Forest Ecosystem Classification for Nova Scotia

Part III: Ecosites
(2010)

prepared by
Nova Scotia Department of Natural Resources

REPORT FOR 2011-2

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Kevin Keys, Peter Neily, Eugene Quigley, Bruce Stewart

Nova Scotia Department of Natural Resources
Renewable Resources Branch

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Introduction

In 2000, the Nova Scotia Department of Natural Resources (NSDNR) began a long-term project to systematically identify and describe stand-level forest ecosystems in Nova Scotia – known as the Forest Ecosystem Classification (FEC) project. To date, over 1,500 FEC plots have been assessed throughout the province using a detailed sampling and assessment protocol (Keys et al. 2007). This has resulted in several publications describing regional forest vegetation types, soil types and ecosites (Keys et al. 2003; Neily et al. 2006, 2007; Keys 2007).

In 2010, results from 10 years of FEC project work were synthesized to produce a comprehensive provincial FEC guide which is presented in three documents: *Forest Ecosystem Classification for Nova Scotia: Part I Vegetation Types (2010)*; *Part II Soil Types (2010)*; and *Part III Ecosites (2010)*. This three-part guide builds upon, but also supersedes, all earlier FEC publications.

Questions arising from use of provincial FEC guides should be directed to the Ecosystem Management Group, Forestry Division, NSDNR. All FEC guide documents are subject to revision and update on a periodic basis. Users should check the NSDNR website for current editions of FEC component guides.

Why Classify Forest Ecosystems

At a landscape level, ecosystem classification provides a framework for landscape analysis and planning which can then be ecologically linked to operational (stand-level) planning and management (Sims et al. 1995). NSDNR has already produced a comprehensive ecological landscape classification (ELC) system for Nova Scotia (Neily et al. 2005). This hierarchical system begins with ecozone and moves through ecoregions, ecodistricts, ecosections and finally ecosites – the level where the ELC and FEC systems converge.

At a stand level, classifying forest ecosystems based on vegetation, soil and site attributes allows users to recognize similar ecosystem units on the ground and to develop a common understanding of these units (Baldwin and Meades 1999; Ponomarenko and Alvo 2001). This allows for ongoing development of guidelines and best management practices which recognize opportunities and constraints associated with different ecosystem units, thereby leading to more predictable and sustainable forest management.

FEC Definitions

A glossary (Appendix G) contains definitions for several ecological and forest management related terms used in this guide. Definitions for provincial FEC units are given below.

Forest Groups are groups of forest vegetation types (VTs) with similar species composition, site conditions and successional pathways. These groups assist in the classification and presentation of unique VTs.

Vegetation Types are recurring and identifiable forest plant communities which reflect differences in site conditions, disturbance regimes and/or successional stage.

Variants are used to distinguish less common stands from the "typic" or average VT condition (based on minor variations in species composition or site features). Relative to differences among VTs, features used to define variants have weaker ecological and classification significance.

Soil Types are soils differentiated based on texture, drainage, fertility and depth; all of which influence site productivity and other management interpretations.

Phases are used to identify features within a soil type which are important for management interpretations, but which do not warrant establishment of a separate unit.

Ecosites are units which represent ecosystems that have developed under a variety of conditions and influences, but which have similar moisture and nutrient regimes. An ecosite is associated with a finite range of soil and site conditions and a finite range of VTs that grow naturally under those conditions.

About this Guide

This guide is part of the Nova Scotia FEC system. It describes all currently recognized FEC ecosites in the province along with related productivity interpretations. Although presented as a separate document, this guide is designed to be used in conjunction with provincial vegetation type and soil type guides to support ecosystem based, stand-level forest management in Nova Scotia.

Ecosite productivity interpretations were derived from 1,153 provincial FEC field plots sampled between 2000 and 2010. Data from an additional 230 non-FEC plots assessed by the province in support of forest land capability mapping were also used (Bailey and Mailman 1972).

Provincial Ecosites

Ecosites represent general productivity units and provide an ecological setting through which vegetation and soil type combinations can be grouped and compared. By itself, ecosite classification is useful for forest-level planning purposes such as growth and yield analysis, wildlife habitat analysis and biodiversity considerations.

Ecosites, as an expression of relative moisture and nutrient regimes, are influenced by regional climate conditions. Nine climate-based ecoregions have been identified in Nova Scotia's ELC system (Neily et al. 2005) (Appendix A). Theoretically, each ecoregion could have its own set of ecosites to represent relative moisture and nutrient regimes. However, it has been determined through analysis of tree growth data that Nova Scotia can be effectively represented by two main ecosite groups, hereafter referred to as Acadian and Maritime Boreal (Table 1).

Seventeen (17) Acadian and eleven (11) Maritime Boreal ecosites have been identified (Tables 2 and 3). Each name describes the general moisture/nutrient condition and typical climax forest community associated with the ecosite.

North Bingay Lake, Digby County

Table 1. FEC ecosite groups and associated ecoregion and ecodistrict units

Acadian Ecosite Group	Maritime Boreal Ecosite Group
Cape Breton Highlands ecoregion: Victoria Lowlands ecodistrict plus long slopes and valleys associated with the Cape Breton Highlands ecodistrict	Cape Breton Highlands ecoregion: High elevation plateaus and upper slopes associated with the Cape Breton Highlands ecodistrict
Nova Scotia Uplands ecoregion	Cape Breton Taiga ecoregion
Eastern ecoregion	Atlantic Coastal ecoregion
Northumberland / Bras d'Or ecoregion	
Valley and Central Lowlands ecoregion	
Western ecoregion	
Fundy Shore ecoregion	

Table 2. Acadian group ecosites

Ecosite	Ecosite Name	Ecosite	Ecosite Name
AC1	Dry-Very Poor / Jack pine-Black spruce	AC10	Fresh-Medium / Red spruce-Hemlock
AC2	Fresh-Very Poor / Black spruce-Pine	AC11	Moist-Medium / Red spruce-Yellow birch
AC3	Moist-Very Poor / Black spruce-Pine	AC12	Wet-Medium / Red maple-White ash-Fir
AC4	Wet-Very Poor / Black spruce-Tamarack	AC13	Fresh-Rich / Sugar maple-Beech
AC5	Dry-Poor / White pine-Oak	AC14	Moist-Rich / Sugar maple-Yellow birch
AC6	Fresh-Poor / Black spruce-White pine	AC15	Wet-Rich / White ash-Red maple
AC7	Moist-Poor / Black spruce-White pine	AC16	Fresh-Very Rich / Sugar maple-White ash
AC8	Wet-Poor / Spruce-Fir-Red maple	AC17	Moist-Very Rich / Sugar maple-White ash
AC9	Dry-Medium / Red maple-Spruce		

Table 3. Maritime Boreal group ecosites

Ecosite	Ecosite Name	Ecosite	Ecosite Name
MB1	Dry-Poor / Black spruce-Jack pine	MB7	Wet-Medium / Red maple-Fir
MB2	Fresh-Poor / Black spruce	MB8	Fresh-Rich / Birch-Fir
MB3	Moist-Poor / Black spruce	MB9	Moist-Rich / Birch-Fir
MB4	Wet-Poor / Black spruce	MB10	Wet-Rich / Red maple
MB5	Fresh-Medium / Fir-Spruce	MB11	Fresh Moist-Very Rich / Red maple-Birch
MB6	Moist-Medium / Fir-Spruce		

Determining Ecosites

In the field, ecosite is determined by first assessing stand level vegetation type (VT) and soil type (ST) using the documents *Forest Ecosystem Classification for Nova Scotia: Part I Vegetation Types (2010)* and *Part II Soil Types (2010)*. Once VT and ST are known, users can quickly assign ecosite using tables found in Appendices B and C of this document.

As part of ongoing ELC project work, NSDNR is currently working on a digital ecosite map layer for the province (based on model predicted soil moisture and nutrient regimes). Once this map layer is completed, ecosite may be estimated using this product; however, field determination of ecosite will always be more definitive than model predictions and should be used whenever possible.

Terminology and Conventions

Terms used to describe ecosite features are defined in the sections below.

Covertype

Covertype refers to the relative percentage of softwood versus hardwood species in the overstory of a stand. In this guide, covertype classes are:

Softwood Overstory coverage of softwood species is 75% or more.

Hardwood Overstory coverage of hardwood species is 75% or more.

Mixedwood Overstory coverage of softwood and hardwood species is between 25% and 75%.

Edatopic Grid

An edatopic grid is a two-dimensional diagram used to plot ecosystems (and subsequently ecosites) with respect to their relative moisture and nutrient regimes.

Moisture Regime

Soil moisture regime represents average moisture availability for plant growth. It is assessed by integrating moisture supply (as related to climate) with soil drainage and moisture holding capacities. In general, very dry to dry moisture regimes are associated with severe to moderate moisture deficits; fresh to moist moisture regimes are associated with little to no moisture deficits; and wet moisture regimes are associated with excess moisture during the growing season.

Table 4 lists soil and site features used to assign soil moisture regime in the field (modified from Meades and Moores 1994).

Table 4. Soil moisture regime as a function of site and soil conditions

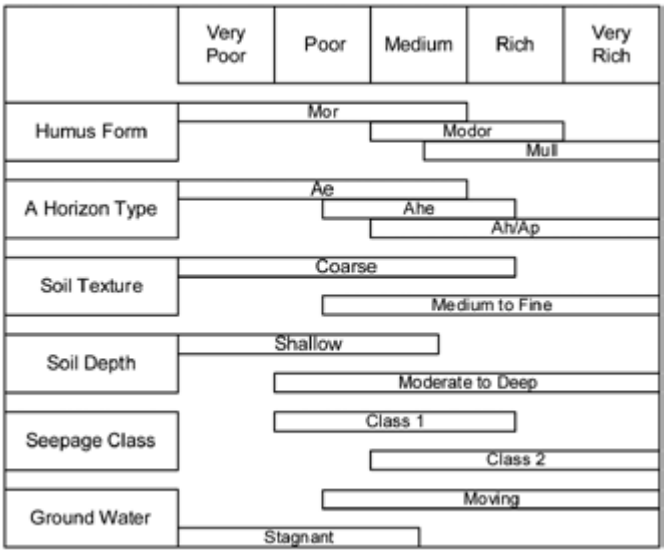
Moisture Regime	General Site and Soil Features
Very Dry	Rapidly drained, coarse textured and/or shallow soils not influenced by ground water or seepage.
Dry	Deeper, well drained, coarse textured soils not influenced by ground water or seepage; and shallow soils not rapidly drained or influenced by ground water or seepage.
Fresh	Deeper, well drained, medium to fine textured soils; moderately well drained coarse textured soils; or well drained coarse textured soils influenced by ground water.
Fresh/Moist	Deeper, moderately well drained, medium to fine textured soils often with some evidence of anaerobic (reducing) conditions in lower BC and C horizons.
Moist	Soils with imperfect drainage, but with surface soil still well aerated during most of the growing season. Evidence of anaerobic (reducing) conditions in upper B horizons.
Moist/Wet	Poorly drained soils with water levels near the surface for most of the year, but with well aerated surface conditions during dry periods.
Wet	Very poorly drained soils with water levels near the surface for most of the year – often associated with wetland organic soils.

White's Cove, Digby County

Nutrient Regime

Soil nutrient regime represents the relative availability of nutrients for plant growth. Determination of nutrient regime requires consideration and integration of several environmental parameters. The chart in Figure 1 was used as a guide for assigning soil nutrient regime during field sampling (modified from Beckingham and Archibald 1996). See Keys et al. (2007) for more details.

Figure 1. Soil nutrient regime as a function of site and soil conditions



Climax Vegetation

Climax vegetation refers to vegetation communities which are relatively long-lasting and self-replacing (Kimmins 1987). In this guide, climax vegetation is described as:

Zonal climax: Climax communities which are mainly a function of regional climate conditions. These occur on sites with average moisture and nutrient conditions (also called zonal sites).

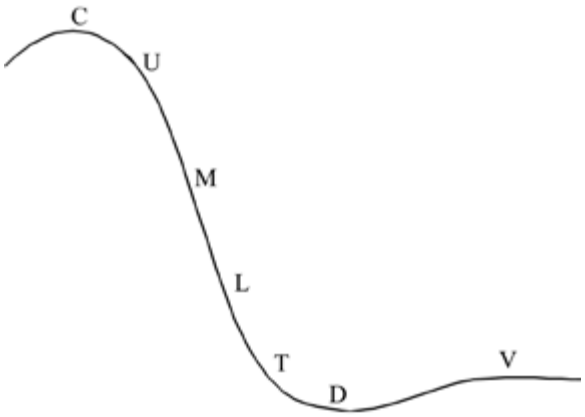
Edaphic (azonal) climax: Climax communities which are mainly a function of local extremes in site conditions (e.g. low nutrient sites, dry sites, wet sites and floodplain sites).

Site Characteristics

A site can be described by several attributes which have ecological or management related importance (i.e. topographic position, percent slope, parent material/landform, drainage, exposure, stoniness and rockiness). Each of these parameters is described in more detail below.

Topographic Position

Topographic position describes the relative slope position of a site within the landscape. Position classes are illustrated and described below (adapted from ECSS 1983):



Crest (C): The generally convex upper-most portion of a hill, it is usually convex in all directions with no distinct aspect.

Upper (U): The upper portion of a hill immediately below the crest – it has a convex surface profile with a specific aspect.

Middle (M): The area of a hill between the upper slope and lower slope with a specific aspect.

Lower (L): The area toward the base of a hill with a specific aspect.

Toe (T): The area below the lower slope usually demarcated by an abrupt leveling of the slope.

Depression (D): An area that is concave in all directions, generally at the foot of a hill or in a level area.

Level (V): Any level area not immediately adjacent to a hill. The surface profile is generally horizontal with no aspect. Level areas can be lower or upper elevations.

Slope Gradient

Slope gradient describes the percentage of vertical rise relative to horizontal distance. Zero percent slope describes a level site, and 100% slope equates to a 45 degree angle. In this guide, slope classes used are:

Level 0-3% **Gentle** 4-15% **Moderate** 16-30% **Steep** 31-60% **Extreme** >60%

Parent Material

Soils can develop from a variety of parent material types, the characteristics of which influence soil development and site quality. Parent material types discussed in this guide are (adapted from ECSS 1983):

Aeolian: Material deposited by wind action. Aeolian deposits are usually high in silt and/or fine sand and may show internal structures such as cross-bedding.

Alluvium: Sediments deposited by streams and rivers (floodplains, deltas, etc.). These deposits are younger than glacial deposits and may or may not contain rock (gravel/cobbles).

Colluvium: Deposits of sand, silt, clay, organic matter and/or rock which have reached their position by gravity-induced movement. These deposits are younger than glacial deposits.

Glacial Till: Unstratified deposits of sand, silt, clay and rock which have been released from glacier ice. Some glacial deposits also have recognizable landform features such as drumlins.

Glaciofluvial: Deposits which were partly or wholly stratified by glacial meltwater. Glaciofluvial deposits are often high sand and/or gravel.

Lacustrine: Sediments deposited in quiet waters (lakes and ponds) which may or may not have been directly associated with glaciers. These deposits tend to be high in silt and clay and generally do not contain rock.

Marine: Sediments deposited in salt or brackish water or through shoreline processes. Marine deposits are generally stratified, of variable texture, and may contain shells and gravel.

Organic: Built up plant debris which does not easily decompose because of high moisture and low soil temperatures.

Organic/Bedrock: Combination of upland organic over weathered, near-surface bedrock.

Till/Bedrock: Combination of thin glacial till over weathered, near-surface bedrock.

Drainage

Soil drainage class reflects the length of time it takes water to be removed from a soil in relation to supply. Several factors affect drainage class, including: (i) slope position, (ii) slope percent and aspect, (iii) soil texture, (iv) depth to impermeable layer, (v) coarse fragment content, and (vi) abundance and type of vegetation (evapotranspiration).

Six drainage classes used in this guide are described below (adapted from ECSS 1983).

Rapid: Water is removed from the soil rapidly in relation to supply. Excess water flows downward if underlying material is permeable, or laterally if vertical flow is restricted. The water source is precipitation. Soils do not show any redoximorphic features within the profile.

Well: Water is removed from the soil readily, but not rapidly. Excess water flows downward if underlying material is permeable, or laterally if vertical flow is restricted. The water source is precipitation. Soils usually do not show redoximorphic features within the first meter, but may show features below this depth.

Moderately Well: Water is removed from the soil somewhat slowly in relation to supply – due to low permeability and lack of slope, shallow water table, seepage inputs, or some combination of these. The water source is precipitation in medium to fine textured soils, and precipitation and seepage flow in coarse textured soils. Soils commonly show redoximorphic features in lower BC and C horizons.

Imperfect: Water is removed from the soil sufficiently slowly in relation to supply to keep the soil wet for a significant part of the growing season. Excess water moves slowly downward if precipitation is the major supply. If seepage water or groundwater (or both) is the main source, the flow rate may vary but the soil remains wet for a significant part of the growing season. Soils commonly show redoximorphic features in upper B horizons and sometimes in A horizons.

Poor: Water is removed so slowly in relation to supply that the soil remains wet for a comparatively large part of the time (when not frozen). Seepage inputs or groundwater flow (or both), in addition to precipitation, are the main water sources. There may also be a perched water table with precipitation exceeding evapotranspiration. Soils usually show redoximorphic features throughout the profile.

Very Poor: Water is removed from the soil so slowly that the water table remains at or near the surface for the greater part of the time (when the soil is not frozen). Groundwater flow and seepage inputs are the major water sources. Precipitation is less important, except where there is a perched water table with precipitation exceeding evapotranspiration. Soils usually show redoximorphic features throughout the profile and are often organic.

Exposure

Exposure refers to the relative openness of a site to weather conditions, particularly wind and sun. Exposure can affect moisture conditions on a site and severely impact the height growth of trees. Exposure classes are described below (from NSDLF 1988).

Exposed: Sites with extreme exposure – includes upper slopes of moderate ridges immediately along the coastline and steep upper slopes of uplands open to winds from two or more directions.

Moderately Exposed: Intermediate between Exposed and Moderate – includes upper slopes of inland ridges or hills, except where sheltered by a larger hill.

Moderate: The topographically neutral category – includes broad flats, lower and middle slopes of strong ridges (plus sheltered upper slopes), and upper slopes of gentle relief in a flat landscape.

Moderately Sheltered: Intermediate between Moderate and Sheltered – includes middle slopes between high ridges and broad basins which are afforded some wind protection from one or more directions.

Sheltered: The most extreme category of protection from wind and atmospheric drought stress, best illustrated by lower slopes of deep valleys where protection is provided on all sides.

Surface Stoniness

Stoniness describes the percentage area of a site covered by exposed stones and boulders (minimum 25 cm in diameter or length). Stoniness classes used in this guide are presented in Table 5 (from ECSS 1983).

Table 5. Surface stoniness class based on stone size and approximate distance

Code	Class	Distance Apart (m) Stones 25 cm Diameter	Distance Apart (m) Stones 60 cm Diameter	Distance Apart (m) Stones 120 cm Diameter
NS	Non-stony	> 25	> 60	> 120
SS	Slightly Stony	8-25	20-60	37-120
MS	Moderately Stony	1-8	3-20	6-37
VS	Very Stony	0.5-1	1-3	2-6
ES	Exceedingly Stony	0.1-0.5	0.2-1	0.5-2
XS	Excessively Stony	< 0.1	< 0.2	< 0.5

Surface Rockiness

Rockiness describes the percentage area of a site with bedrock outcrops. Rockiness classes used in this guide are presented in Table 6 (from ECSS 1983).

Table 6. Surface rockiness class based on percent cover of exposed bedrock

Code	Class	Percent Cover
NR	Non-rocky	< 2
SR	Slightly Rocky	2-10
MR	Moderately Rocky	11-25
VR	Very Rocky	26-50
ER	Exceedingly Rocky	51-90
XR	Excessively Rocky	> 90

Ecosite Fact Sheets

The following sections contain fact sheets describing 17 Acadian and 11 Maritime Boreal ecosites. Below is a summary of information found in each ecosite fact sheet.

1 The ecosite **unit**, **number** and **name** are found at the top of the fact sheet, along with the number of plots (n) described in the field and its **edatopic grid** position.

2. A **description** of the ecosite provides general information on landscape setting and dominant vegetation by category. An outline of natural **disturbance and succession** patterns that occur within the ecosite follows the discussion on vegetation.

3. Information on several **site characteristics** is presented next, followed by a list of **vegetation types** and **soil types** associated with the ecosite. Superscript numbers for site characteristics refer to percentages of each unit found during field sampling (range 1=10% to 10=100%).

4. The **comments** section is used to provide additional information related to the ecology and/or distribution of each ecosite.

Note: In some cases, data were not collected for particular features and these are recorded as **nd** (no data) in site summaries.

For details on VTs and STs found within each ecosite, users should refer to *Forest Ecosystem Classification for Nova Scotia: Part I Vegetation Types (2010)* and *Part II Soil Types (2010)*. For convenience, provincial VTs and STs are also listed by name in Appendix E of this document.

Acadian Ecosites

The Acadian group contains seventeen (17) ecosites representing a full range of forest site conditions (Figure 2).

Zonal ecosites are associated with climax forests containing mainly shade-tolerant and shade-intermediate species such as red spruce, hemlock, white pine, sugar maple, red maple, yellow birch, beech and white ash. Edaphic ecosites are associated with site driven climax forests with species such as black spruce, white pine, red pine, jack pine, balsam fir, tamarack, red oak, red maple and white ash. Transitional ecosites may contain both types of climax conditions with similar moisture and nutrient regimes.

