# FP Flood Plain Forest Group

**(n = 77)**

**FP1** Sugar maple – White ash / Ostrich fern – Wood goldenrod
**FP2** Red maple – Red oak / Bellwort – Nodding trillium . . . . . **FP2a** Sugar maple variant
**FP3** Red maple / Sensitive fern – Rough goldenrod
**FP4** Balsam poplar – White spruce / Ostrich fern – Cow-parsnip
**FP5** Black cherry – Red maple / Rough goldenrod – Jack-in-the-pulpit
**FP6** White spruce / Wood goldenrod / Shaggy moss

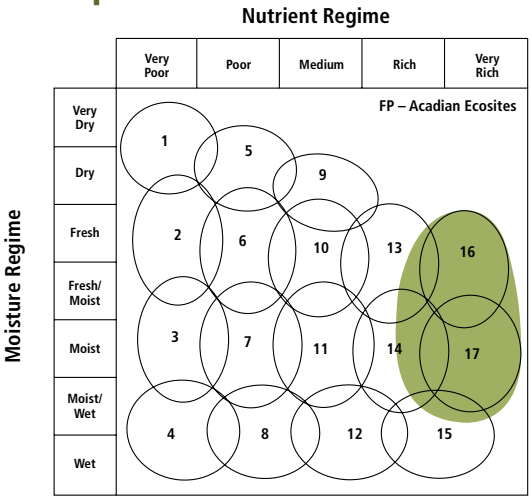
**Concept:** These are forests associated with active floodplains annually or periodically flooded and enriched by sediment. Vegetation Types (VT) are mainly mixed hardwood forests, often with scattered white spruce. The understory is characterized by a species-rich herb layer and a poorly developed or non-existent bryophyte layer. All VTs in this group are found in the Acadian Ecosite group.

**Vegetation:** Vegetation types are mainly closed canopy forests of hardwood including sugar maple, red maple, red oak, white ash, balsam poplar and black cherry. A softwood VT dominated by white spruce occurs on less active floodplains and adjacent terraces. Beaked hazel, chokecherry, wild raisin, ironwood and regenerating tree species are common in the shrub layer. A rich, diverse herb layer usually has meadow rue, several fern species (including ostrich fern), several sedge species, nodding trillium, wood goldenrod and asters. Except for white spruce dominated sites, bryophyte/lichen cover is usually low or non-existent.

**Environmental Setting:** Vegetation types in this group are found on active floodplain sites and occasionally on infrequently flooded terraces and low riparian slopes. Seasonally active channels and small depressions are common providing sites for additional plant diversity. Soils are usually fresh to fresh-moist (but sometimes wetter) and rich to very rich. These alluvium deposits are usually deep, of variable texture and stone free (although gravel layers are often encountered). Earthworms are common in these soils and if an organic layer is present it is usually very thin. This group is prominent in the Northumberland Bras d'Or Lowlands (500) and Valley and Central Lowlands (600) ecoregions, as well as the Inverness Lowlands (320) ecodistrict. It can also be found along some rivers in the Eastern (400) and Western (700) ecoregions.

**Successional Dynamics:** Successional dynamics in this group are not well understood due to a long history of settlement and agricultural activities on these very productive sites. An early pioneer association of willows, cherries, serviceberries and alders may establish on newly created or heavily disturbed sites. Several successional stages are described, leading to a unique climax forest comprised of shade tolerant hardwoods including sugar maple, red maple and white ash. Elm was once a significant part of this forest, but has been almost wiped out in natural habitats by Dutch elm disease. Older forests of red maple and red oak are also known. Flooding, channelization, ice scour, insects and disease are potential disturbance agents.

## Edatopic Grid




## Ecological Features

Flooded forests have the highest landform, structural and species diversity of any forest group in Nova Scotia. This inherent complexity originates with regular flooding events and the associated deposition and erosion of stream sediment. Flood cycles also recharge nutrient and water reserves, producing extremely rich soils and inherently dynamic and productive forests. Ecosystems in this group feature numerous microhabitats including seasonally active channels, vernal pools, levees and ox-bow ponds. Many wildlife species spend all or parts of their lives in these riparian forests. Those with the highest affinities include several rare plants, birds (e.g. grey catbird, yellow warbler, ovenbird, northern waterthrush, mourning warbler, common yellowthroat, Wilson's warbler and northern oriole), amphibians (e.g. wood frog), reptiles (e.g. wood turtle), mammals (e.g. mink, otter, muskrat and several bat species) and invertebrates. Old growth forests composed of very large, tall trees will develop on the less active floodplains with strong sugar and red maple composition. Patch size is variable and most stands have been strongly truncated by past land use.

Brickton,
Annapolis County

# FP1

## Sugar maple – White ash / Ostrich fern – Wood goldenrod

*Acer saccharum – Fraxinus americana / Matteuccia struthiopteris – Solidago flexicaulis*

**n=29**

***Concept:*** This late successional forest is characterized by a well-developed canopy of sugar maple and/or white ash. Herbaceous plants usually dominate the species-rich understory, but shrub development can be moderate to high in younger or disturbed stands. The low elevation deciduous forest is the last stage of successional development on most large, well drained floodplains. The majority of stands have been reduced in size by past land-use activities and/or natural river disturbances.

***Vegetation:*** The overstory may feature one or more layers, depending on the age structure and successional history of the stand. Although many occurrences of FP1 originate with floodplain formation, the inherently dynamic nature of riparian forests often results in pockets of either younger or older trees embedded within the main canopy. This closed canopy ecosystem has well developed layers of sugar maple and/or white ash. Other trees species (e.g. ironwood, white spruce, elm, yellow birch, black cherry) may be found in small clumps or sparsely scattered throughout. Elm is also occasionally found, but rarely in a mature age class because of Dutch elm disease. The species-rich understory is typically dominated by a very well-developed herbaceous layer of ostrich fern, sensitive fern, meadow-rue and numerous other species including several rare vascular plants. Shrub cover is variable but usually reduced, except in younger or disturbed stands. This ecosystem supports very low ground lichen and bryophyte cover.

***Environmental Setting:*** FP1 is mainly associated with fresh to fresh-moist, nutrient very rich alluvium soils. This Vegetation Type (VT) is most often found along rivers in central and northern Nova Scotia, but can also be found in parts of western Nova Scotia and Cape Breton. Most occurrences are on level or gently sloping floodplains. Soils are usually deep medium textured and have low coarse fragment content and minimal humus development. Annual or biannual flood cycles are typical. This VT occurs across southeastern New Brunswick but has been extirpated from Prince Edward Island.

***Successional Dynamics:*** This stable mature forest is the last stage of successional development on rich, actively flooded and well drained riparian soils. It can develop from several early to mid-successional VTs including FP3 (Red maple / Sensitive fern – Rough goldenrod), FP4 (Balsam poplar – White spruce / Ostrich fern – Cow-parsnip) or FP5 (Black cherry – Red maple / Rough goldenrod – Jack-in-the-pulpit). On especially rich river deposits, white ash may play a larger role in stand history, acting as a pioneer before sugar maple advances to co-dominate the canopy. Disturbance agents include flood events, ice scour, insects and disease, and various human activities including farming, cottage and trail development and tree harvest.

