	Betupap
Ea	*Betula neoalaskana* Sarg.	Alaska paper birch	Betuneo

hypsometer. Heights for trees between 3 m and 4 m tall were measured using the method most convenient at that time.

Crown Class refers to the position of the tree crown relative to other trees in the stand. In both 2007 and 2008, all trees were assigned one of four crown classes as outlined in Table 3 and illustrated in Figure. 3.

Status indicates whether the tree was alive or dead at the time of measurement and was recorded in both 2007 and 2008 despite dead trees not being routinely tagged and measured.

Tree Core Collection

In order to determine stand age, as well as past growth patterns of the main canopy trees, cores were collected from nine live dominant or co-dominant trees located outside the permanent monitoring plot area but considered to be representative of trees in the plot. Cores were collected at breast height, using an increment borer (5.1 mm diameter; Haglöf Sweden) and cores were stored in plastic milkshake straws for transportation back to the laboratory. To ensure accurate and consistent estimates of growth rates in the laboratory, cores were collected perpendicular to the axis of the bole and contained, or passed very close to, the pith. On leaning trees, cores were collected perpendicular to the lean. Cores were also collected in one continuous piece and if, after collection, a core broke before or as it was inserted into a straw, the core was discarded and another core collected.

Table 3. Crown classification codes refer to the position of the crown of the tree relative to other trees in the stand

Code	Crown class	Description
D	Dominant	Trees with crowns noticeably extending above the general level of the crown canopy, and receiving full light from above and partly from the side; dominants are larger than average, have well-formed crowns, which may or may not be crowded from the sides. It is important to note that in young stands, the relative position of a dominant tree is often less than one height class above the general crown canopy.
C	Co-dominant	Trees with crowns forming the general crown level of the canopy and receiving full light from above but comparatively little from the sides, usually with medium sized crowns, more or less crowded from the sides.
I	Intermediate	Trees shorter than those in the preceding classes, normally receiving little direct light from above, none from the sides; usually with small crowns, which are considerably crowded on the sides.
S	Suppressed	Trees with crowns entirely below the general level of the canopy, normally receiving no direct light from either above or the sides.

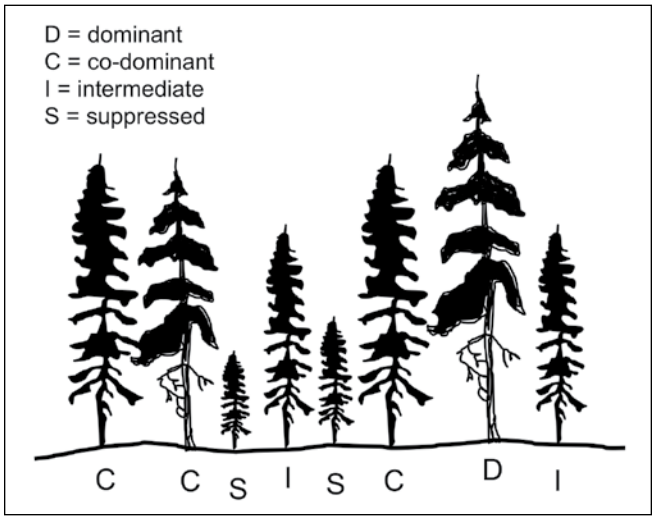


Figure 3. Crown classification (modified from ENR [2006]).

All measurements were collected for cored trees, as for plot trees, although cored trees were not tagged. If two species of trees were prevalent in the stand (at least 30% of canopy), or two distinct canopy layers occurred in the plot, nine trees were cored from each species and/or layer where possible. Due to time constraints in the field it was frequently not possible to collect more than nine cores and in mixed species stands the nine cores were collected for a plot in proportion to the species composition in the stand. For example, if a stand had 60% *Picea mariana* and 40% *Picea glauca* forming the main canopy, 5 cores would be collected from *P. mariana* trees and 4 cores collected from *P. glauca* trees.

Laboratory Methods

Tree Core Processing

Upon arrival at the laboratory, cores were oven-dried at 70°C for 48 hours or until condensation was no longer present on the inner surface of the straw. Cores were then mounted on grooved plywood boards, with xylem cells oriented perpendicular to the face of the mounting board, and were sanded to 1500 grit.

Sanded samples were scanned at either 1600 or 2400 dpi depending on the width of the rings and ring widths were measured with DendroScan (Varem-Sanders and Campbell 1996; most 2007 cores) or CooRecorder (Cybis CDendro & CooRecorder Sweden; most 2008 cores) software. If ring widths were too small to be clearly differentiated in the scanned images used by Dendroscan or CooRecorder, ring widths were measured manually using a Velmex TA system (Velmex Inc.). Samples that were measured with DendroScan or CooRecorder were crossdated within the software, while samples measured using the Velmex system were crossdated in Microsoft Excel. For cores not passing through the pith, an age correction was calculated by estimating the distance to the center of the tree and dividing it by the mean ring width of the three innermost complete rings. The distance to center was estimated one of two ways. If the curvature of the innermost rings was distinct, then the missing distance to center was measured using a concentric ring tool (a piece of transparent cellulose with radial circles printed on the surface). Using this method, the circles on the tool were aligned with the innermost rings, and the distance to the center was measured directly from the tool. However, this method requires that the innermost rings be approximately circular and that the curvature be sufficiently pronounced to allow for alignment with the concentric ring tool. In cases where the innermost rings were distorted, often due to a branch intrusion, or the curvature was not pronounced due to a large missing section near the pith, a second, less accurate, method was employed. In these cases, a ratio of DBH to dry radius was measured for all the cores within the plot, where the missing distance was zero or easily measured using the concentric ring tool. An average of this ratio was calculated for each species, and then used to calculate the total dry radius from which the core length was subtracted to yield the missing distance to center.

Data In-filling and Correction

With the 10-year remeasurement of all NWT plots completed in 2017 and 2018 (not reported here), 63 trees were found to have been missed in the original 2007–2008 survey, while heights of another eight trees were not measured in 2007–2008 or were found to be obviously incorrect in the initial measurement. For those trees missed in 2007–2008, DBH values were in-filled using those of trees of the same species, located in the same region, and having the same 2017–2018 DBH and, if possible also the same height, as the trees missing data for 2007–2008. Tree height was estimated from these DBH values using species- and region-specific regression models developed from tree data collected from 2007 to 2018 (Appendix I; Table A1).

Biomass Calculations

Living tree biomass (kg) was calculated using three methods, depending on tree size. For trees with height > 2 m, species-specific DBH- and height- based equations (Lambert et al. 2005; Ung et al. 2008) were used to estimate total tree-level biomass including stemwood, bark, branches, and foliage. With no biomass equation developed for *Salix* species by either Lambert et al. (2005) or Ung et al. (2008), we estimated the biomass of all *Salix* trees using the parameters developed for *Populus tremuliodes*, a deciduous species also belonging to the *Salicaceae*. These biomass equations, however, all approach zero when the height approaches 1.3 m. Although this error would be negligible in stands dominated by larger trees, because small trees often form a large component of northern forest stands, the use of national biomass equations underestimates biomass in these plots dominated by small trees. In order to more accurately represent biomass of small trees, an adjusted biomass (B) was calculated for trees <2 m, as a linear function of the cube of tree height (h) (Errington et al. 2010; Equation 1). This adjusted biomass is species specific,

with the constant (C) calculated as the mean biomass (kg) of all 2-m tall trees for each species in the Mackenzie Valley dataset. As is evident from Equation 1, this relationship assumes a constant ratio (equal to $C / 2^3$), between biomass and the cube of height, for trees less than 2 m.

$$(1) \qquad B = C * \frac{h^3}{2^3}$$

For the very small trees (height < 1.3 m) that were tallied according to height classes, biomass was calculated with Equation 1, using a single standardized midpoint for each height class (0.397 m, 0.825 m, 1.163 m). Because height class midpoints were used exclusively for biomass calculation, the midpoints themselves were also calculated using the cube of height and reflect a cubic root of the mean of cubed upper and lower height class limits.

To calculate stand level biomass, tree-level biomass values were summed over the fixed area of measurement and then divided by that measured area. In this way, for very small trees, the adjusted biomass of each height class was multiplied by the number of stems for each species measured within a fixed area (subplots or quadrants) and then divided by that sampled area. Similarly, stand biomass values for small and large trees were calculated by summing individual tree biomass of all species, and dividing these by the area in which they were sampled. Total plot biomass was calculated as a sum of the biomass, reported in tonnes per hectare, of all species and size classes found within the plot.

PLOT SUMMARY DESCRIPTION

This section of the report describes the data included and techniques used in developing the plot level summary pages. Stand characteristics are summarized in two pages for each plot (Fig. 4 & 5). The first page (Fig. 4) includes a graph summarizing the stand structure, along with tables identifying where in each plot trees were sampled, summary stand values for each plot, along with a third table outlining information for trees cored within the stand. The second page contains a series of bar graphs summarizing the stem density and tree biomass by height and DBH classes along with photographs illustrating the stand structure and understory vegetation (Fig. 5).

The following information describes the fields listed for each plot within the plot summary pages (Fig. 4 & 5).

Plot Name

This field lists the full plot name as a three-part code comprising the region, site, and type codes. The region consists of a two-letter code indicating the general geographic location of the plot:

IN	Inuvik
NW	Norman Wells
WR	Wrigley
FS	Fort Simpson
AN	Anzac

The site is a two- or three-digit code unique to each site within a geographic region. Most sites are identified with a two-digit numeric code, with the only exceptions being sites identified by the three-letter code of IPY. These 'IPY' designations represent sites examined in more detail for carbon cycling and greenhouse gas dynamics (see, for example, Startsev et al. 2016). The final two digits of the plot name identify the landscape feature represented by the plot:

UD	upland forest
PP	peat plateau

CS collapse scar

BG bog

IL internal lawn

For example, FS 02 UD would be the plot name, indicating that this is an upland forest plot in the Fort Simpson area, belonging to the FS 02 site.

Measurement Date

This field indicates the date of field mensuration data collection in day-month-year format. This is usually a single date but may be a range if data collection of tree mensuration occurred over several days at a plot.

Latitude

The latitudinal component of the geographic coordinates of the plot center is provided in degree, minute, and second format using the WGS 84 datum. This field replicates that provided in Errington et al. (2018) but was included, along with the longitude, to provide basic plot geographic information in a convenient manner.

Longitude

The longitudinal component of the geographic coordinates of the plot center is provided in degree, minute, and second format using the WGS 84 datum. This field replicates that provided in Errington et al. (2018) but was included, along with the latitude, to provide basic plot geographic information in a convenient manner.

Plant Community Type

Although detailed plant community data are not presented here, the classification of general plant community types is used to place the plot vegetation, including the stand structure and composition, within an ecological context. It was necessary to use an alternative system of ecological classification because ecological classification of the NWT has not yet reached the level of detail necessary to provide a standard plant community classification (Ecosystem Classification Group 2007). With the bulk of our MVPMPN lying within the Taiga Plains Ecozone (Ecological Stratification Working Group 1995), an ecozone also represented within an ecological classification system designed for Northern Alberta (Beckingham and Archibald 1996), this Northern Alberta classification was used as the most ecologically appropriate system. Although not an exact correlation, plant community classifications within the Boreal Mixedwood, Boreal Highlands, and Subarctic Ecological Areas of Alberta (Beckingham and Archibald 1996) were used for plots lying within the Mid-Boreal, High Boreal, and Subarctic level III ecoregions of the NWT (Ecosystem Classification Group 2007, 2010), respectively. As such, plant community types follow Beckingham and Arichibald (1996), within the ecological areas identified in parentheses (Fig. 4).

Sample Size and In-Plot Location Table

This table (Fig. 4) outlines the specific area sampled and sample sizes (number of trees measured) for each of three tree size classes as outlined in Table 1. Quadrant or subplot locations reflect the naming scheme outlined in the section on Using this Report, Fig. 2, with the total area reflecting the sum of all quadrants, or subplots measured for each size class of tree.

Stand Values Table

The stand values table (Fig. 4) provides a summary of stand parameters calculated from diameter (DBH) and height measurements of plot trees. Different size classes of tree were often measured over differing plot areas; consequently, values reported on a per hectare basis (basal area, stem density, and biomass) reflect the sum of per hectare measurements of all size classes. Those parameters not reported on a per hectare basis (mean, median, and biomass-weighted mean tree height) only incorporate trees measured over a common area. For example, if small and large trees were all measured in three plot quadrants (a, b, and c) then mean, median and biomass-weighted mean tree height were calculated using all trees ≥ 1.3 m tall in the measured quadrants (a, b, and c). If large trees were measured in all four quadrants (a, b, c, and d) and small trees were only measured in one quadrant (b) then mean, median, and biomass-weighted mean tree heights were calculated using only those trees (both small and large trees) from quadrant b.

Basal area (BA), in square meters per hectare, was calculated according to Equation 2, where D_i is the DBH, measured in centimeters, of tree i and A_i is the plot area, measured in square meters, over which trees of the same size class as tree i were measured. The sample size of all trees ≥ 1.3 m tall (small and large trees) in the plot is denoted by n.

Geographic coordinates of the plot center

Date tree mensuration was conducted in the plot

Plot name: upland forest plot within site FS 02

Stand structure graph

Plot: FS 02 UD

Measurement date: 02-Jul-07, 03-Jul-07

Latitude: 61° 38′ 22.3″N

Longitude: 121° 24′ 20.2″W

Plant community type (Boreal Mixedwood): h1.1 Sw-Sb/Labrador tea/horsetail

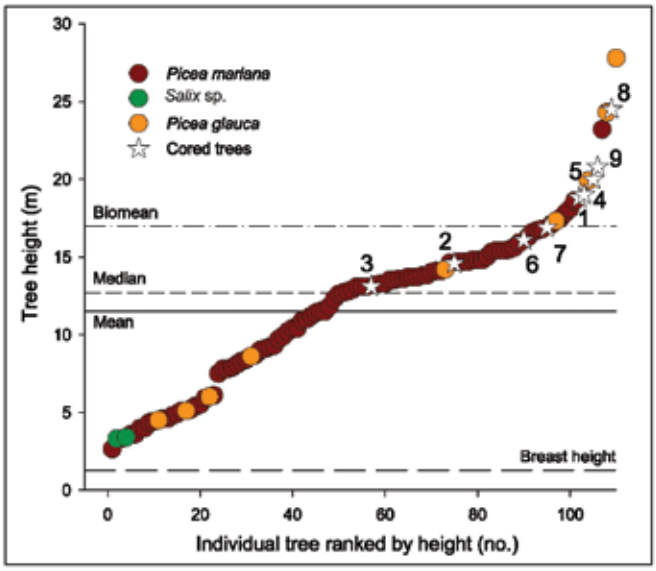
Plant community type as described for the Boreal Mixedwood Ecological area

Sample size and in-plot location

Sample size and in-plot location table

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	280
Small trees	a b c d	400	19
Large trees	a b c d	400	82

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values table

Stand values

Parameter	Picemar[a]	Picegla[b]	Larilar[c]	Salix[d]	Total
Basal area (m^2 ha^{-1})	22.95	6.02	0.00	0.01	28.98
Stem density (stems ha^{-1})	9125	325	25	50	9525
Height ≥ 1.3 m	2250	225	0	50	2525
Height < 1.3 m	6875	100	25	0	7000
Mean tree height (m)	11.4	14.2	NA[e]	3.4	11.5
Median tree height (m)	12.8	14.2	NA	3.4	12.7
Biomass-weighted tree height (m)	14.9	23.7	NA	3.3	17.0
Biomass (t ha^{-1})	92.1	28.5	0.0	0.0	120.6

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Larilar = *Larix laricina*; [d]Salix = *Salix* sp; [e]NA = not applicable.

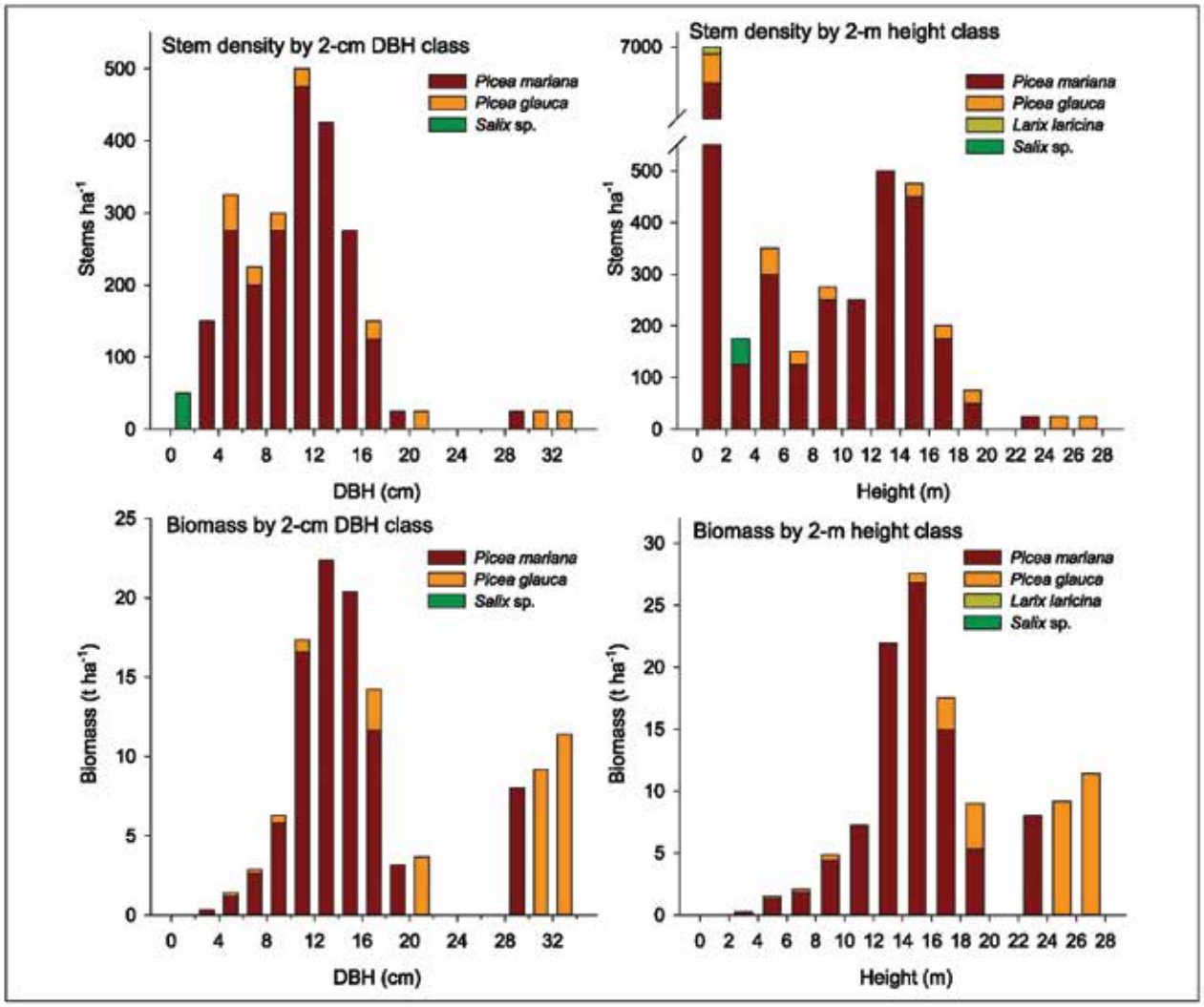
Cored trees table

Cored trees

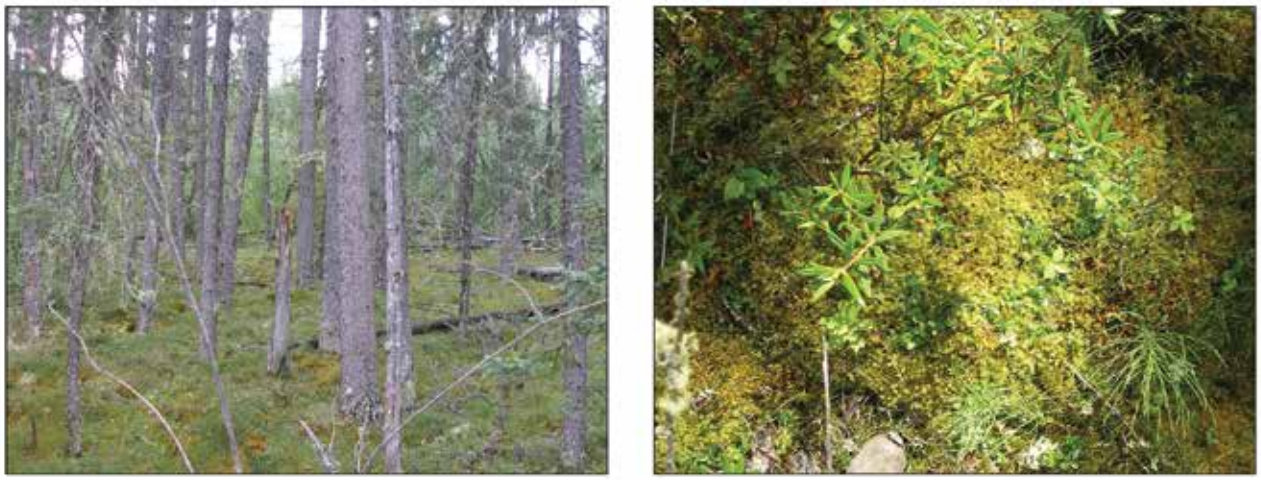
Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picegla	26.6	18.8	150
2	Picegla	19.5	14.6	150
3	Picemar	16.1	13.1	136
4	Picegla	21.4	19	133
5	Picegla	25.9	20	148
6	Picemar	14.9	16.1	152
7	Picemar	18.5	16.9	142
8	Picegla	34	24.5	146
9	Picemar	22	20.8	152

[a]Species: Picegla = *Picea glauca*; Picemar = *Picea mariana*.

Figure 4. Example layout of the first page of plot information.



Bar graphs depicting stem density (top) and biomass disbribution (bottom) according to DBH classes (left) and height classes (right)



Plot photographs depicting the stand structure (left) and understory vegetation (right)

Plot FS 02 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Figure 5. Example layout of the second page of plot information.

(2) $$BA = \sum_{i=1}^{n} \left(\frac{\pi \left(\frac{D_i}{2} \right)^2}{A_i} \right)$$

Stem density is simply a count of the number of trees measured in a fixed area, divided by that area. The calculations of mean and median tree heights incorporate only trees ≥ 1.3 m tall (small and large trees). The biomass-weighted mean tree height, referred to in the stand values table as Biomass-weighted tree height and in the stand structure graph as biomean, was calculated according to Equation 3, where h_i is the height, measured in meters, of tree *i* and B_i is the biomass, calculated in kilograms, of tree *i*. The sample size of all trees ≥ 1.3 m tall (small and large trees) measured in the same quadrant(s) of the plot is denoted by *n*.

(3) $$Biomean = \frac{\sum_{i=1}^{n} [h_i B_i]}{\sum_{i=1}^{n} [B_i]}$$

Biomass was calculated on an individual tree basis according to the Laboratory Methods Section and was summed on a per hectare basis to provide plot totals.

Cored Trees Table

The cored trees table presents basic species, DBH, and height measurements for trees cored outside of the permanent monitoring plot boundaries. The age presented reflects breast height age of each tree and the tree numbers are used to identify individual cored trees in the stand structure graph.

Stand Structure Graph

The stand structure graph (Fig. 4) provides a concise picture of stand structure and species composition within the plot. Trees are plotted by height, with height rankings shown on the x-axis and tree heights on the y-axis. Cored trees are depicted with stars and an identifying tree number to show how these cored trees relate to the stand structure of the plot. The mean, median, and biomass weighted mean (biomean) heights are also shown for context, along with the lower limit of breast height (1.3 m). Each individual tree is plotted with standardized colors indicative of the species. As with the calculation of mean, median, and biomass-weighted mean tree height, data used in this graph is limited to those plot quadrants, or subplots in which both small and large trees were measured.

Bar Graphs

A series of four stacked bar graphs (Fig. 5) also serves to illustrate the stand structure and biomass distribution within each plot. The top two bar graphs show stem density distributions according to 2 cm DBH classes (left) and 2 m height classes (right). The lower two bar graphs show the biomass distribution within the plot as arrayed across 2 cm DBH classes (left) and 2 m height classes (right). Species composition within each diameter or height class is indicated via stacked bars using a standardized color scheme.

Plot Photographs

For each plot, two photographs (Fig. 5) were selected to represent the stand structure and understory vegetation of the plot. Stand structure photographs were taken from a side midpoint, facing towards plot center, while understory photographs were taken, approximately vertically, looking down upon one of the eight subplots used to survey understory vegetation.

DATABASE DESCRIPTION

This third section outlines the database tables and details the specific information included in each table and field of the associated electronic database files.

There are three primary database tables associated with this information report such that both the individual, tree-level measurements, and plot-level summary statistics can be easily retrieved. Large and small trees are combined into a tree table, and very small trees comprise the very small tree table. The cored tree information can be found in the cored tree table. The plot-level summaries form the summary table which also includes some ecological context for this information, containing plot-level location and description information as outlined by Errington et al. (2018). All tables are provided as comma separated values (*.csv) files, a low-level format that can be easily imported into database, spreadsheet, and statistical software packages.

Tree Table

The tree table contains 19 fields, with 4136 records representing every tree tagged and measured within the Mackenzie Valley Permanent Monitoring Plot Network in 2007 and 2008. The following fields are included in the table:

Plot — Full plot name as a three-part code comprising the region, site, and type codes.

Region — Two-letter code indicating the general geographic location of the plot, with the following abbreviations:

IN	Inuvik
NW	Norman Wells
WR	Wrigley
FS	Fort Simpson
AN	Anzac

Site — Two- or three-digit code unique to each site within a geographic region.

Most sites are identified with a two-digit numeric code, with the only exceptions being sites identified by the three-letter code of IPY. These 'IPY' designations represent sites examined in more detail for carbon cycling and greenhouse gas dynamics (see, for example, Startsev et al. 2016).

Type — Two-letter code identifying the landscape feature represented by the plot, with the following abbreviations:

UD	upland forest
PP	peat plateau
CS	collapse scar
IL	internal lawn
BG	bog

Year — The year in which tree data was recorded in the field.

Month — The month when tree data was recorded in the field.

Day — The day of the month on which the tree data was recorded in the field.

Tree number — The number imprinted on the metal tag affixed to the tree.

Quadrant — The plot quadrant in which the tree is located (Fig. 2A).

A dash in this field indicates that plot trees were recorded using subplots rather than quadrants.

Subplot — The mensuration subplot in which the tree is located (Fig. 2B).

A dash in this field indicates that plot trees were recorded using quadrants rather than subplots.

Species — A seven-letter code (Table 2) indicating the tree species.

DBH — Diameter at breast height (1.3 m) measured in centimetres.

CSA — The cross-sectional area (cm^2) of each tree at breast height.

Calculated as

$$CSA = \pi \left(\frac{DBH}{2} \right)^2$$

Height — Height of the tree reported in meters.

Biomass — Tree biomass in kilograms (calculated according to the Laboratory Methods Section).

Area basis — Provides the area (m^2) within each plot in which trees of the appropriate size class were measured.

For example, if trees with DBH < 5 cm were measured in only one quadrant of a 20- x 20-m plot, the area basis for these trees would be 100 m^2 and if trees with DBH ≥ 5 cm were measured in all four quadrants, the area basis for these trees would be 400 m^2.

Notes — Indicates if the tree was missed in the initial 2007/8 measurement and where height was estimated from the DBH according to the procedure outlined in the Laboratory Methods Section.

Very Small Tree Table

The very small tree table contains 12 fields, with 657 records representing all combinations of size class and species within each quadrant of a plot in which very small trees were tallied within the Mackenzie Valley Permanent Monitoring Plot Network in 2007 and 2008. The following fields are included in the table:

Plot — Full plot name as a three-part code comprising the region, site, and type codes.

Region — Two-letter code indicating the general geographic location of the plot, with the following abbreviations:

IN	Inuvik
NW	Norman Wells
WR	Wrigley
FS	Fort Simpson

Site — Two- or three-digit code unique to each site within a geographic region.

Most sites are identified with a two-digit numeric code, with the only exceptions being sites identified by the three-letter code of IPY. These 'IPY' designations represent sites examined in more detail for carbon cycling and greenhouse gas dynamics (see, for example, Startsev et al. 2016).

Type — Two-letter code identifying the landscape feature represented by the plot, with the following abbreviations:

UD	upland forest
PP	peat plateau
CS	collapse scar
IL	internal lawn
BG	bog

Species — A seven-letter code (Table 2) indicating the tree species.

Quadrant — The plot quadrant in which the tree is located (Fig. 2A).

A dash in this field indicates that plot trees were recorded using subplots rather than quadrants.

Subplot — The mensuration subplot in which the tree is located (Fig. 2B).

A dash in this field indicates that plot trees were recorded using quadrants rather than subplots.

Area basis — Provides the area (m^2) within each plot in which trees of the appropriate size class were measured.

For example, if trees with DBH < 5 cm were measured in only one quadrant of a 20- x 20-m plot, the area basis for these trees would be 100 m^2 and if trees with DBH ≥ 5 cm were measured in all four quadrants, the area basis for these trees would be 400 m^2.

Height class — One of three height classes (0–0.49 m; 0.5–0.99 m; 1–1.29 m) in which very small trees were tallied by species.

Height midpoint — Midpoint for each height class, used to calculate tree biomass.

Class midpoints were calculated using the cube of height values (Laboratory Methods Section) to better reflect the mean biomass within each height class.

Stem count — Number of trees tallied according to species and height class within the designated plot quadrant or subplot.

Biomass — Total biomass (kg) for all trees of the designated species and height class within the plot quadrat or subplot.

This is calculated by multiplying the per tree biomass by the stem count, where per-tree biomass (kg) was calculated according to the Laboratory Methods Section using the midpoint of each height class.

Cored Trees Table

The cored trees table provides information on all trees cored in association with the MVPMPN during the 2007/8 sampling campaign. The following fields are included in the table:

Plot — Full plot name as a three-part code comprising the region, site, and type codes.

Region — Two-letter code indicating the general geographic location of the plot, with the following abbreviations:

IN	Inuvik
NW	Norman Wells
WR	Wrigley
FS	Fort Simpson
AN	Anzac

Site — Two- or three-digit code unique to each site within a geographic region.

Most sites are identified with a two-digit numeric code, with the only exceptions being sites identified by the three-letter code of IPY. These 'IPY' designations represent sites examined in more detail for carbon cycling and greenhouse gas dynamics (see, for example, Startsev et al. 2016).

Type — Two-letter code identifying the landscape feature represented by the plot, with the following abbreviations:

UD	upland forest
PP	peat plateau
CS	collapse scar
IL	internal lawn
BG	bog

Year — The year in which tree data was recorded in the field.

Month — The month when tree data was recorded in the field.

Day — The day of the month on which the tree data was recorded in the field.

Tree number — Tree number assigned to each cored tree at the time of sampling. This number is unique only within a plot and is used to associate each core with field measurement of the cored tree.

Species — A seven-letter code (Table 2) indicating the tree species.

DBH — Diameter at breast height (1.3 m) reported in centimeters.

CSA — The cross-sectional area (cm^2) of each tree at breast height.

Calculated as

$$CSA = \pi \left(\frac{DBH}{2} \right)^2$$

Height — Height of the tree reported in meters.

Years in core — The number of annual tree rings measured in each tree core according to methods outlined in the Laboratory Methods Section.

BH age — Breast height age of each cored tree, calculated according to methods outlined in the Laboratory Methods Section.

All trees were cored at breast height, and the DBH age incorporates the years in the core as well as a correction for the number of years missing from the core if the core did not include the pith.

Plot Summary Table

The plot summary table provides stand-level summaries generated for each plot within the MVPMPN. These values are presented for each plot in the plot summary pages that comprise the bulk of this information report and are provided in digital form within this plot table. The following fields are included in the table:

Plot — Full plot name as a three-part code comprising the region, site, and type codes.

Species — A seven-letter code (Table 2) indicating the tree species with the designation of total used to provide a summary across all species.

Size class — The size class denotes the three sampled cohorts of trees referred to as large trees, small

trees, and very small trees (Table 1) with the designation of total used to provide a summary across all size classes.

Density — Stems per hectare by species and size classes.

Basal area — Basal area per hectare. The cross-sectional area of trees at breast height divided by the area over which they were sampled (Equation 2). Units are reported in square meters per hectare.

BioH — Biomass per hectare. The biomass of trees divided by the area over which they were sampled. Units are reported in tonnes per hectare.

Mean height — Average tree height calculated for trees ≥ 1.3 m tall.

For plots where trees of different size classes were measured in overlapping but distinct plot areas, the mean tree height is restricted to a mean over the common area where trees of all size classes were sampled.

Median height — Median tree height calculated for trees ≥ 1.3 m tall.

For plots where trees of different size classes were measured in overlapping but distinct plot areas, the mean tree height is restricted to a mean over the common area where trees of all size classes were sampled.

Biomean height — Biomass-weighted tree height. Average tree height calculated for trees ≥ 1.3 m tall and weighted by tree biomass (Equation 3).

For plots where trees of different size classes were measured in overlapping but distinct plot areas, the mean tree height is restricted to a mean over the common area where trees of all size classes were sampled.

Plot Description Table

The description table incorporates the plot locations and general descriptive parameters included in Errington et al. (2018). Details of these classifications are provided in Errington et al. (2018) and will not be repeated here; however, explanations of any abbreviations and a listing of potential categories is provided. The following fields are included in the plot description table:

Plot — Full plot name as a three-part code comprising the region, site, and type codes.

Region — Two-letter code indicating the general geographic location of the plot, with the following abbreviations:

IN	Inuvik
NW	Norman Wells
WR	Wrigley
FS	Fort Simpson
AN	Anzac

Site — Two- or three-digit code unique to each site within a geographic region.

Most sites are identified with a two-digit numeric code, with the only exceptions being sites identified by the three-letter code of IPY. These 'IPY' designations represent sites examined in more detail for carbon cycling and greenhouse gas dynamics (see, for example, Startsev et al. 2016).

Type — Two-letter code identifying the landscape feature represented by the plot, with the following abbreviations:

UD	upland forest
PP	peat plateau
CS	collapse scar
IL	internal lawn
BG	bog

PF Zone — Permafrost zone as described by Heginbottom et al. (1995)

C	Continuous
ED	Extensive Discontinuous
SD	Sporadic Discontinuous
IP	Isolated Patches

EcoClim — Ecoclimatic region of the Ecoregions Working Group (1989) as updated for the NWT as level III ecoregions (Ecosystem Classification Group 2007, 2010)

HS	High Subarctic
LS	Low Subarctic
HB	High Boreal
MB	Mid-Boreal

Ecoregion	Level IV ecoregion as defined by the Ecosystem Classification Group (2007, 2010).
DegLat	Degrees of latitude (N) recorded using the WGS 84 datum.
MinLat	Minutes of latitude (N) recorded using the WGS 84 datum.
SecLat	Seconds of latitude (N) recorded using the WGS 84 datum.
DegLong	Degrees of longitude (W) recorded using the WGS 84 datum.
MinLong	Minutes of longitude (W) recorded using the WGS 84 datum.
SecLong	Seconds of longitude (W) recorded using the WGS 84 datum.
DDlat	Degrees of latitude as expressed in decimal degrees and recorded using the WGS 84 datum.
DDlong	Degrees of longitude as expressed in decimal degrees and recorded using the WGS 84 datum.
Elevation	Plot elevation as meters above sea level.
Slope	Plot slope (%). Unmeasured slopes determined to be negligible are recorded as NA (not applicable).
Aspect	Plot aspect in degrees. Plots with no slope have aspects recorded as NA (not applicable).
Orientation	Plot orientation in degrees, from the southeasternmost plot corner towards the northeasternmost plot corner.
PlotL	Plot size in meters from the southeasternmost plot corner towards the northeasternmost plot corner.
PlotW	Plot size in meters from the northwesternmost plot corner towards the northeasternmost plot corner.

Structure	Stand structure of the plot.	
	SS	Single storied
	MS	Multistoried
	C	Complex
Terrain	General terrain type in which the plot is located.	
	E	Even
	R	Rolling
	G	Gullied
	B	Broken
Meso	Meso slope position of the plot within the landscape.	
	crest	crest of slope
	upper	upper slope position
	mid	midslope position
	lower	lower slope position
	toe	toe slope position
	depression	depression
	level	level
Drainage	Drainage category of the plot soils	
	E	Excessive
	G	Good
	R	Restricted
Moisture	Soil moisture condition of the plot.	
	VX	very xeric
	X	xeric
	SX	sub-xeric
	Sm	sub-mesic
	m	mesic
	Sh	sub-hygric
	h	hygric
	SH	sub-hydric
	H	Hydric

NETWORK SUMMARY

Summary analyses can be conducted at various levels of detail using the datasets contained within this report. While it is beyond the scope of this report to present a detailed analysis of the data, in this section we present some basic summary figures, with accompanying statistical analyses to elucidate how several stand parameters vary along the climatic and topographic gradient encompassed by this network. Although the analyses presented are not independent (both ecoclimatic regions and latitude vary according to the primarily north to south climatic gradient within the Mackenzie Valley), incorporating analyses of both discrete and continuous variables offers different perspectives on the data, and helps to provide some context for the plot summaries, which comprise the following sections. With the primary goal to present the tree mensuration data for this plot network, we provide limited ecological interpretation of these summary analyses, leaving more in-depth ecological interpretation to others.

Statistical Methods

For this basic analysis, stand parameters were summarized by topographic plot type and ecoclimatic region (Table 4).

Table 4. Mean and standard errors (SE) of stand values reported according to ecoclimatic region and plot type (upland forest, peat plateau, collapse scar) for the Mackenzie Valley Permanent Monitoring Plot Network

	Mid-Boreal			High Boreal			Low Subarctic			High Subarctic	
Stand value	**UD[a]**	**PP[b]**	**CS[c]**	**UD**	**PP**	**CS**	**UD**	**PP**	**CS**	**UD**	**PP**
Basal area (m^2 ha^{-1})	28.47	8.66	0.00	22.39	4.36	0.00	7.89	0.40	0.00	5.54	0.16
SE	4.27	1.81	0.00	2.68	0.58	0.00	1.67	0.26	0.00	1.21	0.16
Stem density (stems ha^{-1})	18235	20290	2056	24056	27013	8441	15925	3390	0	9600	3958
SE	3707	1993	1017	8830	6288	2011	2186	1576	0	2736	3830
Height ≥ 1.3 m (stems ha^{-1})	10125	9690	6	7524	6610	0	4765	265	0	3075	392
SE	2432	2120	6	1666	2295	0	1430	167	0	751	382
Height < 1.3 m (stems ha^{-1})	8110	10600	2050	16532	20403	8441	11160	3125	0	6525	3567
SE	4213	3327	1020	9054	5602	2011	1930	1584	0	2693	3448
Mean tree height (m)	6.61	3.14	2.92	6.51	2.88	NA	3.87	3.09	NA	3.30	1.83
SE	1.27	0.10	NA[d]	0.95	0.21	NA	0.39	0.46	NA	0.22	0.41
Median tree height (m)	6.78	2.82	2.92	6.02	2.60	NA	3.56	3.14	NA	3.07	1.71
SE	1.62	0.12	NA	1.17	0.22	NA	0.42	0.43	NA	0.27	0.29
Biomass-weighted tree height (m)	10.51	4.98	2.92	11.92	4.66	NA	6.48	3.75	NA	4.90	2.22
SE	1.74	0.27	NA	1.13	0.44	NA	1.35	0.81	NA	0.36	0.79
Stand age (years at breast height)	99	65	NA	101	63	NA	123	162	NA	87	NA
SE	19	5	NA	14	6	NA	28	NA	NA	7	NA
Biomass (t ha^{-1})	94.90	24.55	0.02	77.09	13.09	0.04	24.28	1.24	0.00	17.03	0.53
SE	15.59	4.93	0.01	9.28	1.82	0.01	5.51	0.79	0.00	3.84	0.52

[a]UD = upland forest.
[b]PP = peat plateau.
[c]CS = collapse scar.
[d]NA = not applicable.

Statistical analyses were conducted only for the NWT portion of the dataset and, as such, the three topographic plot types considered were upland forest, peat plateau, and collapse scar. Analysis of variance (ANOVA) procedures were used to compare total tree biomass (reported in tonnes per hectare), stand age (reported in years at breast height), and biomass-weighted mean tree height (reported in meters), by topographic plot type and ecoclimatic region. In all cases, it was necessary to transform the independent variable to meet assumptions of normality and equal variances. A natural logarithm transformation was used for both total biomass and the biomass-weighted mean height, and a square root transformation was used for stand age. In the cases of biomass and stand age, transformation alone was not sufficient to meet variance assumptions, and a model of variance, using topographic plot type was incorporated into the ANOVA procedure. With respect to latitude, linear trends were also calculated for total biomass and biomass-weighted mean height (Fig. 6) with regression coefficients shown in Table 5. All analyses were conducted using the base stats package within the R environment for statistical computing (R Core Team 2019), except for the biomass ANOVA where the nlme and emmeans packages (Lenth 2019; Pinheiro et al. 2019) were used.

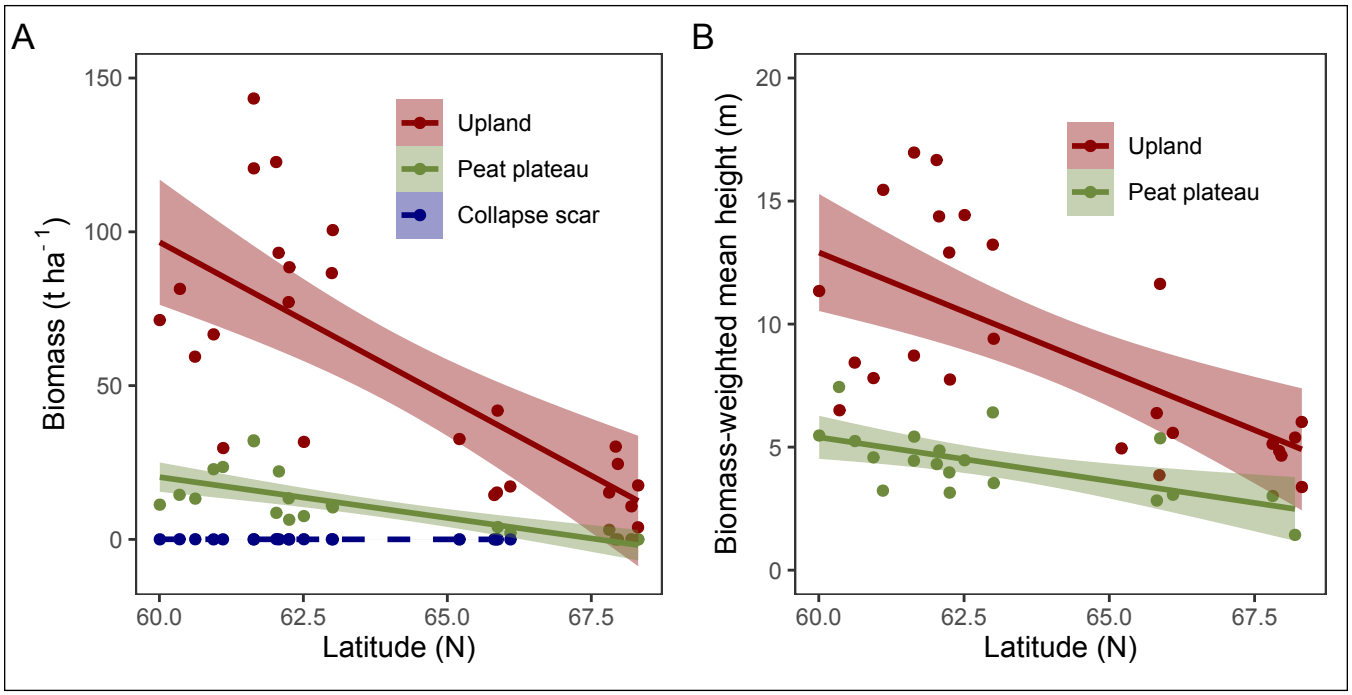


Figure 6. Linear trends in A) biomass, and B) biomass-weighted mean tree height with respect to latitude for upland forests, peat plateaus, and collapse scars in the NWT portion of the MVPMPN. Shaded areas represent standard errors of the linear models, details of which are presented in Table 5.

Table 5. Regression coefficients, coefficients of determination (R^2), and *p*-values for linear models of the form Response = $\beta_0 + \beta_1$*Latitude + ε. All models were conducted using only the NWT portion of the plot network.

Response	Topographic plot type	β_0	β_1	R^2	*p*-value
Biomass	Upland forest	704.130	-10.124	0.5287	<0.0001
Biomass	Peat plateau	179.735	-2.568	0.5837	<0.0001
Biomass	Collapse scar	0.433	-0.007	0.2470	0.0304
Biomass-weighted mean height	Upland forest	70.687	-0.963	0.4262	0.0004
Biomass-weighted mean height	Peat plateau	26.730	-0.356	0.3926	0.0041

Summary

As seen in Figure 7, total tree biomass varies by both topographic plot type and ecoclimatic region, with the greatest tree biomass found in upland forests of the boreal regions and the lowest biomass in the commonly treeless subarctic peat plateaus and collapse scar plots of all regions. Intermediate tree biomass values were found in subarctic upland forests and in boreal peat plateaus. As with biomass, tree height generally decreases from boreal to subarctic ecoclimatic regions and from upland to peat plateau plot types (Fig. 8). However, relatively small height differences between regions and plot types and relatively large variability within the regions and plot types resulted in many of these differences not being statistically significant. All metrics used for tree height (mean, median, biomass-weighted mean) display very similar trends with respect to the plot type and ecoclimatic region. However, only biomass-weighted mean tree height is presented here as it is considered to be a better reflection of canopy height in complex stands. These differences in biomass and tree height were likely not due to systematic differences in stand age along the gradient; although highly variable, significant differences were only found between the younger, boreal peat plateaus and the older, low subarctic peat plateaus (Fig. 9).

Within the NWT portion of the plot network, total tree biomass decreased with increased latitude for both peat plateau and upland forests, with only a marginally significant trend detected for collapse scar plots (Fig. 6A; Table 5). Similarly, biomass-weighted mean tree height decreased with increased latitude for both peat plateaus and upland forests (Fig. 6B; Table 5). The rate of decline in both biomass and height was greater for upland forests than for the peat plateaus, a trend that likely reflects the permafrost constraints of peat plateaus regardless of latitude. While the presence of permafrost is detected more frequently in upland forests as latitude increases, the depth of the active layer does not vary by latitude for peat plateaus within the plot network (Errington et al. 2010). Thus, permafrost constraints on the rooting zone, the most likely factor limiting tree growth in peat plateaus, did not vary with latitude, which is reflected by a lack of similar variation with respect to tree height and biomass.

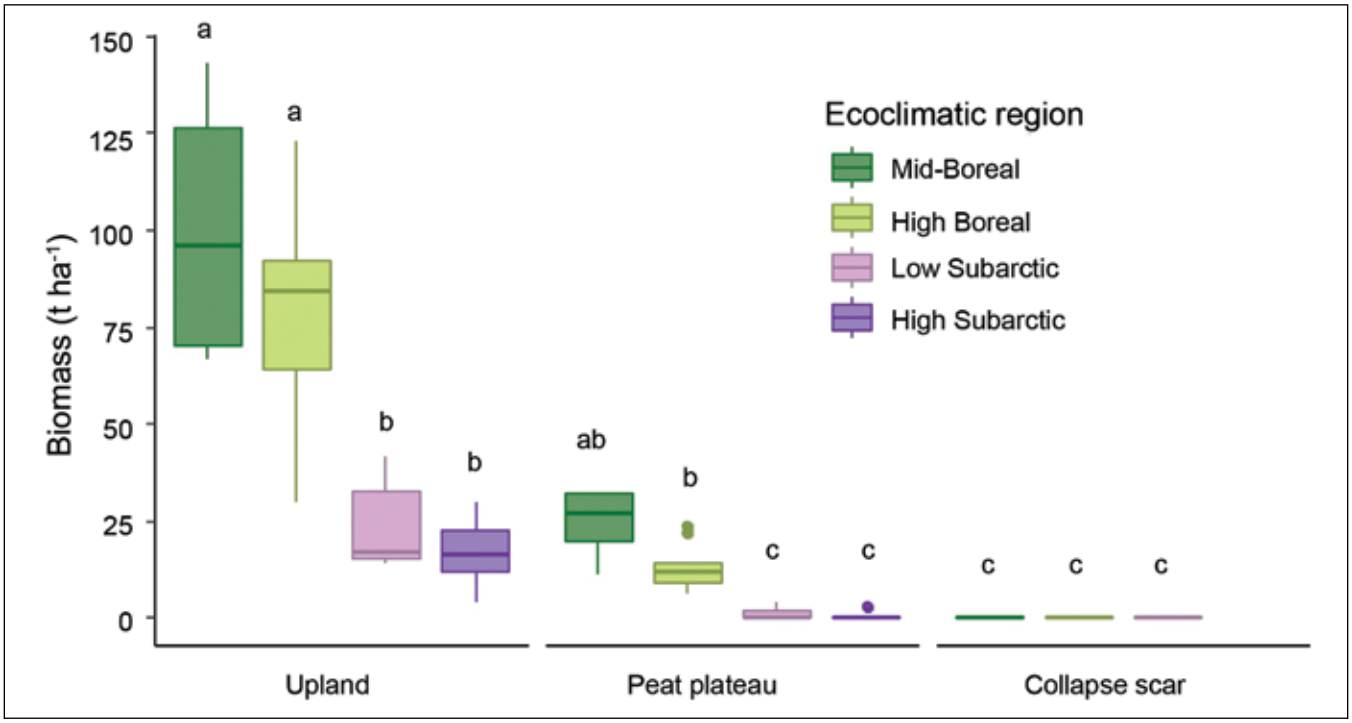


Figure 7. Boxplots of tree biomass (t ha^{-1}) for plots in the NWT portion of the MVPMPN, grouped according to ecoclimatic region and plot type. Letters indicate statistically significant groupings.

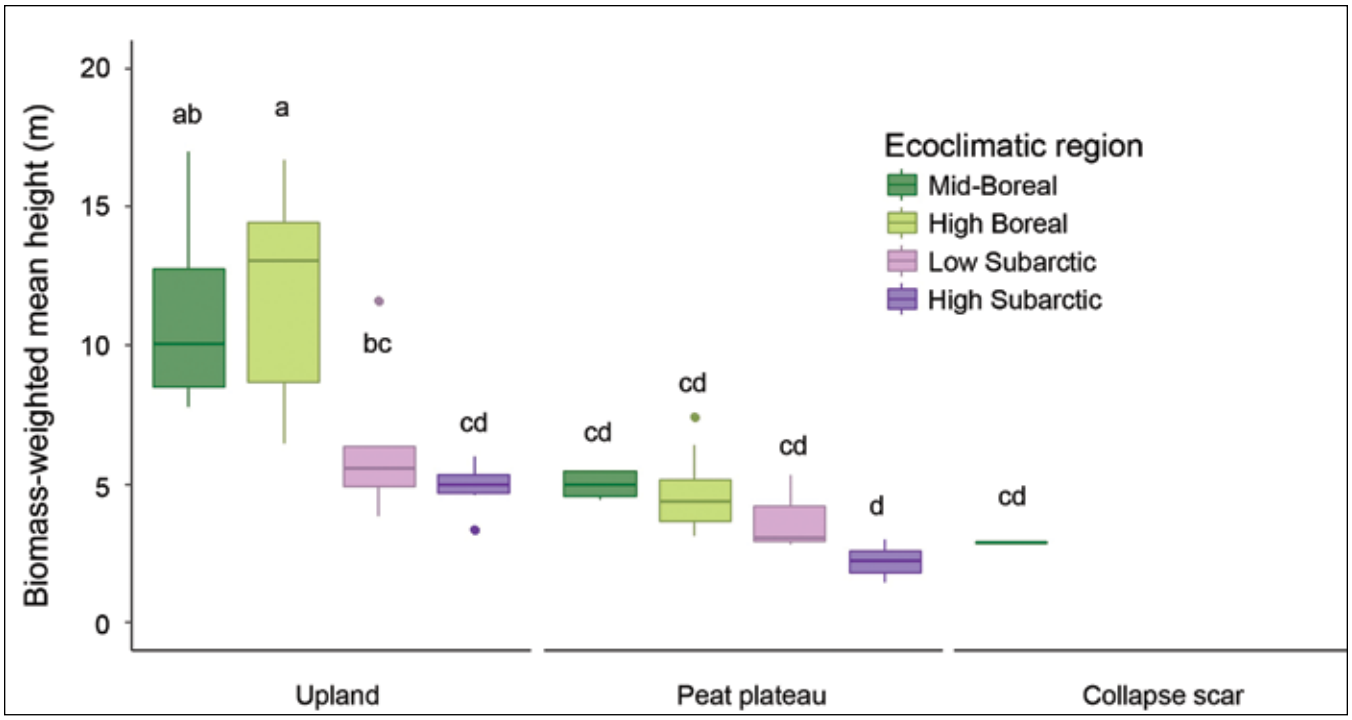


Figure 8. Boxplots of biomass-weighted mean tree height (m) for plots in the NWT portion of the MVPMPN, grouped according to ecoclimatic region and plot type. Letters indicate statistically significant groupings.

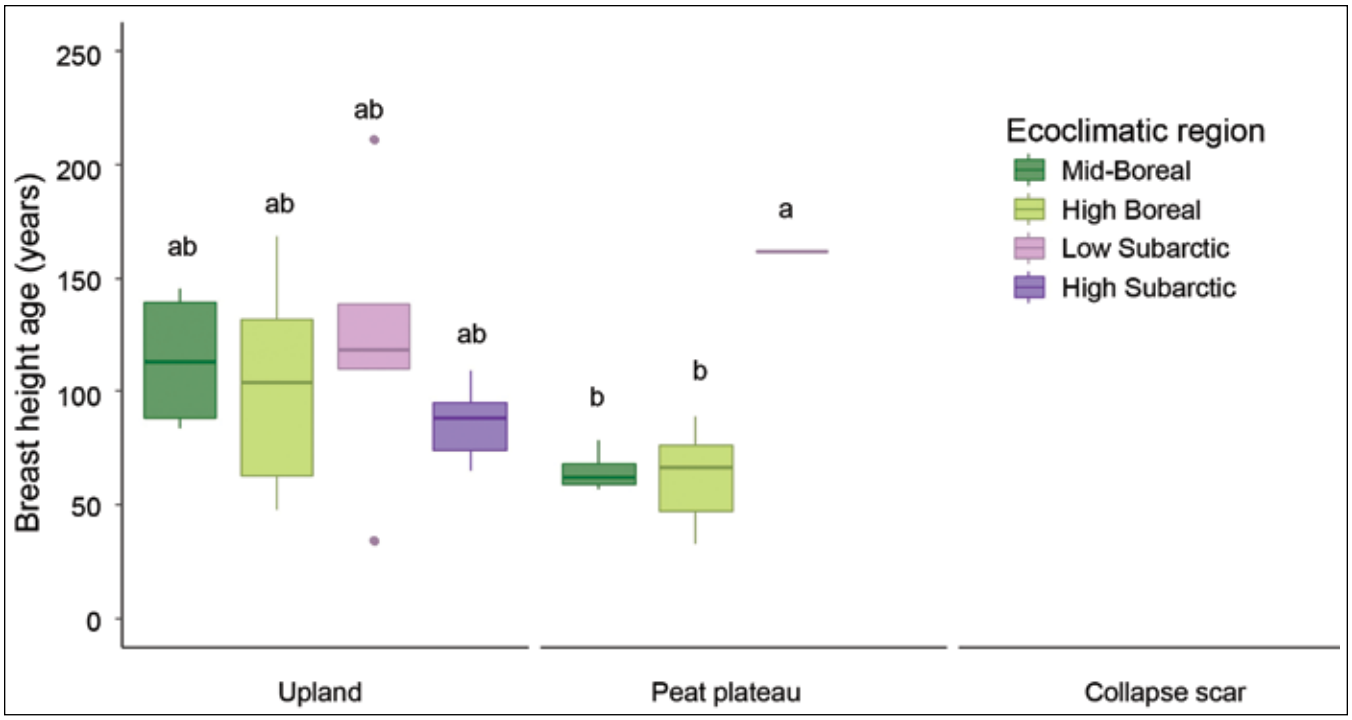


Figure 9. Boxplots of stand age (years at breast height) for plots in the NWT portion of the MVPMPN, grouped according to ecoclimatic region and plot type. Letters indicate statistically significant groupings.

