Appendix 4 : Descriptive Information on Drainages,
Peatland and Ecological Land Classification of the Avalon

The five major drainage divides are included with more detailed water resources information on overview maps included in Figure 1 attached. As a result of the geology of the Avalon, ground water flow systems are closely tied to surface water systems. Although Northwest Brook is the only river longer than 20 miles (32 km), on the Avalon, several streams are between 16 and 32 km long. Many larger rivers originate from chains of ponds which tend to follow circuitous routes before flowing directly to the coast. There are twenty-one scheduled rivers for Atlantic salmon fishing on the Avalon.

Biological production in streams is based on a combination of internal/external nutrient and energy pathways. Stream side vegetation has a strong influence on both since they are so tightly linked to surrounding terrestrial events. Small streams in forested regions receive much of their materials from the surrounding terrestrial ecosystem; detritus in the form of needle and leaf litter, twigs and branches, forms the major energy base for consumer organisms. In highly shaded headwater streams, algae production is often low and yields only a small and seasonally variable contribution to the overall energy budget. As streams enlarge further downstream, sufficient light penetrates the forest canopy and consumer populations can take advantage of both particulate detritus and algae (Toews and Brownlee 1981).

Widespread bogs in many parts of the Avalon act as sponges to absorb heavy rainfall and to moderate runoff. The evolution of peatlands on the Avalon has been mainly influenced by the wet maritime climate. Morphologically they are mostly blanket peatlands. Dwarf shrub-*sphagnum* bogs occur primarily in the forested parts of the Peninsula and acquire nutrients mainly in the form of precipitation. Sedge-*sphagnum* bogs receive groundwater from surrounding upland soils and are more often in association with heathland, barren or scrub. Fen deposits are most often found in areas where more nutrient rich soils are located. Fen vegetation is meadow like and distinguished from bog vegetation by the presence of more exacting plant species such as dwarf birch, rose, and more sedge and grass species (Pollett 1986).

A hierarchical framework of ecological land classifications has been recognized for some time in most jurisdictions as a means of stratifying the earth into progressively smaller areas of increasingly uniform ecological units. In Canada, the Canadian Ecological Land Classification System as depicted in the following table, provides for seven levels of examination or organization based on ecological principles.

Considerable work was done on forest site classification in Newfoundland from 1956 to 1967 by A. W. H. Damman and subsequently by Meades and Roberts (1992) which resulted in the identification of nine ecoregions for insular Newfoundland as represented in Figure 2. Bajzak and Roberts published in 1996

an article dealing with the use of ecological land classification in support of forest management based on work begun in 1994 in the Roddickton area. The intent was to provide all levels of ecological land classifications and applications for forest management. Denes Bajzak and Bruce Roberts undertook preliminary work with Ed Woodrow of Agriculture and Agri-food Canada to develop the ecodistrict and lower levels on the Avalon based on landscape level soils mapping, vegetation pattern and fauna. A preliminary ecoregion, ecodistrict and soil landscape map has been published by Agriculture and Agri-food Canada and will be used as an input into the National Ecological Land Classification System which will be applied to the ecoregions of the Avalon on a priority basis. Meanwhile forest inventory data will be used in the subdivision of ecoregions in relation to topographic features. Excessively wet soil or relatively sensitive sites which will require modification in operations are to be designated in more refined work. As work progresses, each level of the region will be more clearly defined. This information will be included in revisions of the plan as it becomes available.