### *Ecological Features*

This linear ecosystem can be as narrow as a few meters or exceed one hundred meters in width. Most stands have been reduced in size by past land-use activities, but some less disturbed occurrences are also small by nature. It features a closed canopy and a diverse mosaic of microhabitat features. Plant species richness is the highest of any provincial forest ecosystem, and may include numerous rare plants (e.g. Canada lily, blue cohosh, wild leek, thimbleweed, Canada wood-nettle, hairy sedge, blunt-leaved bedstraw, anise-root and Wiegand's wild rye). Riparian forests may provide important nesting or foraging habitat for amphibian, dragonflies, damselflies and vertebrate species. Many bird species are associated with the forest-shoreline interface. Healthy tracts of riparian forests help buffer riparian disturbances such as flooding and ice scour; they regulate water flow and reduce erosion, provide organic matter and nutrients, and contribute to riparian connectivity. Old growth forests of impressive stature may develop.

| Characteristic Plants | FP1 | |
|---|---|---|
| | Freq. (%) | Cover (%) |
| Sugar maple | 89 | 37.7 |
| White ash | 82 | 35.2 |
| Ironwood | 57 | 8.3 |
| White spruce | 50 | 6.7 |
| Yellow birch | 36 | 16.5 |
| Elm | 21 | 5.0 |
| White birch | 21 | 5.0 |
| Black cherry | 18 | 3.0 |
| Red maple | 14 | 12.0 |
| Balsam fir | 14 | 7.8 |
| Hemlock | 14 | 5.0 |
| Red oak | 11 | 5.3 |
| Balsam poplar | 11 | 5.0 |
| **Tree Layer (Mean % Cover)** | | **85** |
| White ash | 86 | 5.0 |
| Sugar maple | 82 | 16.9 |
| Choke cherry | 46 | 14.3 |
| Beaked hazelnut | 43 | 1.0 |
| Ironwood | 39 | 3.3 |
| White spruce | 39 | 3.2 |
| Balsam fir | 36 | 6.9 |
| Alternate-leaved dogwood | 36 | 0.5 |
| Striped maple | 29 | 2.3 |
| **Shrub Layer (Mean % Cover)** | | **39** |
| Meadow-rue | 82 | 0.5 |
| Ostrich fern | 79 | 22.7 |
| Sensitive fern | 75 | 10.0 |
| Wood goldenrod | 64 | 0.4 |
| Nodding trillium | 54 | 0.6 |
| Jewelweed | 43 | 1.6 |
| Bladder sedge | 43 | 0.8 |
| Jack-in-the-pulpit | 43 | 0.8 |
| Lady fern | 39 | 2.2 |
| Drooping wood sedge | 39 | 0.6 |
| Small enchanter's nightshade | 39 | 0.4 |
| Evergreen wood fern | 36 | 7.4 |
| Oak fern | 36 | 2.7 |
| Violets | 36 | 2.2 |
| Tall buttercup | 36 | 1.1 |
| Christmas fern | 36 | 0.5 |
| Wild lily-of-the-valley | 36 | 0.3 |
| Dandelion | 36 | 0.1 |
| Northern beech fern | 32 | 3.0 |
| Dwarf raspberry | 32 | 2.9 |
| Graceful sedge | 32 | 0.8 |
| Starflower | 32 | 0.1 |
| Large enchanter's nightshade | 29 | 2.6 |
| Rough goldenrod | 29 | 1.8 |
| Herb-Robert | 29 | 0.5 |
| Rose twisted stalk | 29 | 0.4 |
| Common speedwell | 29 | 0.3 |
| Tall white aster | 29 | 0.3 |
| Bloodroot | 25 | 12.5 |
| Brome-like sedge | 25 | 1.7 |
| Cow-parsnip | 25 | 1.4 |
| Long-stalked sedge | 25 | 1.3 |
| **Herb Layer (Mean % Cover)** | | **51** |
| Shaggy moss | 32 | 2.5 |
| **Bryo-Lichen Layer (Mean % Cover)** | | **1** |

## Distinguishing Features

Evidence of annual flooding should be apparent. Seasonally active channels are common. Herbs are usually extensive and ground lichens and mosses scarce if present at all. Ostrich fern, meadow rue, Jack-in-the-pulpit and nodding trillium are typical floodplain species. Ironwood is usually present.

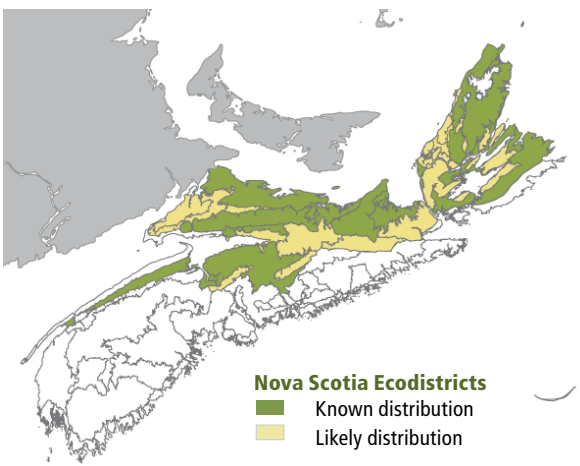
*Bloodroot*

## Site Characteristics

| | |
|---|---|
| Slope Position: | Level[9] Other[1] |
| Surface Stoniness: | (Non - Slightly)[9] (Moderately)[1] |
| Bedrock Outcrop: | (Non-rocky)[10] |
| Elevation Range: | 7 - 149m |
| Slope Gradient: | Level[10] |
| Aspect: | None[10] |
| Exposure: | Mod. sheltered[4] Sheltered[4] Moderate[1] nd[1] |
| Microtopography: | Level[7] Slightly[2] Moderately[1] |
| Drainage: | Well[5] Moderately well[2] Rapid[2] Other[1] |

## Soil Characteristics

| | |
|---|---|
| Soil Type: | ST8[6] ST8-C[2] ST9[1] nd[1] |
| Parent Material: | Alluvium[10] |
| Rooting Depth (cm): | (30-45)[1] (>45)[8] nd[1] |
| Duff Thickness (cm): | (0-5)[6] (6-10)[1] nd[3] |



Greenwood, Kings County

# FP2

## Red maple – Red oak / Bellwort – Nodding trillium

*Acer rubrum – Quercus rubra / Uvularia sessilifolia – Trillium cernuum*

### FP2a
### Sugar maple variant

*Acer saccharum*

**n=9**

***Concept:*** The Red maple - Red oak / Bellwort - Nodding trillium forest is characterized by high levels of red oak and maple in the canopy. It is distinguished from other floodplain forests based on its restricted geographic distribution, reduced fern cover, and prominent representation of species like red oak, bellwort and black cherry. The sugar maple variant (FP2a) describes stands with prominent levels of sugar maple in the canopy.

