



Unit C: Forest Management

Lesson 5: Harvesting Forest Trees

Terms

- Bucking
- Clear cutting
- Establishment cutting
- Felling
- Group selection method
- Limbing
- Logging
- Non-point source pollution
- Removal cuttings
- Seed-tree cutting
- Selection cutting
- Shelterwood cutting
- Silviculture
- Single-tree selection method
- Skidding
- Timber cruise

Major Activities Involved in Harvesting Forest Trees

- Harvesting, or logging, has been called the key to forestry.
- The best silvicultural plans are executed through the proper use of logging.

Silviculture

- Silviculture is the art of producing and tending a forest.
- Conversely, the productivity of timber stands can be virtually destroyed by poorly planned or careless logging.

Silviculture

- Even in forests managed primarily for purposes other than timber production, some logging is often inevitable.
- The cost of logging is a major factor in the production of wood products.
- Timber is heavy, hard, and difficult to handle.

Silviculture

- Logging is in the category of occupations that are considered dangerous.
- Therefore, the activities associated with logging require persons skilled in woods work and the operation of logging equipment.

Silviculture

- Some places in the world require forest-land owners to submit a harvest plan prior to the beginning of logging operations.
- The major purpose for this is to promote logging activities that minimize soil erosion and other types of non-point source pollution (pollution whose source cannot be definitely pinpointed).

General Points of a Logging Plan

- The location of cutting boundaries of the stand to be cut.
- The marking of timber to be harvested (except when all the timber is to be cut).

General Points of a Logging Plan

- The cruise of timber to be removed.
(A timber cruise is the process of determining estimates of timber volume, growth, stand density, and other kinds of information on a forest property.)

General Points of a Logging Plan

- The location of the most efficient log-loading sites.
- The location of skid trails and haul roads.

General Points of a Logging Plan

- The description of equipment to be used and the types of logging to be done.
- The location of emergency equipment storage points, including firefighting tools, first-aid containers, and other emergency equipment.

The harvesting of trees involves several activities.

- Cutting the trees
- Removing the limbs
- Cutting the trees into lengths



Cedar logging in Kunar province

The harvesting of trees involves several activities.

- Either skidding the logs to a central area for loading or loading pulpwood bolts at the general cutting area.
 - Skidding is pulling logs to a central point for loading onto trucks railroad cars.
- Transporting the trees to a mill.



Cedar beams hauled by mule, Kunar province

Types of Harvest Cuttings

- Harvest cuttings provide for the removal of mature timber, the establishment of reproduction, and the supplementary treatments of the timber-growing site to develop favorable conditions for seedling growth.
- There are a variety of methods involved in harvest cutting timber.

Clear Cutting

- This involves the removal of virtually all the trees in the stand.
- This method is used for the purpose of baring the selected area prior to the establishment of an even-aged stand.

