

## 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. Issues pertaining to biodiversity and conservation can be directed to the Wildlife 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. The N.S. Provincial Habitat Classification is currently under development and will provide further information on wildlife values and features.

## 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

Definitions for provincial FEC units are given below. A glossary (Appendix A) contains definitions for other ecological terms found in this guide.

**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.

**Ecosite Groups** represent ecoregion and ecodistrict units with similar climate conditions which can be grouped for FEC purposes. Two ecosite groups have been identified, the Acadian group and Maritime Boreal group (See *Forest Ecosystem Classification for Nova Scotia: Part III Ecosites (2010)* for more details on ecosite groups).

## About this Guide

This guide is part of the Nova Scotia FEC system. It describes all currently recognized forest groups and vegetation types (VTs) in the province along with successional development, coarse woody debris volume, and snag density interpretations. Although presented as a separate document, this guide is designed to be used in conjunction with provincial soil type and ecosite guides to support ecosystem based, stand-level forest management in Nova Scotia.

Vegetation types were derived from 1,456 provincial FEC field plots sampled between 2000 and 2010. Data from an additional 102 non-FEC plots assessed by the Atlantic Canada Conservation Data Centre and NSDNR Wildlife Division were also used (Basquill 2001-2008; Basquill and Benjamin 2009). Vegetation divisions and groupings were based on statistical analysis (Hill 1979) and expert opinion. A total of 14 forest groups, 88 VTs and 22 variants have been identified to date (Tables 1 and 2).

**Table 1. Summary of forest groups, vegetation types (VTs) and variants within the provincial forest ecosystem classification (FEC) system**

<b>Forest Group</b>	<b>Forest Group Code</b>	<b>Number of VTs</b>	<b>Number of Variants</b>
Cedar Forest	CE	2	1
Coastal Forest	CO	7	1
Floodplain Forest	FP	6	1
Highland Forest	HL	4	1
Intolerant Hardwood Forest	IH	7	3
Karst Forest	KA	2	0
Mixedwood Forest	MW	5	1
Old Field Forest	OF	5	0
Open Woodland	OW	6	0
Spruce Hemlock Forest	SH	10	1
Spruce Pine Forest	SP	10	5
Tolerant Hardwood Forest	TH	8	4
Wet Coniferous Forest	WC	8	3
Wet Deciduous Forest	WD	8	1
<b>Total</b>	<b>14</b>	<b>88</b>	<b>22</b>

**TABLE 2. Vegetation types (VTs) and their associated ecosite groups (AC = Acadian, MB = Maritime Boreal)**

<b>VT Code</b>	<b>VT Name</b>	<b>AC</b>	<b>MB</b>
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	
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	

VT Code	VT Name	AC	MB
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 - Bulbet 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 / Grey 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	
SH9	Balsam fir - Black spruce / Blueberry	X	
SH10	White spruce - Balsam fir / Broom moss	X	

VT Code	VT Name	AC	MB
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	

Users of earlier regional guides will note that VT naming has changed for the 2010 provincial guide. This was necessary to accommodate the increased number of units found across the province and to facilitate the use of identification keys. It was also desirable to standardize naming protocols from those used in the regional guides. Appendix B contains synonymy tables listing old regional guide VT names and new 2010 equivalents.