***Vegetation:*** This closed canopy forest features red oak with prominent levels of either red maple or sugar maple. Most occurrences of FP2 support red maple, but somewhat richer and/or older stands feature low to moderate levels of sugar maple. Ironwood is a frequent but minor component of the lower canopy. Other tree species (e.g. black cherry, elm, white spruce, white ash) may be present, but are less common. The understory is open and often sparse, except in young or disturbed stands where shrub cover is promoted. Herbaceous cover is low to moderate depending on available moisture. Bryophyte prominence is reduced. This ecosystem features common floodplain species like nodding trillium, late goldenrod, graceful sedge and brome-like sedge.

***Environmental Setting:*** FP2 is mainly associated with fresh to fresh-moist, nutrient rich to very rich alluvium soils. Most occurrences are on flat or gently sloping floodplains. FP2 sites are often broken up by seasonally active channels and small depressions. Soils are very deep and largely free of coarse fragments. This Vegetation Type (VT) is mainly found in the western ecoregion (along the Annapolis River and major tributaries), but may occur in other warm ecoregions with sandy riparian soils. Annual or biannual flood cycles are typical. Known Canadian occurrences of this mid to late successional forest are limited to Nova Scotia, but the ecosystem may occur in parts of southern New Brunswick.

***Successional Dynamics:*** This ecosystem can be expressed at a variety of successional stages. Typical stands are relatively stable but expected to transition to a later successional stage defined by the sugar maple variant (FP2a). Successional history is otherwise not fully understood. Most known occurrences have been heavily impacted by past land use activity, including cultivation, land clearing and tree harvest. Other disturbance agents include flooding, ice scour, insects and disease.

## *Ecological Features*

This linear ecosystem occurs in unconnected patches along riparian corridors. It features a broad representation of temperate plants, sandy soil and sometimes complex microtopographic features. Plant species richness is lower than some floodplain forests but generally moderate to high. This ecosystem may provide habitat for rare plants such as Canada wood-nettle, wild leek, hooked agrimony and blue cohosh. Small ox bow swamps and inactive riparian channels are often embedded within this ecosystem, providing favourable habitat for a broad variety of insects and vertebrates. This ecosystem often includes large mast and cavity trees such as oak, black cherry and white ash. It also may support impressively large ironwood trees. Similar to other riparian forests, intact stands help reduce the effects of flooding and erosion, provide structure and woody material to aquatic systems, and promote riparian connectivity. Old growth potential is generally reduced in this VT, but it is higher for the sugar maple variant.

| Characteristic Plants | FP2 | | FP2a | |
|---|---|---|---|---|
| | Freq. (%) | Cover (%) | Freq. (%) | Cover (%) |
| Red maple | 100 | 36.2 | 100 | 12.3 |
| Red oak | 100 | 26.0 | 100 | 29.0 |
| Ironwood | 100 | 9.3 | 67 | 2.5 |
| Large-tooth aspen | 33 | 19.0 | | |
| Sugar maple | 33 | 7.0 | 100 | 26.0 |
| Black cherry | 33 | 5.0 | 67 | 1.5 |
| White spruce | 17 | 2.0 | 33 | 5.0 |
| Serviceberry | 17 | 1.0 | 33 | 4.0 |
| White ash | 17 | 1.0 | 33 | 1.0 |
| Elm | 17 | 0.1 | 33 | 3.0 |
| Beech | | | 33 | 1.0 |
| White birch | | | 33 | 4.0 |
| **Tree Layer (Mean % Cover)** | | **83** | | **75** |
| Ironwood | 83 | 8.3 | 67 | 6.3 |
| Red maple | 83 | 5.0 | 33 | 0.1 |
| Balsam fir | 67 | 2.8 | | |
| Black cherry | 67 | 2.1 | 33 | 0.1 |
| Red oak | 50 | 5.0 | 33 | 0.5 |
| Hawthorns | 50 | 1.3 | 33 | 0.1 |
| White pine | 50 | 1.1 | 33 | 0.1 |
| White spruce | 50 | 0.4 | | |
| Sugar maple | 33 | 3.1 | 100 | 2.7 |
| Beaked hazelnut | 33 | 3.0 | 33 | 0.1 |
| Choke cherry | 33 | 1.0 | 67 | 10.0 |
| White ash | 17 | 10.0 | 33 | 2.0 |
| Western poison ivy | 17 | 3.0 | 67 | 0.1 |
| Elm | 17 | 0.1 | 67 | 0.5 |
| Meadow-sweet | 17 | 0.1 | 67 | 0.3 |
| **Shrub Layer (Mean % Cover)** | | **25** | | **16** |
| Nodding trillium | 100 | 1.6 | 67 | 1.5 |
| Graceful sedge | 100 | 0.5 | 67 | 2.0 |
| Wild lily-of-the-valley | 100 | 0.2 | | |
| Calico aster | 83 | 2.6 | 67 | 1.5 |
| Lady fern | 83 | 2.5 | 100 | 2.7 |
| Bellwort | 83 | 2.0 | 67 | 8.0 |
| Meadow-rue | 83 | 0.4 | 67 | 1.5 |
| Rough goldenrod | 67 | 2.6 | 33 | 33.0 |
| False Solomon's seal | 67 | 0.9 | | |
| Bladder sedge | 67 | 0.8 | 67 | 1.5 |
| Drooping wood sedge | 67 | 0.8 | | |
| Live-forever | 67 | 0.3 | | |
| Common speedwell | 67 | 0.1 | | |
| Sensitive fern | 50 | 9.0 | 100 | 5.2 |
| Sarsaparilla | 50 | 2.3 | 33 | 27.0 |
| Wild rye grass | 50 | 1.2 | 67 | 3.0 |
| Late goldenrod | 50 | 0.7 | 100 | 1.4 |
| White lettuce | 50 | 0.5 | 33 | 2.0 |
| Heart-leaved aster | 50 | 0.4 | 33 | 2.0 |
| Rose twisted stalk | 50 | 0.1 | 33 | 0.1 |
| Dandelion | 33 | 0.1 | 67 | 0.1 |
| Jack-in-the-pulpit | 33 | 0.1 | 67 | 0.1 |
| Ostrich fern | 17 | 30.0 | 100 | 5.0 |
| Black snakeroot | 17 | 0.1 | 67 | 1.0 |
| Wood goldenrod | | | 67 | 5.5 |
| Yellow violet | | | 67 | 0.6 |
| Cut-leaved avens | | | 67 | 0.1 |
| Jewelweed | | | 67 | 0.1 |
| **Herb Layer (Mean % Cover)** | | **54** | | **71** |

## Distinguishing Features

Red oak is a significant component of the overstory. Floodplain features such as seasonally active channels and debris piles are evident. Abundant aster and goldenrod species, sedges and grasses and meadow rue help define this vegetation type.

