

- TH1 Sugar maple / Hay-scented fern . . . . . TH1a Beech variant  
 . . . . . TH1b Yellow birch variant
- TH2 Sugar maple / New York fern – Northern beech fern . . . . TH2a Yellow birch variant
- TH3 Sugar maple – White ash / Christmas fern
- TH4 Sugar maple – White ash / Silvery spleenwort – Baneberry
- TH5 Beech / Sarsaparilla / Leaf litter
- TH6 Red oak – Yellow birch / Striped maple
- TH7 Yellow birch – White birch / Evergreen wood fern
- TH8 Red maple – Yellow birch / Striped maple . . . . . TH8a White ash variant

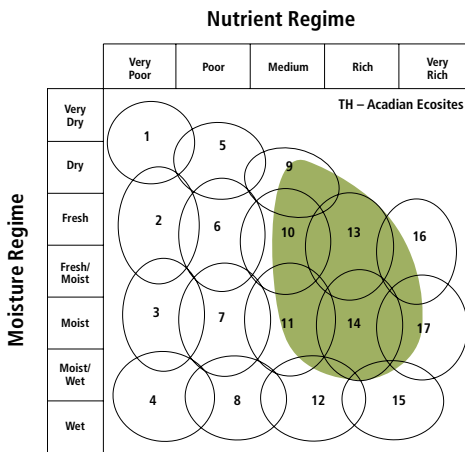
**Concept:** This group represents mid to late successional tolerant hardwood Vegetation Types (VT) found on zonal sites within the Acadian Ecosite group. Representative species include sugar maple, yellow birch, beech, red maple and white ash. The shrub layer can be extensive, but it is the diversity and abundance of ferns that define the understory in this forest group. Bryophytes, if present, are confined to dead wood and lower boles of overstory trees.

**Vegetation:** Vegetation types are closed canopy forests dominated by sugar maple, beech, yellow birch and red maple along with white ash, ironwood and (in western Nova Scotia) red oak. Scattered red spruce and white spruce are also common, while balsam fir can be a significant understory species. The shrub layer consists mainly of regenerating trees. Other common shrubs include striped maple, mountain maple, beaked hazelnut, fly-honeysuckle, hobblebush and alternate-leaved dogwood. Many fern species can be found in the herb layer, but typical species include hay-scented fern, New York fern, northern beech fern, evergreen wood fern and Christmas fern.

**Environmental Setting:** Vegetation types in this group are found on a range of slope positions. Most sites are non-rocky, but surface stoniness can be variable. Soils are mainly derived from glacial till or colluvium deposits. A wide range of moisture levels can be found, but most sites range from fresh to moist. Fertility is generally medium to rich throughout. Various VTs form the matrix forest in the Nova Scotia Uplands (300) ecoregion, slopes of the Cape Breton Highlands (200) ecoregion and in the North Mountain (920) ecodistrict. Some VTs also form small to medium patches in drumlin dominated ecodistricts throughout the province. This group is absent in the Cape Breton Taiga (100) and Atlantic Coastal (800) ecoregions.

**Successional Dynamics:** This group is associated with mid to late successional zonal VTs. Stand-level disturbance events are rare and many VTs in this group will (or can) maintain themselves through gap replacement leading to uneven-aged climax forests. Two historic, province-wide disturbance events have influenced the current composition of this group. The introduction of beech bark canker *circa* 1900 has reduced the overstory prominence of this species and relegated it to an aggressive component of the lower canopy and shrub layers. Birch dieback in the 1940s decreased the abundance of yellow birch in the overstory and led to an increase in sugar maple coverage in some affected areas.

## Edatopic Grid



## Ecological Features

Tolerant hardwood forests are characterized by temperate trees and understory flora, high species richness, diverse stand structures and by generally rich and well drained soils. These large patch and matrix forests typically occur over hundreds of hectares and reach the northeastern extent of their range in Nova Scotia. They have a high potential to sustain old growth stands with complex dynamics supporting a wide range of age and size classes. Tolerant hardwood sites provide numerous microhabitats including: vernal pools, seeps, deep leaf litter and surface relief structures. Additional habitat features are embedded in the vegetation. Larger trees may have broken tops, hollow boles, cavities and rough bark; attributes that provide shelter, foraging, perching and/or growing sites. Vertical complexity is particularly important for aerial foragers and nesters, while other wildlife species are associated with patches of shrubs or ferns, conifer inclusions, deadwood, or with particular age classes or species. The typically fertile soils support many rare plants, while nutrient rich tree bark surfaces provide important bryophyte and lichen habitat.

# TH1

## Sugar maple / Hay-scented fern

*Acer saccharum* / *Dennstaedtia punctilobula*

### TH1a

#### Beech variant

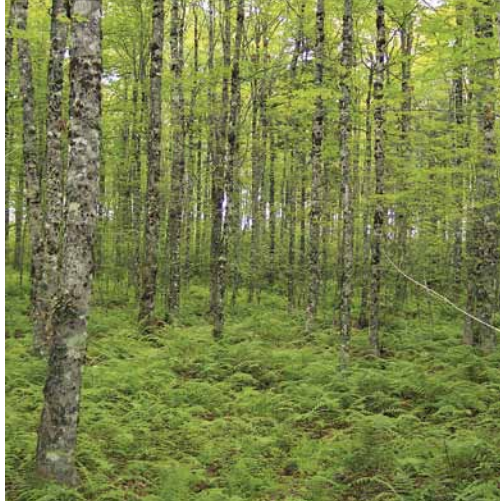
*Fagus grandifolia*

### TH1b

#### Yellow birch variant

*Betula alleghaniensis*

n=59



Lake Alma,  
Annapolis County

**Concept:** This late successional Vegetation Type (VT) has an overstory dominated by sugar maple and yellow birch, accompanied by a mix of mostly shade-tolerant trees. It is similar to TH2 (Sugar maple / New York fern – Northern beech fern), but is generally associated with drier and/or slightly less fertile sites. There are two variants: TH1a, where beech is abundant in both the overstory and understory; and TH1b, where yellow birch is dominant in the overstory. Due to the long-lived and shade-tolerant nature of dominant overstory trees, this VT will develop old forest characteristics maintained by gap disturbance. TH1 is one of several Acadian hardwood VTs found on zonal sites throughout Nova Scotia.

**Vegetation:** Sugar maple, yellow birch and beech are the dominant overstory trees (in various combinations) with lesser red maple and scattered red spruce and white spruce. The shrub layer contains regenerating tree species along with striped maple, fly-honeysuckle and mountain maple. Beech and/or striped maple coverage in this layer can sometimes be extensive, strongly out-competing other species. Herb coverage is diverse, but generally dominated by hay-scented fern and evergreen wood fern. Other common species may include rose twisted stalk, Indian cucumber root, wood sorrel, drooping wood sedge and wood aster. Spring ephemerals may include spring-beauty, Dutchman's-breeches and dog tooth violet. The bryophyte layer is poorly developed, with moss cover generally restricted to tree trunks, stones and downed woody material.

### Ecological Features

This matrix forest typically occurs over hundreds of hectares. The longevity, shade tolerance and deep roots of sugar maple and beech promote stand continuity, high old-growth potential and uneven age structure. Stands on high elevation (greater than 200 m) crests and upper slopes are exposed to strong winds and are susceptible to ice storms, blowdown

and crown breakage. Vernal pools, seeps and springs are common and may provide habitat for several amphibians (e.g. wood frogs). This forest may provide habitat for warblers, thrushes, woodpeckers, flying squirrels and fishers. Large trees may provide nest sites for barred owls and northern goshawks. Downed coarse woody debris may provide cover for red-backed

salamanders and small mammals. Hard mast from beech and beaked hazelnut provides a significant food source for bears and other fauna. These forests host a variety of spring ephemeral plants. With increased light availability caused by canopy disturbances, hay-scented fern can be very invasive and spread aggressively, which restricts tree regeneration.

**Environmental Setting:** TH1 is mainly associated with dry to fresh-moist, nutrient medium to rich soils of glacial origin. This VT is found throughout the province in the Cobequid Hills, North Mountain and Cape Breton Hills ecodistricts, and on the upper slopes of drumlins. However, TH1 is relatively uncommon on the lowland ecodistricts and does not occur in the Atlantic coastal ecoregion. The variant TH1a (Beech) usually occurs on drier sites, while TH1b (Yellow birch) is associated with moister conditions. It is widespread and abundant across New Brunswick but somewhat rare on Prince Edward Island.

**Successional Dynamics:** TH1 is a late successional, uneven-aged climatic climax VT dominated by shade-tolerant hardwood. Excluding harvesting, stand level disturbance events are rare, with gaps or small patches usually created by individual tree mortality, wind or ice damage. Following stand level disturbance, TH1 can develop from early and mid-successional VTs including IH3 (Large-tooth aspen / Christmas fern – New York fern), IH5 (Trembling aspen – White ash / Beaked hazelnut / Christmas fern), IH7 (Red maple / Hay-scented fern – Wood sorrel), TH7 (Yellow birch – White birch / Evergreen wood fern) and TH8 (Red maple – Yellow birch / Evergreen wood fern). Early successional stages can be by-passed if, at the time of disturbance, advanced sugar maple and yellow birch regeneration is retained.

