Canadian Forest Communities

Canada's forests have been separated into eight distinct forest regions, each having its own dominant species and stand type.



FOREST REGION	LOCATION	PREDOMINANT TREE SPECIES
Coastal	British Columbia	western redcedar, western hemlock, Sitka spruce, Douglas-fir
Montane	British Columbia and Alberta	Douglas-fir, lodgepole pine, ponderosa pine, trembling aspen
Columbia	British Columbia	western redcedar, western hemlock, Douglas-fir
Subalpine	British Columbia and Alberta	Engelmann spruce, subalpine fir, lodgepole pine
Boreal	northern Canada	white spruce, black spruce, balsam fir, jack pine, white birch, trembling aspen, tamarack, willow
Carolinian (Deciduous)	southwestern Ontario	beech, maple, black walnut, hickory, oak
Great Lakes–St Lawrence	central Canada	red pine, eastern white pine, eastern hemlock, yellow birch, maple, oak
Acadian	Maritimes	red spruce, balsam fir, yellow birch

Table 1: Canada's eight distinct forest regions (NRCAN, 2022)

Coastal Rainforest Region

The Coastal region of British Colombia is home to the only temperate rainforests in Canada and one of the most diverse and productive ecosystems on the globe! Known for its gigantic and mystical redcedarhemlock forests, the coastal rainforests of British Columbia are truly breathtaking.

The logging industry has been an economic driver within the coastal rainforests of BC for over 100 years. Nearly 50% of productive old growth coastal forest has been logged in BC (Mackinnon 2003). Unlike much of Eastern Canada, logging on the west coast has not resulted in land conversion to agriculture. Logged land in coastal BC is replaced with planted second growth forests for future logging. Old growth Coastal forests exhibit a wide variety in structural complexity including ranges in tree heights, canopy gap sizes, and dead wood abundance. Increases in structural complexity are correlated with increases in plant diversity, vertebrate and invertebrate communities, increased richness and productivity of arboreal and understory plants, and high habitat diversity for vertebrate species (Blackwell, Hedberg and Trofymow 2002).

Predominant species in Coastal BC which can be planted in your mini forests include western redcedar, western hemlock, Sitka spruce, Douglas-fir, amabilis fir, red alder, western yew, western white pine, and grand fir. Note that the lists below do not represent specific forest communities, but rather, list species present within the Coastal Rainforest region. It is recommended to inventory local forests and seek support from local holders of ecological knowledge.

Species:

Canopy	Sub-Canopy	Understory	Shrub
Abies amabilis	Chamaecyparis	Alnus alnobetula subsp.	Arbutus menziesii
	nootkatensis	sinuata	
Acer macrophyllum	Thuja plicata	Malus fusca	Arctostaphylos bakeri
Picea sitchensis	Pinus contorta var. contorta	Sambucus cerulea	Gaultheria shallon
Pinus monticola		Prunus emarginata	Rubus parviflorus
Pseudotsuga menziesii		Acer circinatum	Sambucus callicarpa
Abies grandis			Rubus spectabilis
Tsuga heterophylla			Oplopanax horridus
			Oemleria cerasiformis

When planting your Mini Forest in the Coastal Rainforest Region consider:

This list represents species present within this region, but that do not necessarily grow within the same communities; it is important to evaluate your site's conditions before developing a plant list.

Montane Forest Region

The Montane Forest region is in the southern interior of the Canadian Rockies. Elevation is a key determinant of forest composition in the Rockies. Canadian Montane forests are solely found at mid altitude and receive low levels of annual precipitation. The dry conditions of Montane forests frequently experience forest fires which influence the composition of the forest (Mcdowell and Lloyd 1999). In recent years, the Mountain Pine Beetle has had catastrophic adverse impacts on the predominant pine species in the Montane forests.