INUVIK AREA SITES

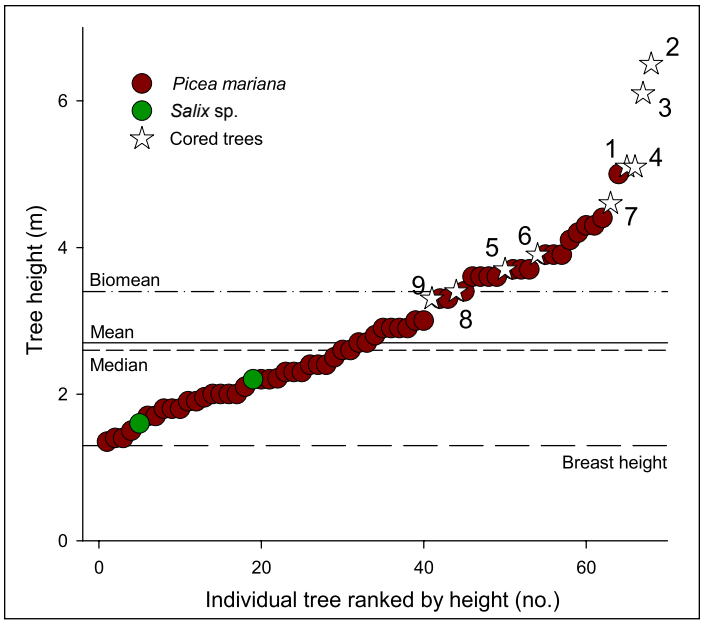
Plot: IN IPY UD

Measurement date: 24-Jul-07

Latitude: 65° 12′ 34.6″N

Longitude: 127° 01′ 01.2″W

Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	100	56
Small trees	1 2 3 4	100	51
Large trees	1 2 3 4	100	8

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.

Stand values

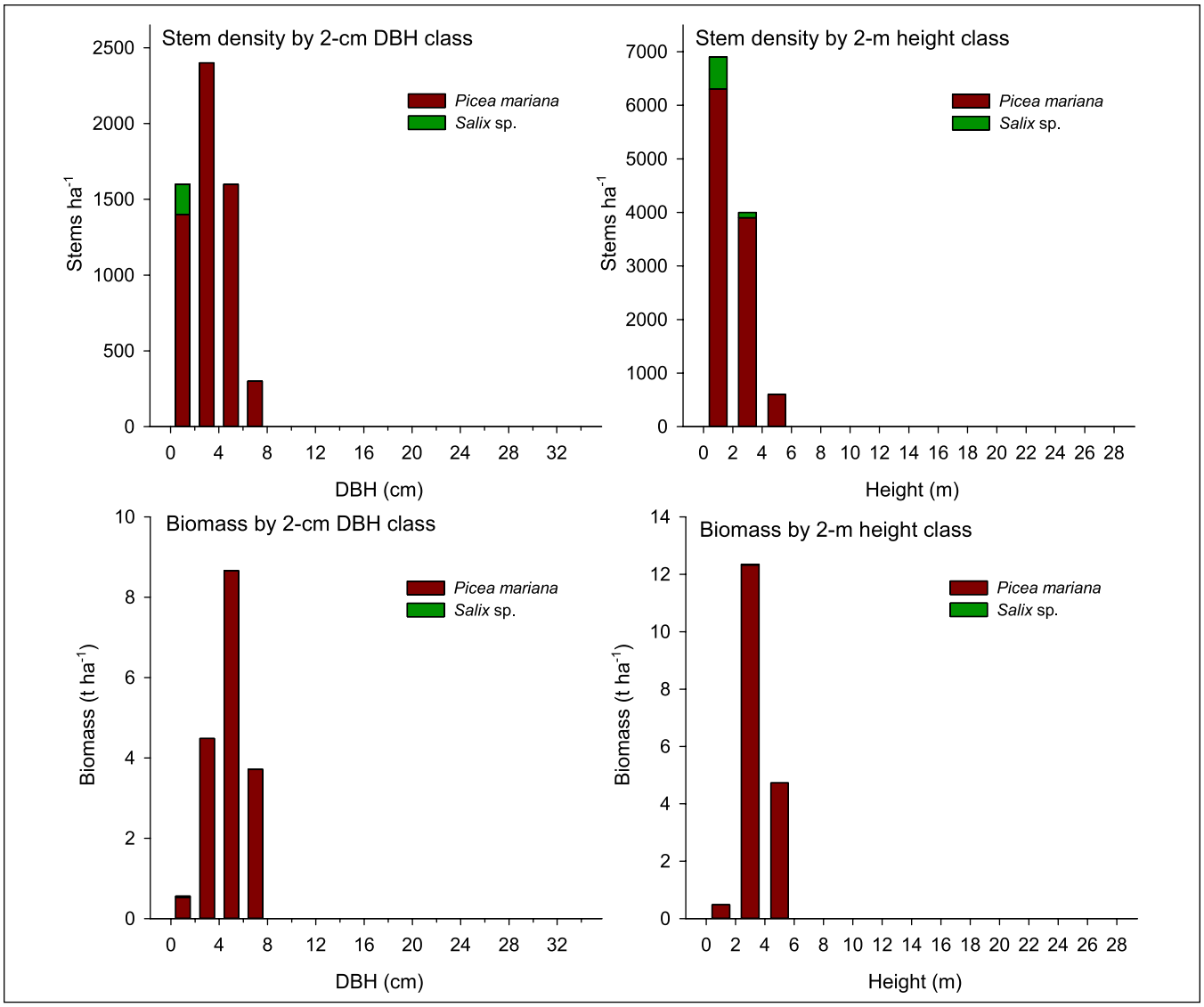
Parameter	Picemar[a]	Salix[b]	Total
Basal area (m^2 ha^{-1})	5.75	0.03	5.78
Stem density (stems ha^{-1})	10800	700	11500
Height ≥ 1.3 m	5700	200	5900
Height < 1.3 m	5100	500	5600
Mean tree height (m)	2.8	1.9	2.7
Median tree height (m)	2.6	1.9	2.6
Biomass-weighted tree height (m)	3.4	2.1	3.4
Biomass (t ha^{-1})	17.5	0.0	17.6

[a]Picemar = *Picea mariana*; [b]Salix = *Salix* sp.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	7.3	5.1	78
2	Picemar	8.9	6.5	84
3	Picemar	7.8	6.1	108
4	Picemar	7.7	5.1	128
5	Picemar	5.0	3.7	87
6	Picemar	4.8	3.9	94
7	Picemar	6.8	4.6	150
8	Picemar	4.9	3.4	87
9	Picemar	4.9	3.3	50

[a]Species: Picemar = *Picea mariana*.



Plot IN IPY UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: IN IPY PP

Measurement date: 24-Jul-07
Latitude: 68° 18′ 54.9″N
Longitude: 133° 25′ 56.7″W
Plant community type (Subarctic): g2.1 northern Labrador tea-dwarf birch/sedge/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	100	0
Small trees	1 2 3 4	100	0
Large trees	1 2 3 4	100	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.

Stand values

Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.

Plot photographs illustrating the stand structure and understory composition for plot IN IPY PP..

Plot: IN 01 UD

Measurement date: 20-Jul-07

Latitude: 68° 18′ 39.9″N

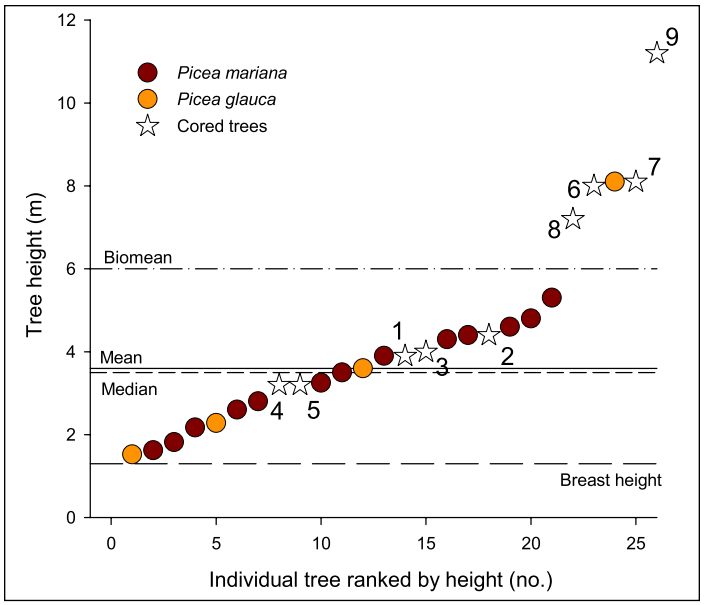
Longitude: 133° 23′ 59.4″W

Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	51
Small trees	a b c d	400	10
Large trees	a b c d	400	7

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

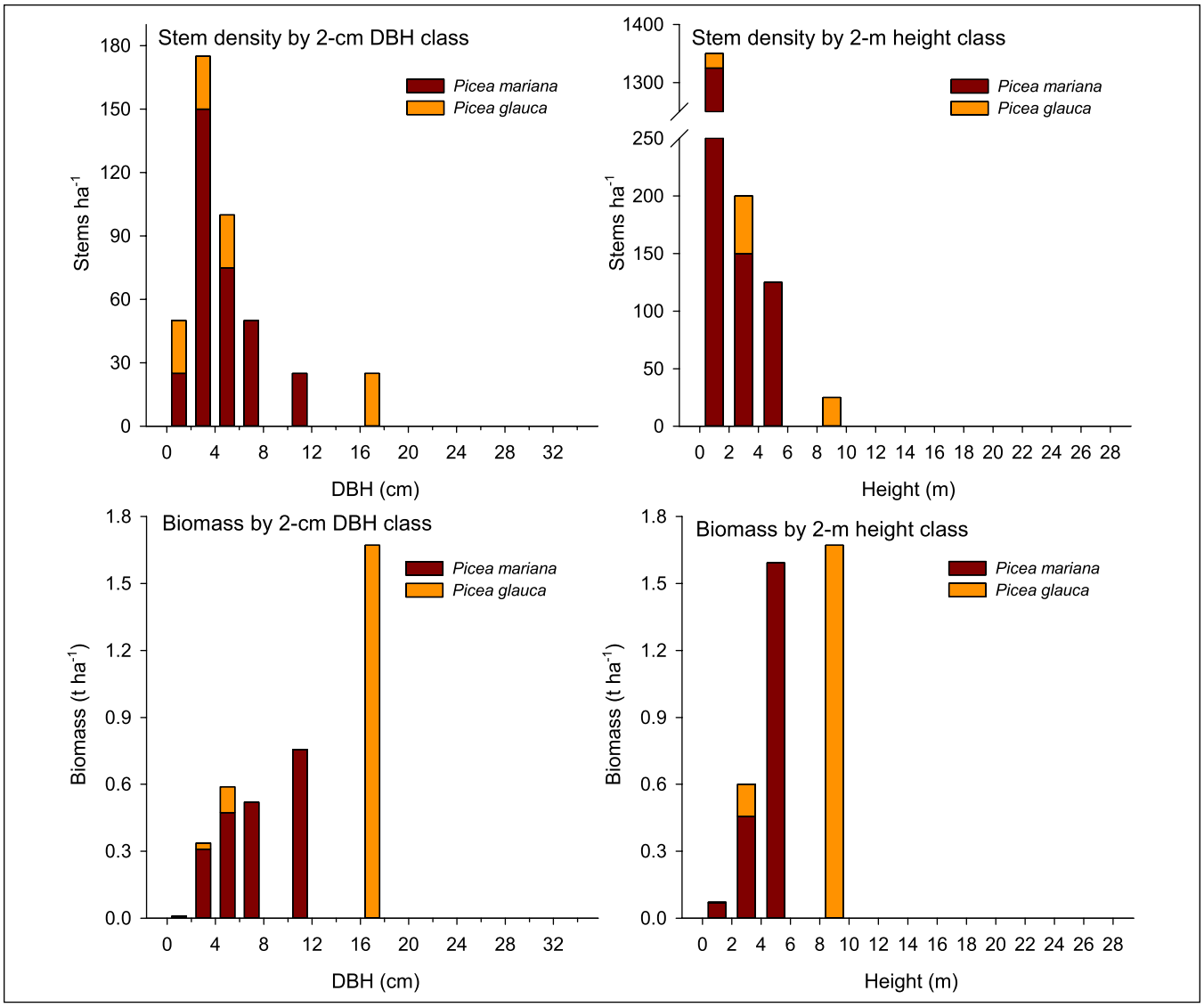
Parameter	Picemar[a]	Picegla[b]	Total
Basal area (m^2 ha^{-1})	0.68	0.59	1.27
Stem density (stems ha^{-1})	1600	100	1700
Height ≥ 1.3 m	325	100	425
Height < 1.3 m	1275	0	1275
Mean tree height (m)	3.5	3.9	3.6
Median tree height (m)	3.5	2.9	3.5
Biomass-weighted tree height (m)	4.5	7.7	6.0
Biomass (t ha^{-1})	2.1	1.8	3.9

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	12.5	3.9	70
2	Picemar	8.3	4.4	63
3	Picemar	7.4	4.0	48
4	Picemar	6.3	3.2	58
5	Picemar	6.3	3.2	48
6	Picemar	18.5	8.0	102
7	Picegla	16.5	8.1	78
8	Picegla	12.5	7.2	78
9	Picegla	30.0	11.2	98

[a]Species: Picemar = *Picea mariana*; Picegla = *Picea glauca*.



Plot IN 01 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: IN 01 PP

Measurement date: 19-Jul-07
Latitude: 68° 18′ 47.8″N
Longitude: 133° 23′ 00.1″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	0
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

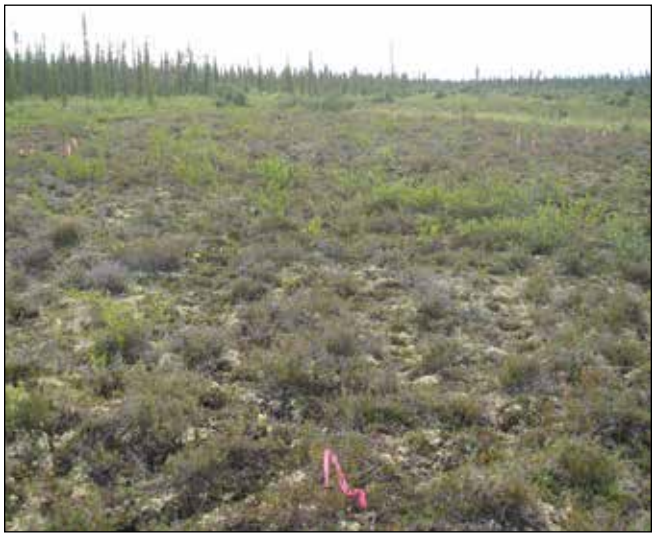
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

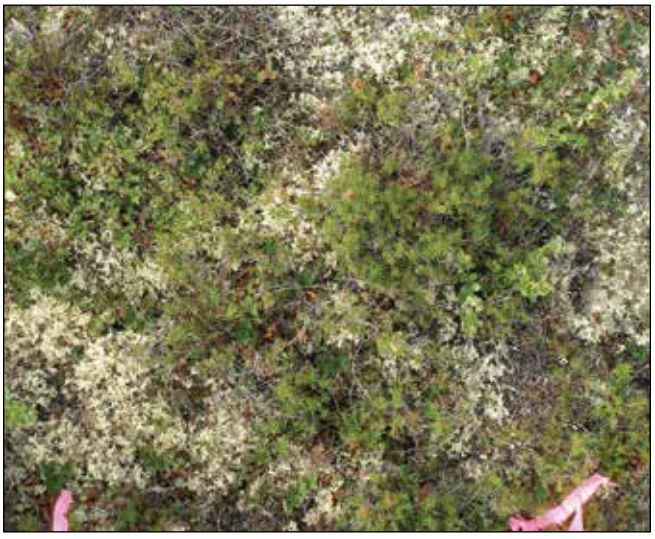
[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.





Plot photographs illustrating the stand structure and understory composition for plot IN 01 PP.

Plot: IN 02 UD

Measurement date: 23-Jul-07

Latitude: 68° 11′ 48.7″N

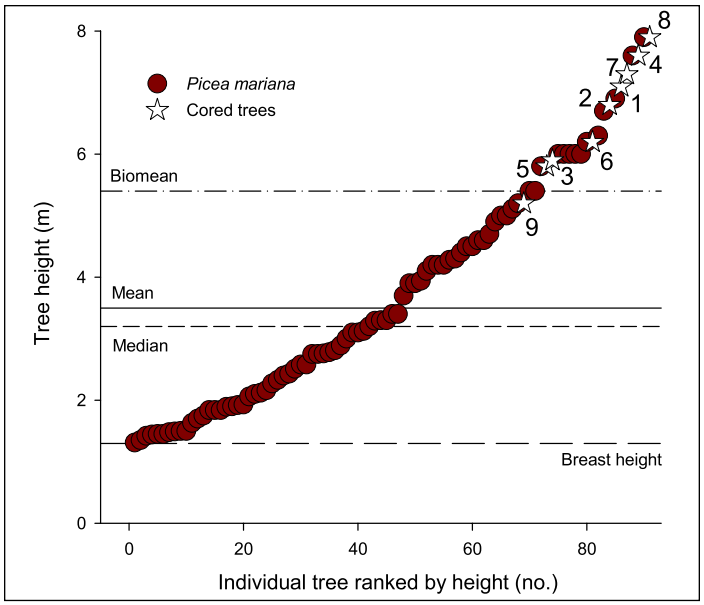
Longitude: 133° 23′ 26.1″W

Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	149
Small trees	a b c d	400	56
Large trees	a b c d	400	26

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

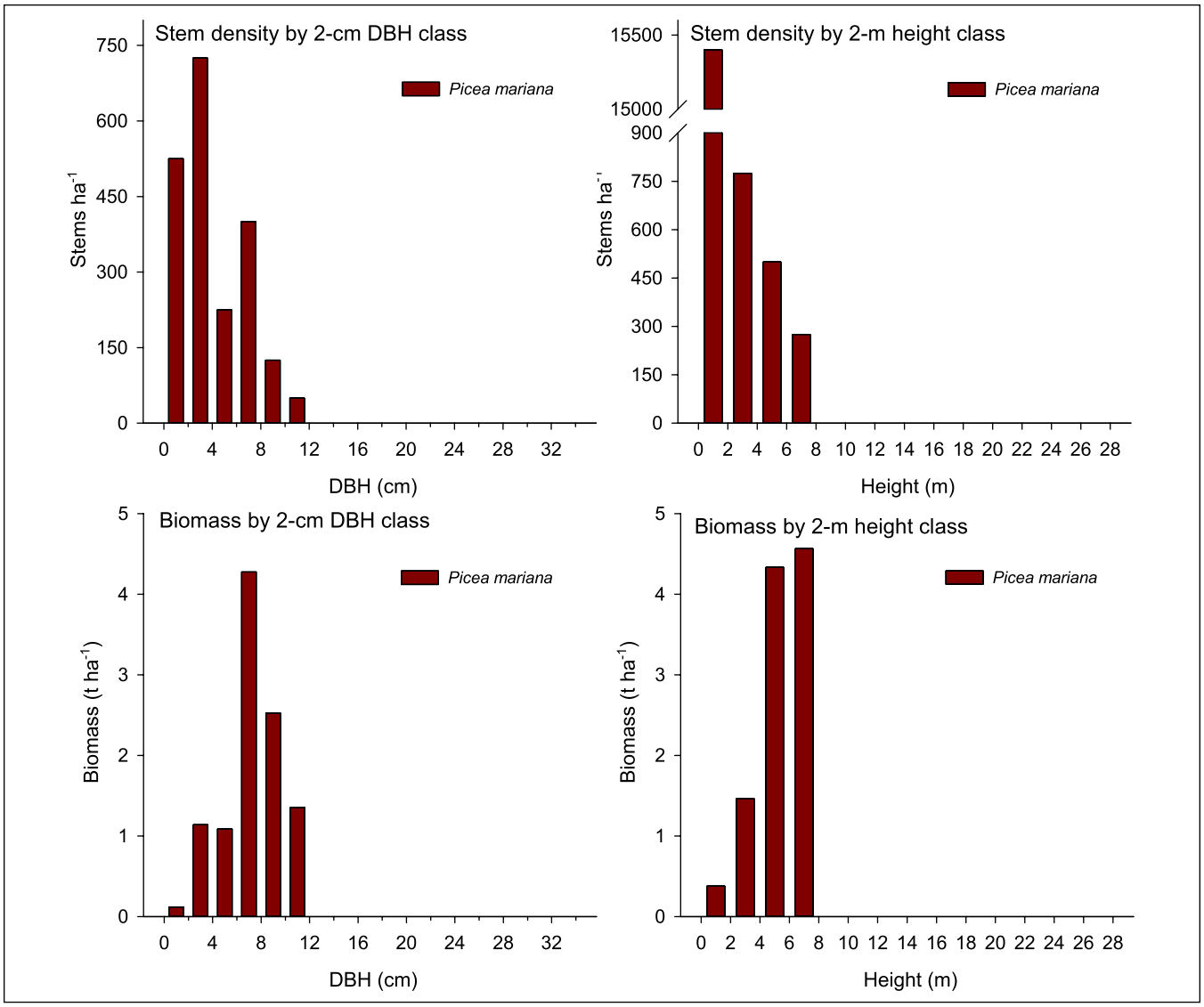
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	3.53	3.53
Stem density (stems ha^{-1})	16950	16950
Height ≥ 1.3 m	2050	2050
Height < 1.3 m	14900	14900
Mean tree height (m)	3.5	3.5
Median tree height (m)	3.2	3.2
Biomass-weighted tree height (m)	5.4	5.4
Biomass (t ha^{-1})	10.7	10.7

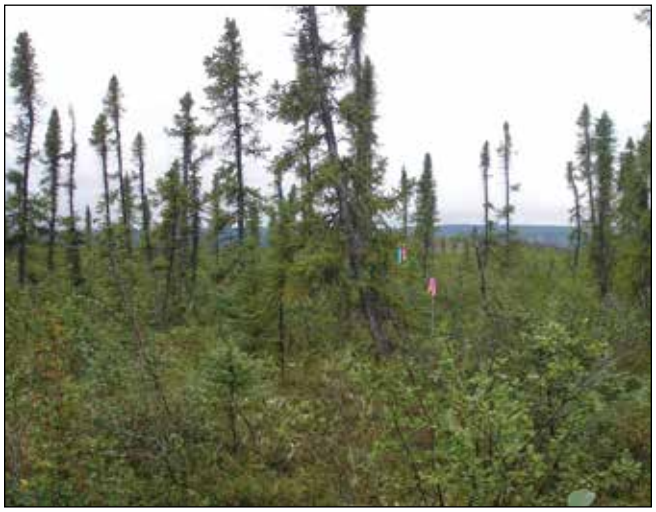
[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	10.3	7.1	112
2	Picemar	8.1	6.8	61
3	Picemar	8.4	5.9	117
4	Picemar	10.9	7.6	135
5	Picemar	9.5	5.8	100
6	Picemar	9.8	6.2	68
7	Picemar	8.7	7.3	103
8	Picemar	10.3	7.9	91
9	Picemar	6.5	5.2	47

[a]Species: Picemar = *Picea mariana*.





Plot IN 02 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

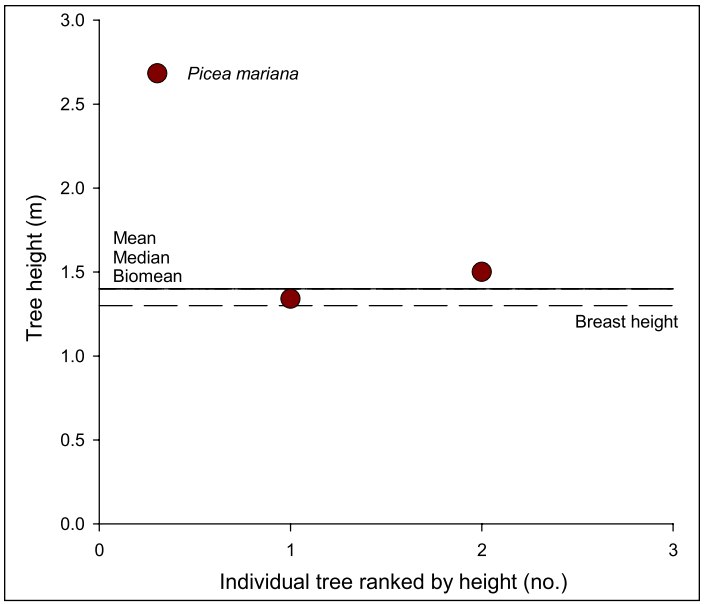
Plot: IN 02 PP

Measurement date: 21-Jul-07
Latitude: 68° 11′ 46.5″N
Longitude: 133° 23′ 14.1″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	6
Small trees	a b c d	400	2
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

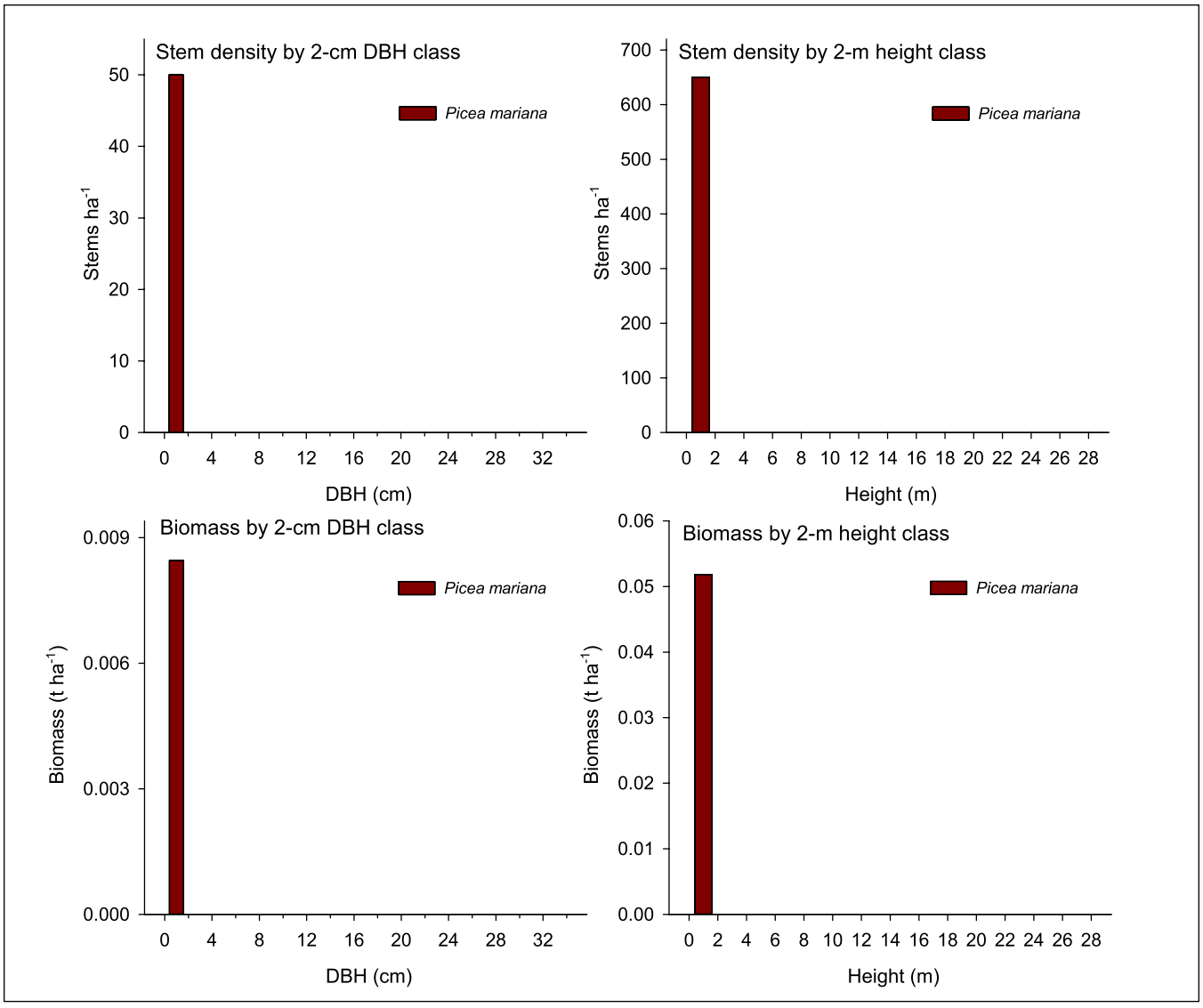
Stand values

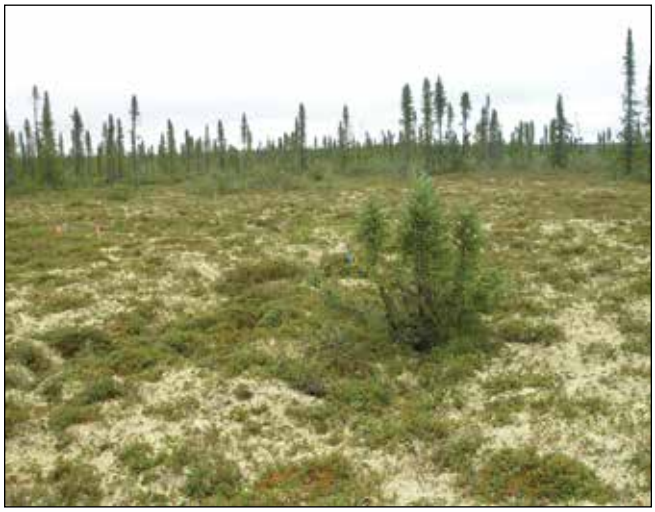
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	650	650
Height ≥ 1.3 m	50	50
Height < 1.3 m	600	600
Mean tree height (m)	1.4	1.4
Median tree height (m)	1.4	1.4
Biomass-weighted tree height (m)	1.4	1.4
Biomass (t ha^{-1})	0.1	0.1

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				





Plot IN 02 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: IN 03 UD

Measurement date: 25-Jul-07

Latitude: 67° 55′ 24.7″N

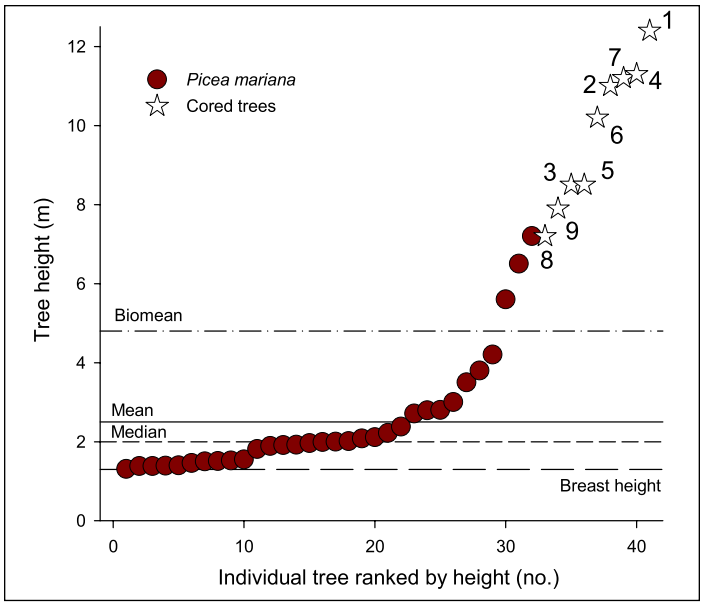
Longitude: 133° 30′ 30.4″W

Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m²)	Sample size
Very small trees	d	100	1
Small trees	d	100	28
Large trees	a b c d	400	47

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

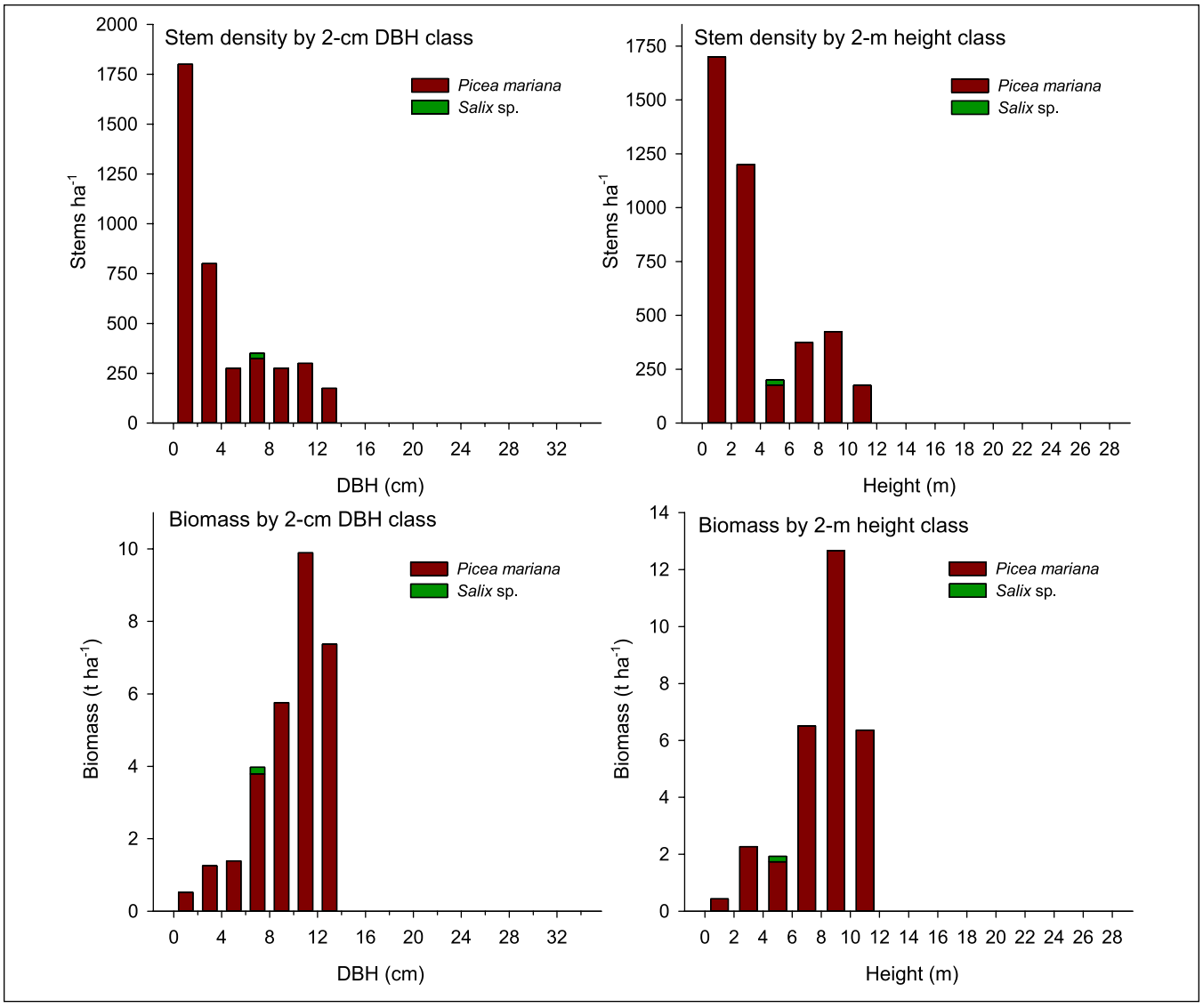
Parameter	Picemar[a]	Salix[b]	Total
Basal area (m^2 ha^{-1})	9.32	0.10	9.43
Stem density (stems ha^{-1})	4050	25	4075
Height ≥ 1.3 m	3950	25	3975
Height < 1.3 m	100	0	100
Mean tree height (m)	2.5	NA[c]	2.5
Median tree height (m)	2.0	NA	2.0
Biomass-weighted tree height (m)	4.8	NA	4.8
Biomass (t ha^{-1})	30.0	0.2	30.2

[a]Picemar = *Picea mariana*; [b]Salix = *Salix* sp.; [c]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	13.3	12.4	125
2	Picemar	14.1	11.0	125
3	Picemar	12.7	8.5	98
4	Picemar	14.0	11.3	118
5	Picemar	12.0	8.5	113
6	Picemar	12.0	10.2	99
7	Picemar	16.5	11.2	125
8	Picemar	9.6	7.2	111
9	Picemar	8.7	7.9	70

[a]Species: Picemar = *Picea mariana*.



Plot IN 03 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: IN 03 PP

Measurement date: 24-Jul-07
Latitude: 67° 55′ 25.3″N
Longitude: 133° 30′ 54.5″W
Plant community type (Subarctic): f2.1 black spruce -northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	0
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

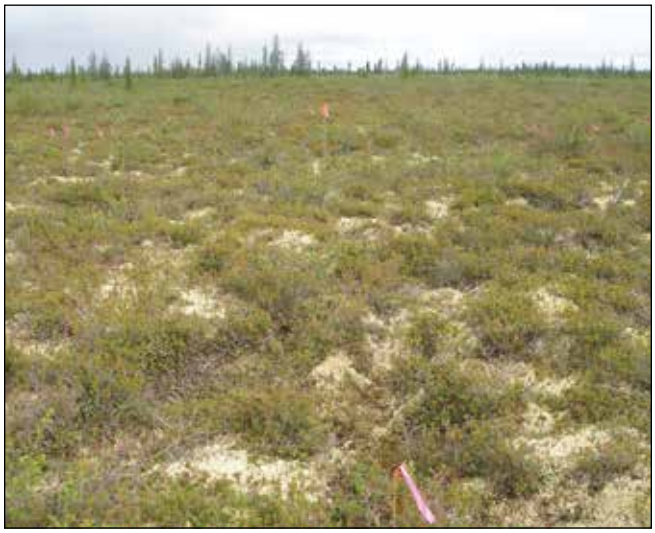
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

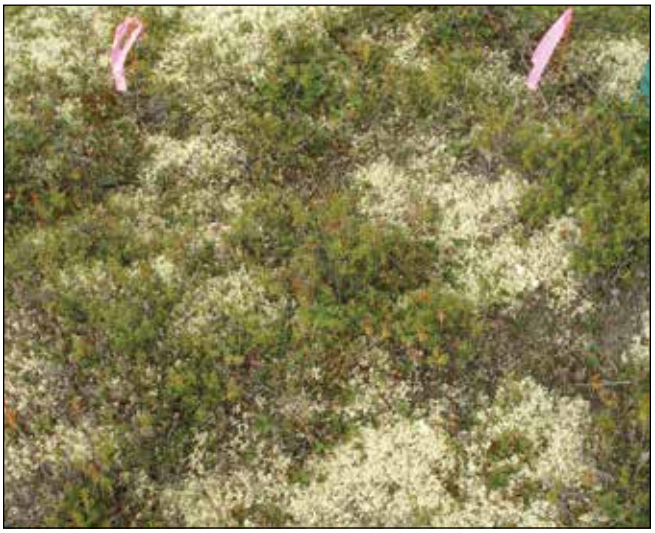
[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.





Plot photographs illustrating the stand structure and understory composition for plot IN 03 PP.

Plot: IN 04 UD

Measurement date: 29-Jul-07

Latitude: 67° 48′ 35.2″N

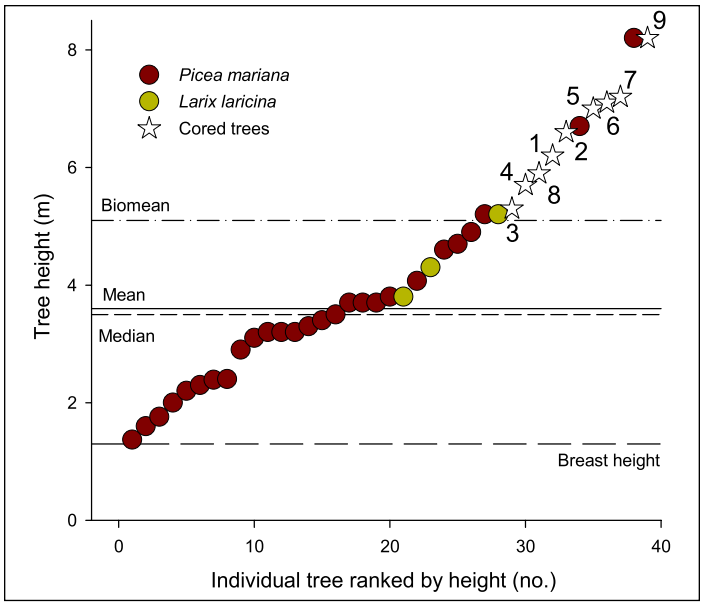
Longitude: 133° 45′ 15.4″W

Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	145
Small trees	d	100	19
Large trees	a b c d	400	40

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

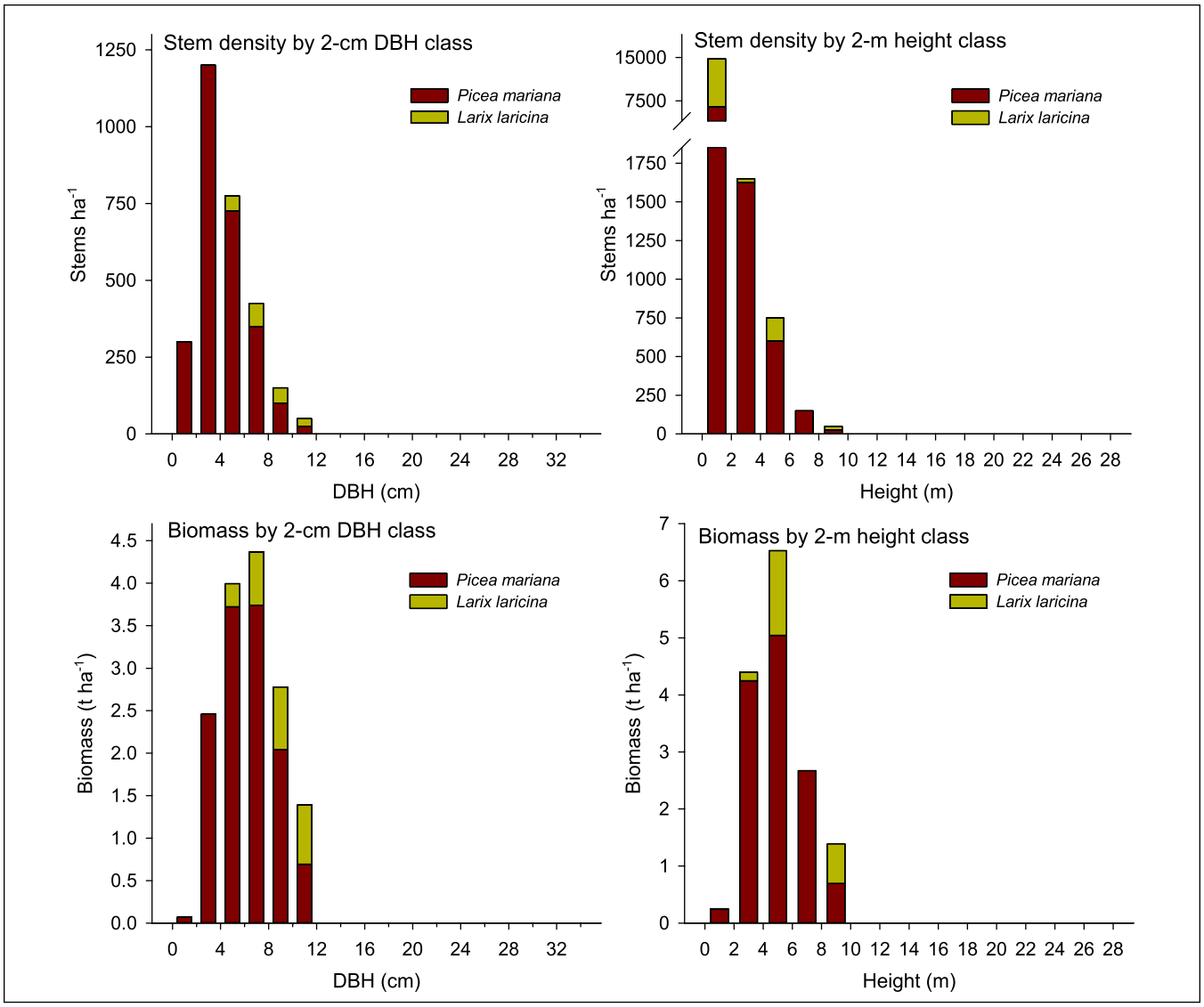
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	4.34	0.88	5.22
Stem density (stems ha^{-1})	8900	8500	17400
Height ≥ 1.3 m	2700	200	2900
Height < 1.3 m	6200	8300	14500
Mean tree height (m)	3.5	4.4	3.6
Median tree height (m)	3.3	4.3	3.5
Biomass-weighted tree height (m)	5.2	4.5	5.1
Biomass (t ha^{-1})	12.9	2.3	15.2

[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	6.9	6.2	79
2	Picemar	8.3	6.6	72
3	Picemar	8.0	5.3	64
4	Picemar	6.1	5.7	56
5	Larilar	8.6	7.0	81
6	Picemar	9.7	7.1	90
7	Picemar	12.2	7.2	131
8	Picemar	6.5	5.9	75
9	Larilar	14.0	8.2	109

[a]Species: Picemar = *Picea mariana;* Larilar = *Larix laricina*.



Plot IN 04 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: IN 04 PP

Measurement date: 28-Jul-07

Latitude: 67° 48′ 41.5″N

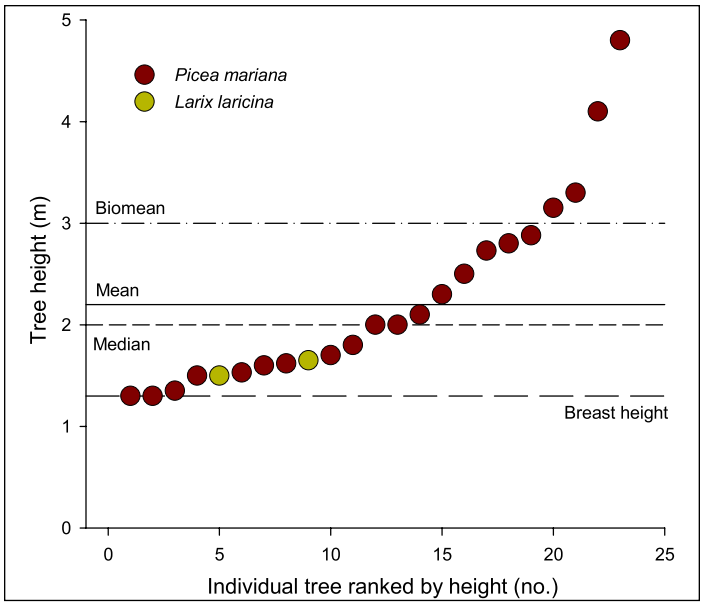
Longitude: 133° 45′ 43.2″W

Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	c	100	208
Small trees	c	100	22
Large trees	c	100	1

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

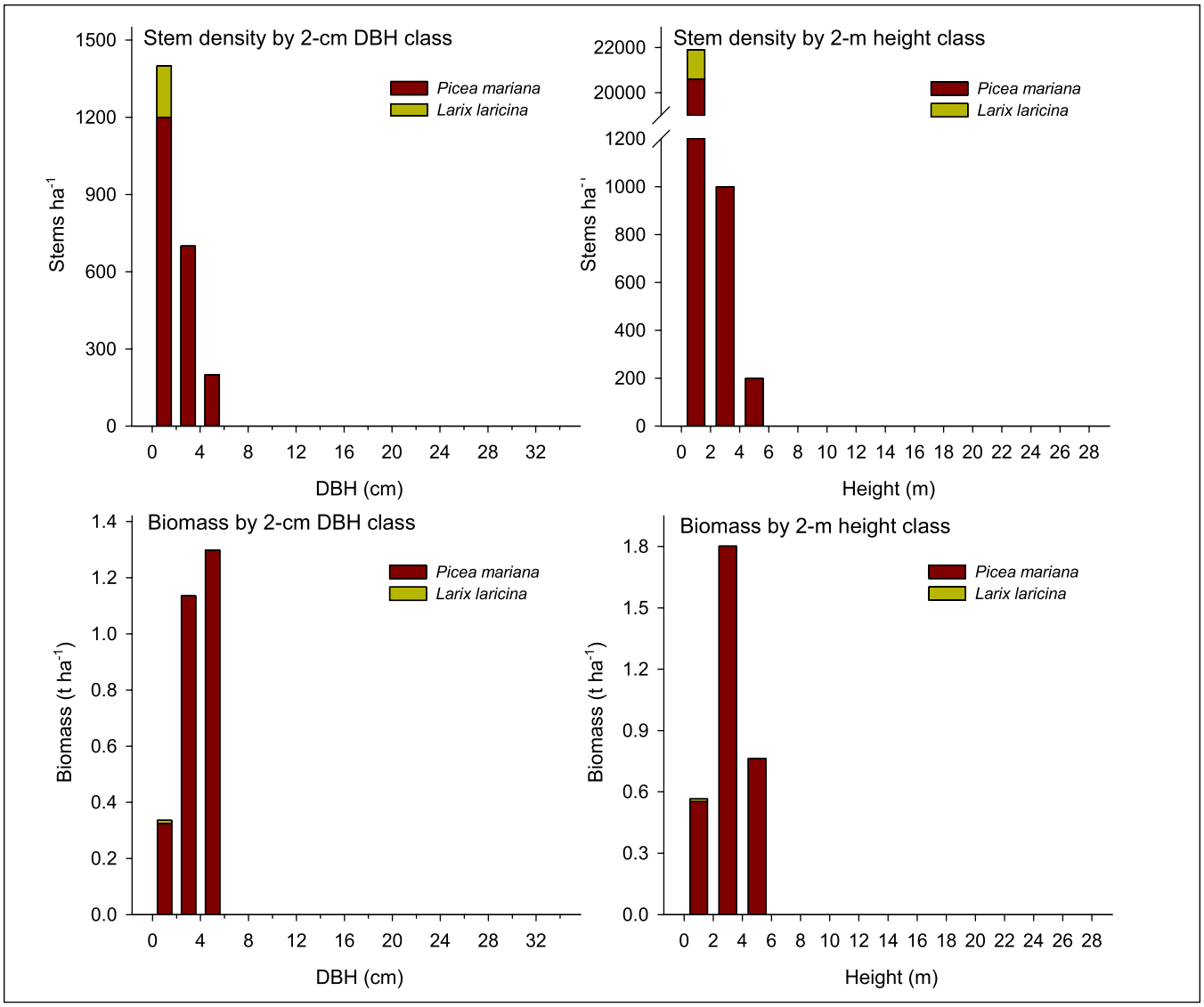
Stand values

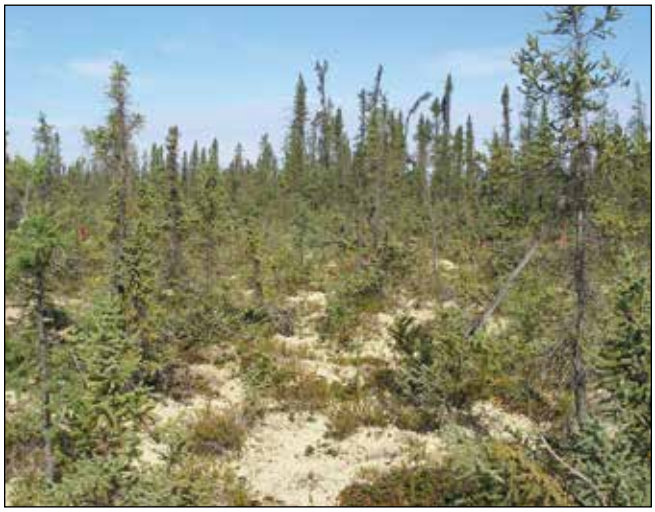
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	0.93	0.00	0.93
Stem density (stems ha^{-1})	21800	1300	23100
Height ≥ 1.3 m	2100	200	2300
Height < 1.3 m	19700	1100	20800
Mean tree height (m)	2.3	1.6	2.2
Median tree height (m)	2.0	1.6	2.0
Biomass-weighted tree height (m)	3.0	1.6	3.0
Biomass (t ha^{-1})	3.1	0.0	3.1

[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina*.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				





Plot IN 04 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

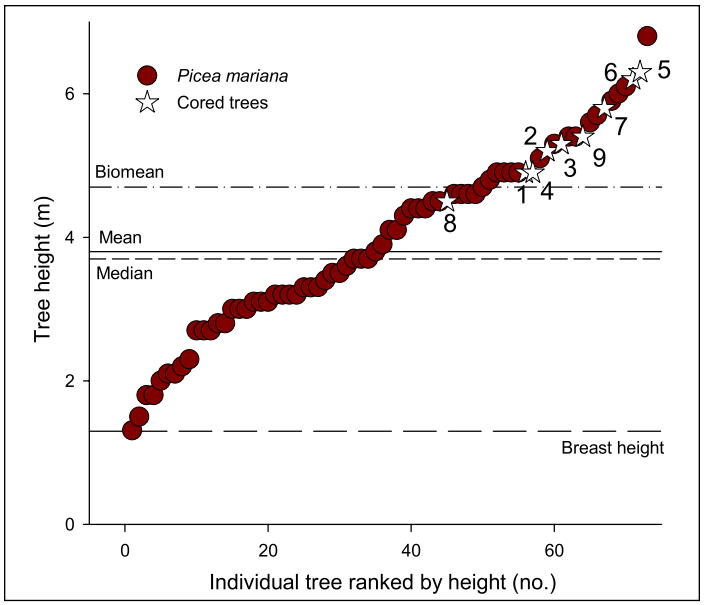
Plot: IN 05 UD

Measurement date: 07-Sep-08
Latitude: 67° 57′ 38.6″N
Longitude: 133° 27′ 59.7″W
Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	111
Small trees	b c	200	34
Large trees	b c	200	30

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

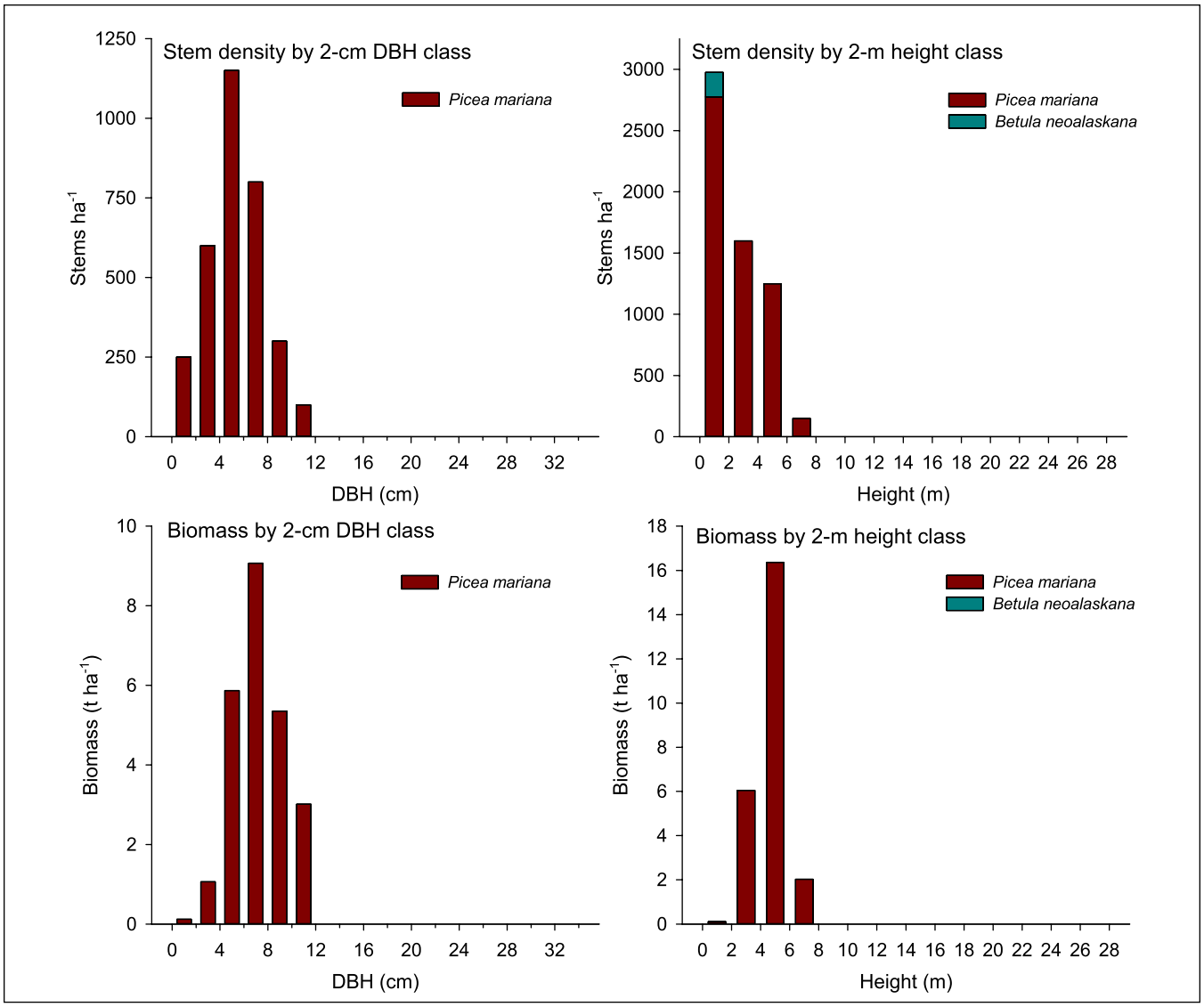
Parameter	Picemar[a]	Betuneo[b]	Total
Basal area (m^2 ha^{-1})	8.01	0.00	8.01
Stem density (stems ha^{-1})	5775	200	5975
Height ≥ 1.3 m	3200	0	3200
Height < 1.3 m	2575	200	2775
Mean tree height (m)	3.8	NA[c]	3.8
Median tree height (m)	3.7	NA	3.7
Biomass-weighted tree height (m)	4.7	NA	4.7
Biomass (t ha^{-1})	24.5	0.0	24.5

[a]Picemar = *Picea mariana*; [b]Betuneo = *Betula neoalaskana;* [c]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	6.6	4.9	70
2	Picemar	6.3	5.2	56
3	Picemar	7.9	5.3	57
4	Picemar	7.9	4.9	72
5	Picemar	10.3	6.3	58
6	Picemar	8.6	6.2	68
7	Picemar	7.8	5.8	79
8	Picemar	6.5	4.5	60
9	Picemar	7.6	5.4	70

[a]Species: Picemar = *Picea mariana.*



Plot IN 05 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: IN 05 PP

Measurement date: 30-Jul-07
Latitude: 67° 57′ 42.6″N
Longitude: 133° 28′ 27.1″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	0
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

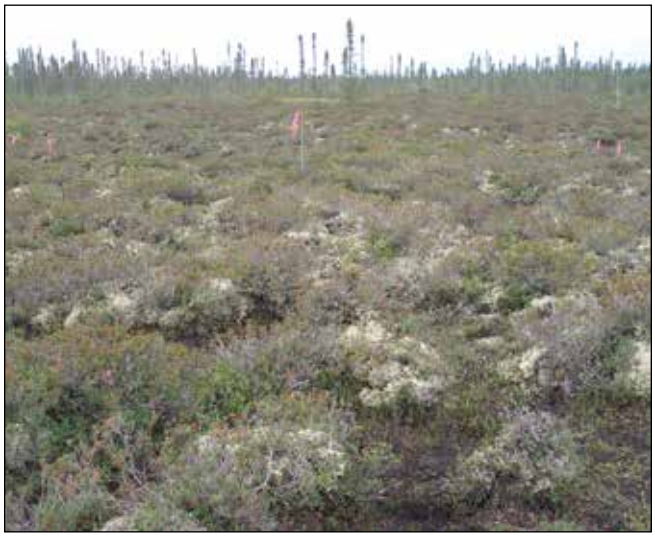
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.