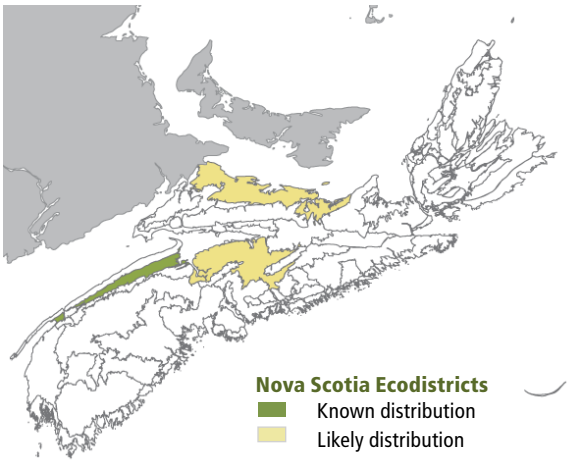
*Nodding trillium*

## Site Characteristics

| | |
|---|---|
| Slope Position: | Level[10] |
| Surface Stoniness: | (Non - Slightly)[9] (Moderately)[1] |
| Bedrock Outcrop: | (Non-rocky)[9] (Slightly - Moderately)[1] |
| Elevation Range: | 12 - 39m |
| Slope Gradient: | Level[10] |
| Aspect: | None[10] |
| Exposure: | Mod. sheltered[8] Moderate[1] nd[1] |
| Microtopography: | Level[3] Slightly[3] Extremely[2] Moderately[2] |
| Drainage: | Well[8] Moderately well[1] nd[1] |

## Soil Characteristics

| | |
|---|---|
| Soil Type: | ST8[7] nd[3] |
| Parent Material: | Alluvium[10] |
| Rooting Depth (cm): | (>45)[3] nd[7] |
| Duff Thickness (cm): | (0-5)[6] nd[4] |



*Crowsnest, Guysborough County*

# FP3

## Red maple / Sensitive fern – Rough goldenrod

*Acer rubrum / Onoclea sensibilis – Solidago rugosa*

**n=9**

***Concept:*** This early to mid-successional ecosystem is the most nutrient-limited floodplain forest classified in Nova Scotia. The low elevation deciduous forest is characterized by red maple canopy dominance and by a moderately broad group of herbaceous species. Typical understory plants include a mix of floodplain and wetland species.

***Vegetation:*** Canopy layers are usually closed but some stands feature more widely-spaced trees. Red maple is the only dominant canopy species, but trace amounts of yellow birch, ironwood, white ash and several conifers may be scattered throughout. The woody understory is usually open with scattered individuals or pockets of wild raisin, beaked hazelnut and regenerating trees. Herbaceous cover is moderate to high depending on available moisture. Dwarf raspberry, sensitive fern, rough goldenrod and bladder sedge are common species. Some occurrences of FP3 support high levels of short husk. Ground bryophyte and lichen cover is absent or reduced.

***Environmental Setting:*** FP3 is mainly associated with fresh to moist, nutrient rich alluvium soils. This Vegetation Type (VT) can be found on active floodplains, low riparian slopes and on inactive terraces. Active sites typically flood annually. Most FP3 sites occur in the middle reaches of rivers found across the province. Rooting zone texture is variable, but sandy loams are most common. FP3 (Red maple / Sensitive fern – Rough goldenrod) occurs across southeastern New Brunswick, but only small, disturbed fragments remain on Prince Edward Island.

***Successional Dynamics:*** FP3 is an early to mid-successional VT. Moister occurrences are expected to persist as an edaphic climax, while stands on better drained sites may succeed to FP1 (Sugar maple – White ash / Ostrich fern – Wood goldenrod). Stands on inactive floodplains or glaciofluvial soils may succeed to an upland forest type. Successional development will depend on available seed sources, site conditions, disturbance regime and geographic location. Disturbance agents include flood events, ice scour, insects and disease, farming and harvesting.

### *Ecological Features*

The Red maple / Sensitive fern – Rough goldenrod is usually on more nutrient-limited floodplains, with lower species richness and reduced productivity, but some stands occur on better sites with increased biodiversity potential. This small patch ecosystem typically supports fewer rare plants than other floodplain forests, with some notable exceptions (e.g. hooked agrimony, Canada wood-nettle and black ash). It is the only forest ecosystem from which the extremely rare false nettle has been documented. The VT supports habitat for numerous riparian vertebrates, while red maple (that flowers before spring leaf out) provides one of the most important early and reliable pollen sources. Similar to other riparian forests, it promotes landscape connectivity, water quality, stream bank stability and channel integrity. Old growth potential is low, except where FP3 forms an edaphic climax on moist sites; in which case a unique form of old growth may develop.

| Characteristic Plants | FP3 | |
|---|---|---|
| | Freq. (%) | Cover (%) |
| Red maple | 100 | 60.4 |
| Red oak | 33 | 7.3 |
| Sugar maple | 33 | 4.0 |
| Ironwood | 33 | 2.7 |
| White pine | 33 | 2.3 |
| Hemlock | 22 | 7.5 |
| Black cherry | 22 | 6.5 |
| White birch | 22 | 5.5 |
| Balsam fir | 22 | 5.0 |
| Yellow birch | 22 | 4.5 |
| Red spruce | 22 | 3.0 |
| White spruce | 22 | 2.5 |
| **Tree Layer (Mean % Cover)** | | **75** |
| Red maple | 56 | 5.4 |
| Balsam fir | 56 | 4.0 |
| Serviceberry | 56 | 1.1 |
| Wild raisin | 44 | 10.3 |
| Beaked hazelnut | 44 | 8.5 |
| Sugar maple | 44 | 7.6 |
| Poison ivy | 44 | 1.5 |
| Meadow-sweet | 44 | 0.9 |
| White pine | 44 | 0.6 |
| Red raspberry | 44 | 0.3 |
| Choke cherry | 33 | 19.5 |
| White ash | 33 | 6.2 |
| Red oak | 33 | 3.3 |
| Speckled alder | 33 | 3.3 |
| White spruce | 33 | 1.2 |
| Black cherry | 33 | 0.5 |
| Virgins bower | 33 | 0.1 |
| **Shrub Layer (Mean % Cover)** | | **36** |
| Meadow-rue | 100 | 1.2 |
| Sensitive fern | 78 | 4.1 |
| Dwarf raspberry | 67 | 3.0 |
| Rough goldenrod | 67 | 0.6 |
| Bladder sedge | 67 | 0.4 |
| Short husk | 56 | 36.4 |
| New York fern | 56 | 7.4 |
| Wild lily-of-the-valley | 56 | 1.1 |
| Partridge-berry | 56 | 0.6 |
| Starflower | 56 | 0.6 |
| Sarsaparilla | 44 | 3.8 |
| Violets | 44 | 1.3 |
| Evergreen wood fern | 44 | 0.8 |
| Lady fern | 44 | 0.3 |
| Bunchberry | 33 | 20.0 |
| Graceful sedge | 33 | 3.3 |
| Calico aster | 33 | 1.0 |
| Rough bedstraw | 33 | 0.7 |
| White panicle aster | 33 | 0.7 |
| Goldthread | 33 | 0.5 |
| Cinnamon fern | 33 | 0.3 |
| Blue flag | 33 | 0.1 |
| Fringed sedge | 33 | 0.1 |
| Nodding trillium | 33 | 0.1 |
| Sweet-scented bedstraw | 33 | 0.1 |
| Stiff sedge | 22 | 13.5 |
| Jewelweed | 22 | 4.0 |
| **Herb Layer (Mean % Cover)** | | **64** |