Characteristic Plants	TH1		TH1a		TH1b	
	Freq. (%)	Cover (%)	Freq. (%)	Cover (%)	Freq. (%)	Cover (%)
Sugar maple	100	51.0	100	53.0	100	18.2
Yellow birch	83	13.5	60	1.7	100	41.5
Red maple	58	14.9	20	35.0	33	3.5
Beech	50	16.3	100	24.0	33	8.0
Red spruce	27	5.3	40	0.1		
White birch	17	7.4	20	5.0	17	0.1
Balsam fir	17	6.1			33	10.0
White spruce	13	4.2			17	5.0
White ash	10	2.0			33	0.1
Hemlock	2	5.0	20	10.0		
<b>Tree Layer (Mean % Cover)</b>	<b>82</b>		<b>86</b>		<b>68</b>	
Sugar maple	88	5.0	80	7.6	100	4.9
Beech	77	11.4	100	16.6	83	19.3
Striped maple	69	3.7	60	1.5	83	2.6
Yellow birch	69	2.8	20	0.3	83	0.4
Balsam fir	60	2.0	80	6.8	83	0.3
Red maple	50	2.3	60	1.6	33	0.8
Fly-honeysuckle	50	0.6	40	0.2	50	0.1
Red spruce	42	3.0	40	0.3	17	1.0
White spruce	19	1.7	40	0.1	33	1.0
Alternate-leaved dogwood	19	1.1	40	1.1	17	0.1
White ash	19	0.6	20	0.5	50	0.2
Hobble-bush	13	2.4	40	0.9		
Common blackberry	13	1.6	40	1.3	17	0.1
Ironwood					33	1.6
<b>Shrub Layer (Mean % Cover)</b>	<b>27</b>		<b>35</b>		<b>26</b>	
Evergreen wood fern	88	12.5	60	4.7	100	7.4
Hay-scented fern	75	29.7	80	20.3	100	17.5
Wild lily-of-the-valley	73	3.1	100	0.4	50	1.3
Rose twisted stalk	71	0.3	60	0.1		
Starflower	67	0.5	60	0.1	67	0.4
Violets	60	1.8	60	0.1	100	0.9
Wood aster	60	1.4	40	1.5	67	1.8
Wood-sorrel	58	4.8	40	2.8	33	7.8
Sarsaparilla	58	2.2	80	1.6	50	4.2
Northern beech fern	50	0.3	40	0.3	33	0.5
Indian cucumber root	46	0.5	40	0.1	33	0.1
Wood reed	44	0.2	40	0.1	50	0.1
Eastern spreading wood fern	38	12.6	40	20.3	50	23.0
New York fern	38	2.3	20	0.7		
Drooping wood sedge	38	0.3	40	0.1	50	0.1
Lions paw	33	0.1	20	0.2		
Christmas fern	31	2.5			33	0.8
Painted trillium	31	0.2	60	0.1		
Shining club-moss	29	1.1	40	0.2	17	5.0
Bluebead lily	27	0.3	40	2.8	50	1.4
Indian pipe	27	0.1	60	0.1		
Fibrous-root sedge	21	0.4	40	0.1	17	0.1
Spinulose wood fern	17	15.0	40	1.0	17	8.0
<b>Herb Layer (Mean % Cover)</b>	<b>50</b>		<b>34</b>		<b>50</b>	
Broom moss	67	1.0	40	0.8	67	1.3
Hypnum moss	48	1.4	60	0.1	67	0.8
Hair-cap moss	46	0.8	40	1.5	17	0.5
Fern moss	29	1.2			33	1.3
Bazzania	21	0.2			33	0.1
Schreber's moss	15	0.9	60	0.1	33	3.0
Wavy dicranum	4	0.1			33	0.1
<b>Bryo-Lichen Layer (Mean % Cover)</b>	<b>9</b>		<b>1</b>		<b>5</b>	

## Distinguishing Features

This is a hardwood forest dominated by sugar maple usually found on well drained soils on upper slopes.

Hay-scented fern is usually present in quantity. Beech is abundant in TH1a and yellow birch is dominant in TH1b. Rose twisted stalk and three species of wood ferns are common.



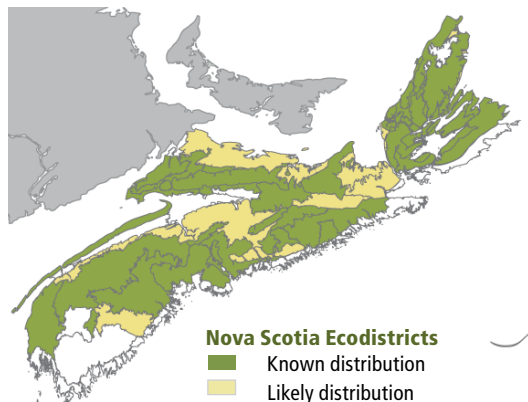
*Dog tooth violet*

## Site Characteristics

- Slope Position: Upper<sup>5</sup> Level<sup>2</sup> Middle<sup>2</sup> Other<sup>1</sup>  
 Surface Stoniness: (Non - Slightly)<sup>5</sup> (Moderately)<sup>4</sup> (Very - Excessively)<sup>1</sup>  
 Bedrock Outcrop: (Non-rocky)<sup>9</sup> (Slightly - Moderately)<sup>1</sup>  
 Elevation Range: 22 - 337m  
 Slope Gradient: Gentle<sup>4</sup> Level<sup>2</sup> Steep<sup>2</sup> Moderate<sup>1</sup> nd<sup>1</sup>  
 Aspect: North<sup>3</sup> East<sup>2</sup> South<sup>1</sup> West<sup>2</sup> None<sup>2</sup>  
 Exposure: Mod. exposed<sup>4</sup> Moderate<sup>3</sup> Exposed<sup>2</sup> Other<sup>1</sup>  
 Microtopography: Strongly<sup>4</sup> Moderately<sup>4</sup> Slightly<sup>1</sup> Other<sup>1</sup>  
 Drainage: Well<sup>6</sup> Moderately well<sup>3</sup> Other<sup>1</sup>

## Soil Characteristics

- Soil Type: ST2-L<sup>4</sup> ST2<sup>3</sup> ST8<sup>1</sup> Other<sup>2</sup>  
 Parent Material: Glacial till<sup>8</sup> Till/Bedrock<sup>1</sup> Other<sup>1</sup>  
 Rooting Depth (cm): (<30)<sup>1</sup> (30-45)<sup>3</sup> (>45)<sup>5</sup> nd<sup>1</sup>  
 Duff Thickness (cm): (0-5)<sup>3</sup> (6-10)<sup>4</sup> (11-20)<sup>2</sup> nd<sup>1</sup>





Lake George,  
Yarmouth County

## TH2

### Sugar maple / New York fern – Northern beech fern

*Acer saccharum* / *Thelypteris noveboracensis* –  
*Phegopteris connectilis*

#### TH2a

#### Yellow birch variant

*Betula alleghaniensis*

n=48

**Concept:** This late successional Vegetation Type (VT) has an overstory dominated by sugar maple and yellow birch accompanied by a mix of mostly shade-tolerant trees. It is similar to TH1 (Sugar maple / Hay-scented fern), but is generally associated with moister and/or slightly more fertile sites. There is one variant (TH2a) where yellow birch is dominant in the overstory, often originating after disturbance has exposed mineral soil seedbeds. Due to the long-lived and shade-tolerant nature of dominant overstory trees, this VT will develop old forest characteristics that are maintained by gap disturbance. TH2 is one of several Acadian hardwood VTs found on zonal sites throughout Nova Scotia.

**Vegetation:** Sugar maple and yellow birch are the dominant overstory trees with lesser red maple and scattered red spruce, white spruce, beech and balsam fir. The shrub layer contains regenerating tree species along with striped maple, fly-honeysuckle, beaked hazelnut and mountain maple. Dense striped maple coverage in this layer can sometimes exclude other species. Herb coverage is diverse, but generally dominated by New York fern, evergreen wood fern and northern beech fern. Other common species may include rose twisted stalk, Indian cucumber root, wood sorrel, drooping wood sedge and wood aster. Spring ephemerals may include spring-beauty, Dutchman's-breeches and dog tooth violet. The bryophyte layer is poorly developed, with moss cover generally restricted to tree trunks, stones and downed woody material.

**Environmental Setting:** TH2 is mainly associated with fresh-moist, nutrient medium to rich soils of glacial origin. This VT is found throughout the province in the Cobequid Hills, North Mountain and Cape Breton Hills ecodistricts and on the upper slopes of drumlins. However, TH2 is relatively uncommon on lowland ecodistricts, and does not occur in the Atlantic coastal ecoregion. The variant TH2a (Yellow birch) usually occurs on slightly moister sites and/or where past disturbance events have created suitable mineral soil seedbeds for regeneration. It is widespread and abundant across New Brunswick but somewhat rare on Prince Edward Island.

**Successional Dynamics:** TH2 is a late successional, uneven-aged climatic climax VT dominated by shade-tolerant hardwood. Excluding harvesting, stand level disturbance events are rare, with gaps or small patches usually created by individual tree mortality, wind or ice damage. Following stand level disturbance, TH2 can develop from early and mid-successional VTs including IH3 (Large-tooth aspen / Christmas fern – New York fern), IH5 (Trembling aspen – White ash / Beaked hazelnut / Christmas fern), IH7 (Red maple / Hay-scented fern – Wood sorrel), TH7 (Yellow birch – White birch / Evergreen wood fern) and TH8 (Red maple – Yellow birch / Evergreen wood fern). Early successional stages can also be by-passed if, at the time of disturbance, advanced sugar maple and yellow birch regeneration is retained.