Plot photographs illustrating the stand structure and understory composition for plot IN 05 PP.

NORMAN WELLS AREA SITES

Plot: NW IPY UD

Measurement date: 27-Jul-07

Latitude: 65° 12′ 34.6″N

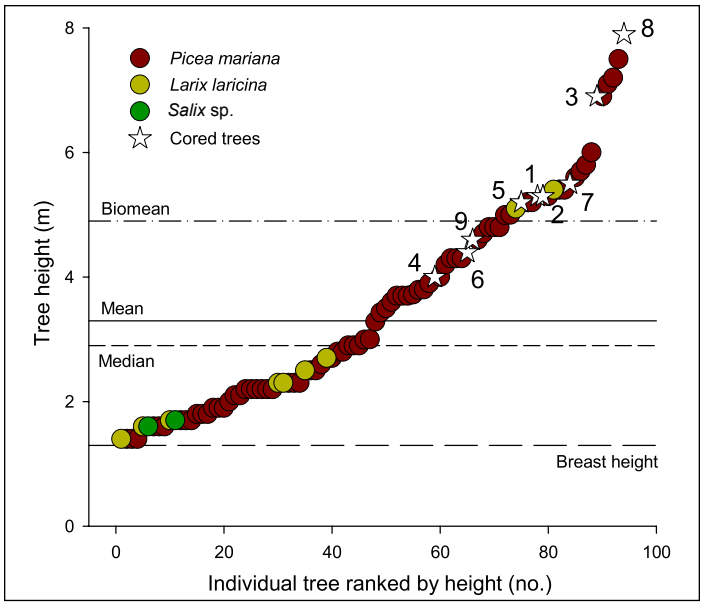
Longitude: 127° 01′ 01.2″W

Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/peat moss

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	100	73
Small trees	1 2 3 4	100	61
Large trees	1 2 3 4	100	24

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

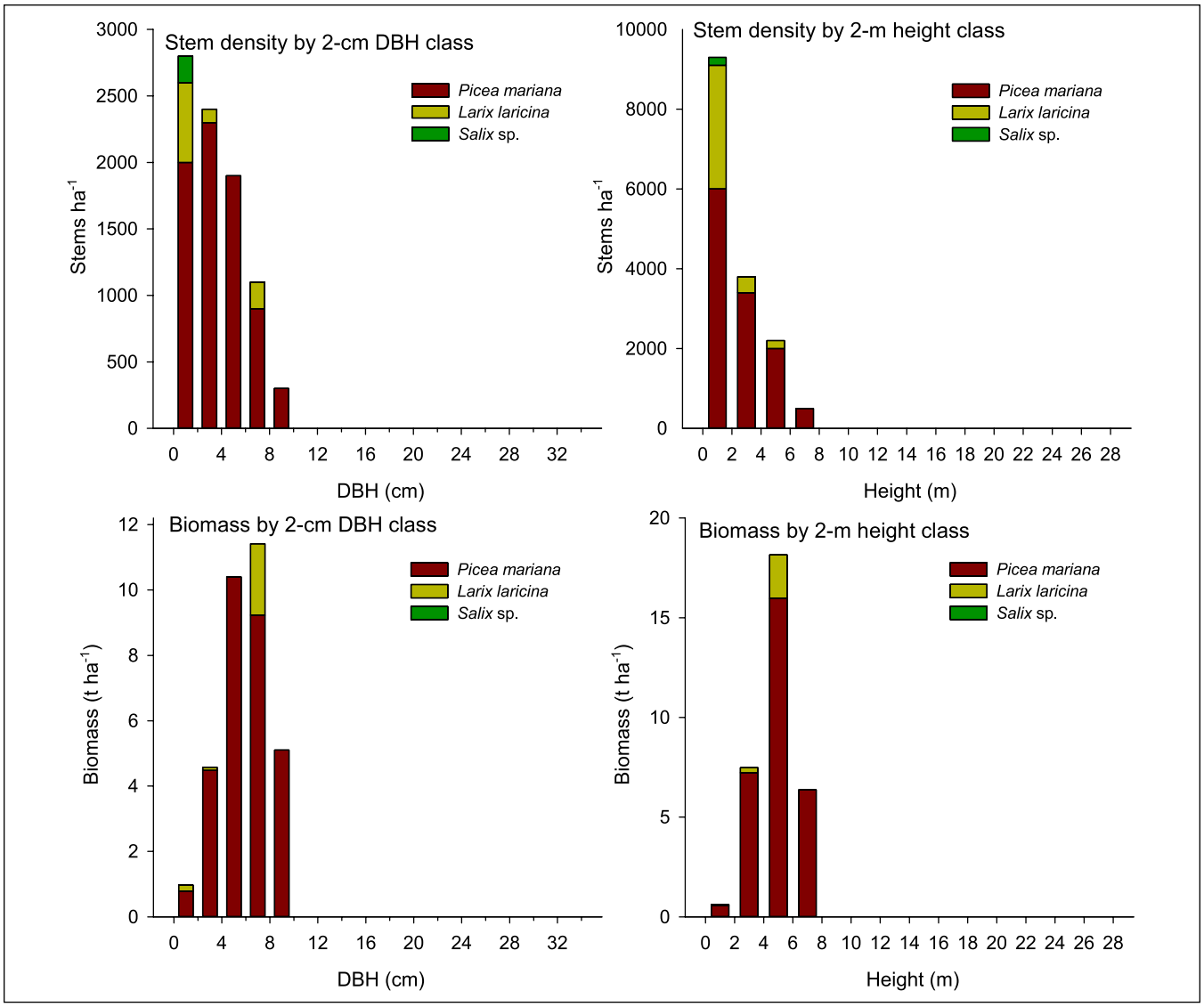
Parameter	Picemar[a]	Larilar[b]	Salix[c]	Total
Basal area (m^2 ha^{-1})	10.40	0.99	0.00	11.40
Stem density (stems ha^{-1})	11900	3700	200	15800
Height ≥ 1.3 m	7400	900	200	8500
Height < 1.3 m	4500	2800	0	7300
Mean tree height (m)	3.5	2.8	1.7	3.3
Median tree height (m)	3.0	2.3	1.7	2.9
Biomass-weighted tree height (m)	5.0	4.9	1.7	4.9
Biomass (t ha^{-1})	30.1	2.5	0.0	32.6

[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina;* [c]Salix = *Salix* sp.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	7.2	5.3	130
2	Picemar	7.5	5.3	125
3	Picemar	9.0	6.9	134
4	Picemar	5.1	4.0	124
5	Picemar	6.3	5.2	123
6	Picemar	4.8	4.4	125
7	Picemar	5.2	5.5	130
8	Picemar	8.9	7.9	115
9	Picemar	5.3	4.6	61

[a]Species: Picemar = *Picea mariana.*



Plot NW IPY UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: NW IPY PP

Measurement date: 27-Jul-07
Latitude: 65° 12′ 36.3″N
Longitude: 127° 00′ 52.0″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	100	0
Small trees	1 2 3 4	100	0
Large trees	1 2 3 4	100	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.

Stand values

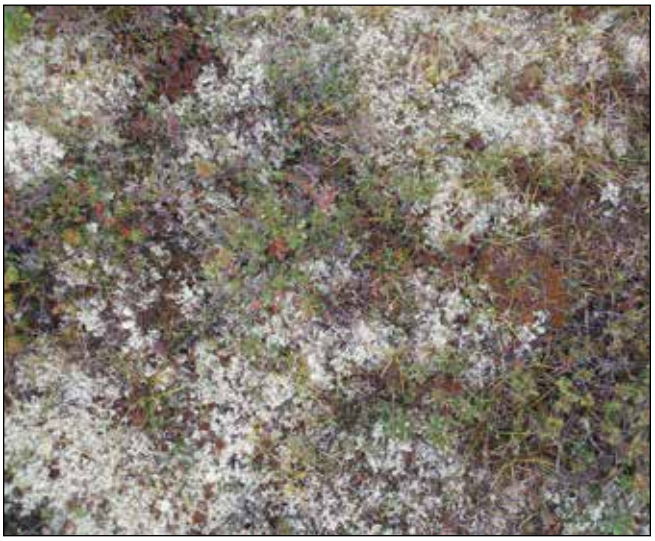
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.



Plot photographs illustrating the stand structure and understory composition for plot NW IPY PP.

Plot: NW IPY CS

Measurement date: 27-Jul-07
Latitude: 65° 12′ 36.5″N
Longitude: 127° 00′ 50.1″W
Plant community type (Subarctic): g2.1 northern Labrador tea-dwarf birch/sedge/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	129	0
Small trees	a b c d	129	0
Large trees	a b c d	129	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Irregular plot shape, follows collapse scar boundary.

Stand values

Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.

Plot photographs illustrating the stand structure and understory composition for plot NW IPY CS.

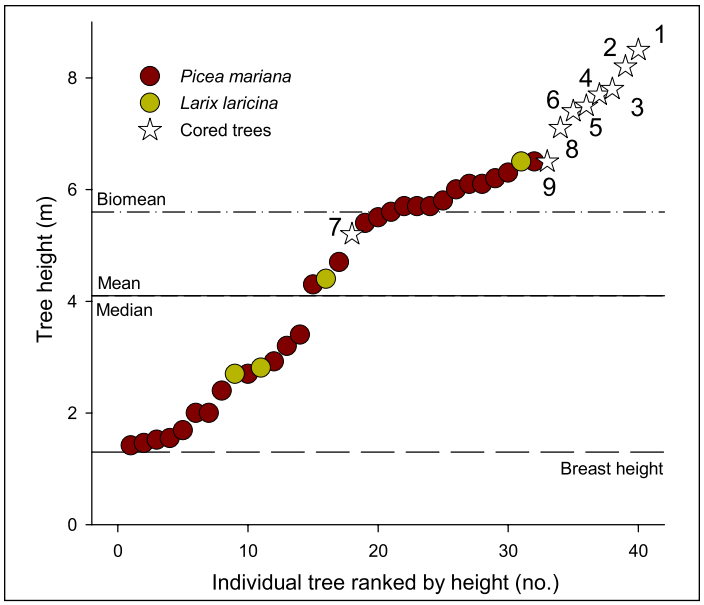
Plot: NW 01 UD

Measurement date: 10-Aug-07
Latitude: 66° 05′ 33.0″N
Longitude: 128° 20′ 12.5″W
Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	57
Small trees	b	100	15
Large trees	a b c d	400	50

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

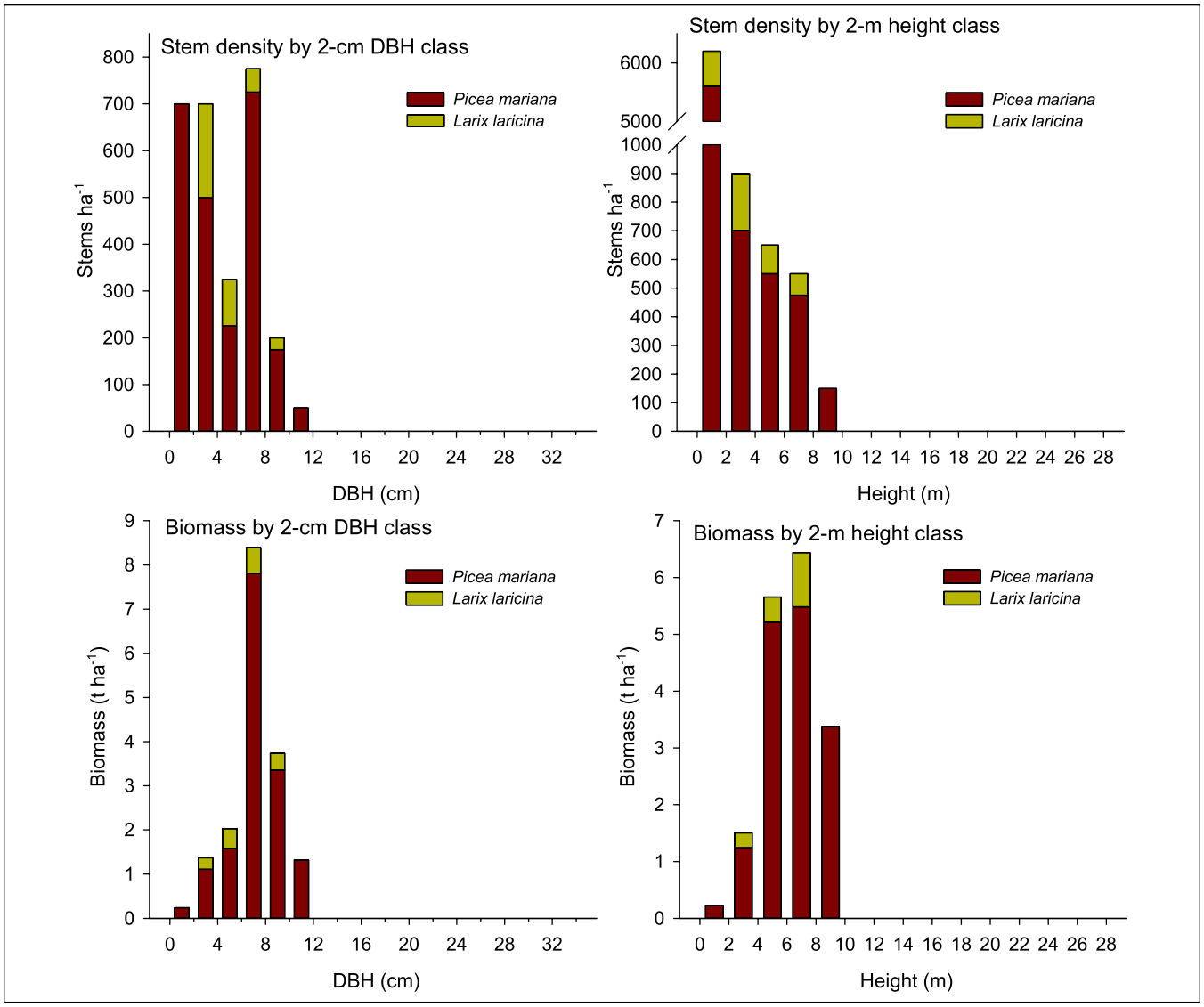
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	5.16	0.66	5.83
Stem density (stems ha^{-1})	7475	975	8450
Height ≥ 1.3 m	2375	375	2750
Height < 1.3 m	5100	600	5700
Mean tree height (m)	4.1	4.1	4.1
Median tree height (m)	4.7	3.6	4.1
Biomass-weighted tree height (m)	5.6	5.5	5.6
Biomass (t ha^{-1})	15.5	1.7	17.2

[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	8.8	8.5	124
2	Picemar	10.1	8.2	116
3	Picemar	9.7	7.8	116
4	Picemar	7.9	7.7	119
5	Picemar	8.1	7.5	115
6	Picemar	8.8	7.4	101
7	Picemar	5.9	5.2	73
8	Picemar	9.5	7.1	113
9	Picemar	7.8	6.5	115

[a]Species: Picemar = *Picea mariana*.



Plot NW 01 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

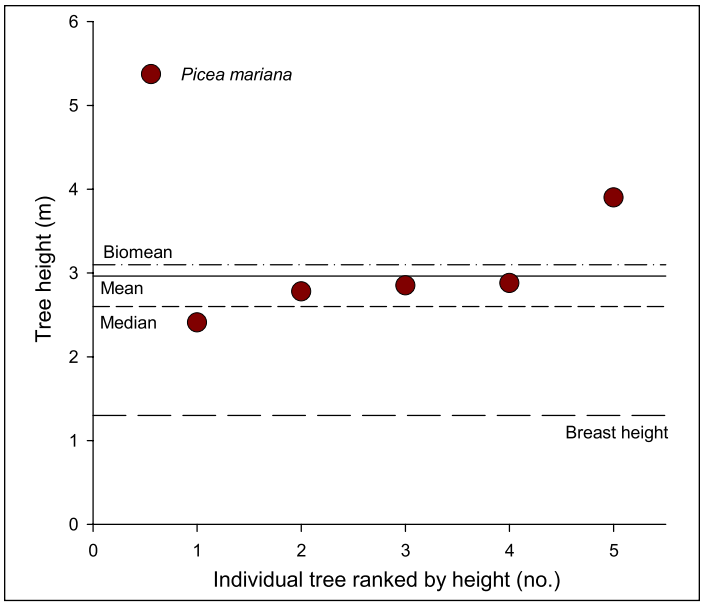
Plot: NW 01 PP

Measurement date: 11-Aug-07
Latitude: 66° 05′ 43.7″N
Longitude: 138° 20′ 39.1″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	28
Small trees	a	100	8
Large trees	a	100	1

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

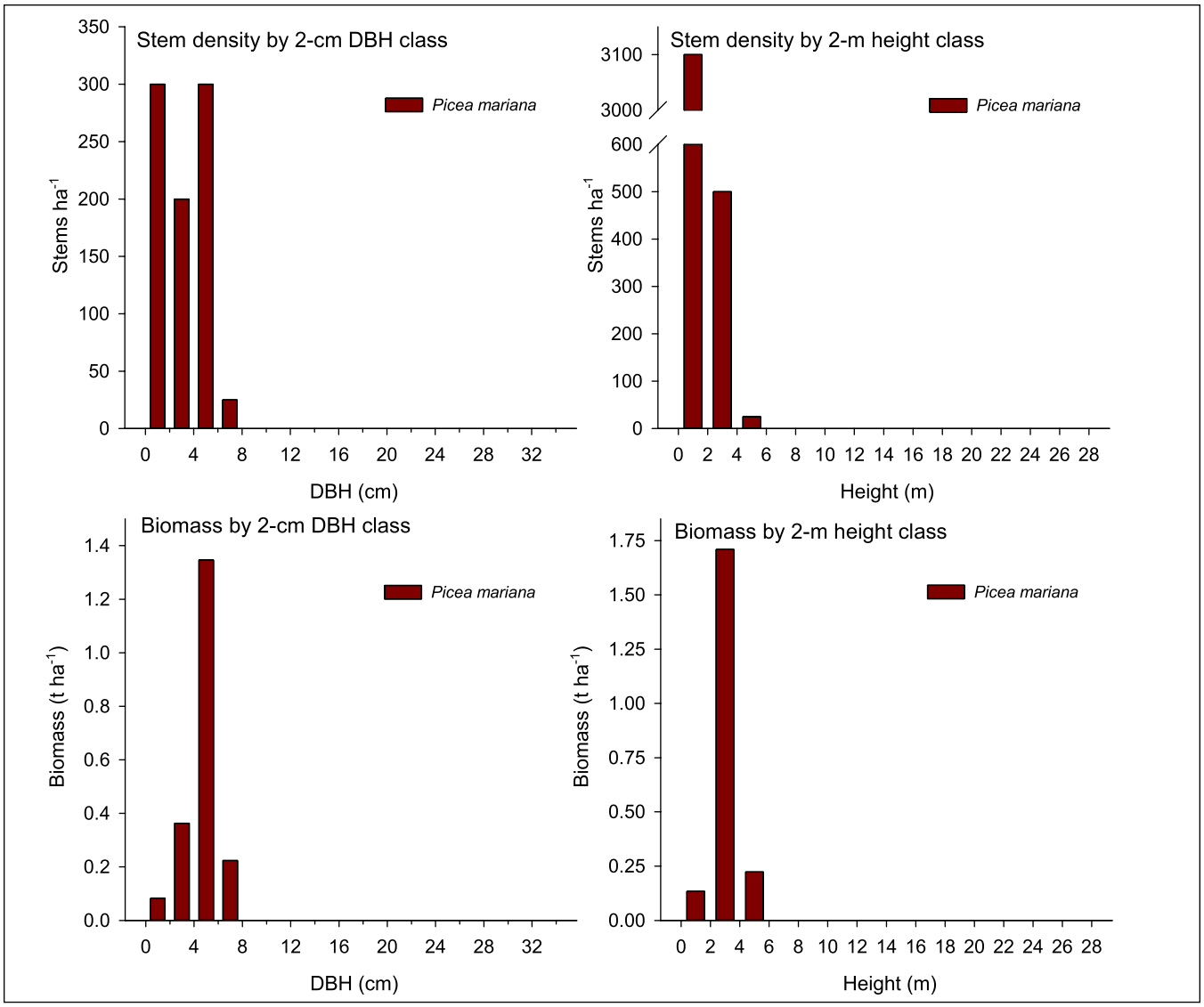
Stand values

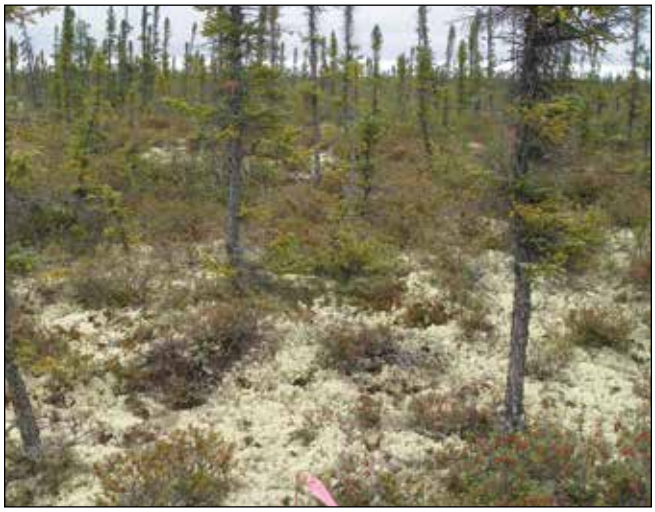
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.70	0.70
Stem density (stems ha^{-1})	3625	3625
Height ≥ 1.3 m	825	825
Height < 1.3 m	2800	2800
Mean tree height (m)	2.5	2.5
Median tree height (m)	2.6	2.6
Biomass-weighted tree height (m)	3.1	3.1
Biomass (t ha^{-1})	2.1	2.1

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				





Plot NW 01 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: NW 01 CS

Measurement date: 12-Aug-07
Latitude: 66° 05′ 46.7″N
Longitude: 128° 20′ 47.2″W
Plant community type (Subarctic): g2.1 northern Labrador tea-dwarf birch/sedge/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	0
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.

Plot photographs illustrating the stand structure and understory composition of plot NW 01 CS.

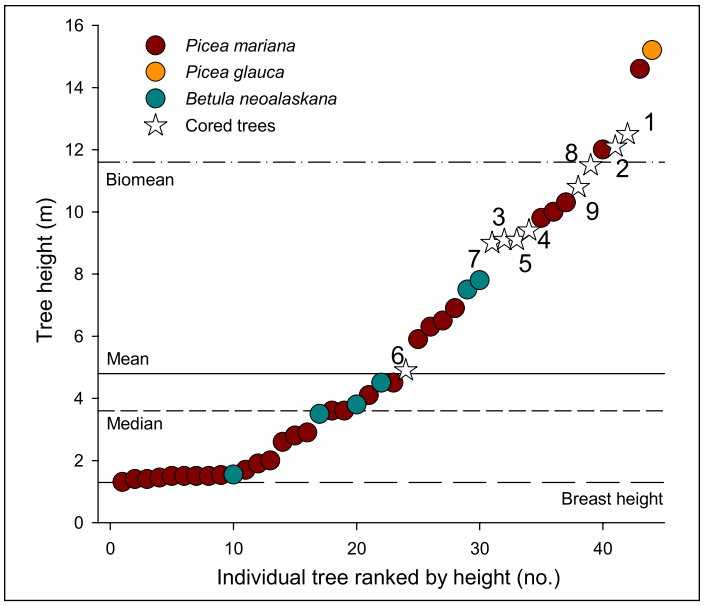
Plot: NW 02 UD

Measurement date: 14-Aug-07
Latitude: 65° 52′ 20.2″N
Longitude: 126° 40′ 45.7″W
Plant community type (Subarctic): c1.1 Pl-Sb/Labrador tea/feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	136
Small trees	a	100	23
Large trees	a b c d	400	44

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

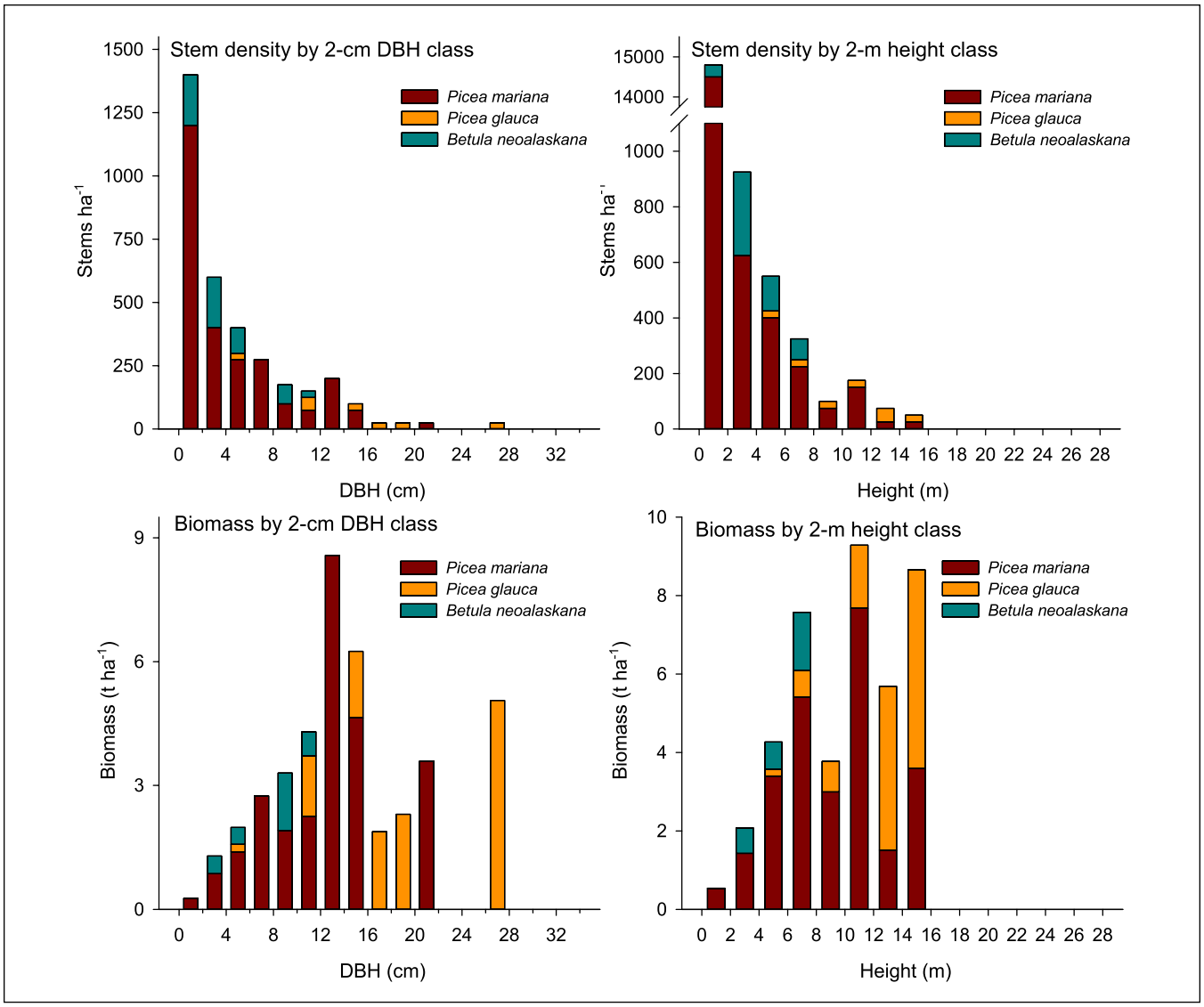
Parameter	Picemar[a]	Picegla[b]	Betuneo[c]	Total
Basal area (m^2 ha^{-1})	7.89	3.55	1.03	12.46
Stem density (stems ha^{-1})	16025	175	800	17000
Height ≥ 1.3 m	2625	175	600	3400
Height < 1.3 m	13400	0	200	13600
Mean tree height (m)	4.5	15.2	4.4	4.8
Median tree height (m)	2.9	15.2	3.8	3.6
Biomass-weighted tree height (m)	10.6	15.2	7.0	11.6
Biomass (t ha^{-1})	26.6	12.5	2.8	41.9

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Betuneo = *Betula neoalaskana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	14.9	12.5	211
2	Picemar	14.5	12.1	241
3	Picemar	11.1	9.1	95
4	Picemar	12.1	9.4	111
5	Picemar	13.2	9.1	241
6	Picemar	10.6	7.6	213
7	Picemar	9.0	9.0	222
8	Picemar	15.0	11.5	327
9	Picemar	11.7	10.8	236

[a]Species: Picemar = *Picea mariana*.



Plot NW 02 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

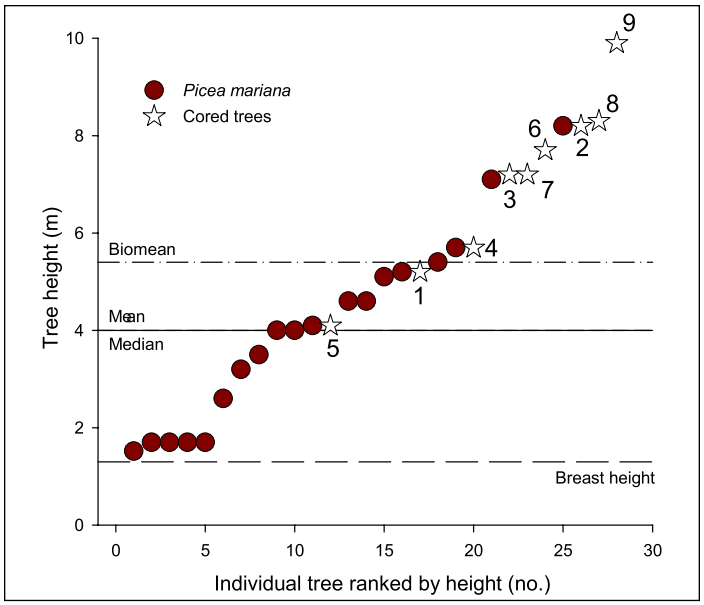
Plot: NW 02 PP

Measurement date: 13-Aug-07
Latitude: 65° 52′ 32.0″N
Longitude: 126° 40′ 42.0″W
Plant community type (Subarctic): f1.1 Sb/Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	108
Small trees	a b c d	400	9
Large trees	a b c d	400	10

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

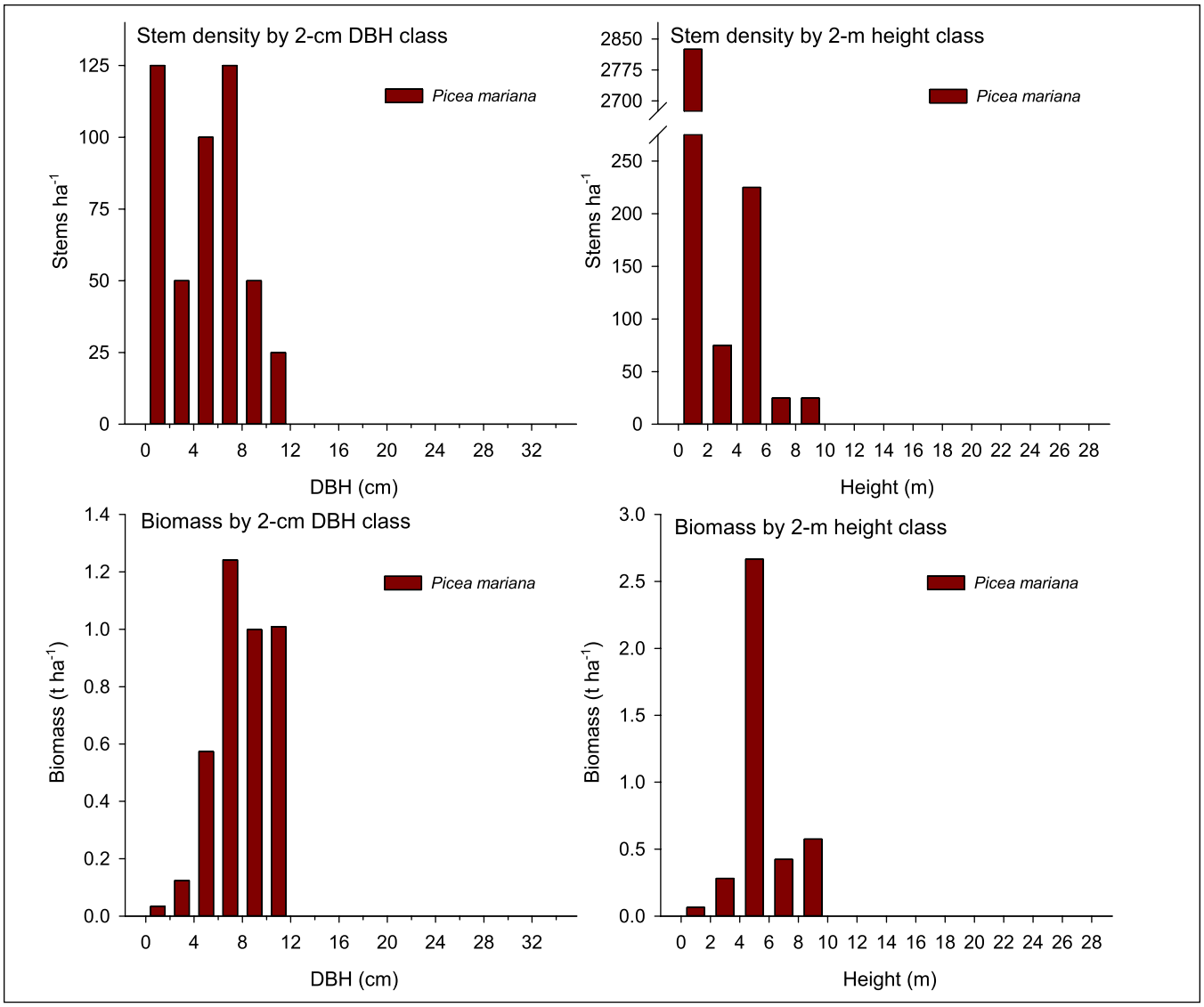
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	1.27	1.27
Stem density (stems ha^{-1})	3175	3175
Height ≥ 1.3 m	475	475
Height < 1.3 m	2700	2700
Mean tree height (m)	4.0	4.0
Median tree height (m)	4.0	4.0
Biomass-weighted tree height (m)	5.4	5.4
Biomass (t ha^{-1})	4.0	4.0

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	6.6	5.2	88
2	Picemar	11.0	8.2	119
3	Picemar	10.3	7.2	183
4	Picemar	7.5	5.7	187
5	Picemar	5.8	4.1	141
6	Picemar	9.8	7.7	199
7	Picemar	9.5	7.2	417
8	Picemar	10.3	8.3	151
9	Picemar	12.1	9.9	185

[a]Species: Picemar = *Picea mariana*.



Plot NW 02 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: NW 02 CS

Measurement date: 15-Aug-07
Latitude: 65° 52′ 30.2″N
Longitude: 126° 40′ 34.8″W
Plant community type (Subarctic): g2.1 northern Labrador tea-dwarf birch/sedge/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	300	0
Small trees	a b c d	300	0
Large trees	a b c d	300	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

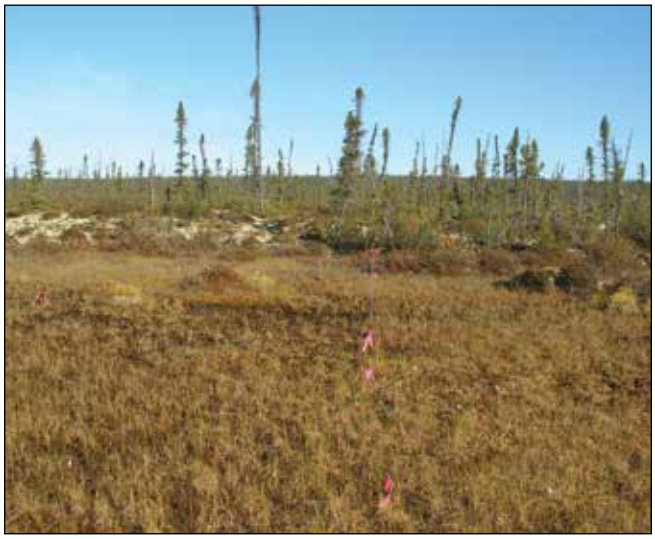
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

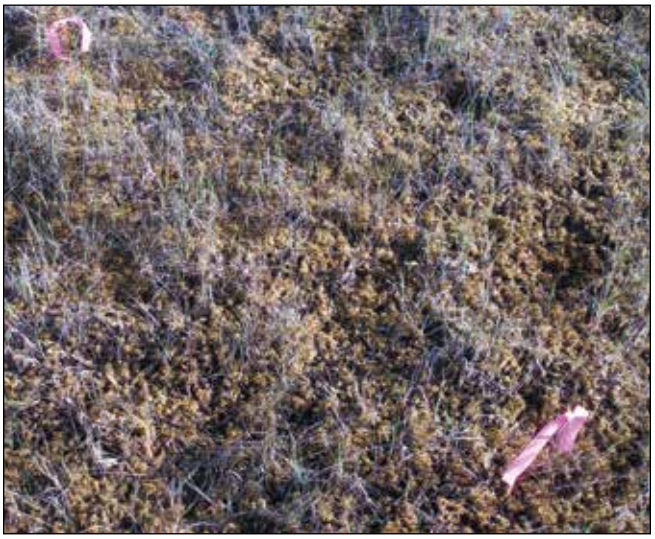
[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.





Plot photographs illustrating the stand structure and understory composition for plot NW 02 CS.

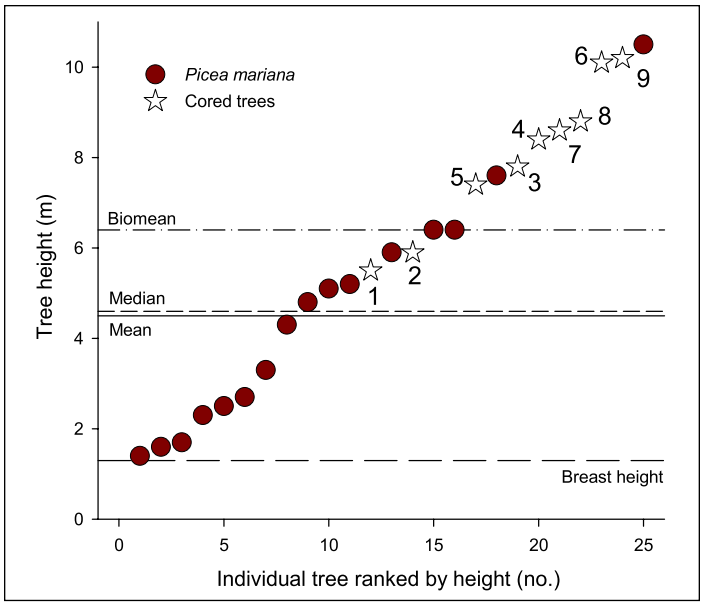
Plot: NW 03 UD

Measurement date: 16-Aug-07
Latitude: 65° 48′ 55.8″N
Longitude: 126° 44′ 52.0″W
Plant community type (Subarctic): g1.1 Sb-Lt/ Labrador tea-dwarf birch/sedge/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	149
Small trees	b	100	7
Large trees	a b c d	400	26

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

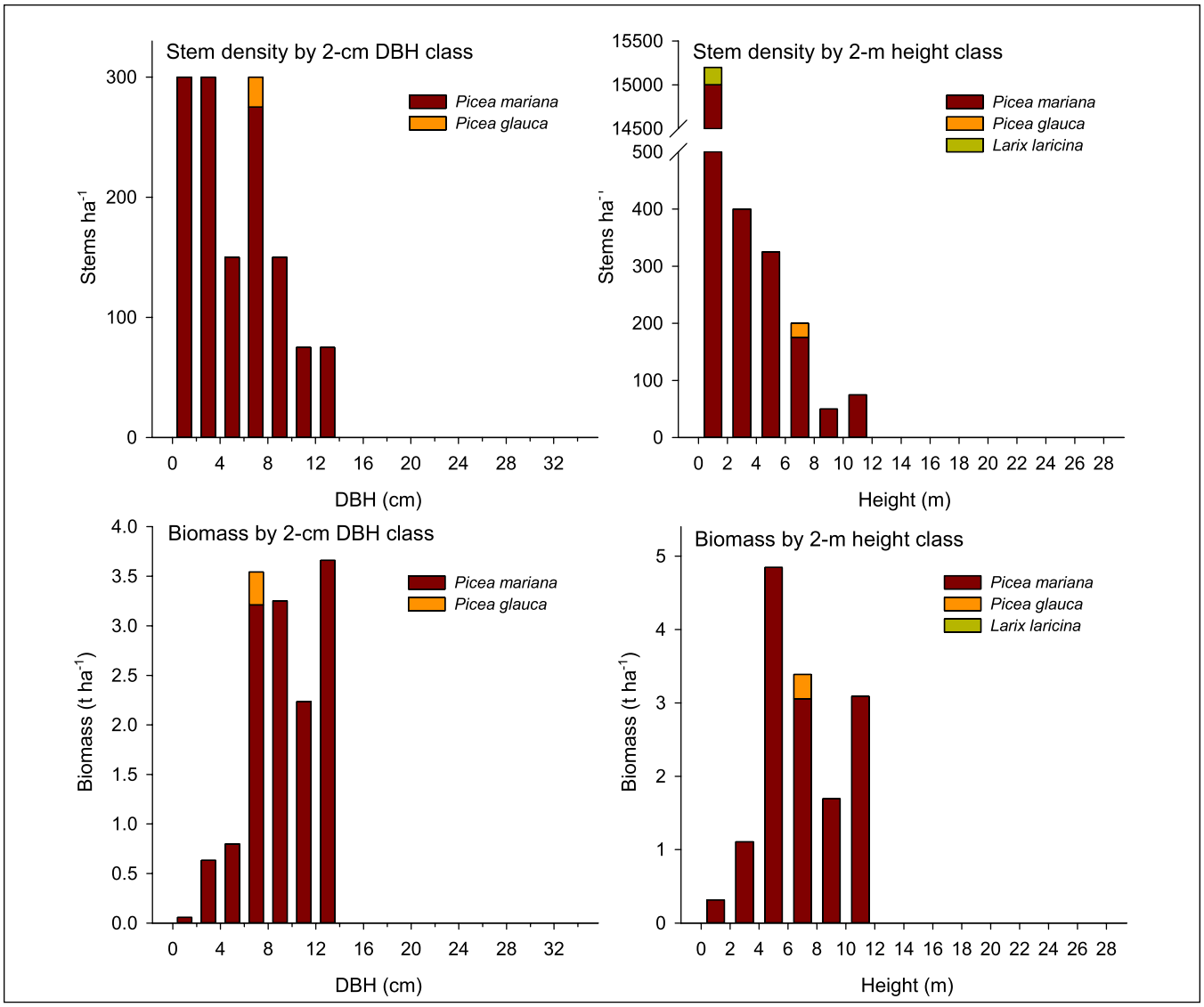
Parameter	Picemar[a]	Picegla[b]	Larilar[c]	Total
Basal area (m^2 ha^{-1})	4.32	0.12	0.00	4.44
Stem density (stems ha^{-1})	16025	25	200	16250
Height ≥ 1.3 m	1325	25	0	1350
Height < 1.3 m	14700	0	200	14900
Mean tree height (m)	4.5	NA[d]	NA	4.5
Median tree height (m)	4.6	NA	NA	4.6
Biomass-weighted tree height (m)	6.4	NA	NA	6.4
Biomass (t ha^{-1})	14.1	0.3	0.0	14.4

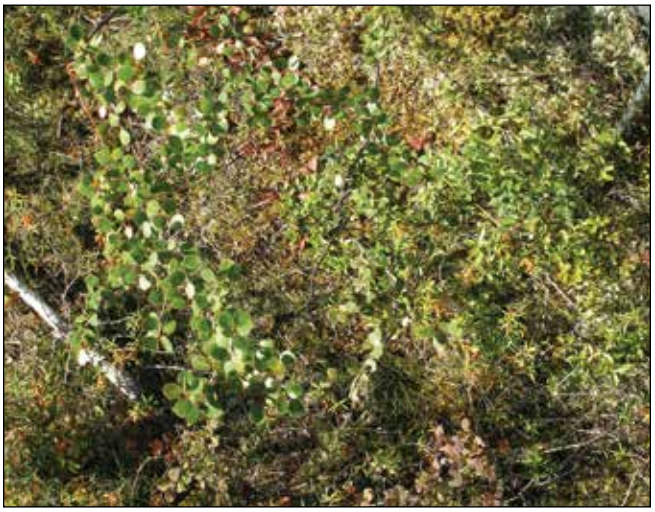
[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Larilar = *Larix Laricina*; [d]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	8.6	5.5	146
2	Picemar	8.0	5.9	61
3	Picemar	12.7	7.8	183
4	Picemar	12.2	8.4	173
5	Picemar	10.9	7.4	145
6	Picemar	14.7	10.1	152
7	Picemar	13.5	8.6	172
8	Picemar	10.6	8.8	61
9	Picemar	14.4	10.2	156

[a]Species: Picemar = *Picea mariana*.





Plot NW 03 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

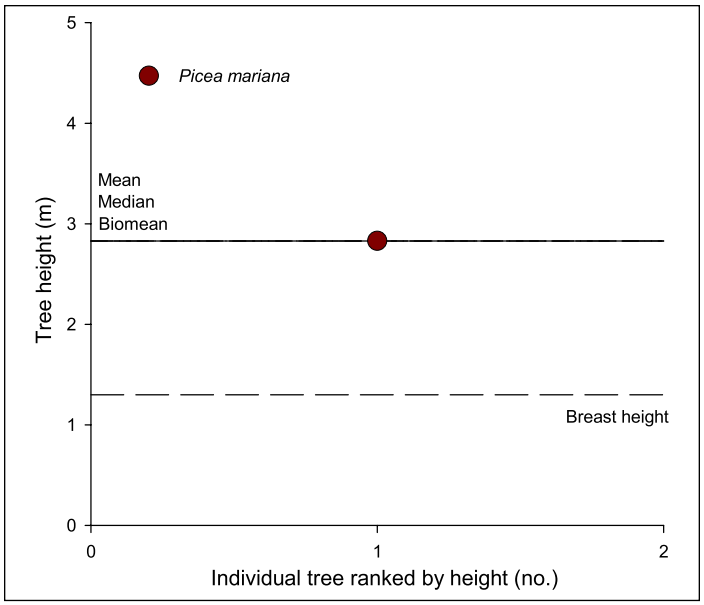
Plot: NW 03 PP

Measurement date: 17-Aug-07
Latitude: 65° 49′ 2.3″N
Longitude: 126° 45′ 8.8″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	41
Small trees	a b c d	400	1
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

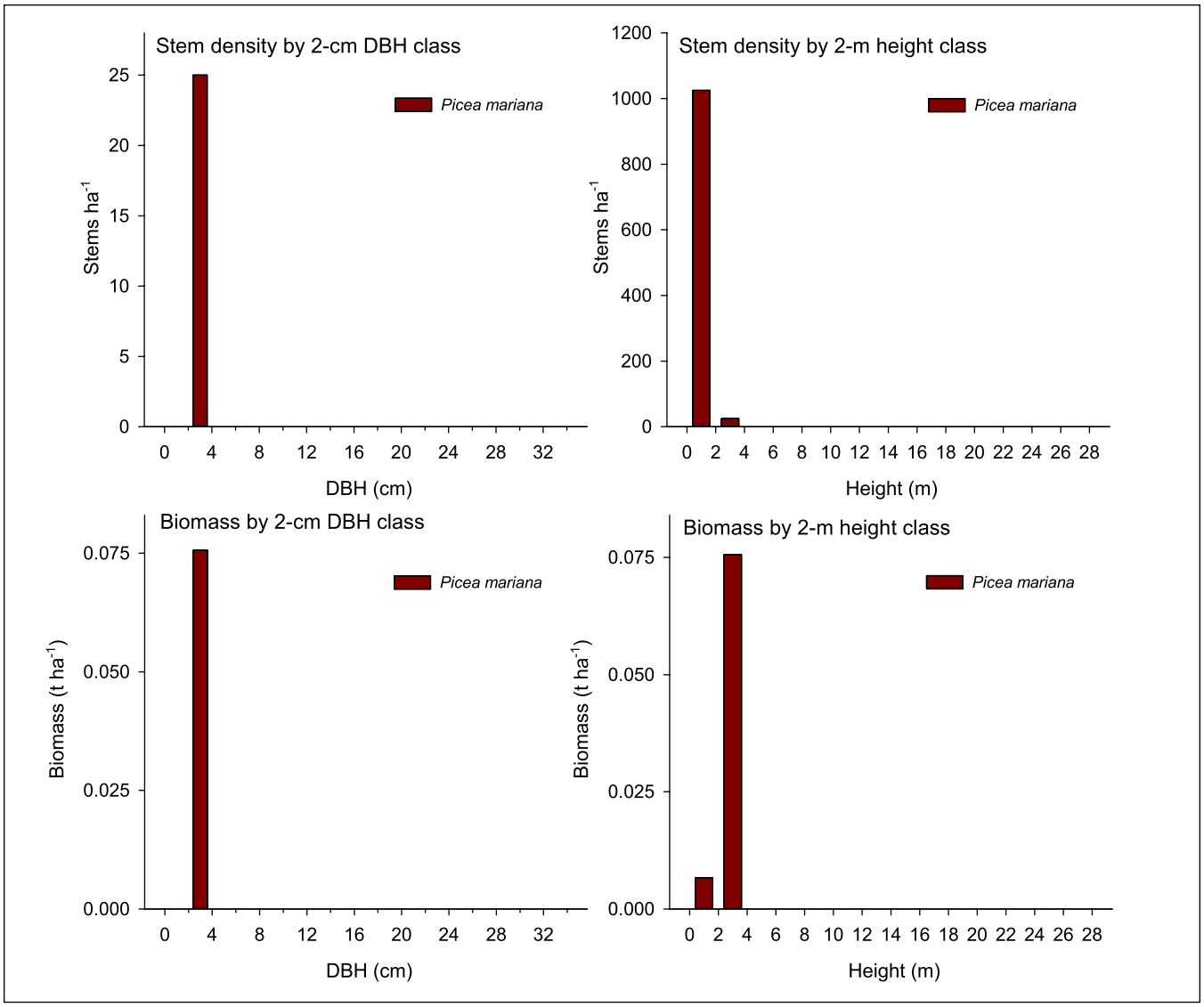
Stand values

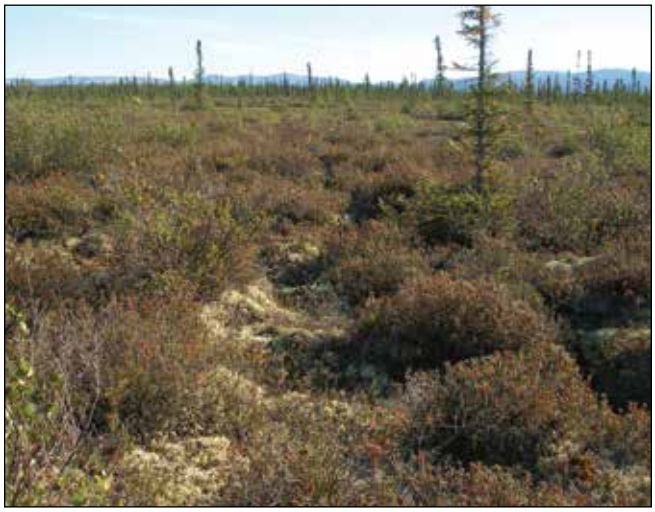
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.03	0.03
Stem density (stems ha^{-1})	1050	1050
Height ≥ 1.3 m	25	25
Height < 1.3 m	1025	1025
Mean tree height (m)	2.8	2.8
Median tree height (m)	2.8	2.8
Biomass-weighted tree height (m)	2.8	2.8
Biomass (t ha^{-1})	0.1	0.1

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				





Plot NW 03 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: NW 03 CS

Measurement date: 18-Aug-07
Latitude: 65° 49′ 2.2″N
Longitude: 126° 45′ 5.7″W
Plant community type (Subarctic): g2.1 northern Labrador tea-dwarf birch/sedge/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	0
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

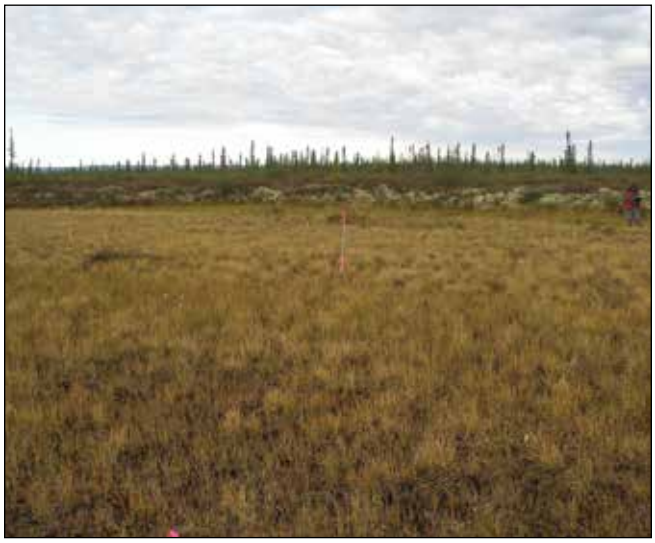
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.



