HABITATS – INTRODUCTION

Habitats can be defined in the landscape as mappable units and include both biotic and abiotic characteristics. This section of the *Natural History of Nova Scotia* deals with the habitats that occur naturally within the province. It is intended to serve both as a guide to recognition and initial investigation of these habitats in the field, and as an integrating link between the Topics and the Theme Regions descriptions. Most habitats occur widely throughout the province but vary according to the Region they are found in. The habitats are further divided into species associations, which provides the basis for understanding plants and animals within a habitat and, consequently, within a Theme Region.

The description of each habitat is, as far as possible, based upon readily visible characteristics and provides sufficient information for one to gain an understanding of the factors that give rise to those characteristics.

The treatment of plants and animals in the habitat descriptions follows the practice of dealing with the common and conspicuous. No attempt has been made to deal with the great species diversity that may exist within each habitat. The plants and animals Topics provide a guide to the Nova Scotia species, but for detailed information the reader must consult more specialized texts.

The habitats described in this section occur naturally in Nova Scotia, that is, their function and structure is primarily natural. Human activities modify the landscape and can alter the abundance, distribution and successional sequence of the natural habitats as well as maintain managed habitats.

Managed habitats accommodate natural and introduced species, however, their function and structure are primarily supported by human endeavour. Some examples of managed habitats are fields under cultivation, reservoirs and submarine structures, such as oil rigs and mussel farms.

Regenerating habitats, on the other hand, have been modified but are no longer managed. The structure and species association may be altered, but their function is once again primarily natural. The only regenerating habitat described in detail in the Habitats section is Oldfield H5.2 as this habitat is a prominent component of Nova Scotia's landscapes.

Topic T12, Cultural Environments, identifies the most conspicuous habitats created or managed by humans in Nova Scotia. The influences of humans on natural habitats is also referred to throughout the Habitats section.

DEFINITION

"Habitat" may be simply defined as the place where an organism lives. Nova Scotia harbours a wide variety of habitat types characterized by abiotic and biotic features. In some cases, the basic definition is dominated by abiotic factors (e.g., Rocky Shore H2.1), in others, biotic factors dominate (e.g., Hardwood Forest H6.1). Between these extremes are those habitats that require definition in terms of both abiotic and biotic factors (e.g., Tidal Marsh H2.5). In all cases, the vegetation character is strongly qualified by the moisture and mineral content of the soil, availability of nutrients and other factors.

RELATIONSHIP TO ECOLOGICAL (BIOPHYSICAL) LAND CLASSIFICATIONS

A biophysical survey is an integrated method of mapping geology, geomorphology, vegetation and hydrology. The land type, is a map area similar to a habitat as previously defined. A grouping of land types, often in a recurring pattern, forms a land system. Land systems are similar but not identical to the Theme Units that form the basis of the Theme Region classification used in the *Natural History of Nova Scotia*. The Department of Natural Resources has mapped the physical elements of the province at the land system level, but the land types have never been systematically identified.

Habitats based on vegetation associations closely resemble land types mapped in Nova Scotia's national parks. Habitats based on a combination of biotic and abiotic factors do not necessarily closely fit the land type definition. At Clam Harbour, for example, an estuary (a land type) contains five habitats: tidal marsh, mud flat, sandy shore, rocky shore and open water. On the other hand, two land types are combined to form one habitat: the dune system (H2.6) is composed of cranberry marsh and Bayberry–White Spruce dune land types.

NHNS	NSWI	CWCS	NSPI
FRESH WATER			
Open Water–River/Stream			
Open Water–Lake			
Bottom–River/Stream			
Bottom–Lake/Pond			
Edge–River/Stream	Open Water	Shore Marsh, Stream Marsh, Shallow Water	
Edge–Lake/Pond	Open Water	Shore Marsh, Stream Marsh, Shallow Water	
FRESHWATER WETLANDS			
Peatlands Bog	Bog	Atlantic Plateau Domed, Flat Slope, Shore or Blanket Bog	Raised, Sloped, Flat or Blanket Bog
Fen	Atlantic Ribbed Shore, Stream or Horizontal Fen	Sloped Fen, Flat Fen	
Swamp	Wooded Swamp, Shrub Swamp	Shore, Stream Basin, Flat Floodplain or Peat Margin Swamp	Swamp
Freshwater Marsh	Deep Marsh, Shallow Marsh, Meadow, Seasonally Flooded Flats	Floodplain, Seepage Track, Shallow Basin Shore, Stream Marsh	
TIDAL MARSHES			
Coastal Fresh Marsh		Coastal High Marsh, Coastal Low Marsh	
Salt Marsh		Estuarine High Marsh, Estuarine Low Marsh	

Legend: **NHNS** –*Natural History of Nova Scotia* • **CWCS** –Canadian Wetland Classification System[1] • **NSWI** –Nova Scotia Wetland Inventory[2] • **NSPI** –Nova Scotia Peatland Inventory[3]

Table HI.1: Comparison chart for classification systems used in habitat mapping

It is hoped that the habitat names defined in this section will prove to be a useful standardized system for identifying and mapping land types as part of ecological (biophysical) land classifications.

