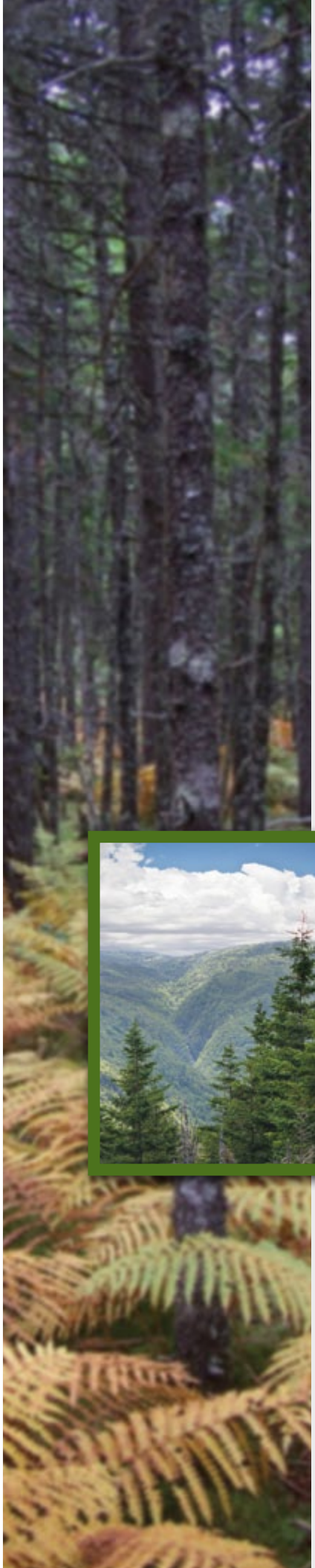

A Woodland Owner's Guide to **Forest Ecosystem Classification** in Nova Scotia

Prepared by
Nova Scotia Department of Natural Resources

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NOVA SCOTIA

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Introduction

A forest ecosite

Forest Ecosystem Classification (FEC) is an exciting development in forest management in Nova Scotia. Over a decade of collective and collaborative research by the Renewable Resources Branch of the Nova Scotia Department of Natural Resources has resulted in the publishing of a ***Forest Ecosystem Classification Guide*** to *Vegetation Types*, *Soil Types* and *Ecosites* in the forests of the province.

With the aid of the ***Forest Ecosystem Classification Guide***, users can identify and classify *Vegetation Types* that are naturally adapted to growing on sites that are defined by climatic and site conditions, including moisture and nutrient availability and physical features of the sites. *Soil Types* can also be identified by texture, drainage, depth and fertility. And ultimately, forest ecosites can be derived from combining knowledge of the *Vegetation* and *Soil Types* of the site.

Forest Ecosystem Classification can assist in ecosystem-based management prescriptions.

Patterns Across the Landscape

Vegetation patterns across the landscape

You have likely noticed that patterns are repeated across the landscape. Where climatic and site conditions are similar, you could expect to find similar types of forest ecosystems.

Take, for example, the upper slopes of the Cobequid Hills. You may expect to find hardwood forests dominated by sugar maple, yellow birch and beech on soils that are usually well-drained sandy loams and are medium in fertility.

Such patterns of ecosystems are present throughout the province. If we are able to infer that similar site conditions support similar vegetation (particularly tree species), we can use this knowledge to predict species and their ecology. This predictability enables us to make informed forest management decisions.

Why Classify Forest Ecosystems?

Using the Forest Ecosystem Classification Guide

As a woodland owner, you probably have objectives that were noted in your woodland stewardship plan (also known as a woodlot management plan). These objectives are realized if they are reinforced with good decision-making, reducing the likelihood of uncertain outcomes. A ***Forest Ecosystem Classification*** approach is based on the recognition of similar ecosystems across a landscape, and the probability that they will respond to management in similar ways. ***Forest Ecosystem Classification*** should assist you in making the results of your management decisions more predictable.

Ecosystem-based management is a management approach that is based on natural forest ecology. An ecosystem-based management approach will always be sound and – together with your woodland objectives – form a foundation upon which all your woodland management decisions can be based.

