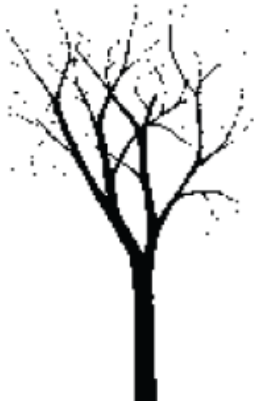


# Paper birch (Ep) - *Betula papyrifera*

Tree Species > Paper birch



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# BC Distribution of Paper birch (Ep)

Range of Paper birch



Paper birch has a transcontinental (incomplete) North American distribution. It has wide climatic and edaphic amplitudes and, in BC, grows predominantly as a minor species in the montane boreal forest. This picture shows the typical growth form of paper birch.

# Geographic Range and Ecological Amplitudes

## Description

Paper birch is a medium-sized (<40 m tall), deciduous broad-leaved tree, at maturity with a narrowly oval, open crown, ascending branches, slender, often curved, stem, and papery bark, with irregular, rough sections. Its wood is used for veneer, pulp, and many specialty products. It is an important browse tree — its seed, buds, and bark are eaten by wildlife.

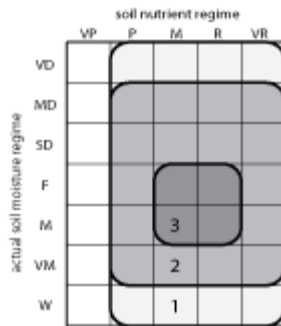
## Geographic Range

Geographic element:  
North American transcontinental-incomplete

Distribution in Western North America:  
(north and central) in the Pacific region; **north**, central, and (south) in the Cordilleran region

## Ecological Amplitudes

**Climatic amplitude:**  
montane boreal - cool temperate - (cool mesothermal)



generalized edaphic amplitude of paper birch according to actual soil moisture and nutrient regimes

**Orographic amplitude:**  
submontane - **montane**

Occurrence in biogeoclimatic zones:  
(MS), **BWBS, SBS**, (SBPS), (PP), IDF, **ICH**, (CDF), (CWH)

### Edaphic Amplitude

Range of soil moisture regimes:  
(very dry) - moderately dry - slightly dry - **fresh - moist** - very moist - (wet)

Range of soil nutrient regimes:  
poor - **medium - rich** - very rich

Paper birch litter contributes to the nutrient status of forest floor by increasing its calcium, magnesium, potassium, phosphorus, and boron concentration, and reducing its aluminum, iron, manganese, and zinc concentration. The presence of birch in coniferous stands will increase decomposition and mineralization

rates, thus altering humus form. The shift in humus form from Mors to Mormoders or even Moders results in increased levels of plant-available soil nutrients. This improvement may extend into the top 3 cm of mineral soil.

## Tolerance and Damaging Agents

### Root System Characteristics

Paper birch is generally a shallow-rooted species. The bulk of the roots are in the top 60 cm; tap roots do not develop. Roots are associated with ecto and endo-mycorrhizae.

### Tolerances

tolerance to	tolerance class	comments
low light	M	probably moderately shade-tolerant
frost	H	frequent on sites with growing season frost
heat	M	in warmer climates it is infrequent on insolated sites
water deficit	M	infrequent on dry sites; like red alder, responds to drought by shedding its leaves
water surplus	H	infrequent on wet sites; tolerates flooding, and sites with a strongly fluctuating water table well
nutrient (mainly N) deficiency	M	absent in acid, very poor soils; a nutrient-sensitive species, responds well to fertilization

### Damaging Agents

damaging agent	resistance class	comments
snow	L	high snowfall will break branches rather than boles
wind	M	high winds will break the boles rather than uproot trees
risk class		
fire	M	bark is highly flammable; fire frequency is lower in pure birch stands, higher in birch-conifer mixtures
insect	L	not a major concern
fungi	L	not a major concern

**Associated tree species and successional role**

In British Columbia, paper birch grows in even-aged, pure stands or mixed with shade-tolerant conifers mainly in second-growth stands. It may be a pioneer (primary succession) on fragmental sites (talus) and is present in early and intermediate (infrequently in late seral) stages of secondary succession on floodplains and upland sites; a minor component in old-growth stands on some montane boreal sites. Paper birch may invade gaps created by windthrow of climax tree species, such as white spruce and hybrid spruce on floodplains, and retain a long-term presence.

associated tree species	occurrence class	major area of occurrence
white spruce (& hybrids)	M	mainly in montane boreal climates
black spruce	L	montane boreal climates
lodgepole pine	L	predominantly in montane boreal climates; occasionally on wet sites in southern B.C
subalpine fir	L	mainly in montane boreal climates
western hemlock	L	mainly in cool temperate climates
trembling aspen	L	mainly in montane boreal climates
common douglas	L	mainly in cool temperate climates
western redcedar	L	mainly in cool temperate climates

**Silvical Characteristics**

characteristic	interpretive class	comments
reproduction capacity	H	reproduces vegetatively from stump sprouts; the minimum age for a seed crop is about 15 years; optimum seed-bearing age is 40-70 years
seed dissemination capacity	H	dispersed by wind, particularly when blown across the snow surface
potential for natural	L	practically nil in the absence of

regeneration in low light		adequate seedbeds
potential for natural regeneration in the open	H	providing the presence of exposed mineral soil or burnt forest floor
potential initial growth rate (<5 years)	M	the best growth (about 40 cm/yr) is in partial shade and on forest floor seedbeds
response of advance regeneration to release	na	advance regeneration does not develop in the absence of adequate light and seedbeds
self-pruning capacity in dense stands	M	dense stands are infrequent
crown spatial requirements	M	varies with stand density
light conditions beneath closed-canopy, mature stands	H	associated with well developed understory vegetation
potential productivity	M	site index functions for B.C. are not available; site index (50 yr @ bh) may be $\pm 35$ m on the most productive sites
longevity	L	maturing at about 70 years, few trees live longer than 200 years

## Genetics and Notes

### Genetics

Paper birch has a large, very plastic gene pool. Six varieties are recognized, and hybridization with almost every other native species in the genus is very common.

### Notes

Paper birch produces moderately high yields of wood in a relatively short time (60 to 80 years) compared to boreal conifers. Considering its productivity, easy regeneration, and low risk of being affected by damaging agents, it is a suitable species for intensive management on some boreal sites. Considering its wildlife and aesthetic values and soil improvement capacity, it is a useful short-term or even a long-term admixture in coniferous stands [e.g., white spruce or hybrid (interior) spruce] throughout the BWBS and SBS zones. More detailed silvics information is given by:

Safford, L.O., J.C. Bjorkbom, and J.C. Zasada. 1990. *Betula papyrifera*. Pp. 158-171 in R.M. Burns and B.H. Honkala (technical coordinators) *Silvics of North America*, Vol 2. Agri. Handbook 654, USDA For. Serv., Washington, D.C.