### Ecological Features

This matrix hardwood forest typically occurs over hundreds of hectares. The longevity, shade tolerance and deep roots of sugar maple and beech promote stand continuity, high old growth potential and uneven age structure. Stands on high elevation (greater than 200 m) crests and upper slopes are exposed to strong

winds and are susceptible to ice storms, blowdown and crown breakage. Vernal pools, seeps and springs are common and may provide habitat for several amphibians (e.g. wood frogs). This forest may provide habitat for warblers, thrushes, woodpeckers, southern flying squirrels and small mammals. Large trees

provide nest sites for barred owls and northern goshawks. Downed coarse woody debris may provide cover for red-backed salamanders and small mammals. Hard mast from beech and beaked hazelnut provides a significant food source for bears, small mammals and birds. These forests host a variety of spring ephemeral plants.

Characteristic Plants	TH2		TH2a	
	Freq. (%)	Cover (%)	Freq. (%)	Cover (%)
Sugar maple	100	58.2	100	19.9
Yellow birch	87	16.5	100	53.8
Red maple	39	22.9	40	11.3
Balsam fir	26	9.9	50	6.2
Beech	21	6.8	40	9.3
White spruce	21	4.1	20	9.0
White birch	5	5.0	20	4.0
<b>Tree Layer (Mean % Cover)</b>	<b>87</b>		<b>88</b>	
Striped maple	84	5.4	70	2.6
Sugar maple	82	8.9	80	1.6
Balsam fir	82	4.3	90	3.8
Fly-honeysuckle	76	1.8	50	0.9
Beech	63	5.5	60	7.9
Yellow birch	63	1.7	40	0.1
Red maple	55	2.3	70	3.9
Mountain maple	45	1.2	20	1.1
Beaked hazelnut	37	1.8		
White spruce	37	0.8	50	6.1
Red spruce	32	1.4	10	7.0
White ash	29	0.5	10	0.1
Mountain-ash	13	0.1	40	0.1
<b>Shrub Layer (Mean % Cover)</b>	<b>25</b>		<b>19</b>	
Evergreen wood fern	89	7.8	100	11.8
Starflower	76	0.4	90	0.7
Rose twisted stalk	71	0.1	30	0.1
New York fern	68	34.6	90	26.2
Violets	66	1.2	40	1.1
Northern beech fern	63	2.9	60	0.9
Wood-sorrel	63	1.2	80	6.1
Wild lily-of-the-valley	61	1.1	60	5.8
Sarsaparilla	58	1.6	40	1.3
Christmas fern	55	1.9	20	10.3
Wood aster	55	0.5	30	0.4
Hay-scented fern	45	15.2	30	11.7
Indian cucumber root	45	0.2	30	0.2
Dwarf raspberry	39	1.2	10	0.3
Drooping wood sedge	39	0.1		
Wood reed	37	0.1	20	0.1
Eastern spreading wood fern	32	14.1	50	8.5
Shinleaf	29	0.2	30	0.2
Spinulose wood fern	26	9.6	40	3.1
Bunchberry	24	1.8	70	11.2
Lady fern	24	0.7	10	2.5
Goldthread	21	2.8	80	1.3
Interrupted fern	11	1.3	30	1.1
Cinnamon fern	11	0.7	30	1.8
Twinflower	8	0.9	50	1.0
<b>Herb Layer (Mean % Cover)</b>	<b>59</b>		<b>70</b>	
Broom moss	66	0.8	90	1.7
Hypnum moss	39	1.0	60	1.4
Fern moss	26	0.5	40	1.8
Stair-step moss	21	3.3	80	2.6
Hair-cap moss	21	0.4	40	0.2
Bazzania	16	0.4	70	1.0
Schreber's moss	16	0.4	60	2.0
Common green sphagnum	11	0.5	30	1.1
Shaggy moss	8	0.2	30	0.2
<b>Bryo-Lichen Layer (Mean % Cover)</b>	<b>2</b>		<b>8</b>	

## Distinguishing Features

Soils are slightly moister in this sugar maple dominated hardwood forest on upper and middle slopes. New York fern and northern beech fern are usually present in quantity; other plants include fly-honeysuckle, wood ferns, rose twisted stalk. Yellow birch is dominant in TH2a.



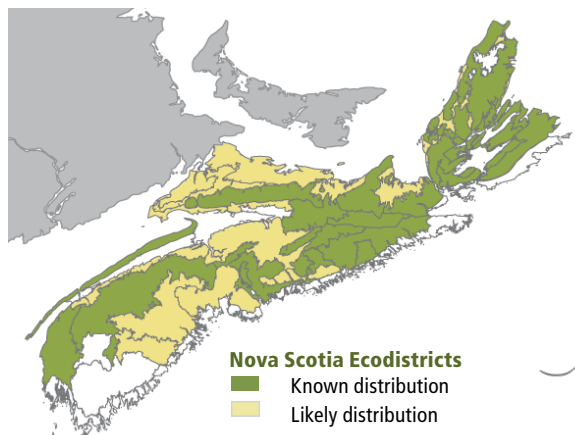
Northern beech fern

## Site Characteristics

Slope Position:	Upper <sup>4</sup> Middle <sup>3</sup> Lower <sup>2</sup> Other <sup>1</sup>
Surface Stoniness:	(Non - Slightly) <sup>5</sup> (Moderately) <sup>4</sup> (Very - Excessively) <sup>1</sup>
Bedrock Outcrop:	(Non-rocky) <sup>9</sup> (Slightly - Moderately) <sup>1</sup>
Elevation Range:	36 - 304m
Slope Gradient:	Gentle <sup>7</sup> Moderate <sup>2</sup> Level <sup>1</sup>
Aspect:	North <sup>3</sup> East <sup>3</sup> South <sup>1</sup> West <sup>3</sup>
Exposure:	Mod. exposed <sup>4</sup> Moderate <sup>3</sup> Exposed <sup>2</sup> Other <sup>1</sup>
Microtopography:	Moderately <sup>5</sup> Strongly <sup>2</sup> Slightly <sup>1</sup> Other <sup>2</sup>
Drainage:	Moderately well <sup>5</sup> Well <sup>4</sup> Imperfect <sup>1</sup>

## Soil Characteristics

Soil Type:	ST2-L <sup>4</sup> ST2 <sup>2</sup> ST8 <sup>2</sup> ST9 <sup>1</sup> Other <sup>1</sup>
Parent Material:	Glacial till <sup>9</sup> Colluvium <sup>1</sup>
Rooting Depth (cm):	(<30) <sup>2</sup> (30-45) <sup>3</sup> (>45) <sup>5</sup>
Duff Thickness (cm):	(0-5) <sup>2</sup> (6-10) <sup>6</sup> (11-20) <sup>2</sup>



## TH3

### Sugar maple – White ash / Christmas fern

*Acer saccharum* – *Fraxinus americana* /  
*Polystichum acrostichoides*

n=40



Lower Springfield,  
Antigonish County

**Concept:** This late successional Vegetation Type (VT) has an overstory dominated by sugar maple and white ash with lesser amounts of other shade-tolerant hardwoods. TH3 primarily occurs as rich, seepage patches within larger TH1 and TH2 forests. Plant species richness is among the highest of any upland hardwood ecosystem in the province. Due to the long-lived and shade-tolerant nature of dominant overstory trees, this VT will develop old forest characteristics maintained by gap disturbance. Sugar maple – White ash / Christmas fern is one of several Acadian hardwood VTs found on zonal sites throughout Nova Scotia.

**Vegetation:** Sugar maple, white ash and yellow birch are the dominant overstory trees accompanied by lesser amounts of red maple, beech and red spruce. Scattered ironwood is typical in the lower canopy or high shrub layer. Although ironwood and sometimes white ash are not dominant in the canopy, their presence is used to distinguish this VT from other sugar maple/yellow birch VTs. The shrub layer is dominated by regenerating hardwood, balsam fir and striped maple, with less prominent amounts of alternate-leaved dogwood, hobblebush and beaked hazelnut. Herb coverage is diverse and may include several rich site indicators including Christmas fern, oak fern, lady fern, shining club-moss and northern beech fern. Spring ephemerals may include

spring-beauty, Dutchman's-breeches and dog tooth violet. The bryophyte layer is poorly developed, with moss cover generally restricted to tree trunks, stones and downed woody material.

**Environmental Setting:** TH3 is mainly found on fresh-moist to moist, nutrient rich soils. These sites often occur in toe slope positions and mid-slope benches, but are sometimes also found on enriched upper slopes. This VT is typically associated with (and found embedded within) larger tracts of TH1 and TH2 matrix forest. TH3 is found throughout the province in the Cobequid Hills, North Mountain and Cape Breton Hills ecodistricts, and on some drumlin sites. It is very rare on Prince Edward Island but abundant and widespread in southern New Brunswick.