Several successional plant communities are also associated with these ecosites with species such as trembling aspen, large-tooth aspen, red oak, white birch, grey birch, red maple, black cherry, balsam fir and white spruce.

Figure 2. Edatopic grid showing relative moisture and nutrient regimes for Acadian group ecosites

Green = zonal ecosites **Black** = edaphic ecosites
Orange = transitional ecosites which can support both edaphic and zonal vegetation types

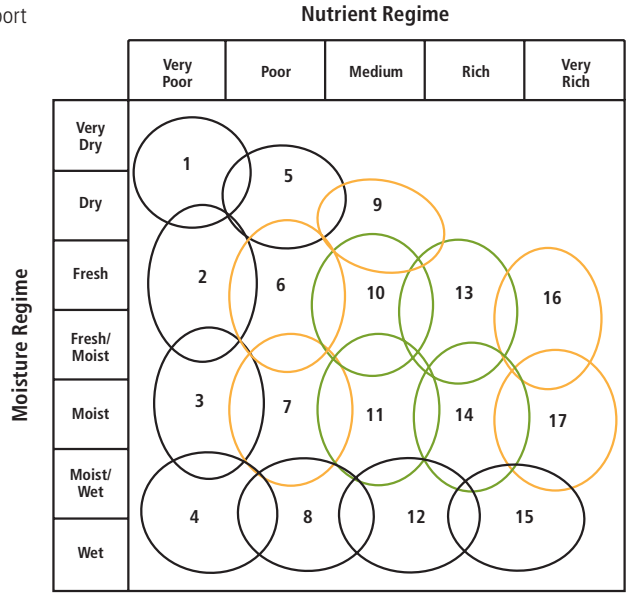
1. Dry-Very Poor / Jack pine-Black spruce
2. Fresh-Very Poor / Black spruce-Pine
3. Moist-Very Poor / Black spruce-Pine
4. Wet-Very Poor / Black spruce-Tamarack

5. Dry-Poor / White pine-Oak
6. Fresh-Poor / Black spruce-White pine
7. Moist-Poor / Black spruce-White pine
8. Wet-Poor / Spruce-Fir-Red maple

9. Dry-Medium / Red maple-Spruce
10. Fresh-Medium / Red spruce-Hemlock
11. Moist-Medium / Red spruce-Yellow birch
12. Wet-Medium / Red maple-White ash-Fir

13. Fresh-Rich / Sugar maple-Beech
14. Moist-Rich / Sugar maple-Yellow birch
15. Wet-Rich /White ash-Red maple

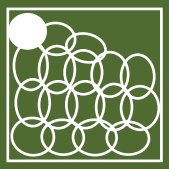
16. Fresh-Very Rich / Sugar maple-White ash
17. Moist-Very Rich / Sugar maple-White ash



Note: It is possible for VTs normally associated with Maritime Boreal ecosites to be found in geographic areas classed as Acadian (Table 1). This would most likely occur near saltwater coastlines (e.g. along the Bay of Fundy and Northumberland Strait) or on higher elevations (e.g. within the Bras d'Or Lowlands (510) ecodistrict). Where Maritime Boreal VTs are found in Acadian areas, users should refer to Maritime Boreal ecosite descriptions and productivity interpretations.

See Appendix F for a list of scientific and common plant names.

AC1
Dry – Very Poor / Jack pine – Black spruce
n = 28



Description

Occurring on upper slopes and crests of bedrock ridges and/or on coarse textured glacial till and glaciofluvial deposits, this ecosite has dry, nutrient very poor soils which generally support open stands of stunted black spruce, red pine, jack pine, red maple and red oak. Ericaceous species dominate the shrub layer (mainly huckleberry, lambkill and blueberry), with black crowberry, broom crowberry, wild raisin and false holly also common. There are usually low levels of herb cover with bracken and teaberry the main species. The forest floor is dominated by reindeer lichens and Schreber's moss.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce. Windthrow and fire are significant disturbance agents, and frequent fires can lead to increased ericaceous cover.

Site Characteristics

Topographic Position	Crest[4] Level[4] Upper[1] Middle[1]
Slope Gradient	Level[3.5] Gentle[2] Moderate[1] nd[3.5]
Exposure	Moderate[5] Mod.Exposed[2] Exposed[2] nd[1]
Parent Material	Glacial till[4] Glaciofluvial[3] Till/Bedrock[2] Organic/Bedrock[1]
Drainage	Rapid[6] Well[3] Mod.Well1
Surface Stoniness	(Non - Slightly)[6] (Moderately)[2] (Very - Excessively)[2]
Surface Rockiness	(Non-rocky)[5] (Very - Excessively)[4] (Slightly - Moderately)[1]

Vegetation Types

Common	OW1, OW2, OW4, OW5, SP2, SP3
Possible	SP1

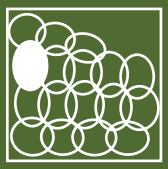
Soil Types

Common	ST1, ST1-G, ST15, ST15-G
Possible	ST15-L, S-phase types

Comments

The range in surface stoniness and rockiness reflects different parent material influences. Large stones and near-surface bedrock are generally not associated with glaciofluvial deposits, whereas glacial till and bedrock sites are often stony and/or rocky.

AC1 sites are scattered throughout Nova Scotia wherever near-surface bedrock and sandy soils can be found. Ecodistricts with increased rockiness include Eastern Granite Uplands (430), Eastern Interior (440) and Chignecto Ridges (560). Glaciofluvial deposits are associated with Annapolis Valley (610) and Minas Lowlands (620) ecodistricts.



AC2
Fresh – Very Poor / Black spruce – Pine
n = 59

Description

Occurring mainly on gentle slopes or well drained level areas with coarse textured glacial till or glaciofluvial deposits, this ecosite has fresh, nutrient very poor soils which generally support poorly stocked forests of black spruce, red pine, jack pine and white pine. Ericaceous species dominate the shrub layer (mainly lambkill, rhodora and blueberry) often with significant black spruce regeneration. Bracken cover can be extensive in the herb layer with teaberry and bunchberry also common. The forest floor is dominated by Schreber's moss.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce. White pine may form a super canopy over black spruce on some sites. Windthrow and fire are significant disturbance agents, and frequent fires can lead to increased ericaceous cover.

Site Characteristics

Topographic Position	Upper[3] Level[3] Middle[2] Crest[1] Lower[1]
Slope Gradient	Gentle[4] Level[3] Moderate - Steep[1] nd[2]
Exposure	Moderate[9] Mod.Exposed[1]
Parent Material	Glacial till[5] Glaciofluvial[1] Till/Bedrock[1] nd[3]
Drainage	Well[4] Rapid[1] Mod.Well[1] Imperfect[1] nd[3]
Surface Stoniness	(Non - Slightly)[5] (Moderately)[1] (Very - Excessively)[1] nd[3]
Surface Rockiness	(Non-rocky)[6] (Slightly - Moderately)[1] nd[3]

Vegetation Types

Common OW1, OW2, OW4, OW5, SP1, SP2, SP3

Soil Types

Common ST1, ST2, ST2-G, ST16, ST16-G,
Possible ST1-G, ST16-L, S-phase types

Comments

AC2 sites may be underlain by ST16 soils which, due to their shallow depth, are only associated with fresh moisture regimes even though they are classed as imperfectly drained.

AC2 sites are distributed throughout Nova Scotia wherever fresh, nutrient poor soils can be found. Areas of higher occurrence include the Northumberland Lowlands (530), Annapolis Valley (610), Minas Lowlands (620) and South Mountain (720) ecodistricts.

AC3
Moist – Very Poor / Black spruce – Pine
n = 12

Description

Occurring mainly on imperfectly drained level areas with coarse textured glacial till or glaciofluvial deposits, this ecosite has moist, nutrient very poor to poor soils which generally support poorly stocked stands of black spruce, red pine, jack pine and white pine. Ericaceous species dominate the shrub layer (mainly lambkill, rhodora and blueberry) often with significant black spruce regeneration. Bracken cover can be extensive in the herb layer with teaberry and bunchberry also common. The forest floor is dominated by Schreber's moss. Plants indicative of moist soils are also found including false holly, Labrador tea, cinnamon fern, creeping snowberry and sphagnum mosses.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce. White pine may form a super canopy over black spruce on some sites. Windthrow and fire are significant disturbance agents and frequent fires can lead to increased ericaceous cover.

Site Characteristics

Topographic Position	Level[7] Upper[2] Middle[1]
Slope Gradient	Level[4] Gentle[3] nd[3]
Exposure	Moderate[9] Mod.Exposed[1]
Parent Material	Glacial till[7] Glaciofluvial[3]
Drainage	Imperfect[6] Mod.Well[4]
Surface Stoniness	(Non - Slightly)[7] (Moderately)[1] (Very - Excessively)[1] nd[1]
Surface Rockiness	(Non-rocky)[9] (Slightly - Moderately)[1]

Vegetation Types

Common	OW2, SP1, SP2, SP3
Possible	OW1, OW4, OW5, WC3, WC4

Soil Types

Common	ST3, ST3-G
Possible	ST3-L, ST6, ST14-U, S-phase types

Comments

AC3 sites are distributed throughout Nova Scotia wherever moist, nutrient poor soils can be found. Areas of higher occurrence include the Bras d'Or Lowlands (510), Northumberland Lowlands (530), Annapolis Valley (610), Minas Lowlands (620) and South Mountain (720) ecodistricts.

AC4
Wet – Very Poor / Black spruce – Tamarack
n = 98

Description

Occurring mainly on poorly to very poorly drained level areas and depressions with coarse textured glacial till and/or organic deposits, this ecosite has wet, nutrient very poor to poor soils which generally support poorly stocked stands of black spruce with tamarack. Depending on moisture levels, stands can also be stunted. False holly and ericaceous species dominate the shrub layer (mainly lambkill, blueberry, rhodora and Labrador tea). Creeping snowberry, bunchberry, cinnamon fern, bracken and three seeded sedge are common herbs. The forest floor is dominated by sphagnum mosses and Schreber's moss.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce. Fluctuating water table levels, windthrow, and insects and disease are significant disturbance agents. Seasonal moisture deficits combined with the flammability of ericaceous vegetation can sometimes create favourable fire conditions.

Site Characteristics

Topographic Position	Level[8] Lower - Toe[1] Depression[1]
Slope Gradient	Level[4] Gentle[1] nd[5]
Exposure	Moderate[8] Mod.Exposed[1] Mod.Sheltered[1]
Parent Material	Glacial till[4] Organic[4] Glaciofluvial[1] Other[1]
Drainage	Poor[5] Very Poor[4] Imperfect[1]
Surface Stoniness	(Non - Slightly)[8] (Moderately)[1] (Very - Excessively)[1]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	WC1, WC2, WC3, WC4

Soil Types

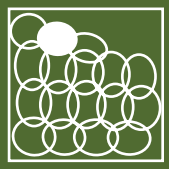
Common	ST4, ST4-G, ST6, ST7, ST14
Possible	ST3, ST3-G, ST3-L, S-phase types

Comments

Forest AC4 sites are generally associated with treed bogs and/or poor, coniferous treed swamps.

AC4 sites are found throughout Nova Scotia, usually embedded as small or large patches within the matrix forest. In the Bras d'Or Lowlands (510), Northumberland Lowlands (530), Central Lowlands (630) and Sable (760) ecodistricts, AC4 sites can also be matrix forming.

AC5
Dry – Poor / White pine – Oak
n = 32



Description

Occurring mainly on well to rapidly drained slopes with coarse textured and/or shallow soils, this ecosite has dry, nutrient poor soils which generally support poorly stocked stands with white pine (often as a super canopy) and other species capable of withstanding harsh site conditions (e.g. black spruce, red pine, red maple, large-tooth aspen and red oak). On slightly richer sites, red spruce and/or hybrid spruce are possible. Ericaceous species dominate the shrub layer (mainly lambkill and blueberry), with wild raisin, witch-hazel and huckleberry also common. Herb coverage and diversity are low and favour species which tolerate dry, acid soils such as bracken, teaberry, mayflower and bunchberry. The forest floor is dominated by Schreber's moss and broom mosses.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce and white pine. Windthrow and fire are significant disturbance agents, and frequent fires can lead to increased ericaceous cover.

Site Characteristics

Topographic Position	Upper[3] Crest[3] Level[3] Other[1]
Slope Gradient	Gentle[4] Level[2] Moderate[1] nd[3]
Exposure	Moderate[8] Exposed[1] Other[1]
Parent Material	Glacial till[5] Glaciofluvial[3] Organic/Bedrock[1] nd[1]
Drainage	Well[6] Rapid[3] nd[1]
Surface Stoniness	(Non - Slightly)[5] (Very - Excessively)[3] (Moderately)[1] nd[1]
Surface Rockiness	(Non-rocky)[6] (Very - Excessively)[2] (Slightly - Moderately)[1] nd[1]

Vegetation Types

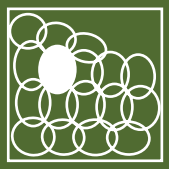
Common	IH1, IH2, IH6, SH4, SH9, SP3, SP4, SP5, SP9
Possible	CE2, OW3, SH5, SH8, SP6, SP8, SP10

Soil Types

Common	ST1, ST1-G, ST15, ST15-G, ST15-L
Possible	ST19, S-phase types

Comments

AC5 sites are mainly found in western Nova Scotia, but are scattered elsewhere wherever dry, nutrient poor soils can be found. Areas of higher occurrence include the Eastern Interior (440), South Mountain (720), Rossignol (750) and Western Barrens (770) ecodistricts.



AC6
Fresh – Poor / Black spruce – White pine
n = 126

Description

Occurring mainly on well drained slopes with coarse textured glacial till deposits, this ecosite has fresh, nutrient poor soils which generally support closed canopy stands of white pine and black spruce. When balsam fir is present, it is generally intermediate in the canopy and of low vigour. Early successional stands are dominated by large-tooth aspen, red oak and red maple. On slightly richer sites, red spruce and/or hybrid spruce are possible. Ericaceous species dominate the shrub layer (mainly lambkill and blueberry), with wild raisin, witch-hazel and huckleberry also common. Herb coverage and diversity are low and favour species which tolerate acid soils such as bracken, teaberry, mayflower and bunchberry. The forest floor is dominated by Schreber's moss.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce and white pine. Windthrow and fire are significant disturbance agents, and frequent fires can lead to increased ericaceous cover.

Site Characteristics

Topographic Position	Upper[4] Middle[3] Level[2] Crest[1]
Slope Gradient	Gentle[6] Level[2] Moderate[1] nd[1]
Exposure	Moderate[7] Mod.Exposed[2] Other[1]
Parent Material	Glacial till[8] Other[1] nd[1]
Drainage	Well[6] Mod.Well[2] Rapid[1] nd[1]
Surface Stoniness	(Very - Excessively)[4] (Non - Slightly)[3] (Moderately)[2] nd[1]
Surface Rockiness	(Non-rocky)[8] (Slightly - Moderately)[1] nd[1]

Vegetation Types

Common	IH1, IH2, IH6, SH1, SH2, SH3, SH4, SH5, SH9, SP2, SP4, SP5, SP6, SP8, SP9, SP10
Possible	CE2, OW3, SH6, SH8, SP1, SP3

Soil Types

Common	ST2, ST2-G, ST2-L, ST16
Possible	ST1, ST5, ST16-G, ST16-L, S-phase types

Comments

AC6 sites are distributed throughout Nova Scotia wherever well drained, nutrient poor soils can be found. Areas of higher occurrence include the Eastern Interior (440), Bras d'Or Lowlands (510), Northumberland Lowlands (530), Minas Lowlands (620), Central Lowlands (630), South Mountain (720) and Rossignol (750) ecodistricts.

AC7
Moist – Poor / Black spruce – White pine
n = 77

Description

Occurring mainly on imperfectly drained slopes and level areas with coarse textured glacial till deposits, this ecosite has moist, nutrient poor soils which generally support closed canopy stands of black spruce with white pine and red pine. When balsam fir is present, it is generally intermediate in the canopy and of low vigour. Early successional stands are dominated by large-tooth aspen, red oak and red maple. On slightly richer sites, red spruce and/or hybrid spruce are possible. Imperfect drainage is indicated by the presence of sphagnum mosses, cinnamon fern and creeping snowberry. Bracken and bunchberry are also present in the herb layer. Ericaceous shrubs still dominate the shrub layer (mainly lambkill and blueberry), but black spruce regeneration (from layering) can also be extensive in the understory.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce. Windthrow and fire are significant disturbance agents, and frequent fires can lead to increased ericaceous cover.

Site Characteristics

Topographic Position	Level[5] Lower - Toe[2] Middle[2] Upper[1]
Slope Gradient	Level[3] Gentle[3] Moderate[1] nd[3]
Exposure	Moderate[9] Mod.Exposed[1]
Parent Material	Glacial till[8] Other[1] nd[1]
Drainage	Imperfect[7] Mod.Well[1] Poor[1] nd[1]
Surface Stoniness	(Non - Slightly)[7] (Moderately)[1] (Very - Excessively)[1] nd[1]
Surface Rockiness	(Non-rocky)[8] (Slightly - Moderately)[1] nd[1]

Vegetation Types

Common	IH1, IH2, SH3, SH4, SH5, SH6, SH8, SH9, SP2, SP4, SP5, SP6, SP7, SP8, SP10,
Possible	CE2, IH6, OW3, SH1, SH2, SP1, SP3, SP9

Soil Types

Common	ST3, ST3-G, ST3-L, ST6
Possible	ST14-U, S-phase types

Comments

AC7 sites are distributed throughout Nova Scotia wherever moist, nutrient poor soils can be found. Areas of higher occurrence include the Eastern Interior (440), Bras d'Or Lowlands (510), Northumberland Lowlands (530), Minas Lowlands (620), Central Lowlands (630), South Mountain (720) and Sable (760) ecodistricts.

AC8
Wet – Poor / Spruce – Fir – Red maple
n = 69

Description

Occurring mainly on poorly to very poorly drained level areas and depressions with medium to coarse textured glacial till and/or organic deposits, this ecosite has wet, nutrient poor to medium soils which generally support softwood stands containing spruce (red, black, hybrid), balsam fir, hemlock, tamarack, and (occasionally) eastern white cedar. Slightly richer sites support red maple mixedwoods with balsam fir and white ash. False holly, wild raisin, speckled alder and softwood regeneration dominate the shrub layer. The herb layer is moderately diverse with cinnamon fern and sedges the main species. Bryophyte diversity is also moderate with sphagnum mosses dominant.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to either an edaphic climax softwood forest dominated by balsam fir, red spruce and hemlock; or an edaphic climax mixedwood forest dominated by red maple and balsam fir. Along with senescence, windthrow and fluctuating water table levels are the main disturbance agents.

Site Characteristics

Topographic Position	Level[8] Lower - Toe[1] Depression[1]
Slope Gradient	Level[5] Gentle[1] nd[4]
Exposure	Moderate[6] Mod.Sheltered[2] Mod.Exposed[1] Sheltered[1]
Parent Material	Glacial till[4] Organic[4] Lacustrine[1] nd[1]
Drainage	Poor[5] Very Poor[4] Imperfect[1]
Surface Stoniness	(Non - Slightly)[8] (Moderately)[1] (Very - Excessively)[1]
Surface Rockiness	(Non-rocky)[9] nd[1]

Vegetation Types

Common	WC5, WC6, WC7, WC8, WD2, WD6
Possible	CE1

Soil Types

Common	ST4, ST4-G, ST6, ST7, ST14
Possible	ST3, ST3-G, ST3-L, S-phase types

Comments

Forest AC8 sites are generally associated with coniferous and mixedwood treed swamps which receive seepage flows and/or ground water inputs.

AC8 sites are found throughout the province, usually embedded as small or large patches within the matrix forest. AC8 sites with red spruce and hemlock are usually found in the Western Ecoregion (700). Mixedwood sites with red maple and balsam fir are found throughout the province, with higher occurrence in the Northumberland Lowlands (530) and Central Lowlands (630) ecodistricts.

AC9
Dry – Medium / Red maple – Spruce
n = 29

Description

Occurring mainly on well drained steep slopes with shallow glacial till and/or colluvium deposits, this ecosite has dry, nutrient medium soils which generally support mixed forests of sugar maple, red maple, white birch and beech. Red spruce, hybrid spruce, white spruce and occasionally hemlock can also be present. Understory vegetation diversity is usually low and coverage is generally sparse to moderate. Ericaceous shrubs such as blueberry and lambkill are present in low numbers. Herbs include typical species such as starflower, evergreen wood fern, sarsaparilla and bracken. Hay-scented fern coverage can sometimes be extensive in hardwood dominated vegetation types. The extent of bryophyte cover depends on tree species mix – usually increasing with softwood cover (mainly Schreber's moss and broom mosses).

Disturbance and Succession

Following disturbance, succession in this ecosite depends on residual overstory condition and the presence/survival of advanced regeneration. Intense disturbance can promote early successional stages dominated by shade-intolerant species. Lightly disturbed late successional stages can continue to develop as uneven-aged forests.