Species:

Canopy	Sub-Canopy	Understory	Shrub
Abies lasiocarpa	Pinus albicaulis	Alnus rubra	Arctostaphylos bakeri
Larix occidentalis	Pinus contorta var. Iatifolia	Amelanchier alnifolia	Gaultheria shallon
Picea engelmannii	Pinus ponderosa^	Sorbus scopulina	Mahonia aquifolium
Picea glauca	Populus tremuloides	Sorbus sitchensis	Menziesia ferruginea
Pinus contorta	Populus trichocarpa	Taxus brevifolia	Ribes laxiflorum
Pinus monticola	Tsuga mertensiana		
Pseudotsuga menziesii			
Tsuga heterophylla			

^shade intolerant

When planting your Mini Forest in the Columbia Region consider:

- The list above represents species that are found within the region but that <u>do not</u> necessarily grow together.
- Seek local ecological knowledge and reference local forest communities to determine your plant list. Refer to the Mini Forest Curriculum for further guidance.

Columbia Forest Region

Columbia forests, also known as "interior rain forests" or "snow forests", are the planet's only temperate inland rainforests! Located at low to middle elevation in southeastern British Columbia, the Columbia Forest region is home to magnificent old growth Redcedar and Western Hemlock forests. The Columbia Region and the Coastal rainforests share many ecological features with the main differences between them found in their hydrologic cycles and exposure to disturbance events. Annual precipitation is significantly lower in the Columbia region compared to the Coastal Rainforests. Greater levels of snow melt contribute to increased moisture levels needed to create ideal growing conditions for eastern redcedar and western hemlock within the Columbia Region. Frequent occurrence of forest fires and avalanches in the Columbia Forests and resulting stand replacement are not observed in Coastal Rainforests (Ketcheson, et al. 1991). Note that the lists below do not represent specific forest communities, but rather, identify species present within the Columbia Forest region. It is recommended to inventory local forests and seek support from local holders of ecological knowledge.

Upland Species:

Canopy	Sub-Canopy	Understory	Shrub
Pinus monticola	Abies lasiocarpa	Alnus rubra	Amelanchier alnifolia
Pseudotsuga menziesii	Picea engelmannii	Juniperus scopulorum	Arctostaphylos uva-ursi
Thuja plicata	Pinus contorta	Pinus albicaulis	Corylus cornuta
Tsuga heterophylla		Populus trichocarpa	Gaultheria shallon
		Sorbus scopulina	Lonicera involucrata
			Rubus parviflorus
			Sambucus cerulea
			Sambucus racemosa

Lowland Species:

Canopy	Sub-Canopy	Understory	Shrub
Abies amabilis	Abies grandis var.	Acer glabrum	Cornus stolonifera
	idahoensis		
Pinus monticola	Cupressus nootkatensis	Alnus alnobetula subsp.	Lonicera involucrata
		sinuata	
Thuja plicata	Thuja plicata	Crataegus douglasii	Physocarpus capitatus
Pseudotsuga menziesii		Oplopanax horridus	Rosa nutkana
Picea sitchensis		Sorbus scopulina	Rubus spectabilis
Tsuga heterophylla		Sorbus sitchensis	Sambucus racemosa
		Vaccinium parvifolium	Symphoricarpos albus
			Vaccinium parvifolium

When planting your Mini Forest in the Columbia Region consider:

The list above represents species that are found within the region but that <u>do not</u> necessarily
grow together. Some species above, such as Douglas Maple, Thimbleberry, and Red Raspberry
dominate early succession forests, whereas Paper Birch, Douglas Fir, Trembling Aspen, and

Mountain Ash thrive in mid succession forests. Western Red Cedar and Western Hemlock dominate the canopy once the stand is 200+ years old.

• This region boasts diverse elevations, aspects, and hydrology; it is important to evaluate your site's conditions before developing a plant list.

Subalpine Forest Region

Subalpine forests are cold weather forests located at high elevations that span from the Pacific coast to the eastern boundaries of the Rockies in Alberta. Species growing within the subalpine forests must be adapted to growing on steep snow-covered mountain sides which are prone to disturbance events from avalanches and forest fires. This region is a transition zone between the forests at lower elevations and the treeless alpine zone above (Turner and Kuhlmann 2014).