## Distinguishing Features

This floodplain vegetation type can be a complex of well to poorly drained sites usually with well-defined seasonally active channels and depressions. Red maple is the dominant overstory species. Sensitive fern, bladder sedge, meadow rue and dwarf raspberry are typically present. Cinnamon fern is scattered but a good indicator.

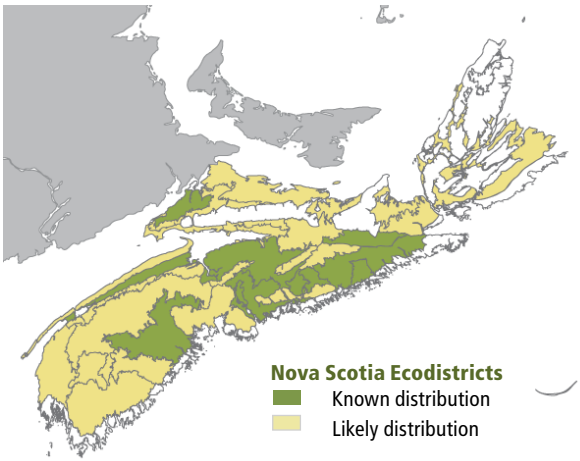
*Sensitive fern*

## Site Characteristics

| | |
|---|---|
| Slope Position: | Level[10] |
| Surface Stoniness: | (Non - Slightly)[9] (Moderately)[1] |
| Bedrock Outcrop: | (Non-rocky)[10] |
| Elevation Range: | 12 - 93m |
| Slope Gradient: | Level[10] |
| Aspect: | None[10] |
| Exposure: | Moderate[5] Mod. sheltered[2] nd[3] |
| Microtopography: | Level[7] Moderate[1] Slightly[1] nd[1] |
| Drainage: | Well[6] Moderately well[3] Imperfect[1] |

## Soil Characteristics

| | |
|---|---|
| Soil Type: | ST8[6] ST8-C[1] ST9[1] nd[2] |
| Parent Material: | Alluvium[8] nd[2] |
| Rooting Depth (cm): | (>45)[9] nd[1] |
| Duff Thickness (cm): | (0-5)[7] (11-20)[1] nd[2] |



Skye Glen,
Inverness County

# FP4

## Balsam poplar – White spruce / Ostrich fern – Cow-parsnip

*Populus balsamifera – Picea glauca / Matteuccia struthiopteris – Heracleum lanatum*

**n=7**

***Concept:*** The Balsam poplar – White spruce / Ostrich fern – Cow-parsnip forest is an early to mid-successional Vegetation Type (VT) characterized by prominent levels of balsam poplar in the canopy, lesser but frequent white spruce, and a well-developed understory. The ecosystem has some boreal affinity, but temperate species like white ash, sugar maple, sensitive fern and alternate-leaved dogwood differentiate it from true boreal floodplains. Many stands have been disturbed and/or reduced in size by human activity, resulting in relatively high shrub density and the frequent presence of plants like wild apple and coltsfoot.

***Vegetation:*** This closed canopy forest is dominated by balsam poplar, with lesser white spruce, white ash and sugar maple. These spruce, ash and maple have a low cover and may be restricted to the understory. Balsam poplar trees have a relatively small crown and most stands have been disturbed. Both these factors increase available light and promote shrub development. Average choke cherry cover is one of the highest of any flooded forest in Nova Scotia. Alternate-leaved dogwood, red-osier dogwood and cow-parsnip also occur more frequently than in other flooded forests. The herbaceous layer is well developed with high fern cover. Ostrich fern, wood goldenrod and cow-parsnip are characteristic. Bryophyte cover is reduced.

***Environmental Setting:*** FP4 is mainly associated with fresh to moist, deep nutrient rich alluvium. It occurs on actively-flooded floodplains and low riparian slopes. This VT is usually found in Cape Breton, but can also occur in central and northern areas of the mainland. Annual or biannual flooding is typical, but longer return intervals have been observed. FP4 is found in southeastern New Brunswick but is absent from Prince Edward Island.

***Successional Dynamics:*** The Balsam poplar – White spruce / Ostrich fern – Cow-parsnip forest is an early to mid-successional VT. In cooler areas of the province it may persist as a late successional stage, but elsewhere it will succeed to FP1 (Sugar maple – White ash / Ostrich fern – Wood goldenrod). On less active floodplains, the VT may transition to FP6 (White spruce / Wood goldenrod / Shaggy moss). This dynamic ecosystem follows herb and shrub dominated vegetation types on newly formed floodplains. Disturbance agents include flood events, ice scour, insects and disease, agriculture, cottage development and tree harvesting.

### Ecological Features

This northern pioneer floodplain ecosystem provides some of the richest forest habitat in Nova Scotia. It supports numerous rare plants, many of which are largely limited to Cape Breton. These include northern wild licorice, small flowered wood rush, male fern, long-bracted green orchid, squash berry, horse-gentian and giant rattlesnake plantain, among others. The small patch ecosystem may cover several hectares, but most historically large stands have been reduced by past land use activity. Woody understory layers are especially well developed, providing cover, forage and/or nesting habitat for numerous vertebrates. Balsam from poplar buds provides an important source of tree resin collected by bees. Sites are often broken by small channels, shallow depressions, and variable micro-relief; this contributes to the site's structural complexity and important microhabitat. Like other floodplain forests, this ecosystem promotes riparian connectivity, stream bank stability, and helps maintain climatic conditions along the land-water interface.

