

Noble Fir (*Abies procera*)

Within western Washington, noble fir is a subalpine species largely restricted to the south Cascades (Figure 75). A disjunct population also occurs at the higher elevations of the Willapa Hills.

Noble fir is a very popular ornamental tree throughout the Pacific Northwest and is considered a premiere Christmas tree. Some of its beauty is attributed to the color of the foliage (Figure 15, left), which is derived from stomatal bands on both the upper and lower surfaces of the needles. Noble fir is the tallest (89.9 m tall) and largest (290 cm diameter, 161 m³ volume)

recorded member of the true firs (genus *Abies*). It also can form pure, incredibly dense stands that can rival Douglas fir stands in total volume (Figure 76).

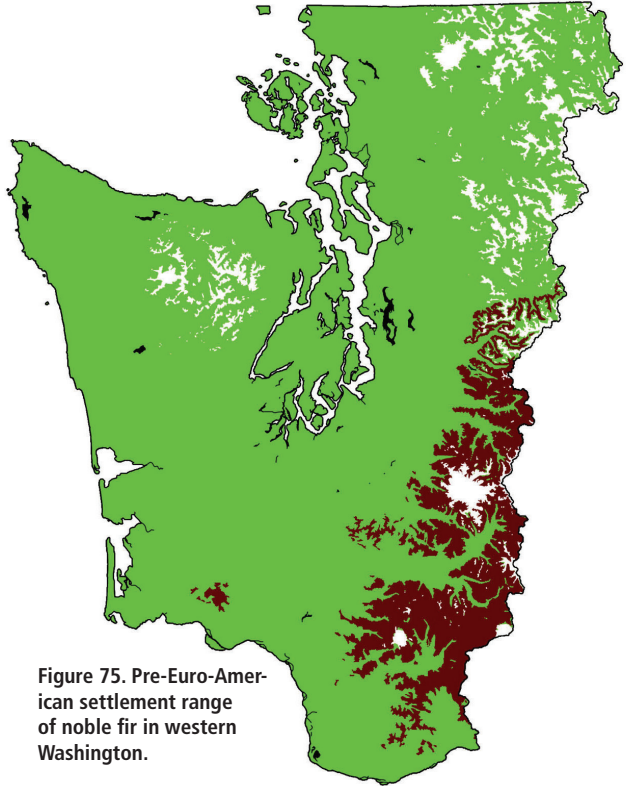


Figure 75. Pre-Euro-American settlement range of noble fir in western Washington.

In many ecological aspects, noble fir shares more in common with Douglas fir than other members of its own genus. Unlike most western true firs, noble fir is a shade-intolerant, pioneer tree that can regenerate abundantly after a severe disturbance. An important physical adaptation is its large cones, which are sparsely produced at the top of trees at maturity (Figure 77, Figure 15, left). These cones contain very large seeds, which can provide a young sprout with nutrients for up to a year while its roots are trying to find a favorable spot to grow. Like many other



Figure 76. One of the densest forests in the Pacific Northwest is surprisingly, *not* a Douglas fir forest, but this noble fir forest at the Mount Saint Helens National Volcanic Monument. This forest contains 3120 m³/ha, 64 percent of which is noble fir.



Figure 77. Noble fir cones, while not prolific, are produced near the top of the tree, providing the best opportunity for seed dispersal. Each large seed stands a better chance of survival than the multitude of tiny seed produced by a tree such as western hemlock.



Figure 78. A stunted old noble fir growing at 1500 m timberline in the south Cascades. Mount Saint Helens is visible in the distance.

true firs, the young seedlings can be very stiff and sturdy, not needing an elevated surface on which to grow. This characteristic allows noble firs to be very successful in areas with deep winter snowpacks (Figure 78). Four to five months of debris can accumulate atop the snowpack found in high elevation forests, smothering or crushing the small seedlings of species such as Douglas fir during spring snowmelt. Noble fir seedlings, even young ones, will often survive such abuse. While large seeds commonly limit seed dispersal distances, the snowy and icy environment of high-elevations can allow seeds to blow around to sometimes great distances (Figure 79).

Like Douglas fir, noble fir can regenerate quite abundantly after a severe fire (Figure 80). This quality, combined with the ability to withstand a deep snowpack, makes noble fir ideal for high-elevation forestry applications. Noble fir is the tree of choice wherever the replanting of Douglas fir is limited by snowpack. The wood of true firs is generally considered soft and weak, lacking the strength and decay resistance of Douglas fir or western larch. As such, the wood is often used for low-grade lumber products or pulp. Noble fir, however, produces a stronger and more durable wood, with a very high strength-to-weight ratio.



Figure 79. A small noble fir seedling in the middle of the pumice plain on the northeast section of Mount Saint Helens. The nearest mature noble fir to this tree is more than 5 km distant.

For this reason, noble fir along with Sitka spruce was used for airplane and ladder construction. When our ancestors discovered that noble fir did not have the poor quality wood associated with true firs, they called it larch, so that people would buy the wood. Both Oregon and Washington have a Larch Mountain, which was named for the noble fir growing atop them.

Like many other true firs, noble fir maintains a very symmetrical shape to its crown well into its second century. It also rigidly adheres to a whorl-based architecture. Young trees often appear perfectly symmetrical. Over time, exposure to wind and elements transforms the symmetrical crowns into the more individualistic crowns

typical of older forests (Figure 81). Many members of the pine family, most notably Douglas fir, continually replace their foliage through epicormic branching. Minor crown damage, from a windstorm for example, is quickly replaced by new foliage. The ability of noble fir to produce epicormic shoots or branches appears to be extremely limited; wind-damaged trees rarely recover. This, combined with susceptibility to root rots, ultimately limits the longevity of noble fir. Noble fir is abundant in old growth forests with ages up to 300, after which there is a rapid decline. A 400 year-old forest will have very few noble firs remaining, most of which will be declining.



Figure 80. Two views of pure noble fir stands. The upper photo shows a pure stand of noble fir (bluish crowns in upper left of photo), that came in very densely after the 1902 Yacolt Burn. Note the scattered noble fir trees in the bottom right of the photo, which is an unburned section of older forest. The bottom photo is the interior of a stand during the height of the biomass accumulation/stem exclusion phase of stand development — note the lack of vegetation in the understory. Also note the white, lichen-covered trunks are just beginning to develop the cracks that lead to bark appearance of mature trees. Photo below: Jerry Franklin.





Figure 81. Mature crowns of Noble fir begin to lose their symmetrical, model-conforming crowns of youth.