

Mountain hemlock (Hm) - *Tsuga mertensiana*

Tree Species > Mountain hemlock



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BC Distribution of Mountain hemlock (Hm)

Range of Mountain hemlock



Mountain hemlock is characteristic of the coastal subalpine forest of western North America. This picture shows a tree island of mountain hemlock in the upper southern maritime MH parkland in early spring in the Coast Mountains.

Geographic Range and Ecological Amplitudes

Description

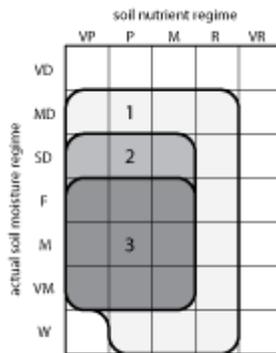
Mountain hemlock is a prevailing coastal, high-elevation, tree species. It is a small- to medium-sized (exceptionally >45 m tall), evergreen conifer, at maturity with a narrow conical crown; leader droops only slightly, branches droop or spread but tend to have an upward sweep at the tips; dark, reddish-brown bark is scaly and divided into hard, narrow, flat-topped ridges. Its moderately strong, light-coloured wood is used for small dimension lumber and pulp.

Geographic Range

Geographic element:
Western North American/Pacific and less Cordilleran

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

Ecological Amplitudes



generalized edaphic amplitude of mountain hemlock according to actual soil moisture and nutrient regimes

Climatic amplitude:

(alpine tundra) - **subalpine boreal** - cool temperate - cold (and cool) mesothermal

Orographic amplitude:

(submontane - montane) - **subalpine**

Occurrence in biogeoclimatic zones:

(lower AT), **MH**, ESSF, (upper and northern CWH)

Edaphic Amplitude

Range of soil moisture regimes:

(moderately dry) - slightly dry - **fresh - moist - very moist** - (wet)

Range of soil nutrient regimes:

very poor - poor - medium - (rich); oxylophyte

Mountain hemlock may grow under the influence of the mesothermal climate prevailing in acidic bogs in the central and northern hypermaritime portion of

the CWH zone. Like western hemlock, mountain hemlock also tolerates very poor soils. It regenerates well on acid forest floors (Mors) and coniferous decaying wood (Lignomors).

Tolerance and Damaging Agents

Root System Characteristics

Mountain hemlock is usually shallow-rooted, with fine and coarse roots confined to the forest floor. Roots are intensely mycorrhizal with both ecto- and endo-mycorrhizae.

Tolerances

tolerance to	tolerance class	comments
low light	M	less tolerant than Pacific silver fir
frost	M	tolerance of roots is low
heat	L	insolated sites are infrequent
water deficit	L	higher tolerance than that of Pacific silver fir
water surplus	M	on wet sites, it usually grows on mounds
nutrient (mainly N) deficiency	H	frequent in strongly acid, very poor soils

Frost resistance of mountain hemlock is evidently higher than that of western hemlock. However, it is doubtful if mountain hemlock would survive completely frozen ground for a prolonged period. One year-old mountain hemlock and western hemlock seedlings were killed when their roots were solidly frozen for ten days, while subalpine fir and Engelmann spruce seedlings survived such treatment (Krajina 1969). Heavy snow cover as insulation is necessary to ensure the survival of mountain hemlock, as well as western hemlock.

Damaging Agents

damaging agent	resistance class	comments
snow	M	less resistant, more resilient - a timberline species; protection-requiring on high snowpack sites
wind	L	very low resistance to windthrow

risk class		
fire	L	not a major concern in MH and wetter CWH
insect	L	not a major concern in MH and wetter CWH
fungi	L	not a major concern (e.g., Indian paint fungus, annosus root and butt rot, and laminated root rot)
other agents	M	dwarf mistletoe (<i>Arceuthobium tsugense</i> (Rosendahl) Jones)

Associated tree species and successional role

In British Columbia, mountain hemlock grows in broadly even-aged and uneven-aged, mixed-species stands, less frequently in pure, even-aged stands (after fire disturbance). It is often a pioneer species on colluvial sites, and is present in early, mid-, and late stages of secondary succession. It is a major component on old-growth stands in the MH zone and wettest ESSF subzones.

associated tree species	occurrence class	major area of occurrence
pacific silver fir	H	one of the most common associates
alaska yellow-cedar	H	one of the most common associates
subalpine fir	L	parkland MH and the wettest ESSF
engelmann spruce	L	the wettest ESSF
sitka spruce	L	hypermaritime MH
western hemlock	L	upper ICH and CWH

Silvical Characteristics

characteristic	interpretive comments class	
reproduction capacity	M	cone production begins as early as 20 years of age
seed dissemination capacity	H	most seeds fall within 500 m of the parent tree

potential for natural regeneration in low light	L	developed mainly in canopy gaps
potential for natural regeneration in the open	M	a long regeneration period, often >50 years in the MH zone after disturbance
potential initial growth rate (<5 years)	L	<10 cm/yr in the first two growing seasons
response of advance regeneration to release	H	best response in younger trees; trees with along history of suppression will support more lateral growth than height growth
self-pruning capacity in dense stands	H	dense stands are infrequent in the upper MH zone
crown spatial requirements	M	low in the upper MH
light conditions beneath closed-canopy, mature stands	M	associated with poorly developed with understory vegetation
potential productivity	L	decreases with increasing elevation; site index (50 yr @ bh) on zonal sites decreases from ± 20 m on lower subalpine sites to <10 m on upper subalpine sites
longevity	H	typically less than 500 years, reported maximum age >1,000 years

Genetics and Notes

Genetics

Individuals morphologically intermediate between western hemlock and mountain hemlock are occasionally found where the two species occupy the same site. They have been given hybrid status: *Tsuga x jeffreyi* (Henry) Henry.

Notes

Perhaps the most important use of mountain hemlock is for watershed protection and recreation. It is uncertain to what extent it will be managed solely for timber production; however, its wood, especially from old-growth is even more valuable than that of western hemlock. More detailed silvics information is given by:

Means, J.E. 1990. *Tsuga mertensiana*. Pp. 623-634 in R.M. Burns and B.H. Honkala (technical coordinators) *Silvics of North America*, Vol. 1. Agri. Handbook 654, USDA For. Serv., Washington, D.C.