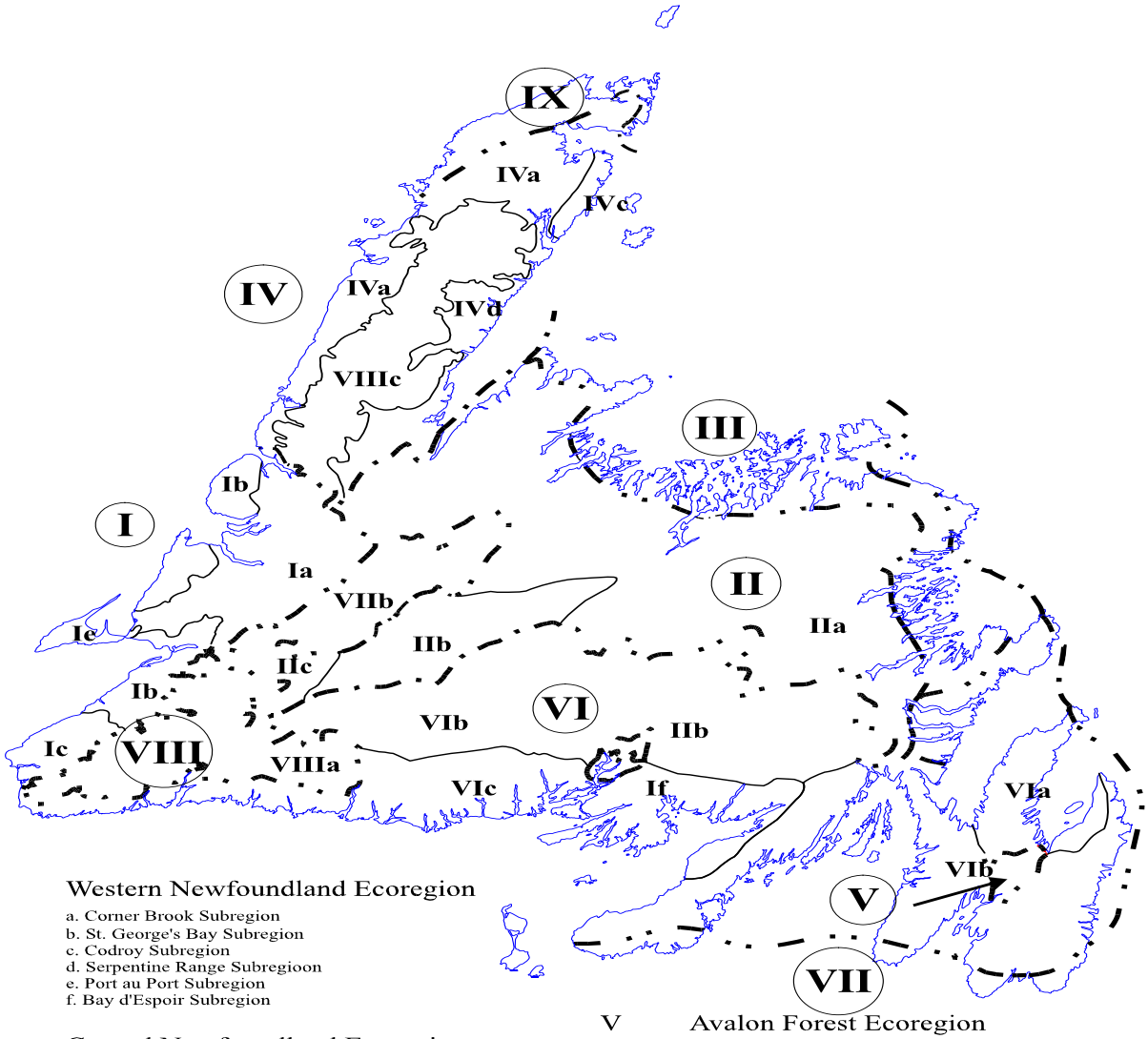
Canadian Ecological Land Classification System

Level	Description	Common Map Scale
ECOZONE	areas of large land masses representing very generalized ecological units, based on the consideration that the earth=s surface is interactive and continuously adjusting to the mix of biotic and abiotic factors that may be present at any given time (e.g. Boreal Shield);	1:50 000 000
ECOPROVINCE	areas of the earth=s surface characterized by major structural or surface forms, faunal realms, vegetation, hydrology, soil, and climatic zones (e.g. Island of Newfoundland);	1:10 000 000 1:5 000 000
ECOREGION	a part of the ecoprovince characterized by distinctive ecological responses to climate as expressed by vegetation, soil, water, and fauna (e.g. Avalon Forest Ecoregion).	1:3 000 000 1:1 000 000
ECODISTRICT	a part of ecoregion characterized by a distinctive pattern of relief, geology, geomophology, vegetation, water and and fauna;	1:500 000 1:125 000
ECOSECTION	a part of the ecodistrict throughout which there is a	1:250 000