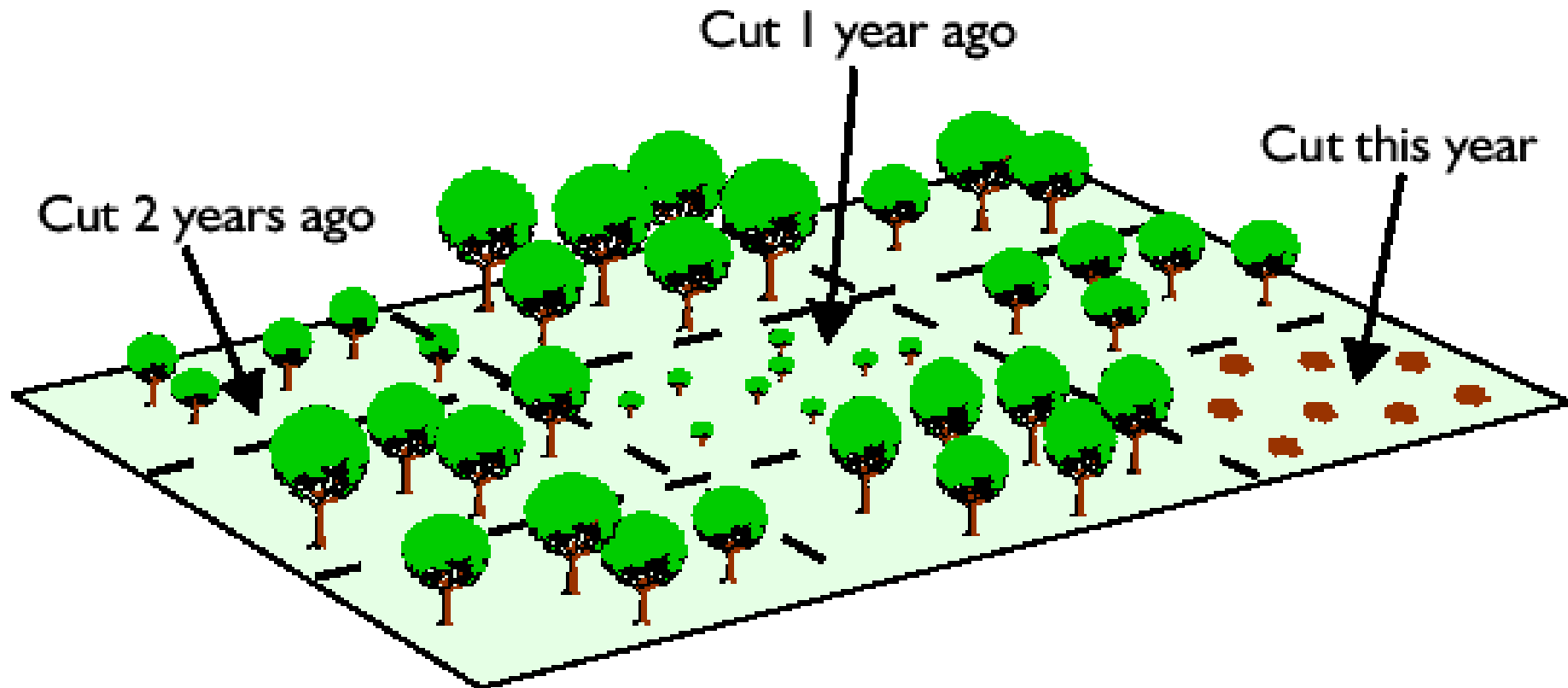
Clear Cutting

- After clear cutting, regeneration may occur by planting or direct seeding of new trees.
- It may also occur as a result of seed from adjacent trees or from trees that cut in the process

Clear Cutting

- Clear cutting is applicable in stands where the trees are no longer needed for growth and value increase, for a source of seed, for the protection of reproduction, or for other silvicultural purposes.
- This method is used in mature and overly mature stands to remove undesirable species and to facilitate site treatment, including the planting of superior tree stock.