**Successional Dynamics:** TH3 is a late successional, uneven-aged climatic climax VT dominated by shade-tolerant hardwood. Excluding harvesting, stand-level disturbance events are rare, with gaps or small patches usually created by individual tree mortality, wind or ice damage. Although TH3 sites generally maintain themselves through gap replacement, this VT can develop from other early and mid-successional VTs including IH3 (Large-tooth aspen / Christmas fern – New York fern) and IH5 (Trembling aspen – White ash / Beaked hazelnut / Christmas fern).

### Ecological Features

This hardwood seepage forest typically occurs in small patches (from less than 1 hectare up to 50 hectares), infrequently scattered as inclusions within broader hardwood matrix forest. Longevity of the overstory tree species increases the potential for old growth development. Vernal pools and moist surface

depressions common in this seepage forest provides habitat for red-backed salamanders, yellow-spotted salamanders and wood frogs, while seeds of ash and maple trees may be eaten by evening grosbeaks. Plants that favour moist rich sites are common, including several rare species (e.g. lance-leaved and little

grapeferns, foamflower and anise-root). These forests host a variety of spring ephemeral plants, like spring beauty, dog tooth violet and Dutchman's breeches which take advantage of early spring sunlight before tree leaf out. In southwest Nova Scotia this community is home to southern flying squirrels.

## Characteristic Plants

TH3

	Freq. (%)	Cover (%)
Sugar maple	100	38.4
White ash	93	16.0
Yellow birch	88	11.9
Beech	60	10.1
Red maple	45	21.1
Red spruce	28	7.9
Ironwood	23	6.2
Balsam fir	15	7.0
White spruce	15	1.2
Hemlock	13	9.2
White birch	10	4.3
<b>Tree Layer (Mean % Cover)</b>		<b>86</b>
Balsam fir	88	2.3
Sugar maple	85	8.9
White ash	83	3.5
Beech	78	15.6
Striped maple	73	4.6
Red spruce	53	2.9
Red maple	50	1.1
Fly-honeysuckle	50	0.7
White spruce	48	1.9
Yellow birch	43	1.8
Beaked hazelnut	30	1.4
<b>Shrub Layer (Mean % Cover)</b>		<b>37</b>
Christmas fern	93	6.0
Evergreen wood fern	93	4.1
Starflower	83	0.5
Wild lily-of-the-valley	68	1.6
Violets	60	2.4
Sarsaparilla	60	1.5
New York fern	55	14.8
Rose twisted stalk	53	0.1
Indian cucumber root	50	0.3
Northern beech fern	48	1.3
Partridge-berry	48	0.4
Wood aster	48	0.2
Lions paw	43	0.7
Hay-scented fern	40	7.8
Drooping wood sedge	38	0.1
Shining club-moss	35	1.0
Shinleaf	30	0.6
Indian pipe	30	0.1
Wood reed	30	0.1
Lady fern	25	1.3
Oak fern	25	1.3
Wood-sorrel	25	1.2
False Solomon's seal	25	0.1
White lettuce	23	0.6
Calico aster	23	0.3
Common speedwell	23	0.2
<b>Herb Layer (Mean % Cover)</b>		<b>32</b>
Broom moss	85	1.0
Hypnum moss	58	1.6
Fern moss	58	1.1
Hair-cap moss	45	0.3
Stair-step moss	38	1.3
Schreber's moss	33	0.5
<b>Bryo-Lichen Layer (Mean % Cover)</b>		<b>4</b>

## Distinguishing Features

In this rich hardwood forest found on middle to lower slope positions the herb layer is diverse and usually includes Christmas fern, northern beech fern, shining club-moss, lady fern and oak fern. White ash, ironwood and Christmas fern are diagnostic for this forest.



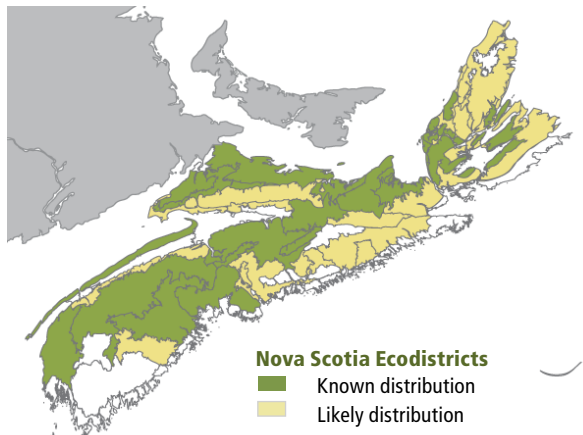
Christmas fern

## Site Characteristics

Slope Position:	Middle <sup>4</sup> Lower <sup>3</sup> Upper <sup>2</sup> Other <sup>1</sup>
Surface Stoniness:	(Non - Slightly) <sup>4</sup> (Moderately) <sup>3</sup> (Very - Excessively) <sup>3</sup>
Bedrock Outcrop:	(Non-rocky) <sup>8</sup> (Slightly - Moderately) <sup>2</sup>
Elevation Range:	57 - 237m
Slope Gradient:	Gentle <sup>5</sup> Moderate <sup>2</sup> Level <sup>1</sup> Steep <sup>1</sup> nd <sup>1</sup>
Aspect:	North <sup>2</sup> East <sup>3</sup> South <sup>3</sup> West <sup>2</sup>
Exposure:	Moderate <sup>5</sup> Mod. exposed <sup>3</sup> Mod. sheltered <sup>1</sup> Sheltered <sup>1</sup>
Microtopography:	Moderately <sup>5</sup> Strongly <sup>3</sup> Slightly <sup>1</sup> Other <sup>1</sup>
Drainage:	Moderately well <sup>5</sup> Well <sup>3</sup> Imperfect <sup>2</sup>

## Soil Characteristics

Soil Type:	ST8 <sup>3</sup> ST2-L <sup>2</sup> ST2 <sup>1</sup> ST9 <sup>1</sup> ST11 <sup>1</sup> ST2 <sup>1</sup> Other <sup>1</sup>
Parent Material:	Glacial till <sup>8</sup> Colluvium <sup>1</sup> Till/Bedrock <sup>1</sup> nd <sup>1</sup>
Rooting Depth (cm):	(<30) <sup>1</sup> (30-45) <sup>4</sup> (>45) <sup>4</sup> nd <sup>1</sup>
Duff Thickness (cm):	(0-5) <sup>4</sup> (6-10) <sup>4</sup> (11-40) <sup>1</sup> nd <sup>1</sup>





## TH4

### Sugar maple – White ash / Silvery spleenwort – Baneberry

*Acer saccharum* – *Fraxinus americana* /  
*Deparia acrostichoides* – *Actaea* spp.

n=27



Sandy Gunn Lake,  
Pictou County

**Concept:** This late successional Vegetation Type (VT) has an overstorey dominated by sugar maple, white ash and yellow birch. TH4 primarily occurs as a small patch VT on rich seepage sites embedded within larger tracts of TH1 and TH2 matrix forest. It is similar to TH3 (Sugar maple – White ash / Christmas fern), but is even more fertile, supporting numerous rich site indicator species. TH4 is the richest upland hardwood VT in Nova Scotia and, excluding floodplain forests, has the most diverse suite of understory plants. Due to the long-lived and shade-tolerant nature of dominant overstorey trees, this VT will develop old forest characteristics which are maintained by gap disturbance. Sugar maple – White ash / Silvery spleenwort – Baneberry is one of several Acadian hardwood VTs found on zonal sites throughout Nova Scotia.

**Vegetation:** Sugar maple is the dominant overstorey tree with lesser amounts of white ash and yellow birch. Scattered ironwood (when present) is typically found in the lower canopy or high shrub layer. The shrub layer is dominated by regenerating hardwood (mainly sugar maple) along with fly-honeysuckle, striped maple, mountain maple and beaked hazelnut. Alternate-leaved dogwood, if present, is diagnostic of this VT. Herb coverage is diverse and includes a suite of rich site indicators such as lady fern, sweet cicely, silvery spleenwort, wood goldenrod, Christmas fern, northern beech fern, red and white baneberry

#### Ecological Features

This hardwood seepage forest typically occurs in small patches (less than 1 hectare up to 10 hectares), infrequently scattered as inclusions within broader hardwood matrix forest. Longevity of the overstorey tree species increases the potential for old growth forest development. Vernal pools and moist surface depressions common

in this seepage forest provide habitat for red-backed salamanders, yellow-spotted salamanders and wood frogs, while seeds of ash and maple trees may be eaten by evening grosbeaks. Plants that favour moist rich sites are common, including several rare species (e.g. lance-leaved and little grapeferns, foamflower and anise-

root). This forest has the highest fern diversity of all VTs in the TH group, with 13 species present at least 20% of the time. These forests also host a variety of spring ephemeral plants like spring beauty, dog tooth violet and Dutchman's breeches that take advantage of early spring sunlight before tree leaf out.

and oak fern. Spring ephemerals may include spring-beauty, Dutchman's-breeches and dog tooth violet. The bryophyte layer is poorly developed, with moss cover generally restricted to tree trunks, stones and downed woody material.

**Environmental Setting:** TH4 is found on fresh-moist to moist, nutrient rich soils associated with seepage sites. These sites often occur where slope angle decreases as in toe slope positions and mid-slope benches. This VT is typically associated with (and found embedded within) larger tracts of TH1 and TH2 matrix forest. TH4 is mainly found in the Cobequid Hills, North Mountain and Cape Breton Hills ecodistricts. It is very rare on Prince Edward Island but abundant and widespread in southern New Brunswick.