| Characteristic Plants | FP4 | |
|---|---|---|
| | Freq. (%) | Cover (%) |
| Balsam poplar | 100 | 41.4 |
| White spruce | 100 | 12.1 |
| Sugar maple | 71 | 6.4 |
| White ash | 57 | 17.3 |
| Elm | 29 | 8.5 |
| Red maple | 29 | 5.0 |
| Ironwood | 29 | 0.5 |
| **Tree Layer (Mean % Cover)** | | **72** |
| Choke cherry | 100 | 12.9 |
| White ash | 86 | 9.5 |
| Sugar maple | 86 | 8.5 |
| Balsam poplar | 86 | 5.4 |
| Speckled alder | 57 | 8.8 |
| Wild apple | 57 | 3.5 |
| Alternate-leaved dogwood | 57 | 1.1 |
| Elm | 43 | 6.3 |
| White spruce | 43 | 2.4 |
| Red raspberry | 43 | 0.7 |
| Ironwood | 29 | 1.5 |
| Meadow-sweet | 29 | 0.8 |
| Red-osier dogwood | 29 | 0.5 |
| Serviceberry | 29 | 0.3 |
| Balsam fir | 29 | 0.1 |
| Virgins bower | 29 | 0.1 |
| **Shrub Layer (Mean % Cover)** | | **46** |
| Ostrich fern | 100 | 35.5 |
| Sensitive fern | 86 | 11.4 |
| Wood goldenrod | 71 | 1.9 |
| Cow-parsnip | 57 | 8.3 |
| Meadow-rue | 57 | 2.9 |
| Coltsfoot | 57 | 2.0 |
| Creeping buttercup | 57 | 0.8 |
| Jewelweed | 43 | 3.0 |
| Small enchanter's nightshade | 43 | 3.0 |
| Tall white aster | 43 | 1.0 |
| Late goldenrod | 43 | 0.8 |
| Dwarf raspberry | 43 | 0.4 |
| Calico aster | 43 | 0.1 |
| Field horsetail | 43 | 0.1 |
| Lady fern | 43 | 0.1 |
| Long-stalked sedge | 43 | 0.1 |
| Ribless woodland sedge | 43 | 0.1 |
| Large enchanter's nightshade | 29 | 2.6 |
| Agrimony | 29 | 2.3 |
| Bittersweet | 29 | 1.0 |
| White avens | 29 | 1.0 |
| Hooked agrimony | 29 | 0.5 |
| Horse-gentian | 29 | 0.5 |
| Dandelion | 29 | 0.3 |
| Bladder sedge | 29 | 0.1 |
| Blue joint | 29 | 0.1 |
| Brome-like sedge | 29 | 0.1 |
| Common speedwell | 29 | 0.1 |
| Sweet-scented bedstraw | 29 | 0.1 |
| Tall buttercup | 29 | 0.1 |
| Yellow violet | 29 | 0.1 |
| **Herb Layer (Mean % Cover)** | | **56** |
| Shaggy moss | 57 | 12.8 |
| **Bryo-Lichen Layer (Mean % Cover)** | | **7** |

## Distinguishing Features

A dominant balsam poplar overstory with a strong understory of shrubs and herbs is typical. Evidence of regular flooding is apparent with debris piles. Choke cherry and alder are usually abundant; red-osier and alternate-leaved dogwoods typically present. Meadow rue, ostrich fern and sensitive fern are very common.

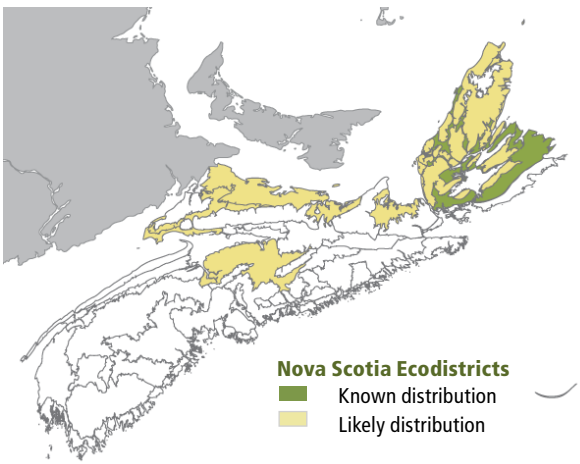
*Ostrich fern*

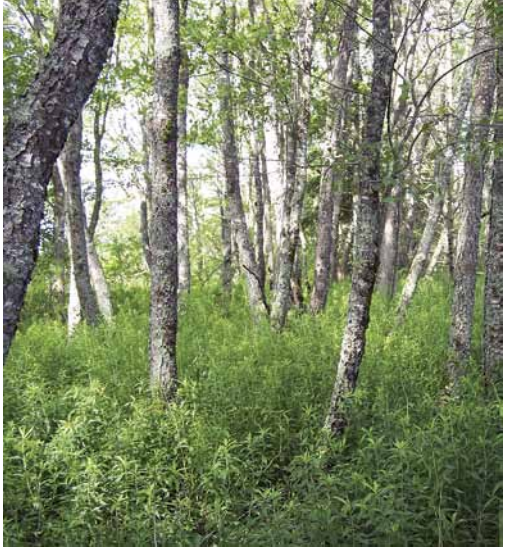
## Site Characteristics

| | |
|---|---|
| Slope Position: | Level[10] |
| Surface Stoniness: | (Non - Slightly)[10] |
| Bedrock Outcrop: | (Non-rocky)[10] |
| Elevation Range: | 9 - 60m |
| Slope Gradient: | Level[10] |
| Aspect: | None[10] |
| Exposure: | Mod. sheltered[7] Moderate[3] |
| Microtopography: | Level[10] |
| Drainage: | Rapid[6] Well[2] Moderately well[1] Imperfect[1] |

## Soil Characteristics

| | |
|---|---|
| Soil Type: | ST8C[6] ST8[3] ST9[1] |
| Parent Material: | Alluvium[10] |
| Rooting Depth (cm): | (30-45)[3] (>45)[7] |
| Duff Thickness (cm): | (0-5)[4] nd[6] |





*Reynolds Bridge, Upper Stewiacke, Colchester County*

# FP5

## Black cherry – Red maple / Rough goldenrod – Jack-in-the-pulpit

*Prunus serotina – Acer rubrum / Solidago rugosa – Arisaema triphyllum*

**n=12**

***Concept:*** This relatively uncommon deciduous forest is found on floodplains and river terraces across mainland Nova Scotia. The Black cherry - Red maple / Rough goldenrod - Jack-in-the-pulpit Vegetation Type (VT) is an early to mid-successional forest characterized by prominent black cherry and by a moderately broad group of floodplain and upland understory species. This is a relatively temperate forest.

***Vegetation:*** Canopy layers are well developed in most FP5 sites, but younger or poorly-developed stands have lower, more widely-spaced, trees. Black cherry is prominent but may co-dominate with red maple or, less often, with white spruce. Other tree species are less common and may be restricted to the understory. The shrub layer is very well developed with the highest mean cover of any flooded forest in Nova Scotia. Black cherry, choke cherry and beaked hazelnut are characteristic of the woody understory. Herbaceous cover is high but composed of a somewhat variable mix of upland and floodplain species. Many associated plants are tolerant of disturbance and may be found on fresh to moist upland soils (e.g. rough goldenrod, dwarf raspberry, red raspberry, tall white aster). Bryophyte development is usually reduced except in less actively flooded sites, where shaggy moss cover may be high.