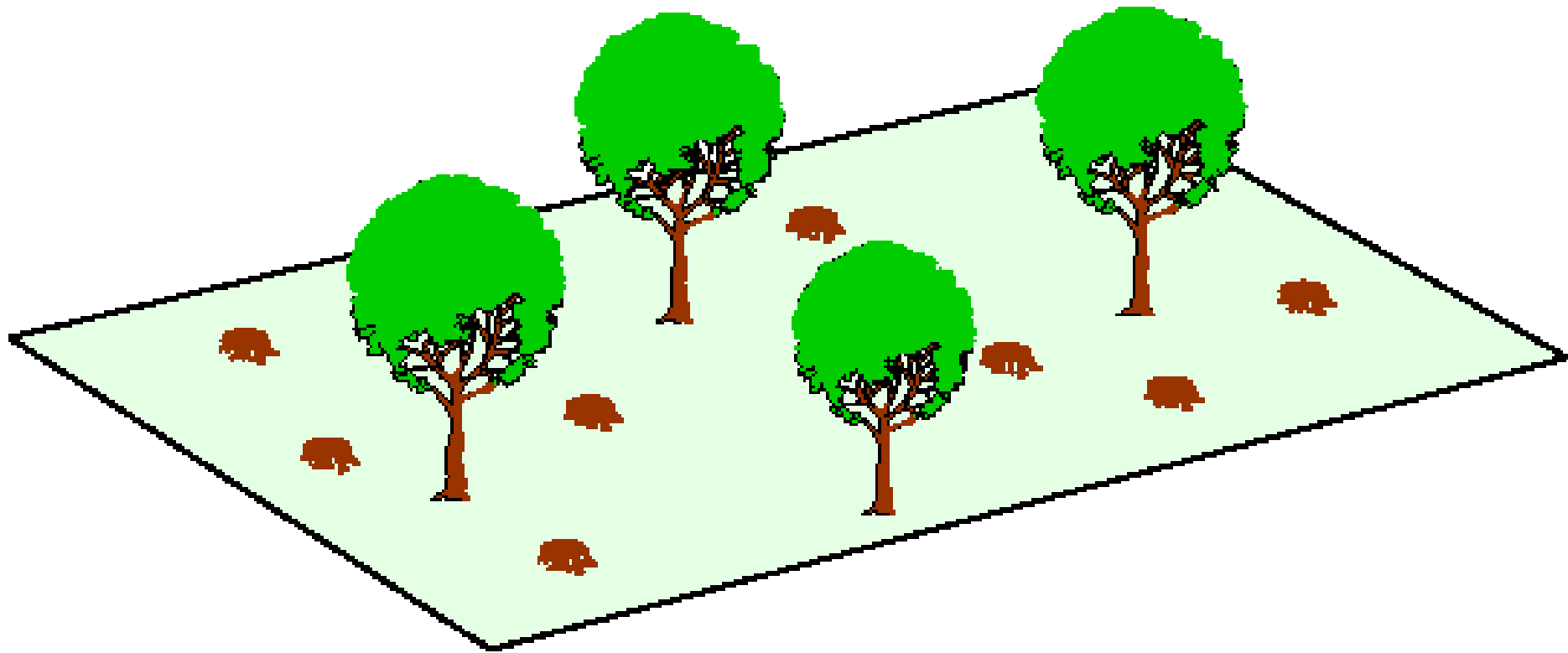
CLEAR CUTTING



Seed-tree Cutting

- Seed-tree cutting is a form of clear cutting in which seed-bearing trees are left suitably dispersed throughout the harvest area to provide for reproduction.
- This method is used with species that bear seed frequently and abundantly so that scattered seed trees will regenerate the area with desired species within a reasonable period.

SEED-TREE CUTTING



Shelterwood Cutting

- Shelterwood cutting is similar to the seed-tree method except that a greater number of trees are left after the initial cuts to provide shelter for the reproduction as well as a seed source for its establishment.