The habitat terminology generally conforms to that used in the provincial program for mapping important freshwater wetlands and coastal wildlife habitats. However, the grouping of these habitats as significant wildlife habitats more closely resembles the terminology used for land districts. The Nova Scotia Department of Natural Resources has developed a manual on significant wildlife habitats.[5]

Table HI.1 uses freshwater and wetland habitats as an example of how the terminology used in the *Natural History of Nova Scotia* Habitats sections compares with other federal and provincial systems available.

VARIATIONS WITHIN HABITATS

A defined habitat type will normally include a certain degree of variation, due to small differences in shade, soil, drainage, etc. that may occur. A good example of this is seen within the White Spruce, Fir–Maple, Birch association in the mixedwood forest habitat (H6.3) that occurs around the coast, in association with distinct areas of bog and barren. Along the Eastern Shore, the parallel ridge and depression structure of the Meguma outcrops results in a sequence of alternating forest and bog habitat on a scale that might not allow the bog to be clearly distinguished in general habitat mapping. In this way, small areas of bog habitat are normally found to occur in areas identified as forest habitat (Fig HI.1).

In addition, within any habitat, a diversity of interesting and often clearly defined microhabitats may be found. Examples of microhabitats are the

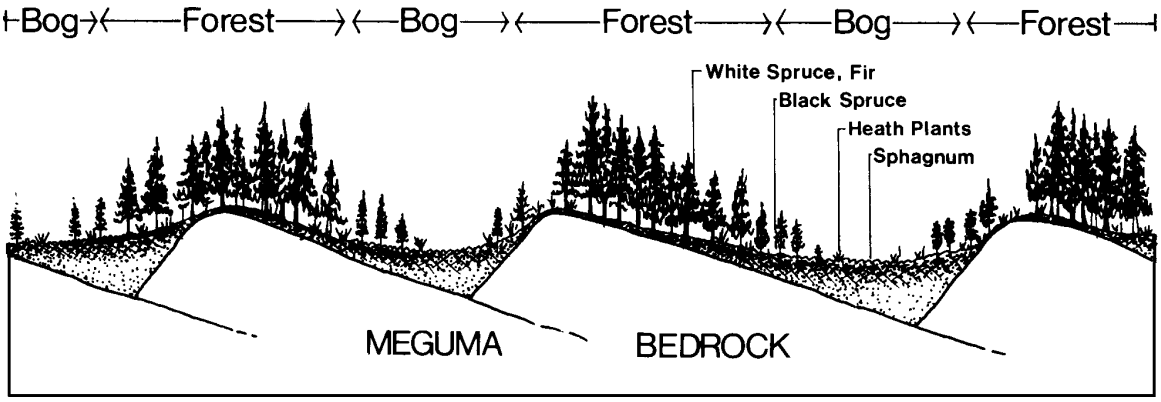

Figure HI.1. A diagrammatic cross section showing the alternation of bog and forest habitats associated with geological structure on the Eastern Shore.[4]