Forest Ecosystem Classification is the first step in building a database of knowledge of your woodland. While it is a relatively recent concept, the past 10 years has seen an enormous step forward in the formulation and application of ***Forest Ecosystem Classification*** approaches to woodland management.

How to use the Forest Ecosystem Classification Guide

Eastern white cedar vegetation type near Oxford.

Identification of forest *Vegetation Types*, *Soil types* and *Ecosites* using the ***Forest Ecosystem Classification Guide*** is based on the use of keys. Keys are tools to help make choices. At each step in a key, a decision must be made. Usually this is a "**yes**" or "**no**" decision. Choosing one or the other will lead you to a different outcome.

The keys have been created and identify most of the forest ecosystems in Nova Scotia.

There are three keys in the ***Forest Ecosystem Classification Guide***. The first is the ***Forest Group*** key, in which we could be asked to make the following choice:

Eastern white cedar present (excluding ornamental escapes) or Eastern white cedar absent

If cedar is absent, the key will lead us away from the Cedar *Forest Group*.

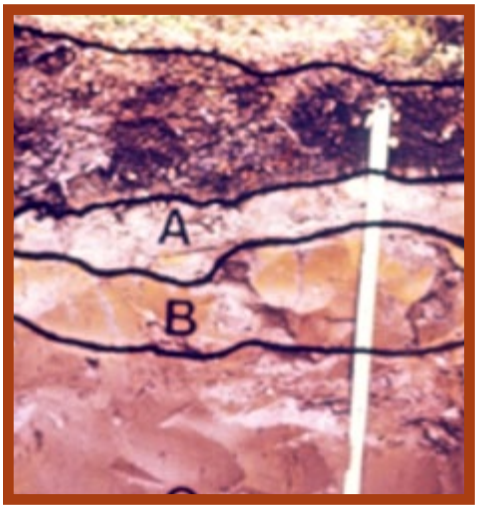
Stands with more than 75% softwood in the overstory.

Here is an example from the *Vegetation Type* key:

Stands with > 75% softwood in the overstory or
Stands with < 75% softwood in the overstory

You must make a choice based on the amount of softwood in the overstory.
Choosing one or the other will eventually lead you to classifying a particular *Vegetation Type*.

The same type of key is used in classifying *Soil Types*.



An example of a soil profile with identified horizons

An example of a *Soil Type* key decision:

Soil has a well developed, unbroken Ah or Ap horizon > 3 cm thick or Not as above

Once you become familiar with the way that the keys work, you will become more proficient in classifying *Vegetation Types* and *Soil Types*.

Ecosites

Maritime Boreal Ecosite on the Cape Breton Highlands.

Nova Scotia has two broad classes of forest *Ecosites* within the Acadian Forest region: the ***Acadian Forest Ecosite Group*** and the ***Maritime Boreal Ecosite Group***. Of these, the Acadian Forest Ecosite Group represents most of the forest in the province, and is generally found on warmer, inland sites. The Maritime Boreal Ecosite Group is usually found along the Atlantic and Fundy coasts and in the Cape Breton Highlands where the climate is cool and moist for most of the year.

A total of 28 *Ecosites* are identified according to the relative amounts of moisture and nutrients that are available for plant growth. For example, dry infertile sites are classed differently than wet rich sites, with a wide range of sites between these two extremes.

Each *Ecosite* has a unique combination of vegetation and soils that are classified using the keys in the ***Forest Ecosystem Classification Guide***. By using a chart which is arranged by ***Forest Group***, the *Vegetation Types* and *Soil Types* are brought together and the *Ecosite* is easily identified.

Forest Groups

A Wet Coniferous Forest. Photo courtesy NSDNR

Vegetation Types which are similar in species composition, site conditions and the ways in which the sites develop over time (called succession), can be brought together under the same ***Forest Group***. There are 14 ***Forest Group***s in Nova Scotia, and the names of each ***Forest Group*** are descriptive of the tree species, site characteristics, or general location of the ***Forest Group***.

Each ***Forest Group*** is composed of **two or more** *Vegetation Types*.