***Environmental Setting:*** FP5 is mainly associated with fresh to moist, nutrient rich to very rich alluvium soils. Soil depth, texture, and coarse fragment content is somewhat variable, but moderately deep loams, with few coarse fragments and reduced humus accumulation, are typical. The majority of sites are flooded annually or biannually, but some stands occur on infrequently flooded terraces. Most occurrences are in central and northern areas but some are in the Annapolis Valley ecodistrict. Black cherry has been found scattered on floodplains of southern Cape Breton, but because of the small percentage of black cherry on these site, they are not listed as FP5. Canadian occurrences are limited to Nova Scotia and parts of southern New Brunswick.

***Successional Dynamics:*** The Black cherry - Red maple / Rough goldenrod - Jack-in-the-pulpit forest is expressed at early to mid-successional stages. It may persist, as described, for long durations but most occurrences are expected to succeed to FP1 (Sugar maple – White ash / Ostrich fern – Wood goldenrod) or possibly FP2a (Red maple – Red oak / Bellwort – Nodding trillium variant Sugar maple). The majority of stands are found near agriculture or other disturbed areas. Disturbance agents include flooding, tree harvest, cottage development, domestic animal grazing, ice scour and disease (especially black knot fungus).

### Ecological Features

The Black Cherry – Red Maple / Rough Goldenrod – Jack-in-the-pulpit forest is a relatively uncommon temperate pioneer ecosystem. It occurs as a small patch often in, or adjacent to, areas strongly shaped by past land-use activity. The closed canopy stand and its dense woody understory may provide important forage and nesting habitat for riparian wildlife. Beaked hazelnut, an important mast species, is especially common in this forest, but few rare plants are documented (e.g. early leaf brome grass, Philadelphia panic grass, black ash and Canada wood nettle). Larger intact tracts of this forest contribute to riparian connectivity, stream channel stability and aquatic health.

| Characteristic Plants | FP5 | |
|---|---|---|
| | Freq. (%) | Cover (%) |
| Black cherry | 100 | 38.2 |
| Red maple | 75 | 9.6 |
| White ash | 42 | 11.6 |
| White spruce | 33 | 10.3 |
| Red oak | 25 | 6.7 |
| Balsam fir | 25 | 5.0 |
| Ironwood | 25 | 2.3 |
| Trembling aspen | 17 | 9.0 |
| Serviceberry | 17 | 5.0 |
| Elm | 17 | 3.5 |
| **Tree Layer (Mean % Cover)** | | **64** |
| Black cherry | 83 | 26.9 |
| Red raspberry | 75 | 4.6 |
| Beaked hazelnut | 67 | 14.1 |
| Choke cherry | 58 | 35.7 |
| Red maple | 58 | 8.9 |
| Speckled alder | 58 | 4.5 |
| Hawthorns | 58 | 1.0 |
| Wild raisin | 58 | 0.9 |
| Alternate-leaved dogwood | 50 | 1.0 |
| Common blackberry | 50 | 0.8 |
| White spruce | 42 | 2.4 |
| White ash | 42 | 1.6 |
| Meadow-sweet | 42 | 0.2 |
| Balsam fir | 33 | 5.5 |
| Virgins bower | 33 | 4.6 |
| Highbush cranberry | 33 | 2.4 |
| **Shrub Layer (Mean % Cover)** | | **72** |
| Sensitive fern | 100 | 11.4 |
| Meadow-rue | 92 | 2.4 |
| Rough goldenrod | 83 | 14.7 |
| Dwarf raspberry | 75 | 11.2 |
| Bladder sedge | 67 | 1.1 |
| Jack-in-the-pulpit | 67 | 0.4 |
| Late goldenrod | 58 | 5.7 |
| Tall white aster | 58 | 5.3 |
| Graceful sedge | 58 | 3.4 |
| Nodding trillium | 58 | 2.4 |
| Brome-like sedge | 58 | 1.2 |
| Live-forever | 58 | 0.3 |
| Lady fern | 50 | 1.5 |
| Violets | 50 | 0.5 |
| Wild lily-of-the-valley | 50 | 0.3 |
| Cut-leaved avens | 50 | 0.1 |
| Ostrich fern | 42 | 4.4 |
| Calico aster | 42 | 1.2 |
| Rough bedstraw | 42 | 1.2 |
| Evergreen wood fern | 42 | 0.3 |
| Canada goldenrod | 33 | 9.6 |
| White avens | 33 | 1.3 |
| Small enchanter's nightshade | 33 | 1.1 |
| Spinulose wood fern | 33 | 0.9 |
| Jewelweed | 33 | 0.6 |
| Strawberry | 33 | 0.4 |
| Wild rye grass | 33 | 0.3 |
| **Herb Layer (Mean % Cover)** | | **68** |
| Atrichum moss | 58 | 2.9 |
| Shaggy moss | 42 | 11.8 |
| **Bryo-Lichen Layer (Mean % Cover)** | | **7** |

## Distinguishing Features

Black cherry is required to confirm this vegetation type found on floodplains and river terraces. Asters, goldenrods and sedges are extensive. Sites may not always be flooded annually. Sensitive fern and meadow rue is usually present.

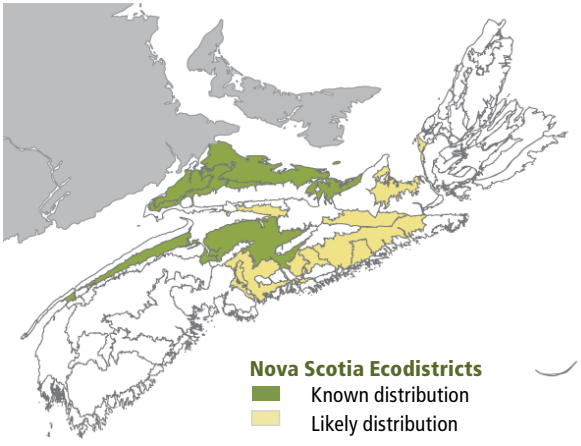
*Jack-in-the-pulpit*

## Site Characteristics

| | |
|---|---|
| Slope Position: | Level[10] |
| Surface Stoniness: | (Non - Slightly)[9] nd[1] |
| Bedrock Outcrop: | (Non-rocky)[10] |
| Elevation Range: | 12 - 49m |
| Slope Gradient: | Level[10] |
| Aspect: | South[1] None[9] |
| Exposure: | Mod. sheltered[3] Moderate[2] Sheltered[1] nd[4] |
| Microtopography: | Level[7] Slightly[2] nd[1] |
| Drainage: | Well[8] Imperfect[1] nd[1] |

## Soil Characteristics

| | |
|---|---|
| Soil Type: | ST8[7] ST12[1] nd[2] |
| Parent Material: | Alluvium[10] |
| Rooting Depth (cm): | (30-45)[1] (>45)[7] nd[2] |
| Duff Thickness (cm): | (0-5)[5] (6-10)[1] (11-20)[1] nd[3] |



*Wallace River,*
*Lower Wentworth,*
*Cumberland County*

# FP6

## White spruce / Wood goldenrod / Shaggy moss

*Picea glauca / Solidago flexicaulis / Rhytidiadelphus triquetrus*

**n=11**

***Concept:*** The White spruce / Wood goldenrod / Shaggy moss forest features prominent white spruce, variable shrub and herb development, and moderate to high bryophyte cover. Site conditions suggest this forest floods less frequently and/or for shorter durations than other flooded forest ecosystems in Nova Scotia. The ecosystem has some boreal affinity but differs from boreal floodplain forests by its array of temperate species (e.g. white ash, sugar maple, and plants such as sensitive fern and wood goldenrod).