**Successional Dynamics:** TH4 is a late successional, uneven-aged climatic climax VT dominated by shade-tolerant hardwood. Excluding harvesting, stand-level disturbance events are rare with gaps or small patches usually created by individual tree mortality, wind, or ice damage. Although TH4 sites generally maintain themselves through gap replacement, this VT can develop from other early and mid-successional VTs including IH3 (Large-tooth aspen / Christmas fern – New York fern) and IH5 (Trembling aspen – White ash / Beaked hazelnut / Christmas fern).

## Characteristic Plants

TH4

	Freq. (%)	Cover (%)
Sugar maple	100	56.3
Yellow birch	74	16.7
White ash	48	20.9
Beech	19	19.4
Red maple	19	7.0
White spruce	15	3.5
Balsam fir	11	9.3
<b>Tree Layer (Mean % Cover)</b>		<b>84</b>
Sugar maple	100	19.0
Fly-honeysuckle	85	1.0
Striped maple	74	2.8
Yellow birch	63	4.6
Mountain maple	63	3.1
White ash	63	1.1
Balsam fir	59	1.4
Beech	56	11.2
Beaked hazelnut	52	3.5
White spruce	52	0.6
Alternate-leaved dogwood	48	0.9
<b>Shrub Layer (Mean % Cover)</b>		<b>37</b>
Evergreen wood fern	96	6.8
Lady fern	78	4.2
Sarsaparilla	78	3.3
Wood aster	74	6.0
Northern beech fern	74	4.5
Wood-sorrel	74	1.7
Silvery spleenwort	70	7.0
Violets	70	2.0
Rose twisted stalk	70	0.4
Christmas fern	67	3.0
Wild lily-of-the-valley	67	1.7
Wood reed	67	0.3
Starflower	59	0.4
Drooping wood sedge	59	0.2
Wood goldenrod	56	6.8
Red baneberry	48	0.5
Dwarf raspberry	44	3.1
White lettuce	44	0.1
Oak fern	41	2.8
Hairy sweet cicely	41	2.2
Eastern spreading wood fern	33	5.7
White baneberry	33	0.5
Braun's holly fern	33	0.3
Spinulose wood fern	30	9.3
Lions paw	30	0.8
Nodding trillium	30	0.1
New York fern	26	10.9
Hay-scented fern	26	6.5
Rattlesnake fern	26	0.8
Bladder sedge	26	0.2
Bluebead lily	26	0.2
Dewey's sedge	26	0.1
Small bedstraw	26	0.1
Solomon's seal	26	0.1
White panicle aster	26	0.1
<b>Herb Layer (Mean % Cover)</b>		<b>52</b>
Broom moss	41	0.6
Fern moss	22	1.3
<b>Bryo-Lichen Layer (Mean % Cover)</b>		<b>2</b>

## Distinguishing Features

This is the richest upland hardwood forest and occurs on moist, middle to lower slope positions. The abundance of white ash and ironwood is used as a diagnostic feature of this forest. The presence of silvery spleenwort, hairy sweet cicely and ostrich fern are diagnostic of this rich, seepage forest.



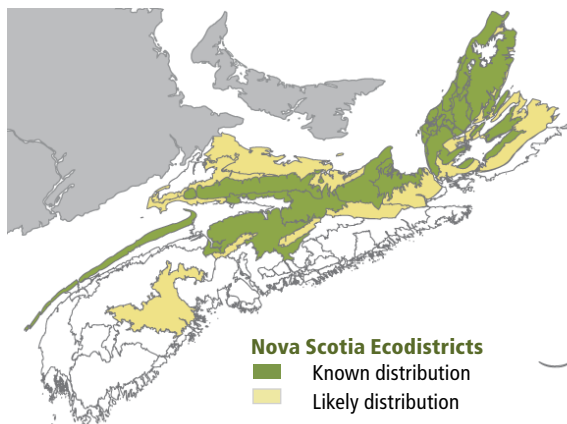
Red baneberry

## Site Characteristics

Slope Position:	Lower <sup>3</sup> Middle <sup>3</sup> Upper <sup>2</sup> Crest <sup>1</sup> Level <sup>1</sup>
Surface Stoniness:	(Non - Slightly) <sup>5</sup> (Moderately) <sup>4</sup> (Very - Excessively) <sup>1</sup>
Bedrock Outcrop:	(Non-rocky) <sup>9</sup> (Slightly - Moderately) <sup>1</sup>
Elevation Range:	94 - 286m
Slope Gradient:	Gentle <sup>5</sup> Moderate <sup>3</sup> Level <sup>1</sup> Steep <sup>1</sup>
Aspect:	North <sup>1</sup> East <sup>2</sup> South <sup>3</sup> West <sup>3</sup> None <sup>1</sup>
Exposure:	Moderate <sup>3</sup> Mod. exposed <sup>3</sup> Exposed <sup>2</sup> Mod. Sheltered <sup>1</sup> Sheltered <sup>1</sup>
Microtopography:	Moderately <sup>4</sup> Slightly <sup>4</sup> Strongly <sup>1</sup> Other <sup>1</sup>
Drainage:	Well <sup>4</sup> Moderately well <sup>4</sup> Imperfect <sup>2</sup>

## Soil Characteristics

Soil Type:	ST8 <sup>4</sup> ST9 <sup>3</sup> ST2-L <sup>1</sup> ST6 <sup>1</sup> Other <sup>1</sup>
Parent Material:	Glacial till <sup>7</sup> Colluvium <sup>2</sup> Till/Bedrock <sup>1</sup>
Rooting Depth (cm):	(<30) <sup>2</sup> (30-45) <sup>4</sup> (>45) <sup>3</sup> nd <sup>1</sup>
Duff Thickness (cm):	(0-5) <sup>4</sup> (6-10) <sup>3</sup> (11-20) <sup>1</sup> (21-40) <sup>1</sup> nd <sup>1</sup>



**Nova Scotia Ecodistricts**  
■ Known distribution  
■ Likely distribution

## Beech / Sarsaparilla / Leaf litter

*Fagus grandifolia / Aralia nudicaulis*

n=21



Twelve O'Clock Mountain,  
Inverness County

**Concept:** This late successional Vegetation Type (VT) has an overstory dominated by beech that can sometimes dominate the shrub layer. Other than beech, below canopy ground cover is typically sparse, aside from leaf litter on the forest floor. Prior to the introduction of beech bark canker, the long-lived and shade-tolerant nature of beech allowed this ecosystem to develop old forest characteristics maintained by gap disturbance. However, Beech / Sarsaparilla / Leaf litter is now relatively uncommon in the province.

**Vegetation:** Beech is the dominant overstory tree, with minor amounts of sugar maple, red maple and yellow birch. Species diversity and coverage in the shrub and herb layers are typically very low – a condition likely related to the phytotoxicity (toxicity to plants) of beech litter leachate. Some shrub and herb cover can be found under mixed species portions of the canopy. Understory species include regenerating trees, striped maple, sarsaparilla and a variety of ferns. Beech drops, a saprophytic plant, is also usually found. As in other tolerant hardwood VTs, the bryophyte layer is poorly developed, with moss cover generally restricted to tree trunks, stones and downed woody material.

### Ecological Features

This closed canopy hardwood forest typically occurs in large patches. Beech scale disease, introduced from Europe in the 1890s, has decimated tree quality and mast production in these forests. Beech is very shade-tolerant and the impact of the disease has reduced this species to an intermediate or understory species, altering

its ecological role in stand structure and dynamics. However, beech is still an important food source for bears, small mammals, blue jays, finches, woodpeckers and yellow-bellied sapsuckers. Cavities in tree stems, often created when branches break off, provide nesting and denning habitat. Beech-drops, a parasitic plant on

beech roots, are often found wherever the tree grows. There is evidence of some genetic resistance to beech scale, thus mature, clean, trees may present conservation and restoration opportunities. These forests may host a variety of spring ephemeral plants, which take advantage of early spring sunlight before tree leaf out.

**Environmental Setting:** TH5 is found on dry to fresh, nutrient-medium soils derived from glacial till or colluvium. This VT is mainly found in hilly topography associated with the Nova Scotia Uplands ecoregion and the North Mountain and South Mountain ecodistricts. It can also occur on the crests of drumlins. Beech / Sarsaparilla / Leaf litter is relatively uncommon in New Brunswick and on Prince Edward Island mature stands of this VT are absent.

**Successional Dynamics:** TH5 is a late successional, climatic climax VT dominated by beech. Excluding harvesting, stand-level disturbance events are rare with gaps or small patches usually created by individual tree mortality, wind, or ice damage. This VT has been significantly impacted by beech bark canker, and its future in the Acadian forest is uncertain. Trends suggest that other shade-tolerant hardwoods will eventually establish on these sites. At present most TH5 sites are even-aged, but eventual replacement by sugar maple, red maple and yellow birch will lead to a more uneven-aged condition. Progression to TH1 (Sugar maple / Hay-scented fern), TH2 (Sugar maple / New York fern – Northern beech fern) or IH7 (Red maple / Hay-scented fern – Wood sorrel) is likely.

