

Planting Sitka Spruce and Western Redcedar in the Same Hole to Mitigate Browsing Damage

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Abstract

This article describes an original approach to mitigating wildlife predation of young western redcedar (*Thuja plicata* Donn ex D. Don) seedlings in plantations in the Pacific Northwest and British Columbia. This method was developed by the author through direct observation while managing reforestation projects on the Olympic Peninsula in Washington State and British Columbia over many years. In the author's experience, this method has proven to be cost effective and environmentally sound.

Background

Planting western redcedar (*Thuja plicata* Donn ex D. Don) and Sitka spruce (*Picea sitchensis* [Bong.] Carrière) seedlings in the same hole is an effective method to reduce deer and elk browse and increase western redcedar seedling survival. I first conceived of this silvicultural practice of planting double seedlings along the banks of the South Fork of the Pysht River (Olympic Peninsula, WA) while working on the Pysht South Fork Riparian Forest Restoration project. The goal of the project was to harvest red alder (*Alnus rubra* Bong.) and reforest the area with native conifer species including western redcedar. The forests in the Pysht South Fork drainage had been harvested in the 1920s, and a dense stand of conifer regenerated naturally. Unfortunately, a series of fires in the late 1930s destroyed the young conifer forests, and the ensuing forest became predominantly stocked with red alder.

The Pysht South Fork Riparian Forest Restoration project was initiated in June 1994. Five small alder stands were harvested along one side of the South

Fork of the Pysht River. These stands were separated by a 1,000-foot (305-m) length of stream where the alder forest was left undisturbed. The average size of each harvested stand was less than 2 ac (0.8 ha), with an average linear distance parallel to the stream of 600 ft (183 m). All alder trees were cut, leaving scattered conifer trees. A 10-ft (3-m) tree buffer remained uncut along the stream to protect its bank integrity.

After the alder harvest, the site was prepared, and seedlings were planted the following winter. The mixture of seedlings planted included Douglas-fir (*Pseudotsuga menziesii* [Mirb.] Franco), western hemlock (*Tsuga heterophylla* [Raf.] Sarg.), Sitka spruce, and western redcedar. Field reviews the following winter showed high mortality in the planted western redcedar due to deer browse. It was then that I conceived the idea of planting doubles of one Sitka spruce seedling and one western redcedar seedling in the same hole. I knew that deer left the spruce seedlings alone because the very sharp, pointed needles hurt their noses. With some trepidation, I proceeded to plant spruce and cedar seedlings together in the same hole (doubles) the following winter. After the first growing season, 90 percent of the doubles survived.

Recommendations

Planting Sitka spruce and western redcedar doubles is similar to planting any forest seedling with a few exceptions. The seedling stock of each species for an individual planting hole should be the same size whether they are bareroot or container seedlings. Each Sitka spruce and western redcedar double should occupy one planting microsite (figure 1).



Figure 1. Double Sitka spruce and western redcedar after planting. (Photo by Joseph Murray 2014)

For example, if 430 planting spots per acre are prescribed for a stand, and doubles would inhabit all planting spots, then 860 trees per acre would be planted in the 430 planting spots with a Sitka spruce and a western redcedar in each hole. If other species are prescribed, then the densities would be adjusted accordingly.

Site preparation, vegetation control, and other animal control methods are similar to those used in routine plantation development and cultivation for a specific forest habitat. These silvicultural activities should be designed to assist the plantation in achieving a free-to-grow status in a cost-effective manner.

The double-planting practice does not completely eliminate deer and elk browse. It will, however, help young western redcedar seedlings survive and reach a free-to-grow condition in a timeframe similar to other conifer species on the same site (figure 2). As the trees grow together, the browse is limited to the margins of the double-plant complex, and both trees increase in size and height each growing season.



Figure 2. Western redcedar forest after cutting out the double-planted Sitka spruce. (Photo by Joseph Murray 2016)

Within 7 to 10 years, depending on site quality and wildlife populations, the western redcedar seedling will attain a height where browse will no longer affect its survival. At this point, foresters should consider cutting the Sitka spruce out of the double-plant complex. The standard practice in much of the forest industry is to cut the Sitka spruce below the lowest green limb. This practice, however, has a high likelihood of damaging the western redcedar. Heavy-duty pruning shears can be used to remove the Sitka spruce, but this is very time consuming. I recommend cutting the Sitka spruce with a chain saw as high above the ground as possible where there is less opportunity to damage the western redcedar. Then, prune the lateral branches on the Sitka spruce stump growing on the side opposite from the western redcedar. The objective is to reduce the amount of live, green Sitka spruce branches, thus minimizing its potential to compete with the western redcedar.

Whether the intention is to grow western redcedar for economic return or for habitat diversity, planting doubles is a reasonable and cost-effective practice.



Figure 3. Western redcedar and Sitka spruce doubles grown in a single plug at the nursery. (Photo by Joseph Murray 2017)

New seedling products have been developed where western redcedar and Sitka spruce are grown in the same container at the nursery (figure 3). This production practice ensures uniformity and reduces planting cost.

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