Site Characteristics

Topographic Position	Upper - Crest[4] Middle[3] Level[2] Lower[1]
Slope Gradient	Steep - Extreme[3] Moderate[2] Gentle[2] Level[2] nd[1]
Exposure	Moderate[4] Mod.Exposed[3] Exposed[2] Mod.Sheltered[1]
Parent Material	Colluvium[3] Till/Bedrock[3] Glacial till[3] nd[1]
Drainage	Well[5] Rapid[2] Mod.Well[2] nd[1]
Surface Stoniness	(Non - Slightly)[5] (Moderately)[2] (Very - Excessively)[2] nd[1]
Surface Rockiness	(Non-rocky)[4] (Slightly - Moderately)[4] (Very - Excessively)[1] nd[1]

Vegetation Types

Common	IH6, MW3, MW5, SH5, TH1, TH5, TH6, TH7
Possible	CE2, IH4, IH7, KA1, KA2, MW1, MW2, MW4, OW6, SH1, SH2, SH3, SH4, SH7, SH8, SH9, SH10, TH2, TH3, TH8

Soil Types

Common	ST1, ST15, ST15-L, ST17
Possible	ST1-G, ST19-M, S-phase types

Comments

AC9 sites are often associated with mafic bedrock and/or mafic rock colluvium which make these sites inherently more fertile than AC5 sites; however, exposure often precludes good tree growth.

AC9 sites are scattered throughout Nova Scotia. Areas of higher occurrence include the Cape Breton Highlands (210), Cape Breton Hills (310), Pictou Antigonish Highlands (330), Cobequid Hills (340) and North Mountain (920) ecodistricts.

AC10
Fresh – Medium / Red spruce – Hemlock
n = 336

Description

Occurring mainly on well drained slopes with medium textured glacial till deposits, this ecosite has fresh, nutrient medium soils which generally support late successional forests dominated by red spruce, hemlock and yellow birch. Earlier successional forests contain balsam fir, white birch, red maple and trembling aspen. The shrub layer is usually dominated by regenerating softwoods, while typical softwood forest plants are found in the herb layer (e.g. wild lily-of-the-valley, starflower, bluebead lily, partridge-berry and wood ferns). Schreber's moss is the main bryophyte along with stair-step moss and bazzania.

Disturbance and Succession

Natural stand-level disturbances are infrequent and usually due to windthrow (hurricanes) and/or fire. Following disturbance, succession in this ecosite depends on residual overstory condition and the presence/survival of advanced regeneration. Intense disturbance can promote early successional stages dominated by shade-intolerant species. Lightly disturbed late successional stages will continue to develop as uneven-aged forests.

Site Characteristics

Topographic Position	Upper[4] Middle[3] Level[2] Lower[1]
Slope Gradient	Gentle[5] Level[2] Moderate[1] Steep[1] nd[1]
Exposure	Moderate[6] Mod.Exposed[2] Mod.Sheltered[1] Other[1]
Parent Material	Glacial till[7] Other[1] nd[2]
Drainage	Well[5] Mod.Well[3] nd[2]
Surface Stoniness	(Non - Slightly)[4] (Moderately)[3] (Very - Excessively)[1] nd[2]
Surface Rockiness	(Non-rocky)[8] (Slightly - Moderately)[1] nd[1]

Vegetation Types

Common	IH4, IH6, IH7, MW1, MW2, MW3, MW4, MW5, SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8, SH10, TH1, TH2, TH5, TH6, TH7, TH8
Possible	CE2, IH3, IH5, KA1, KA2, OF1, OF3, OF4, OF5, OW6, SH9, TH3

Soil Types

Common	ST2, ST2-L, ST5, ST8-C
Possible	ST1, ST2-G, ST8, ST16, ST16-L, ST18, S-phase types

Comments

In Nova Scotia, the majority of Acadian climax softwood forests are found on AC10 and AC11 sites. Areas of higher AC10 occurrence include the South Mountain (720), Rossignol (750) and St. Margaret's Bay (780) ecodistricts (red spruce, hemlock and white pine dominant); and the Central Uplands (380), Eastern Interior (440), Governor Lake (450), Cumberland Hills (540) and Parrsboro Shore (910) ecodistricts (red spruce dominant).

AC11
Moist – Medium / Red spruce – Yellow birch
n = 111

Description

Occurring mainly on imperfectly drained lower slopes and level areas with medium textured glacial till deposits, this ecosite has moist, nutrient medium soils which generally support mixedwood climax communities dominated by red spruce, hemlock and yellow birch. Earlier successional forests contain balsam fir, aspen, white birch and red maple. The shrub layer usually includes regenerating tree species (especially balsam fir) along with striped maple and fly-honeysuckle. Many fern species are found in the herb layer, usually dominated by New York fern and wood ferns (club-mosses are also present). Bryophyte cover will vary depending on tree species mix – usually increasing in both diversity and coverage as the softwood component increases.

Disturbance and Succession

Natural stand-level disturbances are infrequent and usually due to windthrow (hurricanes) and/or fire. Following disturbance, succession in this ecosite depends on residual overstory condition and the presence/survival of advanced regeneration. Intense disturbance can promote early successional stages dominated by shade-intolerant species. Lightly disturbed late successional stages will continue to develop as uneven-aged forests.

Site Characteristics

Topographic Position	Level[4] Lower - Toe[3] Middle[2] Upper[1]
Slope Gradient	Gentle[5] Level[3] nd[2]
Exposure	Moderate[7] Mod.Exposed[2] Mod.Sheltered[1]
Parent Material	Glacial till[9] Other[1]
Drainage	Imperfect[6] Mod.Well[4]
Surface Stoniness	(Non - Slightly)[7] (Moderately)[2] (Very - Excessively)[1]
Surface Rockiness	(Non-rocky)[9] (Slightly - Moderately)[1]

Vegetation Types

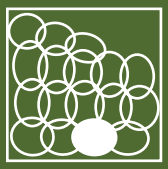
Common	IH4, IH6, IH7, MW1, MW2, MW3, MW4, MW5, SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8, SH10, TH1, TH2,
Possible	CE2, IH3, IH5, KA1, KA2, OF1, OF2, OF3, OF4, OF5, SH9, TH3, TH6, TH7, TH8

Soil Types

Common	ST3, ST3-L, ST6
Possible	ST3-G, ST9-C, S-phase types

Comments

In Nova Scotia, the majority of Acadian climax softwood and mixedwood forests are found on AC11 and AC10 sites. Areas of higher AC11 occurrence are similar to AC10, with mixedwood climax forests more prominent in the Rawdon/Wittenburg Hills (410), St. George's Bay (520), Central Lowlands (630), Clare (730) and LaHave Drumlins (740) ecodistricts.



AC12
Wet – Medium / Red maple – White ash – Fir
n = 77

Description

Occurring mainly on poorly to very poorly drained level areas and depressions with medium to fine textured glacial till and/or organic deposits, this ecosite has wet, nutrient medium to rich soils which generally support hardwood stands dominated by red maple and/or trembling aspen. Slightly richer sites will also have a component of white ash. Balsam fir, red spruce and hemlock can also contribute to a mixedwood condition on slightly poorer sites. Shrub cover consists mainly of regenerating trees, wild raisin and speckled alder. Herb layers are often species poor with cinnamon fern, sensitive fern, dwarf raspberry and sedge species common. Bryophyte coverage is moderate and consists mainly of sphagnum mosses (with lesser amounts of common upland mosses).

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands usually leading to an edaphic climax mixedwood or hardwood forest. Along with senescence, windthrow and fluctuating water table levels are the main disturbance agents.

Site Characteristics

Topographic Position	Level[6] Lower - Toe[2] Depression[1] Middle[1]
Slope Gradient	Level[3] Gentle[2] nd[5]
Exposure	Moderate[6] Mod.Sheltered[1] Mod.Exposed[1] Sheltered[1] nd[1]
Parent Material	Glacial till[4] Organic[4] Lacustrine[1] Alluvium[1]
Drainage	Poor[5] Very Poor[4] Imperfect[1]
Surface Stoniness	(Non - Slightly)[8] (Moderately)[1] (Very - Excessively)[1]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	WC8, WD2, WD3, WD4, WD5, WD6, WD7, WD8
Possible	CE1, OF2, WC5, WC6, WC7

Soil Types

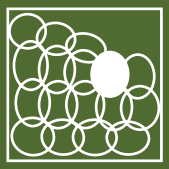
Common	ST4, ST7, ST10, ST13, ST14
Possible	ST3, ST3-G, ST3-L, ST6, ST9, ST9-C, ST12, S-phase types

Comments

Forest AC12 sites are generally associated with mixedwood and hardwood treed swamps which receive nutrient rich seepage flows and/or ground water inputs.

AC12 sites are scattered throughout Nova Scotia usually embedded as small or large patches within the matrix forest. Areas of higher occurrence include the Northumberland/Bras d'Or (500) and Valley and Central Lowlands (600) ecoregions.

AC13
Fresh – Rich / Sugar maple – Beech
n = 352



Description

Occurring mainly on well drained slopes with medium textured glacial till deposits, this ecosite has fresh, nutrient rich soils which generally support late successional forests dominated by sugar maple and beech along with yellow birch, red maple, white ash, and occasionally ironwood. Earlier successional forests contain aspen, white birch and red maple. Old field forests of white spruce and white pine are also common where upland hardwood forests were cleared for agriculture and later abandoned. Typical hardwood forest plants dominate all layers in this ecosite. The shrub layer usually includes regenerating trees along with beaked hazelnut, striped maple, fly-honeysuckle and hobble-bush. Ferns are extensive in the herb layer and include hay-scented, New York and wood fern species. Except for old field sites, bryophytes are typically absent from the forest floor, but can be found on stumps, downed wood and live tree boles.

Disturbance and Succession

Most natural disturbance is small scale (individual trees or small patches) which promotes uneven-aged forests. Natural stand-level disturbances are infrequent and usually due to windthrow (hurricanes); however, insects, disease and/or abiotic stresses have caused significant mortality in some regions (e.g. beech scale disease and sugar maple die-back). These large scale disturbances have impacted species distribution and dynamics in affected stands. Following disturbance, succession in this ecosite depends on residual overstory condition and the presence/survival of advanced regeneration. Intense disturbance can promote early successional stages dominated by shade-intolerant species. Lightly disturbed late successional stages will continue to develop as uneven-aged forests.

Site Characteristics

Topographic Position	Upper[3] Middle[3] Level[2] Lower[1] Other[1]
Slope Gradient	Gentle[5] Moderate[2] Level[1] Steep[1] nd[1]
Exposure	Moderate[5] Mod.Exposed[3] Mod.Sheltered[1] Exposed[1]
Parent Material	Glacial till[5] Alluvium[1] Other[1] nd[3]
Drainage	Well[4] Mod.Well[3] nd[3]
Surface Stoniness	(Non - Slightly)[4] (Moderately)[2] (Very - Excessively)[1] nd[3]
Surface Rockiness	(Non-rocky)[6] (Slightly - Moderately)[1] nd[3]

Vegetation Types

Common	FP5, FP6, IH3, IH5, IH7, KA1, KA2, MW1, MW2, MW3, OF1, OF3, OF4, OF5, TH1, TH2, TH3, TH4, TH5, TH6, TH7, TH8
Possible	CE2, FP1, FP2, FP3, FP4, IH4, IH6, MW4, MW5, SH1, SH2, SH3, SH5, SH6, SH7, SH8, SH10

Soil Types

Common	ST2-L, ST5, ST8, ST11
Possible	ST2, ST8-C, S-phase types

Comments

In Nova Scotia, the majority of Acadian climax hardwood forests are found on AC13 and AC14 sites. The Nova Scotia Uplands ecoregion (300) has the greatest percentage of AC13 sites. Other areas of high occurrence include drumlin sites in the Eastern Interior (440), Clare (730) and LaHave Drumlins (740) ecodistricts.

AC14
Moist – Rich / Sugar maple – Yellow birch
n = 113

Description

Occurring mainly on moderately well to imperfectly drained slopes with medium textured glacial till deposits, this ecosite has moist, nutrient rich soils which generally support late successional forests dominated by sugar maple with lesser amounts of white ash, yellow birch and ironwood. Rich mixedwood stands of red spruce, hemlock, sugar maple and yellow birch can also found. Earlier successional forests are rare as vegetation types in this unit are usually small patches embedded within a larger matrix forest. Plant diversity is very high and typical of rich hardwood sites. The shrub layer usually includes regenerating trees along with alternate-leaved dogwood, mountain maple, striped maple, beaked hazelnut and fly-honeysuckle. Fern diversity is the greatest of all ecosites and includes Christmas fern, silvery spleenwort, northern beech fern, oak fern and lady fern. Except for old field sites, bryophyte cover is usually sparse.

Disturbance and Succession

Most natural disturbance is small scale (individual trees or small patches) which promotes uneven-aged forests. Natural stand-level disturbances are infrequent and usually due to windthrow (hurricanes); however, insects, disease and/or abiotic stresses have also caused significant mortality in some regions (e.g. sugar maple die-back and yellow birch die-back). These large scale disturbances have impacted species distribution and dynamics in affected stands. Following disturbance, succession in this ecosite depends on residual overstory condition and the presence/survival of advanced regeneration. Intense disturbance can promote early successional stages dominated by shade-intolerant species. Lightly disturbed late successional stages will continue to develop as uneven-aged forests.

Site Characteristics

Topographic Position	Level[3] Lower - Toe[3] Middle[3] Upper[1]
Slope Gradient	Gentle[6] Level[2] Moderate[1] nd[1]
Exposure	Moderate[6] Mod.Exposed[2] Mod.Sheltered[1] Sheltered[1]
Parent Material	Glacial till[7] Other[1] nd[2]
Drainage	Imperfect[6] Mod.Well[2] nd[2]
Surface Stoniness	(Non - Slightly)[6] (Moderately)[1] (Very - Excessively)[1] nd[2]
Surface Rockiness	(Non-rocky)[8] nd[2]

Vegetation Types

Common	FP5, FP6, IH3, IH5, IH7, MW1, MW2, MW3, OF1, OF2, OF3, OF4, OF5, TH1, TH2, TH3, TH4, TH6, TH7, TH8
Possible	CE2, FP1, FP2, FP3, FP4, IH4, IH6, KA1, KA2, MW4, MW5, SH1, SH2, SH3, SH5, SH6, SH7, SH8, SH10

Soil Types

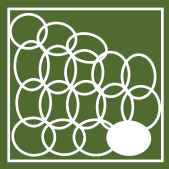
Common	ST3-L, ST6, ST9, ST12
Possible	ST3, ST9-C, S-phase types

Comments

In Nova Scotia, the majority of Acadian climax hardwood forests are found on AC14 and AC13 sites. The Nova Scotia Uplands ecoregion (300) has the greatest percentage of AC14 sites. Other areas of high occurrence include long slopes in the Northumberland Lowlands (530) and Central Lowlands (630) ecodistricts.

This ecosite can support several rare and endangered plant species including foamflower, thimbleweed, grape fern species and sedge species.

AC15
Wet – Rich / White ash – Red maple
n = 11



Description

Occurring mainly on poorly drained level areas with medium to fine textured glacial till or alluvium deposits, this ecosite has wet, nutrient rich to very rich soils which generally support a well developed canopy dominated by white ash with frequent red maple, sugar maple and yellow birch. The herb layer is well developed, usually dominated by sensitive fern and lady fern. The bryophyte layer is composed of small pockets of upland species and nutrient demanding wetland species such as prickly sphagnum. Shrub cover and diversity are low.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax hardwood forest. Along with senescence, windthrow and fluctuating water table levels are the main disturbance agents.

Site Characteristics

Topographic Position	Level[8] Lower - Toe[2]
Slope Gradient	Level[4] Gentle[3] nd[3]
Exposure	Moderate[6] Mod.Sheltered[4]
Parent Material	Glacial till[5] Alluvium[2] Organic[1] Lacustrine[1] nd[1]
Drainage	Poor[4] Imperfect[4] Very Poor[2]
Surface Stoniness	(Non - Slightly)[7] (Very - Excessively)[2] nd[1]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	WD1, FP3

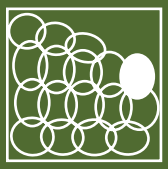
Soil Types

Common	ST9, ST10, ST13, ST14
Possible	ST6, ST7, ST9-C, ST12, S-phase types

Comments

Forest AC15 sites are generally associated with hardwood treed swamps which receive nutrient rich seepage flow, ground water inputs and/or flood waters.

AC15 sites are scattered throughout mainland Nova Scotia with areas of higher occurrence in the Northumberland Lowlands (530), Annapolis Valley (610) and Central Lowlands (630) ecodistricts.



AC16
Fresh – Very Rich / Sugar maple – White ash
n = 48

Description

Occurring mainly on well to moderately well drained alluvial floodplains, this ecosite has fresh, nutrient very rich soils which generally support closed canopy forests dominated by sugar maple and white ash (sometimes multi-layered). Earlier successional stages may contain various levels of red maple, balsam poplar, black cherry and white spruce. The species rich understory is typically dominated by ferns, especially ostrich fern. Earlier successional stages may also have significant coverage of meadow-rue and goldenrod species. Shrub cover is variable and includes choke cherry, beaked hazelnut and alternate-leaved dogwood. Bryophyte cover is typically very low except where white spruce cover is dominant.

Disturbance and Succession

The floodplain climax forest dominated by sugar maple and white ash is expected to endure small disturbances caused by windthrow or fluctuating water levels; however, earlier successional stages are usually even-aged and prone to larger disturbances and loss (e.g. black knot fungus on black cherry). Flood events and/or ice scour can also cause individual tree and stand-level disturbance. On upland sites, the climax forest is expected to endure scattered gap disturbances and develop (or maintain) an uneven-aged condition.

Site Characteristics

Topographic Position	Level[7] Upper[1] Middle[1] Lower[1]
Slope Gradient	Level[3] Moderate[1] Steep[1] nd[5]
Exposure	Mod.Sheltered[4] Moderate[3] Sheltered[2] Exposed[1]
Parent Material	Alluvium[7] Glacial till[2] Other[1]
Drainage	Well[6] Mod.Well[3] Rapid[1]
Surface Stoniness	(Non - Slightly)[8] (Moderately)[2]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	FP1, FP2, FP3, FP4, TH4
Possible	FP5, FP6

Soil Types

Common ST8, ST11

Comments

Although mainly associated with active floodplains, AC16 sites can also be associated with stands of Sugar maple – White ash / Silvery spleenwort – Baneberry (TH4) found on rich, glacial till deposits.

AC16 floodplain sites occur primarily along major rivers in central and northern Nova Scotia. Other areas of occurrence include the Annapolis Valley (610) and Inverness Lowlands (320) ecodistricts, and along the east and west branches of the St. Mary's River. Upland AC16 sites are typically small patches embedded within larger AC13 forests and are mainly associated with the Nova Scotia Uplands (300) ecoregion.

This ecosite can support several rare and endangered plant species including wild leek, blue cohosh, Canada lily and wood-nettle (on floodplain sites).

AC17
Moist – Very Rich / Sugar maple – White ash
n = 13

Description

Occurring mainly on imperfectly drained alluvial floodplains and upland lower slopes, this ecosite has moist, nutrient very rich soils. On floodplains the closed canopy is dominated by red maple with lesser amounts of yellow birch, white ash, red spruce and hemlock. Earlier successional stages will have red maple, balsam poplar and black cherry. Typical understory shrubs and herbs include a mix of floodplain and wetland species. On upland sites the closed canopy is dominated by white ash and sugar maple. Typical understory shrubs and herbs include alternate-leaved dogwood, silvery spleenwort and sweet cicely. Bryophyte cover is typically very low.

Disturbance and Succession

The floodplain climax forest dominated by red maple is expected to endure small disturbances caused by windthrow or fluctuating water levels; however, earlier successional stages are usually even-aged and prone to larger disturbances and loss (e.g. black knot fungus on black cherry). Flood events and/or ice scour can also cause individual tree and stand-level disturbance. On upland sites, the climax forest of sugar maple and white ash is expected to endure scattered gap disturbances and develop (or maintain) an uneven-aged condition.

Site Characteristics

Topographic Position	Level[5] Lower[3] Middle[2]
Slope Gradient	Gentle[4] Moderate[2] nd[4]
Exposure	Mod.Sheltered[4] Mod.Exposed[2] Moderate[2] Sheltered[1] nd[1]
Parent Material	Glacial till[5] Alluvium[4] Colluvium[1]
Drainage	Imperfect[7] Mod.Well[3]
Surface Stoniness	(Non - Slightly)[6] (Moderately)[4]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	FP1, FP2, FP3, FP4, TH4
Possible	FP5, FP6

Soil Types

Common	ST9, ST12
Possible	S-phase types

Comments

Although mainly associated with active floodplains, AC17 sites can also be associated with stands of Sugar maple – White ash / Silvery spleenwort – Baneberry (TH4) found on rich, glacial till deposits.

AC17 floodplain sites occur primarily along major rivers in central and northern Nova Scotia. Other areas of occurrence include the Annapolis Valley (610) and Inverness Lowlands (320) ecodistricts, and along the east and west branches of the St. Mary's River. Upland AC17 sites are typically small patches embedded within larger AC14 forests and are mainly associated with the Nova Scotia Uplands (300) ecoregion.

This ecosite can support several rare and endangered plant species including wild leek, blue cohosh, Canada lily and wood-nettle on floodplain sites; and wild leek, foamflower, thimbleweed, grape fern species, and sedge species on upland sites.

