

Genetics-Regeneration Project to Help Yellow-cedar Adapt to Climate

By Sheila Spores, Silviculturist, and Paul Hennon, Research Plant Pathologist

The forests of Southeast Alaska have been experiencing a widespread mortality of yellow-cedar trees due to a phenomenon termed yellow-cedar decline. Yellow-cedar trees have been dying for more than 100 years on over a half a million acres in Southeast Alaska. Mortality is caused by freezing injury involving thaw-freeze weather cycles in late winter and early spring. Yellow-cedar trees become physiologically active during mild weather and fine roots are then injured during cold events if snow is not present.

Scientists and managers have been working to devise a conservation strategy for yellow-cedar on the Tongass. The strategy includes actions such as salvaging dead yellow-cedar trees to capture the value and allow regeneration of other tree species on that site. The restoration and facilitated migration of yellow-cedar to cooler sites or on well drained soils where decline is not predicted to occur can help to establish and maintain cedar in areas where it can thrive. Silvicultural practices such as site preparation, planting, and thinning may be implemented on favorable sites to maintain populations of this valuable tree species.

A part of this conservation strategy for yellow-cedar is to develop a genetics program aimed at evaluating genetic sources for slow spring dehardening and freezing resistance. Other factors that may improve the survival and establishment of yellow-cedar are trees with fast growth so they can compete with faster growing western hemlock and trees with high foliage terpene levels to make them less palatable to deer. A



Scott McDonald, Britta Schroeder, Chris Scott, Pat Tierney, Sheila Spores, Paul Hennon, Billy Steele. Photos by Sheila Spores.

cooperative project called the Common Garden Study was established this year through the combined effort of the Tongass National Forest, R10 State and Private Forestry, and



Paul Hennon with a planted and flagged yellow-cedar seedling.

the Pacific Northwest Research Station. Additional funding was also provided through partnerships with American Forests and the Western Bark Beetle Initiative. For many years, silviculturists across the forest have collected yellow-cedar cones and the resulting seeds are stored in the Regional Seed Cache in Petersburg. Trees from 16 of these seed lots were grown as one year old seedlings and then planted this year. Four sites, one in Juneau and three on Prince of Wales Island, were planted with 1,600 trees at each site. The trees were planted in-house in a large effort by silviculturists from across the forest and employees from the PNW research lab. R.D. Parks and Chuck Ressler, who manage the seed cache, helped prepare the cone seed for growing seedlings. The logistics of growing tree seedlings for planting on the Tongass

includes sending seeds to a contract tree nursery down South, coordinating the return of the seedlings to Petersburg and then on to the planting sites, while keeping the trees sorted by seed lot and at the appropriate temperature prior to planting. R.D. Parks was instrumental in getting the trees grown for this study. The actual planting of trees was physically challenging and all involved

put in long days of moving, planting and marking trees. Each and every tree was marked with a flag and a numbered tag that will allow that specific tree and its genetic source (seedlot) to be tracked and allow for monitoring through the years. Tree planters on Prince of Wales included Gary Lawton, Pat Tierney, Scott McDonald, Billy Steele, Britta Schroeder, Paul Hennon, Carol

McKenzie, Sheila Spores and Chris Scott.

With an expected good survival rate, this study will allow scientists to test which yellow-cedar seed lots are best adapted to regenerate successfully by measuring differences in freezing resistance, growth rates and foliar terpene levels, allowing an increase in our knowledge for this important species.