	recurring pattern of terrain, soil, vegetation, water bodies and fauna;	1:50 000
ECOSITE	a part of the ecosection having a relatively uniform parent material, soil, hydrology, and chronosequence of vegetation;	1:50 000 1:10 000
ECOELEMENT	a part of ecosite displaying uniform soil, topographical, vegetative and hydrological characteristics.	1:10 000 1:2 500

An ecoregion is a geographic unit defined by a unique combination of vegetation toposequence, vegetation structure, floristic composition or plant distribution patterns and climate. The three ecoregions found on the Avalon Peninsula (with their corresponding number under Dammans mapping) are:

1. The Avalon Forest Ecoregion (Ecoregion V)
2. The Maritime Barrens Ecoregion (Ecoregion VI)
3. The Eastern Hyper-Oceanic Ecoregion (Ecoregion VII)



I Western Newfoundland Ecoregion

a. Corner Brook Subregion
b. St. George's Bay Subregion
c. Codroy Subregion
d. Serpentine Range Subregioon
e. Port au Port Subregion
f. Bay d'Espoir Subregion

II Central Newfoundland Ecoregion

a. Northcentral Subregion
b. Red Indian Lake Subregion
c. Portage Pond Subregion
d. Twillick Steady Subregion

III North Shore Ecoregion

IV Northern Peninsula Ecoregion

a. Coastal Plain Subregion
b. Beaver Brook Limeston Subregion
c. Northern Coastal Subregion
d. Eastern Long Range Subregion

V Avalon Forest Ecoregion

VI Maritime Barrens Ecoregion

a. Northeastern Barrens Subregion
b.. Southeastern Barrens Subregion
c. South Coast Barrens Subregion
d. Central Barrens Subregion

VII Eastern Hyper-Oceanic Barrens Ecoregion

VIII Long Range Barrens Ecoregion

VIX Strait of Belle Isle Ecoregion

Figure 2. Ecoregions and subregions of Insular Newfoundland

A subregion is a division within an ecoregion with differences not significant enough to constitute a separate ecoregion. The Maritime Barrens Ecoregion of Newfoundland has four subregions, two of which are located on the Avalon;

i. Northeastern Barrens Subecoregion (Dammans VI A)
ii. Southeastern Barren Subecoregion (Dammans VI B)

The Avalon Forest Ecoregion represents a sheltered outlier within the more open and exposed Maritime Barrens Ecoregion. Pure stands of balsam fir with a significant mixture of white and yellow birch dominate this region. The excessively moist climate and ribbed moraine topography give this small ecoregion its uniqueness. Aspect appears to be a significant factor controlling forest composition and growth. Fragic Ferro-Humic Podzol soils give way to gleyed ferro-humic podzols in south facing slopes. (Meades and Moores 1989).

The Maritime Barrens Ecoregion has the coldest summers with frequent fog and strong winds. Winters are relatively mild with intermittent snow cover particularly near the coastline. Subregion A (Figure 2) has lower fog and somewhat higher temperatures than subregion B. In subregion A alpine species and yellow birch are absent and soils of orthic humo-ferro podzols grade to fibric humisols as slopes are descended. Subregion B has frequent heathlands but good specimens of yellow birch. Typic folisol grades to peaty gleyed humic podzols as soils are examined going down slope.

The Eastern Hyper-Oceanic Barrens Ecoregion includes the extreme southern part of the Avalon Peninsula and the northwest coast near Bay de Verde. Elevation is less than 200 m with the extreme oceanic climate precluding the development of forest other than balsam fir tuckamoor (*krummholz*). Forest stands can be found in the more sheltered valleys of the ecoregion. Rock barren is common throughout.

More detail on climate and wildlife for each ecoregion is available in the publication ANatural Regions of Newfoundland and Labrador@ prepared for the Protected Areas Association (Meades 1990).