Maritime Boreal Ecosites

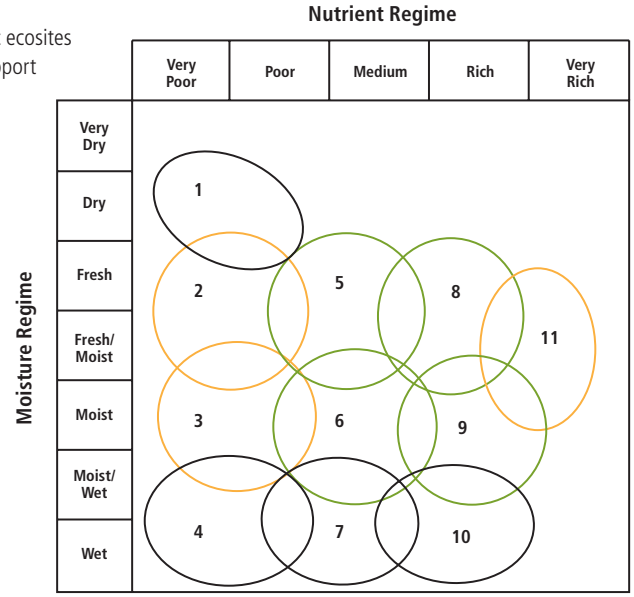
The Maritime Boreal group includes eleven (11) ecosites representing a range of forest site conditions, but with less coverage and precision than the Acadian group (Figure 3). This is due, in part, to lower sampling intensity which currently does not allow for finer divisions within this group. Also, no treed ecosystems have been found within the moist to wet, very rich edatopic grid position.

Exposure and climate differentiates the Maritime Boreal group from the Acadian group. These differences lead to zonal climax forests containing balsam fir, white spruce, black spruce, red spruce, red maple, white birch and yellow birch (in various combinations). Climate differences also promote thicker forest floors and more extensive moss cover in Maritime Boreal ecosites compared to similar Acadian units. Edaphic climax ecosites contain mainly black spruce, white spruce, red maple and/or balsam fir. In both cases, tree species associated with successional communities are similar to those found in climax forests.

Figure 3. Edatopic grid showing relative moisture and nutrient regimes for Maritime Boreal group ecosites

Green = zonal ecosites **Black** = edaphic ecosites
Orange = transitional ecosites which can support both edaphic and zonal vegetation types.

1. Dry-Poor / Black spruce-Jack pine
2. Fresh-Poor / Black spruce
3. Moist-Poor / Black spruce
4. Wet-Poor / Black spruce
5. Fresh-Medium / Fir-Spruce
6. Moist-Medium / Fir-Spruce
7. Wet-Medium / Red maple-Fir
8. Fresh-Rich / Birch-Fir
9. Moist-Rich / Birch-Fir
10. Wet-Rich / Red maple
11. Fresh Moist-Very Rich / Red maple-Birch



Note: It is possible for zonal VTs normally associated with Acadian ecosites to be found in geographic areas classed as Maritime Boreal (Table 1). This could occur, for example, in sheltered locations along the Atlantic coast. Where zonal Acadian VTs are found in Maritime Boreal areas, users should refer to Acadian ecosite descriptions and productivity interpretations.

See Appendix F for a list of scientific and common plant names.

MB1
Dry – Poor / Black spruce – Jack pine
n = 4

Description

Occurring mainly on upper slopes and crests of bedrock ridges and/or on coarse textured glacial till deposits, this ecosite has dry, nutrient very poor to poor soils which generally support open stands of stunted black spruce, balsam fir, white spruce, red maple and jack pine. On extremely exposed sites (such as coastal headlands, ridges and hilltops), tree growth can become even more scrubby and twisted (referred to as krummholtz). The shrub layer can be extensive with lambkill, blueberry, black crowberry, ground juniper and bayberry. There are usually low levels of herb cover, with bracken, teaberry and bunchberry the main species. The bryophyte/lichen layer can be well developed with Schreber's moss, broom mosses and several reindeer lichens.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce, white spruce, balsam fir and/or jack pine. Windthrow and fire are significant disturbance agents, and frequent fires can lead to increased ericaceous cover.

Site Characteristics

Topographic Position	Upper[5] Crest[2.5] Level[2.5]
Slope Gradient	Moderate[2.5] Level[2.5] nd[5]
Exposure	Exposed[7.5] nd[2.5]
Parent Material	Glacial till[5] Till/Bedrock[5]
Drainage	Rapid[7.5] nd[2.5]
Surface Stoniness	(Non - Slightly)[5] (Very to Excessively)[2.5] nd[2.5]
Surface Rockiness	(Very - Excessively)[5] (Non-rocky)[2.5] nd[2.5]

Vegetation Types

Common	OW1, OW2
Possible	CO7, SP1, SP4, SP5, SP6

Soil Types

Common	ST1, ST1-G, ST15, ST15-G
Possible	ST15-L, S-phase types

Comments

MB1 sites occur as small to large patches within a larger softwood matrix forest wherever near-surface bedrock and sandy soils can be found.

Highland MB1 sites are found scattered throughout the Cape Breton Taiga (100) ecoregion and Cape Breton Highlands (210) ecodistrict. Coastal MB1 sites are mainly found in the Atlantic Coastal (800) ecoregion, but also occur in association with coastal (CO) vegetation types in other areas.

MB1 sites with jack pine are uncommon, with known stands on the eastern slopes of the Cape Breton Highlands near Neil's Harbour; and along the Atlantic coast near Isle Madame, Canso, Peggy's Cove and Blandford.

MB2
Fresh – Poor / Black spruce
n = 10

Description

Occurring mainly on well drained slopes and level areas with coarse textured glacial till and/or near surface bedrock, this ecosite has fresh, nutrient very poor to poor soils which generally support poorly stocked stands of black spruce. Other minor species include balsam fir, jack pine, white pine, red spruce, white spruce and red maple. This ecosite also includes coastal areas with stabilized marine sands supporting white spruce growth. Ericaceous shrubs such as lambkill, blueberry and huckleberry dominant the shrub layer along with black spruce regeneration. The herb layer consists mainly of bracken, teaberry and bunchberry. Frequently occurring coastal plants include twinflower, bunchberry and foxberry. In Highland forests, wood-sorrel and large-leaved goldenrod are common. A thick forest floor is typically overlain by Schreber's moss, plume moss and stair-step moss.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands usually leading to an edaphic climax forest dominated by black spruce. Windthrow is the primary disturbance agent, usually occurring in small to large patches. Secondary disturbance agents include insects and diseases which take advantage of trees weakened by wind and breakage.

Site Characteristics

Topographic Position	Middle[4] Level[3] Upper[2] Crest[1]
Slope Gradient	Gentle[3] Level[3] Moderate[1] Steep[1] nd[2]
Exposure	Exposed[8] Mod.Exposed[2]
Parent Material	Glacial till[5] Till/Bedrock[3] nd[2]
Drainage	Rapid[3] Mod.Well[3] Well[2] Imperfect[2]
Surface Stoniness	(Non - Slightly)[6] (Very to Excessively)[3] (Moderate)[1]
Surface Rockiness	(Non-rocky)[5] (Slightly - Moderately)[4] (Very - Excessively)[1]

Vegetation Types

Common	CO1, OW2, SP5, SP6
Possible	CO2, CO3, CO4, HL1, HL2, OW1, SP1, SP4

Soil Types

Common	ST1, ST2, ST2-G, ST15, ST15-G
Possible	ST1-G, ST2-L, ST5, ST15-L, ST16, ST16-G, ST16-L, S-phase types

Comments

MB2 sites may be underlain by ST16 soils which, due to their shallow depth, are only associated with fresh moisture regimes even though they are classed as imperfectly drained.

In the Highlands, MB2 sites are mainly found in the Cape Breton Taiga (100) ecoregion and eastern slopes of the Cape Breton Highlands (210) ecodistrict. Coastal MB2 sites occur on all saltwater coastlines, but areas of highest occurrence are the Cape Breton Coastal (810), Eastern Shore (820) and South Shore (830) ecodistricts.

MB3
Moist – Poor / Black spruce
n = 11

Description

Occurring mainly on imperfectly drained gentle slopes and level areas with medium to coarse textured glacial till deposits, this ecosite has moist, nutrient very poor to poor soils which generally support poorly stocked stands of black spruce. Other minor species include balsam fir, jack pine, white pine, red spruce, white spruce and red maple. Non-tree species found are similar to MB2 sites, but also include plants associated with higher moisture levels including false holly, cinnamon fern, creeping snowberry and sphagnum mosses. Frequently occurring coastal plants include twinflower, bunchberry and foxberry. In Highland forests, wood-sorrel and large-leaved goldenrod are common.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands usually leading to an edaphic climax forest dominated by black spruce. Windthrow is the primary disturbance agent, usually occurring in small to large patches. Secondary disturbance agents include insects and diseases which take advantage of trees weakened by wind and breakage.

Site Characteristics

Topographic Position	Upper[4] Level[3] Middle[3]
Slope Gradient	Gentle[6] Level[3] Moderate[1]
Exposure	Exposed[7] Mod.Exposed[2] Moderate[1]
Parent Material	Glacial till[9] Till/Bedrock[1]
Drainage	Imperfect[8] Mod.Well[2]
Surface Stoniness	(Non - Slightly)[5] (Moderate)[2.5] (Very to Excessively)[2.5]
Surface Rockiness	(Non-rocky)[8] (Slightly - Moderately)[1] (Very - Excessively)[1]

Vegetation Types

Common	CO1, OW2, SP5, SP6, SP7
Possible	CO2, CO3, CO4, HL1, HL2, OW1, SP1, SP4

Soil Types

Common	ST3, ST3-G, ST3-L
Possible	ST4, ST4-G, ST6, ST14-U, ST16, ST16-G, ST16-L, S-phase types

Comments

In the Highlands, MB3 sites are mainly found in the Cape Breton Taiga (100) ecoregion and eastern slopes of the Cape Breton Highlands (210) ecodistrict. Coastal MB3 sites occur on all saltwater coastlines, but areas of highest occurrence are the Cape Breton Coastal (810), Eastern Shore (820) and South Shore (830) ecodistricts.

MB4
Wet – Poor / Black spruce
n = 16

Description

Occurring mainly on poorly to very poorly drained level areas and depressions with glacial till and/or organic deposits, this ecosite has wet, nutrient very poor to poor soils which generally support black spruce dominated stands with scattered balsam fir and (in a few localized areas) jack pine. Crown closure in these stands can be low to high with some sites supporting densely populated stands of stunted trees. The shrub layer is dominated by ericaceous species such as Labrador tea, lambkill and rhodora. Characteristic herbs include cinnamon fern, three seeded sedge, goldthread and creeping snowberry. The bryophyte layer is dominated by sphagnum mosses.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by black spruce. Fluctuating water table levels and windthrow are the main disturbance agents.

Site Characteristics

Topographic Position	Level[5] Lower[2] Middle[1] Upper[1] nd[1]
Slope Gradient	Level[5] Gentle[5]
Exposure	Exposed[6] Mod.Exposed[2] Moderate[2]
Parent Material	Glacial till[7] Organic[3]
Drainage	Poor[6] Very Poor[3] Imperfect[1]
Surface Stoniness	(Non - Slightly)[8] (Moderate)[1] (Very - Excessively)[1]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	WC1, WC2, WC3, WC7

Soil Types

Common	ST4, ST4-G, ST6, ST7, ST14
Possible	ST3, ST3-G, ST3-L, S-phase types

Comments

Forest MB4 sites are generally associated with treed bogs and/or poor, coniferous treed swamps.

Highland MB4 sites are found only in the Cape Breton Taiga (100) ecoregion and Cape Breton Highlands (210) ecodistrict. Coastal MB4 sites are mainly found in the Atlantic Coastal (800) ecoregion, but also occur in association with coastal (CO) vegetation types in other areas.

MB4 sites with jack pine are uncommon, with known stands at Isle Madame and Blandford along the Atlantic coast.

MB5
Fresh – Medium / Fir – Spruce
n = 40

Description

Occurring mainly on well drained slopes with medium to coarse textured glacial till and/or colluvium deposits, this ecosite has fresh, nutrient poor to medium soils which generally support closed canopy forests of balsam fir and spruce (mainly white, but occasionally red and black). Red maple, white birch, heart-leaf birch and mountain-ash are also present, but seldom extend into the overstory. The shrub layer is dominated by regenerating overstory species, while the herb layer is sparse to moderate with typical woodland flora such as starflower, bluebead lily, sarsaparilla and wood aster. Frequently occurring coastal plants include twinflower, bunchberry and foxberry. In Highland forests wood-sorrel and large-leaved goldenrod are common. A thick forest floor is typically overlain by Schreber's moss, broom mosses and stair-step moss.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands. Earlier successional stages may contain red maple, white birch and pin cherry, but exposure impacts quickly return these sites to softwood species. Windthrow is the primary disturbance agent in coastal areas, usually occurring in small to large patches. Mortality can also be caused by spruce bark beetle or spruce budworm. On the Highlands, spruce budworm periodically causes a collapse of the balsam fir forest resulting in landscape-scale disturbance. In the absence of spruce budworm, balsam fir longevity is in the range of 70-80 years.

Site Characteristics

Topographic Position	Upper[5] Middle[3] Level[1] Lower[1]
Slope Gradient	Gentle[5] Moderate[2] Level[1] Steep[1] nd[1]
Exposure	Exposed[7] Mod.Exposed[3]
Parent Material	Glacial till[7] Colluvium[1] nd[2]
Drainage	Well[5] Mod.Well[3] nd[2]
Surface Stoniness	(Non - Slightly)[4] (Moderate)[2] (Very - Excessively)[1] nd[3]
Surface Rockiness	(Non-rocky)[7] (Slightly - Moderately)[1] nd[2]

Vegetation Types

Common	CO2, CO3, CO4, HL1, HL2
Possible	CO5, CO6, HL3, HL4

Soil Types

Common	ST2, ST2-L
Possible	ST2-G, ST5, ST15, ST15-G, ST15-L, ST17, S-phase types

Comments

Highland MB5 sites are found only in the Cape Breton Taiga (100) ecoregion and Cape Breton Highlands (210) ecodistrict. Coastal MB5 sites occur on all saltwater coastlines, but areas of highest occurrence are in the Atlantic Coastal (800) ecoregion. Vegetation type CO3 (Red spruce / Mountain-ash / Foxberry) is only found in the Fundy Shore (900) ecoregion and the Tusket Islands (840) ecodistrict.

Balsam fir wave forests are common on more exposed sites in the Cape Breton Highlands (210) ecodistrict (including St. Paul's Island) and on off-shore islands associated with the Cape Breton Coastal (810) and Eastern Shore (820) ecodistricts. White spruce krummholtz forests are found on all coastlines, including the Northumberland / Bras d'Or (500) and Fundy Shore (900) ecoregions, as well as on more exposed sites in the Cape Breton Highlands.

MB6
Moist – Medium / Fir – Spruce
n = 18

Description

Occurring mainly on imperfectly drained gentle slopes and level areas with medium to coarse textured glacial till deposits, this ecosite has moist, nutrient poor to medium soils which generally support closed canopy forests of balsam fir and spruce (mainly white, but occasionally red and black). Red maple, white birch, heart-leaf birch and mountain-ash are also present, but seldom extend into the overstory. Non-tree species found are similar to MB5 sites, but also include plants associated with higher moisture levels including false holly, cinnamon fern, creeping snowberry and sphagnum mosses. Frequently occurring coastal plants include twinflower, bunchberry and foxberry. In Highland forests wood-sorrel and large-leaved goldenrod are common.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands. Earlier successional stages may contain red maple, white birch and pin cherry, but exposure impacts quickly return these sites to softwood species. Windthrow is the primary disturbance agent in coastal areas, usually occurring in small to large patches. Mortality can also be caused by spruce bark beetle or spruce budworm. On the Highlands, spruce budworm periodically causes a collapse of the balsam fir forest resulting in landscape-scale disturbance. In the absence of spruce budworm, balsam fir longevity is in the range of 70-80 years.

Site Characteristics

Topographic Position	Middle[4] Level[2] Lower[1] Upper[1] nd[2]
Slope Gradient	Gentle[6] Level[2] Moderate[1] nd[1]
Exposure	Exposed[7] Mod.Exposed[2] Moderate[1]
Parent Material	Glacial till[9] nd[1]
Drainage	Imperfect[5] Mod.Well[4] nd[1]
Surface Stoniness	(Non - Slightly)[9] nd[1]
Surface Rockiness	(Non-rocky)[9] nd[1]

Vegetation Types

Common	CO2, CO3, CO4, HL1, HL2
Possible	CO5, CO6, HL3, HL4

Soil Types

Common	ST3, ST3-L
Possible	ST3-G, ST6, ST16, ST16-G, ST16-L, ST18, S-phase types

Comments

Highland MB6 sites are found only in the Cape Breton Taiga (100) ecoregion and Cape Breton Highlands (210) ecodistrict. Coastal MB6 sites occur on all saltwater coastlines, but areas of highest occurrence are in the Atlantic Coastal (800) ecoregion. Vegetation type CO3 (Red spruce / Mountain-ash / Foxberry) is only found in the Fundy Shore (900) ecoregion and the Tusket Islands (840) ecodistrict.

MB7
Wet – Medium / Red maple – Fir
n = 7

Description

Occurring mainly on poorly drained level areas and depressions with glacial till and/or organic deposits, this ecosite has wet, nutrient poor to medium soils which generally support a closed canopy dominated by balsam fir and/or red maple. Shrub layer development can be variable, but usually contains regenerating trees, false holly, wild raisin and scattered ericaceous species such as Labrador tea and lambkill. Herb cover is moderate to high consisting of cinnamon fern, wood aster, creeping snowberry and three seeded sedge. The forest floor has a well developed bryophyte layer dominated by sphagnum mosses.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by red maple. Fluctuating water table levels and windthrow are the main disturbance agents.

Site Characteristics

Topographic Position	Level[7] nd[3]
Slope Gradient	Level[7] Gentle[3]
Exposure	Exposed[7] Mod.Exposed[1.5] Moderate[1.5]
Parent Material	Glacial till[8] Organic[2]
Drainage	Poor[9] Imperfect[1]
Surface Stoniness	(Non - Slightly)[6] (Moderate)[3] (Very - Excessively)[1]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	WC5, WC6, WD6

Soil Types

Common	ST4, ST4-G, ST6, ST7, ST14
Possible	ST3, ST3-G, ST3-L, S-phase types

Comments

Forest MB7 sites are generally associated with coniferous and mixedwood treed swamps which receive seepage flows and/or ground water inputs.

Highland MB7 sites are scattered throughout the Cape Breton Taiga (100) ecoregion and Cape Breton Highlands (210) ecodistrict, but mainly in association with vegetation type WC6 (Balsam fir / Cinnamon fern – Three seeded sedge / Sphagnum). Coastal MB7 sites are mainly found in the Atlantic Coastal (800) ecoregion, but also occur in association with coastal (CO) vegetation types in other areas.

MB8
Fresh – Rich / Birch – Fir
n = 16

Description

Occurring mainly on well drained slopes with medium to coarse textured glacial till and/or colluvium deposits, this ecosite has fresh, nutrient medium to rich soils which generally support closed canopy forests of white birch, yellow birch (Highlands only) and red maple. Heart-leaf birch and balsam fir can also form a portion of the overstory. The sparse shrub layer consists mainly of regenerating trees and mountain-ash. Ericaceous shrubs are also present in coastal areas including lambkill and blueberry. In Highland areas, mountain maple and striped maple are also common. The coastal herb layer is generally sparse and includes bunchberry, goldthread and wood ferns. On Highland sites wood fern coverage can be extensive along with wood-sorrel and bunchberry. Bryophyte coverage is usually moderate with Schreber's moss the dominant species.

Disturbance and Succession

Most natural disturbance is small scale with regeneration to similar species found in mature stands (mainly red maple and white birch in coastal areas and yellow birch in Highland areas). A conifer dominated successional stage is also possible where more intense stand-level disturbances occur. Along with natural senescence, windthrow and insects are the primary disturbance agents. The transitional climax yellow birch-balsam fir forest of the Highlands may have an uneven-aged structure owing to the longevity of birch which has been aged to 225 years. In coastal areas, both red maple and white birch seldom exceed 125 years.

Site Characteristics

Topographic Position	Upper[4] Middle[4] Level[1] nd[1]
Slope Gradient	Gentle[4] Moderate[2] Level[1] Steep[1] Extreme[1] nd[1]
Exposure	Exposed[6] Mod.Exposed[4]
Parent Material	Glacial till[8] Colluvium[1] Till/Bedrock[1]
Drainage	Well[7] Mod.Well[3]
Surface Stoniness	(Moderate)[5] (Non - Slightly)[3] (Very - Excessively)[2]
Surface Rockiness	(Non-rocky)[8] (Slightly - Moderately)[2]

Vegetation Types

Common	CO5, CO6, HL3, HL4
Possible	CO2, CO3, CO4, HL1, HL2

Soil Types

Common	ST2, ST2-L, ST8
Possible	ST8-C, ST17, S-phase types

Comments

Highland MB8 sites are mainly found in the Cape Breton Highlands (210) ecodistrict. Coastal MB8 sites occur on all saltwater coastlines, but areas of highest occurrence are in the Atlantic Coastal (800) ecoregion (especially in more sheltered areas). Vegetation type CO3 (Red spruce / Mountain-ash / Foxberry) is only found in the Fundy Shore (900) ecoregion and the Tusket Islands (840) ecodistrict.

MB9
Moist – Rich / Birch – Fir
n = 8

Description

Occurring mainly on imperfectly drained gentle slopes and level areas with medium to coarse textured glacial till deposits, this ecosite has moist, nutrient medium to rich soils which generally support closed canopy forests of white birch, yellow birch and red maple. Heart-leaf birch and balsam fir can also form a portion of the overstory. Non-tree species found are similar to MB8 sites, but also include plants associated with higher moisture levels including cinnamon fern, interrupted fern, New York fern and sedge species. Old field forests (OF1, OF2, OF4) have flora typical of these vegetation types along with a well developed bryophyte layer (mainly Schreber's moss and stair-step moss).