## Characteristic Plants

TH5

	Freq. (%)	Cover (%)
Beech	100	58.1
Yellow birch	67	14.4
Red maple	67	12.6
Sugar maple	62	11.6
White birch	29	5.8
Balsam fir	24	4.2
White spruce	14	6.7
Hemlock	14	3.3
Red oak	10	7.5
Red spruce	10	7.5
White pine	10	7.5
Large-tooth aspen	10	7.0
White ash	10	4.0
Striped maple	10	2.5
<b>Tree Layer (Mean % Cover)</b>		<b>90</b>
Beech	90	16.3
Balsam fir	67	2.1
Striped maple	62	1.0
Red maple	52	2.0
Sugar maple	48	5.2
Fly-honeysuckle	33	0.2
Mountain maple	24	3.7
White spruce	24	2.7
<b>Shrub Layer (Mean % Cover)</b>		<b>27</b>
Sarsaparilla	71	1.4
Wild lily-of-the-valley	67	1.5
Starflower	67	0.2
Evergreen wood fern	48	5.9
Hay-scented fern	48	1.2
Beech-drops	48	1.1
Wood aster	48	0.8
Eastern spreading wood fern	33	18.0
Bunchberry	33	1.3
Drooping wood sedge	33	0.4
Common speedwell	33	0.2
Rose twisted stalk	33	0.1
New York fern	29	14.8
Christmas fern	29	3.1
Wood-sorrel	29	1.4
Violets	29	0.2
Partridge-berry	29	0.1
Goldthread	24	0.5
Bluebead lily	24	0.1
Indian pipe	24	0.1
<b>Herb Layer (Mean % Cover)</b>		<b>23</b>
Broom moss	76	1.4
Hypnum moss	62	1.2
Hair-cap moss	57	0.7
Schreber's moss	43	1.3
Fern moss	38	1.5
Bazzania	29	0.1
Stair-step moss	24	1.3
<b>Bryo-Lichen Layer (Mean % Cover)</b>		<b>4</b>

## Distinguishing Features

Located on rapid to well drained soils of crests and upper slopes this hardwood forest is dominated by beech. Shrub and herb coverage is sparse and the forest floor is primarily beech leaf litter. Beech drops are common. Beech canker scars on all age classes of beech is usually evident.



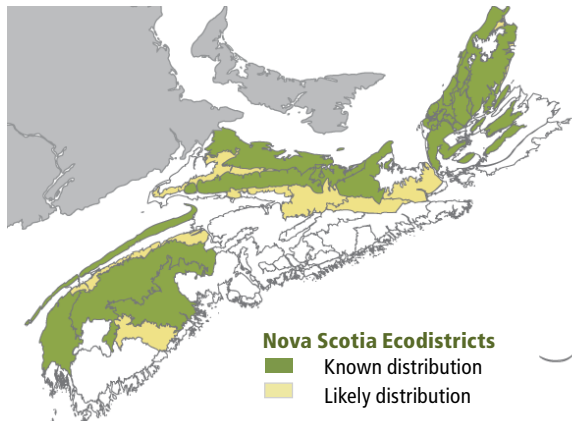
*Diseased beech*

## Site Characteristics

Slope Position:	Upper <sup>7</sup> Middle <sup>2</sup> Other <sup>1</sup>
Surface Stoniness:	(Non - Slightly) <sup>5</sup> (Very - Excessively) <sup>3</sup> (Moderately) <sup>2</sup>
Bedrock Outcrop:	(Non-rocky) <sup>8</sup> (Slightly - Moderately) <sup>2</sup>
Elevation Range:	69 - 357m
Slope Gradient:	Gentle <sup>4</sup> Steep <sup>4</sup> Level <sup>1</sup> Moderate <sup>1</sup>
Aspect:	North <sup>2</sup> East <sup>4</sup> South <sup>3</sup> West <sup>1</sup>
Exposure:	Mod. exposed <sup>4</sup> Exposed <sup>3</sup> Moderate <sup>2</sup> Other <sup>1</sup>
Microtopography:	Moderately <sup>4</sup> Strongly <sup>3</sup> Slightly <sup>2</sup> Level <sup>1</sup>
Drainage:	Well <sup>8</sup> Rapid <sup>1</sup> Other <sup>1</sup>

## Soil Characteristics

Soil Type:	ST2 <sup>4</sup> ST8 <sup>3</sup> ST2-L <sup>1</sup> Other <sup>2</sup>
Parent Material:	Glacial till <sup>7</sup> Colluvium <sup>2</sup> Till/Bedrock <sup>1</sup>
Rooting Depth (cm):	(<30) <sup>1</sup> (30-45) <sup>2</sup> (>45) <sup>6</sup> nd <sup>1</sup>
Duff Thickness (cm):	(0-5) <sup>3</sup> (6-10) <sup>3</sup> (11-20) <sup>3</sup> nd <sup>1</sup>



## TH6

### Red oak – Yellow birch / Striped maple

*Quercus rubra* – *Betula alleghaniensis* /  
*Acer pensylvanicum*

n=11



Baker Settlement,  
Lunenburg County

**Concept:** This mid to late successional Vegetation Type (VT) has an overstory dominated by red oak and yellow birch with lesser amounts of other species. Red oak's co-dominance with other hardwoods defines this VT. Due to the long-lived and shade-tolerant nature of dominant overstory trees, TH6 can develop old forest characteristics that are maintained by gap disturbance. However disturbance regimes associated with this VT are variable.

**Vegetation:** Red oak and yellow birch are the dominant overstory trees, with lesser amounts of sugar maple and/or red maple. Scattered beech, balsam fir, white birch, red spruce and white pine are also common. The shrub layer contains regenerating tree species (especially red oak) along with striped maple. Balsam fir can be locally abundant, but the balsam fir woolly adelgid often keeps this species from advancing into the overstory. A diverse and extensive herb layer is characterized by sarsaparilla, Indian cucumber root, partridge-berry, bunchberry and hay-scented fern. The bryophyte layer is discontinuous and species-poor, especially where the forest floor is characterized by leaf litter and/or where the softwood component is low.

#### Ecological Features

In western Nova Scotia, this forest is distributed as a large patch spanning several hundred hectares. Longevity and high shade tolerance promote old growth potential. Beech scale disease, introduced from Europe in the 1890s, has decimated the beech component of these stands and reduced mast production. This forest may provide habitat for warblers, thrushes,

woodpeckers, flying squirrels and fishers. Large trees may provide nest sites for barred owls and northern goshawks, while downed coarse woody debris can provide cover for red-backed salamanders and small mammals. Hard mast from beech, oak and beaked hazelnut provides significant food for bears, squirrels, chipmunks, small mammals and birds.

Oak regeneration is favoured as browse by deer. Generally oak regeneration performs poorly in the understory unless enhanced by fire. Oak is the preferred host of maitake, or hen-of-the-woods, a prized edible mushroom. Black trumpet mushrooms may also be found as mycorrhizal partners with oak and beech.

## Characteristic Plants

### TH6

	Freq. (%)	Cover (%)
Red oak	100	26.1
Yellow birch	91	22.9
Sugar maple	82	13.7
Red maple	64	24.1
White birch	55	9.3
Beech	45	19.6
White ash	27	8.3
Balsam fir	27	6.3
<b>Tree Layer (Mean % Cover)</b>		<b>93</b>
Balsam fir	100	2.8
Striped maple	100	2.5
Red oak	100	1.3
Red maple	82	2.2
Yellow birch	73	0.3
Sugar maple	64	7.0
White pine	64	1.5
Beech	55	4.5
Red spruce	36	2.4
Velvet-leaf blueberry	36	0.9
White spruce	36	0.3
Hemlock	27	1.4
Serviceberry	27	0.2
Wild raisin	27	0.1
<b>Shrub Layer (Mean % Cover)</b>		<b>20</b>
Sarsaparilla	82	1.6
Wild lily-of-the-valley	82	0.6
Bunchberry	73	2.5
Partridge-berry	73	1.2
Starflower	73	0.9
Indian cucumber root	73	0.3
Bluebead lily	64	0.1
Hay-scented fern	55	9.5
Evergreen wood fern	55	0.4
Indian pipe	55	0.1
Christmas fern	45	6.1
Goldthread	45	2.1
Violets	45	0.2
Rose twisted stalk	45	0.1
Wood aster	36	11.7
Shinleaf	36	0.9
Bristly club-moss	36	0.6
Ground pine	36	0.4
False Solomon's seal	36	0.1
Lions paw	36	0.1
New York fern	27	18.4
Bracken	27	3.0
Large-leaved aster	27	0.2
Painted trillium	27	0.1
Teaberry	27	0.1
<b>Herb Layer (Mean % Cover)</b>		<b>34</b>
Hair-cap moss	82	2.3
Stair-step moss	82	1.2
Broom moss	64	1.3
Schreber's moss	64	0.5
Hypnum moss	45	3.0
Bazzania	27	2.0
Fern moss	27	0.2
<b>Bryo-Lichen Layer (Mean % Cover)</b>		<b>6</b>

## Distinguishing Features

Red oak and at least one northern hardwood species (yellow birch, sugar maple, beech) in the upper canopy of this hardwood forest is diagnostic for classification. TH6 forest is typical of western Nova Scotia and usually found on drier soils than the other TH forests.



