

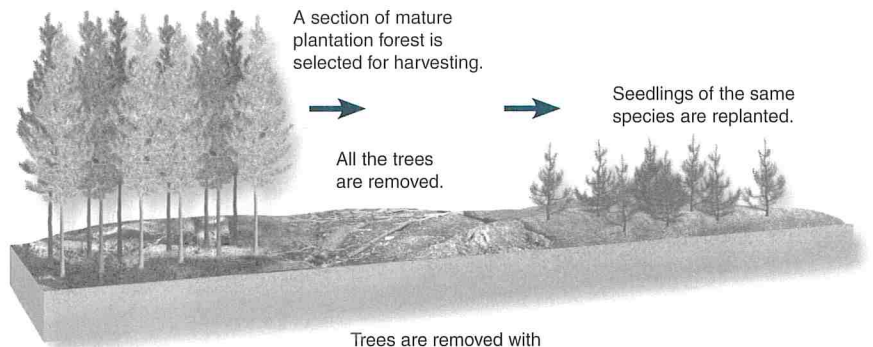
Forestry

The idea of **sustainable forestry** followed acknowledgement of the damage done by unrestricted logging of old growth forests. For forestry to be sustainable, demand for timber must be balanced with the regrowth of seedlings. Sustainable forestry allows timber demands to be met without over-exploiting the timber-producing

trees. Different methods for logging are used depending on the type of forest being logged. This allows the various services provided by forests to remain undisrupted. These services include providing shelter for wildlife, acting to reduce water runoff by absorbing excess rainwater, and moderating the local climate.

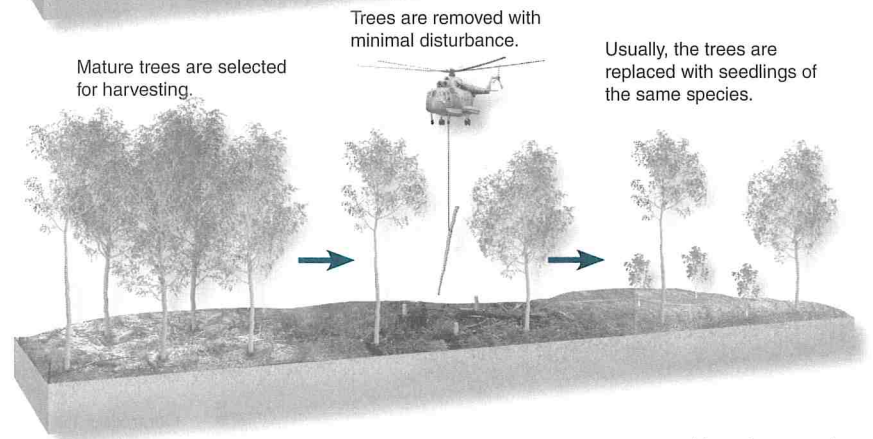
Clear Cutting

A section of a mature forest is selected (based on tree height, girth, or species), and all the trees are removed. During this process the understorey is destroyed. A new forest of economically desirable trees may be planted. In plantation forests, the trees are generally of a single species and may even be clones. Clear cutting is a very productive and economical method of managing a forest, however it is also the most damaging to the natural environment. In plantation forests, this may not be of concern and may not affect sustainability, but clear cutting of old growth forests causes enormous ecological damage.



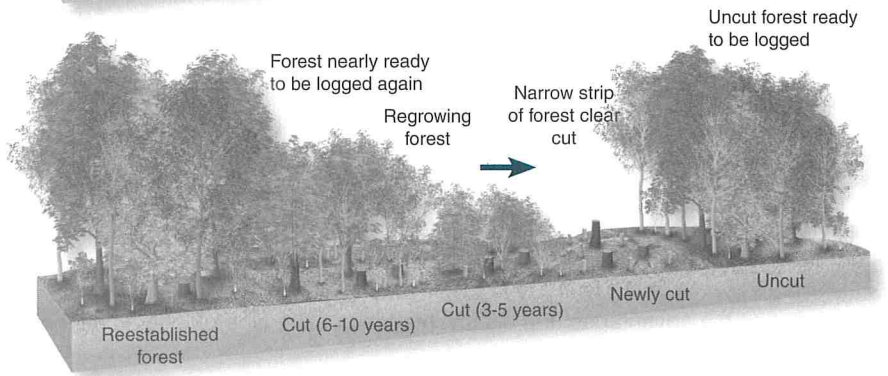
Selective Logging

A mature forest is examined, and trees are selected for removal based on height, girth, or species. These trees are felled individually and directed to fall in such a way as to minimize the damage to the surrounding younger trees. The forest is managed in such a way as to ensure continual regeneration of young seedlings and provide a balance of tree ages that mirrors the natural age structure.