Disturbance and Succession

Most natural disturbance is small scale with regeneration to similar species found in mature stands (mainly red maple and white birch in coastal areas and yellow birch in Highland areas). A conifer dominated successional stage is also possible where more intense stand-level disturbances occur. Along with natural senescence, windthrow and insects are the primary disturbance agents. The transitional climax yellow birch-balsam fir forest of the Highlands may have an uneven-aged structure owing to the longevity of birch which has been aged to 225 years. In coastal areas, both red maple and white birch seldom exceed 125 years.

Site Characteristics

Topographic Position	Middle[5] Level[1.5] Lower[1.5] Upper[1] nd[1]
Slope Gradient	Gentle[4] Level[1.5] Moderate[1.5] Steep[1] nd[2]
Exposure	Exposed[10]
Parent Material	Glacial till[8] nd[2]
Drainage	Imperfect[4] Mod.Well[4] nd[2]
Surface Stoniness	(Non - Slightly)[4] (Moderate)[3] (Very - Excessively)[1] nd[2]
Surface Rockiness	(Non-rocky)[5] (Slightly - Moderately)[2.5] nd[2.5]

Vegetation Types

Common	CO5, CO6, HL3, HL4, OF1
Possible	CO2, CO3, CO4, HL1, HL2, OF2, OF4

Soil Types

Common	ST3, ST3-L, ST9
Possible	ST9-C, ST12, ST18, S-phase types

Comments

Highland MB9 sites are mainly found in the Cape Breton Highlands (210) ecodistrict. Coastal MB9 sites occur on all saltwater coastlines, but areas of highest occurrence are in the Atlantic Coastal (800) ecoregion (especially in more sheltered areas).

MB10
Wet – Rich / Red maple
n = 2

Description

Occurring mainly on poorly drained level areas and depressions with glacial till and/or organic deposits, this ecosite has wet, nutrient medium to rich soils which generally support a closed canopy dominated by red maple with lesser amounts of other species. Regenerating trees, wild raisin and downy alder provide moderate cover in the shrub layer. The herb layer is typically dominated by fern species including cinnamon fern and sensitive fern. The forest floor has a well developed bryophyte layer dominated by sphagnum mosses.

Disturbance and Succession

Following disturbance or natural mortality, this ecosite regenerates to similar species found in mature stands leading to an edaphic climax forest dominated by red maple. Fluctuating water table levels and windthrow are the main disturbance agents.

Site Characteristics

Topographic Position	Depression[10]
Slope Gradient	Level[10]
Exposure	Exposed[5] Moderate[5]
Parent Material	Organic[10]
Drainage	Poor[10]
Surface Stoniness	(Non - Slightly)[5] (Very - Excessively)[5]
Surface Rockiness	(Non-rocky)[10]

Vegetation Types

Common	WD2, WD3, WD4

Soil Types

Common	ST4, ST6, ST7, ST10, ST12, ST13, ST14
Possible	ST3, ST3-G, ST3-L, ST9, ST9-C, S-phase types

Comments

Forest MB10 sites are generally associated with hardwood treed swamps which receive nutrient rich seepage flows and/or ground water inputs.

Highland MB10 sites are absent from the Cape Breton Taiga (100) ecoregion and infrequent in the Cape Breton Highlands (210) ecodistrict. Coastal MB10 sites are mainly found in sheltered areas along the Atlantic Coastal (800) ecoregion.

MB11
Fresh Moist – Very Rich / Red maple – Birch
n = 7

Description

Occurring mainly on moderately well drained, gentle slopes with medium to coarse textured glacial till deposits, this ecosite has fresh to moist, nutrient rich to very rich soils which generally support closed canopy forests of white birch, yellow birch and red maple. Sugar maple is occasionally present in Highland areas both in the overstory and understory layers. Increased site fertility is evident by the presence of lady fern, northern beech fern, shining club-moss and the overall diversity of flora. Old field forests (OF1, OF4) have flora typical of these vegetation types along with a well developed bryophyte layer (mainly Schreber's moss and stair-step moss).

Disturbance and Succession

Most natural disturbance is small scale with regeneration to similar species found in mature stands (mainly red maple and white birch in coastal areas and yellow birch in highland areas). A conifer dominated successional stage is also possible where more intense stand-level disturbances occur. Along with natural senescence, windthrow and insects are the primary disturbance agents. The transitional climax yellow birch-balsam fir forest of the Highlands may have an uneven-aged structure owing to the longevity of birch which has been aged to 225 years. In coastal areas, both red maple and white birch seldom exceed 125 years.

Site Characteristics

Topographic Position	Middle[6] Upper[3] Lower[1]
Slope Gradient	Gentle[9] Steep[1]
Exposure	Mod.Exposed[4] Exposed[3] Moderate[3]
Parent Material	Glacial till[7] nd[3]
Drainage	Mod.Well[4] Well[3] nd[3]
Surface Stoniness	(Non - Slightly)[6] (Moderate)[1] nd[3]
Surface Rockiness	(Non-rocky)[7] nd[3]

Vegetation Types

Common	HL3, HL4, OF1
Possible	CO5, CO6, OF4

Soil Types

Common	ST8, ST11
Possible	ST8-C, S-phase types

Comments

Highland MB11 sites are found only on the transitional slopes of the Cape Breton Highlands (210) ecodistrict. Coastal MB11 sites are mainly found in more sheltered areas along the Atlantic Coastal (800) and Fundy Shore (900) ecoregions.

Land Capability Interpretations

Land capability (LC) interpretations have been made for all major commercial tree species commonly found in Acadian and Maritime Boreal ecosites (Tables 7-23). These interpretations are based on LC functions developed by NSDNR (NSDLF 1990; NSDNR 1993; O'Keefe and McGrath 2006; McGrath 2011) as applied to tree data collected during FEC and forest land capability field sampling.

Land capability values are derived from site index (height over age) curves. They represent expected productivity (m^3/ha/yr) in fully stocked, even-aged stands at peak mean annual increment (MAI) when left to grow without silviculture treatments (NSDLF 1990). As such, LC values represent maximum potential stand productivity under natural conditions.

In Tables 7-23, LC values are reported by species or species group for ecosites they are most associated with (based on VT and ST combinations). Differences in LC values reflect differences between tree species physiology and site. Recommended planning values are based on field data interpretation and expected relationships between ecosites (see Appendix D for more details). These values are intended for use at the forest or landscape planning scale where differences between individual stands would be expected to average out. Recommended LC values can be used to project yields over time by using Nova Scotia's Growth and Yield Model located at: (http://www.gov.ns.ca/natr/forestry/programs/timberman/growthyield.asp).

Note: In Tables 7-21, sample size refers to the number of trees sampled, not the number of plots. Sample size is low for some species/ecosite combinations. Tables 7-21 will be updated as additional data are collected.

Table 7. Red spruce LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
5	3.9	3.2-4.8	2.8 / 5.0	6	4.0
6	4.5	3.9-5.0	3.0 / 5.9	38	4.5
7	4.9	4.4-5.5	4.0 / 6.1	15	5.0
8	4.4	4.1-4.9	3.0 / 5.5	29	4.5
9				0	4.5
10	5.5	4.9-6.0	3.5 / 7.2	277	5.5
11	5.3	4.7-6.0	3.7 / 7.1	67	5.5
12	5.2	4.6-5.9	3.9 / 6.6	16	5.0
13	5.8	5.2-6.2	4.5 / 7.7	31	6.0
14	6.1	5.6-6.6	5.0 / 7.6	15	6.0

Table 8. Black spruce LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
1	3.2	2.6-3.7	1.1 / 5.1	20	3.0
2	4.2	3.6-5.1	2.4 / 5.9	23	4.0
3	3.4	2.9-4.0	2.1 / 5.0	9	3.5
4	3.1	2.2-4.0	1.2 / 5.4	98	3.0
5	3.8	3.1-4.7	2.0 / 5.4	27	3.5
6	4.6	4.1-5.2	3.0 / 6.2	52	4.5
7	4.3	3.8-4.9	2.4 / 6.1	72	4.5
8	3.8	3.1-4.4	2.6 / 5.4	27	3.5
9				0	4.0
10	5.3	4.5-6.1	4.2 / 6.1	5	5.0
11	5.1	4.8-5.5	4.4 / 5.9	5	5.0
12	4.1	3.7-4.4	3.5 / 5.4	12	4.0

Table 9. Balsam fir LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
5				0	3.5
6				0	4.5
7				0	5.0
8	3.4	3.0-3.9	2.6 / 4.5	9	3.5
10	5.1	4.1-6.0	3.2 / 6.5	32	5.0
11	5.3	4.8-5.8	3.8 / 6.7	26	5.5
12	4.0	3.1-5.0	2.5 / 5.8	8	4.0
13	5.8	4.7-6.7	4.2 / 7.6	28	5.5
14	5.9	5.3-6.4	4.4 / 7.7	10	6.0

Table 10. White spruce LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
9				0	5.5
10	6.3	5.8-7.0	4.4 / 7.7	42	6.0
11	5.9	5.6-6.3	5.0 / 6.9	13	6.0
13	7.0	6.2-7.8	5.0 / 9.7	282	7.0
14	7.1	6.6-7.7	5.2 / 8.7	58	7.0
16	8.1	7.5-8.6	6.9 / 9.4	9	8.0
17	8.3	7.6-8.8	7.5 / 9.8	3	8.0

Table 11. White pine LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
5	6.6	5.7-7.3	5.3 / 8.0	13	6.5
6	7.1	6.3-7.9	5.4 / 9.1	40	7.0
7	7.2	6.1-7.5	6.0 / 9.2	5	7.0
9				0	7.0
10	7.3	6.3-8.2	5.6 / 8.2	4	7.5
11					7.5
13*	8.2	7.5-8.8	5.8 / 10.5	106	8.0
14*				0	8.0

* Old field sites

Table 12. Red pine LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
1	4.0	2.5-4.9	2.3 / 5.5	9	4.0
2	5.1	4.6-5.6	3.4 / 6.7	77	5.0
3				0	5.0
5				0	5.0
6	5.9	6.1-6.3	5.9 / 6.5	5	6.0
7	6.1	4.9-7.5	4.4 / 7.7	11	6.0
13*	7.0	6.6-7.7	5.1 / 8.3	16	7.0

* Old field sites

Table 13. Red maple and white birch LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
1				0	1.25
2				0	1.75
3				0	2.00
5				0	1.50
6	1.90	1.68-2.24	1.57 / 2.36	6	2.00
7				0	2.25
8*	1.72	1.46-1.98	1.38 / 2.09	4	1.75
9	1.97	1.89-2.04	1.89 / 2.04	2	2.00
10	2.18	1.91-2.43	1.53 / 2.96	36	2.25
11	2.66	2.49-2.89	2.42 / 3.03	8	2.50
12*	1.92	1.76-2.09	1.30 / 2.43	19	2.00
13	2.74	2.60-2.87	2.60 / 2.87	2	2.75
14	2.96	2.85-3.01	2.85 / 3.20	5	3.00
15*	2.26	2.22-2.29	2.22 / 2.29	2	2.25

* Refers mainly to red maple

Table 14. Red oak LC values (m^3/ha/yr) for representative Acadian (AC) ecosites*

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
1	1.38	0.87-1.89	0.87 / 1.89	2	1.50
2	1.98	1.89-2.06	1.89 / 2.06	2	2.00
3				0	2.25
5	1.72			1	1.75
6	2.27	1.84-2.74	1.40 / 3.43	20	2.25
7				0	2.50

* See Table 16 for values associated with richer ecosites.

Table 15. Aspen LC values (m^3/ha/yr) for representative Acadian (AC) ecosites (trembling aspen and large-tooth aspen)

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
5-6-7	4.55	3.88-5.39	3.16 / 5.76	23	4.50
9-10-11	4.96	4.30-5.50	3.75 / 5.94	23	5.00
12	3.72	3.47-4.04	3.08 / 4.50	13	3.75
13-14	5.37	4.92-5.82	4.28 / 6.56	80	5.50

Table 16. Tolerant hardwood LC values (m^3/ha/yr) for representative Acadian (AC) ecosites (sugar maple, yellow birch, red maple, red oak)

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
8*	1.72	1.46-1.98	1.38 / 2.09	4	1.75
9	2.64	2.61-2.66	2.61 / 2.66	2	2.50
10-11	2.76	2.47-3.04	1.91 / 3.64	50	2.75
12*	1.92	1.76-2.09	1.30 / 2.43	19	2.00
13-14	2.91	2.66-3.13	2.21 / 3.73	114	3.00
15*	2.26	2.22-2.29	2.22 / 2.29	2	2.25
16-17	3.48	3.21-3.74	2.99 / 3.98	21	3.50
Vegetation Type TH5**	1.73	1.25-2.18	0.94 / 2.20	8	1.75
Exposed Sites***	2.02	1.78-2.26	1.35 / 2.83	35	2.00

* Refers mainly to red maple

** Applies only to stands classed as vegetation type TH5 (Beech/Sarsaparilla/Leaf litter)

*** Refers to exposed sites as defined under Site Characteristics and is applicable regardless of ecosite

Table 17. White ash LC values (m^3/ha/yr) for representative Acadian (AC) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
12	1.91	1.65-2.16	1.37 / 2.39	9	2.00
13-14	3.33	2.96-3.67	2.34 / 4.44	44	3.25
15	2.63	2.43-3.00	1.80 / 3.19	15	2.50
16-17	3.78	3.33-4.22	2.85 / 4.95	26	3.75

Table 18. Black spruce LC values (m^3/ha/yr) for representative Maritime Boreal (MB) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
1				0	2.0
2	2.8	2.3-3.7	1.0 / 4.3	9	3.0
3	2.6	1.9-3.4	1.0 / 4.1	16	2.5
4	2.0	0.9-3.1	0.8 / 3.3	6	2.0
5	2.8	2.7-3.0	2.6 / 3.1	4	3.0
6				0	2.5
7				0	2.0

Table 19. Balsam fir LC values (m^3/ha/yr) for representative Maritime Boreal (MB) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
5	4.1	3.4-4.8	2.1 / 5.9	69	4.0
6	3.4	2.8-4.2	2.0 / 5.0	43	3.5
7	1.9	1.7-2.0	1.6 / 2.3	5	2.0
8	4.2	3.5-4.7	3.5 / 5.1	6	4.5
9				0	4.0
10				0	2.5
11	5.8	5.1-6.6	4.1 / 6.8	4	5.5

Table 20. White spruce LC values (m^3/ha/yr) for representative Maritime Boreal (MB) ecosites

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
5-6	3.8	3.1-4.6	2.5 / 5.6	27	4.0
8-9	4.7	4.2-5.4	3.1 / 5.9	15	5.0
11	6.9	6.4-7.5	5.5 / 8.0	13	6.5

Table 21. Hardwood LC values (m^3/ha/yr) for representative Maritime Boreal (MB) ecosites (red maple, white birch, yellow birch)

AC Ecosite	Mean	Middle Range (25%-75%)	Min / Max	Sample Size	Recommended Planning Value
5	1.41	1.28-1.55	1.09 / 1.71	7	1.50
6				0	1.25
7				0	1.00
8	1.53	1.44-1.61	1.37 / 1.62	4	1.50
9				0	1.25
10				0	1.00
11				0	1.75

Table 22. Summary of recommended LC planning values (m^3/ha/yr) by species for representative Acadian (AC) ecosites

AC Ecosite	rS	bS	bF	wS	wP	rP	IHW*	rO	Aspen	THW**	wA
1		3.0				4.0	1.25	1.50			
2		4.0				5.0	1.75	2.00			
3		3.5				5.0	2.00	2.25			
4		3.0									
5	4.0	3.5	3.5		6.5	5.0	1.50	1.75	4.50		
6	4.5	4.5	4.5		7.0	6.0	2.00	2.25	4.50		
7	5.0	4.5	5.0		7.0	6.0	2.25	2.50	4.50		
8	4.5	3.5	3.5				1.75			1.75	
9	4.5	4.0		5.5	7.0		2.00		5.00	2.50	
10	5.5	5.0	5.0	6.0	7.5		2.25		5.00	2.75	
11	5.5	5.0	5.5	6.0	7.5		2.50		5.00	2.75	
12	5.0	4.0	4.0				2.00		3.75	2.00	2.00
13	6.0		5.5	7.0	8.0	7.0	2.75		5.50	3.00	3.25
14	6.0		6.0	7.0	8.0		3.00		5.50	3.00	3.25
15							2.25			2.25	2.50
16				8.0						3.50	3.75
17				8.0						3.50	3.75

* Refers to red maple and white birch not found in tolerant hardwood (TH) vegetation types

** Refers to sugar maple, yellow birch, red maple and red oak found in tolerant hardwood (TH) vegetation types (except TH5) and richer intolerant hardwood (IH) vegetation types (IH3, IH5, IH7). Does not apply to exposed sites (See Table 16 for further details).

rS = red spruce
bS = black spruce
bF = balsam fir
wS = white spruce
wP = white pine
rP = red pine

IHW = intolerant hardwoods
rO = red oak
Aspen = trembling aspen and large-tooth aspen
THW = tolerant hardwoods
wA = white ash

Table 23. Summary of recommended LC planning values (m^3/ha/yr) by species for representative Maritime Boreal (MB) ecosites

MB Ecosite	Black Spruce	Balsam Fir	White Spruce	Hardwoods*
1	2.0			
2	3.0			
3	2.5			
4	2.0			
5	3.0	4.0	4.0	1.50
6	2.5	3.5	4.0	1.25
7	2.0	2.0		1.00
8		4.5	5.0	1.50
9		4.0	5.0	1.25
10		2.5		1.00
11		5.5	6.5	1.75

* Refers to red maple, white birch and/or yellow birch found in coastal (CO) and Highland (HL) vegetation types

near Blandford, Lunenburg County

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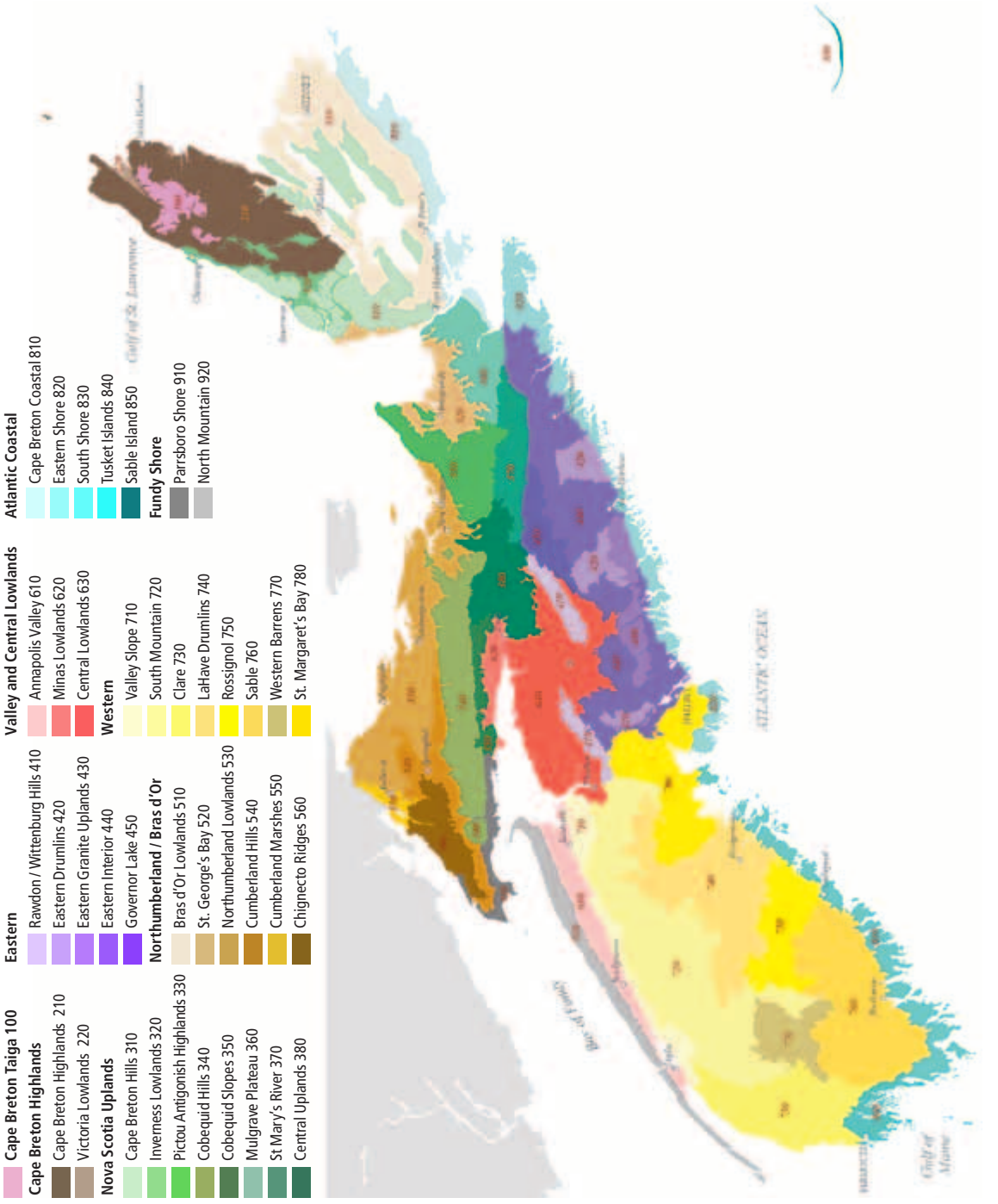
Appendix A
Ecoregions and ecodistricts of Nova Scotia



Appendix B
Ecosite matrix tables – Acadian ecosites

Tables below are used to determine Acadian ecosites based on vegetation type (VT) and soil type (ST) information. Assignment of ecosite to VT/ST combinations was based on expert opinion and analysis of land capability (LC) data collected from 1,309 sample plots.