Species:

Canopy	Sub-Canopy	Understory	Shrub
Abies lasiocarpa	Betula papyrifera	Callitropsis nootkatensis	Kalmia microphylla^
Pseudotsuga menziesii	Larix lyallii^	Sorbus sitchensis	Loiseleuria procumbens^
Picea engelmannii	Pinus albicaulis	Taxus berifolia	Phyllodoce empetriformis
Picea glauca	Populus tremuloides^		Rhododendron albiflorum^
Pinus contorta			Rhododendron macrophyllum
Pinus flexilis			Salix glauca
Tsuga mertensiana			Spriraea densiflora
Larix lyallii^			Vaccinium caespitosum^
Larix occidentalis^			

^shade intolerant

When planting your Mini Forest in the Columbia Region consider:

- This forest community is open and less dense than forests found at lower elevations. The mini forest approach will need to be tailored to reflect the forest structure found within this region (high density may not be appropriate).
- The species listed above may not grow within the same forest community. Engage with local ecological knowledge keepers and inventory reference forests to inform your plant palette.

Boreal Forest Region

One of the largest Intact forests ecosystems on the planet, the Canadian Boreal Forest stretches from Newfoundland all the way to the Yukon, covering 60% of Canada's land mass (Nature Conservancy of Canada, 2023). The Boreal Forest is often thought to be dominated by old growth; however, this is not the case: The vegetation in the Boreal is young relative to temperate forests in Canada. Disturbance events such as forest fires, insect outbreaks, and severe storms are highly frequent across the Boreal region. The species within the Boreal Forest are highly adapted to disturbance events and in some cases even require them to propagate. For example, Jack Pine and Black Spruce contain **serotinous** and **semi-serotinous cones** that require extreme heat from forest fires to release their seeds.

The upland areas within the Boreal Forest are dominated by Jack Pine, Trembling Aspen, and Paper Birch. Black Spruce, Tamarack and Grey alder occupy the lowland areas. Species such as Balsam fir and White Spruce can be found across both upland and lowland forests.

The lists below do not represent specific forest communities, but rather, list species present within the Boreal Forest region.

Upland Species:

Canopy	Sub-Canopy	Understory	Shrub
Abies balsamea	Abies balsamea	Prunus pensylvanica	Gaultheria procumbens
Betula papyrifera	Betula papyrifera	Prunus virginiana	Lonicera canadensis
Picea glauca	Picea glauca	Sorbus americana	Linnea borealis
Pinus banksiana	Pinus banksiana	Sorbus decora	Symphoricarpos spp.
		Corylus cornuta	Taxus canadensis
			Vaccinium myrtilloides

Lowland Species:

Canopy	Sub-Canopy	Understory	Shrub
Abies balsamea	Abies balsamea	Andromeda polifolia	Chamaedaphne calyculata
Larix laricina	Alnus incana ssp. rugosa	Betula glandulosa	Rubus pubescens
Picea glauca	Larix laricina	Ilex mucronata	Rubus chamaemorus
Picea mariana	Picea glauca	Kalmia polfolia	Vaccinium vitis-idaea
	Picea mariana	Rhododendron groenlandicum Ribes hudsonianum	

When planting your Mini Forest in the Boreal region consider:

- The woody species forest diversity within this region is generally lower than the recommended 30 species minimum. Emulating the local ecology is recommended over meeting this threshold.
- This method recommends planting late succession species. Trembling aspen and paper birch are considered early succession in forest regions south of the Boreal, however in this region, they should be considered late succession. Reflect the local forest communities in your planting.

Carolinian (Eastern Deciduous) Forest Region

Spanning across much of eastern North America, the Carolinian forests in southern Ontario represent the northern limit of this forest region in North America. The Carolinian Forest is Canada's southernmost forest ecosystem and is home to an extraordinary amount of biological diversity. Unfortunately, the impressive amount of biodiversity in the Carolinian forest is also the most threatened in Canada. Occupying only one per cent of Canada's landmass, Ontario's Carolinian forests support an estimated 50 per cent of Canada's species-at-risk (Canada, 2014). Anthropogenic activities such as agriculture, logging, urban expansion, and industrialization have had profound adverse impacts to the Carolinian Forests of southern Ontario: Today nearly 90% of these forests have been lost (Canada, 2014).

Note that the lists below do not represent specific forest communities, but rather, list species present within the Carolinian Forest region.