Here is a list of ***Forest Groups*** that are found within the provincial ***Forest Ecosystem Classification*** system:

Cedar Forest
Coastal Forest
Floodplain Forest
Highland Forest
Intolerant Hardwood Forest
Karst Forest
Mixedwood Forest
Old Field Forest
Open Woodland
Spruce Pine Forest
Tolerant Hardwood Forest
Wet Coniferous Forest
Wet Deciduous Forest
Spruce Hemlock Forest

Forest Groups continued...

A Flood Plain (FP1) Vegetation Type
Photo courtesy NSDNR

Vegetation Types

Forest plant communities that reflect similar site conditions, site disturbances and successional stages in their development are called *Vegetation Types*. Each *Vegetation Type* is a member of a ***Forest Group***. For example, the SH2 (Hemlock – White pine / Sarsaparilla) *Vegetation Type* is part of the ***SH (Spruce-Hemlock) Forest Group***.

The vegetation key is relatively straightforward for anyone who is familiar with the tree species of Nova Scotia, plus a few key shrubs, herbs and mosses. Once you have reached a decision on *Vegetation Type* using the key, the relevant fact sheets should be consulted for that *Vegetation Type* to confirm your decision. The fact sheets describe the characteristics which define the *Vegetation Type,* including the environmental setting, successional dynamics and ecological features.

You will quickly become familiar with the *Vegetation Types* that are present on your woodland using the key and fact sheets. To identify the *Ecosites* on your woodland, however, you must first identify the *Soil Types*.

Assessing soil texture is important
in determining soil type

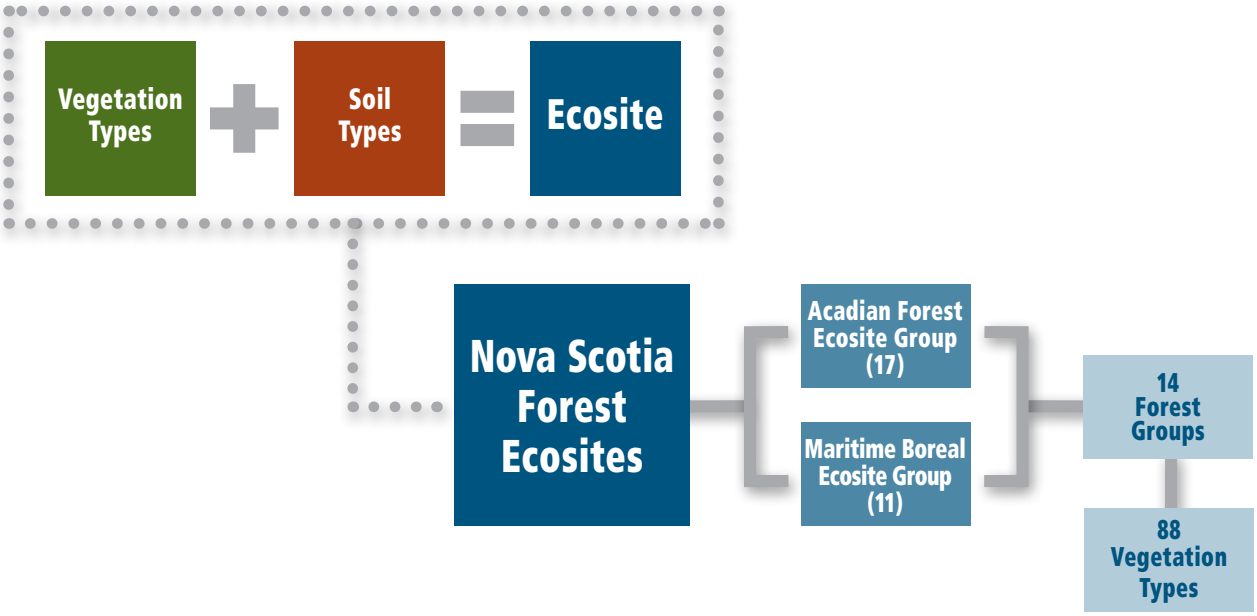
Soil Types

Forest soils are classified for ***Forest Ecosystem Classification*** purposes according to their texture, drainage, fertility and depth. The *Soil Type* key is similar to the *Vegetation Type* key, with 19 *Soil Types* identified across the province. Each soil has characteristics that will affect both site productivity and physical site conditions. A *Soil Type* will govern what *Vegetation Types* are possible on a given site. You should be aware that one *Vegetation Type* can occur on more than one *Soil Type*.