To use these tables, simply find the cell associated with the VT/ST combination found during field assessment – the number in the cell is the ecosite for that combination (also see note below on stony phase STs).

Blue shaded numbers indicate VT/ST combinations found during field sampling. Non-shaded numbers indicate VT/ST combinations not found during field sampling, but which are considered probable or possible. Cells with no numbers are VT/ST combinations thought to be impossible or improbable (and therefore not associated with any ecosite).

Users who find VT/ST combinations associated with blank cells should reassess VT and/or ST to verify these units. If VT and ST are still considered correct, users are encouraged to contact the Ecosystem Management Group, Forestry Division, Nova Scotia Department of Natural Resources for further guidance.

Note: These tables are intended for use in Acadian ecosite areas only (see Table 1); however, it is possible that coastal (CO) or Highland (HL) vegetation types can be found near the boundaries of Acadian and Maritime Boreal groups. In these cases, users should verify the VT call and, if correct, use Maritime Boreal ecosite tables to determine ecosite and related productivity interpretations.

Stony phase STs are not listed in ecosite matrix tables. Users should refer to the closest ST listed to assign ecosite for stands with S-phase soils (e.g. ST1-S use ST1, ST3-GS use ST3-G). Due to reduced soil volumes, productivity values for these sites would tend to be on the lower end of ranges listed in Tables 7-17.

Provincial VTs and STs are listed by name in Appendix E.

Table B1. AC ecosite table for spruce hemlock forest (SH) vegetation types

Spruce Hemlock Forest

Soil Type	Vegetation Type									
	SH1	SH2	SH3	SH4	SH5	SH6	SH7	SH8	SH9	SH10
1	10	10	10	5	9		9	9	5	9
1-G				5	5			5	5	
2	10	10	10	6	10	10	10	10	6	10
2-G	6	6	6	6	6	6		6	6	
2-L	10	10	10	10	10	10	10	10	10	10
3	11	11	11	7	11	11	11	11	7	11
3-G	7	7	7	7	7	7		7	7	
3-L	11	11	11	11	11	11	11	11	11	11
4										
4-G										
5	10	10	10	10	10	10	10	10	10	10
6	11	11	11	11	11	11	11	11	11	11
7										
8	13	13	13		13	13	13	13		13
8-C	10	10	10		10	10	10	10		10
9	14	14	14		14	14	14	14		14
9-C	11	11	11		11	11	11	11		11
10										
11	13	13	13		13	13	13	13		13
12	14	14	14		14	14	14	14		14
13										
14										
14-U		7	7	7	7	7		7	7	
15	9	9	9	5	9		9	9	5	9
15-G				5	5			5	5	
15-L	9	9	9	9	9		9	9	9	9
16	10	10	10	6	10	10	10	10	6	10
16-G				6	6	6		6	6	
16-L	10	10	10	10	10	10	10	10	10	10
17					9		9	9		
18					10	10	10	10		
19										
19-M										

Table B2. AC ecosite table for spruce pine forest (SP) vegetation types

Spruce Pine Forest

Soil Type	Vegetation Type									
	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10
1	2	2	2	5	5	5		5	5	5
1-G	2	2	2	5	5	5		5	5	
2	2	2	2	6	6	6		6	6	6
2-G	2	2	2	6	6	6		6	6	
2-L	6	6	6	6	6	6		6	6	6
3	3	3	3	7	7	7	7	7	7	7
3-G	3	3	3	7	7	7	7	7	7	
3-L	7	7	7	7	7	7	7	7	7	7
4							7			
4-G							7			
5	6	6	6	6	6	6		6	6	6
6	7	7	7	7	7	7	7	7	7	7
7							7			
8										
8-C										
9										
9-C										
10										
11										
12										
13										
14										
14-U					7	7	7			
15	1	1	1	5	5	5		5	5	
15-G	1	1	1	5	5	5		5	5	
15-L	5	5	5	5	5	5		5	5	
16	2	2	2	6	6	6	7	6	6	
16-G	2	2	2	6	6	6	7	6	6	
16-L	6	6	6	6	6	6	7	6	6	
17										
18										
19										
19-M										

Table B3. AC ecosite table for mixedwood forest (MW) vegetation types

Mixedwood Forest

Soil Type	Vegetation Type				
	MW1	MW2	MW3	MW4	MW5
1	9	9	9	9	9
1-G	9	9	9	9	9
2	10	10	10	10	10
2-G	10	10	10	10	10
2-L	13	10	13	10	10
3	11	11	11	11	11
3-G	11	11	11	11	11
3-L	14	11	14	11	11
4					
4-G					
5	13	10	13	10	10
6	14	11	14	11	11
7					
8	13	13	13	13	13
8-C	10	10	10	10	10
9	14	14	14	14	14
9-C	11	11	11	11	11
10					
11	13	13	13	13	13
12	14	14	14	14	14
13					
14					
14-U					
15					
15-G					
15-L					
16					
16-G					
16-L					
17					
18					
19					
19-M					

Table B4. AC ecosite table for intolerant hardwood forest (IH) vegetation types

Intolerant Hardwood Forest

Soil Type	Vegetation Type						
	IH1	IH2	IH3	IH4	IH5	IH6	IH7
1	5	5		9		9	
1-G	5	5				5	
2	6	6	10	10	10	10	10
2-G	6	6	10			6	10
2-L	6	6	13	10	13	10	13
3	7	7	11	11	11	11	11
3-G	7	7	11			7	11
3-L	7	7	14	11	14	11	14
4							
4-G							
5	6	6	13	10	13	10	13
6	7	7	14	11	14	11	14
7							
8			13	13	13	13	13
8-C			10	10	10	10	10
9			14	14	14	14	14
9-C			11	11	11	11	11
10							
11			13	13	13	13	13
12			14	14	14	14	14
13							
14							
14-U							
15	5	5		9		9	9
15-G	5	5				5	
15-L	5	5		9		9	9
16	6	6		10		10	10
16-G	6	6				6	
16-L	6	6		10		10	10
17							9
18							10
19							
19-M							

Table B5. AC ecosite table for tolerant hardwood forest (TH) vegetation types

Tolerant Hardwood Forest

Soil Type	Vegetation Type							
	TH1	TH2	TH3	TH4	TH5	TH6	TH7	TH8
1	9	9			9	9	9	9
1-G						9		
2	10	10	13	13	10	10	10	10
2-G	10	10	10		10	10	10	10
2-L	13	13	13	13	13	13	13	13
3	11	11	14	14		11	11	11
3-G	11	11	11			11	11	11
3-L	14	14	14	14		14	14	14
4								
4-G								
5	13	13	13	13	13	13	13	13
6	14	14	14	14		14	14	14
7								
8	13	13	13	16	13	13	13	13
8-C	10	10	13	13	10	10	10	10
9	14	14	14	17		14	14	14
9-C	11	11	14	14		11	11	11
10								
11	13	13	13	16	13	13	13	13
12	14	14	14	17		14	14	14
13								
14								
14-U								
15	9	9			9	9	9	9
15-G								
15-L	9	9			9	9	9	9
16	10	10	10			10	10	10
16-G								
16-L	10	10	10			10	10	10
17	9	9	9		9	9	9	9
18	10	10	10			10	10	10
19								
19-M								

Table B6. AC ecosite table for old field forest (OF) vegetation types

Old Field Forest

Soil Type	Vegetation Type				
	OF1	OF2	OF3	OF4	OF5
1					
1-G					
2	10		10	10	10
2-G					
2-L	13		13	13	13
3	11	11	11	11	11
3-G					
3-L	14	14	14	14	14
4					
4-G					
5	13		13	13	13
6	14	14	14	14	14
7		12			12
8	13		13	13	13
8-C	13		13	13	13
9	14	14	14	14	14
9-C	14	14	14	14	14
10					
11	13		13	13	13
12	14	14	14	14	14
13		12			
14					
14-U					
15					
15-G					
15-L					
16					
16-G					
16-L					
17					
18					
19					
19-M					

Table B7. AC ecosite table for floodplain forest (FP) vegetation types

Floodplain Forest

Soil Type	Vegetation Type					
	FP1	FP2	FP3	FP4	FP5	FP6
1						
1-G						
2						
2-G						
2-L						
3						
3-G						
3-L						
4						
4-G						
5						
6						
7						
8	16	16	16	16	13	13
8-C	13	13	13	13	13	13
9	17	17	17	17	14	14
9-C	14	14	14	14	14	14
10			15			
11	16	16	16	16	16	16
12	17	17	17	17	17	17
13			15			
14						
14-U						
15						
15-G						
15-L						
16						
16-G						
16-L						
17						
18						
19						
19-M						

Table B8. AC ecosite table for open woodland (OW), eastern white cedar (CE), and karst forest (KA) vegetation types

	Open Woodland						Cedar Forest		Karst Forest	
Soil Type	Vegetation Type									
	OW1	OW2	OW3	OW4	OW5	OW6	CE1	CE2	KA1	KA2
1	1	1	6	1	1			9		
1-G	1	1		1	1			5		
2	2	2	6	2	2			10	10	10
2-G	2	2		2	2			6		
2-L								10	13	13
3	3	3		3	3			11	11	11
3-G	3	3		3	3			7		
3-L								11	14	14
4							8			
4-G										
5								10	13	13
6								11	14	14
7							8			
8						10		13	13	13
8-C						10		10		
9								14	14	14
9-C								11		
10							12			
11								13	13	13
12								14	14	14
13							12			
14							8			
14-U		3	7							
15	1	1		1	1			9	9	9
15-G	1	1		1	1					
15-L	1	1		1	1			9	9	9
16	2	2		2	2			10	10	10
16-G	2	2		2	2					
16-L	2	2		2	2			10	10	10
17						9		9	9	9
18						10		10	10	10
19			5							
19-M						9				

Table B9. AC ecosite table for wet conifer forest (WC) vegetation types

Wet Conifer Forest

Soil Type	Vegetation Type							
	WC1	WC2	WC3	WC4	WC5	WC6	WC7	WC8
1								
1-G								
2								
2-G								
2-L								
3	4	4	3	3	8	8	8	8
3-G	4	4	3	3	8	8	8	8
3-L	4	4	3	3	8	8	8	8
4	4	4	4	4	8	8	8	8
4-G	4	4	4	4	8	8	8	8
5								
6	4	4	3	3	8	8	8	8
7	4	4	4	4	8	8	8	8
8								
8-C								
9					12	12	12	12
9-C					12	12	12	12
10					12	12	12	12
11								
12					12	12	12	12
13					12	12	12	12
14	4	4	4	4	8	8	8	8
14-U								
15								
15-G								
15-L								
16								
16-G								
16-L								
17								
18								
19								
19-M								

Table B10. AC ecosite table for wet deciduous forest (WD) vegetation types

Wet Deciduous Forest

Soil Type	Vegetation Type							
	WD1	WD2	WD3	WD4	WD5	WD6	WD7	WD8
1								
1-G								
2								
2-G								
2-L								
3		8	12	12	12	8	12	12
3-G		8	12	12		8	12	12
3-L		8	12	12	12	8	12	12
4		8	12	12	12	8	12	12
4-G		8	12	12		8	12	12
5								
6	15	12	12	12	12	12	12	12
7	15	12	12	12	12	12	12	12
8								
8-C								
9	15	12	12	12	12	12	12	12
9-C	15	12	12	12	12	12	12	12
10	15	12	12	12	12	12	12	12
11								
12	15	12	12	12	12	12	12	12
13	15	12	12	12	12	12	12	12
14	15	8	12	12	12	8	12	12
14-U								
15								
15-G								
15-L								
16								
16-G								
16-L								
17								
18								
19								
19-M								

Appendix C
Ecosite matrix tables – Maritime Boreal ecosites

Tables below are used to determine Maritime Boreal ecosites based on vegetation type (VT) and soil type (ST) information. Assignment of ecosite to VT/ST combinations was based on expert opinion and analysis of land capability (LC) data collected from 74 sample plots.

To use these tables, simply find the cell associated with the VT/ST combination found during field assessment – the number in the cell is the ecosite for that combination (also see note below on stony phase STs).

Blue shaded numbers indicate VT/ST combinations found during field sampling. Non-shaded numbers indicate VT/ST combinations not found during field sampling, but which are considered probable or possible. Cells with no numbers are VT/ST combinations thought to be impossible or improbable (and therefore not associated with any ecosite).

Users who find VT/ST combinations associated with blank cells should reassess VT and/or ST to verify these units. If VT and ST are still considered correct, users are encouraged to contact the Ecosystem Management Group, Forestry Division, Nova Scotia Department of Natural Resources for further guidance.

Note: These tables are intended for use in Maritime Boreal ecosite areas only (see Table 1). If a vegetation type is found which does not match those listed in the tables below, users may be in a stand which is not severely influenced by Maritime Boreal conditions and which may support vegetation types normally associated with zonal Acadian ecosites. In these cases, users should use Acadian ecosite tables to determine ecosite and related productivity interpretations.

Stony phase STs are not listed in ecosite matrix tables. Users should refer to the closest ST listed to assign ecosite for stands with S-phase soils (e.g. ST1-S use ST1, ST3-GS use ST3-G). Due to reduced soil volumes, productivity values for these sites would tend to be on the lower end of ranges listed in Tables 18-21.

Provincial VTs and STs are listed by name in Appendix E.

Table C1. MB ecosite table for coastal forest (CO) vegetation types

Coastal Forest

Soil Type	Vegetation Type						
	CO1	CO2	CO3	CO4	CO5	CO6	CO7
1	2	2					1
1-G	2	2					
2	2	5	5	5	8	8	
2-G	2	2		2	5	5	
2-L	2	5	5	5	8	8	
3	3	6	6	6	9	9	
3-G	3	3		3	6	6	
3-L	3	6	6	6	9	9	
4	3	6	6	6	9	9	
4-G	3	3		3	6	6	
5	2	5		5			
6	3	6		6			
7	3	6		6			
8		8	8	8	11	11	
8-C		8	8	8	8	8	
9		9	9	9	9	9	
9-C		9	9	9	9	9	
10		9		9			
11							
12							
13							
14							
14-U	3	6	6	6			
15	2	2	2	2	5	5	
15-G	2	2		2	5	5	
15-L	2	2	2	2	5	5	
16	3	3	3	3	6	6	
16-G	3	3		3	6	6	
16-L	3	3	3	3	6	6	
17		5	5	5	8	8	
18		6	6	6	9	9	
19							
19-M							

Table C2. MB ecosite table for Highland forest (HL) vegetation types

Highland Forest

Soil Type	Vegetation Type			
	HL1	HL2	HL3	HL4
1	2	2		
1-G	2	2		
2	5	5	8	8
2-G	2	2	5	5
2-L	5	5	8	8
3	6	6	9	9
3-G	3	3	6	6
3-L	6	6	9	9
4	6			
4-G	3			
5				
6				
7				
8	8	8	11	11
8-C	8	8	8	8
9	9	9	9	9
9-C	9	9	9	9
10				
11				
12				
13				
14				
14-U	6			
15	2	2	5	5
15-G	2	2	5	5
15-L	2	2	5	5
16	3	3	6	6
16-G	3	3	6	6
16-L	3	3	6	6
17				
18				
19				
19-M				

Table C3. MB ecosite table for open woodland (OW), spruce pine forest (SP), and old field (OF) vegetation types

	Open Woodland		Spruce Pine Forest					Old Field Forest		
Soil Type	Vegetation Type									
	OW1	OW2	SP1	SP4	SP5	SP6	SP7	OF1	OF2	OF4
1	1	1	1	1	1	1				
1-G		1	1	1	1	1				
2	2	2	2	2	2	2				
2-G	2	2	2	2	2	2				
2-L			2	2	2	2				
3	3	3	3	3	3	3	3			
3-G	3	3	3	3	3	3	3			
3-L			3	3	3	3	3			
4							3			
4-G							3			
5										
6										
7										
8								11		11
8-C								11		11
9								9	9	9
9-C								9	9	9
10										
11								11		11
12								9	9	9
13										
14										
14-U		3			3	3	3			
15	1	1	1	1	1	1				
15-G	1	1	1	1	1	1				
15-L	1	1	1	1	1	1				
16	2	2	2	2	2	2	3			
16-G	2	2	2	2	2	2	3			
16-L	2	2	2	2	2	2	3			
17										
18										
19										
19-M										

Table C4. MB ecosite table for wet conifer forest (WC) and wet deciduous forest (WD) vegetation types

	Wet Conifer Forest						Wet Deciduous Forest			
Soil Type	Vegetation Type									
	WC1	WC2	WC3	WC5	WC6	WC7	WD2	WD3	WD4	WD6
1										
1-G										
2										
2-G										
2-L										
3	4	4	4	7	7	4	10	10	10	7
3-G	4	4	4	7	7	4	10	10	10	7
3-L	4	4	4	7	7	4	10	10	10	7
4	4	4	4	7	7	4	10	10	10	7
4-G	4	4	4		7	4	10	10	10	7
5										
6	4	4	4	7	7	4	10	10	10	7
7	4	4	4	7	7	4	10	10	10	7
8										
8-C										
9							10	10	10	
9-C							10	10	10	
10							10	10	10	
11										
12							10	10	10	
13							10	10	10	
14	4	4	4	7	7	4	10	10	10	7
14-U										
15										
15-G										
15-L										
16										
16-G										
16-L										
17										
18										
19										
19-M										

Appendix D
Land capability analyses

Boxplot figures below show results of productivity analyses conducted for tree species in the Acadian and Maritime Boreal ecosite groups. These results are summarized in Tables 7-21 within this guide.

LANDCAP = Land Capability (m^3/ha/yr) based on tree height and age data

ECOSITE = Ecosite or ecosite range

N = Sample size (number of trees)

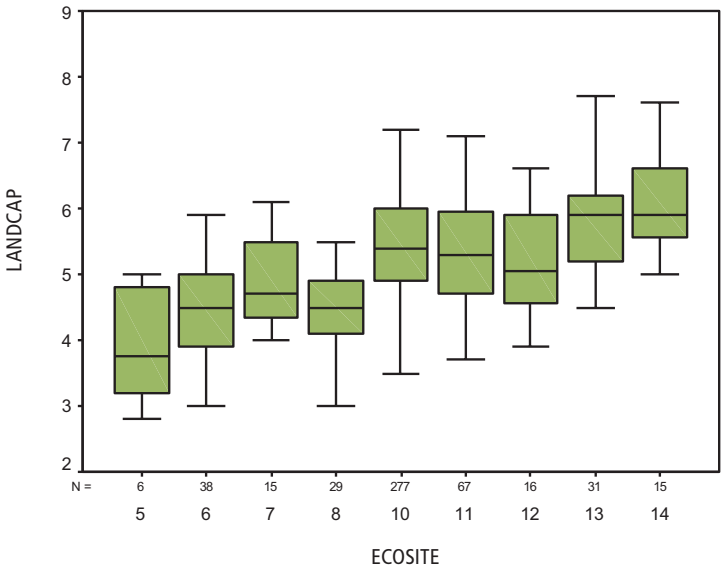
Coloured (green or blue) boxes represent the 25-75 percentile range, i.e. the middle 50% of results.

The solid line in each box shows the median value.

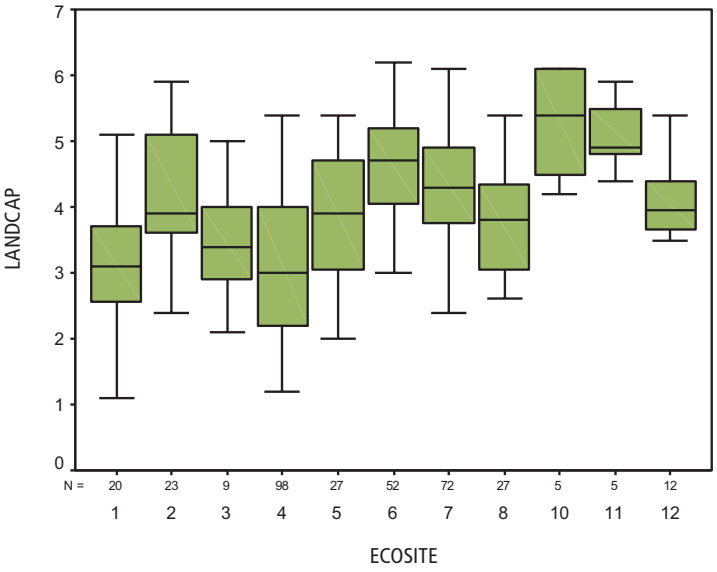
Bars represent the range of values (if they exist) that fall within 1.5 times the width (height) of the box.

Outliers and extreme values (not shown) were removed as part of data analyses.