Plot photographs illustrating the stand structure and understory composition for plot NW 03 CS.

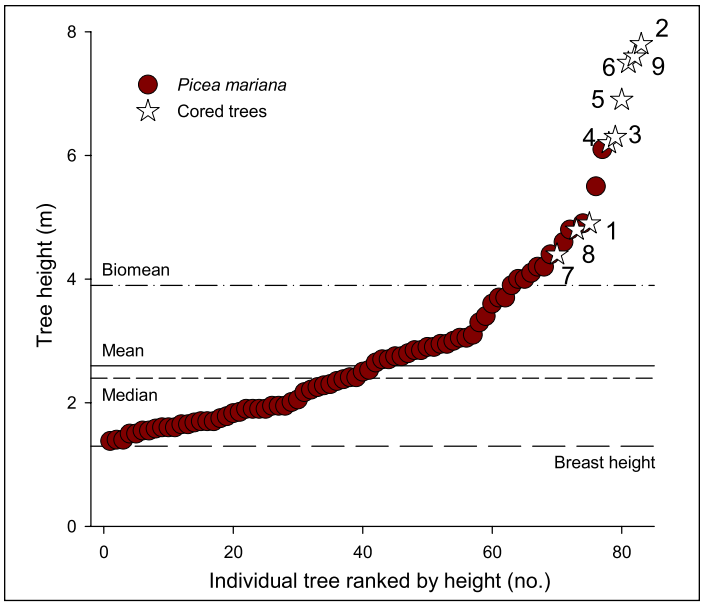
Plot: NW 04 UD

Measurement date: 03-Sept-08
Latitude: 65° 51′ 39.6″N
Longitude: 127° 22′ 33.4″W
Plant community type (Subarctic): e1.1 Sb-Pl/ Labrador tea/feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	c	100	143
Small trees	c	100	69
Large trees	a b c d	400	37

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

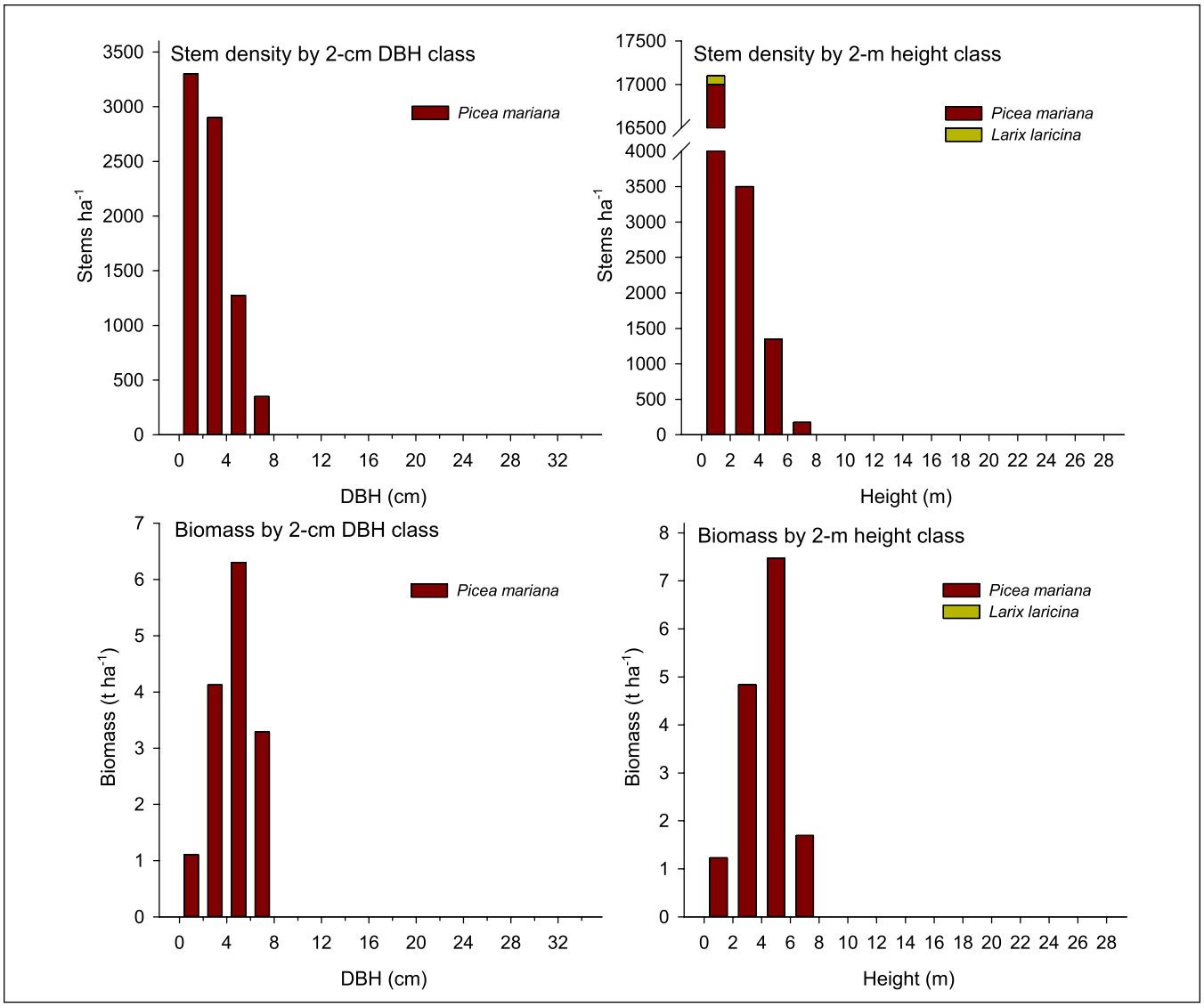
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	5.34	0.00	5.34
Stem density (stems ha^{-1})	22025	100	22125
Height ≥ 1.3 m	7825	0	7825
Height < 1.3 m	14200	100	14300
Mean tree height (m)	2.6	NA[c]	2.6
Median tree height (m)	2.4	NA	2.4
Biomass-weighted tree height (m)	3.9	NA	3.9
Biomass (t ha^{-1})	15.2	0.0	15.2

[a]Picemar = *Picea mariana*; [b]Larilar = *Larix Laricina*; [c]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	5.6	4.9	33
2	Picemar	9.3	7.8	43
3	Picemar	7.1	6.3	32
4	Picemar	6.1	6.2	33
5	Picemar	8.0	6.9	32
6	Picemar	9.1	7.5	40
7	Picemar	6.8	4.4	34
8	Picemar	5.4	4.8	34
9	Picemar	8.5	7.6	34

[a]Species: Picemar = *Picea mariana*.



Plot NW 04 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: NW 04 PP

Measurement date: 21-Aug-07
Latitude: 65° 51′ 10.7″N
Longitude: 127° 22′ 43.8″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	91
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

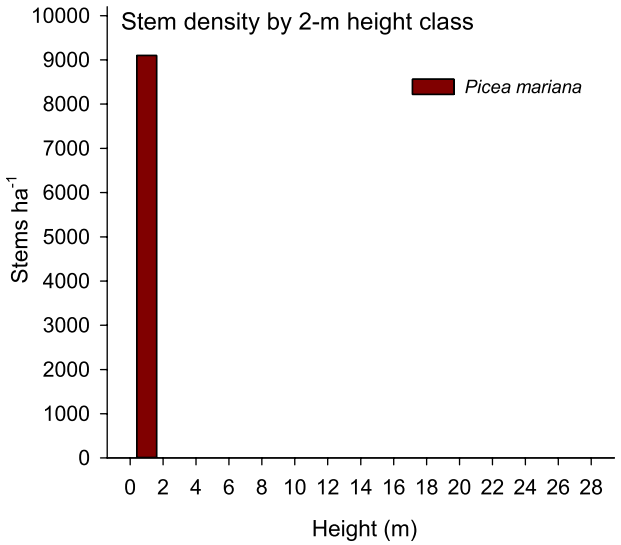
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	9100	9100
Height ≥ 1.3 m	0	0
Height < 1.3 m	9100	9100
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.1	0.1

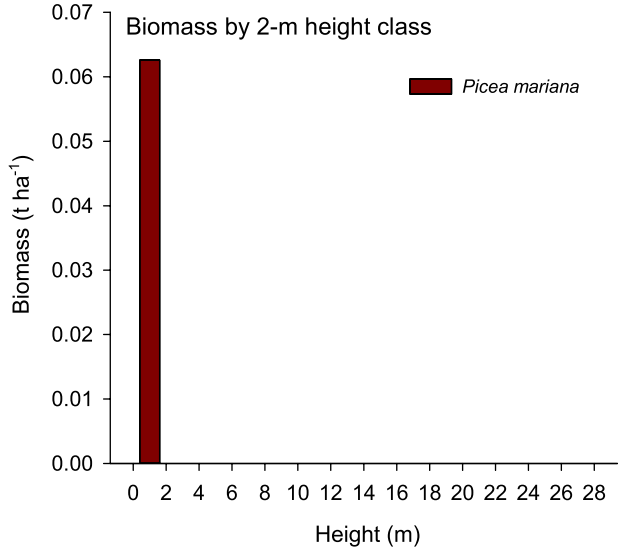
[a]Picemar = *Picea mariana;* [b]NA = *not applicable.*

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.





Plot NW 04 PP stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: NW 04 CS

Measurement date: 22-Aug-07
Latitude: 65° 51′ 10.0″N
Longitude: 127° 22′ 39.3″W
Plant community type (Subarctic): f2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	300	0
Small trees	a b c d	300	0
Large trees	a b c d	300	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

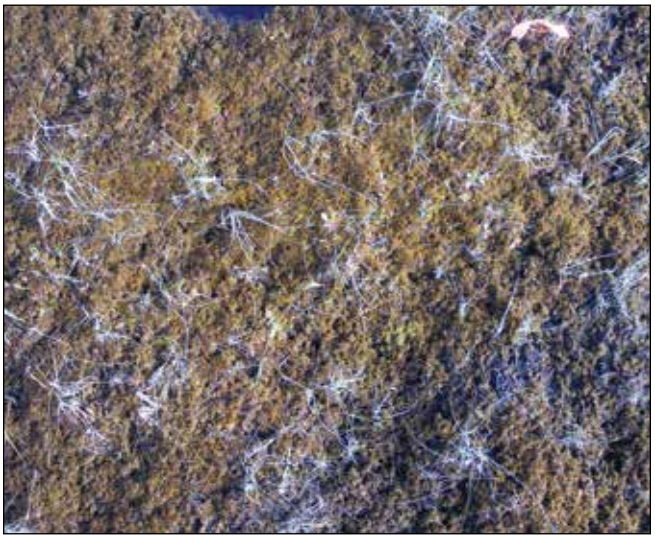
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.



Plot photographs illustrating the stand structure and understory composition for plot NW 04 CS.

WRIGLEY AREA SITES

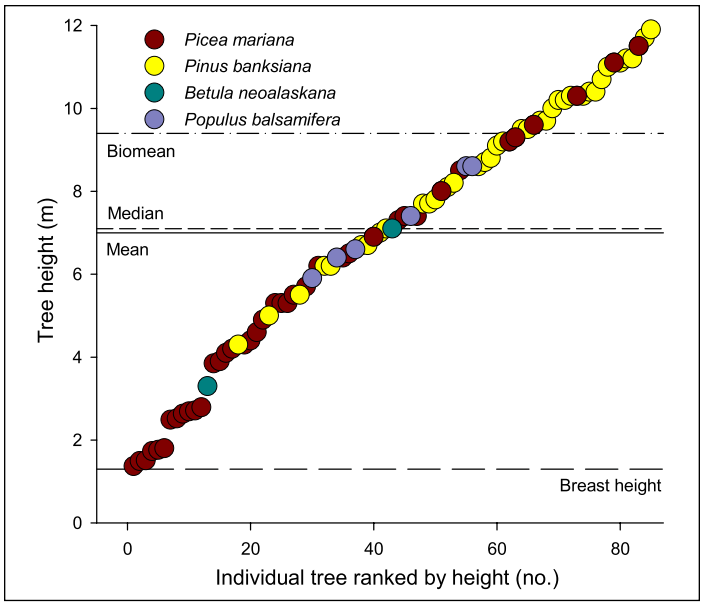
Plot: WR 01 UD

Measurement date: 06-Jul-07
Latitude: 63° 00′ 36.6″N
Longitude: 123° 12′ 37.9″W
Plant community type (Boreal Highlands): c1.2 Pj-Sb/feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	44
Small trees	b	100	29
Large trees	b	100	56

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

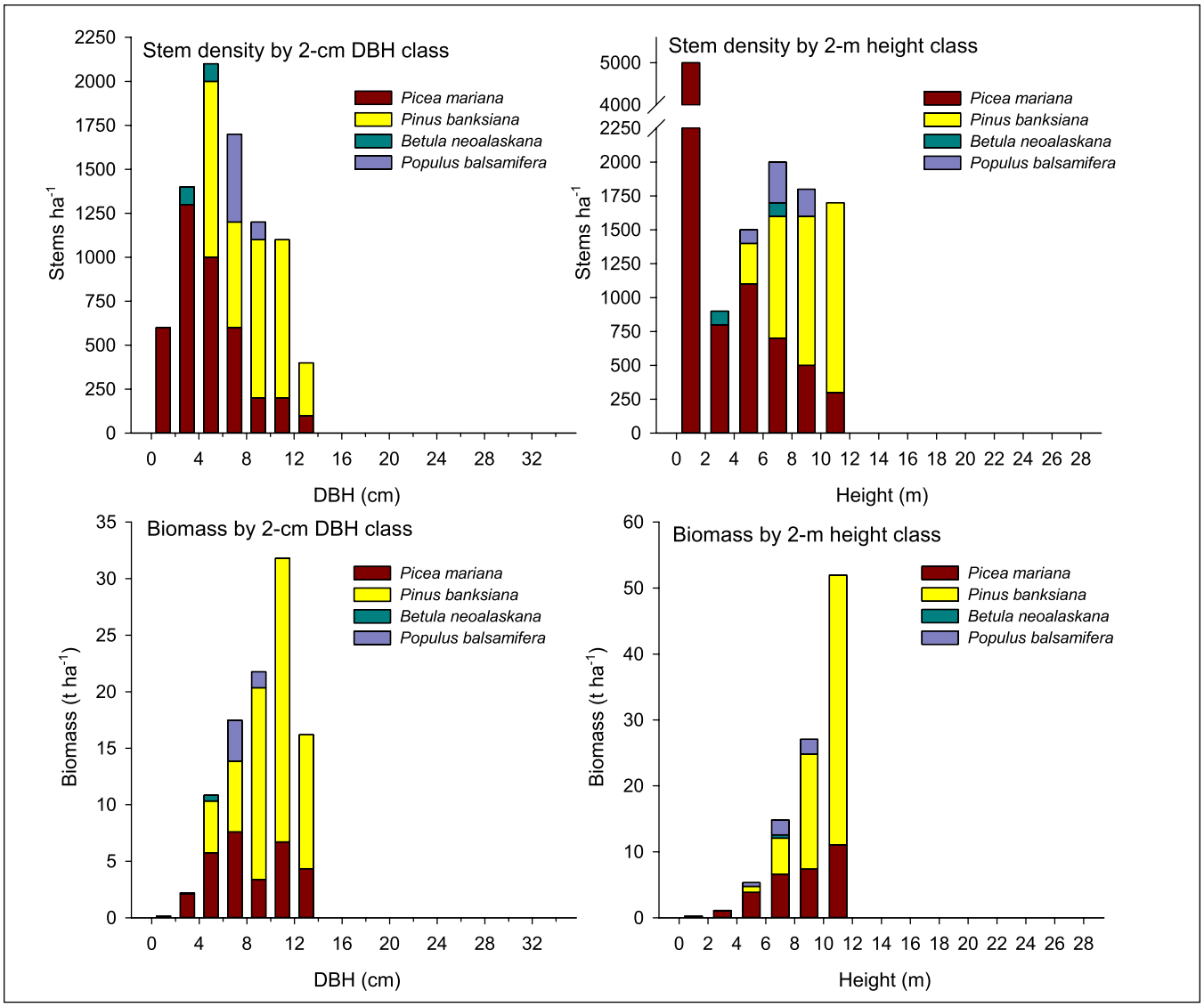
Stand values

Parameter	Picemar[a]	Pinuban[b]	Betuneo[c]	Popubal[d]	Total
Basal area (m^2 ha^{-1})	9.48	21.81	0.22	2.37	33.89
Stem density (stems ha^{-1})	8400	3700	200	600	12900
Height ≥ 1.3 m	4000	3700	200	600	8500
Height < 1.3 m	4400	0	0	0	4400
Mean tree height (m)	5.3	8.9	5.2	7.3	7.0
Median tree height (m)	5.1	9.2	5.2	7.0	7.1
Biomass-weighted tree height (m)	8.5	10.0	6.6	7.5	9.4
Biomass (t ha^{-1})	30.2	64.8	0.6	5.0	100.6

[a]Picemar = *Picea mariana*; [b]Pinuban = *Pinus banksiana*; [c]Betuneo = *Betula neoalaskana*; [d]Popubal = *Populus balsamifera*.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				



Plot WR 01 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

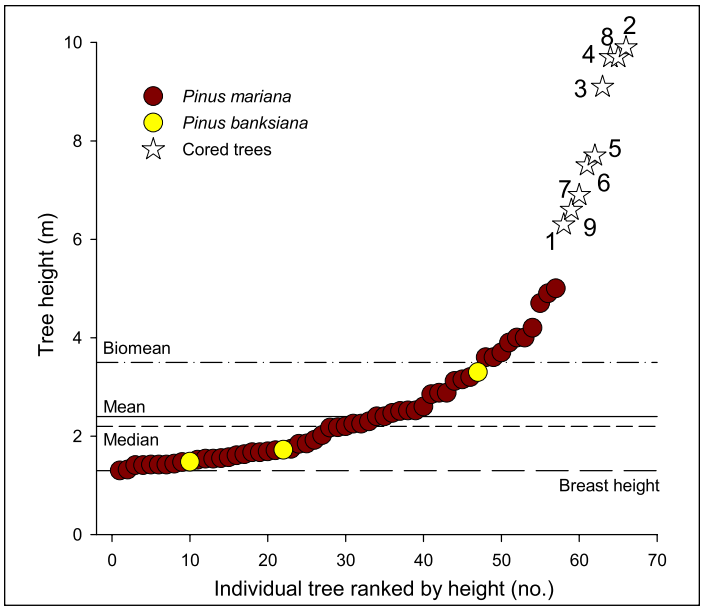
Plot: WR 01 PP

Measurement date: 05-Jul-07, 06-Jul-07
Latitude: 63° 00′ 38.7″N
Longitude: 123° 12′ 27.5″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	160
Small trees	d	100	53
Large trees	a b c d	400	16

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

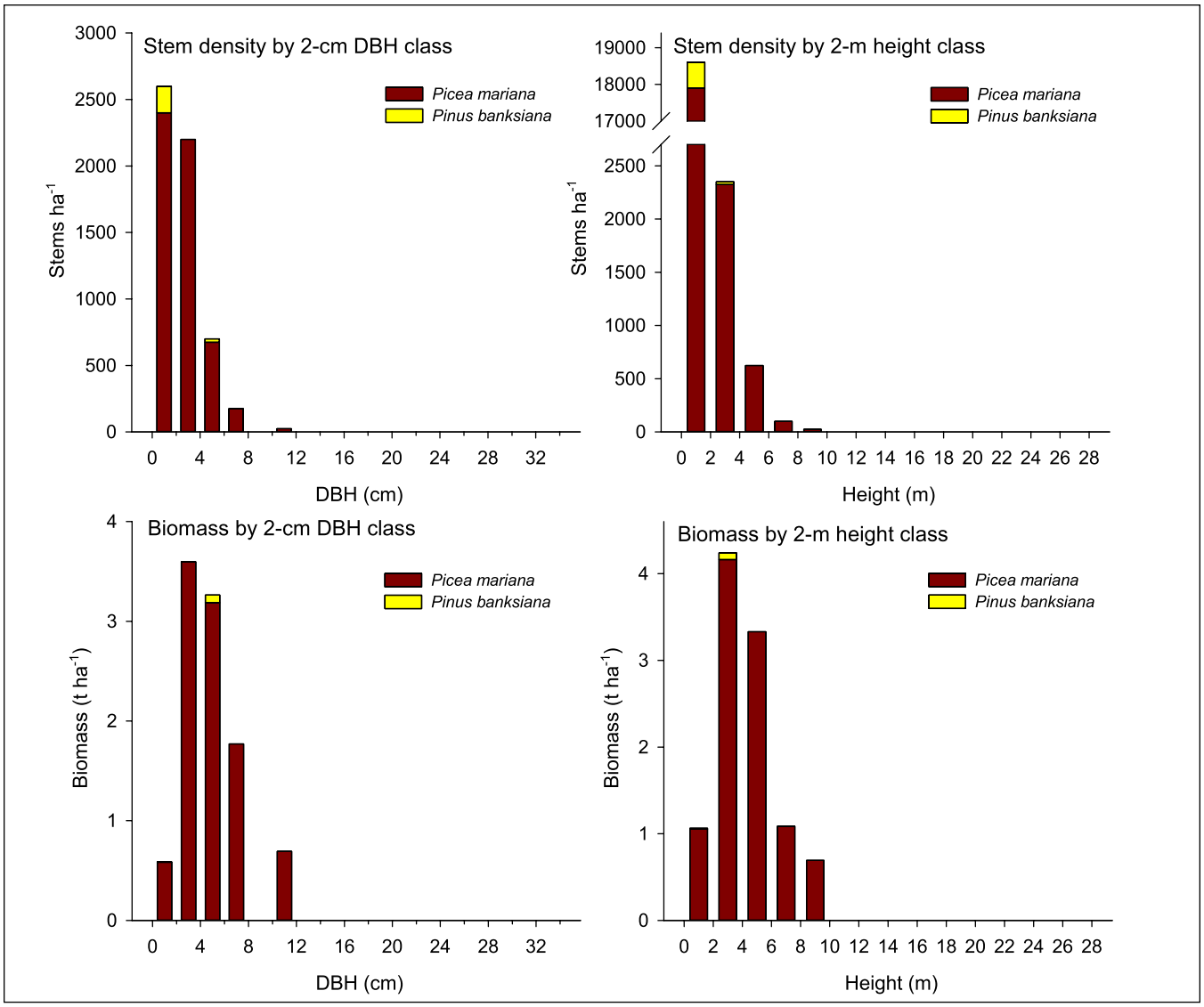
Parameter	Picemar[a]	Pinuban[b]	Total
Basal area (m^2 ha^{-1})	3.63	0.06	3.69
Stem density (stems ha^{-1})	20975	725	21700
Height ≥ 1.3 m	5475	225	5700
Height < 1.3 m	15500	500	16000
Mean tree height (m)	2.4	2.2	2.4
Median tree height (m)	2.2	1.7	2.2
Biomass-weighted tree height (m)	3.5	3.3	3.5
Biomass (t ha^{-1})	10.3	0.1	10.4

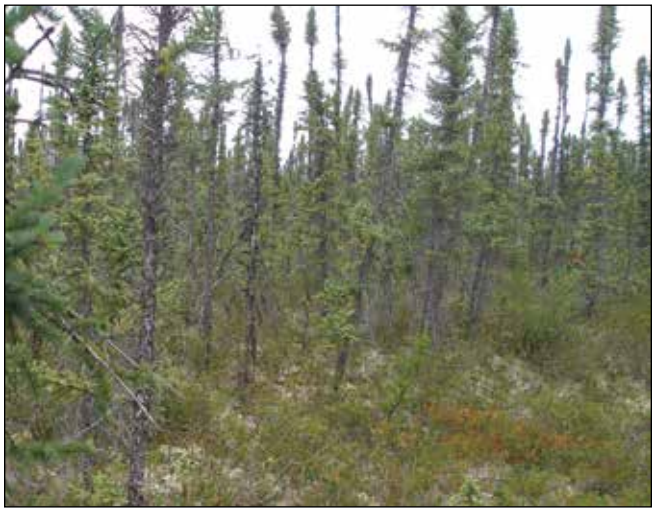
[a]Picemar = *Picea mariana;* [b]Pinuban = *Pinus banksiana.*

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	7.5	6.3	68
2	Picemar	10.1	9.9	98
3	Picemar	10.1	9.1	73
4	Picemar	10.0	9.7	76
5	Picemar	8.7	7.7	65
6	Picemar	9.3	7.5	63
7	Picemar	7.9	6.9	64
8	Picemar	10.2	9.7	66
9	Picemar	6.0	6.6	62

[a]Species: Picemar = *Picea mariana.*





Plot WR 01 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 01 CS

Measurement date: 05-Jul-07

Latitude: 63° 00′ 38.6″N

Longitude: 123° 12′ 32.3″W

Plant community type (Boreal Highlands): i2.1

Labrador tea-dwarf birch/cloudberry/sedge/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	5
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

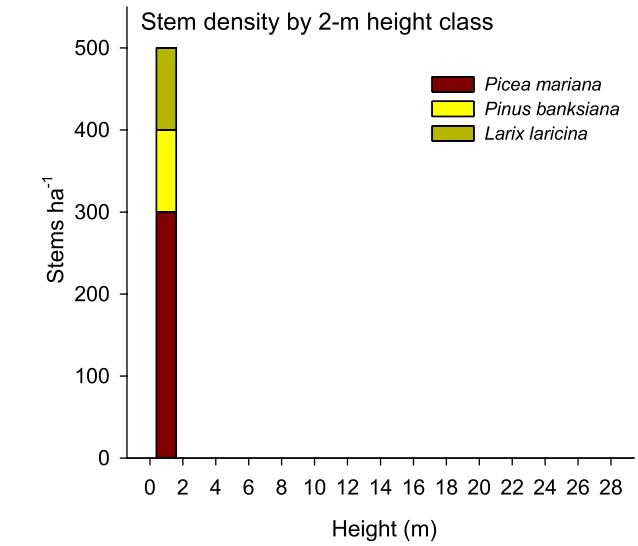
Parameter	Picemar[a]	Pinuban[b]	Larilar[c]	Total
Basal area (m^2 ha^{-1})	0.00	0.00	0.00	0.00
Stem density (stems ha^{-1})	300	100	100	500
Height ≥ 1.3 m	0	0	0	0
Height < 1.3 m	300	100	100	500
Mean tree height (m)	NA[d]	NA	NA	NA
Median tree height (m)	NA	NA	NA	NA
Biomass-weighted tree height (m)	NA	NA	NA	NA
Biomass (t ha^{-1})	0.0	0.0	0.0	0.0

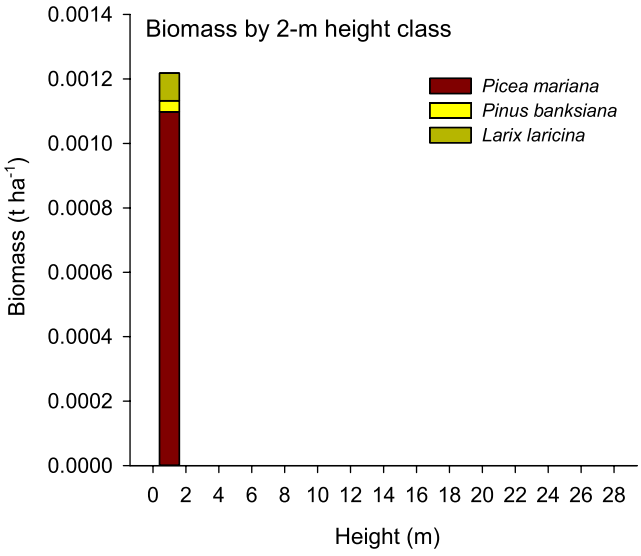
[a]Picemar = *Picea mariana*; [b]Pinuban = *Pinus banksiana*; [c]Larilar = *Larix laricina*; [d]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.





Plot WR 01 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

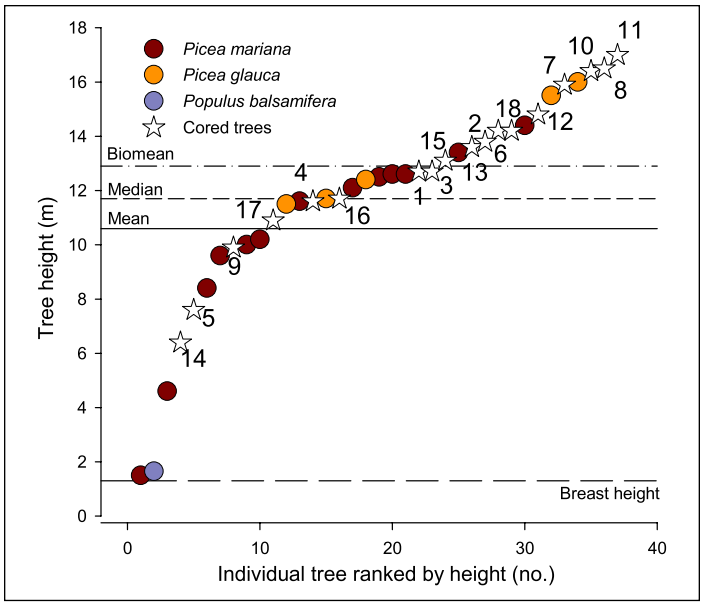
Plot: WR 02 UD

Measurement date: 06-Jul-08
Latitude: 62° 14′ 37.2″N
Longitude: 122° 34′ 42.0″W
Plant community type (Boreal Highlands): d3.2 Sw/ low-bush cranberry-rose

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b d	307.5	268
Small trees	b	102.5	3
Large trees	a b	205	41

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

Parameter	Picemar[a]	Picegla[b]	Larilar[c]	Betuneo[d]	Popubal[e]	Total
Basal area (m^2 ha^{-1})	11.26	9.23	0.00	0.00	0.77	21.26
Stem density (stems ha^{-1})	8943	780	943	195	146	11008
Height ≥ 1.3 m	1366	780	0	0	146	2293
Height < 1.3 m	7577	0	943	195	0	8715
Mean tree height (m)	10.3	13.4	NA[f]	NA	1.7	10.6
Median tree height (m)	11.6	12.4	NA	NA	1.7	11.7
Biomass-weighted tree height (m)	12.1	14.1	NA	NA	1.7	12.9
Biomass (t ha^{-1})	41.8	33.4	0.0	0.0	2.0	77.1

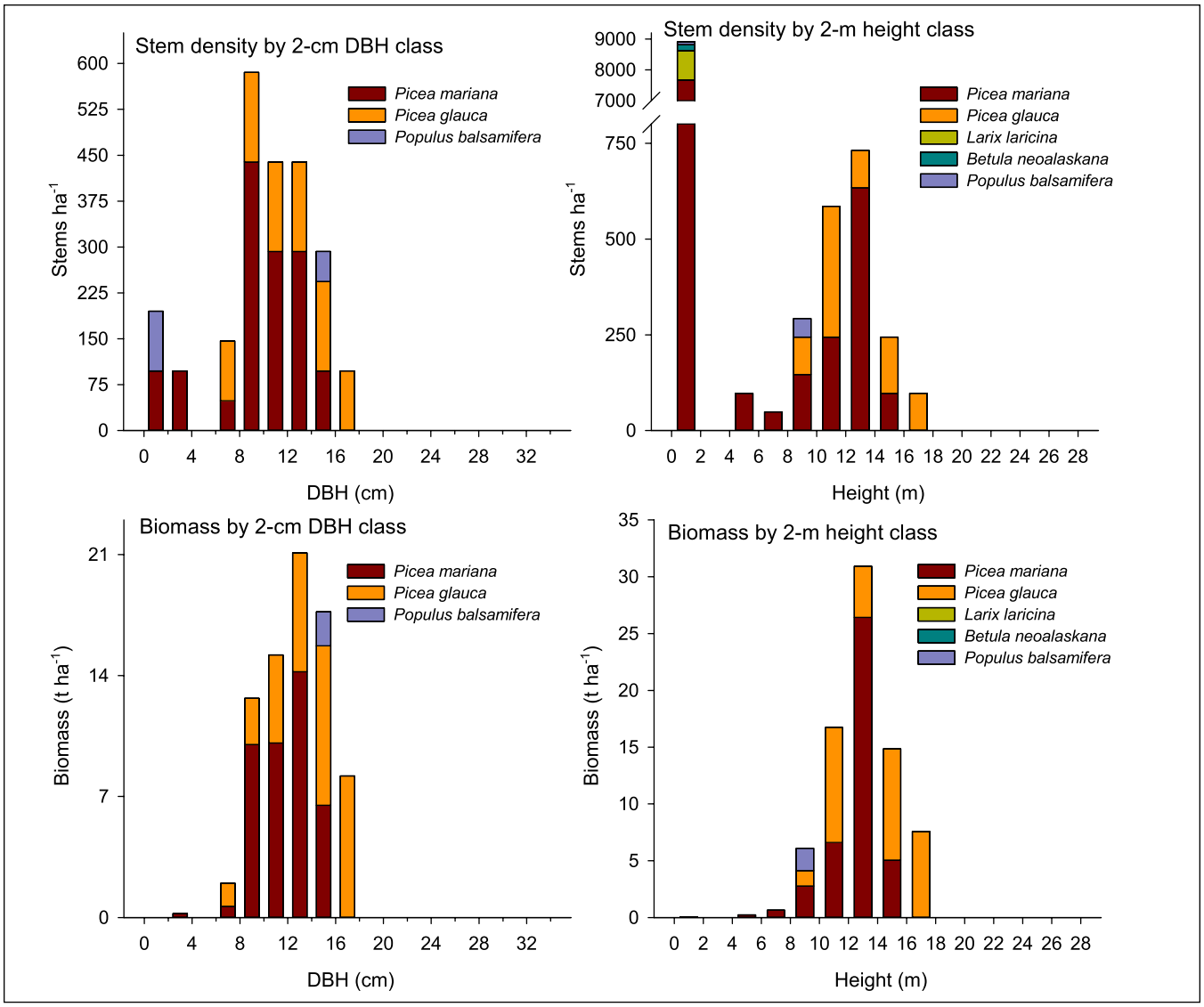
[a]Picemar = *Picea mariana;* [b]Picegla = *Picea glauca*; [c]Larilar = *Larix laricina*; [d]Betuneo = *Betula neoalaskana*; [e]Popubal = *Populus balsamiferous*; [f]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picegla	13.3	12.7	106
2	Picemar	15.8	13.8	99
3	Picegla	14.9	12.7	104
4	Picegla	9.8	11.6	100
5	Picemar	10.1	7.6	105
6	Picegla	13.4	14.2	104
7	Picemar	15.0	15.9	109
8	Picemar	16.2	16.5	106
9	Picemar	10.2	9.9	100

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
10	Picegla	15.8	16.4	104
12	Picemar	12.9	14.8	101
13	Picemar	11.9	13.6	110
14	Picegla	6.9	6.4	98
15	Picemar	15.6	13.1	109
16	Picemar	11.6	11.7	99
17	Picegla	11.3	10.9	107
18	Picegla	14.6	14.2	114

[a]Species: Picegla = *Picea glauca;* Picemar = *Picea mariana.*



Plot WR 02 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

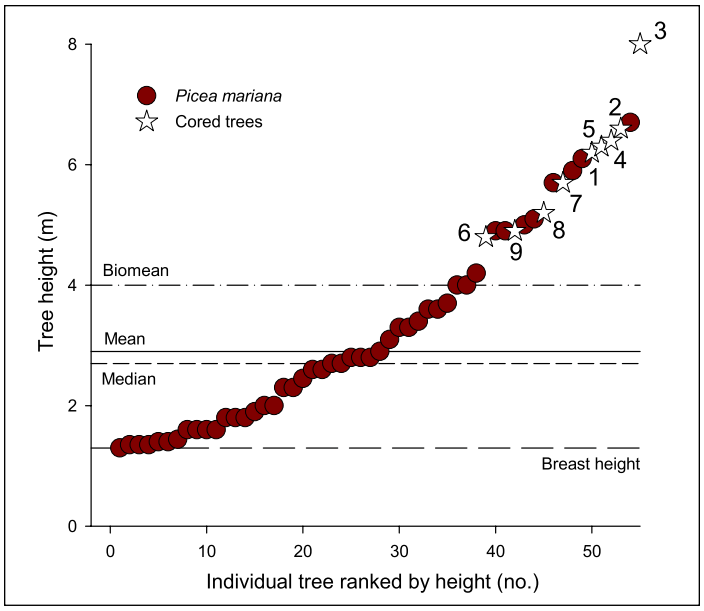
Plot: WR 02 PP

Measurement date: 05-Jul-08
Latitude: 62° 14′ 43.7″N
Longitude: 122° 34′ 20.4″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	557
Small trees	c	100	34
Large trees	a b c d	400	25

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

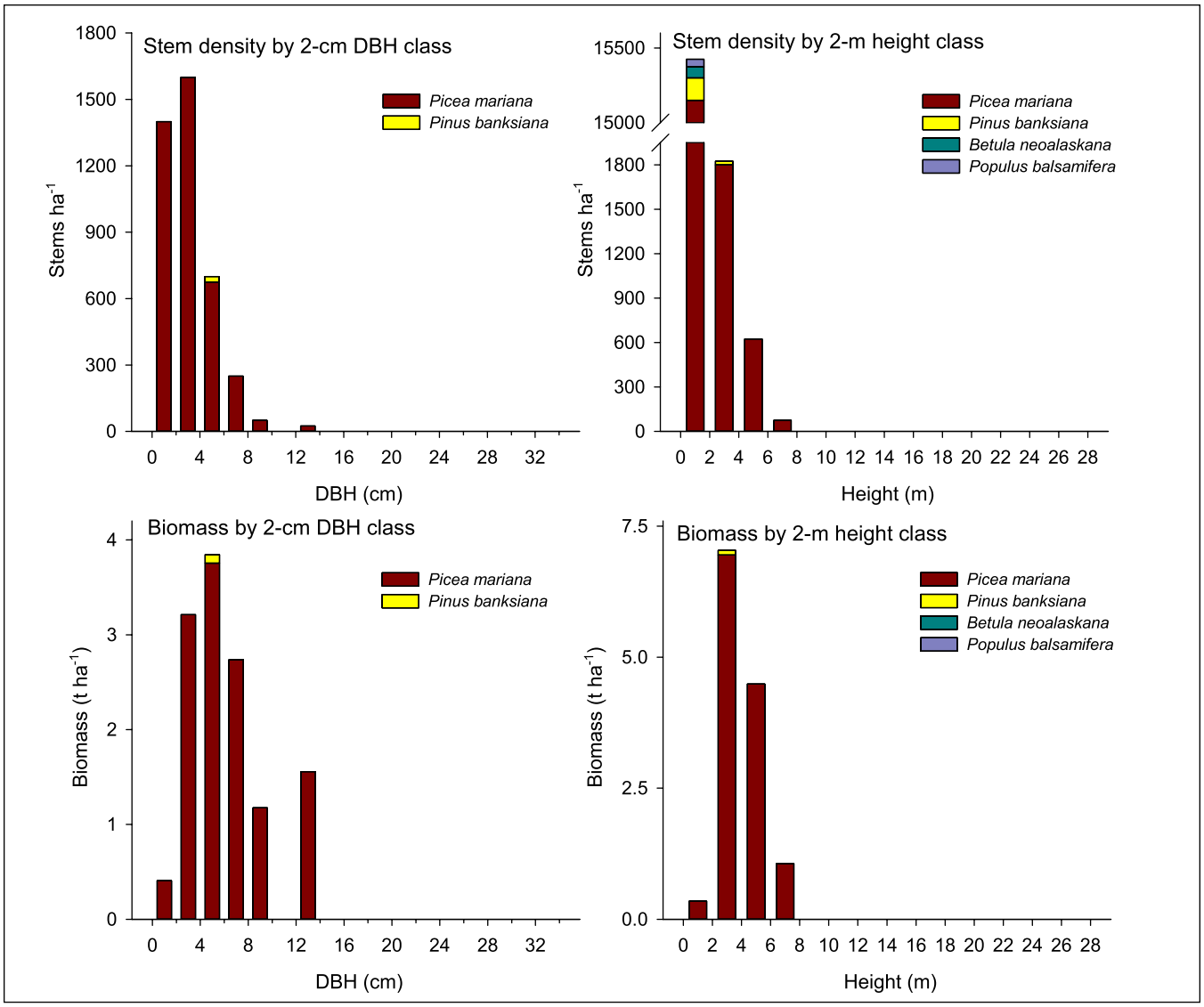
Parameter	Picemar[a]	Pinuban[b]	Betuneo[c]	Popubal[d]	Total
Basal area (m^2 ha^{-1})	4.24	0.05	0.00	0.00	4.30
Stem density (stems ha^{-1})	17650	175	75	50	17950
Height ≥ 1.3 m	4000	25	0	0	4025
Height < 1.3 m	13650	150	75	50	13925
Mean tree height (m)	2.9	NA[e]	NA	NA	2.9
Median tree height (m)	2.7	NA	NA	NA	2.7
Biomass-weighted tree height (m)	4.0	NA	NA	NA	4.0
Biomass (t ha^{-1})	13.3	0.1	0.0	0.0	13.4

[a]Picemar = *Picea mariana;* [b]Pinuban = *Pinus banksiana*; [c]Betuneo = *Betula neoalaskana*; [d]Popubal = *Populus balsamifera*; [e]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	7.2	6.2	43
2	Picemar	7.2	6.6	51
3	Picemar	9.1	8.0	71
4	Picemar	6.9	6.4	49
5	Picemar	7.6	6.3	48
6	Picemar	5.9	4.8	42
7	Picemar	6.9	5.7	54
8	Picemar	6.3	5.2	60
9	Picemar	5.6	4.9	46

[a]Species: Picemar = *Picea mariana*.



Plot WR 02 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 02 CS

Measurement date: 04-Jul-08
Latitude: 62° 14′ 44.1″N
Longitude: 122° 34′ 16.7″W
Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	3
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

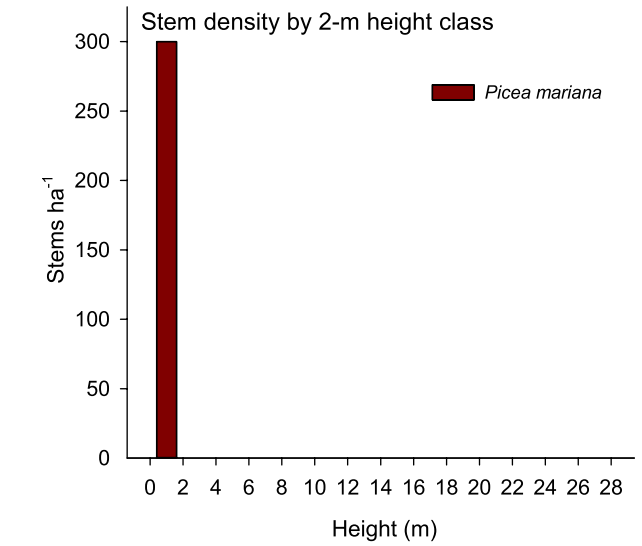
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	300	300
Height ≥ 1.3 m	0	0
Height < 1.3 m	300	300
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.0	0.0

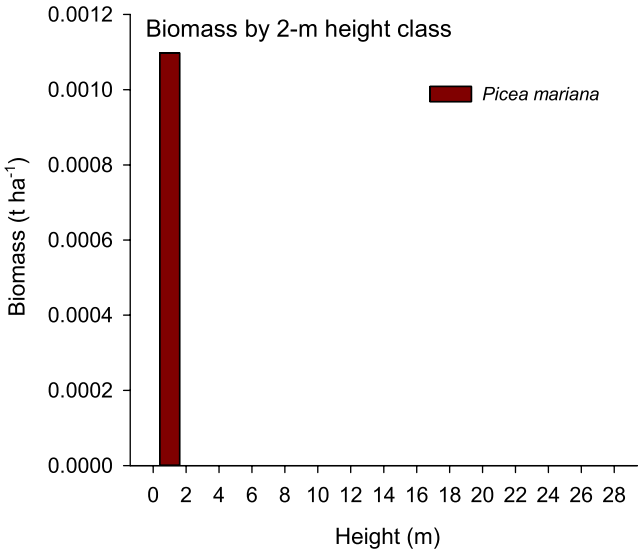
[a]Picemar = *Picea mariana*; [b]NA = not applicable.

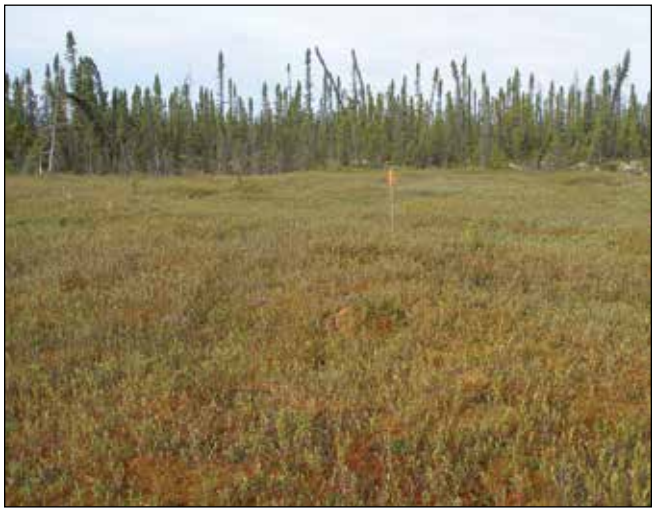
Cored trees

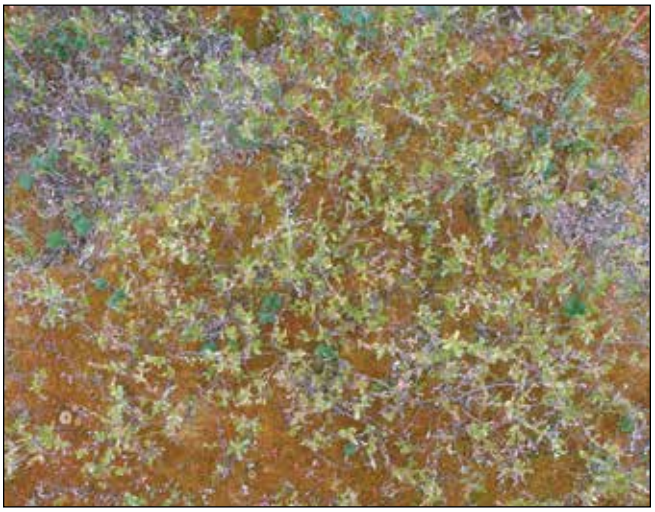
Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.









Plot WR 02 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

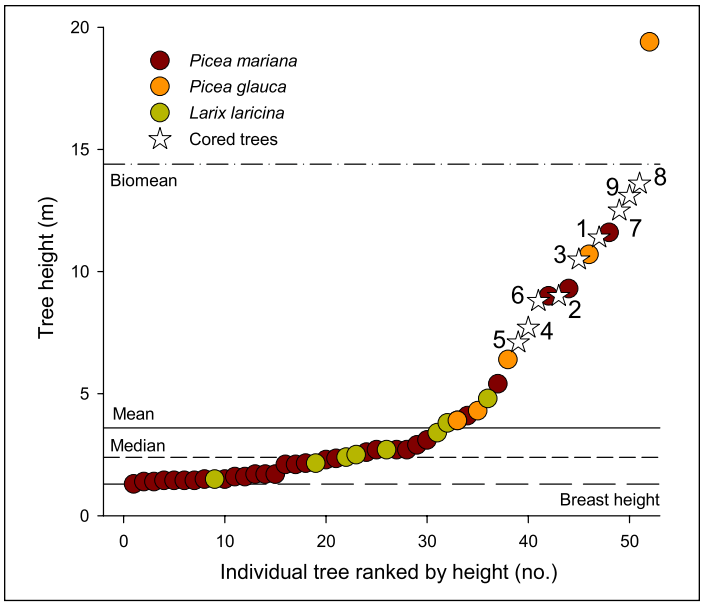
Plot: WR 03 UD

Measurement date: 09-Jul-08

Latitude: 62° 30′ 35.4″ N

Longitude: 123° 00′ 58.1″ W

Plant community type (Boreal Highlands): b3.1 Sw-Pj/blueberry-Labrador tea



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	83
Small trees	a	100	36
Large trees	a b c d	400	23

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

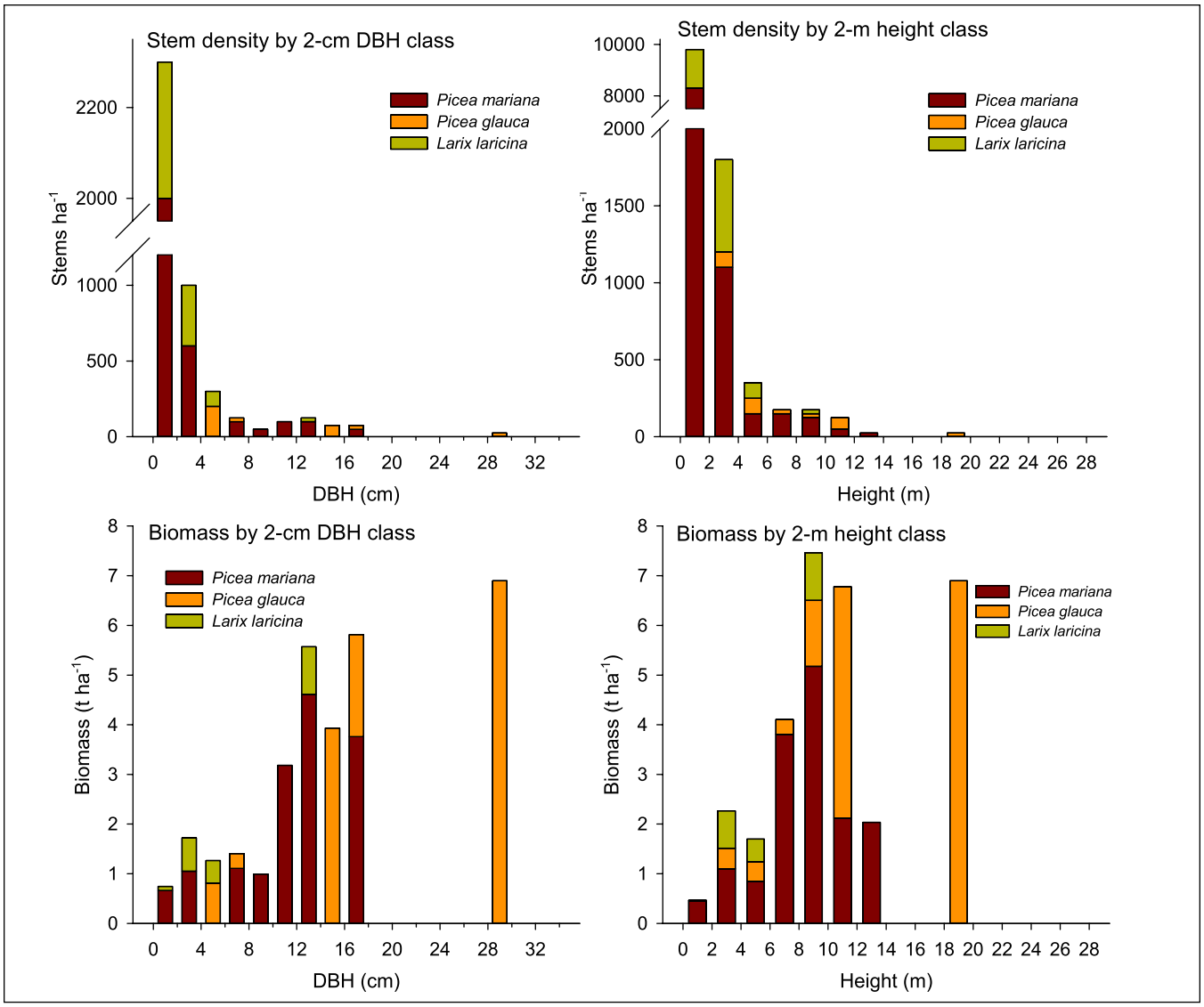
Parameter	Picemar[a]	Picegla[b]	Larilar[c]	Total
Basal area (m^2 ha^{-1})	4.64	3.87	0.84	9.35
Stem density (stems ha^{-1})	9900	350	2225	12475
Height ≥ 1.3 m	3000	350	825	4175
Height < 1.3 m	6900	0	1400	8300
Mean tree height (m)	2.9	8.9	2.9	3.6
Median tree height (m)	2.1	6.4	2.6	2.4
Biomass-weighted tree height (m)	9.0	16.8	3.8	14.4
Biomass (t ha^{-1})	15.5	14.0	2.2	31.7

[a]Picemar = *Picea mariana;* [b]Picegla = *Picea glauca*; [c]Larilar = *Larix laricina*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	14.7	11.4	180
2	Picemar	11.1	9.0	187
3	Picemar	11.2	10.5	187
4	Picemar	9.2	7.7	200
5	Picemar	7.3	7.1	35
6	Picemar	11.1	8.8	175
7	Picemar	13.3	12.5	180
8	Picemar	11.9	13.6	186
9	Picemar	11.3	13.1	184

[a]Species: Picemar = *Picea mariana*.



