

## CO2

### White spruce – Balsam fir / Foxberry – Twinflower

*Picea glauca* – *Abies balsamea* /  
*Vaccinium vitis-idaea* – *Linnaea borealis*

#### CO2a

### Black crowberry Headland variant

*Empetrum nigrum*

n=6



Colin's Cove,  
Richmond County

**Concept:** This mid to late successional Vegetation Type (VT) has an overstory dominated by white spruce, with a component of balsam fir. Strong winds, salt spray and harsher climatic conditions, along more exposed headlands and shorelines, often create a severely stunted canopy structure called krummholtz. The CO2a variant defines a krummholtz vegetation type. White spruce – Balsam fir / Foxberry – Twinflower is scattered along the Nova Scotia coast and is typically closer to the shore than other VTs in this group.

**Vegetation:** White spruce is the dominant overstory tree along with balsam fir. Black spruce, white birch and red maple are minor associates. The shrub layer is often poorly developed, but includes mountain-ash, wild raisin, false holly, blueberries and lambkill (along with regenerating balsam fir). The well-developed herb layer includes typical upland forest flora such as bunchberry, twinflower, wild lily-of-the-valley, wood sorrel and starflower. For the exposed CO2a variant, ground juniper, sweet gale, bayberry, chokeberry and black crowberry are also common. Schreber's moss and stair-step moss dominate the well-developed bryophyte layer.

### Ecological Features

This closed canopy matrix forest is primarily associated with the Maritime Boreal Atlantic Coastal ecoregion. The forest's longevity is a function of either canopy tree senescence or the frequency of catastrophic stand disturbances (usually hurricanes). Stands close to the coast or

on islands are used as nesting sites and roosts for great blue herons and various seabirds. Older stands with balsam fir may host the endangered boreal felt lichen and other uncommon cyanolichens. White spruce is the most salt-tolerant and wind resistant of the native softwood species

and acts as a protective belt for balsam fir. Krummholtz (trees stunted by severe wind and salt spray exposure) is common at the coastline especially on headlands. Coastal forests are often used by songbirds as they travel along the coast during spring and fall migration.

**Environmental Setting:** CO2 is mainly associated with fresh-moist to moist, nutrient poor to nutrient-medium soils of glacial origin. These soils are generally medium to coarse textured and potentially shallow to bedrock in some locations. This VT is mainly found near shorelines on exposed headlands, hills and ridges, as well as off-shore islands. High winds and salt spray limit tree height potential in this VT, especially in CO2a stands. The VT occurs in more exposed coastal areas of both New Brunswick and Prince Edward Island.

**Successional Dynamics:** CO2 is a mid to late successional VT dominated by white spruce. On relatively sheltered sites, this even-aged VT typically follows stand-replacing disturbances such as windthrow, breakage and harvesting. CO4 (Balsam fir / Foxberry – Twinflower) may be an earlier successional stage on these sites. On the more exposed CO2a sites, gap or patch disturbance may be more typical because stunted white spruce are less prone to windthrow. CO2a does not tend to shift to other VTs, but does change in development stage. Between stand-level disturbances, natural tree senescence can create uneven age class distribution and other stand structures.