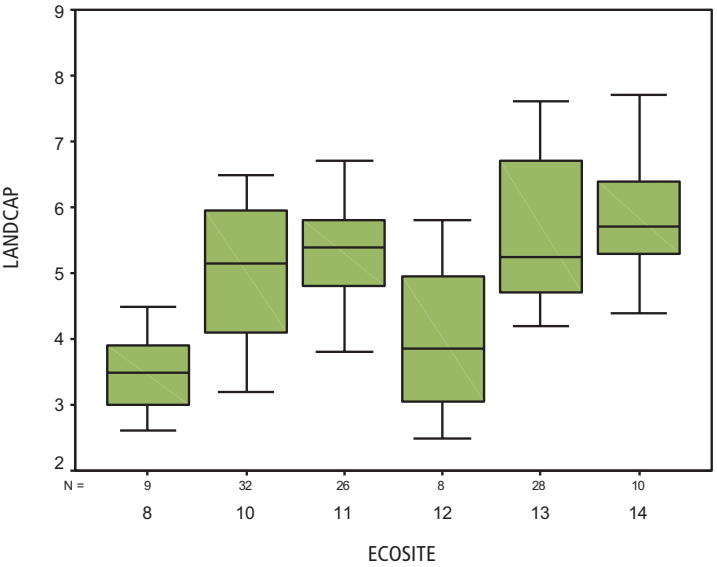
AC ecosites – Red spruce



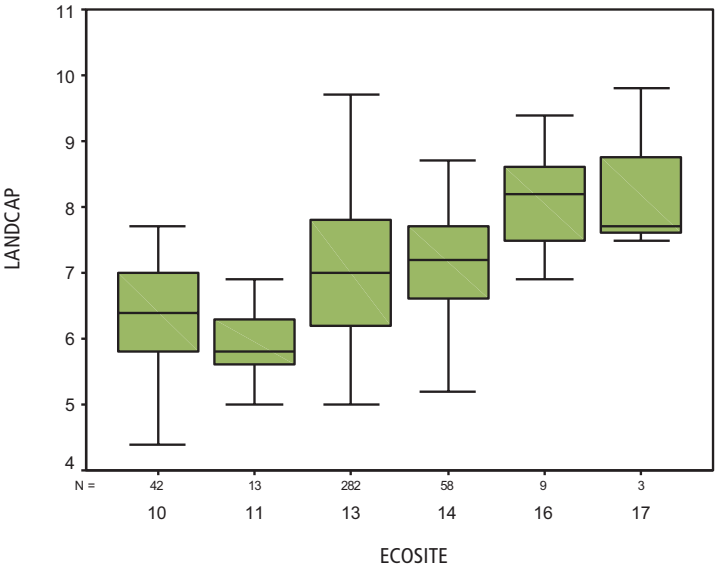
AC ecosites – Black spruce



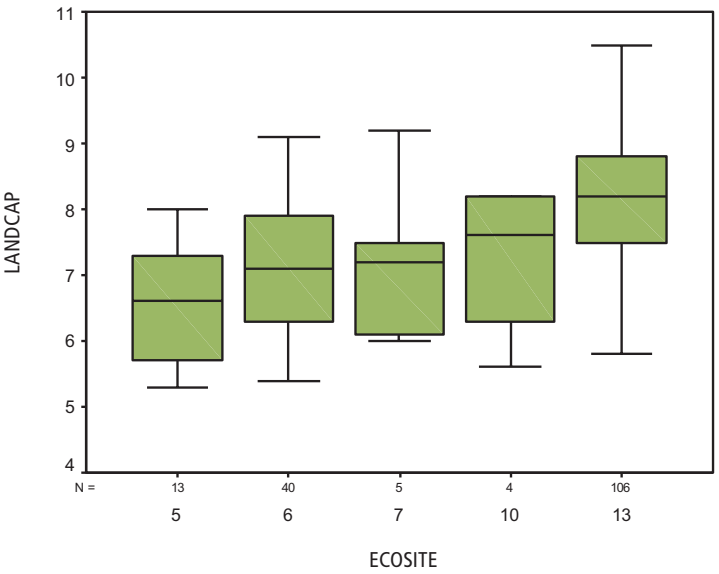
AC ecosites – Balsam fir



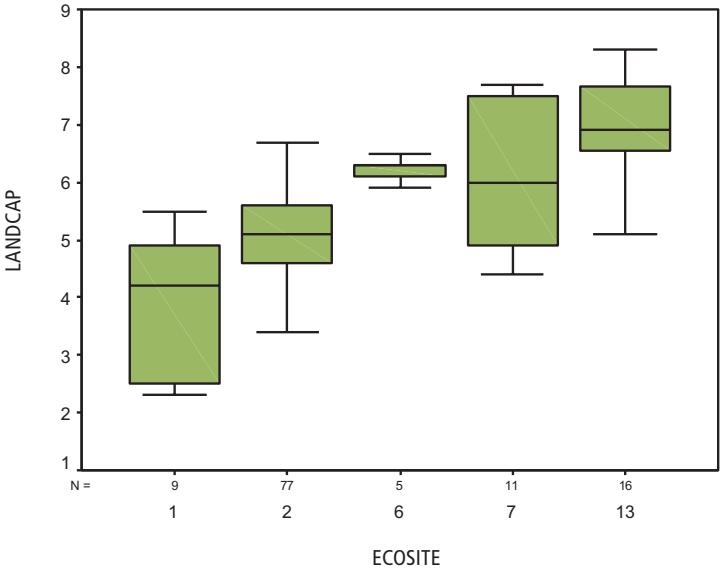
AC ecosites – White spruce



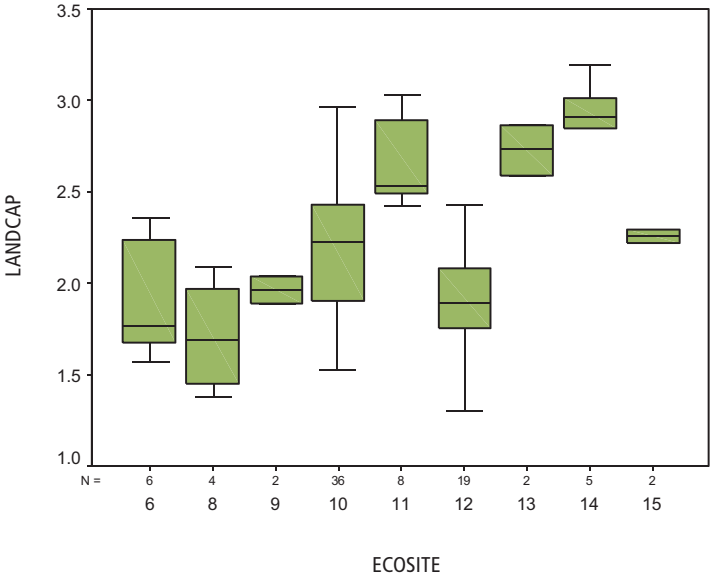
AC ecosites – White pine



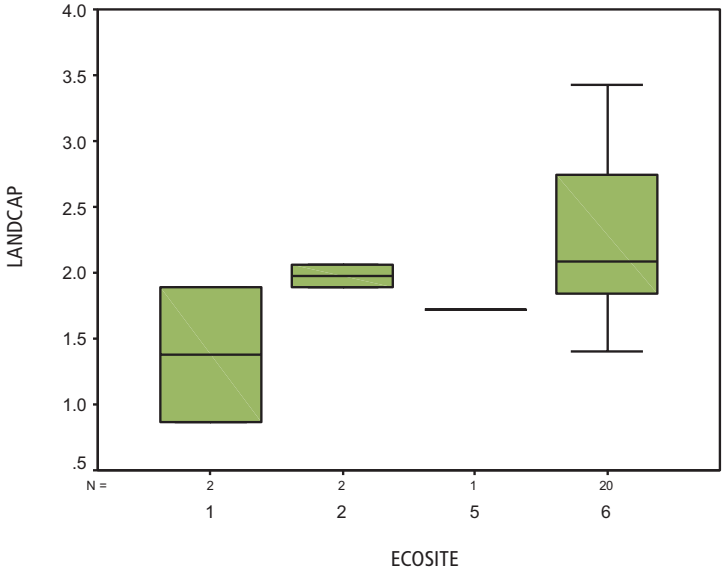
AC ecosites – Red pine



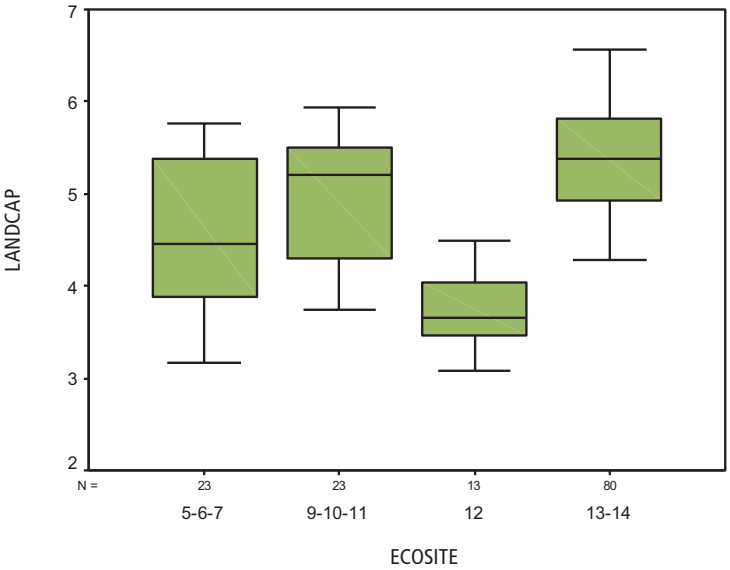
AC ecosites – Red maple and White birch (IH vegetation types)



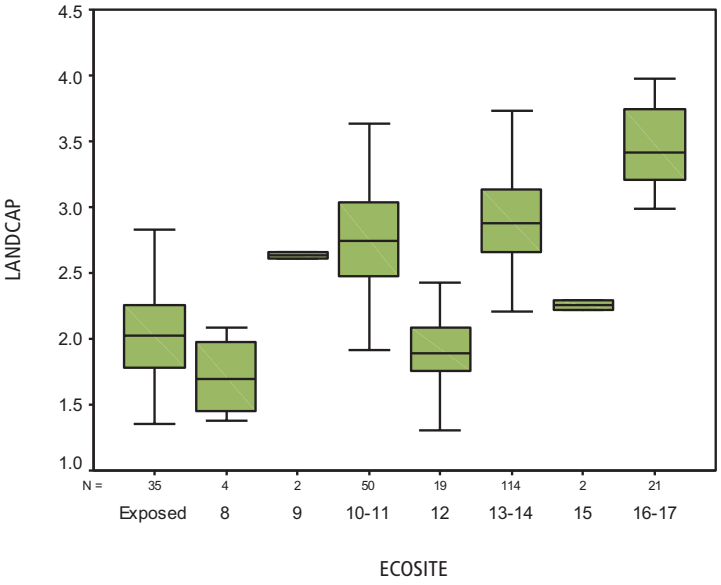
AC ecosites – Red oak (IH vegetation types)



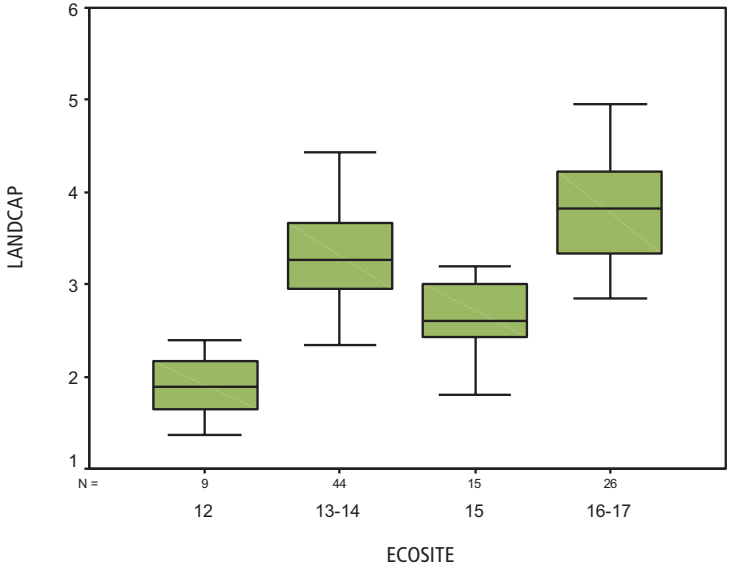
AC ecosites – Aspen (Trembling aspen, Large-tooth aspen)



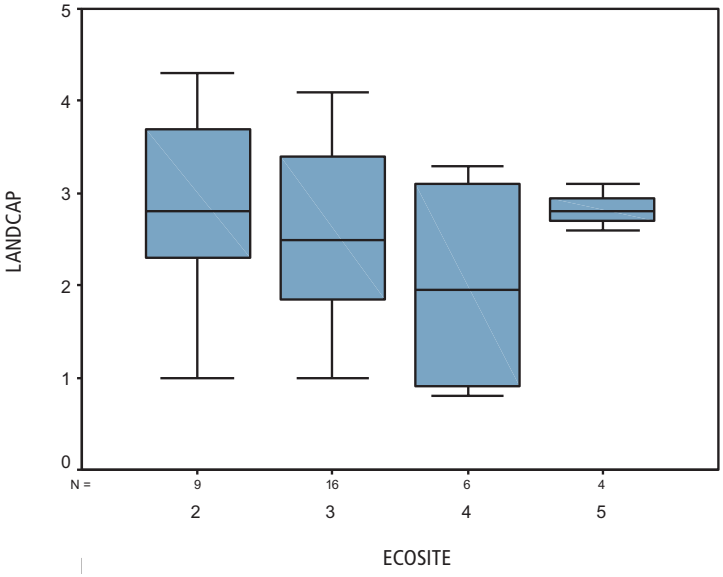
AC ecosites – Tolerant Hardwood (Sugar maple, Yellow birch, Red maple, Red oak)



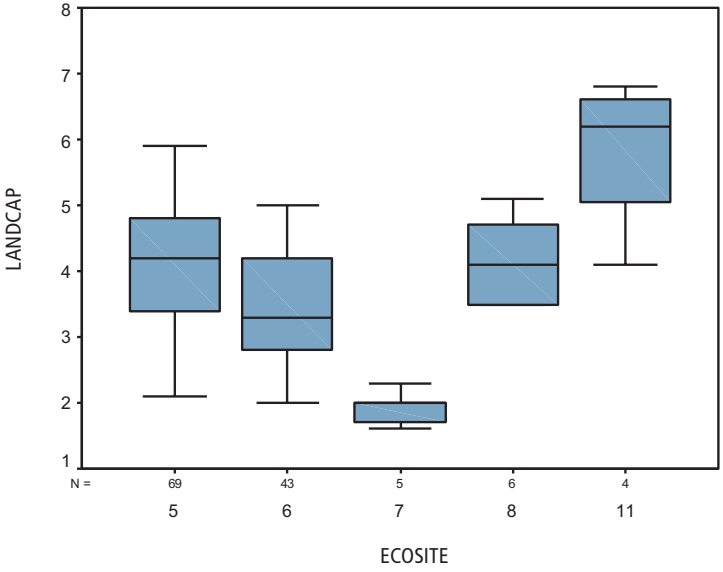
AC ecosites – White ash



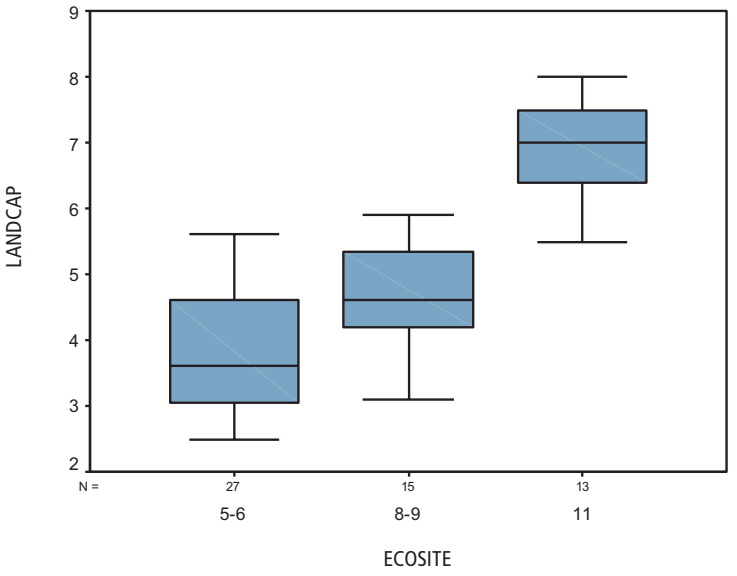
MB ecosites – Black spruce



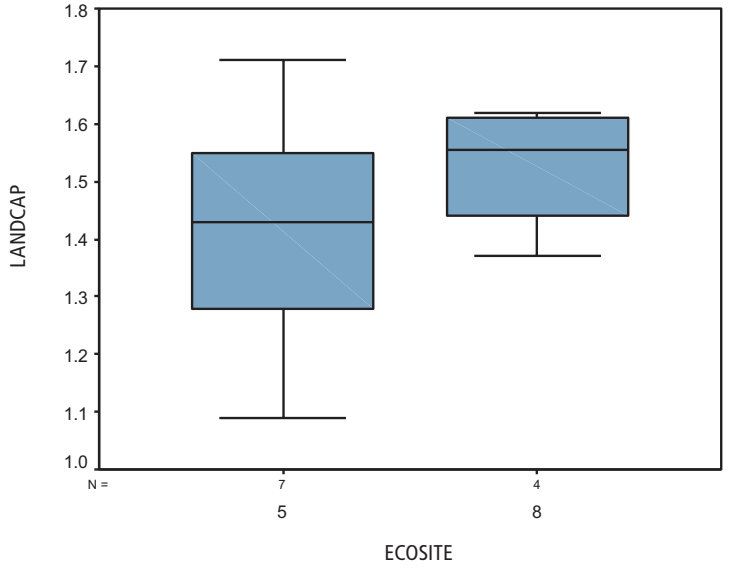
MB ecosites – Balsam fir



MB ecosites – White spruce



MB ecosites – Hardwood (Red maple, White birch, Yellow birch)



Appendix E
List of provincial forest vegetation types and soil types

Provincial vegetation types (VTs), VT variants and their associated ecosite groups (AC = Acadian, MB = Maritime Boreal).

VT Code	VT Name	AC	MB
CE1	Eastern white cedar / Speckled alder / Cinnamon fern / Sphagnum	X	
CE1a	(Poison ivy variant)	X	
CE2	Eastern white cedar – Balsam fir / Stair-step moss	X	
CO1	Black spruce – Balsam fir / Foxberry / Plume moss		X
CO2	White spruce – Balsam fir / Foxberry / Twinflower		X
CO2a	(Black crowberry Headland variant)		X
CO3	Red spruce / Mountain-ash / Foxberry		X
CO4	Balsam fir / Foxberry – Twinflower		X
CO5	White birch – Balsam fir / Foxberry – Wood aster		X
CO6	Red maple – Birch / Bunchberry – Sarsaparilla		X
CO7	White spruce / Bayberry		X
FP1	Sugar maple – White ash / Ostrich fern – Wood goldenrod	X	
FP2	Red maple – Red oak / Bellwort – Nodding trillium	X	
FP2a	(Sugar maple variant)	X	
FP3	Red maple / Sensitive fern – Rough goldenrod	X	
FP4	Balsam poplar – White spruce / Ostrich fern – Cow-parsnip	X	
FP5	Black cherry – Red maple / Rough goldenrod – Jack-in-the-pulpit	X	
FP6	White spruce / Wood goldenrod / Shaggy moss	X	
HL1	Balsam fir / Mountain-ash / Large-leaved goldenrod		X
HL1a	(White birch / Wood sorrel variant)		X
HL2	White spruce / Wood aster		X
HL3	Yellow birch – Balsam fir / Eastern spreading wood fern – Wood sorrel		X
HL4	Birch / Wood fern – Wood sorrel		X
IH1	Large-tooth aspen / Lambkill / Bracken	X	
IH1a	(Red oak variant)	X	
IH2	Red oak – Red maple / Witch-hazel	X	
IH2a	(Red oak variant)	X	

VT Code	VT Name	AC	MB
IH3	Large-tooth aspen / Christmas fern – New York fern	X	
IH4	Trembling aspen / Wild raisin / Bunchberry	X	
IH5	Trembling aspen – White ash / Beaked hazelnut / Christmas fern	X	
IH6	White birch – Red maple / Sarsaparilla – Bracken	X	
IH6a	(Aspen variant)	X	
IH7	Red maple / Hay-scented fern – Wood sorrel	X	
KA1	Hemlock / Christmas fern – White lettuce – Wood goldenrod	X	
KA2	Sugar maple / Christmas fern – Rattlesnake fern – Bulblet bladder fern	X	
MW1	Red spruce – Yellow birch / Evergreen wood fern	X	
MW2	Red spruce – Red maple – White birch / Goldthread	X	
MW2a	(Aspen variant)	X	
MW3	Hemlock – Yellow birch / Evergreen wood fern	X	
MW4	Balsam fir – Red maple / Wood sorrel – Goldthread	X	
MW5	White birch – Balsam fir / Starflower	X	
OF1	White spruce / Aster – Goldenrod / Shaggy moss	X	X
OF2	Tamarack / Speckled alder / Rough goldenrod / Shaggy moss	X	X
OF3	White pine – Balsam fir / Shinleaf – Pine-sap	X	
OF4	Balsam fir – White spruce / Evergreen wood fern – Wood aster	X	X
OF5	Trembling aspen – Grey birch / Rough goldenrod – Strawberry	X	
OW1	Jack pine / Huckleberry / Black crowberry / Reindeer lichen	X	X
OW2	Black spruce / Lambkill / Reindeer lichen	X	X
OW3	Red spruce / Red-berried elder / Rock polypody	X	
OW4	Red pine – White pine / Broom crowberry / Gray reindeer lichen	X	
OW5	Red oak / Huckleberry / Cow-wheat – Rice grass / Reindeer lichen	X	
OW6	White birch – Red oak – White ash / Marginal wood fern – Herb-Robert	X	
SH1	Hemlock / Pin cushion moss / Needle carpet	X	
SH2	Hemlock – White pine / Sarsaparilla	X	
SH3	Red spruce – Hemlock / Wild lily-of-the-valley	X	
SH4	Red spruce – White pine / Lambkill / Bracken	X	
SH4a	(Red spruce variant)	X	
SH5	Red spruce – Balsam fir / Schreber's moss	X	
SH6	Red spruce – Balsam fir / Stair-step moss – Sphagnum	X	
SH7	White spruce – Red spruce / Blueberry / Schreber's moss	X	
SH8	Balsam fir / Wood fern / Schreber's moss	X	