Upland Species:

Canopy	Sub-Canopy	Understory	Shrub
Acer saccharum	Acer rubrum	Cornus alternifolia	Ribes cynosbati
Carya glabra	Aesculus glabra	Cornus florida	Rhus aromatica
Celtis occidentalis	Betula alleghaniensis	Hamamelis virginiana	Rubus odoratus
Fagus americana	Betula lenta*	Ostrya virginiana	Sambucus racemosa
Fraxinus americana	Carya cordiformis	Prunus virginiana	Viburnum acerifolium
Liriodendron tulipifera	Magnolia acuminata		
Pinus strobus	Prunus serotina		
Quercus alba	Quercus ellipsoidalis		
Quercus muehlenbergii	Sassafras albidum		
Quercus rubra			
Tilia americana			
Tsuga canadensis			

Lowland Species:

Canopy	Sub-Canopy	Understory	Shrub
Acer nigrum	Acer rubrum	Asimina triloba	Cornus racemosa
Acer saccharinum	Betula alleghaniensis	Carpinus caroliniana	Lindera benzoin
Carya laciniosa	Carya ovata	Cornus alternifolia	Ribes americanum
Celtis occidentalis	Fraxinus pennsylvanica	Cornus florida	Ribes triste
Fraxinus quadrangulata	Prunus serotina	Crataegus punctata	Rubus occidentalis
Platanus occidentalis	Sassafras albidum	Prunus virginiana	Rubus pubescens
Quercus bicolor		Viburnum lentago	Zanthoxylum
			americanum
Quercus macrocarpa			
Quercus palustris			
Quercus shumardii			
Ulmus americana			

^{*} Native classification contested. Present just south of the Canada-US border.

Trees and shrubs at Risk in the Carolinian Zone

- American chestnut (Castanea dentata)
- Butternut (*Juglans cinerea*)

- Red mulberry (*Morus rubra*)
- Flowering dogwood (Cornus florida)
- Cucumber tree (Magnolia acuminata)
- Hop tree (*Ptelea trifoliata*)
- Kentucky coffee tree (Gymnocladus dioicus)
- Blue Ash (Fraxinus quadrangulata)
- Black Ash (Fraxinus nigra)

When planting your Mini Forest in the Carolinian region consider:

- There are several different forest community types within this region, so it is recommended that you develop a plant list based on your site's soils and hydrology.
- Although the Carolinian Forest region is also referred to as the deciduous forest, this region does in fact support coniferous species too.
- If you choose to include species-at-risk in your plant palette, seek these plants from a reliable source and ensure you are following local guidelines and regulations.
- The non-native white mulberry (*Morus alba*), and its hybrids with the native red mulberry (*Morus rubra*), are often labeled as red mulberry in nurseries. There is no known reliable supply of red mulberry in Canada.

Great Lakes St Lawrence Forest Region

The Great Lakes St Lawrence region is Canada's 2nd largest forest after the Boreal Forest, stretching from eastern Manitoba to the Gaspé Peninsula. The Great Lakes St Lawrence region is known for its fertile soil and forests abundant with both deciduous and coniferous species (Crins, et al. 2009). Historically this landscape was dominated by old growth White Pine, representing nearly 50% of the forest cover prior to Europeans settlement (Wilson & Gray, 2001). Today less than 2% of old growth white pine remains (Wilson & Gray, 2001). Much like the Carolinian and Acadian Forest regions, this region too was drastically cleared for agriculture and extractive industries such as logging and leather tanning. Although today's remnant forests consist of mainly deciduous species, this region has historically been comprised of mixed woods. The increase of maple is largely due to logging and fire suppression. The opening of the canopy created ideal conditions for species that are abundant seed producers such as maples.

Upland Species:

Canopy	Sub-Canopy	Understory	Shrub
Acer saccharum	Acer rubrum	Acer pensylvanica	Dirca palustris
Fagus americana	Betula alleghaniensis	Cornus alternifolia	Diervilla lonicera
Fraxinus americana	Carya cordiformis		Ribes cynosbati
Picea glauca	Prunus serotina	Ostrya virginiana	Sambucus racemosa
Pinus strobus		Prunus virginiana	Taxus canadensis
Quercus alba			
Quercus rubra			
Tilia americana			
Tsuga canadensis			

Lowland Species:

Canopy	Sub-Canopy	Understory	Shrub
Abies balsamifera	Acer rubrum	Acer spicatum	Ribes americanum
Acer saccharinum	Betula alleghaniensis	Carpinus caroliniana	Ribes triste
Fraxinus nigra	Carya ovata	Cornus alternifolia	Rubus occidentalis
Larix laricina	Fraxinus pennsylvanica	Prunus virginiana	Rubus pubescens
Picea mariana	Prunus serotina	Viburnum lentago	
Quercus macrocarpa	Salix amygdaloides		
Ulmus americana	Salix nigra		
	Thuja occidentalis		

Acadian Forest Region

One of the most diverse forest ecosystems in Canada, the Acadian Forest, spans the maritime provinces of PEI, Nova Scotia, and New Brunswick. This forest zone occurs within the transitional landscape between the hardwood forests to the south and the boreal forests to the north, thus harboring a mix of species that can be found in the two neighbouring forest zones. Red Spruce is one of the most prominent tree species of the Acadian Forest, which may be mixed with combinations of White and Black Spruce; Sugar and Red Maple; Balsam Fir; Yellow, White, and Grey Birch; American Beech; White Pine; White Ash; Eastern Hemlock; and Trembling and Large-tooth Aspen (Simpson 2008).

The Acadian region has the longest history of colonial development and land conversion in Canada; dating back to the 1600's with the initial European settlement of North America (Noseworthy and Beckley 2020). Logging, land clearing, agriculture, and intensive forest management practices have drastically changed the forest composition of the Acadian region (Simpson 2008). In highly impacted areas such as PEI, up to 70% of forested areas were cleared for agriculture (Noseworthy and Beckley 2020). Today less than 5% of old growth forests remains in the Acadian region where they are isolated to logging-inaccessible valleys and gorges (Nature Conservancy of Canada 2023).

Since European settlement, the Acadian region has undertaken the process of Borealization. Beginning in the early 20th century the Acadian region saw a large increase in forest cover due to agricultural abandonment. The bare landscape of abandoned agricultural fields favor boreal species, which are adapted to exposed environments, so these were favored in reforestation efforts. The Acadian region has seen drastic increases in (short-lived) boreal species; Balsam Fir, White Birch, Jack Pine, Black Spruce, Trembling Aspen, Tamarack and White Spruce while seeing declines in (long-lived, late successional) temperate species; Red Spruce, Sugar Maple, Yellow Birch, Eastern Hemlock, American Beech, and Eastern White Cedar (Noseworthy and Beckley 2020).

The lists below do not represent specific forest communities, but rather, list species present within the Acadian Forest region. A great resource for Atlantic Canada is available at https://novascotia.ca/natr/forestry/veg-types/printable.asp.

Upland Species:

Canopy	Sub-Canopy	Understory	Shrub
Tsuga canadensis	Acer rubrum	Amelanchier canadensis	Corylus cornuta
Acer saccharum	Betula alleghaniensis	Ostrya virginiana	Viburnum lantanoides
Fagus grandifolia	Juglans cinerea	Acer pensylvanicum	Rubus occidentalis
Picea rubens	Fraxinus americana	Prunus virginiana	Lonicera canadensis
Pinus strobus	Picea glauca	Cornus alternifolia	Sambucus racemosa
Tilia americana	Pinus banksiana	Viburnum trilobum	Rosa acicularis
Quercus rurbra	Prunus serotina		Vaccinium myrtilloides

Lowland Species:

Canopy	Sub-Canopy	Understory	Shrub	
Fraxinus nigra	Abies balsamea	Alnus rugosa	Chamaedaphne calyculata	
Ulmus americanaa	Thuja occidentalis	Betula pumila	Rubus chamaemorus	
Picea mariana	Betula populifolia		Cornus sericea (edge)	
	Acer rubrum		Sambucus canadensis (edge)	

When planting your Mini Forest in the Acadian region consider:

- Adopting temperate species that have experienced declines such as Red Spruce, Sugar Maple, Yellow Birch, Eastern Hemlock, and Eastern White Cedar.
- Selecting species based on the drainage/moisture level of your site. (e.g., Red Spruce will thrive on sites with moderate moisture, whereas Black Spruce prefers wet sites).
- Understory species could include Striped Maple, Chokecherry, or Serviceberry species.
- The Atlantic Canada Conservation Data Centre (ACCDC) can be contacted for provincial plant species lists and information about native species statuses.

Working with local land trusts may help to protect properties for generations into the future.

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