## Characteristic Plants

C02

	C02	
	Freq. (%)	Cover (%)
White spruce	100	44.2
Balsam fir	100	15.7
Black spruce	83	4.2
White birch	50	4.0
Red maple	17	17.0
Choke cherry	17	0.1
Mountain-ash	17	0.1
<b>Tree Layer (Mean % Cover)</b>		<b>68</b>
Balsam fir	83	1.3
False holly	83	0.1
White birch	67	0.2
Lowbush blueberry	67	0.1
Velvet-leaf blueberry	50	0.4
Lambkill	50	0.1
Sweet gale	33	1.5
Mountain-ash	33	0.2
Common blackberry	33	0.1
Red raspberry	33	0.1
Wild red currant	33	0.1
<b>Shrub Layer (Mean % Cover)</b>		<b>15</b>
Bunchberry	83	12.4
Wild lily-of-the-valley	83	6.6
Starflower	83	1.2
Twinflower	67	12.3
Wood-sorrel	67	1.4
Foxberry	67	0.6
Cinnamon fern	67	0.1
Wood aster	67	0.1
Sarsaparilla	50	13.3
Goldthread	50	1.3
Bent-grass	50	0.1
Poverty grass	34	0.4
Black crowberry	33	7.5
Eastern spreading wood fern	33	1.5
Bracken	33	0.8
Evergreen wood fern	33	0.6
Creeping snowberry	33	0.1
Dwarf raspberry	33	0.1
Northern beech fern	33	0.1
Pink lady's slipper	33	0.1
White panicle aster	33	0.1
<b>Herb Layer (Mean % Cover)</b>		<b>35</b>
Schreber's moss	83	63.0
Stair-step moss	83	14.1
Bazzania	67	1.3
Broom moss	67	0.9
Pin cushion moss	50	0.1
Shaggy moss	33	2.8
Hypnum moss	33	0.6
Grey reindeer lichen	33	0.4
Plume moss	33	0.1
<b>Bryo-Lichen Layer (Mean % Cover)</b>		<b>67</b>

## Distinguishing Features

Abundant white spruce in the overstory is required to classify this coastal softwood forest. Mountain-ash, heart-leaf birch, foxberry and bazzania are indicators of a coastal influence, though they are not always present. The variant, CO2a, is usually open grown and typical of headlands. Under open conditions black crowberry and common juniper grow in large patches.



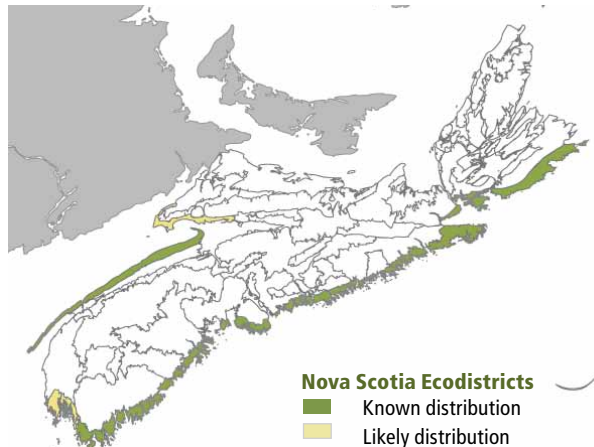
Headland

## Site Characteristics

Slope Position:	Middle <sup>5</sup> Upper <sup>5</sup>
Surface Stoniness:	(Non - Slightly) <sup>7</sup> (Moderately) <sup>3</sup>
Bedrock Outcrop:	(Non-rocky) <sup>8</sup> (Slightly - Moderately) <sup>2</sup>
Elevation Range:	18 - 58m
Slope Gradient:	Gentle <sup>6</sup> Moderate <sup>2</sup> nd <sup>2</sup>
Aspect:	East <sup>5</sup> West <sup>5</sup>
Exposure:	Exposed <sup>7</sup> Mod. exposed <sup>3</sup>
Microtopography:	Slightly <sup>5</sup> Level <sup>3</sup> Moderately <sup>2</sup>
Drainage:	Moderately well <sup>5</sup> Well <sup>5</sup>

## Soil Characteristics

Soil Type:	ST2 <sup>8</sup> ST2-L <sup>1</sup> ST8 <sup>1</sup>
Parent Material:	Glacial till <sup>10</sup>
Rooting Depth (cm):	(<30) <sup>3</sup> (30-45) <sup>7</sup>
Duff Thickness (cm):	(0-5) <sup>3</sup> (6-10) <sup>5</sup> (11-20) <sup>2</sup>



### Nova Scotia Ecodistricts

- █ Known distribution
- █ Likely distribution