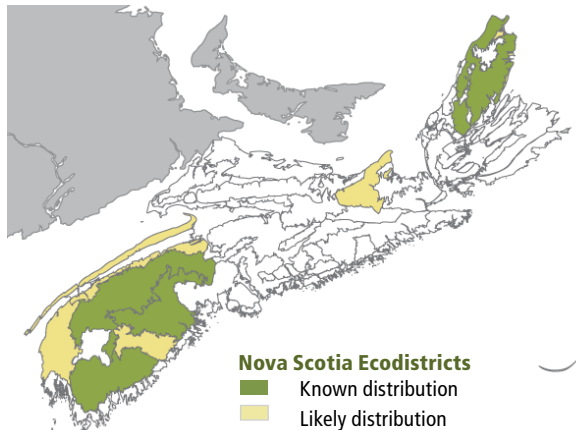
Cancer root

## Site Characteristics

Slope Position:	Upper <sup>5</sup> Middle <sup>3</sup> Crest <sup>1</sup> Level <sup>1</sup>
Surface Stoniness:	(Non - Slightly) <sup>4</sup> (Moderately) <sup>4</sup> (Very - Excessively) <sup>2</sup>
Bedrock Outcrop:	(Non-rocky) <sup>10</sup>
Elevation Range:	50 - 201m
Slope Gradient:	Gentle <sup>6</sup> Steep <sup>2</sup> Level <sup>1</sup> Moderate <sup>1</sup>
Aspect:	North <sup>3</sup> East <sup>3</sup> South <sup>3</sup> None <sup>1</sup>
Exposure:	Moderate <sup>5</sup> Exposed <sup>2</sup> Mod. exposed <sup>2</sup> Mod. Sheltered <sup>1</sup>
Microtopography:	Moderately <sup>3</sup> Strongly <sup>3</sup> Level <sup>2</sup> Severely <sup>1</sup> Ultra <sup>1</sup>
Drainage:	Well <sup>7</sup> Moderately well <sup>2</sup> Rapid <sup>1</sup>

## Soil Characteristics

Soil Type:	ST2 <sup>4</sup> ST2-G <sup>2</sup> ST8 <sup>2</sup> ST1 <sup>1</sup> ST2-L <sup>1</sup>
Parent Material:	Glacial till <sup>5</sup> Colluvium <sup>2</sup> nd <sup>3</sup>
Rooting Depth (cm):	(<30) <sup>1</sup> (30-45) <sup>5</sup> (>45) <sup>3</sup> nd <sup>1</sup>
Duff Thickness (cm):	(0-5) <sup>4</sup> (6-10) <sup>4</sup> (11-20) <sup>1</sup> nd <sup>1</sup>



## TH7

### Yellow birch – White birch / Evergreen wood fern

*Betula alleghaniensis* – *Betula papyrifera* /  
*Dryopteris intermedia*

n=11



Hornes Road,  
Cape Breton County

**Concept:** This mid-successional Vegetation Types VT has an overstory dominated by yellow birch with a strong component of white birch. Balsam fir is also common in both the overstory and understory – its dominance in either layer reflects the time elapsed since the last major insect disturbance (spruce budworm or tussock moth). Yellow birch – White birch / Evergreen wood fern is mainly found in the eastern Nova Scotia.

**Vegetation:** Yellow birch and white birch are the dominant overstory trees, with lesser amounts of balsam fir, red maple and white spruce. Scattered sugar maple, red spruce and beech are also typical. Balsam fir, and sometimes red maple, is prominent in the shrub layer with red maple also common in some stands. The herb layer has extensive fern cover including wood ferns, hay-scented fern, northern beech fern, bracken and New York fern. Other common plants include wild lily-of-the-valley, bunchberry, wood sorrel, sarsaparilla and gold thread. The bryophyte layer is discontinuous and species-poor, especially where the forest floor is characterized by leaf litter and/or where the softwood component is low.

#### Ecological Features

This closed canopy hardwood forest frequently occurs in small patches, most of which are inclusions within broader hardwood matrix forest. Yellow birch's longevity and intermediate shade tolerance facilitates the development of uneven-aged canopy structures particularly as white birch trees are eliminated through natural mortality.

Yellow birch can produce stems more than 25 meters tall with diameters of up to 100 cm, and it has the ability to withstand severe crown breakage and rotting. Large diameter, living, hollow trees are common in this forest type and provide good denning sites, cavity nest sites for songbirds, and nest sites for broad-winged hawks and northern goshawks.

Downed coarse woody debris may provide cover for red-backed salamanders and small mammals. Birch seeds and catkins are an abundant food source during the winter for many species of birds (e.g. ruffed grouse) and small mammals. Birch trees may be deformed by birch cinder conch, a fungal growth occasionally harvested for Chaga tea.

**Environmental Setting:** TH7 is mainly associated with fresh, nutrient medium soils of glacial origin. This VT is primarily found in eastern Nova Scotia and Cape Breton. TH7 is similar but ecologically distinct from HL4 (Birch / Wood fern – Wood sorrel), a transition forest occurring on upper slopes adjacent to the Cape Breton Highlands plateau. It is common in New Brunswick but rare on Prince Edward Island.

**Successional Dynamics:** TH7 is a mid-successional hardwood VT that follows partial stand-level disturbance in mixedwood forests such as MW1 (Red spruce – Yellow birch / Evergreen wood fern), MW4 (Balsam fir – Red maple / Wood sorrel – Goldthread) and MW5 (White birch – Balsam fir / Sarsaparilla – Bracken). The softwood component in these mixedwood stands has been removed either by harvesting or insect/disease. TH7 may also originate after partial harvesting in TH1 (Sugar maple / Hay-scented fern), TH2 (Sugar maple / New York fern – Northern beech fern) and IH7 (Red maple / Hay-scented fern – Wood sorrel) stands.

## Characteristic Plants

TH7

	Freq. (%)	Cover (%)
Yellow birch	100	45.3
White birch	100	20.4
Balsam fir	82	10.3
Red maple	45	7.2
White spruce	36	4.0
Beech	18	10.0
Sugar maple	18	5.0
Red spruce	18	2.5
<b>Tree Layer (Mean % Cover)</b>		<b>83</b>
Balsam fir	91	6.9
Red maple	82	3.6
Sugar maple	45	0.9
Striped maple	45	0.6
Fly-honeysuckle	36	0.4
White spruce	36	0.3
Velvet-leaf blueberry	36	0.1
White birch	27	3.4
Mountain maple	27	0.2
<b>Shrub Layer (Mean % Cover)</b>		<b>19</b>
Evergreen wood fern	91	7.1
Wild lily-of-the-valley	91	5.1
Bunchberry	82	9.9
Wood-sorrel	73	4.4
Starflower	73	0.8
Indian pipe	73	0.1
Eastern spreading wood fern	64	12.8
Sarsaparilla	64	3.3
Goldthread	64	2.4
Bluebead lily	64	0.9
Wood aster	64	0.1
Hay-scented fern	55	13.8
Bracken	45	4.8
New York fern	45	2.9
Twinflower	45	1.2
Northern beech fern	36	1.8
Spinulose wood fern	36	1.5
Drooping wood sedge	36	0.1
Rose twisted stalk	27	0.2
Bristly club-moss	27	0.1
Ground pine	27	0.1
Shining club-moss	27	0.1
<b>Herb Layer (Mean % Cover)</b>		<b>46</b>
Schreber's moss	100	3.5
Broom moss	91	2.0
Stair-step moss	82	4.4
Bazzania	73	1.3
Hypnum moss	55	1.1
Shaggy moss	18	1.3
Shaded wood moss	18	1.1
Hair-cap moss	18	0.1
<b>Bryo-Lichen Layer (Mean % Cover)</b>		<b>11</b>

## Distinguishing Features

This hardwood forest is dominated by yellow and white birch with only a scattering of other hardwood species.

Balsam fir can be abundant in both the canopy and understory layers. It is primarily found in eastern Nova Scotia. Several species of ferns create extensive ground cover.



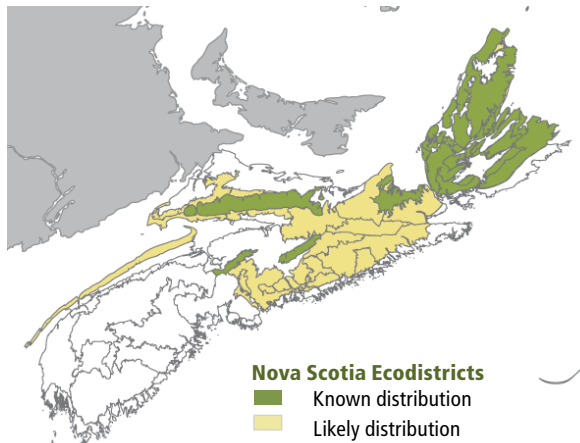
*Hobble-bush*

## Site Characteristics

Slope Position:	Upper <sup>6</sup> Middle <sup>4</sup>
Surface Stoniness:	(Moderately) <sup>5</sup> (Non - Slightly) <sup>4</sup> (Very - Excessively) <sup>1</sup>
Bedrock Outcrop:	(Non-rocky) <sup>7</sup> (Slightly - Moderately) <sup>3</sup>
Elevation Range:	51 - 336m
Slope Gradient:	Gentle <sup>7</sup> Moderate <sup>2</sup> Steep <sup>1</sup>
Aspect:	North <sup>4</sup> East <sup>1</sup> West <sup>5</sup>
Exposure:	Exposed <sup>4</sup> Mod. exposed <sup>4</sup> Moderate <sup>2</sup>
Microtopography:	Moderately <sup>8</sup> Severely <sup>1</sup> Slightly <sup>1</sup>
Drainage:	Moderately well <sup>6</sup> Well <sup>3</sup> Rapid <sup>1</sup>