To determine the *Soil Types* that are present on your woodland, you must dig soil pits or obtain samples with a soil auger. The auger is fast and easy to use, and recommended.

As with the *Vegetation Types*, once the key has been used to determine a *Soil Type*, the fact sheets for that soil should be consulted to confirm your results.

Ecosites are determined by identifying site features, including vegetation types and soil types and fall within one of two ecosite groups



Showy Lady's Slipper
Photo courtesy NSDNR

Wildlife Considerations

Ecosystem classification can be used to predict the presence of wildlife habitat. This is particularly important when species at risk, or species of special concern, may be present. For example, the northern goshawk is a large predatory bird that requires open mature hardwood forests for nesting and hunting. Late-succession shade-tolerant hardwood forests (Tolerant Hardwood *Vegetation Types*) containing sugar maple and yellow birch may be good habitat for these raptors. By classifying ecosystems on the ground, we can predict areas on a landscape (perhaps on your woodland!) that are suitable habitat for goshawks.

Other species may require special habitat that help them survive. Whitetail deer sometimes require heavy softwood cover (such as Spruce-Hemlock *Vegetation Types*) for wintering areas, and several species of Lady's Slipper are found in wet areas with significant amounts of shade (Wet Coniferous *Vegetation Types*).

This information is used by bird watchers, mushroom pickers and others who find the *Vegetation Type* and *Soil Type* guides useful.

Putting It All Together

Woodlot owner and Forester

As a tool, ***Forest Ecosystem Classification*** can assist us in making wise decisions. By assessing the ground vegetation, soil structure and depth, drainage and site exposure, we can make appropriate forest management decisions.

This is especially true on wet sites, even if the ground does not appear to be wet. We know that wet sites support a unique suite of plants that only grow when moisture is present. These plants can be used as indicators of sites that may be too wet to support heavy forestry equipment during most of the year, and where **rutting and soil compaction** may result.

We can also predict the hazards associated with growing trees on some *Soil Types*, where the productivity of the site may be limited or where the soil may be shallow or too stony for good rooting characteristics, resulting **in blowdown**.

Forest Ecosystem Classification is a good starting point for managing a woodland. Be sure to seek out the services of a Forest Professional should you require further information or advice.

The potential uses of ***Forest Ecosystem Classification*** to help us make decisions related to forest management are only beginning to unfold. This is an exciting time to be a woodland owner in Nova Scotia!

To obtain a copy of "***Forest Ecosystem Classification for Nova Scotia***" for $20 plus HST, contact the NSDNR Library at the following number: **(902) 424-8633** or email **nsdnrlib@gov.ns.ca**

Other Resources

For detailed information, please visit the following resources:

NS Department of Natural Resources
novascotia.ca/natr
1-866-226-7577
woodlot@gov.ns.ca

Forest Professionals

Registered Professional Foresters Association of Nova Scotia
www.rpfans.ca

Nova Scotia Forest Technicians Association
www.nsfta.ca

Canadian Institute of Forestry
www.cif-ifc.org

Silviculture Assistance and Woodland Stewardship Plans

Association for Sustainable Forestry
www.asforestry.com

Woodlot Owner Organizations

Federation of Nova Scotia Woodland Owners
www.fnswo.ca

Nova Scotia Landowners and Forest Fiber Producers Association
www.nslffpa.org

Nova Scotia Woodlot Owners and Operators Association
www.nswooa.ca

Harvesting and Silviculture Contractors

Atlantic Master Loggers
www.cwfcof.org

Forest Service Directory
www.nsfsd.ca

Woodlot Road Assistance

Forest Products Association of Nova Scotia
www.fpans.ca