Plot WR 03 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

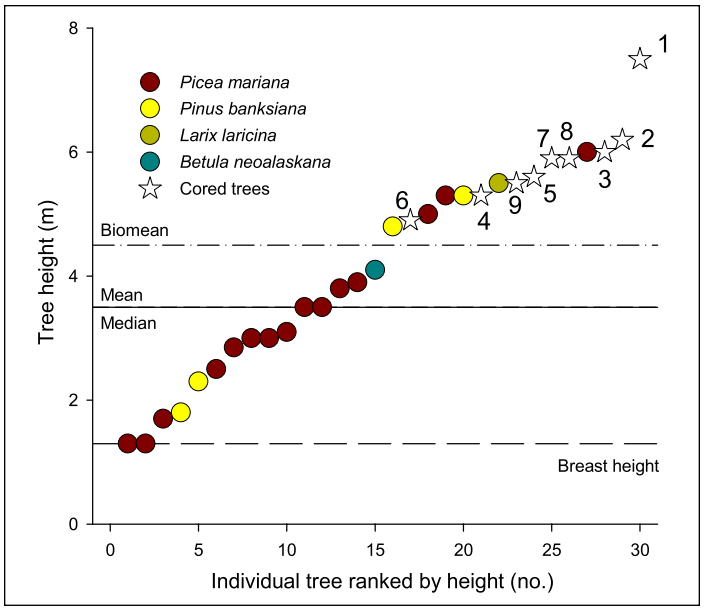
Plot: WR 03 PP

Measurement date: 08-Jul-08
Latitude: 62° 30′ 32.4″N
Longitude: 123° 01′ 59.7″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	36
Small trees	b	100	15
Large trees	a b c d	400	16

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

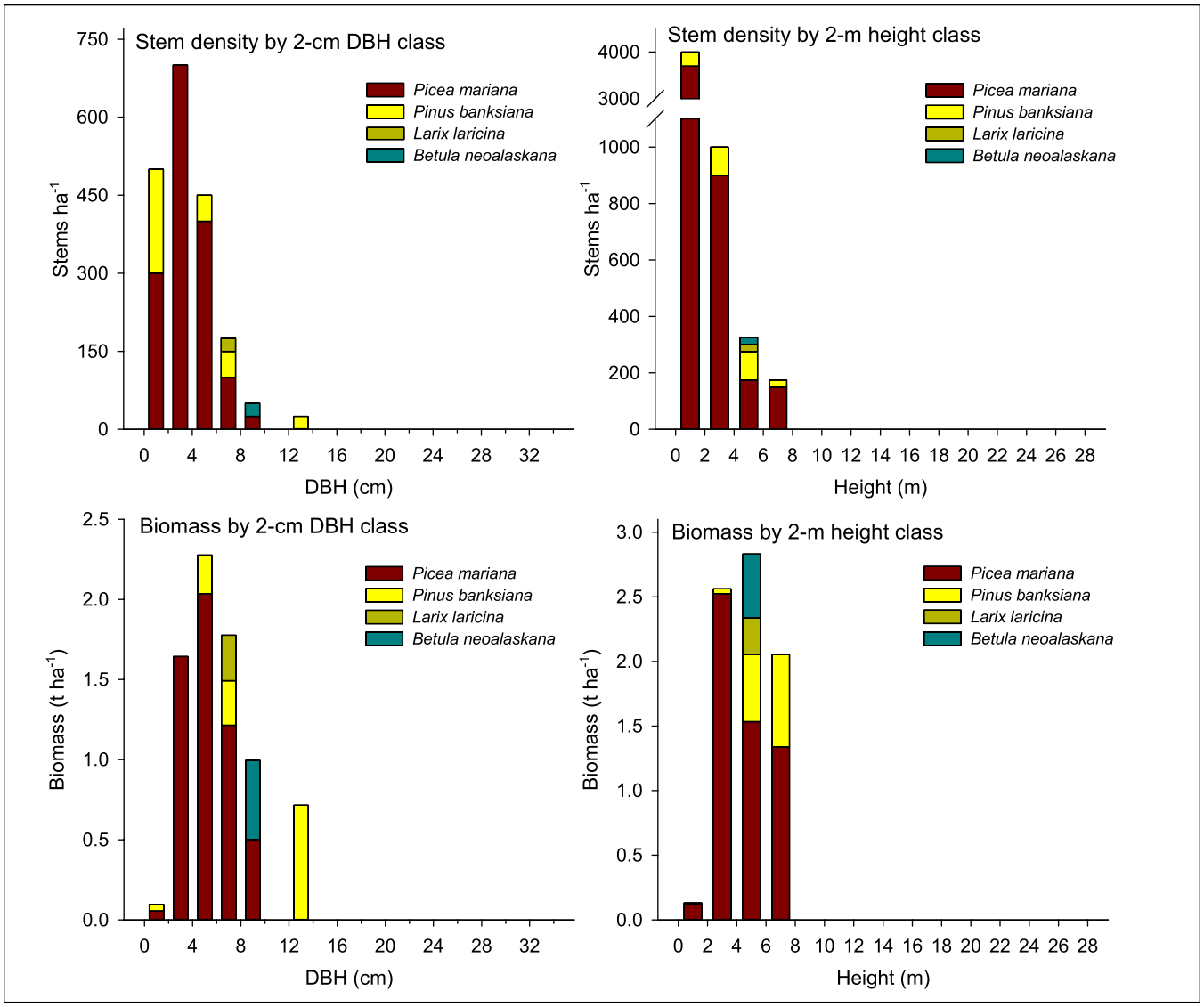
Parameter	Picemar[a]	Pinuban[b]	Larilar[c]	Betuneo[d]	Total
Basal area (m^2 ha^{-1})	1.90	0.62	0.11	0.16	2.79
Stem density (stems ha^{-1})	4925	525	25	25	5500
Height ≥ 1.3 m	1525	325	25	25	1900
Height < 1.3 m	3400	200	0	0	3600
Mean tree height (m)	3.3	3.6	5.5	4.1	3.5
Median tree height (m)	3.1	3.6	5.5	4.1	3.5
Biomass-weighted tree height (m)	4.3	4.9	5.5	4.1	4.5
Biomass (t ha^{-1})	5.5	1.3	0.3	0.5	7.6

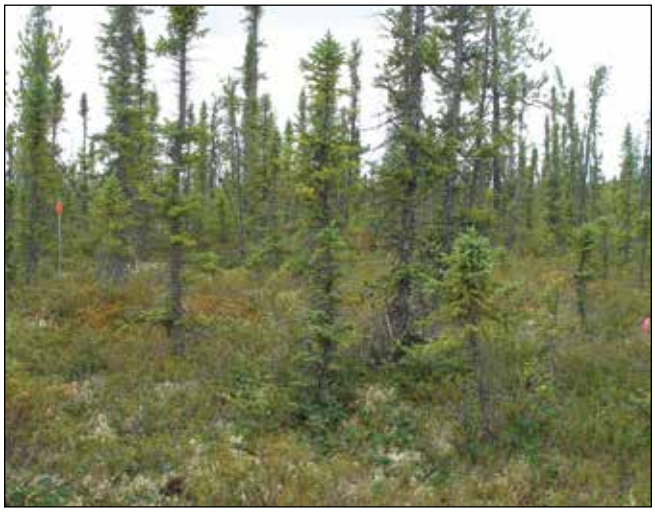
[a]Picemar = *Picea mariana*; [b]Pinuban = *Pinus banksiana*; [c]Larilar = *Larix laricina*; [d]Betuneo = *Betula neoalaskana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	9.3	7.5	72
2	Picemar	6.6	6.2	70
3	Picemar	7.3	6.0	71
4	Picemar	8.4	5.3	53
5	Picemar	6.8	5.6	67
6	Picemar	6.0	4.9	59
7	Picemar	8.4	5.9	62
8	Picemar	7.8	5.9	56
9	Picemar	6.3	5.5	51

[a]Species: Picemar = *Picea mariana*.





Plot WR 03 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 03 CS

Measurement date: 07-Jul-08

Latitude: 62° 30′ 32.0″N

Longitude: 123° 02′ 09.1″W

Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	115
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

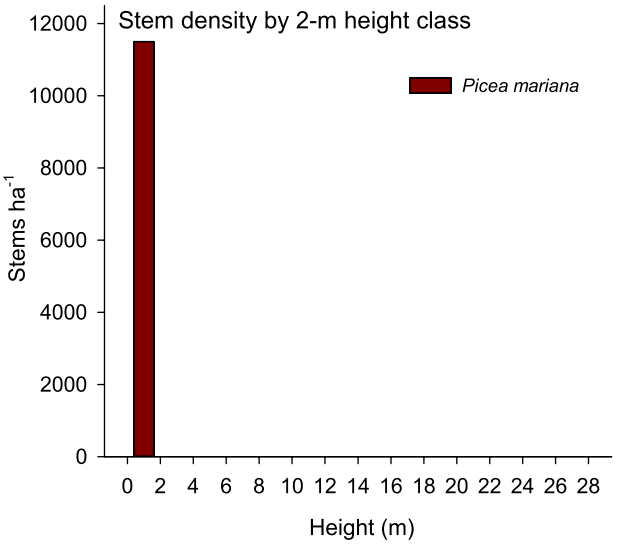
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	11500	11500
Height ≥ 1.3 m	0	0
Height < 1.3 m	11500	11500
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.1	0.1

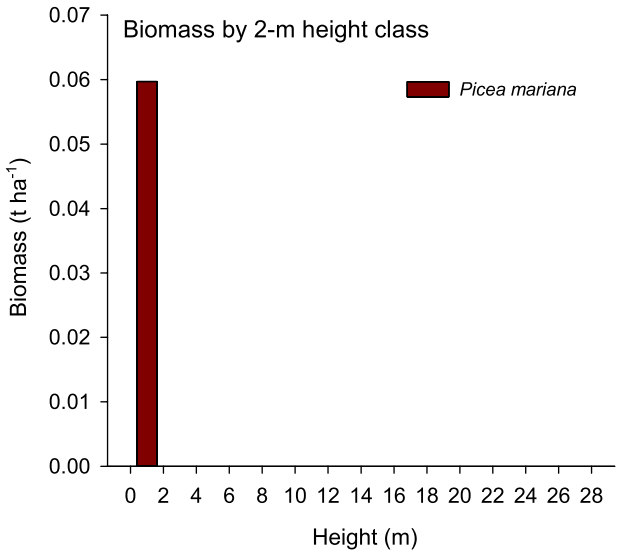
[a]Picemar = *Picea mariana*; [b]NA = not applicable.

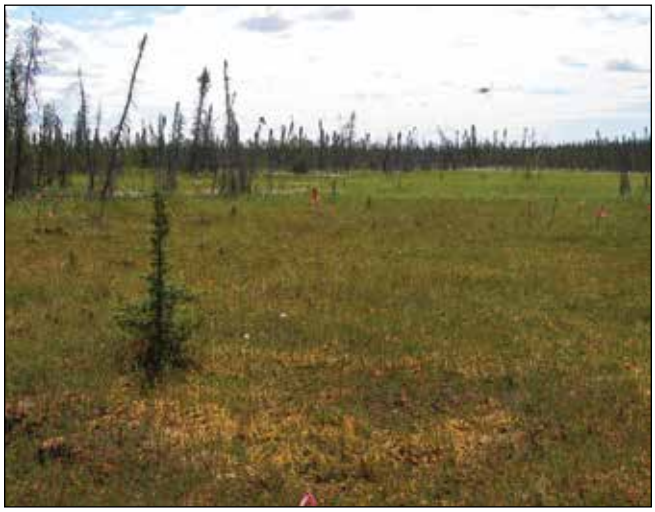
Cored trees

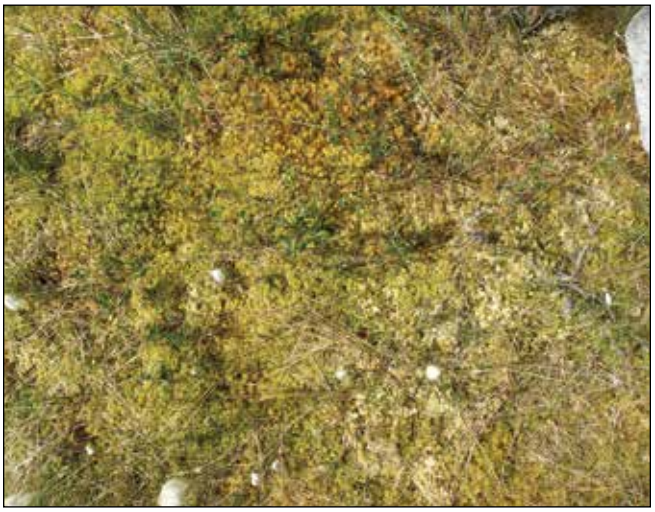
Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.









Plot WR 03 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

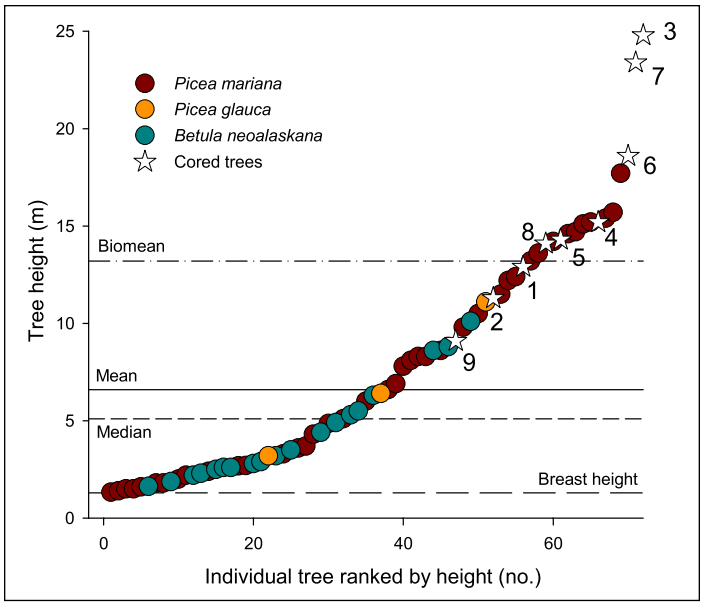
Plot: WR 04 UD

Measurement date: 12-Jul-08
Latitude: 62° 59′ 37.3″N
Longitude: 123° 12′ 9.7″ W
Plant community type (Boreal Highlands): d3.1 Sw/green alder

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	48
Small trees	d	100	39
Large trees	a d	200	31

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

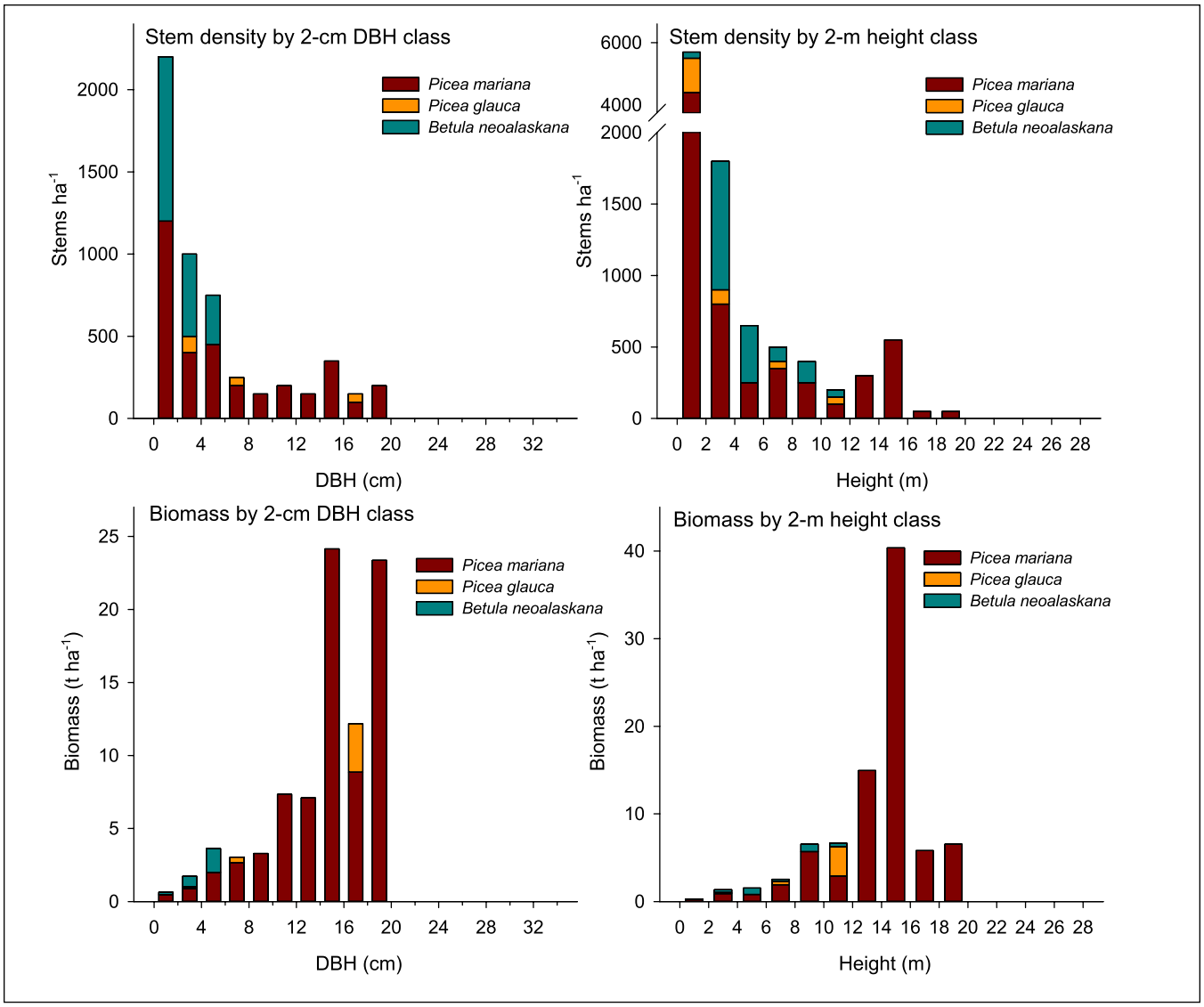
Parameter	Picemar[a]	Picegla[b]	Betuneo[c]	Total
Basal area (m^2 ha^{-1})	20.57	1.20	0.92	22.70
Stem density (stems ha^{-1})	7100	1300	1800	10200
Height ≥ 1.3 m	3400	200	1800	5400
Height < 1.3 m	3700	1100	0	4800
Mean tree height (m)	7.7	6.9	4.3	6.6
Median tree height (m)	6.9	6.4	3.2	5.1
Biomass-weighted tree height (m)	13.6	10.5	7.5	13.2
Biomass (t ha^{-1})	80.2	3.9	2.5	86.6

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Betuneo = *Betula neoalaskana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	12.9	12.9	124
2	Picemar	12.8	11.3	132
3	Picemar	13.2	24.8	141
4	Picemar	14.0	15.2	113
5	Picemar	15.2	14.3	101
6	Picemar	15.4	18.6	130
7	Picemar	18.3	23.4	93
8	Picemar	14.1	14.1	134
9	Picemar	9.9	9.1	86

[a]Species: Picemar = *Picea mariana*.



Plot WR 04 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

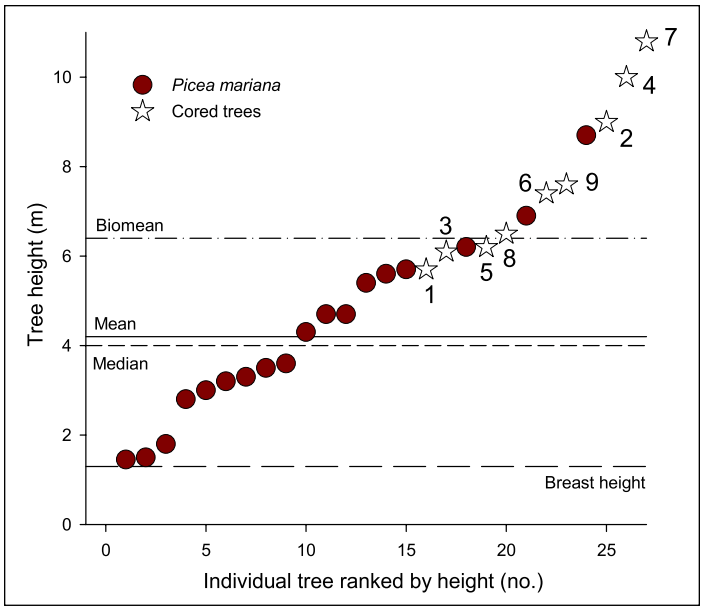
Plot: WR 04 PP

Measurement date: 10-Jul-08
Latitude: 62° 59′ 42.2″N
Longitude: 123° 11′ 35″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	c	100	41
Small trees	c	100	11
Large trees	a b c d	400	24

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

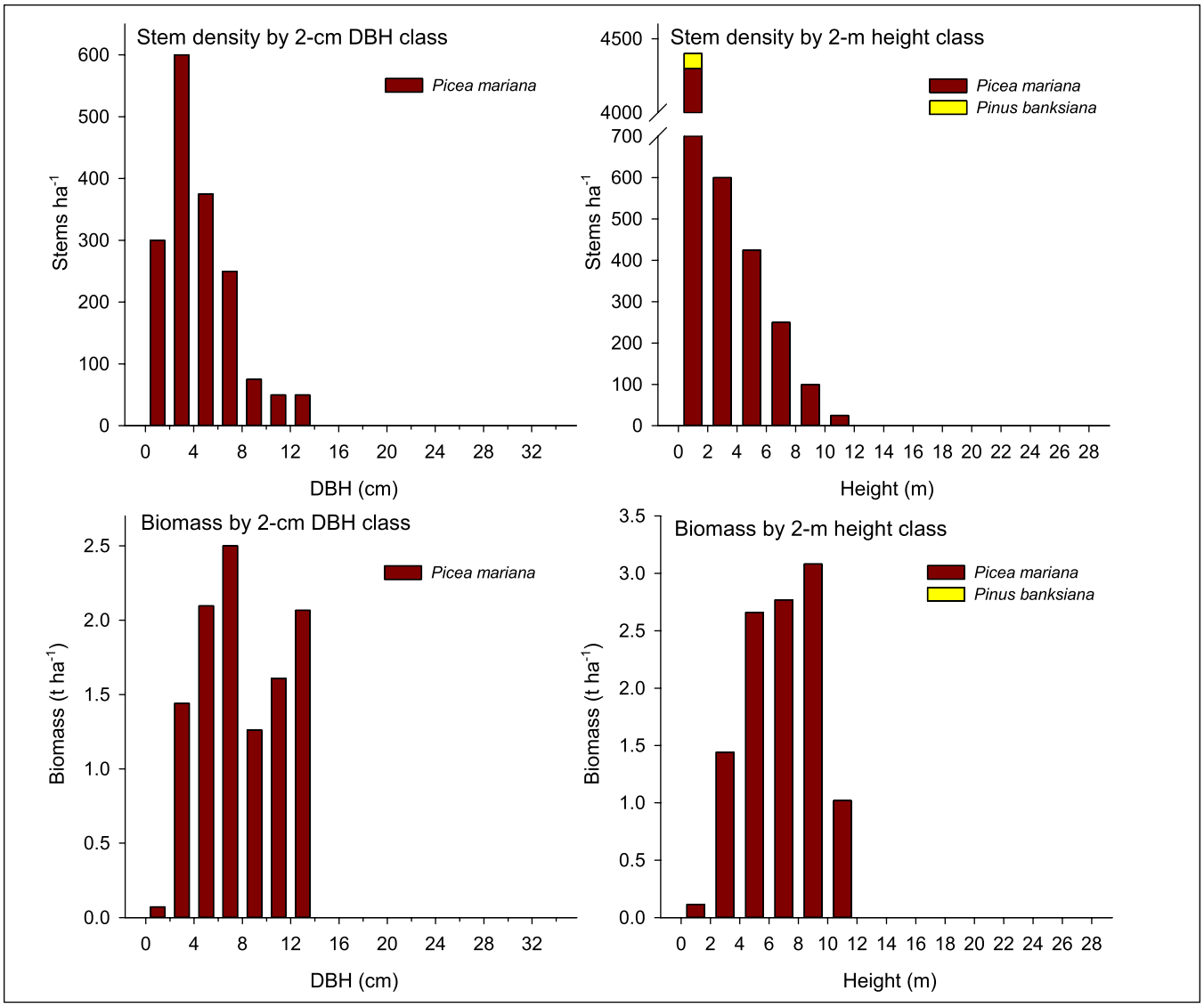
Parameter	Picemar[a]	Pinuban[b]	Total
Basal area (m^2 ha^{-1})	3.65	0.00	3.65
Stem density (stems ha^{-1})	5700	100	5800
Height ≥ 1.3 m	1700	0	1700
Height < 1.3 m	4000	100	4100
Mean tree height (m)	4.2	NA[c]	4.2
Median tree height (m)	4.0	NA	4.0
Biomass-weighted tree height (m)	6.4	NA	6.4
Biomass (t ha^{-1})	11.1	0.0	11.1

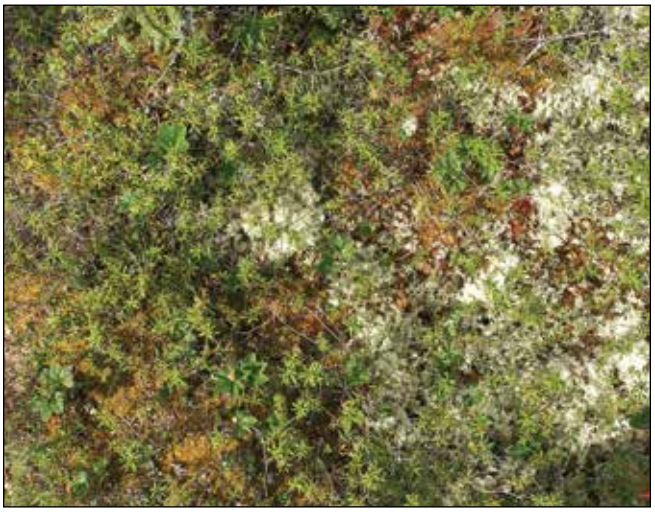
[a]Picemar = *Picea mariana;* [b]Pinuban = *Pinus banksiana*; [c]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	5.2	5.7	54
2	Picemar	10.6	9.0	97
3	Picemar	6.8	6.1	84
4	Picemar	10.9	10.0	111
5	Picemar	6.6	6.2	100
6	Picemar	7.6	7.4	108
7	Picemar	12.0	10.8	124
8	Picemar	6.4	6.5	55
9	Picemar	8.3	7.6	70

[a]Species: Picemar = *Picea mariana*.





Plot WR 04 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 04 CS

Measurement date: 11-Jul-08
Latitude: 62° 59′ 41.7″N
Longitude: 123° 11′ 38.5″W
Plant community type (Boreal Highlands): i2.1
Labrador tea-dwarf birch/cloudberry/sedge/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	196	202
Small trees	a b c d	784	0
Large trees	a b c d	784	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

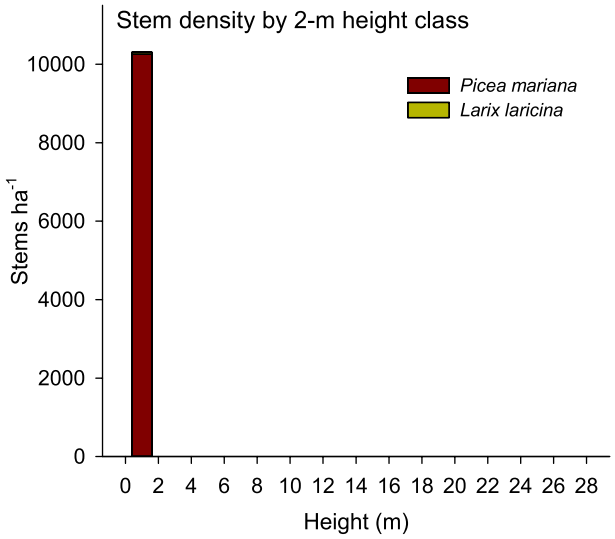
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	0.00	0.00	0.00
Stem density (stems ha^{-1})	10255	51	10306
Height ≥ 1.3 m	0	0	0
Height < 1.3 m	10255	51	10306
Mean tree height (m)	[c]n/a	n/a	n/a
Median tree height (m)	n/a	n/a	n/a
Biomass-weighted tree height (m)	n/a	n/a	n/a
Biomass (t ha^{-1})	0.0	0.0	0.0

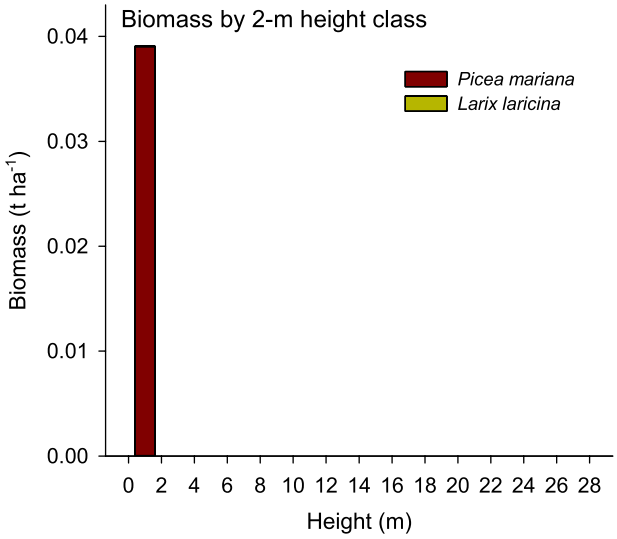
[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina*; [c]NA = not applicable.

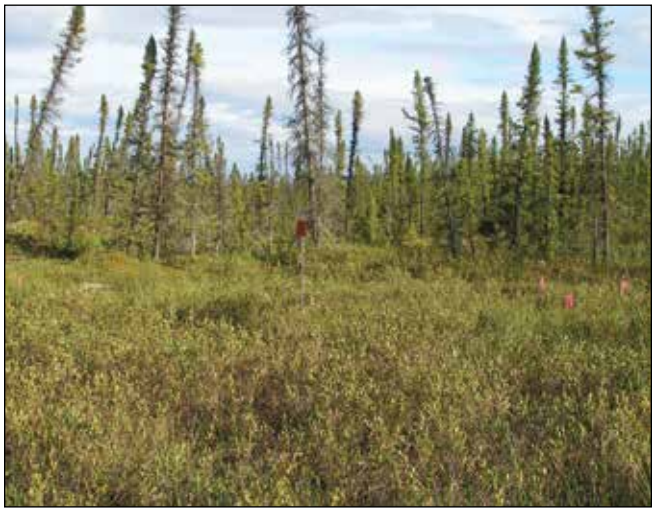
Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.



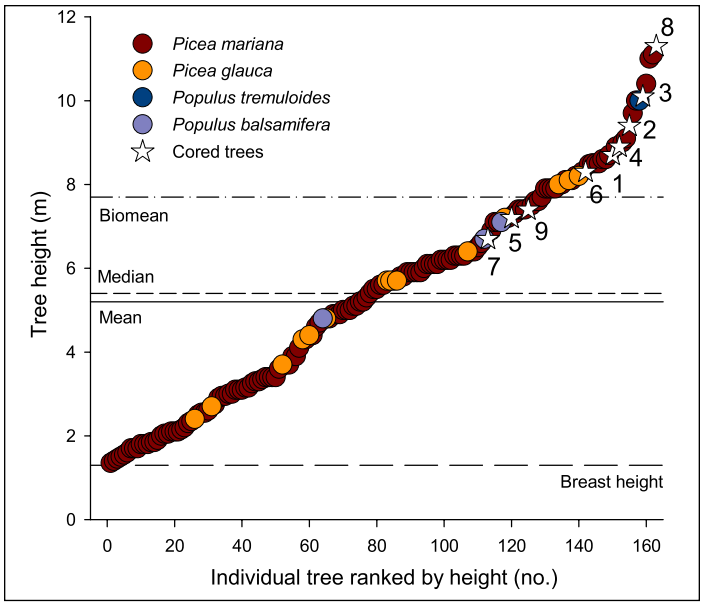




Plot WR 04 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 05 UD

Measurement date: 07-Aug-08
Latitude: 62° 15′ 26.6″N
Longitude: 122° 35′ 11.0″W
Plant community type (Boreal Highlands): d2.1 Aw-Sw-Sb/green alder



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	74
Small trees	d	100	99
Large trees	d	100	55

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

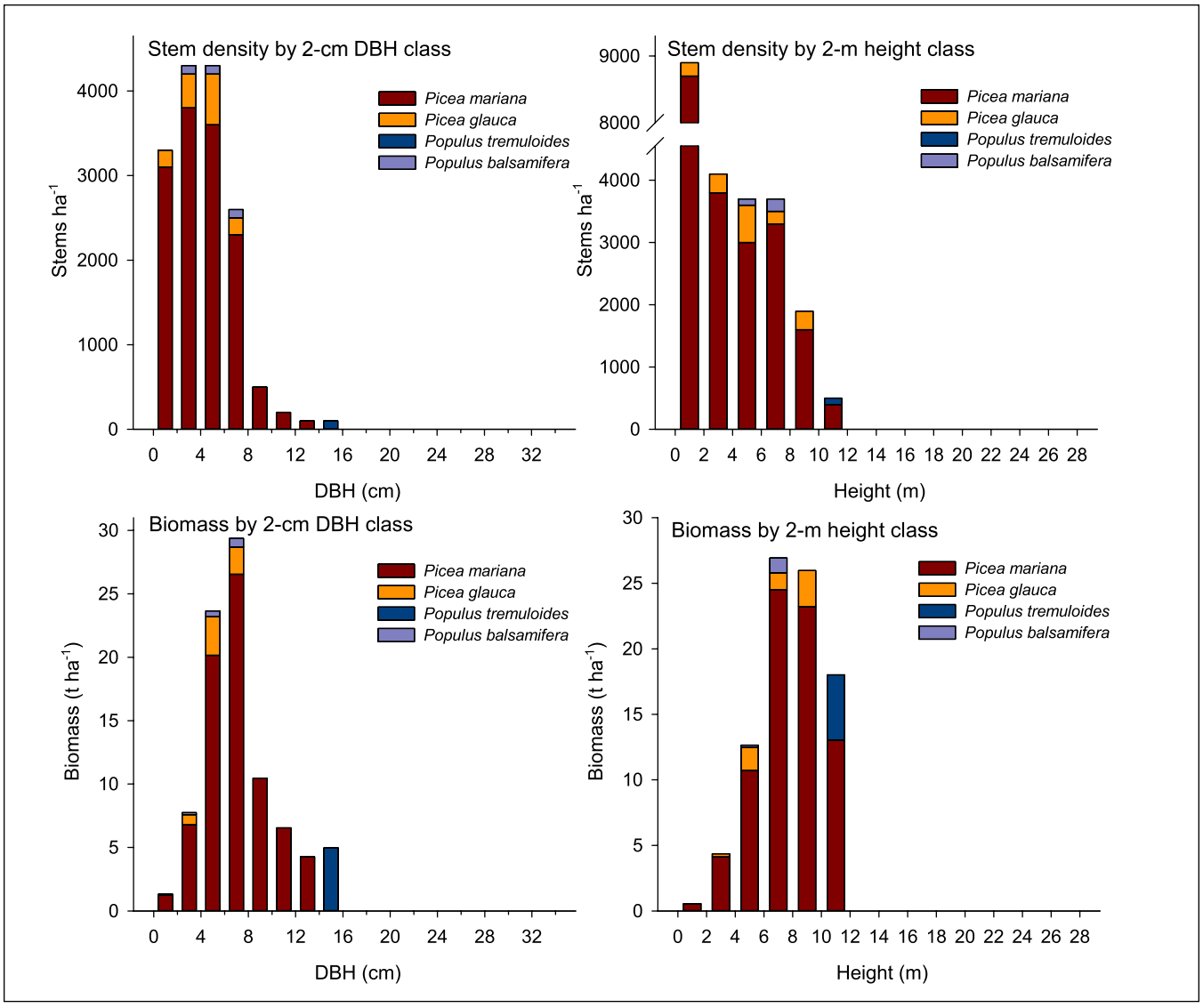
Parameter	Picemar[a]	Picegla[b]	Poputre[c]	Popubal[d]	Total
Basal area (m^2 ha^{-1})	24.81	2.19	1.74	0.65	29.39
Stem density (stems ha^{-1})	20800	1600	100	300	22800
Height ≥ 1.3 m	13600	1400	100	300	15400
Height < 1.3 m	7200	200	0	0	7400
Mean tree height (m)	5.1	5.5	10.0	6.2	5.2
Median tree height (m)	5.2	5.7	10.0	6.7	5.4
Biomass-weighted tree height (m)	7.7	6.8	10.0	6.7	7.7
Biomass (t ha^{-1})	76.2	6.1	5.0	1.3	88.5

[a]Picemar = *Picea mariana;* [b]Picegla = *Picea glauca*; [c]Poputre = *Populus tremuloides*; [d]Popubal = *Populus balsamifera.*

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	7.5	8.7	54
2	Picemar	8.4	9.4	52
3	Picemar	7.7	10.1	50
4	Picemar	8.5	8.9	55
5	Picemar	6.8	7.2	40
6	Picemar	7.3	8.3	53
7	Picemar	5.3	6.7	45
8	Picemar	12.2	11.3	54
9	Picemar	5.3	7.4	43

[a]Species: Picemar = *Picea mariana.*



Plot WR 05 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 05 PP

Measurement date: 05-Aug-08

Latitude: 62° 15′ 12.8″N

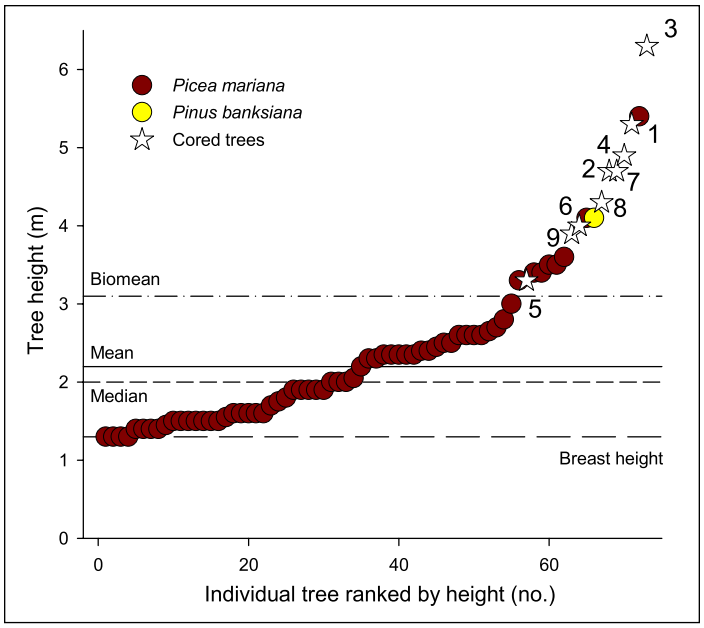
Longitude: 122° 35′ 59.6″W

Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	165
Small trees	d	100	63
Large trees	a b c d	400	4

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

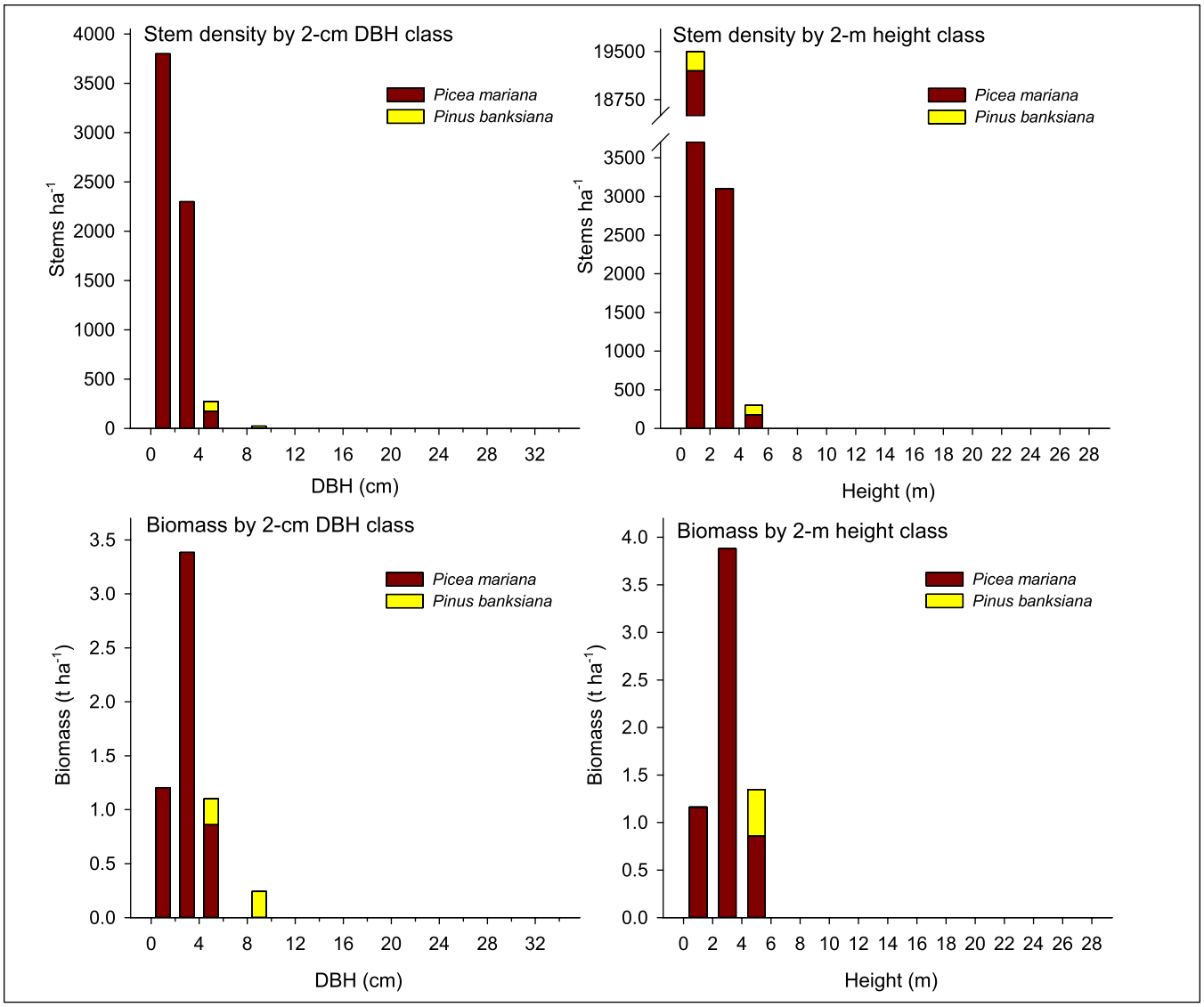
Parameter	Picemar[a]	Pinuban[b]	Total
Basal area (m^2 ha^{-1})	2.00	0.27	2.27
Stem density (stems ha^{-1})	22475	425	22900
Height ≥ 1.3 m	6275	125	6400
Height < 1.3 m	16200	300	16500
Mean tree height (m)	2.2	4.1	2.2
Median tree height (m)	2.0	4.1	2.0
Biomass-weighted tree height (m)	3.1	4.1	3.1
Biomass (t ha^{-1})	5.9	0.5	6.4

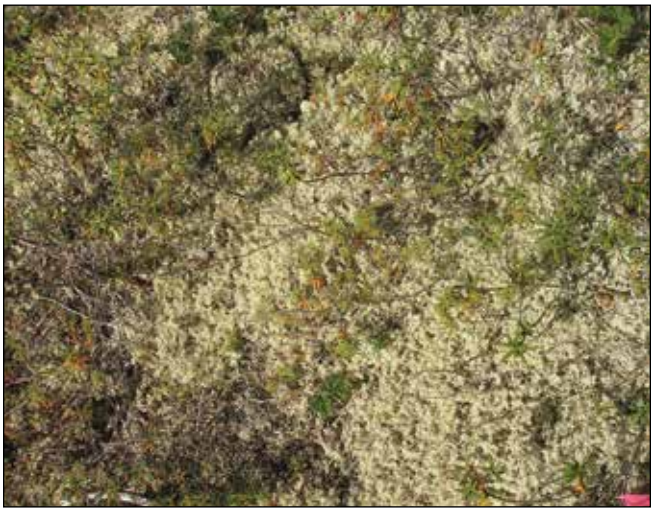
[a]Picemar = *Picea mariana;* [b]Pinuban = *Pinus banksiana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	5.8	5.3	37
2	Picemar	4.9	4.7	35
3	Picemar	7.4	6.3	36
4	Picemar	4.6	4.9	21
5	Picemar	3.3	3.3	27
6	Picemar	4.2	4.0	34
7	Picemar	5.7	4.7	35
8	Picemar	4.9	4.3	34
9	Picemar	4.1	3.9	38

[a]Species: Picemar = *Picea mariana*.





Plot WR 05 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 05 CS

Measurement date: 06-Aug-08
Latitude: 62° 15′ 11.1″N
Longitude: 122° 35′ 58.3″W
Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	267
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

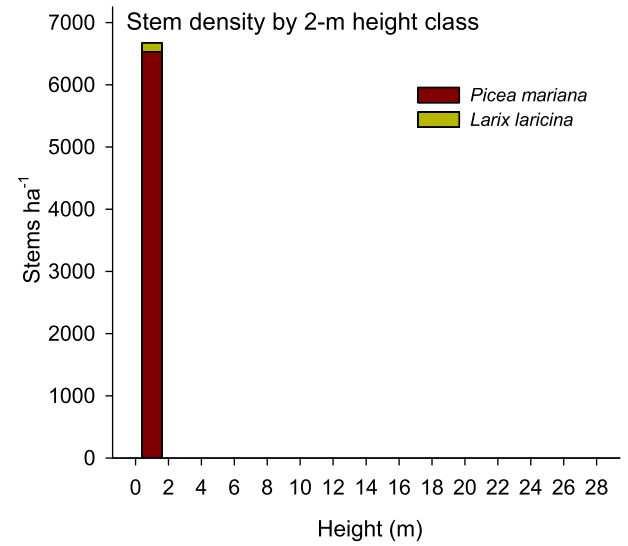
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	0.00	0.00	0.00
Stem density (stems ha^{-1})	6525	150	6675
Height ≥ 1.3 m	0	0	0
Height < 1.3 m	6525	150	6675
Mean tree height (m)	NA[c]	NA	NA
Median tree height (m)	NA	NA	NA
Biomass-weighted tree height (m)	NA	NA	NA
Biomass (t ha^{-1})	0.0	0.0	0.0

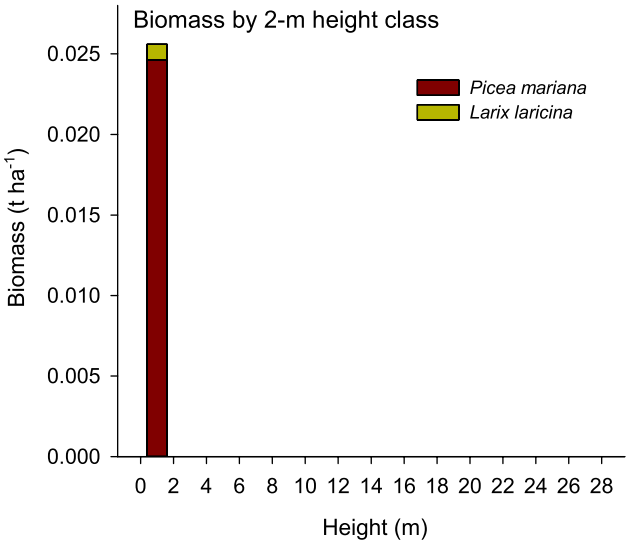
[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina*; [c]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.





Plot WR 05 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

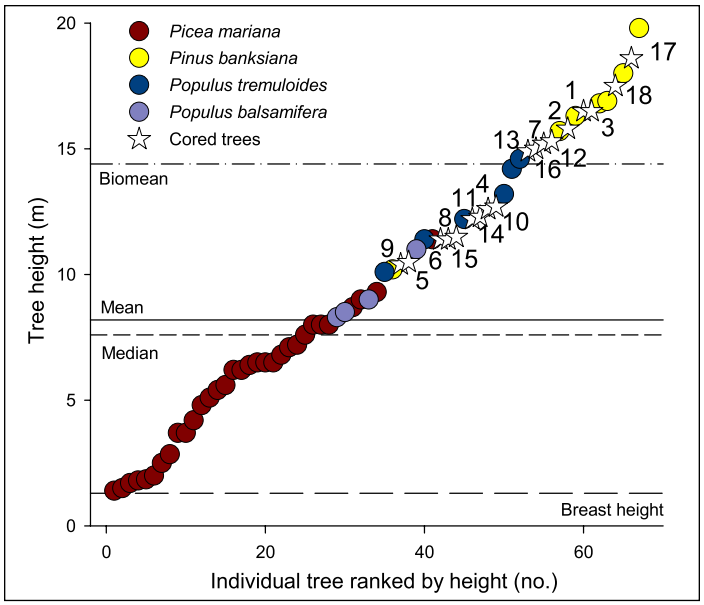
Plot: WR 06 UD

Measurement date: 14-Aug-08
Latitude: 62° 04′ 11.0″N
Longitude: 121° 21′ 14.3″W
Plant community type (Boreal Highlands): c1.2 Pj-Sb/ Labrador tea/feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	24
Small trees	a	100	20
Large trees	a b	200	51

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

Parameter	Picemar[a]	Pinuban[b]	Poputre[c]	Popubal[d]	Total
Basal area (m^2 ha^{-1})	7.12	13.21	3.41	1.52	25.25
Stem density (stems ha^{-1})	5300	900	500	250	6950
Height ≥ 1.3 m	3100	700	500	250	4550
Height < 1.3 m	2200	200	0	0	2400
Mean tree height (m)	5.5	16.2	12.6	9.2	8.2
Median tree height (m)	6.2	16.8	12.7	8.8	7.6
Biomass-weighted tree height (m)	8.1	17.0	13.2	9.5	14.4
Biomass (t ha^{-1})	22.8	55.5	11.1	3.8	93.2

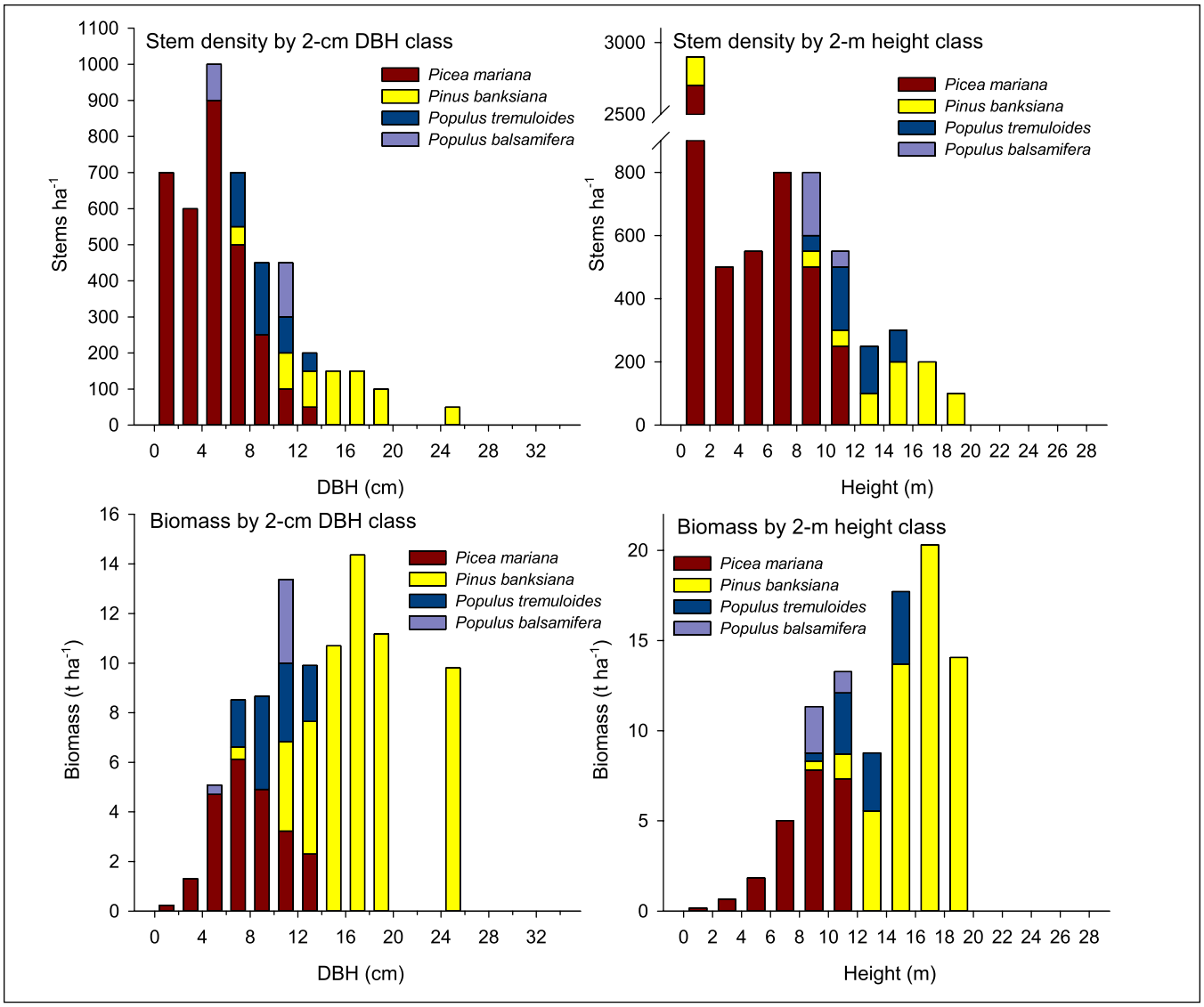
[a]Picemar = *Picea mariana;* [b]Pinuban = *Pinus banksiana*; [c]Poputre = *Populus tremuloides*; [d]Popubal = *Populus balsamifera.*

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Pinuban	12.6	16.5	52
2	Pinuban	15.0	15.8	55
3	Pinuban	16.4	16.5	60
4	Picemar	11.0	12.6	42
5	Picemar	10.1	10.5	44
6	Picemar	8.3	11.4	42
7	Pinuban	18.4	15.2	53
8	Picemar	11.1	11.4	43
9	Picemar	10.7	10.4	38

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
10	Picemar	10.3	12.7	35
11	Picemar	11.0	12.2	38
12	Pinuban	12.6	15.3	53
13	Pinuban	16.7	14.9	60
14	Picemar	12.4	12.3	40
15	Picemar	11.4	11.5	40
16	Pinuban	15.6	15.0	53
17	Pinuban	26.4	18.6	58
18	Pinuban	20.8	17.5	56

[a]Species: Pinuban = *Pinus banksiana*; Picemar = *Picea mariana.*



Plot WR 06 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

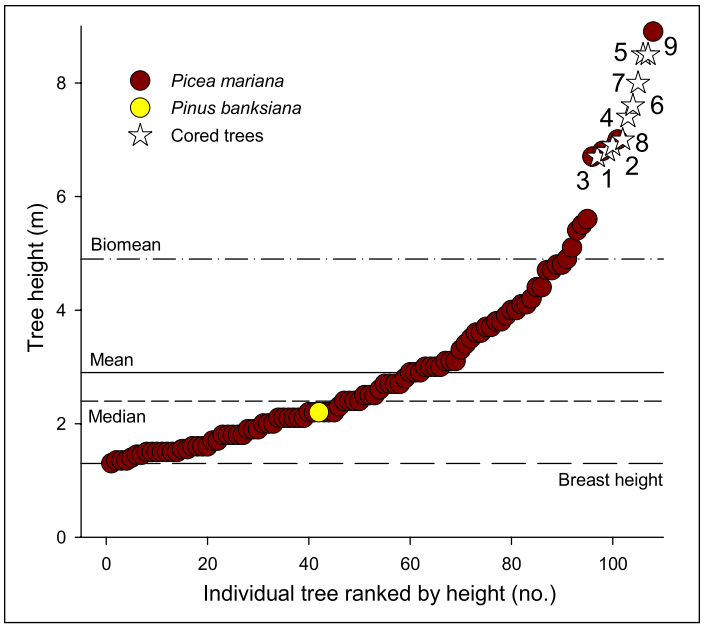
Plot: WR 06 PP

Measurement date: 15-Aug-08
Latitude: 62° 04′ 30.1″N
Longitude: 121° 21′ 20.3″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	322
Small trees	b	100	92
Large trees	a b c d	400	32

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

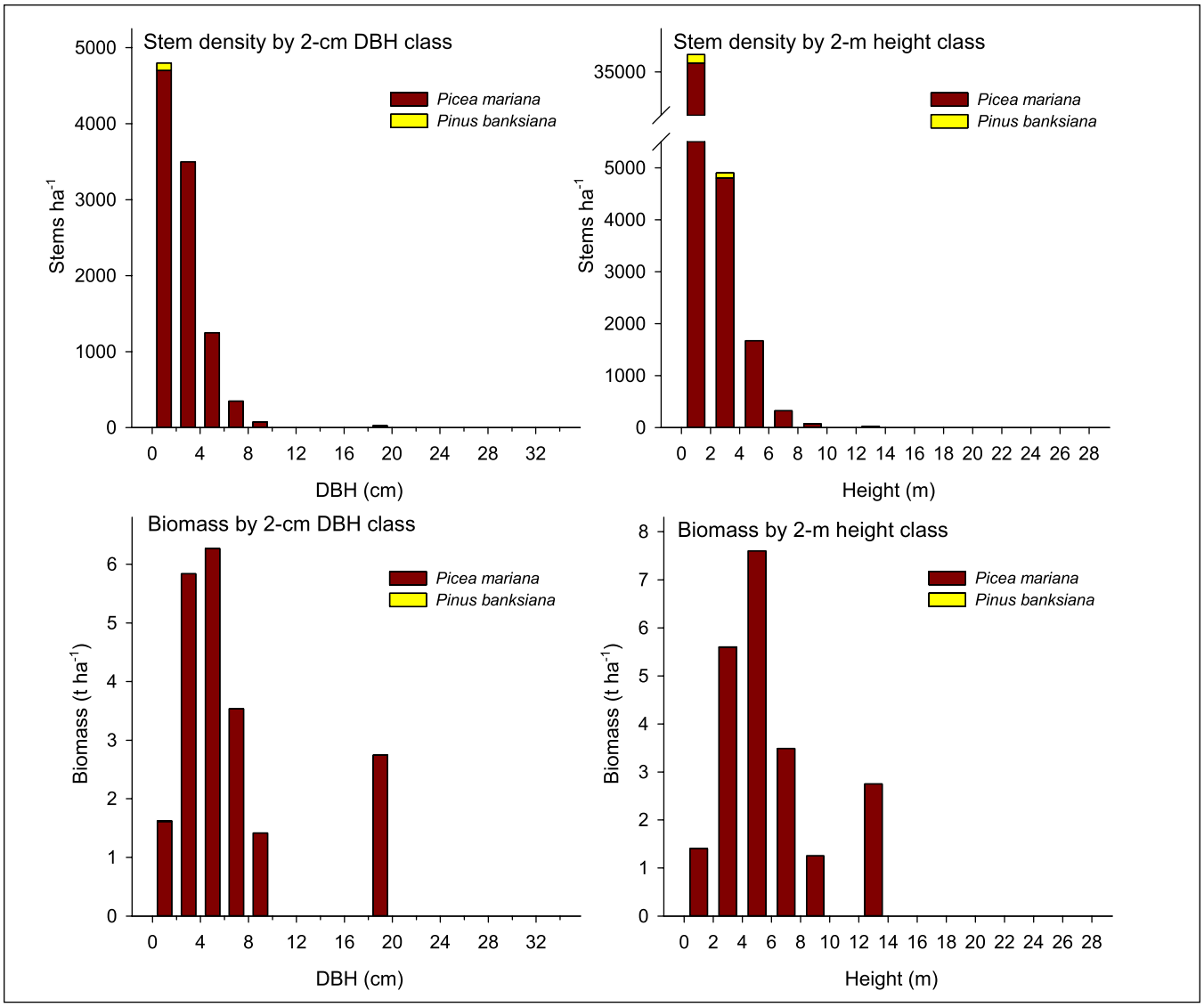
Parameter	Picemar[a]	Pinuban[b]	Total
Basal area (m^2 ha^{-1})	7.34	0.01	7.35
Stem density (stems ha^{-1})	42000	200	42200
Height ≥ 1.3 m	9900	100	10000
Height < 1.3 m	32100	100	32200
Mean tree height (m)	2.9	2.2	2.9
Median tree height (m)	2.5	2.2	2.4
Biomass-weighted tree height (m)	4.9	2.2	4.9
Biomass (t ha^{-1})	22.1	0.0	22.1

[a]Picemar = *Picea mariana;* [b]Pinuban = *Pinus banksiana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	6.9	6.8	43
2	Picemar	6.8	6.9	48
3	Picemar	6.3	6.7	46
4	Picemar	7.6	7.4	46
5	Picemar	8.7	8.5	51
6	Picemar	7.5	7.6	51
7	Picemar	8.5	8.0	46
8	Picemar	7.5	7.0	41
9	Picemar	10.2	8.5	42

[a]Species: Picemar = *Picea mariana*.