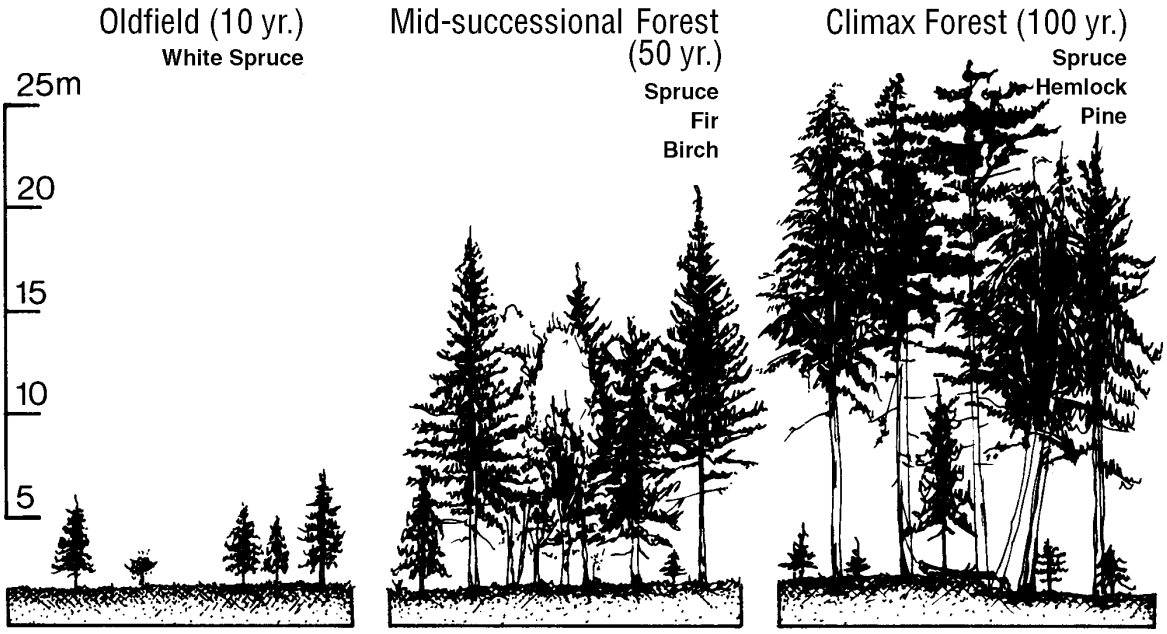

Figure HI.2 Three seral stages in the succession from oldfield to climax softwood forest on a mesic site

bark of a tree (often a particular level or side of the tree), a rotting log or shaded ground beneath a spruce tree. Each microhabitat will be characterized by small variations in physical, chemical and biological factors. The habitat descriptions refer to microhabitats where relevant, but in general they are beyond the scope of the present work.

SUCCESSION

Within any study of habitats, it is essential to be aware of the nature of ecological succession (see T10.2, Successional Trends in Vegetation). In this process, an organism or group of organisms progressively alters the conditions in a habitat at a specific site, making it more suitable for colonization by other species. In certain habitats (e.g., a rocky shore), the situation is relatively stable, with the organisms present arranged in fairly distinct zones that reflect prevailing conditions. However, in other habitats, the zones indicate stages (known as seres or seral stages) in the successional change from one habitat to another. The aquatic plants at the edge of a pond will progressively grow towards the middle as organic debris from their productivity accumulates. In time, the pond edge converts to a wetland and later to a terrestrial habitat.

The various associations described in the forest habitats are often related because they represent seral stages in succession. Some forest associations are described as pioneer, representing an early stage in succession on bare ground following cul-

Plate HI.1: Habitat diversity in the landscape. St. Marys River, Guysborough County (sub-Unit 413b). The view includes flowing open water (H3.1), fen (H4.2), river bank (H3.5) and mixed forest (H6.3). Photo: R. Merrick.

tivation, severe fire or other forms of clearance. The climax-forest types represent the last stages in succession, where the species maintain the conditions suitable for their own continuance. Figure HI.2 shows three seral stages in the development of a climax forest on an abandoned field. The nature of the successional process will obviously depend upon the conditions prevailing on the site, particularly climate, soil and moisture. Significant changes are seen when the site is subjected to other factors, such as fire or cutting. Table T10.4.1, in Plant Communities in Nova Scotia, shows the relationship between site conditions and dominant–tree–species compositions in terms of seral stage.

ECOTONE

Clearly distinguishing between different habitats in the field may not be easy in some instances, particularly when one is trying to draw boundaries, due to the presence of areas of transition from one habitat to another. These areas are known as ecotones. An example is the area of bare rock that lies between the top of the intertidal zone and beginning of terrestrial vegetation.

Similarly, the area of transition between an oldfield and a forest may make it difficult to establish a distinct boundary. Careful examination of ecotones can often provide useful information on the nature and rate of succession on the site. In each habitat description, the information on for-

mation and successional sequence should be of use in understanding adjacent ecotone areas. Ecotones between disturbed and undisturbed areas are generally referred to as edge habitats in wildlife management.

Ecotones are often important because of their diverse flora and fauna.

ECOSYSTEM

An ecosystem explains the flow of energy through a community. It relates various levels of consumer organisms to the primary producers (green plants). When the ecosystem is worked out for a particular habitat, it is possible to identify the species that function at each trophic level. This is particularly important where one or two dominant species are responsible for most of the primary production (e.g., in a low-level tidal marsh or sand dune). The amount of energy available within an ecosystem at a given point in time is represented by the biomass. This standing crop provides a measure of the ecological value of species within the ecosystem.

PLANTS AND ANIMALS

Energy flow may vary significantly in different habitats. For example, in a rapidly moving stream, most of the production is exported, whereas in a forest, most of the production remains on site as wood or leaf litter.

In any area, a diversity of habitats and plant species will generally result in a high diversity of animal species. In a forest, the physical structure provides distinct animal habitats in the canopy, midstory, ground flora and soil.

● ● ● ● ● ● ● ●

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