***Vegetation:*** Canopy layers are heavily dominated by white spruce. Elm, white and yellow birch, white ash, sugar maple and balsam fir may be scattered with low cover or restricted to the understory. Black ash is an infrequent associate. Shrub cover is low to moderate depending on disturbance history, stand size and adjacent land use. Compared to most other flooded forests of Nova Scotia, herbaceous development is relatively low, but more actively flooded, usually moister, and more northern stands support higher herb cover. Mean bryophyte cover is the highest of any flooded forest type. Shaggy moss is the only common species, but some stands support high levels of Atrichum moss.

***Environmental Setting:*** FP6 is mainly associated with fresh to fresh-moist, nutrient rich alluvium soils. This Vegetation Type (VT) is most often found in Cape Breton, but can also occur in central and northern areas of Nova Scotia. Flood cycles are intermittent or of short duration. Soils are usually deep with low coarse fragment content and thin forest floor. FP6 is uncommon across northern and central New Brunswick, but absent from Prince Edward Island.

***Successional Dynamics:*** The White spruce / Wood goldenrod / Shaggy moss forest is an early to mid-successional ecosystem. Stands may succeed shrub and herb dominated vegetation, after floodplain formation, or after some level of human disturbance (usually agriculture). On most sites FP6 is expected to perpetuate or transition to FP4 (Balsam poplar – White spruce / Ostrich fern – Cow-parsnip). Stands on relatively inactive floodplains may eventually succeed to an upland forest type. Disturbance agents include flood events, insects and disease (especially spruce bark beetle) and harvesting.

### *Ecological Features*

This ecosystem displays a unique combination of upland and riparian features, and is the only floodplain forest dominated by an evergreen tree species. Infrequent and/or low duration floods promote favourable habitat conditions for ground bryophytes, fungi and some rare vascular plants. Stands may be important deer yards in cooler areas of Cape Breton and northern Nova Scotia. This ecosystem promotes riparian connectivity, reduces erosion of stream channels and banks, and augments levels of coarse woody debris and organic matter into adjacent aquatic habitats. Rare plant potential is low.

| Characteristic Plants | FP6 | |
|---|---|---|
| | Freq. (%) | Cover (%) |
| White spruce | 100 | 50.5 |
| White ash | 64 | 7.9 |
| White birch | 36 | 7.3 |
| Elm | 36 | 2.0 |
| Balsam fir | 27 | 10.3 |
| Yellow birch | 27 | 7.3 |
| Black cherry | 18 | 17.0 |
| Balsam poplar | 18 | 16.0 |
| White pine | 18 | 8.0 |
| Sugar maple | 18 | 6.0 |
| Red maple | 18 | 4.0 |
| **Tree Layer (Mean % Cover)** | | **74** |
| Sugar maple | 91 | 3.9 |
| White ash | 82 | 17.1 |
| Balsam fir | 55 | 3.7 |
| Red maple | 45 | 2.0 |
| Wild raisin | 45 | 0.1 |
| Choke cherry | 36 | 4.0 |
| Striped maple | 36 | 2.5 |
| Speckled alder | 36 | 1.3 |
| Beaked hazelnut | 36 | 0.8 |
| Fly-honeysuckle | 36 | 0.6 |
| White spruce | 27 | 2.5 |
| Yellow birch | 27 | 1.5 |
| **Shrub Layer (Mean % Cover)** | | **26** |
| Wood goldenrod | 73 | 1.1 |
| Bladder sedge | 73 | 0.7 |
| Sensitive fern | 64 | 3.1 |
| Drooping wood sedge | 64 | 0.9 |
| Meadow-rue | 64 | 0.8 |
| Starflower | 64 | 0.1 |
| Ostrich fern | 55 | 2.8 |
| Common speedwell | 55 | 1.0 |
| Calico aster | 55 | 0.3 |
| Coltsfoot | 45 | 3.4 |
| Lady fern | 45 | 2.4 |
| Tall white aster | 45 | 1.9 |
| Evergreen wood fern | 45 | 1.8 |
| Short husk | 45 | 1.0 |
| Wild lily-of-the-valley | 45 | 0.5 |
| Long-stalked sedge | 36 | 2.0 |
| Creeping buttercup | 36 | 0.8 |
| Dwarf raspberry | 36 | 0.8 |
| Wood-sorrel | 36 | 0.8 |
| Red baneberry | 36 | 0.1 |
| Violets | 27 | 20.1 |
| Northern beech fern | 27 | 6.3 |
| Spinulose wood fern | 27 | 3.5 |
| Bloodroot | 27 | 1.7 |
| New York fern | 27 | 1.7 |
| Cow-parsnip | 27 | 0.7 |
| Wood aster | 27 | 0.7 |
| Jewelweed | 27 | 0.5 |
| Stinking Willie | 27 | 0.4 |
| **Herb Layer (Mean % Cover)** | | **30** |
| Shaggy moss | 82 | 36.0 |
| Schreber's moss | 45 | 7.2 |
| Stair-step moss | 27 | 19.0 |
| **Bryo-Lichen Layer (Mean % Cover)** | | **41** |

## Distinguishing Features

Sites for this softwood forest occupy a floodplain or river terrace setting that is flooded less frequently than other floodplain forest types. Mosses are common, including shaggy, stair-step and Schreber's. Evidence of recent flooding is not always present.

*Meadow-rue*

## Site Characteristics

| | |
|---|---|
| Slope Position: | Level[10] |
| Surface Stoniness: | (Non - Slightly)[9] (Moderately)[1] |
| Bedrock Outcrop: | (Non-rocky)[10] |
| Elevation Range: | 10 - 96m |
| Slope Gradient: | Level[10] |
| Aspect: | None[10] |
| Exposure: | Sheltered[4] Mod. sheltered[3] Moderate[2] nd[1] |
| Microtopography: | Level[8] Slightly[2] |
| Drainage: | Well[4] Imperfect[3] Moderately well[2] Rapid[1] |

## Soil Characteristics

| | |
|---|---|
| Soil Type: | ST8[3] ST9[3] ST8-C[2] ST11[1] nd[1] |
| Parent Material: | Alluvium[10] |
| Rooting Depth (cm): | (<30)[1] (30-45)[2] (>45)[5] nd[2] |
| Duff Thickness (cm): | (0-5)[5] (6-10)[1] nd[4] |