Choosing the Right System

A silviculture system covers all management activities related to growing forests—from early planning through harvesting, replanting and tending the new forest. Canada’s diverse forests are generally managed under one or a blend of three silvicultural systems:

- The clearcut system removes most of the trees from an area, with patches of trees and buffers left to protect other values.
- The shelterwood system harvests trees in stages over a short period of time so the new forest grows under the shelter of the existing trees.
- The selection system removes timber as single trees or in small groups at relatively short intervals, repeated indefinitely. This is done carefully to protect the quality and value of the forest area.

Forest managers consider a variety of factors when choosing a silviculture system, including the tree species; their age and condition; soils; local ecology; and possible impacts on values such as wildlife habitat, water quality and scenery. They also look at economic and social factors, including cost, timber productivity and worker safety.

As a result, silvicultural systems meet the unique needs of each forest site. The clearcut and shelterwood systems are used to manage even aged forests such as the boreal forest, which are defined by relatively small age differences between individual trees.

Clearcutting is generally the most ecologically appropriate way to harvest and renew the boreal forest because it most closely resembles the large natural disturbances, such as fire, wind, floods and insects, which are common in the region.

Tree species such as black spruce, jack pine, aspen, and birch germinate and grow best in full sunlight, resulting in natural, pure stands of trees of the same age.

The selection system is used to manage uneven-aged stands, which means the forest has trees in various stages of development, including seedling, juvenile and mature trees. It is appropriate for species that thrive in shade such as western red cedar and sugar maple.

Canada’s Diverse Forests

Canada’s diverse woodlands cover about 400 million hectares (988 million acres). Less than one per cent of the land available for commercial forest activities is harvested annually. In contrast, on average, an area more than twice this size is damaged each year by wildfire, insects and disease. Companies that harvest Canada’s public lands are responsible for reforestation, which is one of the reasons why Canada has about 90 per cent of the forested area it had before European settlement.
Managing an Even-Aged Forest

Clearcutting results in a new, even aged forest that can be regenerated naturally or through planting. Harvesting is done in blocks, strips, patches or other configurations to mimic natural disturbance patterns. Debris such as stumps, branches and fallen trees are left on the forest floor to maintain biodiversity and to provide habitat for plants, animals and insects, and nutrients for soil development. In order to protect water quality and habitat, areas of uncut forest are left along rivers and lakes and around and in areas important to wildlife such as nesting and moose calving sites.

Cut boundaries often follow natural landscape contours, and reserves are left throughout and within larger patches to protect features such as wildlife corridors. Harvest operations are laid out to maintain or enhance a variety of habitat. For example, moose require dense, mature coniferous forests as winter cover close to areas with young woody shoots used for food sources.

Once a site is renewed through the clearcut or shelterwood system, it is left to grow freely until it is mature in 60 to 120 years. Clearcutting is often safer for forest workers and can be the best way to deal with pests or disease.

Managing Forests Naturally

Forest managers plan the new forest long before a tree is cut. They can encourage natural regeneration by harvesting after a good seed year or by leaving uncut strips, patches and individual seed trees. More than half of the area harvested in Canada regenerates naturally, and the rest is replanted or seeded.

In British Columbia, where the unprecedented mountain pine beetle infestation has led to large-scale salvage harvesting, the province’s chief forester has recommended that companies leave behind more dead trees, understory vegetation and coarse woody debris to better resemble the natural outcome and help to protect biodiversity.

Ontario’s Forest Management Guide for Boreal Landscapes and Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales require that harvest areas retain large uncut patches within the blocks and approximately 25 large living and dead trees per hectare to provide seeds, wildlife habitat, food and shelter and to maintain biodiversity and to support natural ecological processes.

Canada is always looking for ways to meet the ecological needs of each site and the demand for fibre while addressing public concerns about forest harvesting.

Certification and Clearcutting

Canada has the world’s largest area of forest certified to third-party sustainable forest certification. Among other things, the three globally recognized certification standards used in Canada all ensure that harvested areas are reforested and that biological diversity is conserved. CSA, FSC and SFI all allow clearcutting as an acceptable harvesting method when used appropriately.