Regeneration (planting and natural seeding)

Regeneration, the renewal of a tree crop, employs both natural and artificial means in coastal British Columbia. Natural regeneration is commonly used when western or mountain hemlock, western redcedar, or amabilis fir is the desired species. It is often successful on moist coastal sites and accounts for about 30% of the area reforested each year in the Vancouver Forest Region. Natural regeneration is much less successful for Douglas-fir and Sitka spruce, which have irregular cone crops, so artificial regeneration is usually used to establish these species.

All artificial regeneration in coastal British Columbia is by planting (direct seeding is not used in south-coastal British Columbia). Fourteen different species totalling 19-31 million trees were planted annually in the Vancouver Forest Region from 1983 to 1988. About 3 times as many Douglas-fir seedlings were planted as the next most common species (amabilis fir). The usual planting density is approximately 1100 trees per hectare.

Regeneration of trees has both positive and negative effects on deer and elk. The establishment of a coniferous stand can eventually be beneficial because cover will be provided, but it can also be detrimental because forage will be reduced through competition with the trees for growing space, light, water, and nutrients. Short-term effects are minor, consisting only of the small increase in forage abundance and diversity that is provided by newly established trees, some of which are often browsed (see pp. 124-125). Only after a minimum of 5-10 years, as the trees reach several metres in height and the crowns begin to close, do the effects of the new stand become important. With the development of a closed canopy, thermal and snow interception cover begin to form. At the same time, dense lower branches conceal animals well, providing some of the best security cover to be found in any habitat. However, as crowns close, a period of poor forage production begins. This condition may persist for several decades or longer if the stand remains dense.

Variations in density and survival of young trees can greatly alter the interval between stand establishment and the time at which major long-term effects on deer and elk arise. Very dense hemlock stands (>5000 trees per hectare) on productive sites may begin to provide good cover and lose their understories as early as 7 years after tree establishment, but open stands (800-1200 stems per hectare) of Douglas-fir on dry sites may retain patches of good forage for more than 20 years (Nyberg et al. 1990a). The densest hemlock stands, which in patches may exceed 100000 stems per hectare, are virtually impassable to deer and elk and receive no use.
Species conversion (site rehabilitation)

Species conversion is an intensive silvicultural practice designed to replace non-commercial trees, such as alder, with conifers. It may employ some or all of the individual practices already discussed, including road construction (to reach the site), logging, site preparation (including burning or herbicide treatments, or both), and regeneration (planting). Because of the high cost of these treatments and the long delay before a cash crop is produced, species conversion has been uncommon to date, being restricted on the coast largely to accessible and highly productive sites occupied by red alder stands. Since 1983, an average of only 800 ha/yr on Crown land have been converted in the Vancouver Forest Region.

Because of the large number of different treatments used in species conversion, the effects on habitat are numerous. Readers interested in detailed effects can refer to the descriptions of each practice on preceding pages. To a large extent, the individual effects on deer and elk eventually cancel each other out because an overstory of one type (deciduous) is replaced with an overstory of another (coniferous). The short-term effects, however, can be important in areas where cover is scarce, because species conversion initially reduces security cover and summer thermal cover.

Effects on forage may initially be beneficial or detrimental, depending on whether herbicides are used and how they are applied. Broadcast application of glyphosate or 2,4-D to control salmonberry or other shrubs may seriously reduce elk habitat quality, but spot treatments of shrub patches or of small areas around planted seedlings may leave abundant forage elsewhere on the site. Long-term cumulative effects of species conversion are sometimes of concern because stands of large alders provide habitat diversity and a rich herbaceous understory in landscapes dominated by dense, uniform coniferous stands with little forage (portions of the Sayward Forest, for example). This is especially important for elk, because deciduous and mixed deciduous-coniferous stands are highly preferred foraging areas (Brunt et al. 1989) (Figure 80).