Plot WR 06 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 06 CS

Measurement date: 14-Aug-08
Latitude: 62° 04′ 37.1″N
Longitude: 121° 21′ 22.1″W
Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	171
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

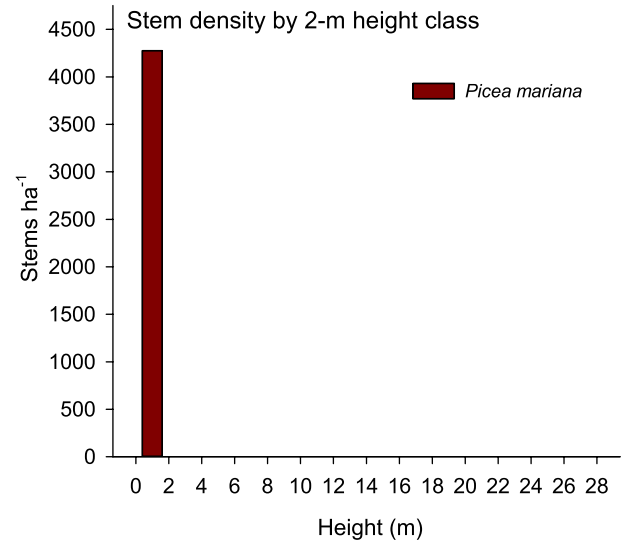
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	4275	4275
Height ≥ 1.3 m	0	0
Height < 1.3 m	4275	4275
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.0	0.0

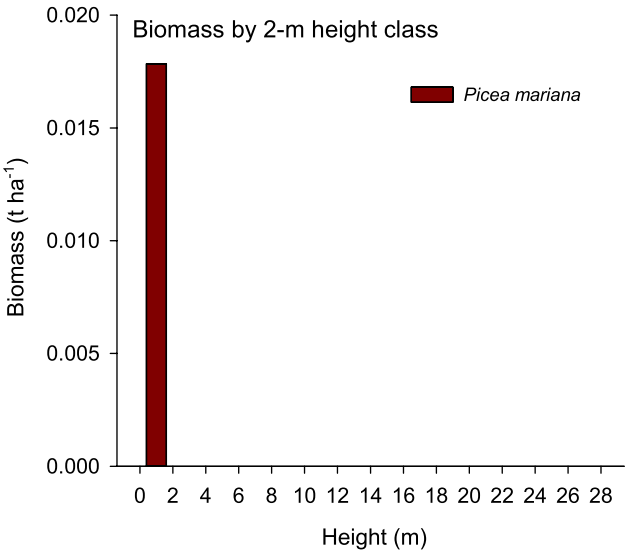
[a]Picemar = *Picea mariana*; [b]NA = not applicable.

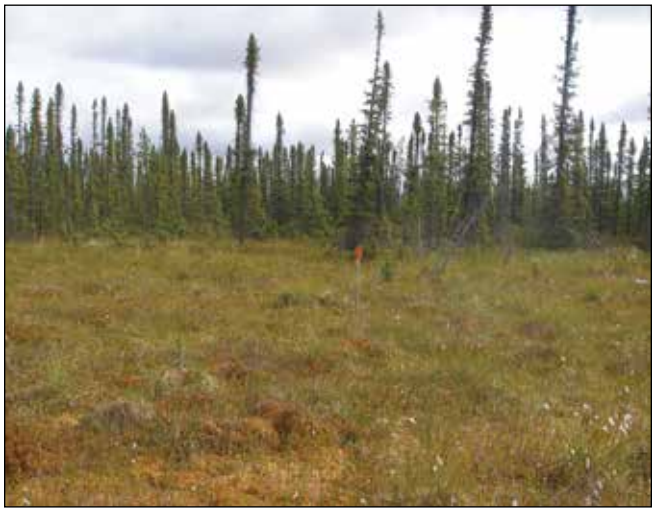
Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.







Plot WR 06 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

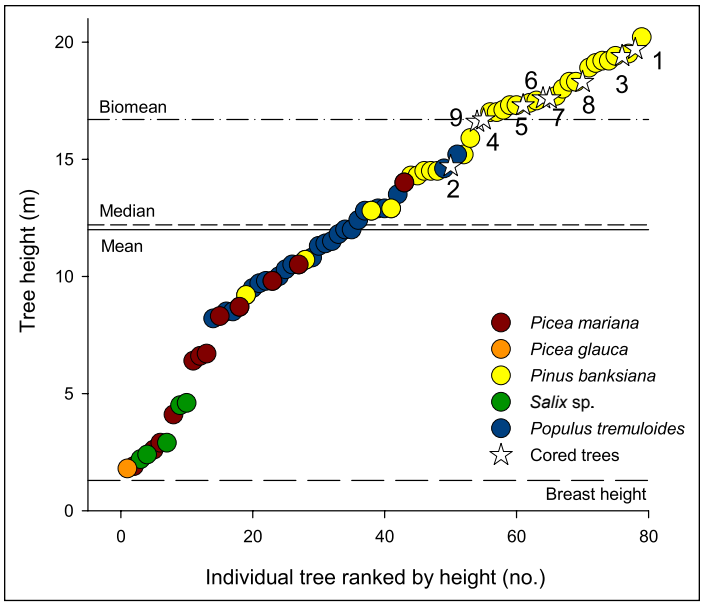
Plot: WR 07 UD

Measurement date: 18-Aug-08
Latitude: 62° 01′ 39.1″N
Longitude: 121° 21′ 26.9″W
Plant community type (Boreal Highlands): c1.2 Pj-Sb/ feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a d	200	45
Small trees	a d	200	13
Large trees	a d	200	57

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

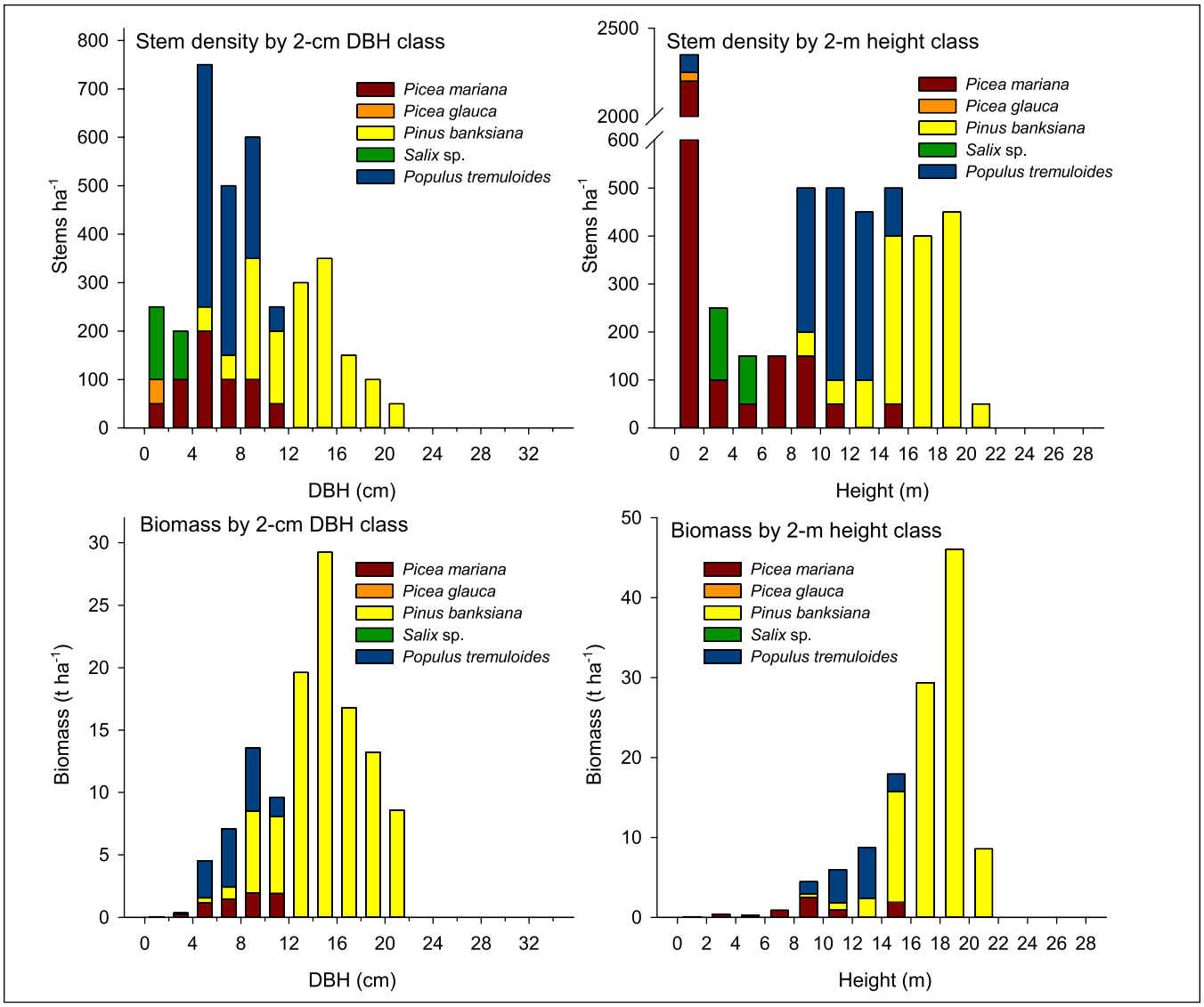
Parameter	Picemar[a]	Picegla[b]	Pinuban[c]	Poputre[d]	Salix[e]	Total
Basal area (m^2 ha^{-1})	1.98	0.01	21.57	4.58	0.10	28.24
Stem density (stems ha^{-1})	2750	50	1450	1250	250	5750
Height ≥ 1.3 m	600	50	1450	1150	250	3500
Height < 1.3 m	2150	0	0	100	0	2250
Mean tree height (m)	6.9	1.8	16.5	11.3	3.3	12.0
Median tree height (m)	6.7	1.8	17.3	11.4	2.9	12.2
Biomass-weighted tree height (m)	9.8	1.8	17.8	12.2	4.3	16.7
Biomass (t ha^{-1})	6.8	0.0	101.5	14.3	0.1	122.7

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Pinuban = *Pinus banksiana*; [d]Poputre = *Populus tremuloides*; [e]Salix = *Salix* sp.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Pinuban	23.5	19.7	62
2	Pinuban	11.9	14.7	59
3	Pinuban	14.3	19.4	65
4	Pinuban	15.7	16.7	66
5	Pinuban	19.0	17.3	62
6	Pinuban	16.1	17.6	57
7	Pinuban	11.2	17.6	66
8	Pinuban	17.9	18.3	65
9	Pinuban	17.3	16.6	63

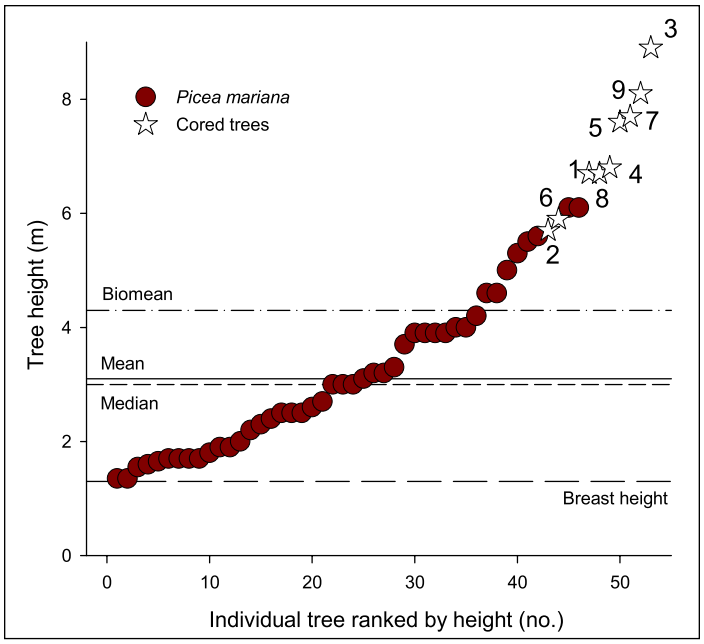
[a]Species: Pinuban = *Pinus banksiana*.



Plot WR 07 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 07 PP

Measurement date: 17-Aug-08
Latitude: 62° 01′ 50.9″N
Longitude: 121° 21′ 26.8″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	c	100	82
Small trees	b c	200	38
Large trees	a b c d	400	16

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

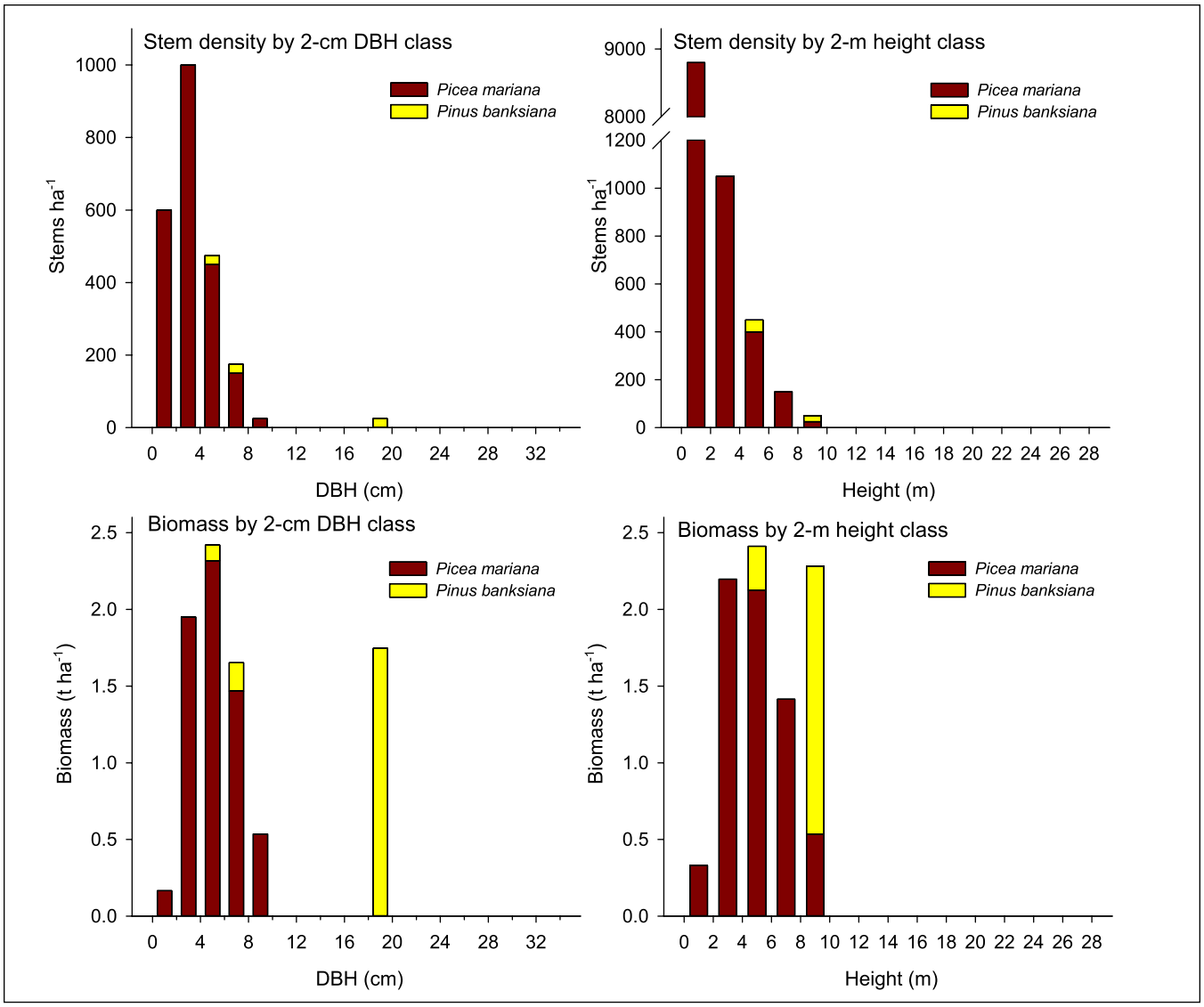
Parameter	Picemar[a]	Pinuban[b]	Total
Basal area (m^2 ha^{-1})	2.28	0.79	3.07
Stem density (stems ha^{-1})	10425	75	10500
Height ≥ 1.3 m	2225	75	2300
Height < 1.3 m	8200	0	8200
Mean tree height (m)	3.1	NA[c]	3.1
Median tree height (m)	3.0	NA	3.0
Biomass-weighted tree height (m)	4.3	NA	4.3
Biomass (t ha^{-1})	6.6	2.0	8.6

[a]Picemar = *Picea mariana;* [b]Pinuban = *Pinus banksiana*; [c]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	6.4	6.7	45
2	Picemar	6.0	5.7	33
3	Picemar	10.1	8.9	52
4	Picemar	8.4	6.8	43
5	Picemar	7.3	7.6	49
6	Picemar	6.5	5.9	35
7	Picemar	7.0	7.7	46
8	Picemar	10.1	6.7	58
9	Picemar	8.5	8.1	53

[a]Species: Picemar = *Picea mariana*.



Plot WR 07 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: WR 07 CS

Measurement date: 17-Aug-08

Latitude: 62° 01′ 54.2″N

Longitude: 121° 21′ 25.9″W

Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	825
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

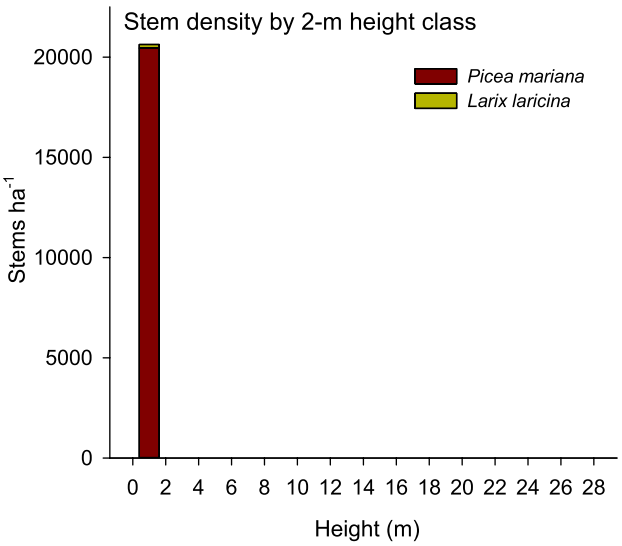
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	0.00	0.00	0.00
Stem density (stems ha^{-1})	20450	175	20625
Height ≥ 1.3 m	0	0	0
Height < 1.3 m	20450	175	20625
Mean tree height (m)	NA[c]	NA	NA
Median tree height (m)	NA	NA	NA
Biomass-weighted tree height (m)	NA	NA	NA
Biomass (t ha^{-1})	0.1	0.0	0.1

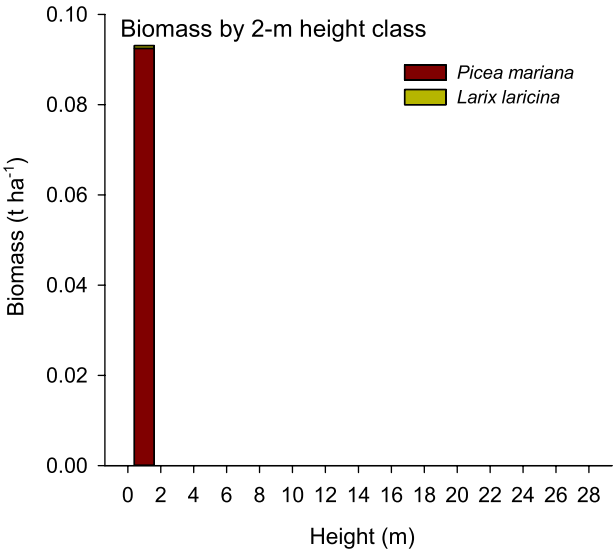
[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina*; [c]NA = not applicable.

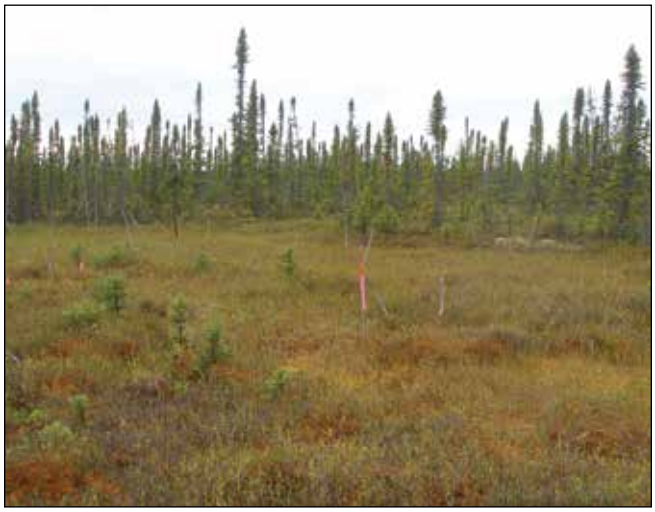
Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.





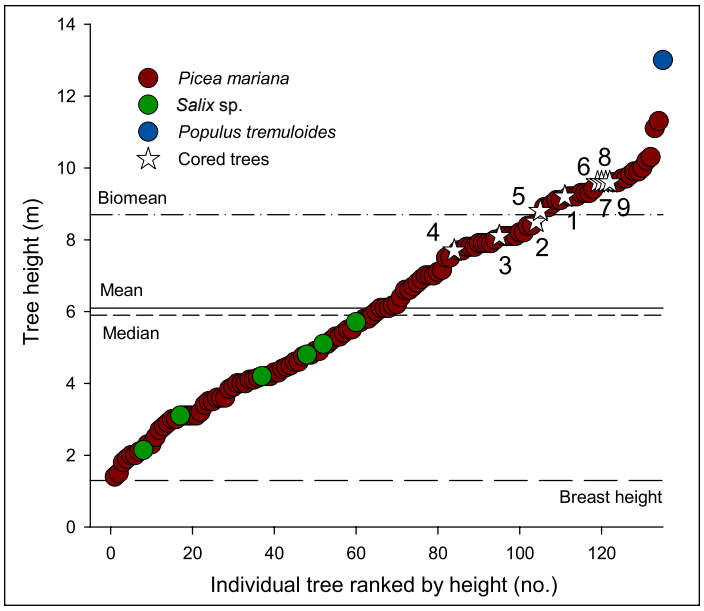


Plot WR 07 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

FORT SIMPSON AREA SITES

Plot: FS IPY UD

Measurement date: 07-Aug-08
Latitude: 61° 38′ 15.1″N
Longitude: 121° 23′ 51.2″W
Plant community type (Boreal Mixedwood): g1.2 Sb-Pj/feather moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3	75	0
Small trees	1 2 3	75	71
Large trees	1 2 3	75	55

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.

Stand values

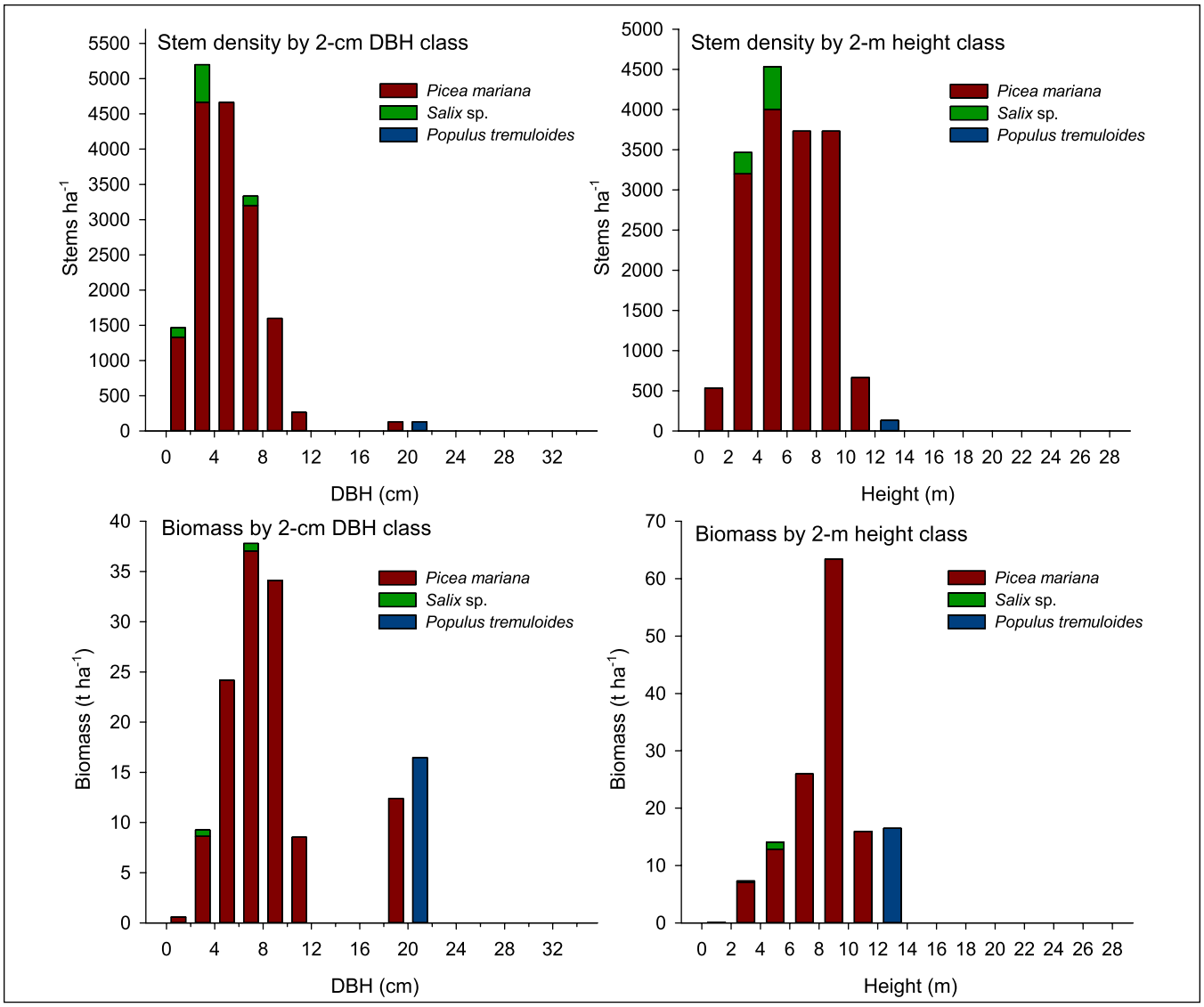
Parameter	Picemar[a]	Poputre[b]	Salix[c]	Total
Basal area (m^2 ha^{-1})	39.25	4.66	0.87	44.78
Stem density (stems ha^{-1})	15867	133	800	16800
Height ≥ 1.3 m	15867	133	800	16800
Height < 1.3 m	0	0	0	0
Mean tree height (m)	6.1	13.0	4.2	6.1
Median tree height (m)	6.1	13.0	4.5	5.9
Biomass-weighted tree height (m)	8.2	13.0	5.0	8.7
Biomass (t ha^{-1})	125.5	16.5	1.4	143.3

[a]Picemar = *Picea mariana*; [b]Poputre = *Populus tremuloides*; [c]Salix = *Salix* sp.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height[b] (m)	Age (yr)
1	Picemar	9.7	9.2	80
2	Picemar	8.2	8.5	72
3	Picemar	8.3	8.1	79
4	Picemar	6.8	7.7	71
5	Picemar	7.1	8.8	80
6	Picemar	15.0	9.6	90
7	Picemar	15.2	9.6	101
8	Picemar	15.4	9.6	102
9	Picemar	17.1	9.6	83

[a]Species: Picemar = *Picea mariana*. [b]Height estimated from similarly sized plot trees.



Plot FS IPY UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

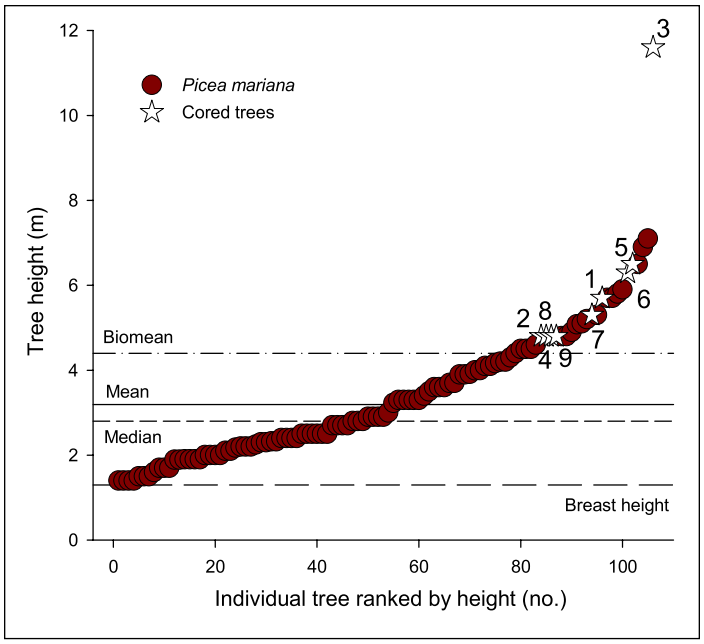
Plot: FS IPY PP

Measurement date: 07-Aug-08
Latitude: 61° 38′ 13.2″N
Longitude: 121° 23′ 57.0″W
Plant community type (Boreal Mixedwood): i1.1 Sb/ Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3	75	21
Small trees	1 2 3	75	84
Large trees	1 2 3	75	13

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

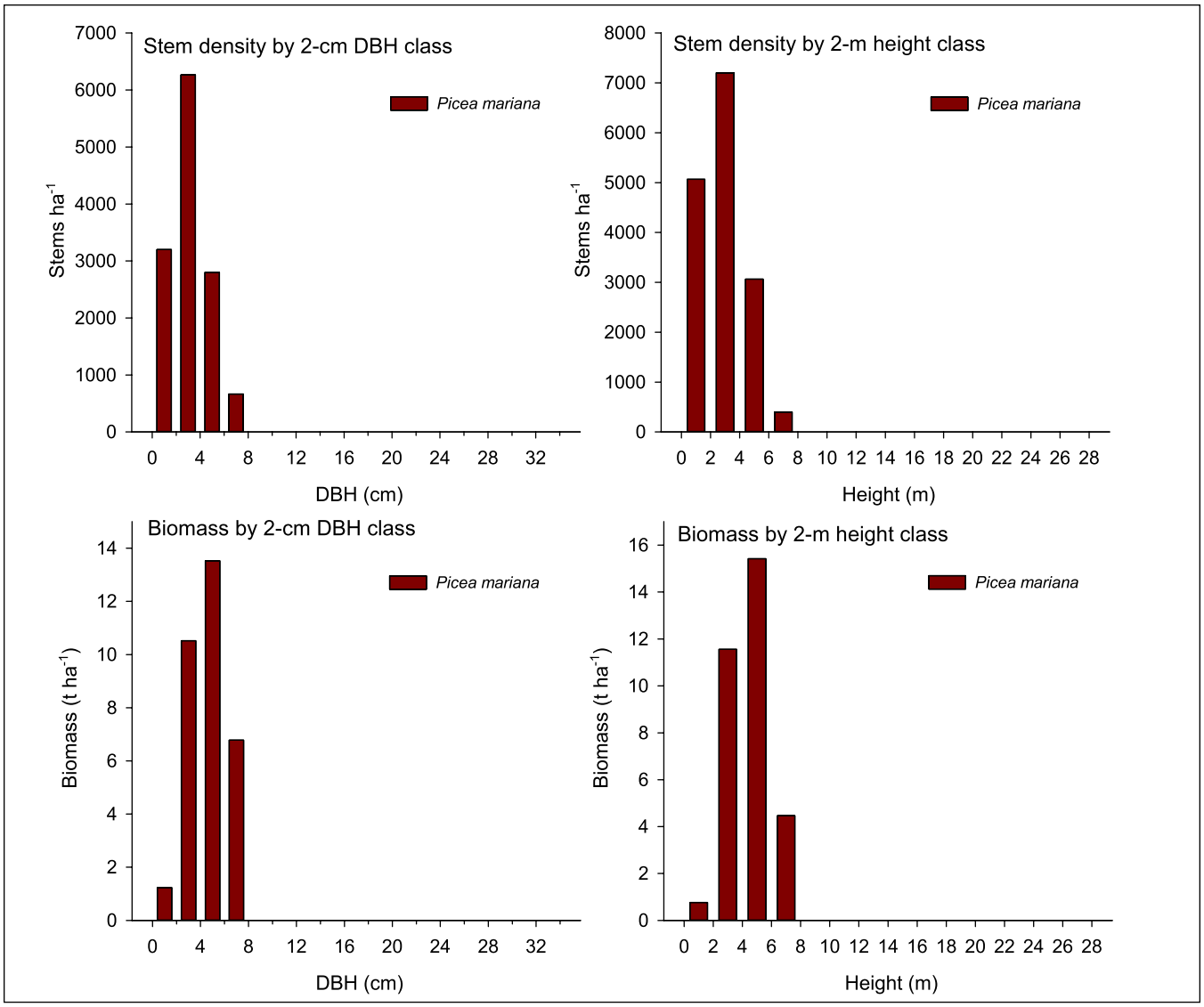
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	11.63	11.63
Stem density (stems ha^{-1})	15733	15733
Height ≥ 1.3 m	12933	12933
Height < 1.3 m	2800	2800
Mean tree height (m)	3.2	3.2
Median tree height (m)	2.8	2.8
Biomass-weighted tree height (m)	4.4	4.4
Biomass (t ha^{-1})	32.2	32.2

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height[b] (m)	Age (yr)
1	Picemar	6.0	5.7	81
2	Picemar	4.7	4.8	76
3	Picemar	11.2	11.6	105
4	Picemar	4.7	4.8	67
5	Picemar	8.2	6.5	89
6	Picemar	6.1	6.3	71
7	Picemar	6.4	5.3	78
8	Picemar	5.0	4.8	71
9	Picemar	4.7	4.8	72

[a]Species: Picemar = *Picea mariana*; [b]Height estimated from similarly sized plot trees.



Plot FS IPY PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS IPY CS

Measurement date: 07-Aug-08
Latitude: 61° 38′ 10.4″N
Longitude: 121° 23′ 51.7″W
Plant community type (Boreal Mixedwood): i2.1 black spruce-Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Sup-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	100	0
Small trees	1 2 3 4	100	0
Large trees	1 2 3 4	100	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.

Stand values

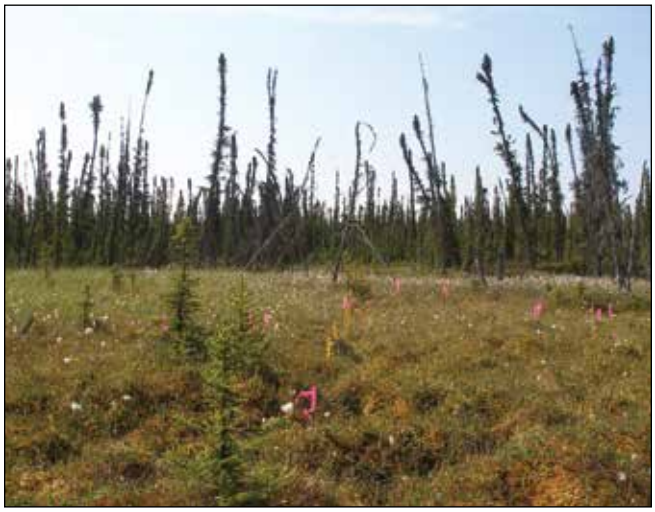
Parameter	Total
Basal area (m^2 ha^{-1})	0.00
Stem density (stems ha^{-1})	0
Height ≥ 1.3 m	0
Height < 1.3 m	0
Mean tree height (m)	NA[a]
Median tree height (m)	NA
Biomass-weighted tree height (m)	NA
Biomass (t ha^{-1})	0.0

[a]NA = not applicable.

Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees were present in the plot.



Plot photographs illustrating the stand structure and understory composition for plot FS IPY CS.

Plot: FS 02 UD

Measurement date: 02-Jul-07, 03-Jul-07

Latitude: 61° 38′ 22.3″N

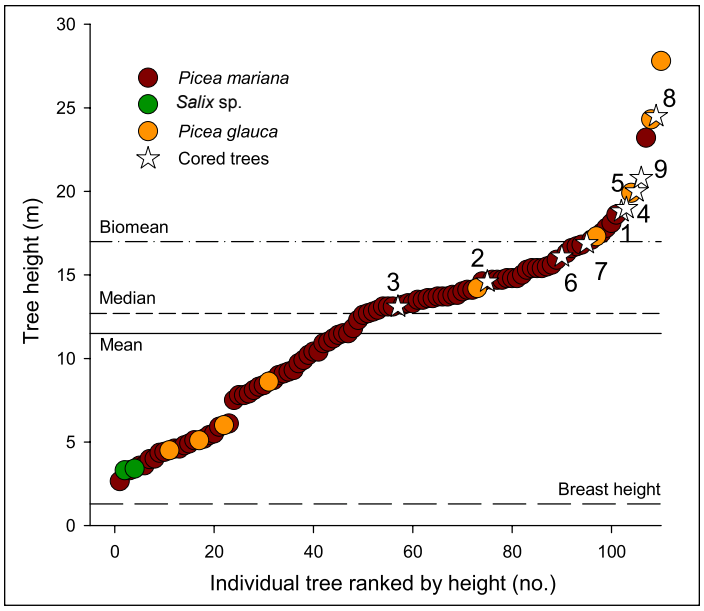
Longitude: 121° 24′ 20.2″W

Plant community type (Boreal Mixedwood): h1.1 Sw-Sb/Labrador tea/horsetail

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	280
Small trees	a b c d	400	19
Large trees	a b c d	400	82

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

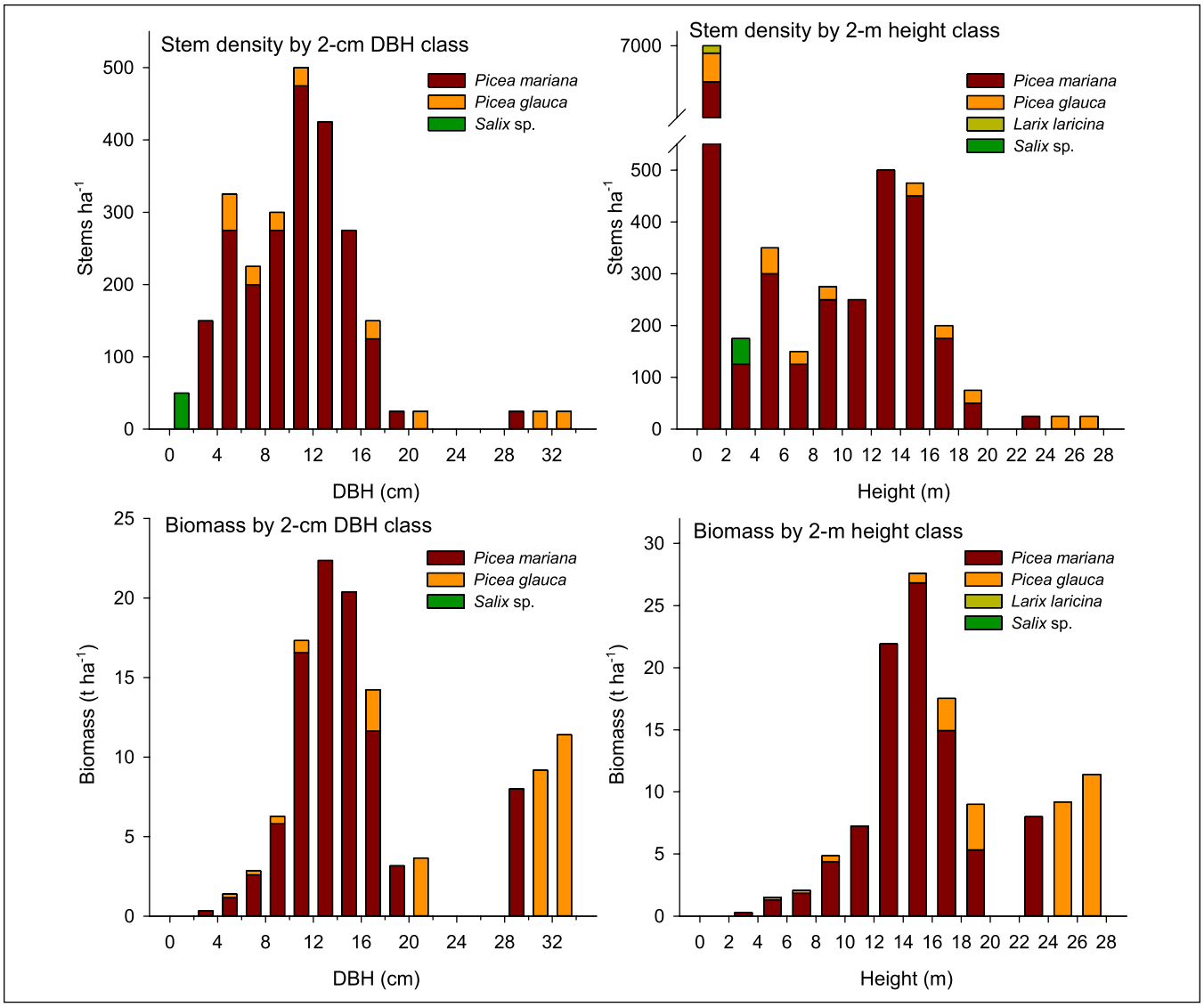
Parameter	Picemar[a]	Picegla[b]	Larilar[c]	Salix[d]	Total
Basal area (m^2 ha^{-1})	22.95	6.02	0.00	0.01	28.98
Stem density (stems ha^{-1})	9125	325	25	50	9525
Height ≥ 1.3 m	2250	225	0	50	2525
Height < 1.3 m	6875	100	25	0	7000
Mean tree height (m)	11.4	14.2	NA[e]	3.4	11.5
Median tree height (m)	12.8	14.2	NA	3.4	12.7
Biomass-weighted tree height (m)	14.9	23.7	NA	3.3	17.0
Biomass (t ha^{-1})	92.1	28.5	0.0	0.0	120.6

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Larilar = *Larix laricina*; [d]Salix = *Salix* sp; [e]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picegla	26.6	18.8	150
2	Picegla	19.5	14.6	150
3	Picemar	16.1	13.1	136
4	Picegla	21.4	19	133
5	Picegla	25.9	20	148
6	Picemar	14.9	16.1	152
7	Picemar	18.5	16.9	142
8	Picegla	34	24.5	146
9	Picemar	22	20.8	152

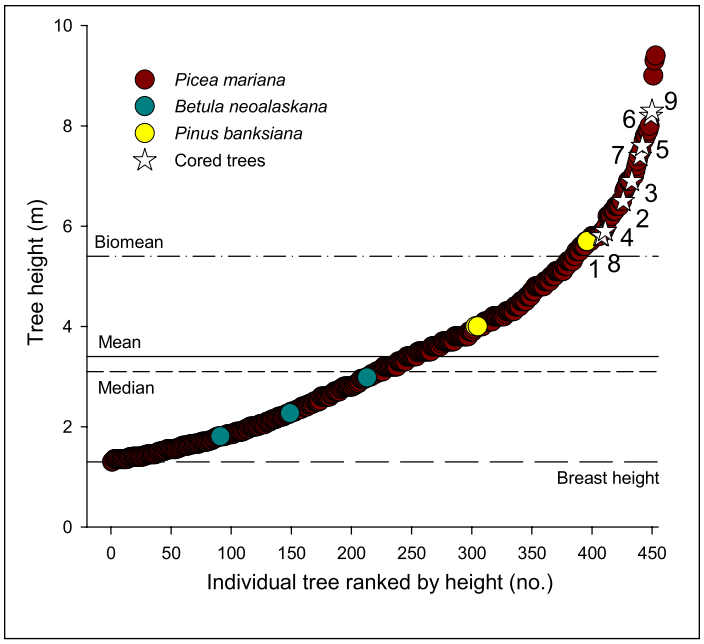
[a]Species: Picegla = *Picea glauca;* Picemar = *Picea mariana.*



Plot FS 02 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 02 PP

Measurement date: 28-Jun-07, 29-Jun-07, 30-Jun-07
Latitude: 61° 38′ 29.1″N
Longitude: 121° 24′ 23.3″W
Plant community type (Boreal Mixedwood): i1.1 Sb/ Labrador tea/cloudberry/peat moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	312
Small trees	a b c d	400	374
Large trees	a b c d	400	70

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

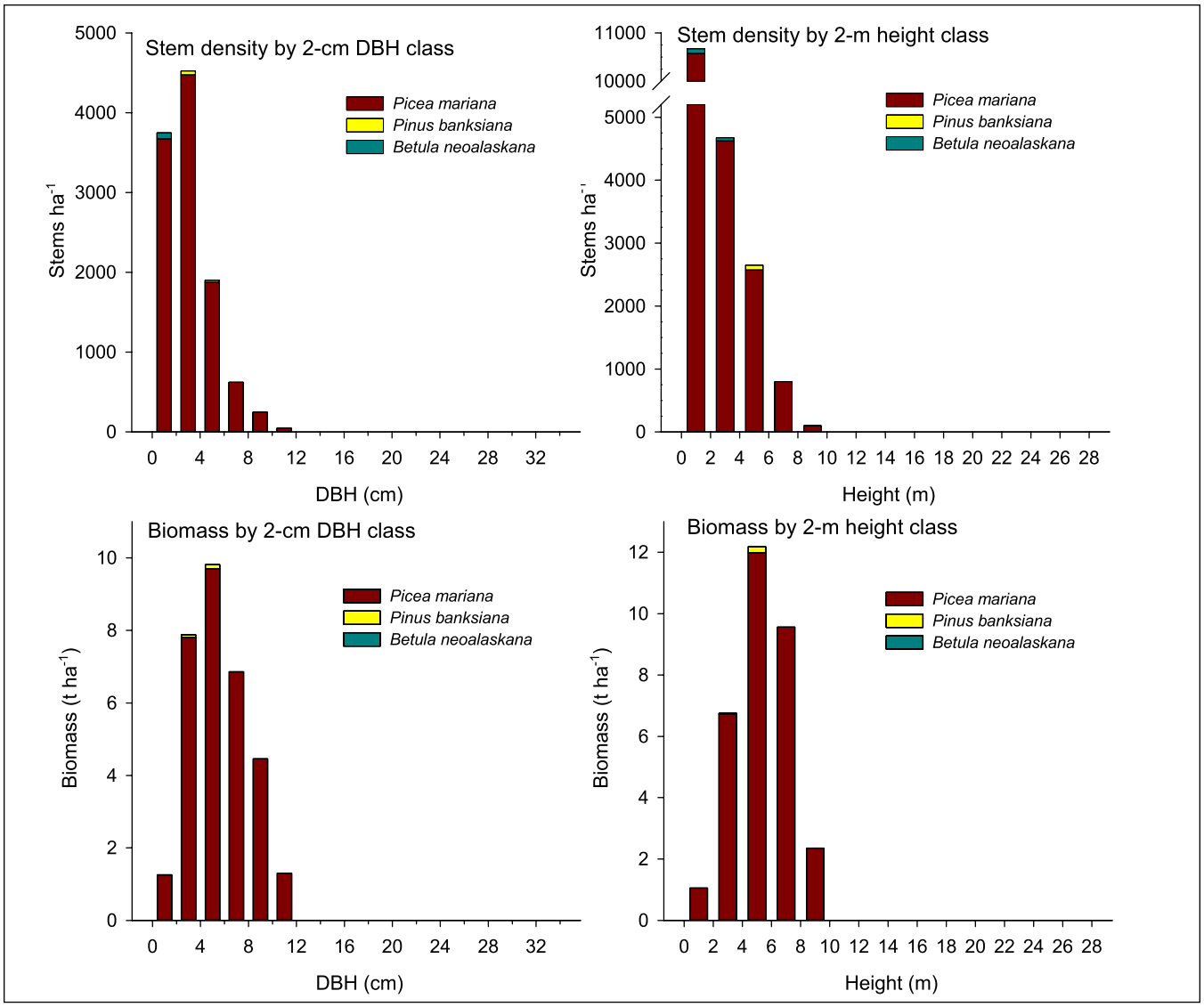
Parameter	Picemar[a]	Pinuban[b]	Betuneo[c]	Total
Basal area (m^2 ha^{-1})	11.04	0.10	0.01	11.15
Stem density (stems ha^{-1})	18675	75	150	18900
Height ≥ 1.3 m	10950	75	75	11100
Height < 1.3 m	7725	0	75	7800
Mean tree height (m)	3.4	4.6	2.4	3.4
Median tree height (m)	3.1	4.0	2.3	3.1
Biomass-weighted tree height (m)	5.4	5.0	2.5	5.4
Biomass (t ha^{-1})	31.7	0.2	0.0	31.9

[a]Picemar = *Picea mariana*; [b]Pinuban = *Pinus banksiana*; [c]Betuneo = *Betula neoalaskana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	6.6	5.8	58
2	Picemar	6.9	6.5	66
3	Picemar	7.8	6.9	62
4	Picemar	6.4	5.9	62
5	Picemar	8.3	7.6	66
6	Picemar	10.1	8.2	69
7	Picemar	7.6	7.4	65
8	Picemar	7.3	5.8	63
9	Picemar	6.8	8.3	68

[a]Species: Picemar = *Picea mariana*.



Plot FS 02 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

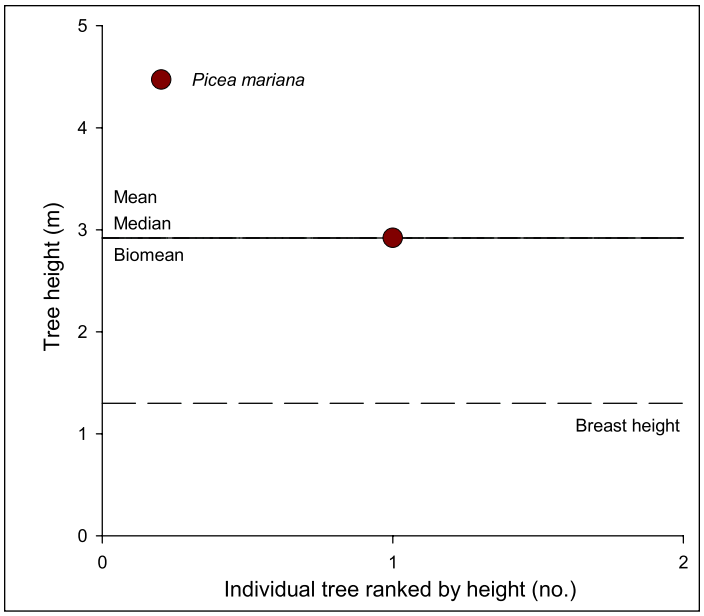
Plot: FS 02 CS

Measurement date: 25-Jun-07

Latitude: 61° 38′ 32.1″N

Longitude: 121° 24′ 24.2″W

Plant community type (Boreal Mixedwood): i2.1 black spruce-Labrador tea/cloudberry/peat moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	30
Small trees	a b c d	400	1
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

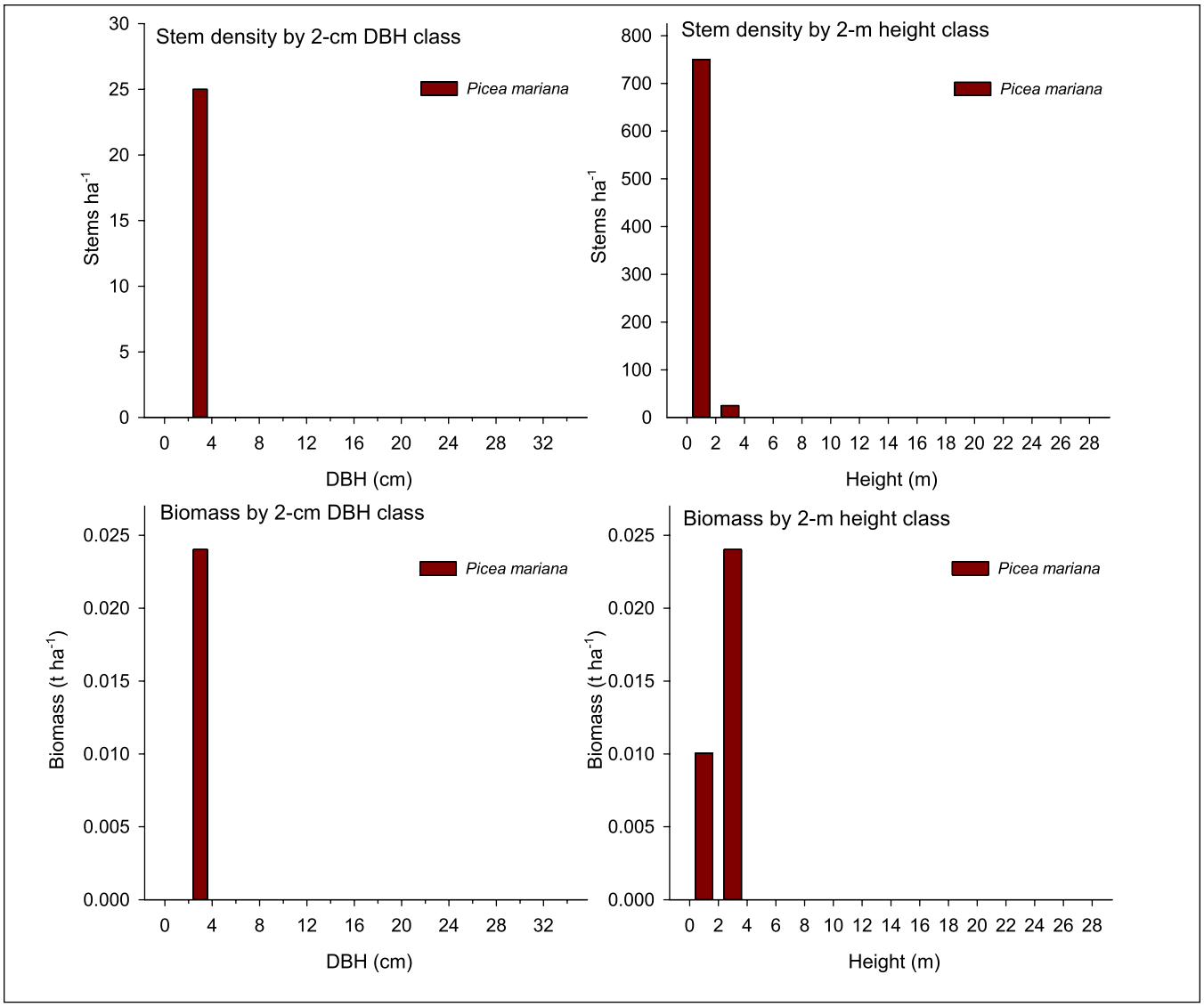
Stand values

Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.01	0.01
Stem density (stems ha^{-1})	775	775
Height ≥ 1.3 m	25	25
Height < 1.3 m	750	750
Mean tree height (m)	2.9	2.9
Median tree height (m)	2.9	2.9
Biomass-weighted tree height (m)	2.9	2.9
Biomass (t ha^{-1})	0.0	0.0

[a]Picemar = *Picea mariana*.