Strip Cutting

Strip cutting is a variation of clear cutting. Trees are clear cut out of a forest in strips. The strip is narrow enough that the forest on either side is able to reclaim the cleared land. As the cleared forest reestablishes (3-5 years) the next strip is cut. This allows the forest to be logged with minimal effort and damage to forest on either side of the cutting zone, while at the same time allowing the natural reestablishment of the original forest. Each strip is not cut again for around 30 years, depending on regeneration time.



Old growth forests are climax communities. They have remained undisturbed by natural events and human interference for many hundreds of years. Old growth forests are ecologically significant because of their high biodiversity, and they are often home to endangered or endemic species. Larger forests also play a part in climate modification.



Second growth forests result from secondary ecological succession after a major forest disturbance such as fire or logging. At first, these forests may have quite different characteristics from the original community, especially if particular tree species were removed completely by logging. As the forest develops, the trees are often of the same age so that a single canopy develops.



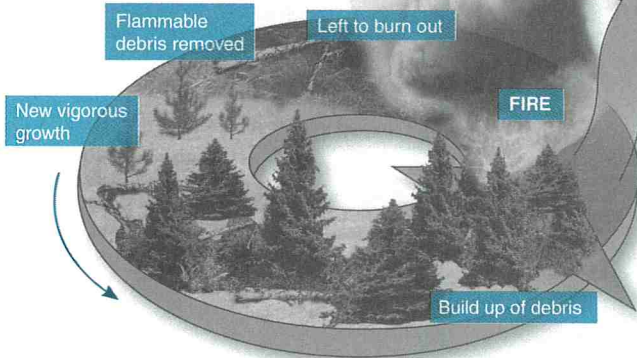
Commercial plantations (tree farms) are specifically planted and grown for the production of timber or timber based products. These forests are virtual monocultures containing a specific timber tree, such as *Pinus radiata* (Monterey or radiata pine). These trees have often been selectively bred to produce straight-trunked, uniform trees that grow quickly and can be easily harvested and milled.

1. Suggest which logging method best suits the ideas of sustainability and explain your answer: _____

Forests and Fires

Fires are a part of natural forest development and may occur as a result of lightning strikes, the concentration of heat on dry tinder, or by human activities. For many years, these natural fires were extinguished by fire services or prevented by education campaigns, but this led to a build up of flammable material in forested areas.

1 In natural, unmodified environments, fires tend to be brief and small. They burn out relatively quickly, removing material near the surface.



2 **Surface fires** provide important services including removal of dead material, aggressive weed species, and pests. They also stimulate new growth and promote the germination of some seeds.

4 The build up of debris can eventually lead to small fires quickly forming wildfires, which devastate large tracts of forest.

3 Prevention of natural forest fires causes flammable debris to build up in the forest.

Many fires services now attempt to contain forest fires rather than extinguish them, unless the fire threatens important habitat or human settlements.

Part of forest management is to reduce the occurrence of large, serious fires. **Controlled burns** are designed to remove excess flammable material in a section of forest, and so significantly reduce the risk of a wildfire. This is done in colder seasons where the risk of the burn becoming uncontrollable is reduced. The controlled burns also help to stimulate new growth.



Controlled burns are carried out to prevent small **surface fires** from becoming crown fires or out of control wildfires. Surface fires burn debris close to the ground and can be of benefit to a forest. **Crown fires** are large, extremely hot forest fires that often destroy large trees and forests. **Ground fires** are fires that burn material underground (such as peat) but may emerge to cause surface fires.



2. Describe the advantages and disadvantages of each type of logging method: _____

3. Explain the importance of old growth forests: _____

4. (a) Distinguish between, ground fires, surface fires, and crown fires: _____

(b) Describe the benefits of controlled burns: _____