VT Code	VT Name	AC	MB
SH9	Balsam fir – Black spruce / Blueberry	X	
SH10	White spruce – Balsam fir / Broom moss	X	
SP1	Jack pine / Bracken – Teaberry	X	X
SP1a	(Black spruce variant)	X	X
SP2	Red pine / Blueberry / Bracken	X	
SP2a	(Black spruce variant)	X	
SP3	Red pine – White pine / Bracken – Mayflower	X	
SP3a	(Black spruce variant)	X	
SP4	White pine / Blueberry / Bracken	X	X
SP4a	(Black spruce variant)	X	X
SP4b	(Huckleberry variant)	X	X
SP5	Black spruce / Lambkill / Bracken	X	X
SP6	Black spruce – Red maple / Bracken – Sarsaparilla	X	X
SP7	Black spruce / False holly / Ladies' tresses sphagnum	X	X
SP8	Black spruce – Aspen / Bracken – Sarsaparilla	X	
SP9	Red oak – White pine / Teaberry	X	
SP10	Tamarack / Wild raisin / Schreber's moss	X	
TH1	Sugar maple / Hay-scented fern	X	
TH1a	(Beech variant)	X	
TH1b	(Yellow birch variant)	X	
TH2	Sugar maple / New York fern – Northern beech fern	X	
TH2a	(Yellow birch variant)	X	
TH3	Sugar maple – White ash / Christmas fern	X	
TH4	Sugar maple – White ash / Silvery spleenwort – Baneberry	X	
TH5	Beech / Sarsaparilla / Leaf litter	X	
TH6	Red oak – Yellow birch / Striped maple	X	
TH7	Yellow birch – White birch / Evergreen wood fern	X	
TH8	Red maple – Yellow birch / Striped maple	X	
TH8a	(White ash variant)	X	
WC1	Black spruce / Cinnamon fern / Sphagnum	X	X
WC2	Black spruce / Lambkill – Labrador tea / Sphagnum	X	X
WC2a	(Huckleberry – Inkberry variant)	X	X
WC3	Jack pine – Black spruce / Rhodora / Sphagnum	X	X
WC3a	(Black spruce variant)	X	X

VT Code	VT Name	AC	MB
WC4	Red pine – Black spruce / Huckleberry – Rhodora / Sphagnum	X	
WC5	Red spruce – Balsam fir / Cinnamon fern / Sphagnum	X	X
WC6	Balsam fir / Cinnamon fern – Three seeded sedge / Sphagnum	X	X
WC7	Tamarack – Black spruce / Lambkill / Sphagnum	X	X
WC7a	(Huckleberry – Inkberry variant)	X	X
WC8	Hemlock / Cinnamon fern – Sensitive fern / Sphagnum	X	
WD1	White ash / Sensitive fern – Christmas fern	X	
WD2	Red maple / Cinnamon fern / Sphagnum	X	X
WD3	Red maple / Sensitive fern – Lady fern / Sphagnum	X	X
WD4	Red maple / Poison ivy / Sphagnum	X	X
WD4a	(Huckleberry – Inkberry variant)	X	X
WD5	Trembling aspen / Beaked hazelnut / Interrupted fern / Sphagnum	X	
WD6	Red maple – Balsam fir / Wood aster / Sphagnum	X	X
WD7	Balsam fir – White ash / Cinnamon fern – New York fern / Sphagnum	X	
WD8	Red spruce – Red maple / Wood sorrel – Sensitive fern / Sphagnum	X	

Provincial soil types (STs) and phases (MCT = medium-coarse textured, FMT = fine-medium textured).

ST	ST Name	ST	ST Name
ST1	Dry – MCT	ST10	Rich Wet – MCT
ST1-G	Dry – MCT (granite phase)	ST11	Rich Fresh – FMT
ST2	Fresh – MCT	ST12	Rich Moist – FMT
ST2-G	Fresh – MCT (granite phase)	ST13	Rich Wet – FMT
ST2-L	Fresh – MCT (loamy phase)	ST14	Organic
ST3	Moist – MCT	ST14-U	Organic (upland phase)
ST3-G	Moist – MCT (granite phase)	ST15	Dry Shallow – MCT
ST3-L	Moist – MCT (loamy phase)	ST15-G	Dry Shallow – MCT (granite phase)
ST4	Wet – MCT	ST15-L	Dry Shallow – MCT (loamy phase)
ST4-G	Wet – MCT (granite phase)	ST16	Moist Shallow – MCT
ST5	Fresh – FMT	ST16-G	Moist Shallow – MCT (granite phase)
ST6	Moist – FMT	ST16-L	Moist Shallow – MCT (loamy phase)
ST7	Wet – FMT	ST17	Rich Dry Shallow – MCT
ST8	Rich Fresh – MCT	ST18	Rich Moist Shallow – MCT
ST8-C	Rich Fresh – MCT (coarse phase)	ST19	Talus
ST9	Rich Moist – MCT	ST19-M	Talus (mafic phase)
ST9-C	Rich Moist – MCT (coarse phase)		

Appendix F
Scientific and common names

Common Name	*Scientific name*
Trees	
Aspen	*Populus spp.*
Balsam fir	*Abies balsamea*
Balsam poplar	*Populus balsamifera*
Beech	*Fagus grandifolia*
Black cherry	*Prunus serotina*
Black spruce	*Picea mariana*
Eastern white cedar	*Thuja occidentalis*
Grey birch	*Betula populifolia*
Heart-leaf birch	*Betula cordifola*
Hemlock	*Tsuga canadensis*
Hybrid spruce	*Picea rubens x P. mariana*
Ironwood	*Ostrya virginiana*
Jack pine	*Pinus banksiana*
Large-tooth aspen	*Populus grandidentata*
Mountain-ash	*Sorbus americana*
Pin cherry	*Prunus pensylvanica*
Red maple	*Acer rubrum*
Red oak	*Quercus rubra*
Red pine	*Pinus resinosa*
Red spruce	*Picea rubens*
Striped maple	*Acer pensylvanicum*
Sugar maple	*Acer saccharum*
Tamarack	*Larix laricina*
Trembling aspen	*Populus tremuloides*
White ash	*Fraxinus americana*
White birch	*Betula papyrifera*
White pine	*Pinus strobus*
White spruce	*Picea glauca*
Yellow birch	*Betula alleghaniensis*

Common Name	*Scientific name*
Small Trees and Shrubs	
Alternate-leaved dogwood	*Cornus alternifolia*
Bayberry	*Myrica pensylvanica*
Beaked hazelnut	*Corylus cornuta*
Black crowberry	*Empetrum nigrum*
Blueberry	*Vaccinium spp.*
Broom crowberry	*Corema conradii*
Choke cherry	*Prunus virginiana*
Downy alder	*Alnus viridis*
False holly	*Nemopanthus mucronatus*
Fly-honeysuckle	*Lonicera canadensis*
Ground juniper	*Juniperus communis*
Hobble-bush	*Viburnum alniifolium*
Huckleberry	*Gaylussacia baccata*
Labrador tea	*Ledum groenlandicum*
Lambkill	*Kalmia angustifolia*
Mountain maple	*Acer spicatum*
Rhodora	*Rhododendron canadense*
Speckled alder	*Alnus incana*
Wild raisin	*Viburnum nudum*
Witch-hazel	*Hamamelis virginiana*
Dwarf Shrubs	
Bunchberry	*Cornus canadensis*
Creeping snowberry	*Gaultheria hispidula*
Dwarf raspberry	*Rubus pubescens*
Foxberry	*Vaccinium vitis-idaea*
Mayflower	*Epigaea repens*
Teaberry	*Gaultheria procumbens*

Common Name	*Scientific name*
Ferns and Fern Allies	
Bracken	*Pteridium aquilinum*
Christmas fern	*Polystichum acrostichoides*
Cinnamon fern	*Osmunda cinnamomea*
Club-mosses	*Lycopodiaceae family*
Evergreen wood fern	*Dryopteris intermedia*
Grape ferns	*Botrychium spp.*
Hay-scented fern	*Dennstaedtia punctilobula*
Interrupted fern	*Osmunda claytoniana*
Lady fern	*Athyrium filix-femina*
New York fern	*Thelypteris noveboracensis*
Northern beech fern	*Phegopteris connectilis*
Oak fern	*Gymnocarpium dryopteris*
Ostrich fern	*Matteuccia struthiopteris*
Sensitive fern	*Onoclea sensibilis*
Shining club-moss	*Huperzia lucidula*
Silvery spleenwort	*Deparia acrostichoides*
Wood ferns	*Dryopteris spp.*
Graminoids	
Sedges	*Carex spp.*
Three seeded sedge	*Carex trisperma*
Herbs	
Baneberry	*Actaea spp.*
Blue cohosh	*Caulophyllum thalictroides*
Bluebead lily	*Clintonia borealis*
Canada lily	*Lilium canadense*
Foamflower	*Tiarella cordifolia*
Goldenrods	*Solidago spp.*
Goldthread	*Coptis trifolia*
Large-leaved goldenrod	*Solidago macrophylla*
Meadow-rue	*Thalictrum pubescens*
Partridge-berry	*Mitchella repens*
Sarsaparilla	*Aralia nudicaulis*
Starflower	*Trientalis borealis*
Sweet cicely	*Osmorhiza spp.*
Thimbleweed	*Anemone virginiana*
Twinflower	*Linnaea borealis*
Wild leek	*Allium tricoccum*
Wild lily-of-the-valley	*Maianthemum canadense*
Wood aster	*Aster acuminatus*
Wood-nettle	*Laportea canadensis*
Wood-sorrel	*Oxalis acetosella*
Bryophytes	
Bazzania	*Bazzania trilobata*
Broom mosses	*Dicranum spp.*
Plume moss	*Ptilium crista-castrensis*
Prickly sphagnum	*Sphagnum squarrosum*
Schreber's moss	*Pleurozium schreberi*
Sphagnum mosses	*Sphagnum spp.*
Stair-step moss	*Hylocomium splendens*
Lichens	
Reindeer lichens	*Cladina spp.*
Insects/Disease	
Spruce bark beetle	*Dendroctonus rufipennis*
Black knot fungus	*Apiosporina morbosa*
Beech scale disease	*Nectria ditissima*
Spruce budworm	*Choristoneura fumiferana*

Appendix G
Glossary

Ecological and forest management related terms found in this guide are defined below. References are given where definitions (or portions thereof) have been taken directly from other sources.

A horizon – a mineral soil horizon formed at or near the surface of the soil, generally immediately beneath the forest floor. It is usually formed by (derived from SCWG 1998):

- leaching or loss of iron and aluminum, clay and organic matter to form an **Ae** horizon,
- by natural accumulation of partially decomposed organic matter to form an **Ah** horizon,
- a combination of leaching and natural organic matter accumulation to form an **Ahe** horizon,
- incorporation of organic matter through human disturbance to form an **Ap** horizon, or
- additional influence of prolonged anaerobic conditions to form an **Aeg**, **Ahg**, **Aheg** or **Apg** horizon.

Advanced regeneration – trees of variable age found in the understory shrub layer which are in a position to grow into the canopy when overstory competition has been removed by disturbance or natural mortality.

Anaerobic (reducing) conditions – in microbially active soils, a condition where oxygen is absent or in very low concentrations for a prolonged period usually due to water saturation.

Aspect – the direction of a downhill slope expressed in degrees or as a compass point.

Azonal – the opposite of zonal. Also see edaphic.

B horizon – a mineral soil horizon characterized by enrichment of material lost from the A horizon above and/or through transformations (chemical reactions) within the horizon itself (derived from SCWG 1998).

BC horizon – a transition soil horizon between the B horizon and C horizon which has features of both (derived from SCWG 1998).

Bog – a type of wetland characterized by peat accumulation and virtually unaffected by runoff waters or ground water from surrounding mineral soils (NWWG 1997).

Bryophytes – mosses, hornworts and liverworts.

C horizon – a mineral soil horizon relatively unaffected by the formation processes active in the A and B horizons above (derived from SCWG 1998).

Canopy – the uppermost continuous layer of branches and foliage in a stand of trees.

Climax community – a relatively stable and self-perpetuating community condition which maintains itself (more or less) until stand-level disturbance causes a return to an earlier successional stage.

Disturbance – a discreet force that causes significant change in structure and/or composition of a forest (Dunster and Dunster 1996). Also see Natural disturbance.

Drumlin – A low, smoothly rounded, elongate hill of compact glacial till built under the margin of the ice and shaped by its flow. Its long axis is parallel to the direction of ice movement (AGI 1984).

Ecodistrict – a subdivision of ecoregion and the third level within the Nova Scotia ecological land classification system. It is based on distinct assemblages of relief, geology and landform.

Ecological land classification – a classification of lands from an ecological perspective based on factors such as climate, physiography and site conditions. It is a framework used to delineate ecosystems at different landscape scales and includes five levels: ecozone, ecoregion, ecodistrict, ecosection and ecosite.

Ecoregion – the second level in the Nova Scotia ecological land classification system used to characterize a distinctive regional climate as expressed by vegetation. There are nine ecoregions identified in Nova Scotia.

Edaphic – refers to the influence of soil and site conditions on plant growth. In this guide, edaphic is used to express the dominance of site over climate in vegetation development.

Edaphic climax forest – results when a forest community cannot progress to the zonal climax due to local extremes in site conditions.

Edatopic grid – a two-dimensional diagram used to plot ecosystems (and subsequently ecosites) with respect to their relative moisture and nutrient regimes.

Ericaceous – plants in or related to the heath family (Ericaceae) usually found on acidic (nutrient poor) soils including *Kalmia spp.*, *Vaccinium spp.* and *Rhododendron spp.* (Dunster and Dunster 1996).

Even-aged – describes a forest, stand, or vegetation type in which relatively small age differences exist between individual trees.

Forest – in this guide, sites which can (and normally do) support a minimum of 30% crown closure by trees.

Forest floor – a general term encompassing the layer of undecomposed organic matter (leaves, twigs and plant remains in various stages of decomposition) lying on top of the mineral soil (Dunster and Dunster 1996). Often referred to as the duff layer.

Gap disturbance – see Natural disturbance regime.

Gross merchantable volume – in this guide, total tree stem volume per hectare of merchantable sized trees (minimum 9.1 cm at 1.3 m height), excluding bark, tops (stem above 7.6 cm diameter) and stumps (15 cm height). It is expressed in solid cubic metres per hectare (m^3/ha) not reduced for cull or waste.

Ground water – that part of subsurface water that is in the zone of saturation, including underground streams (AGI 1984).

Humus form – a system for describing and classifying organic (forest floor) horizons. Common humus forms include (derived from Green et al. 1993):

Mor – Organic horizons (generally derived from acidic plant material) which have decomposition and horizon features dominated by fungal processes. There is no mixing of organic material into surface mineral soil.

Moder – Similar to mor humus forms in appearance, but more zoologically active (less fungi). There is only minor (if any) mixing of organic material into surface mineral soil.

Mull – Humus form with high zoological activity characterized by significant incorporation of humus into surface mineral soil forming an Ah horizon.

Hybrid spruce – in Nova Scotia, a natural cross between red spruce and black spruce displaying features of both.

Intermediate – in reference to shade tolerance, a condition between intolerant and tolerant.

Intolerant – refers to shade tolerance and defines a condition whereby trees are not capable of successfully growing beneath the shading canopy of other or similar species.

Karst – surface and subsurface features created by the dissolving of soluble rock such as limestone and gypsum which results in features such as caverns and sinkholes (Cauboue et al. 1996). In this guide, karst sites are limited to those which have gypsum or limestone bedrock exposures in addition to sinkholes and/or caverns.

Krummholz – scrubby and stunted growth form in trees, often forming a characteristic zone at the limit of tree growth in mountains (Cauboue et al. 1996) or along coastlines and high elevation plateaus.

Land capability (LC) – LC values represent expected productivity (m^3/ha/yr) in fully stocked, even-aged stands at peak mean annual increment (MAI) when left to grow without silviculture treatments (i.e. the maximum potential stand productivity under natural conditions).

Landscape – an expanse of land with landforms, land cover, habitats, and natural features which are repeated in similar form and that, taken together, form a composite (Dunster and Dunster 1996).

Layering – a form of vegetative reproduction where a branch buried in the forest floor develops roots and becomes independent of the parent tree (Dunster and Dunster 1996).

Mafic – referring to igneous rock composed chiefly of dark, ferromagnesian minerals (AGI 1984) (i.e. basalt and gabbro).

Matrix forest – a widespread forest community which dominates the landscape and forms the background in which other smaller scale communities occur (Thompson 2002).

Mean annual increment (MAI) – in this guide, MAI is accumulated gross merchantable volume per hectare divided by years (stump height age) to grow this volume (m^3/ha/yr). Peak Mean Annual Increment is the maximum MAI over the life of a stand.

Moder – see Humus form.

Moisture regime – represents average moisture in the soil available for plant growth. It is assessed by integrating moisture supply (as related to climate) with soil drainage and moisture holding capacities.

Mor – see Humus form.

Mull – see Humus form.

Natural disturbance – a natural force that causes significant change in forest stand structure and/or composition such as fire, wind, flood, insect damage and disease.

Natural disturbance regime – the frequency and type of natural disturbances that influence the arrangement of forested ecosystems and their biodiversity on a given landscape. Three disturbance regimes recognized in Nova Scotia are:

Frequent: Disturbances which result in the rapid mortality of an existing stand and the establishment of a new stand of relatively even-age. The time interval between stand initiating events typically occurs more frequently than the longevity of the climax species that would occupy the site – therefore, evidence of gap dynamics and understory recruitment is usually absent. This regime results in the establishment and perpetuation of early to mid successional vegetation types.

Infrequent: Stand initiating disturbances which result in the rapid mortality of an existing stand and the establishment of a new stand of relatively even-age but the time interval between disturbance events is normally longer than the average longevity of the dominant species – thereby allowing gap dynamics and understory recruitment to evolve and become evident (eventually creating uneven-aged stands). This regime generally leads to the establishment and/or perpetuation of mid to late successional vegetation types.

Gap replacement: Stand initiating disturbances are rare. Instead, disturbances are characterized by gap and small patch mortality, followed by understory recruitment, resulting in stands with multiple age classes. This regime generally leads to the establishment and/or perpetuation of late successional vegetation types.

Nutrient regime – represents the relative availability of nutrients in the soil for plant growth. Determination of nutrient regime requires consideration and integration of several environmental features including forest floor humus form, soil type, seepage class, and ground water characteristics.

Open woodland – in this guide, upland sites which (due to natural disturbances and/or site conditions) are generally limited to less than 30% crown closure by trees.

Overstory – refers to trees which occupy the dominant, co-dominant and intermediate canopy positions.

Patch forest – a discrete forest community nested within a matrix forest. Both large and small patches are associated with ecological processes or environmental conditions, but small patches usually have several processes and conditions come together in a very precise way (Thompson 2002).

Redoximorphic features – visible evidence of chemical (redox) reactions in microbially active soils under prolonged anaerobic conditions (Richardson and Vepraskas 2001).

Seepage – in this guide, all lateral subsurface water flow (includes precipitation and spring sources).

Senescence – generally, the process of aging in mature individuals (trees), typical toward the end of an organism's life (Dunster and Dunster 1996).

Soil texture – the percentage of sand, silt and clay in a soil. In general, fine textured soils are relatively high in clay, medium textured soils are relatively high in silt, and coarse textured soils are relatively high in sand.

Stand – in the case of forests, a group of trees in a specific area which are sufficiently uniform in composition, age, arrangement and condition to be distinguishable from adjacent forest areas (Dunster and Dunster 1996).

Succession – is an orderly process of community development that involves changes in species structure and community processes with time; it is reasonably directional and, therefore, predictable (Odum 1971).

Successional development – plant community development which proceeds through a number of distinct successional stages (e.g. early, middle, late) that replace one another in a predictable sequence.

Super canopy – a canopy position above the normal overstory/canopy layer.

Swamp – a treed or tall shrub dominated wetland that is influenced by ground water, either on mineral or organic soils (NWWG 1997).

Tolerant – refers to shade tolerance and defines a condition whereby trees are capable of successful growth and reproduction beneath the shading canopy of other or similar species.

Understory – refers to vegetation growing below the overstory grouped into three categories:

Shrub layer: Woody stemmed species and regenerating trees usually less than 2 m in height, but occasionally taller.

Herb layer: Dwarf woody plants plus ferns, club mosses and other herbaceous plants.

Bryophytes and Lichens: Mosses, hornworts, liverworts and lichens.

Uneven-aged – describes a forest, stand, or vegetation type in which intermingling trees differ markedly in age.

Wave forest – a wave-like pattern of dead and living trees found on highly exposed sites and created by wind damage and subsequent mortality.

Windthrow – a disturbance where a tree (or trees) has been uprooted by the force of the wind. Over time, windthrow leads to the development of mound and pit microtopography. Windthrow is synonymous with blowdown.

Zonal climax forest – results when a forest community reflects regional climate norms and is not unduly affected by local extremes in site conditions.

Zonal site – In this guide, a site with conditions that could potentially support establishment of a zonal climax forest.