Cored trees

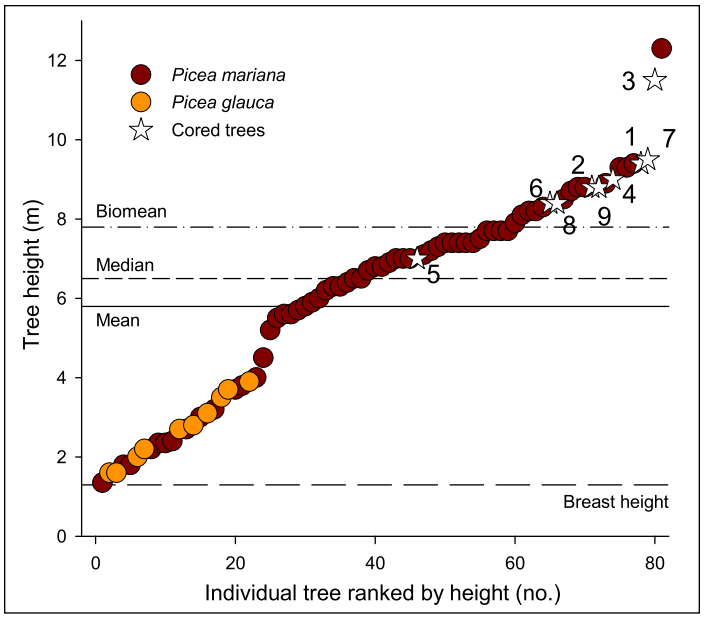
Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				



Plot FS 02 CS stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 03 UD

Measurement date: 15-Jul-08
Latitude: 60° 56′ 28.4″N
Longitude: 117° 22′ 59.3″W
Plant community type (Boreal Mixedwood): h1.2 Sw-Sb/Labrador tea/feather moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	231
Small trees	a	100	30
Large trees	a	100	42

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

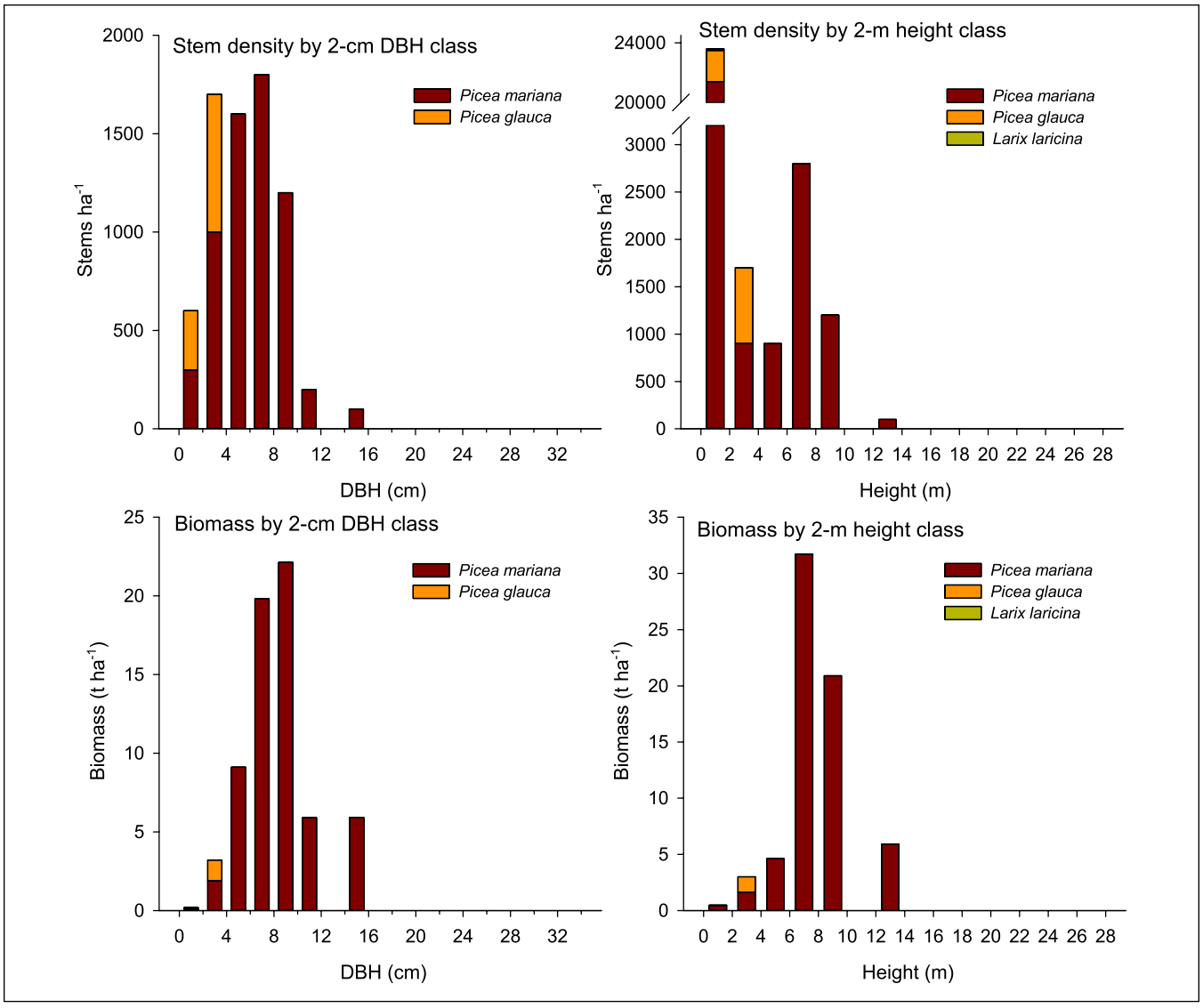
Parameter	Picemar[a]	Picegla[b]	Larilar[c]	Total
Basal area (m^2 ha^{-1})	20.78	0.54	0.00	21.32
Stem density (stems ha^{-1})	27300	2900	100	30300
Height ≥ 1.3 m	6200	1000	0	7200
Height < 1.3 m	21100	1900	100	23100
Mean tree height (m)	6.3	2.7	NA[d]	5.8
Median tree height (m)	6.9	2.8	NA	6.5
Biomass-weighted tree height (m)	7.9	3.1	NA	7.8
Biomass (t ha^{-1})	65.2	1.4	0.0	66.7

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Larilar = *Larix laricina*; [d]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	11.2	9.4	137
2	Picemar	12.0	8.8	121
3	Picemar	11.8	11.5	140
4	Picemar	9.4	9.0	139
5	Picemar	7.8	7.0	133
6	Picemar	8.7	8.4	140
7	Picemar	9.0	9.5	141
8	Picemar	11.0	8.4	145
9	Picemar	9.5	8.8	136

[a]Species: Picemar = *Picea mariana*.



Plot FS 03 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

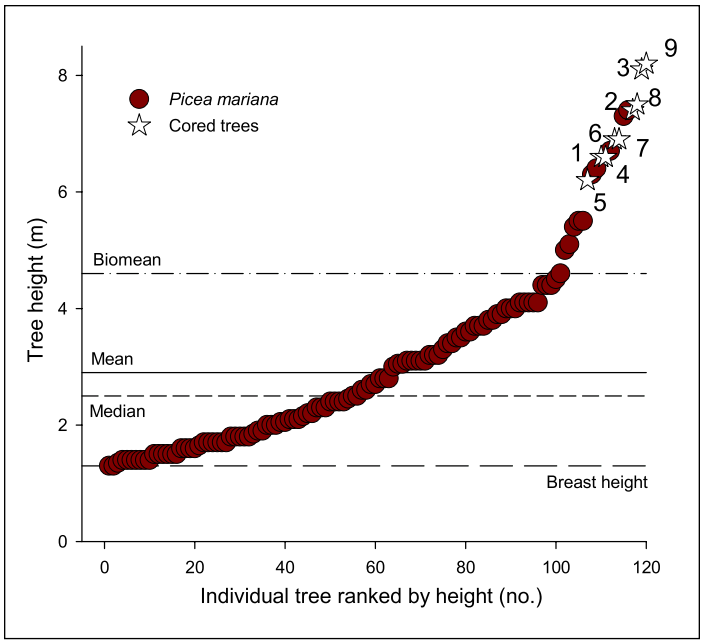
Plot: FS 03 PP

Measurement date: 14-Jul-08
Latitude: 60° 56′ 26″N
Longitude: 117° 21′ 52.7″W
Plant community type (Boreal Mixedwood): i1.1 Sb/ Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b	100	139
Small trees	b	100	103
Large trees	a b c d	400	39

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

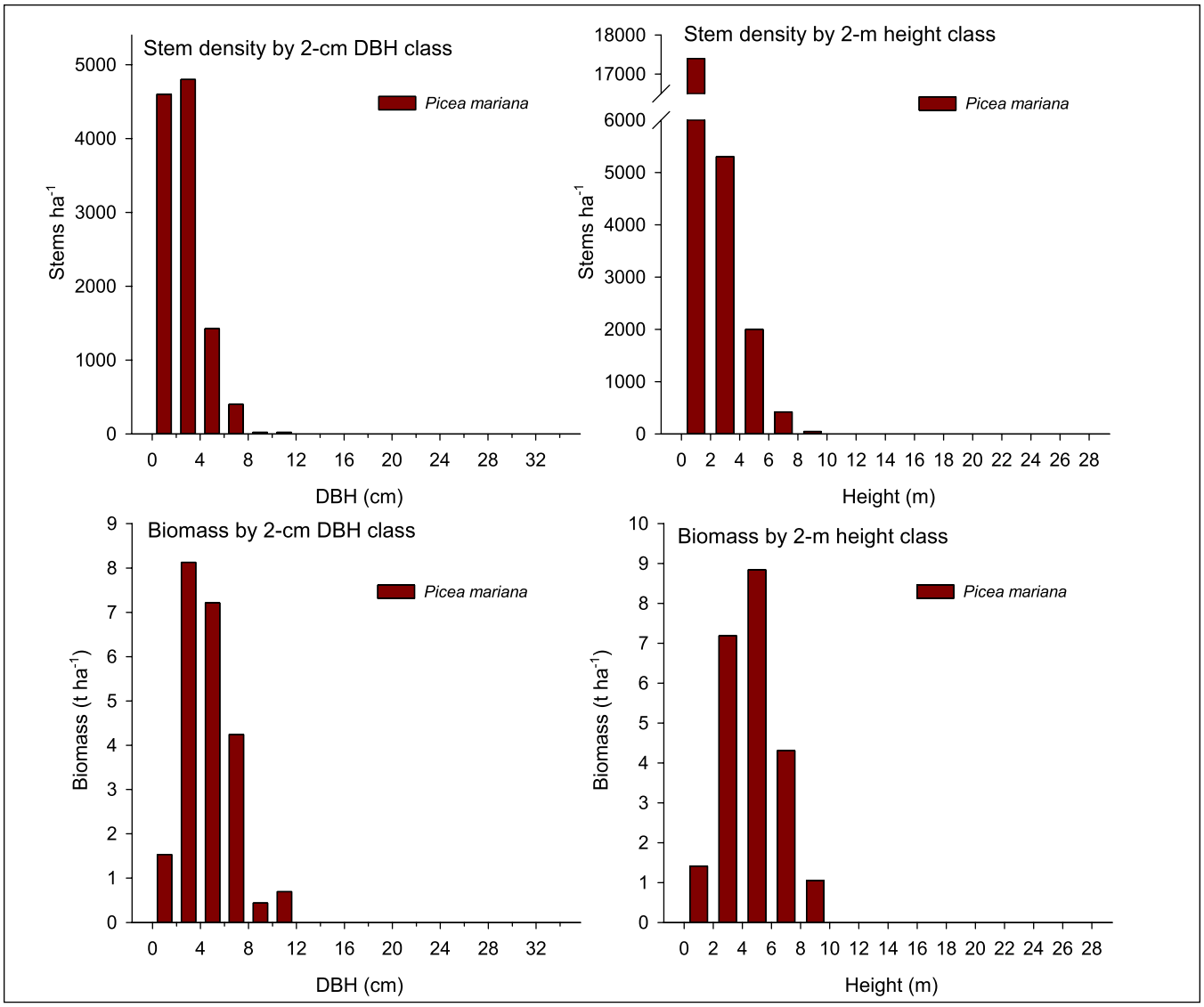
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	8.08	8.08
Stem density (stems ha^{-1})	25175	25175
Height ≥ 1.3 m	11275	11275
Height < 1.3 m	13900	13900
Mean tree height (m)	2.9	2.9
Median tree height (m)	2.5	2.5
Biomass-weighted tree height (m)	4.6	4.6
Biomass (t ha^{-1})	22.8	22.8

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	7.1	6.6	62
2	Picemar	7.7	7.4	65
3	Picemar	8.2	8.1	62
4	Picemar	7.0	6.6	60
5	Picemar	7.5	6.2	58
6	Picemar	7.5	6.9	58
7	Picemar	6.9	6.9	57
8	Picemar	8.4	7.5	58
9	Picemar	10.0	8.2	62

[a]Species: Picemar = *Picea mariana*.



Plot FS 03 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 03 CS

Measurement date: 13-Jul-08

Latitude: 60° 56′ 26.2″N

Longitude: 117° 21′ 48.8″W

Plant community type (Boreal Mixedwood): i2.1 black spruce-Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	121
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

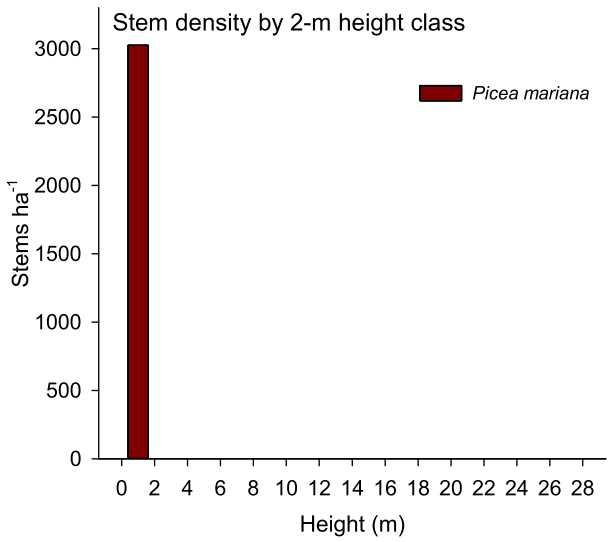
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	3025	3025
Height ≥ 1.3 m	0	0
Height < 1.3 m	3025	3025
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.0	0.0

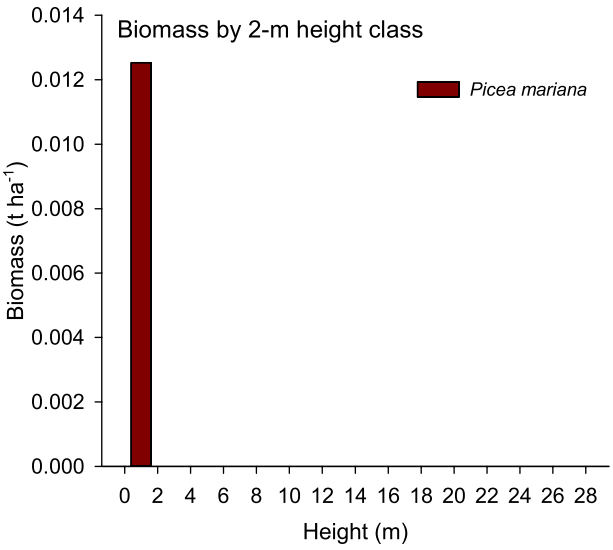
[a]Picemar = *Picea mariana*; [b]NA = not applicable.

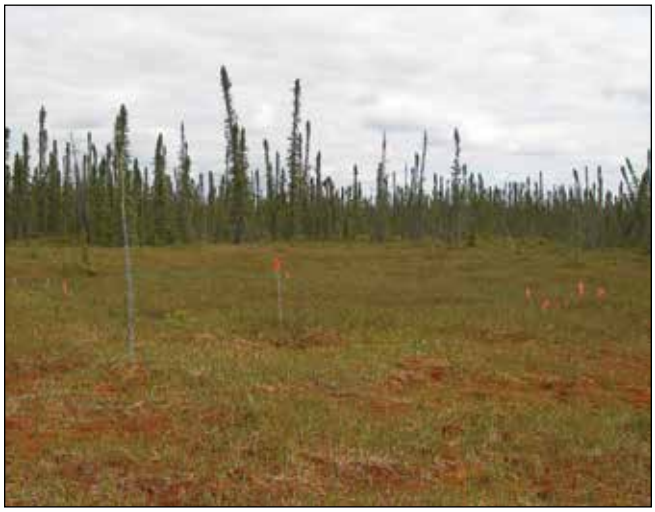
Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.







Plot FS 03 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 04 UD

Measurement date: 18-Jul-08

Latitude: 60° 00′ 19.9″N

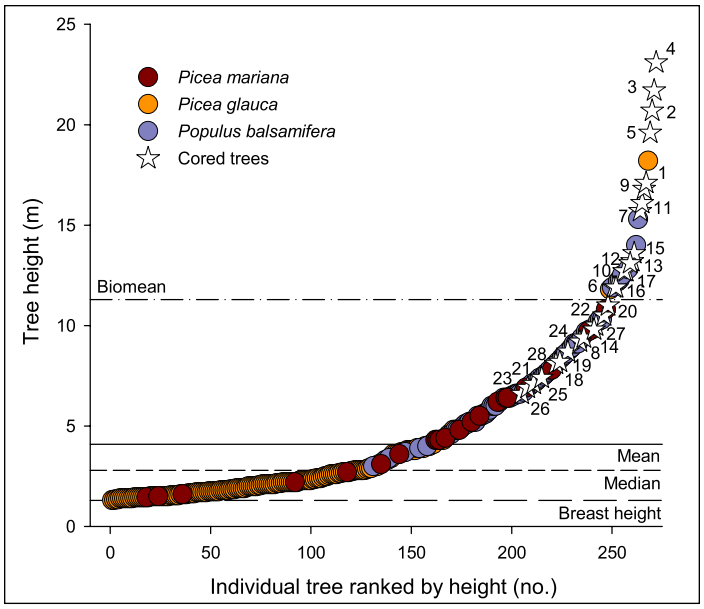
Longitude: 116° 59′ 19.1″W

Plant community type (Boreal Mixedwood): d2.1 Aw-Sw/Canada buffalo-berry

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a c	200	201
Small trees	a c	200	196
Large trees	a c	200	48

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

Parameter	Picemar[a]	Picegla[b]	Poputre[c]	Total
Basal area (m^2 ha^{-1})	1.93	5.40	15.83	23.15
Stem density (stems ha^{-1})	6100	12900	3250	22250
Height ≥ 1.3 m	1050	7900	3250	12200
Height < 1.3 m	5050	5000	0	10050
Mean tree height (m)	4.9	2.6	7.2	4.1
Median tree height (m)	4.4	2.1	6.5	2.8
Biomass-weighted tree height (m)	7.8	11.7	11.7	11.3
Biomass (t ha^{-1})	6.1	18.0	47.2	71.3

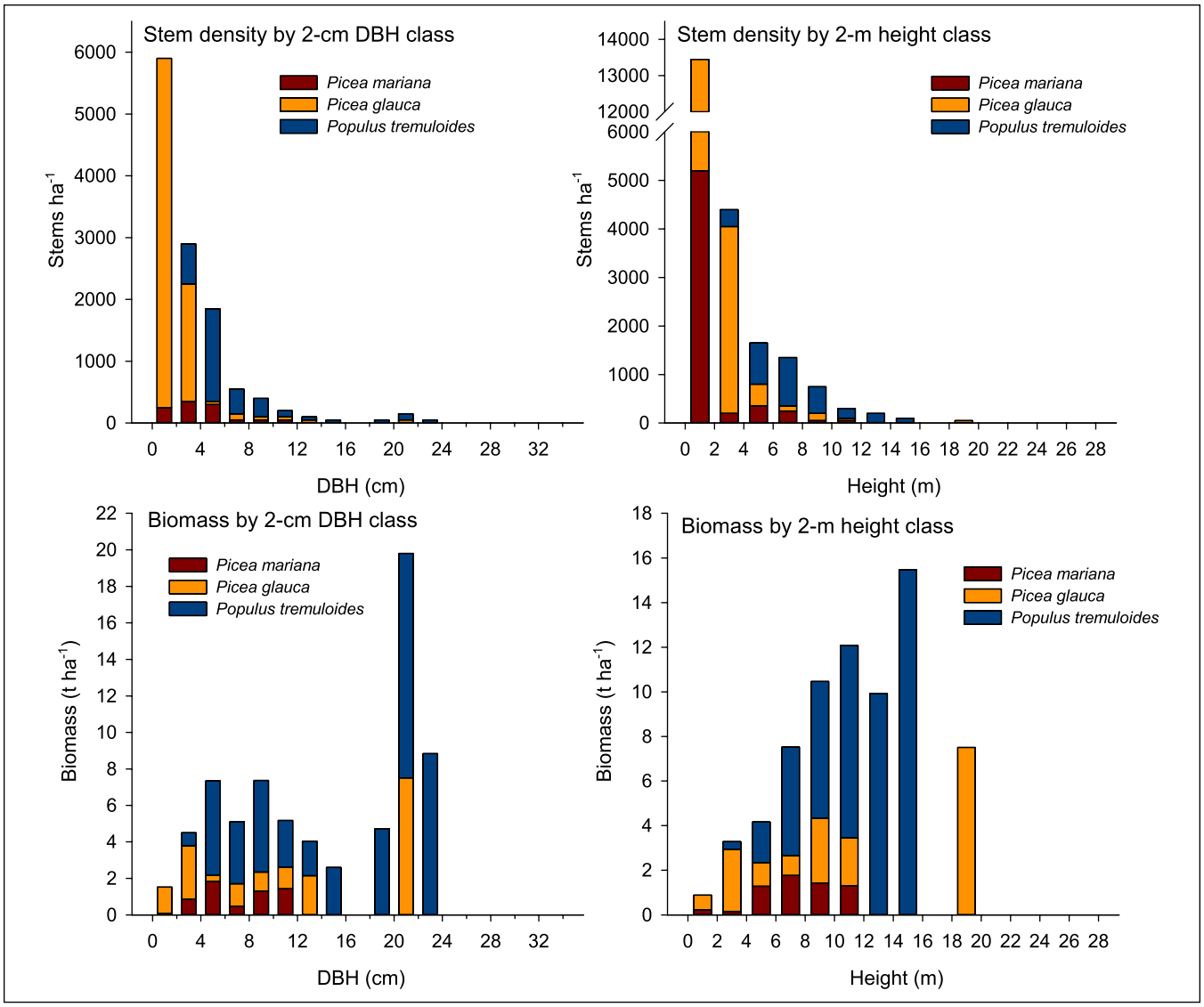
[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Poputre = *Populus tremuloides*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picegla	27.1	17.1	111
2	Picegla	28.2	20.7	125
3	Picegla	29.2	21.7	153
4	Picegla	38.7	23.1	150
5	Picegla	28.6	19.6	146
6	Poputre	12.0	11.9	55
7	Picegla	20.0	15.7	146
8	Poputre	10.0	9.4	59
9	Picegla	21.3	16.8	106
10	Poputre	10.6	12.7	49
11	Picegla	20.1	16.1	102
12	Poputre	13.2	13.1	136
13	Picegla	14.4	13.2	97
14	Poputre	9.1	9.8	59

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
15	Picegla	16.2	13.6	98
16	Poputre	12.2	11.9	58
17	Picegla	12.9	12.7	69
18	Poputre	11.0	8.2	152
19	Picegla	8.9	8.7	78
20	Poputre	8.6	11.0	58
21	Picegla	6.7	7.1	84
22	Poputre	10.4	10.5	60
23	Picegla	7.3	6.6	81
24	Picegla	7.5	9.2	44
25	Picegla	6.0	7.4	88
26	Picegla	6.5	6.9	41
27	Picegla	10.9	10.0	51
28	Picegla	6.8	8.1	57

[a]Species: Picegla = *Picea glauca*; Poputre = *Populus tremuloides*.



Plot FS 04 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

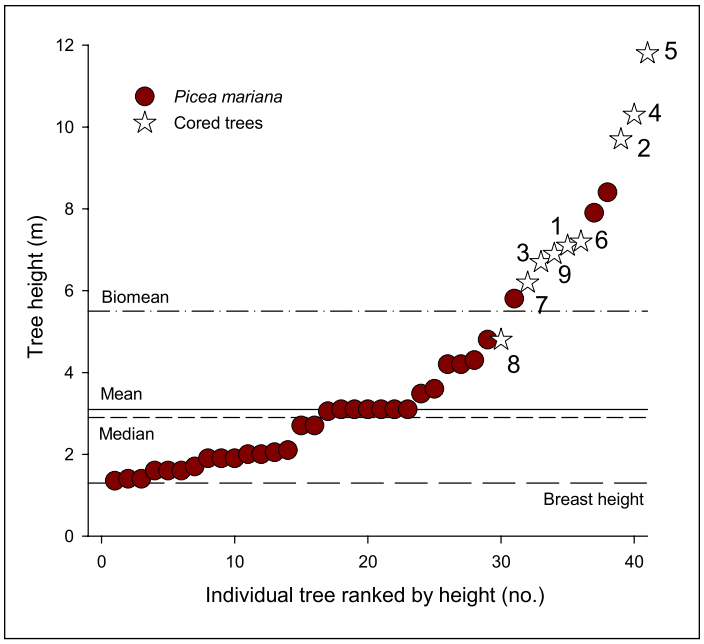
Plot: FS 04 PP

Measurement date: 17-Jul-08
Latitude: 60° 00′ 25.1″N
Longitude: 116° 59′ 30.9″W
Plant community type (Boreal Mixedwood): i1.1 Sb/ Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	179
Small trees	d	100	28
Large trees	a b c d	400	26

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

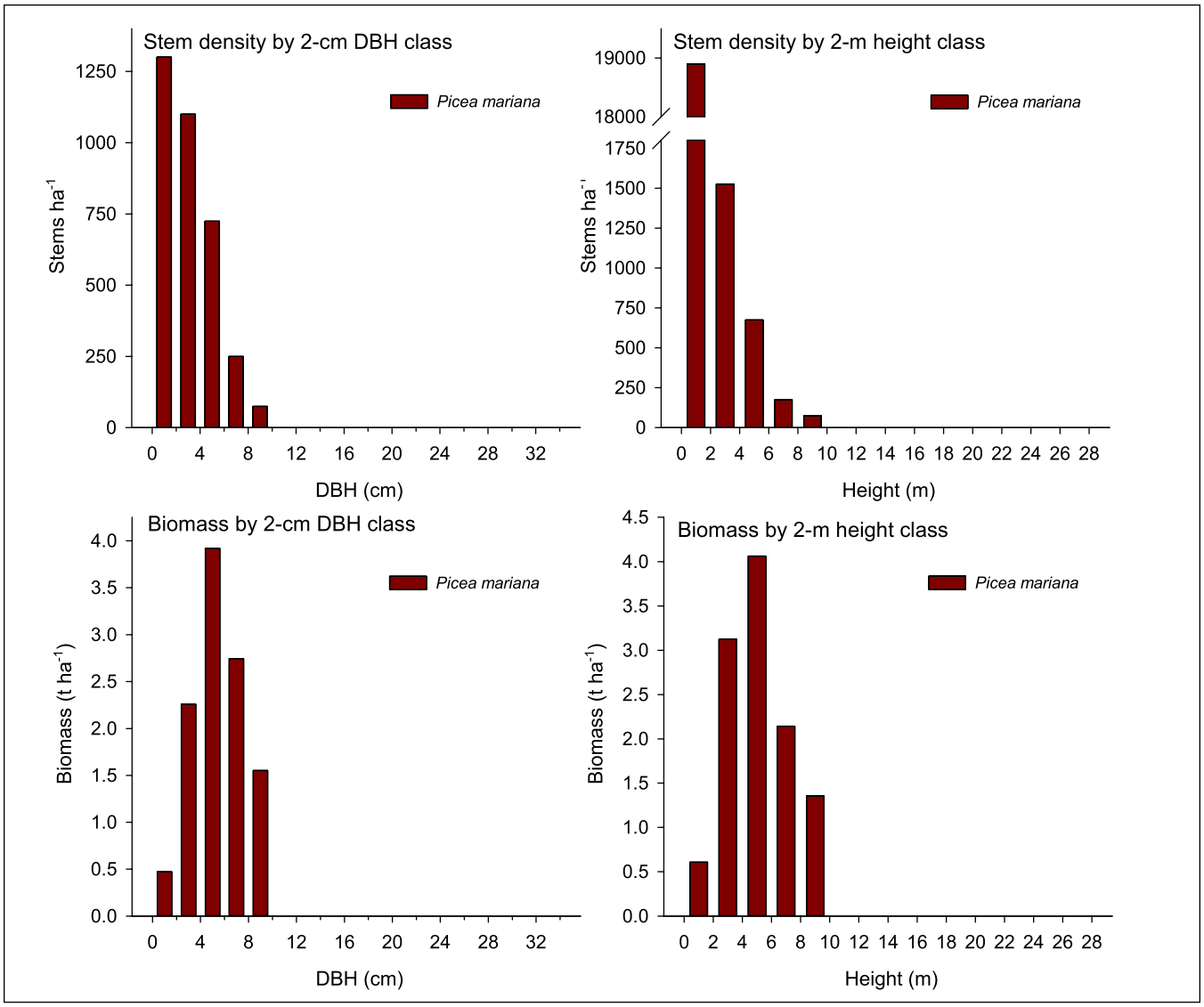
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	3.79	3.79
Stem density (stems ha^{-1})	21350	21350
Height ≥ 1.3 m	3450	3450
Height < 1.3 m	17900	17900
Mean tree height (m)	3.1	3.1
Median tree height (m)	2.9	2.9
Biomass-weighted tree height (m)	5.5	5.5
Biomass (t ha^{-1})	11.3	11.3

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	7.6	7.1	32
2	Picemar	10.6	9.7	40
3	Picemar	8.4	6.7	30
4	Picemar	12.5	11.8	151
5	Picemar	9.2	10.3	40
6	Picemar	8.4	7.2	34
7	Picemar	6.1	6.2	30
8	Picemar	5.9	4.8	29
9	Picemar	8.7	6.9	129

[a]Species: Picemar = *Picea mariana*.



Plot FS 04 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 04 CS

Measurement date: 17-Jul-08
Latitude: 60° 00′ 27″N
Longitude: 116° 59′ 30.3″W
Plant community type (Boreal Mixedwood): i2.1 black spruce-Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	177
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

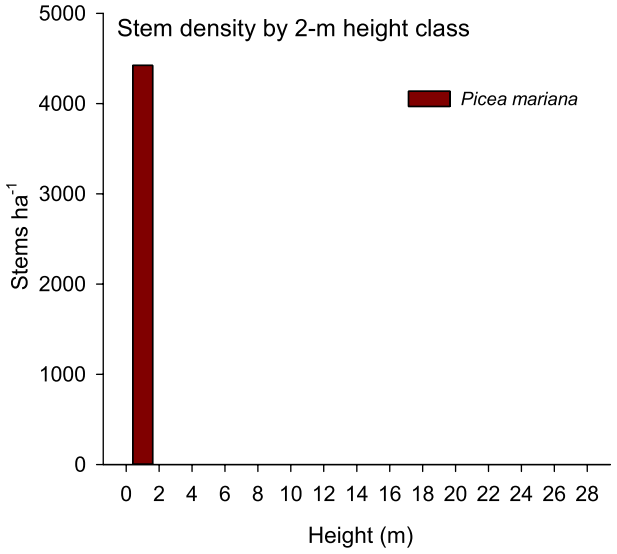
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	4425	4425
Height ≥ 1.3 m	0	0
Height < 1.3 m	4425	4425
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.0	0.0

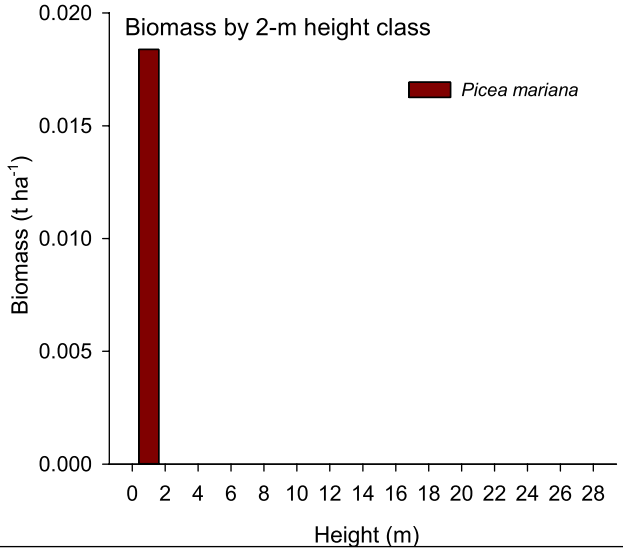
[a]Picemar = *Picea mariana*; [b]NA = not applicable.

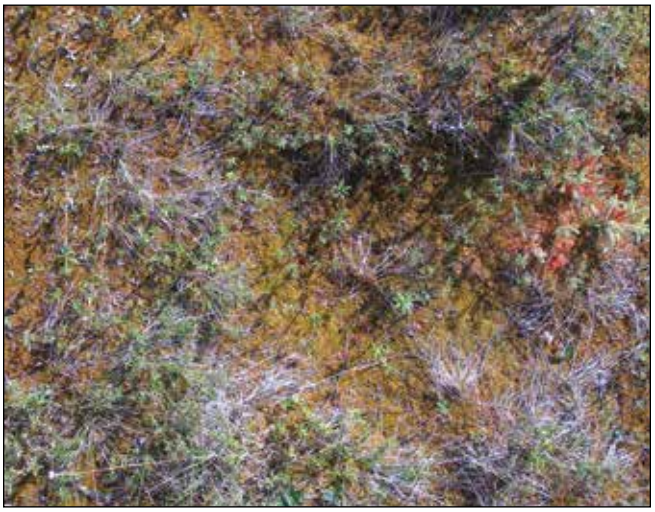
Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.







Plot FS 04 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

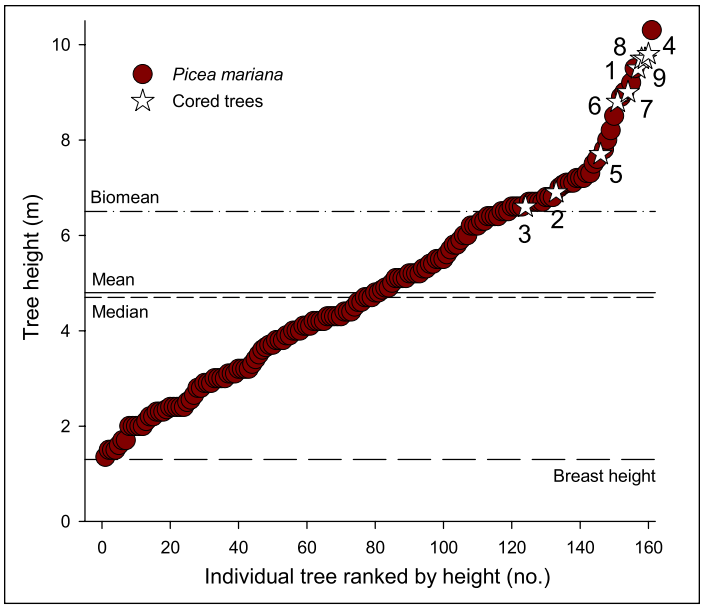
Plot: FS 05 UD

Measurement date: 02-Aug-08
Latitude: 60° 21′ 22.4″N
Longitude: 120° 28′ 22.1°W
Plant community type (Boreal Highlands): g1.1 Sb-Pj/ Labrador tea/feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	c	100	125
Small trees	c	100	97
Large trees	c	100	55

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

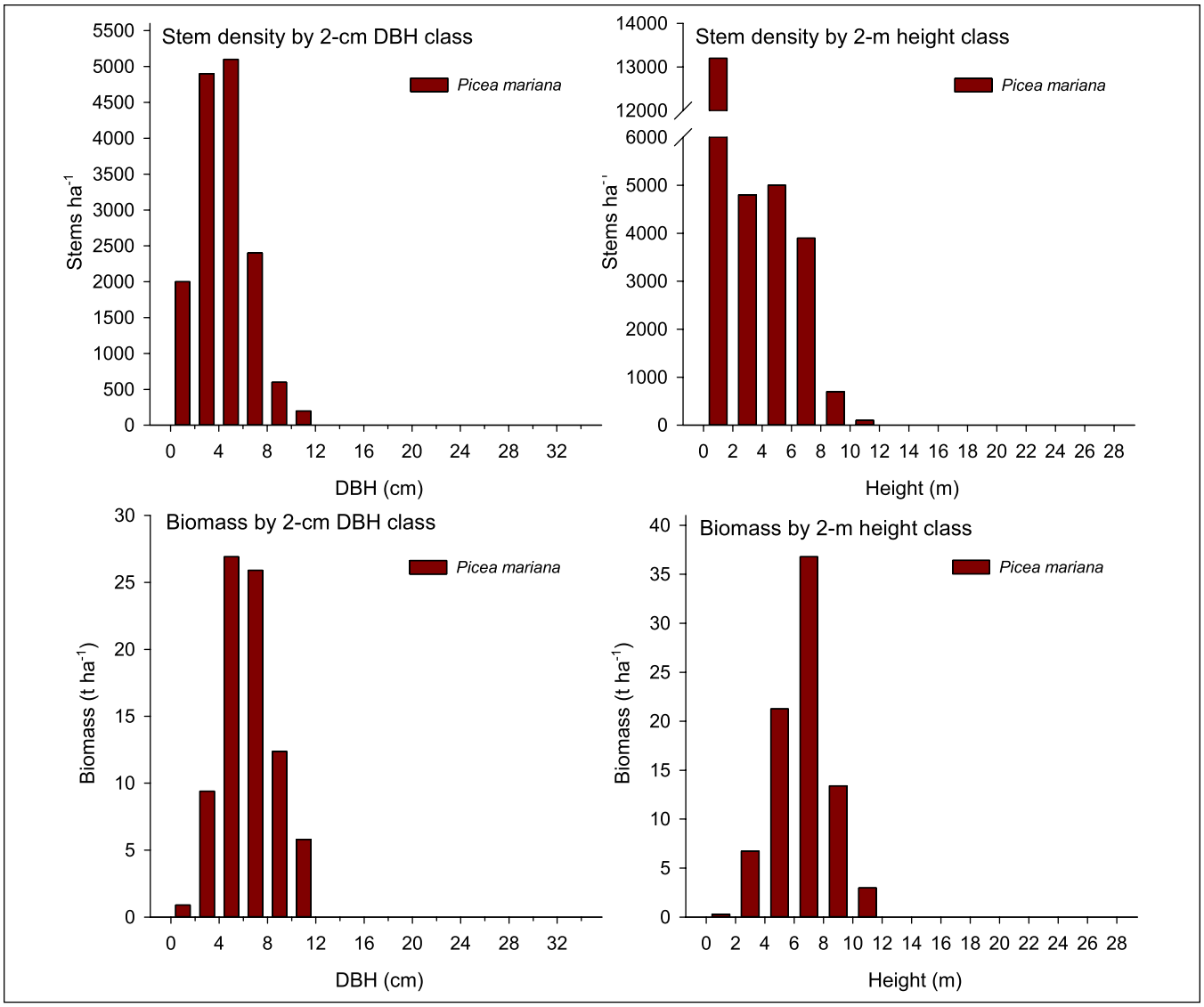
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	27.61	27.61
Stem density (stems ha^{-1})	27700	27700
Height ≥ 1.3 m	15200	15200
Height < 1.3 m	12500	12500
Mean tree height (m)	4.8	4.8
Median tree height (m)	4.7	4.7
Biomass-weighted tree height (m)	6.5	6.5
Biomass (t ha^{-1})	81.4	81.4

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	9.3	9.5	132
2	Picemar	6.5	6.9	125
3	Picemar	6.6	6.6	126
4	Picemar	8.6	9.8	138
5	Picemar	8.0	7.7	139
6	Picemar	7.9	8.8	127
7	Picemar	9.3	9.0	135
8	Picemar	10.5	9.7	131
9	Picemar	9.7	9.7	135

[a]Species: Picemar = *Picea mariana*.



Plot FS 05 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

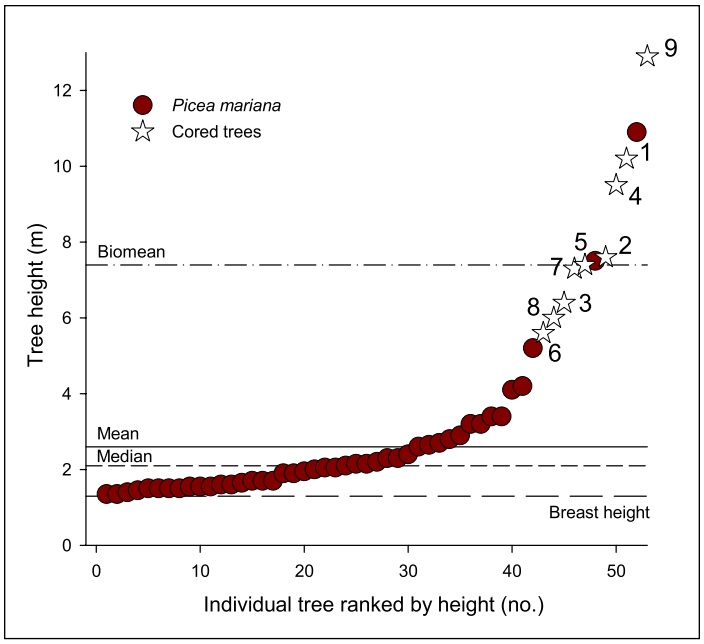
Plot: FS 05 PP

Measurement date: 01-Aug-08
Latitude: 60° 20′ 54.3″N
Longitude: 120° 28′ 14.6″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	635
Small trees	b	100	41
Large trees	a b c d	400	23

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

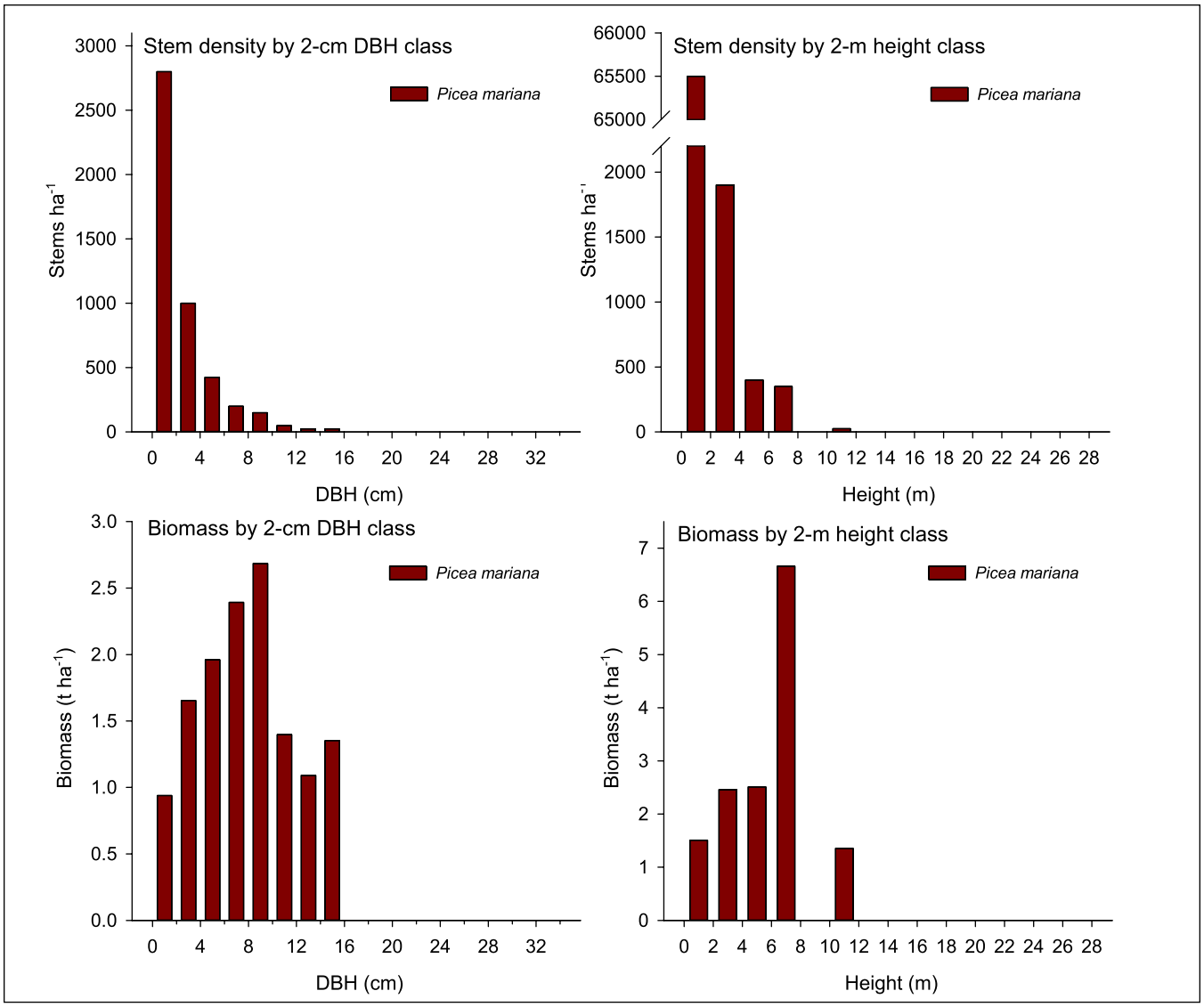
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	4.43	4.43
Stem density (stems ha^{-1})	68175	68175
Height ≥ 1.3 m	4675	4675
Height < 1.3 m	63500	63500
Mean tree height (m)	2.6	2.6
Median tree height (m)	2.1	2.1
Biomass-weighted tree height (m)	7.4	7.4
Biomass (t ha^{-1})	14.5	14.5

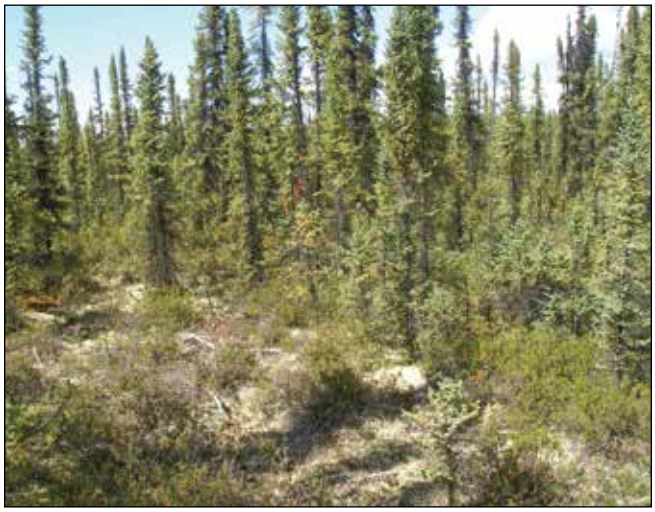
[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	13.2	10.2	116
2	Picemar	8.0	7.6	54
3	Picemar	9.3	6.4	122
4	Picemar	12.7	9.5	120
5	Picemar	9.0	7.4	54
6	Picemar	7.1	5.6	35
7	Picemar	8.2	7.3	40
8	Picemar	7.0	6.0	50
9	Picemar	14.4	12.9	112

[a]Species: Picemar = *Picea mariana*.





Plot FS 05 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 05 CS

Measurement date: 03-Aug-08
Latitude: 60° 21′ 3.5″N
Longitude: 120° 28′ 24.5″W
Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	b c	200	282
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

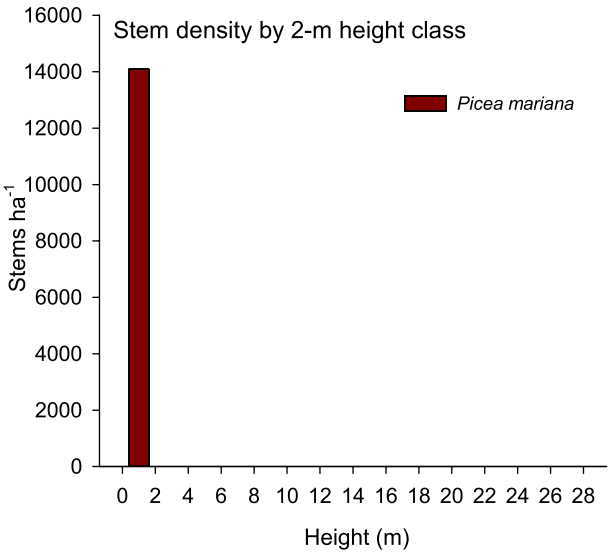
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	14100	14100
Height ≥ 1.3 m	0	0
Height < 1.3 m	14100	14100
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.1	0.1

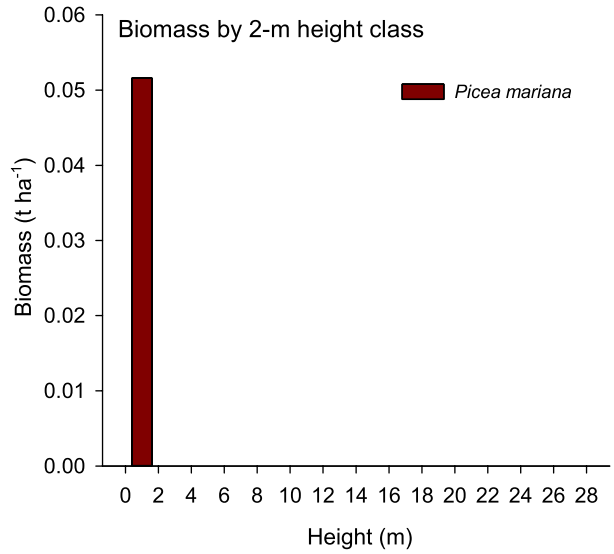
[a]Picemar = *Picea mariana*; [b]NA = not applicable.

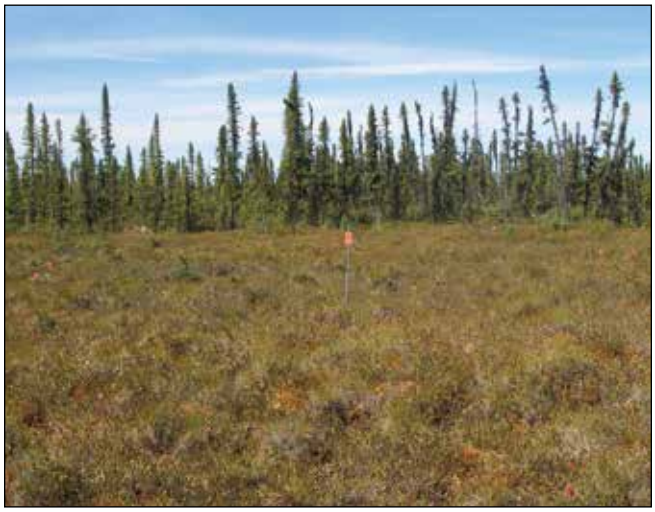
Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.







Plot FS 05 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

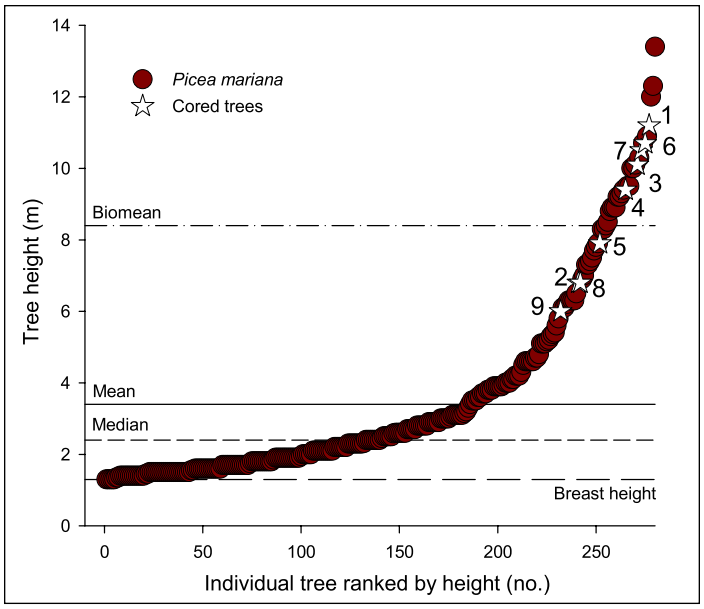
Plot: FS 06 UD

Measurement date: 09-Aug-08
Latitude: 60° 37′ 5.2″N
Longitude: 121° 53′ 57.7″W
Plant community type (Boreal Highlands): c1.2 Pj-Sb/ feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a c	200	353
Small trees	a c	200	230
Large trees	a c	200	41

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

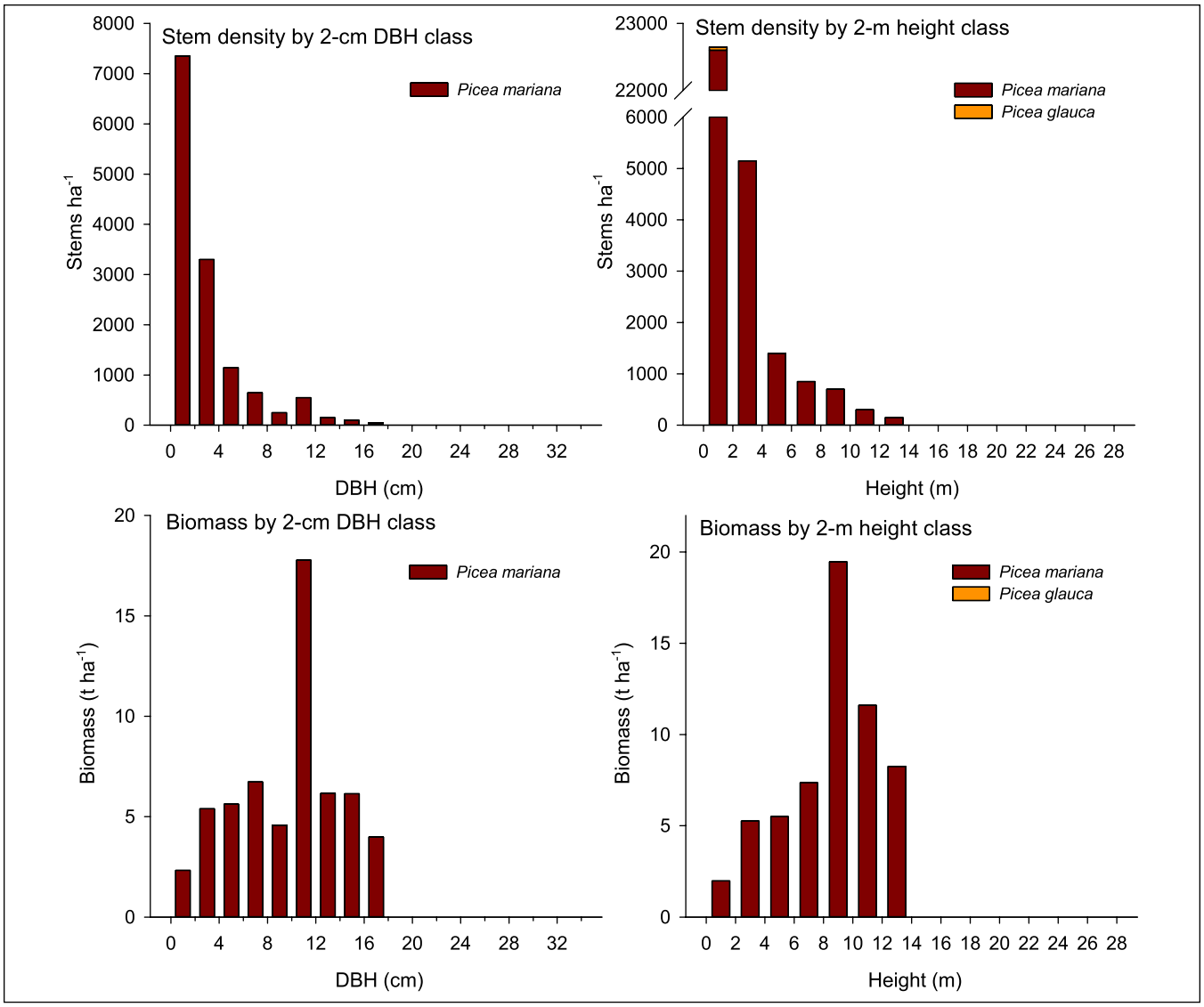
Parameter	Picemar[a]	Picegla[b]	Total
Basal area (m^2 ha^{-1})	18.18	0.00	18.18
Stem density (stems ha^{-1})	31150	50	31200
Height ≥ 1.3 m	13550	0	13550
Height < 1.3 m	17600	50	17650
Mean tree height (m)	3.4	NA[c]	3.4
Median tree height (m)	2.4	NA	2.4
Biomass-weighted tree height (m)	8.4	NA	8.4
Biomass (t ha^{-1})	59.4	0.0	59.4

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	12.3	11.2	140
2	Picemar	8.0	6.8	40
3	Picemar	10.8	10.1	44
4	Picemar	10.0	9.4	106
5	Picemar	6.5	7.9	32
6	Picemar	12.8	10.7	148
7	Picemar	11.3	10.5	167
8	Picemar	6.6	6.8	31
9	Picemar	5.9	6.0	35

[a]Species: Picemar = *Picea mariana*.