## Soil Characteristics

Soil Type:	ST2-L <sup>6</sup> ST2 <sup>2</sup> ST15 <sup>1</sup> nd <sup>1</sup>
Parent Material:	Glacial till <sup>8</sup> Colluvium <sup>1</sup> Till/Bedrock <sup>1</sup>
Rooting Depth (cm):	(<30) <sup>1</sup> (30-45) <sup>3</sup> (>45) <sup>5</sup> nd <sup>1</sup>
Duff Thickness (cm):	(0-5) <sup>1</sup> (6-10) <sup>6</sup> (11-20) <sup>2</sup> nd <sup>1</sup>







Twin Lakes,  
Guysborough County

## TH8

### Red maple – Yellow birch / Striped maple

*Acer rubrum* – *Betula alleghaniensis* /  
*Acer pensylvanicum*

#### TH8a

#### White ash variant

*Fraxinus americana*

n=52

**Concept:** This mid to late successional Vegetation Type (VT) has an overstory dominated by red maple and yellow birch. Sugar maples are noticeably absent or only present as a minor structural component. The variant (TH8a) defines stands where white ash is present in the overstory, a reflection of increased moisture and/or fertility. In the eastern mainland, TH8 is a late successional VT; elsewhere in Nova Scotia it is considered mid-successional.

**Vegetation:** Red maple and yellow birch are the dominant overstory trees, but most stands also have a minor softwood component comprised of balsam fir, red spruce and/or white spruce. In the shrub layer these roles reverse with softwood regeneration dominant (especially balsam fir). Other shrubs include striped maple, mountain maple and fly-honeysuckle. The herb layer has extensive fern cover including wood ferns, hay-scented fern and New York fern. Other common plants include bunchberry, wood sorrel and gold thread. The bryophyte layer is discontinuous and species-poor, especially where the forest floor is characterized by leaf litter and/or where the softwood component is low.

**Environmental Setting:** TH8 is mainly associated with fresh to fresh-moist, nutrient medium to rich soils of glacial origin. It is found primarily in eastern Nova Scotia on upper and middle slopes of gentle terrain and on the drumlins of the Eastern Interior, Mulgrave Plateau and Bras d'Or Lowlands ecodistricts. However, it can be found scattered throughout Nova Scotia on similar sites. This VT is widespread and common throughout the Acadian Forest Region.

**Successional Dynamics:** TH8 is a mid to late successional climatic climax hardwood VT dominated by red maple and yellow birch. Stands are predominantly even-aged but can develop uneven-aged canopy structures with time. Disturbance agents include wind, ice damage, insects/disease and harvesting. In eastern Nova Scotia, early successional VTs include IH4 (Trembling aspen / Wild raisin / Bunchberry), IH6 (White birch – Red maple / Sarsaparilla – Bracken) and IH7 (Red maple / Hay-scented fern – Wood sorrel). Early successional stages can be by-passed if, at the time of disturbance, advanced red maple and yellow birch regeneration is retained. In the Nova Scotia Uplands ecoregion where sugar maple occurs, later successional VTs include TH1 (Sugar maple / Hay-scented fern) and TH2 (Sugar maple / New York fern – Northern beech fern).

### Ecological Features

Across eastern Nova Scotia, this closed canopy hardwood forest is distributed as a large patch spanning several hundred hectares. Yellow birch's longevity and shade tolerance facilitates the development of uneven-aged stand structures. The tree can produce stems 25 meters tall with diameters of up to 100 cm, and

has the ability to withstand severe crown breakage and rotting. Large diameter, living, hollow trees are common in this forest type and provide good denning opportunities, cavity nest sites for songbirds, and nest sites for broad-winged hawks and northern goshawks. Downed coarse woody debris may provide cover for red-

backed salamanders and small mammals. Yellow birch is an abundant source of seed during the winter for many species of birds and small mammals, while red maple is an important early spring pollen source. Birch trees may be deformed by birch cinder conch, a fungal growth occasionally harvested for Chaga tea.

Characteristic Plants	TH8		TH8a	
	Freq. (%)	Cover (%)	Freq. (%)	Cover (%)
Yellow birch	100	33.2	86	6.7
Red maple	98	37.5	100	34.0
Sugar maple	40	6.2	57	10.8
Balsam fir	33	7.0	29	10.0
Red spruce	29	7.2	29	5.0
White birch	29	2.9	43	7.3
Beech	22	8.3	14	5.0
White spruce	20	6.8	29	0.1
White ash	9	3.8	86	25.5
Hemlock	4	3.0	14	5.0
Large-tooth aspen	2	4.0	14	5.0
Ironwood			71	4.0
Striped maple			14	3.0
<b>Tree Layer (Mean % Cover)</b>		<b>82</b>		<b>81</b>
Balsam fir	98	9.1	100	3.9
Red maple	82	3.5	86	1.9
Yellow birch	76	1.8	57	0.6
Striped maple	60	4.1	100	2.2
Sugar maple	56	1.9	71	1.5
White spruce	44	1.9	71	1.5
Red spruce	42	10.4	57	3.5
Beech	40	6.5	14	0.1
Fly-honeysuckle	36	1.5	71	0.2
Mountain maple	27	1.7	71	0.4
Wild raisin	18	0.2	57	0.1
White ash	13	5.1	100	1.0
Beaked hazelnut	4	1.8	57	5.3
Ironwood			29	4.9
<b>Shrub Layer (Mean % Cover)</b>		<b>27</b>		<b>19</b>
Evergreen wood fern	91	8.7	100	9.2
Wild lily-of-the-valley	84	3.2	86	2.0
Goldthread	73	3.1	86	0.4
Hay-scented fern	71	11.9	43	25.0
Starflower	67	0.6	100	1.0
Bunchberry	62	8.8	43	0.2
Sarsaparilla	58	1.6	86	0.9
New York fern	56	13.4	71	6.3
Wood aster	53	0.5	43	1.1
Wood-sorrel	51	4.7	71	0.7
Rose twisted stalk	49	0.1	43	0.1
Twinflower	47	3.2		
Violets	44	0.5	29	6.5
Painted trillium	38	0.1	14	0.1
Indian cucumber root	36	0.1	43	0.1
Cinnamon fern	33	0.4	29	0.5
Northern beech fern	24	1.0	86	2.0
Christmas fern	20	2.7	86	3.2
Interrupted fern	16	0.3	57	3.1
Lady fern	9	0.6	57	1.1
<b>Herb Layer (Mean % Cover)</b>		<b>50</b>		<b>43</b>
Broom moss	82	1.4	86	1.4
Hypnum moss	69	1.7	86	4.7
Stair-step moss	64	3.3	57	1.6
Bazzania	62	2.4	43	1.7
Hair-cap moss	62	0.7	57	0.1
Schreber's moss	53	2.4	14	0.3
Prickly sphagnum	2	0.5	29	12.5
<b>Bryo-Lichen Layer (Mean % Cover)</b>		<b>9</b>		<b>18</b>

## Distinguishing Features

This forest is common in eastern Nova Scotia on well drained upper slopes. The absence or sparse cover of sugar maple and beech is diagnostic. Evergreen wood fern is typically the most abundant fern, although New York can also be locally extensive.



Striped maple

## Site Characteristics

Slope Position:	Upper <sup>4</sup> Middle <sup>3</sup> Level <sup>2</sup> Other <sup>1</sup>
Surface Stoniness:	(Non - Slightly) <sup>4</sup> (Moderately) <sup>4</sup> (Very - Excessively) <sup>2</sup>
Bedrock Outcrop:	(Non-rocky) <sup>9</sup> (Slightly - Moderately) <sup>1</sup>
Elevation Range:	19 - 286m
Slope Gradient:	Gentle <sup>6</sup> Moderate <sup>2</sup> Other <sup>1</sup> nd <sup>1</sup>
Aspect:	North <sup>3</sup> East <sup>3</sup> South <sup>2</sup> West <sup>1</sup> None <sup>1</sup>
Exposure:	Moderate <sup>4</sup> Mod. exposed <sup>4</sup> Exposed <sup>1</sup> Sheltered <sup>1</sup>
Microtopography:	Moderately <sup>4</sup> Strongly <sup>3</sup> Slightly <sup>2</sup> Other <sup>1</sup>
Drainage:	Moderately well <sup>4</sup> Well <sup>4</sup> Imperfect <sup>2</sup>

## Soil Characteristics

Soil Type:	ST <sup>2</sup> ST <sup>2</sup> -L <sup>3</sup> ST <sup>6</sup> ST <sup>8</sup> Other <sup>2</sup>
Parent Material:	Glacial till <sup>9</sup> Other <sup>1</sup>
Rooting Depth (cm):	(<30) <sup>1</sup> (30-45) <sup>3</sup> (>45) <sup>3</sup> nd <sup>1</sup>
Duff Thickness (cm):	(0-5) <sup>2</sup> (6-10) <sup>6</sup> (11-20) <sup>1</sup> nd <sup>1</sup>