Plot FS 06 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

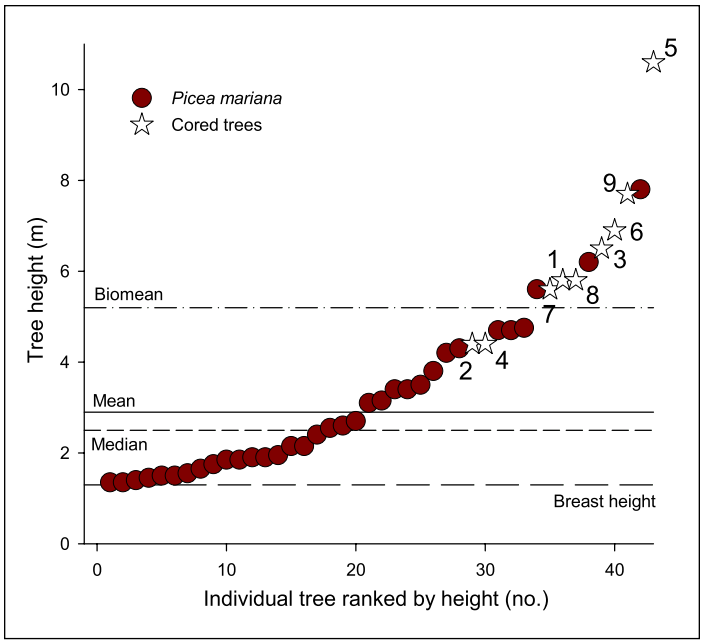
Plot: FS 06 PP

Measurement date: 08-Aug-08
Latitude: 60° 37′ 22.0″N
Longitude: 121° 54′ 2.1″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a	100	275
Small trees	a	100	27
Large trees	a b c d	400	28

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

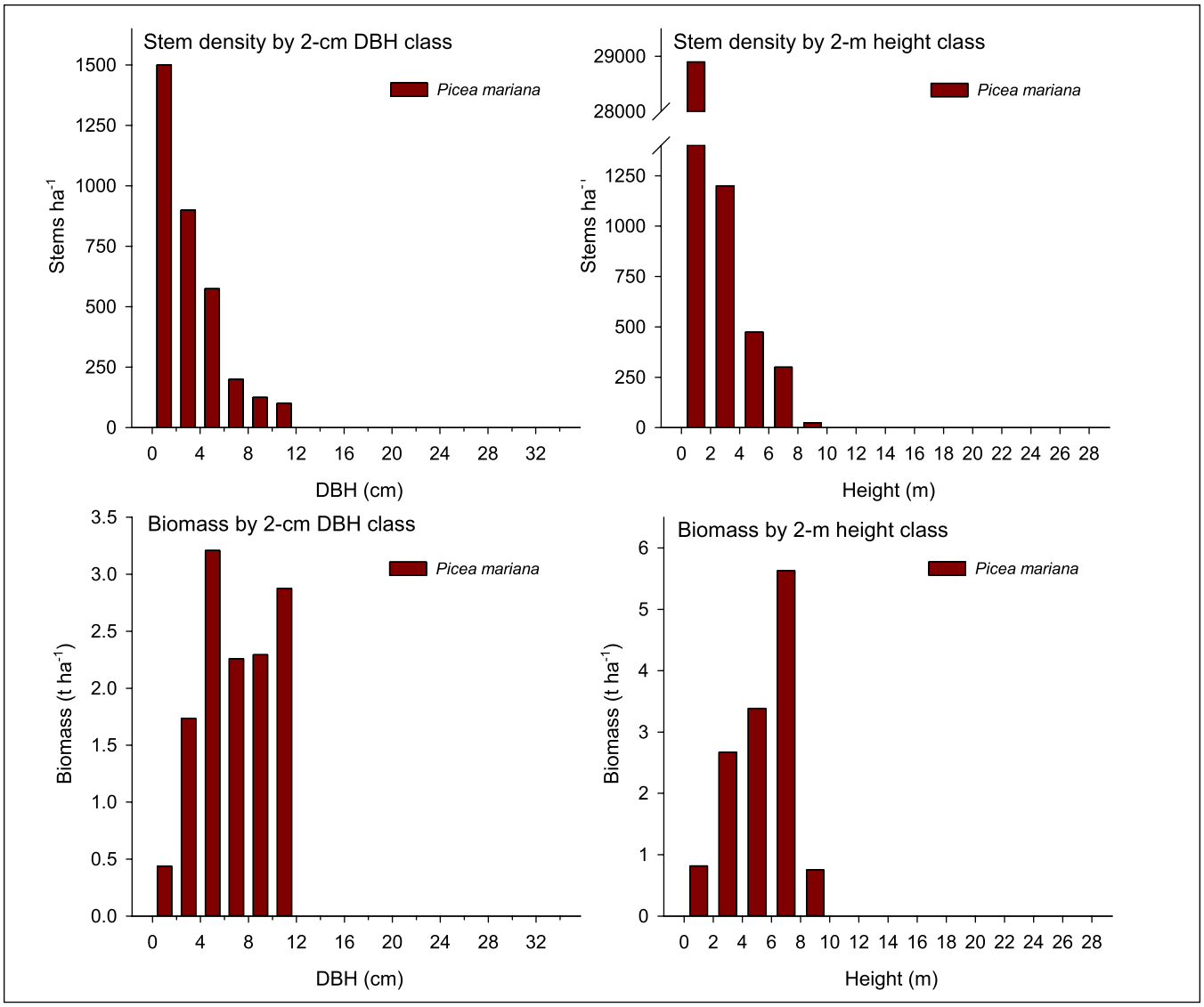
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	4.31	4.31
Stem density (stems ha^{-1})	30900	30900
Height ≥ 1.3 m	3400	3400
Height < 1.3 m	27500	27500
Mean tree height (m)	2.9	2.9
Median tree height (m)	2.5	2.5
Biomass-weighted tree height (m)	5.2	5.2
Biomass (t ha^{-1})	13.3	13.3

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	6.7	5.8	33
2	Picemar	5.7	4.4	35
3	Picemar	7.3	6.5	52
4	Picemar	5.7	4.4	65
5	Picemar	14.6	10.6	148
6	Picemar	8.3	6.9	151
7	Picemar	5.7	5.6	43
8	Picemar	6.5	5.8	45
9	Picemar	11.9	7.7	84

[a]Species: Picemar = *Picea mariana*.



Plot FS 06 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 06 CS

Measurement date: 10-Aug-08

Latitude: 60° 37′ 21.0″N

Longitude: 121° 54′ 4.9″W

Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	451
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

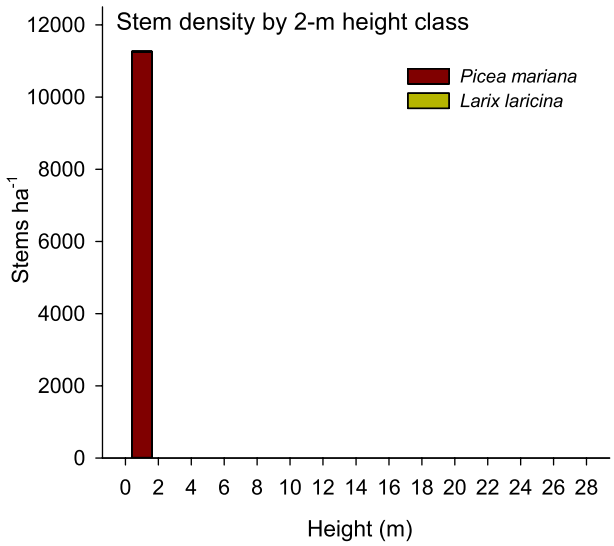
Parameter	Picemar[a]	Larilar[b]	Total
Basal area (m^2 ha^{-1})	0.00	0.00	0.00
Stem density (stems ha^{-1})	11250	25	11275
Height ≥ 1.3 m	0	0	0
Height < 1.3 m	11250	25	11275
Mean tree height (m)	NA[c]	NA	NA
Median tree height (m)	NA	NA	NA
Biomass-weighted tree height (m)	NA	NA	NA
Biomass (t ha^{-1})	0.1	0.0	0.1

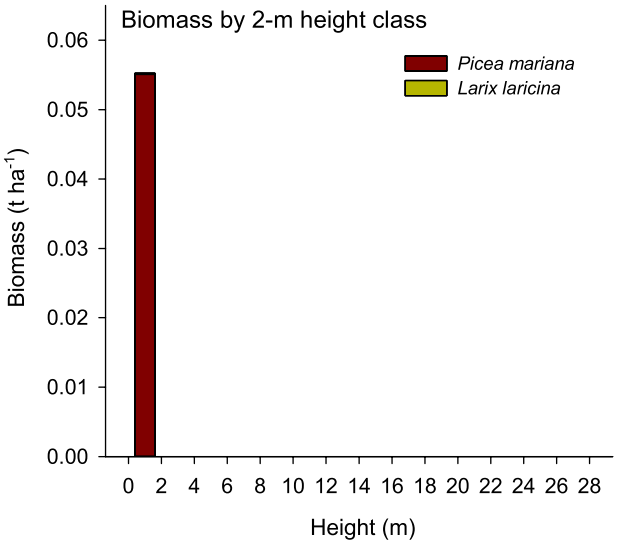
[a]Picemar = *Picea mariana*; [b]Larilar = *Larix laricina*; [c]NA = not applicable.

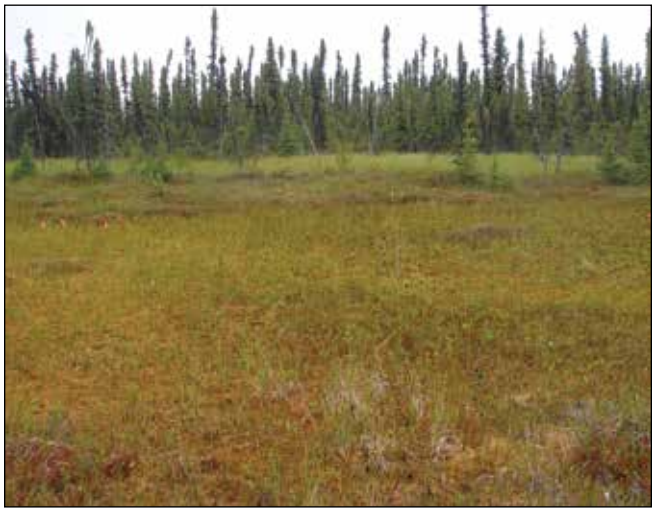
Cored trees

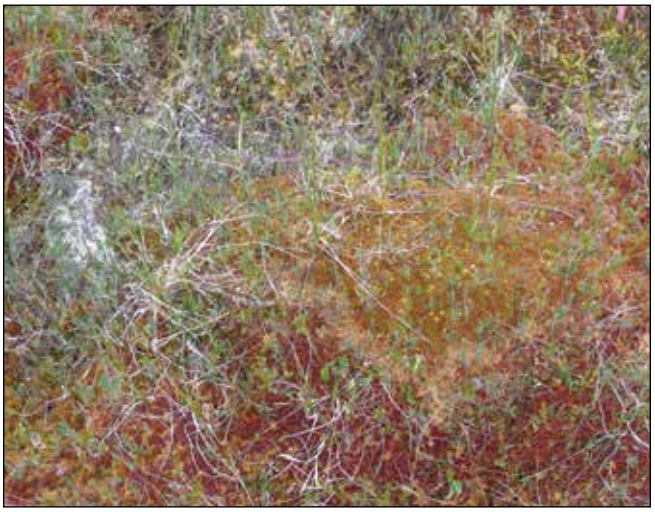
Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.









Plot FS 06 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

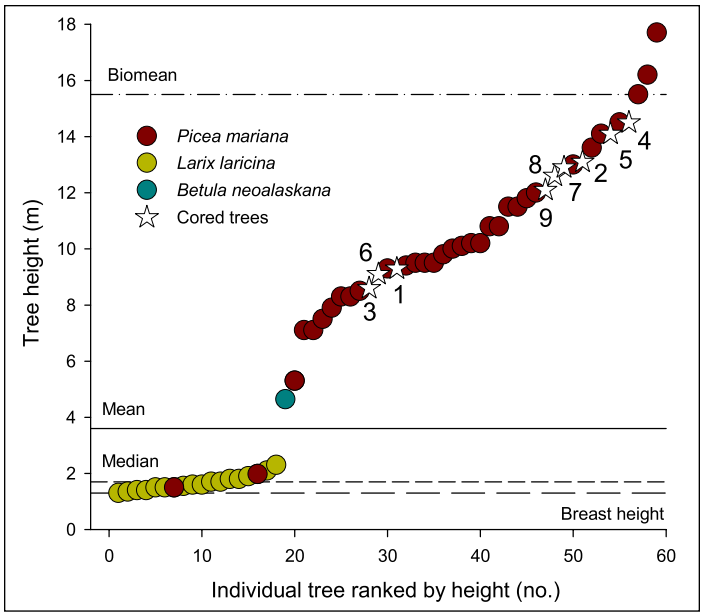
Plot: FS 07 UD

Measurement date: 12-Aug-08
Latitude: 61° 06′ 28.8″N
Longitude: 120° 58′ 24.3′W
Plant community type (Boreal Highlands): g1.1 Sb-Pj/ Labrador tea/feather moss

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	d	100	969
Small trees	d	100	19
Large trees	a b c d	400	31

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

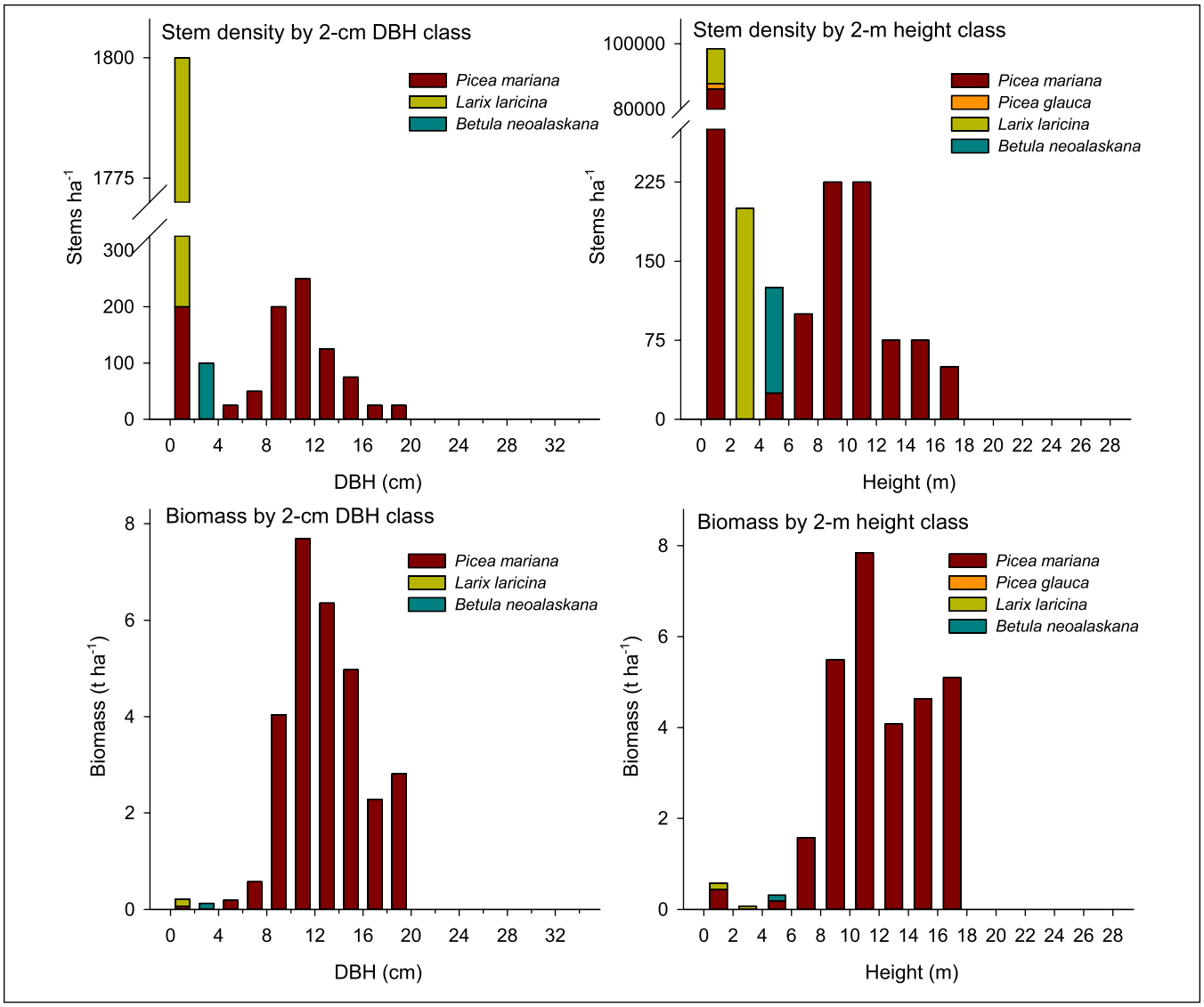
Parameter	Picemar[a]	Picegla[b]	Larilar[c]	Betuneo[d]	Total
Basal area (m^2 ha^{-1})	7.89	0.00	0.07	0.05	8.02
Stem density (stems ha^{-1})	86875	1800	10800	100	99575
Height ≥ 1.3 m	975	0	1600	100	2675
Height < 1.3 m	85900	1800	9200	0	96900
Mean tree height (m)	8.7	NA[e]	1.7	4.6	3.6
Median tree height (m)	7.7	NA	1.6	4.6	1.7
Biomass-weighted tree height (m)	15.6	NA	1.9	4.6	15.5
Biomass (t ha^{-1})	29.4	0.0	0.2	0.1	29.7

[a]Picemar = *Picea mariana*; [b]Picegla = *Picea glauca*; [c]Larilar = *Larix laricina*; [d]Betuneo = *Betula neoalaskana*; [e]NA = not applicable.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	9.0	9.3	136
2	Picemar	12.0	13.1	141
3	Picemar	7.4	8.6	128
4	Picemar	15.4	14.5	159
5	Picemar	16.1	14.1	144
6	Picemar	12.7	9.1	117
7	Picemar	15.3	12.9	151
8	Picemar	14.6	12.6	164
9	Picemar	12.1	12.1	138

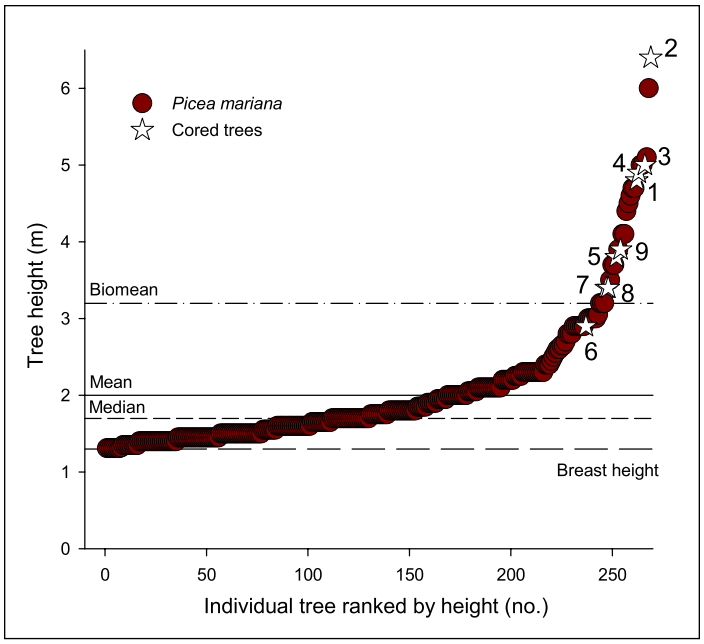
[a]Species: Picemar = *Picea mariana*.



Plot FS 07 UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 07 PP

Measurement date: 11-Aug-08
Latitude: 61° 06′ 11.7″N
Longitude: 120° 58′ 24.2″W
Plant community type (Boreal Highlands): h1.1 Sb/ northern Labrador tea/cloudberry/peatmoss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	c	100	185
Small trees	c	100	252
Large trees	c	100	8

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

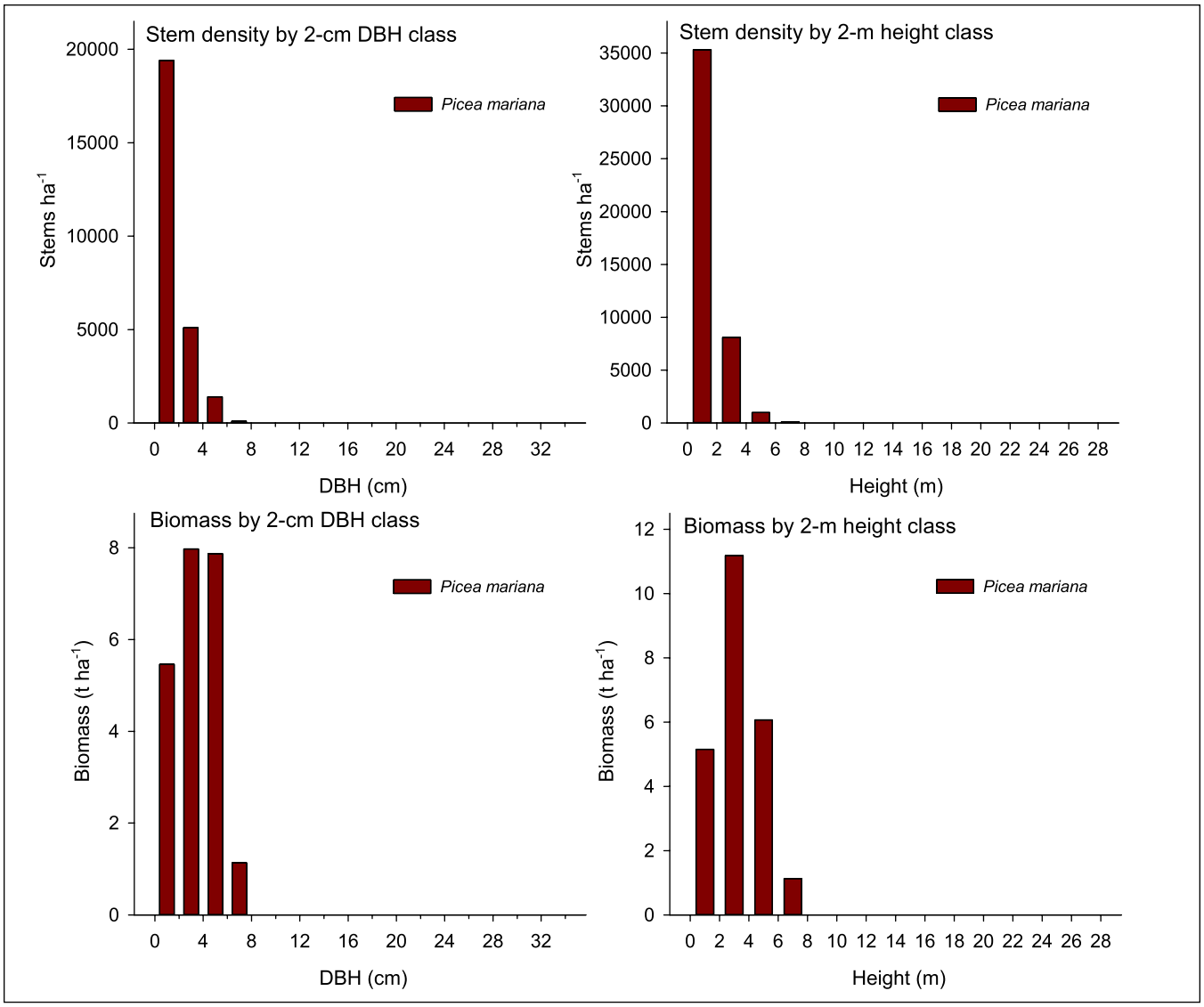
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	7.75	7.75
Stem density (stems ha^{-1})	44500	44500
Height ≥ 1.3 m	26000	26000
Height < 1.3 m	18500	18500
Mean tree height (m)	2.0	2.0
Median tree height (m)	1.7	1.7
Biomass-weighted tree height (m)	3.2	3.2
Biomass (t ha^{-1})	23.5	23.5

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	4.5	4.8	75
2	Picemar	6.4	6.4	113
3	Picemar	5.2	5.0	94
4	Picemar	4.9	4.9	109
5	Picemar	4.7	3.8	59
6	Picemar	3.2	2.9	58
7	Picemar	3.7	3.4	60
8	Picemar	3.6	3.4	84
9	Picemar	3.7	3.9	73

[a]Species: Picemar = *Picea mariana*.



Plot FS 07 PP stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: FS 07 CS

Measurement date: 13-Aug-08
Latitude: 61° 06′ 12.0″N
Longitude: 120° 58′ 29.1″W
Plant community type (Boreal Highlands): h2.1 black spruce-northern Labrador tea/cloudberry/peat moss

Graph omitted because
no trees ≥ breast height were present in the plot.

Sample size and in-plot location

Size class[a]	Quadrant[b]	Total area (m^2)	Sample size
Very small trees	a b c d	400	194
Small trees	a b c d	400	0
Large trees	a b c d	400	0

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2A for plot layout.

Stand values

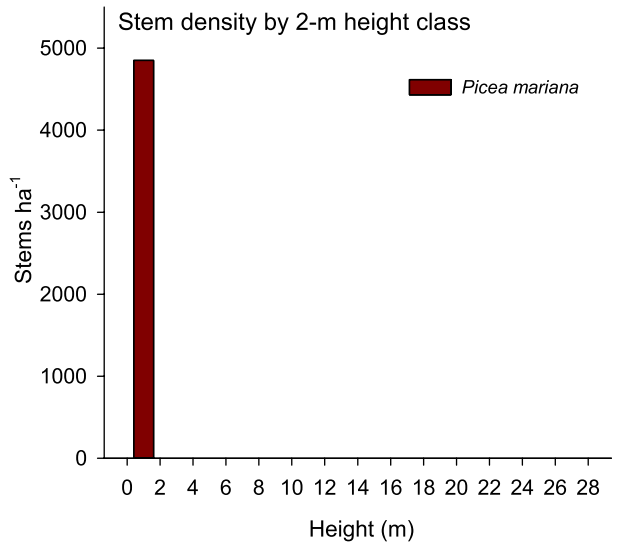
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	0.00	0.00
Stem density (stems ha^{-1})	4850	4850
Height ≥ 1.3 m	0	0
Height < 1.3 m	4850	4850
Mean tree height (m)	NA[b]	NA
Median tree height (m)	NA	NA
Biomass-weighted tree height (m)	NA	NA
Biomass (t ha^{-1})	0.0	0.0

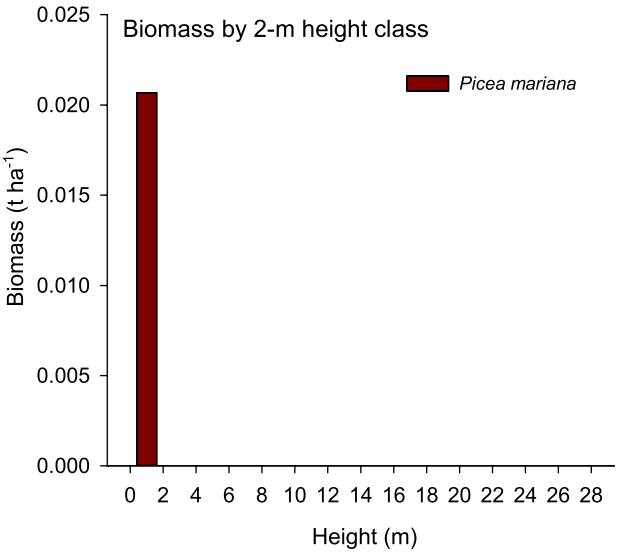
[a]Picemar = *Picea mariana*; [b]NA = not applicable.

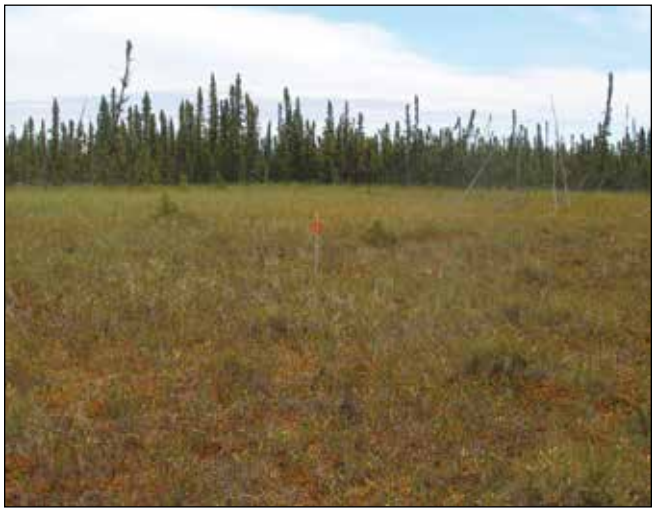
Cored trees

Tree no.	Species	DBH (cm)	Height (m)	Age (yr)
No trees were cored at this plot.				

Graphs omitted because
no trees ≥ breast height were present
in the plot.







Plot FS 07 CS stem density and biomass by tree size (height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

ANZAC AREA SITES

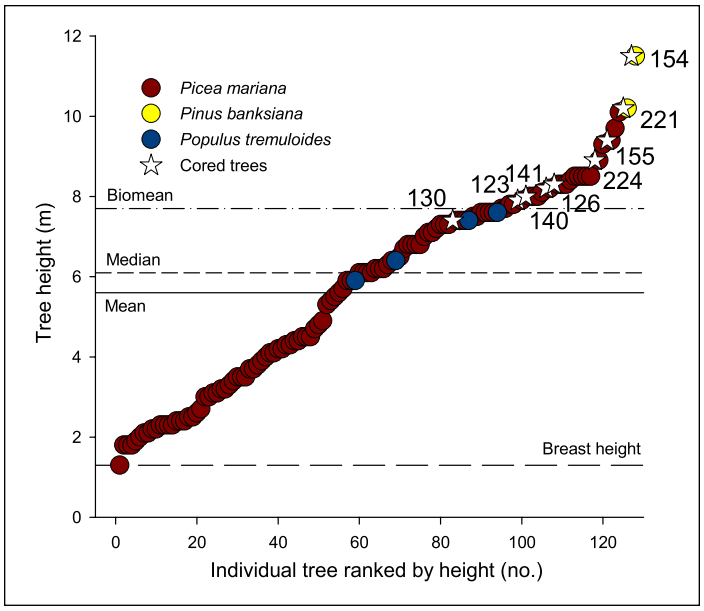
Plot: AN IPY UD

Measurement date: 13-Sep-07; 10-Aug-07

Latitude: 56° 23′ 55.8″N

Longitude: 111° 02′ 02.6″W

Plant community type (Boreal Mixedwood): g1.2 Sb-Pj/feather moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	100	4
Small trees	1 2 3 4	100	74
Large trees	1 2 3 4	100	45

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.

Stand values

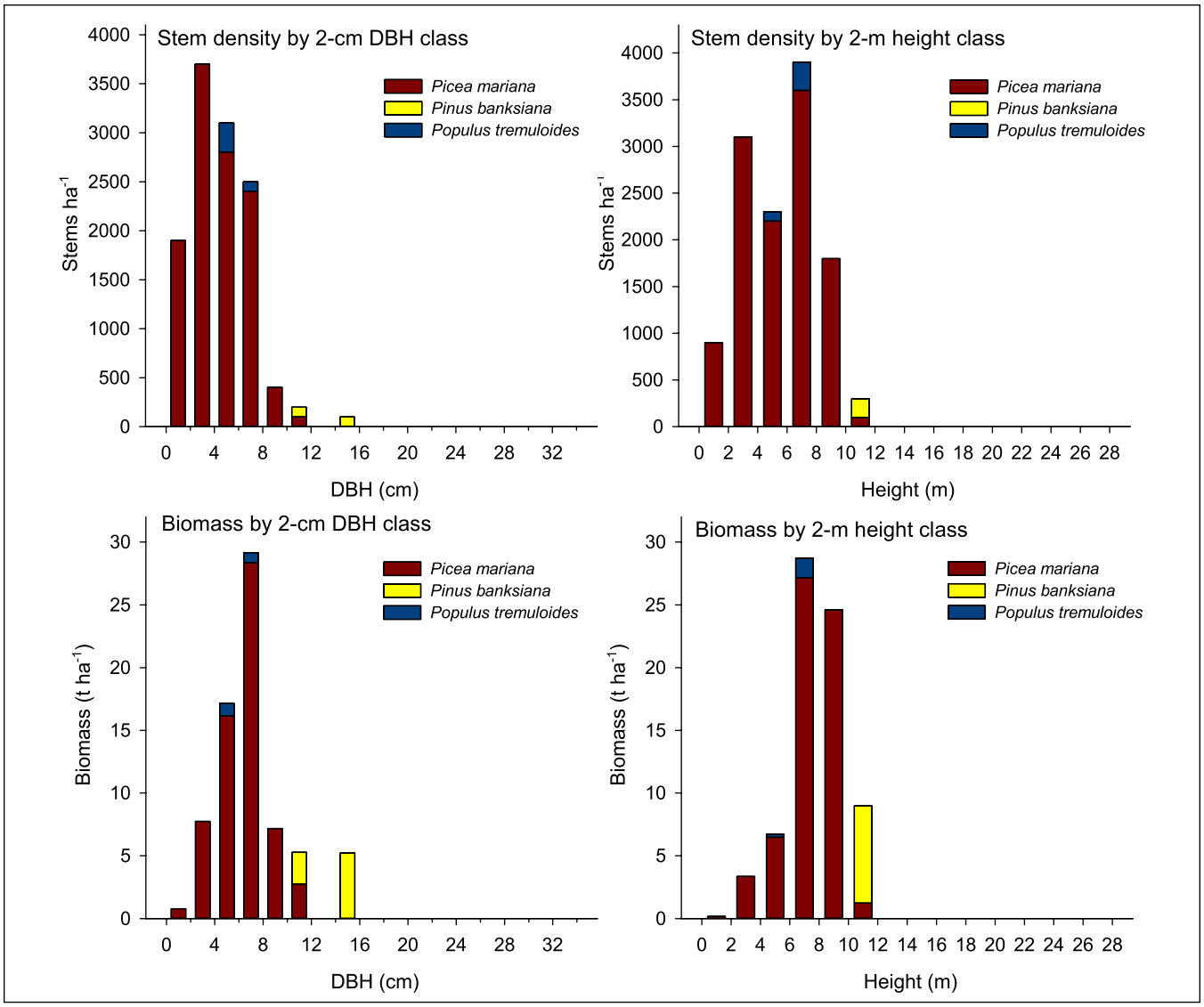
Parameter	Picemar[a]	Poputre[b]	Pinuban[c]	Total
Basal area (m^2 ha^{-1})	20.78	0.87	2.48	24.14
Stem density (stems ha^{-1})	11700	400	200	12300
Height ≥ 1.3 m	11300	400	200	11900
Height < 1.3 m	400	0	0	400
Mean tree height (m)	5.5	6.8	10.9	5.6
Median tree height (m)	5.9	6.9	10.9	6.1
Biomass-weighted tree height (m)	7.3	7.1	11.1	7.7
Biomass (t ha^{-1})	63.0	1.8	7.8	72.5

[a]Picemar = *Picea mariana*; [b]Poputre = *Populus tremuloides*; [c]Pinuban = *Pinus banksiana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
123	Picemar	8.0	7.9	41
126	Picemar	7.4	8.3	34
130	Picemar	7.2	7.4	34
140	Picemar	3.4	8.0	43
141	Picemar	7.5	8.2	40
154	Pinuban	14.5	11.5	49
155	Picemar	8.6	9.4	39
221	Pinuban	10.3	10.2	49
224	Picemar	7.3	8.9	35

[a]Species: Picemar = *Picea mariana*; Pinuban = *Pinus banksiana*.



Plot AN IPY UD stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

Plot: AN IPY BG

Measurement date: 13-Sep-07

Latitude: 56° 24′ 00.6″N

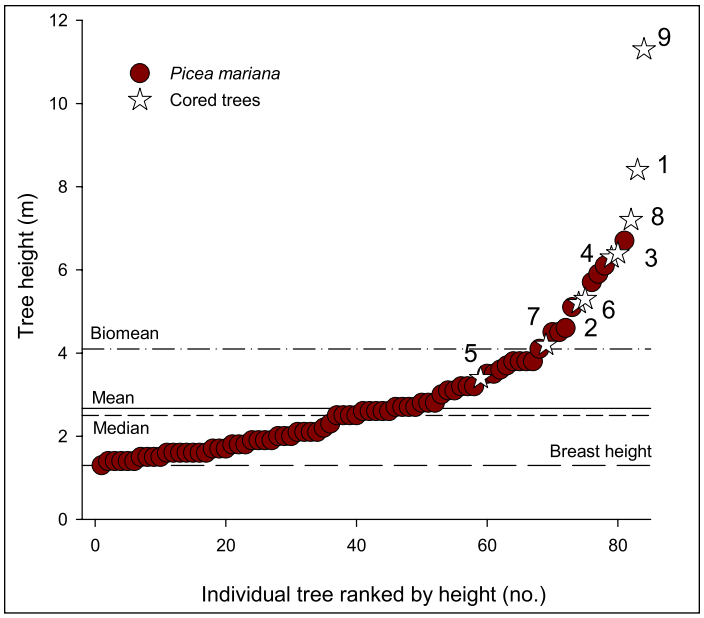
Longitude: 111° 01′ 52.6″W

Plant community type (Boreal Mixedwood): i1.1 Sb/ Labrador tea/cloudberry/peat moss

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	100	125
Small trees	1 2 3 4	100	69
Large trees	1 2 3 4	100	6

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Stand values

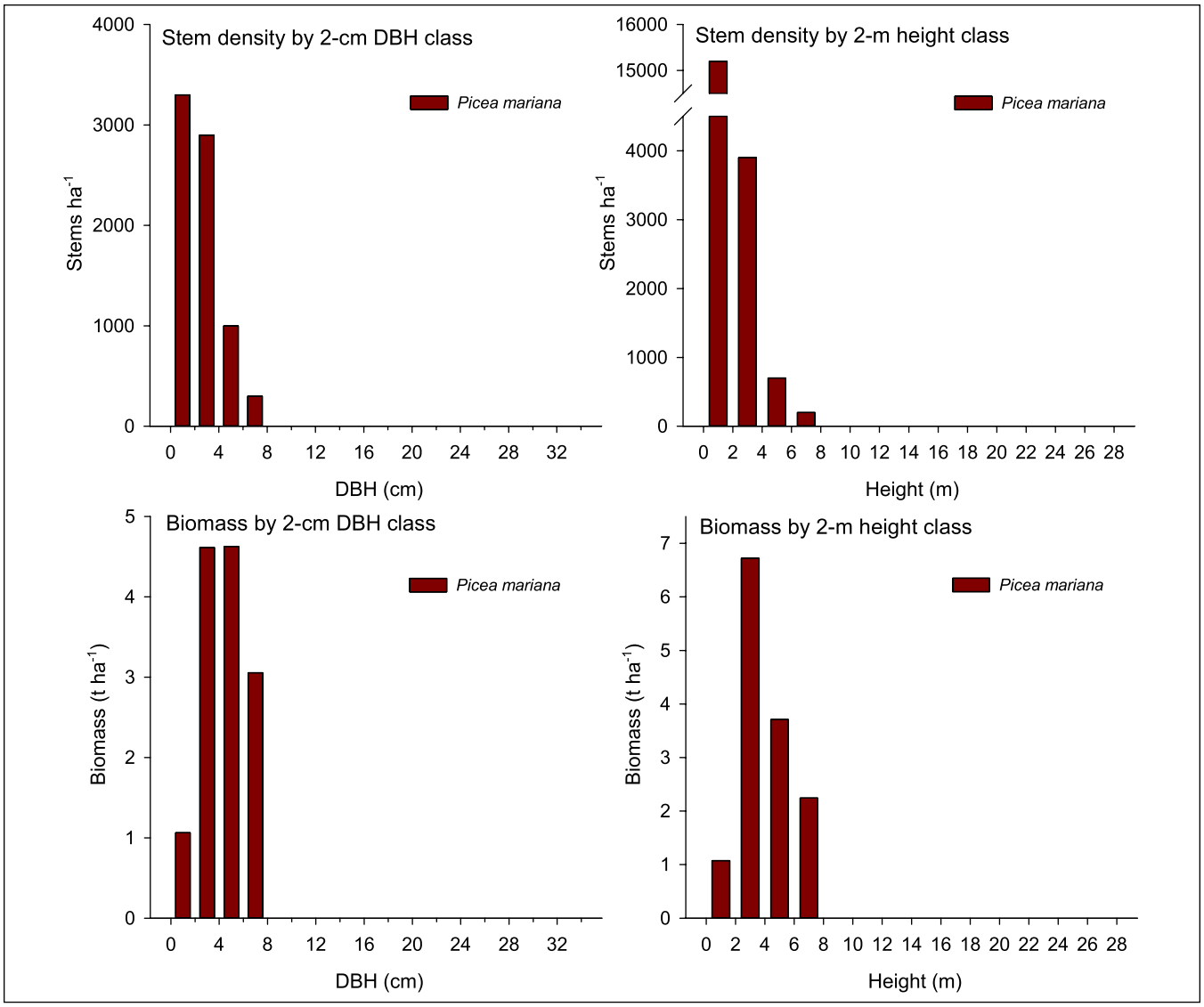
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	4.78	4.78
Stem density (stems ha^{-1})	20000	20000
Height ≥ 1.3 m	7500	7500
Height < 1.3 m	12500	12500
Mean tree height (m)	2.7	2.7
Median tree height (m)	2.5	2.5
Biomass-weighted tree height (m)	4.1	4.1
Biomass (t ha^{-1})	13.7	13.7

[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	10.8	8.4	59
2	Picemar	5.4	5.2	44
3	Picemar	7.0	6.4	59
4	Picemar	6.0	6.3	56
5	Picemar	3.2	3.4	50
6	Picemar	6.3	5.3	65
7	Picemar	3.8	4.2	51
8	Picemar	6.4	7.2	59
9	Picemar	11.9	11.3	80

[a]Species: Picemar = *Picea mariana*.



Plot AN IPY BG stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

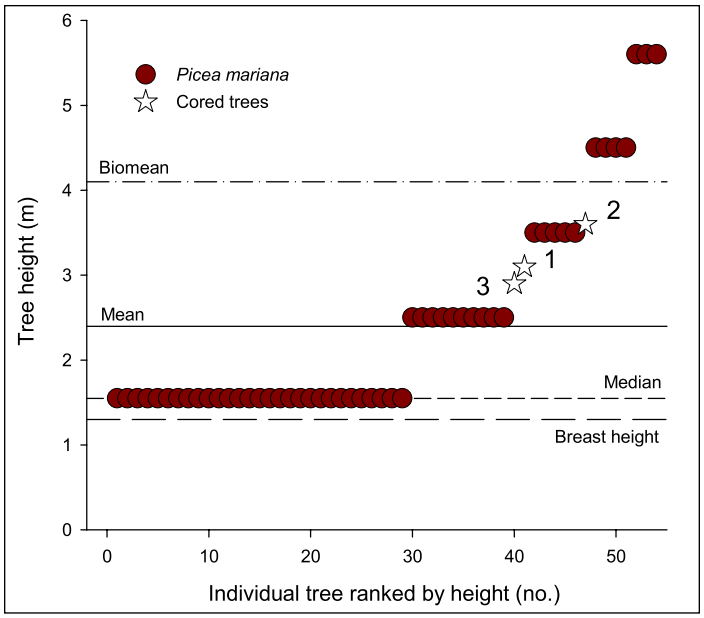
Plot: AN IPY IL

Measurement date: 13-Sep-07

Latitude: 56° 23′ 58.9″N

Longitude: 111° 01′ 52.5″W

Plant community type (Boreal Mixedwood): i2.1 black spruce-Labrador tea/cloudberry/peat moss



Height of trees in relation to mean, median, and biomass-weighted mean (Biomean) tree heights were all trees are ranked by height. Numbers identify the tree no. of cored trees in the cored trees table (below).

Sample size and in-plot location

Size class[a]	Sub-plot[b]	Total area (m^2)	Sample size
Very small trees	1 2 3 4	213.2	77
Small trees	1 2 3 4	213.2	48
Large trees	1 2 3 4	213.2	3

[a]Very small trees = height < 1.3 m; small trees = height ≥ 1.3 m and DBH < 5 cm; large trees = DBH ≥ 5 cm.
[b]Refer to Using This Report, Figure 2B for plot layout.

Stand values

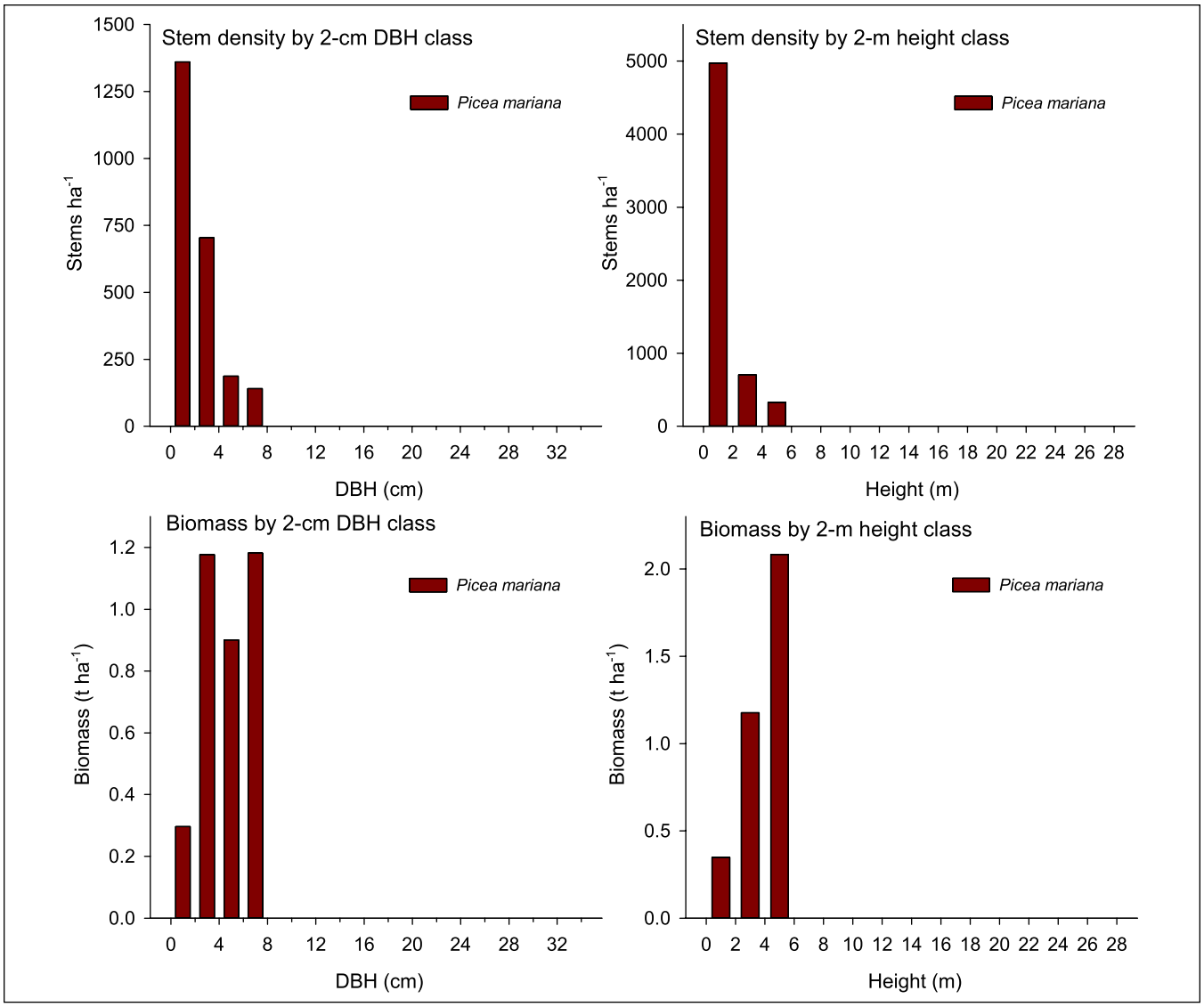
Parameter	Picemar[a]	Total
Basal area (m^2 ha^{-1})	1.23	1.23
Stem density (stems ha^{-1})	6005	6005
Height ≥ 1.3 m	2393	2393
Height < 1.3 m	3612	3612
Mean tree height (m)	2.4	2.4
Median tree height (m)	1.6	1.6
Biomass-weighted tree height (m)	4.1	4.1
Biomass (t ha^{-1})	3.6	3.6

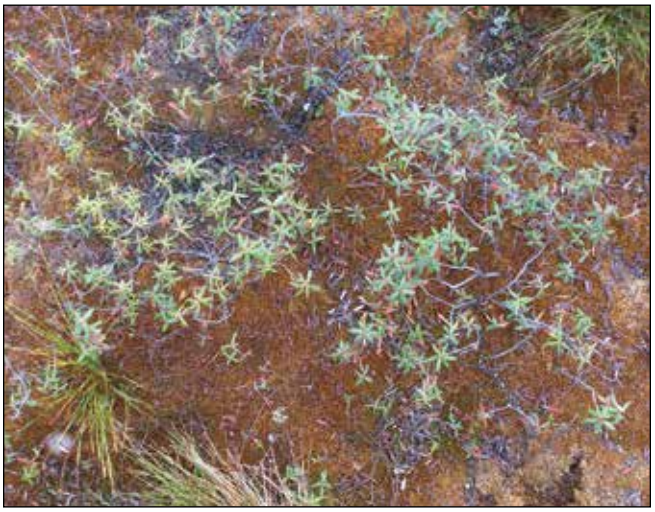
[a]Picemar = *Picea mariana*.

Cored trees

Tree no.	Species[a]	DBH (cm)	Height (m)	Age (yr)
1	Picemar	4.0	3.1	38
2	Picemar	3.7	3.6	41
3	Picemar	3.0	2.9	35

[a]Species: Picemar = *Picea mariana*.





Plot AN IPY IL stem density and biomass by tree size (diameter and height classes) and species as well as plot photographs illustrating the stand structure and understory composition.

CONCLUDING REMARKS

This report details baseline tree mensuration data collected for 69 permanent monitoring plots established in the Mackenzie Valley region of the Northwest Territories and three associated plots in northern Alberta. Although plots were established, and baseline data were collected in 2007 and 2008, this report is only now being published in 2019, following a 10-year remeasurement of the NWT plots. Despite this delay in publishing, it is still our intent that this be the second in a three-part series. The first report (Errington et al. 2018) outlines the plot locations and descriptions. The second (current) report provides overstory tree vegetation information, data collection and analysis methods, and plot level summaries of stand characteristics. The third report will include the baseline plant community, soil, and water chemistry data.

Having now revisited many of the plots, we have taken the opportunity to correct errors in the baseline data, such as species misidentification, as well as to correct several obvious errors in initial height measurements, as described in the Laboratory Methods section. In the intervening 10-years only one NWT site was affected by forest fire, with FS 03 burned in the Kakisa Wildfire of 2014. We were able to relocate all plots in FS 03; however, in both FS 03 UD and FS 03 PP all trees were killed by the fire. The fire did not penetrate far into the collapse scar, and FS 03 CS was untouched by fire. In FS 03 UD, tree tags were generally burned beyond readability and were replaced with new tag numbers as they were re-measured. We did not revisit the site in northern Alberta (AN IPY), but we suspect that it was burned by the 2016 Horse River Wildfire, which resulted in the evacuation of Fort McMurray.

ACKNOWLEDGMENTS

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APPENDIX 1 HEIGHT — DIAMETER RELATIONSHIPS USED TO INFILL MISSING TREE HEIGHTS

Missing tree height values were estimated using a series of species- and region-specific models incorporating DBH (diameter at breast height) as the independent variable (Table A1). Several nonlinear regression models were fit, tested, and selected based on the methods of Huang et al. (1992) using model forms appropriate to the relationship (Curtis et al. 1981; Larsen and Hann 1987; Wang and Hann 1988; Richards 1959). Simple linear models were also fit, and final models were selected to have the lowest residual sum of squares (SSE) and residual standard error (RMSE) where all parameters are significant, and assumptions of homogeneous variance, and model fit are not violated. All selected models are one of three model forms: modified exponential (Equation A1), Chapman-Richards (Equation A2), or linear (Equation A3).

(A1) $$\hat{H} = 1.3 + e^{a+bD^c}$$

(A2) $$\hat{H} = 1.3 + a(1 - e^{-bD})^c$$

(A3) $$\hat{H} = a + bD$$

Where $\hat{H}$ is the predicted height and D is the DBH, with a, b, and c parameters fit by region and species as presented in Table A1. Models were fit using the nlme package (Pinheiro et al. 2018) within the R statistical computing environment (R Core Team 2018).

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Table A1. Fitted model forms used to predict height from DBH (breast height diameter) within the Mackenzie Valley Permanent Monitoring Plot Network

Species:	*Picea mariana*				*Picea glauca*		*Betula neoalaskana*	
Region:[a]	**Inuvik**	**Sahtu**	**Dehcho**		**Sahtu**	**Dehcho**	**Sahtu**	**Dehcho**
Type	Upland	Upland	Upland	Peat plateau	Upland	Upland	Upland	Upland
Sample size	576	499	1743	2414	12	450	13	53
Mean DBH	4.8	5.1	5.0	3.1	9.8	3.5	5.9	2.1
(range)	(0.1, 13.6)	(0.1, 21.5)	(0.1, 28.5)	(0.1, 19.5)	(0.9, 26.1)	(0.1, 33.1)	(0.3, 10.7)	(0.1, 6.5)
Median height	3.7	4.5	4.6	2.6	5.9	2.4	4.5	3.2
(range)	(1.2, 12.4)	(1.3, 14.6)	(1.3, 23.2)	(0.7, 14.3)	(1.5, 15.2)	(1.3, 27.8)	(1.6, 8.3)	(1.4, 10.1)
Model form[b]	A1	A1[c]	A2[c]	A2[c]	A2[c]	A2[c]	A3	A3
a	-14.59644	5.9122	20.9168	10.1997	23.43064	27.32851	1.8999	1.71
b	13.81588	-6.8911	0.07939	0.1596	0.04634	0.05195	0.5445	1.127
c	0.07608	-0.2315	1.38353	1.7714	1.31029	1.2192	NA[g]	NA
SSE[d]	294.9	18.00	103.6	77.58	0.6839	18.02	5.646	41.26
RMSE[e]	0.7174	0.1905	0.2440	0.1794	0.2757	0.2008	0.7164	0.8995
MSE[f]	0.5147	0.0329	0.0595	0.0322	0.0760	0.0403	0.5132	0.8091

[a]The Sahtu region includes the Norman Wells sites, and the Dehcho region includes both the Fort Simpson and Wrigley sites.
[b]Model forms of modified exponential (A1), Chapman-Richards (A2), and linear (A3).
[c]Variance was modeled as a power function of the predicted height.
[d]SSE = residual sum of squares.
[e]RMSE = residual standard error.
[f]MISE = mean standard error.
[g]NA = not applicable.