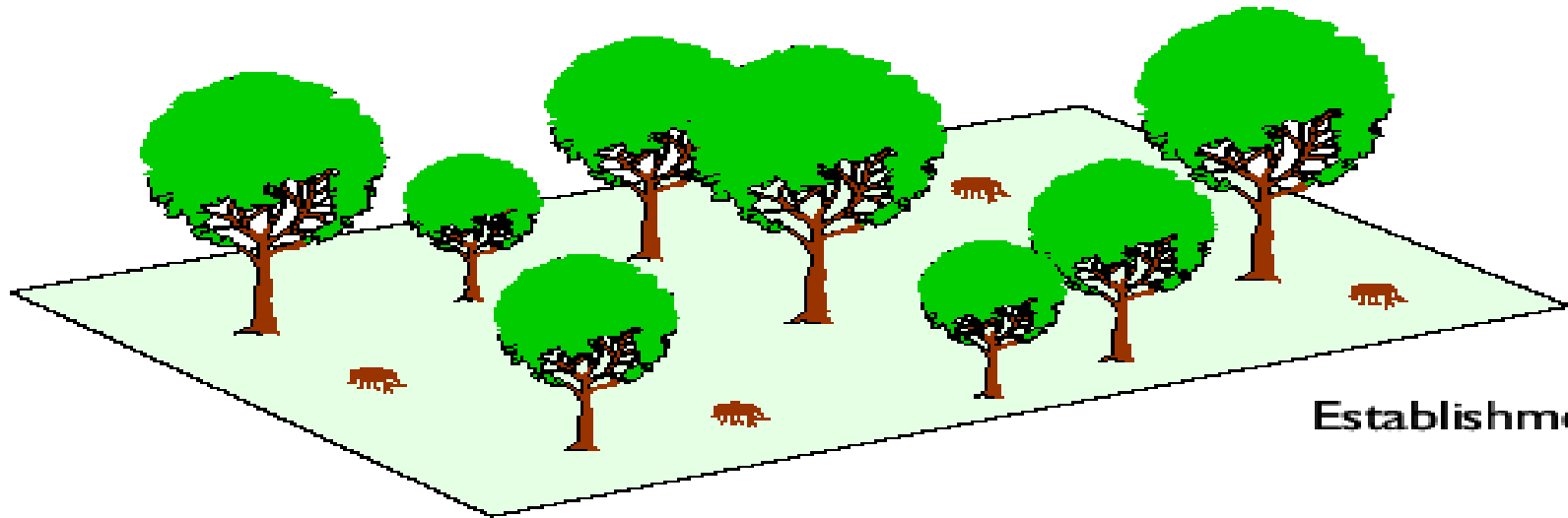
Shelterwood Cutting

- A shelterwood harvest is completed in stages.
- The first stage is to harvest a portion of the crop trees sufficient to allow reproduction.
- This is known as the establishment cutting.

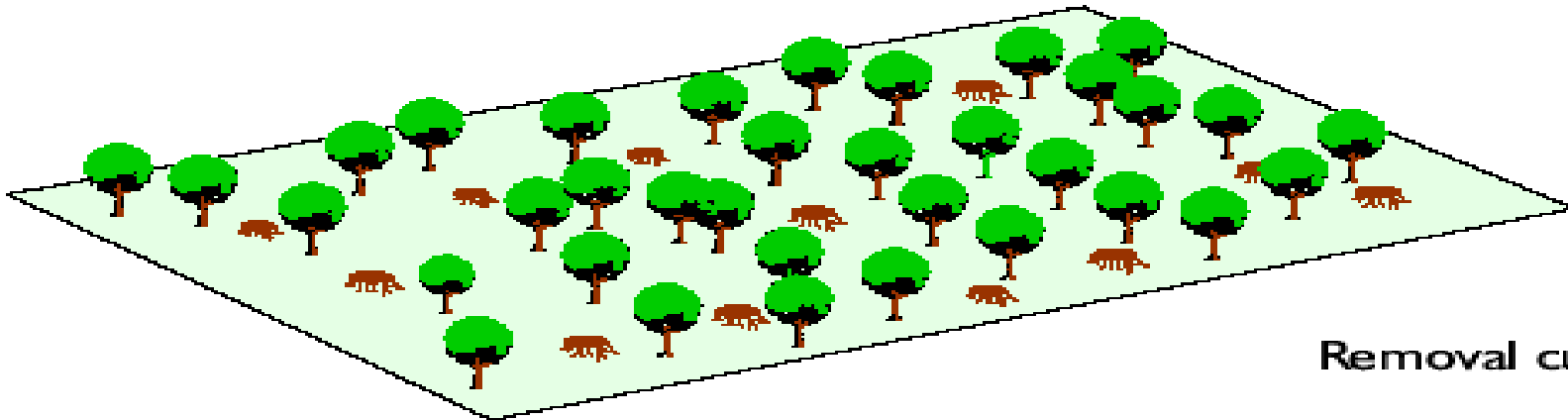
Shelterwood Cutting

- The remaining trees, which are greater in number than in the seed-tree method, provide a seed source for this reproduction as well as protect the new seedlings.
- In the later stages, known as removal cuttings, the remaining trees are removed as the need for their shelter diminishes.

SHELTERWOOD CUTTING



Establishment cutting



Removal cutting

Selection Cutting

- Selection cutting is a complex system of cutting used to create or maintain an uneven-aged stand.
- The goal of selection cutting is to remove mature timber in a manner and amount that will allow for reproduction sufficient to maintain the distribution of multiple age classes within the individual stand.

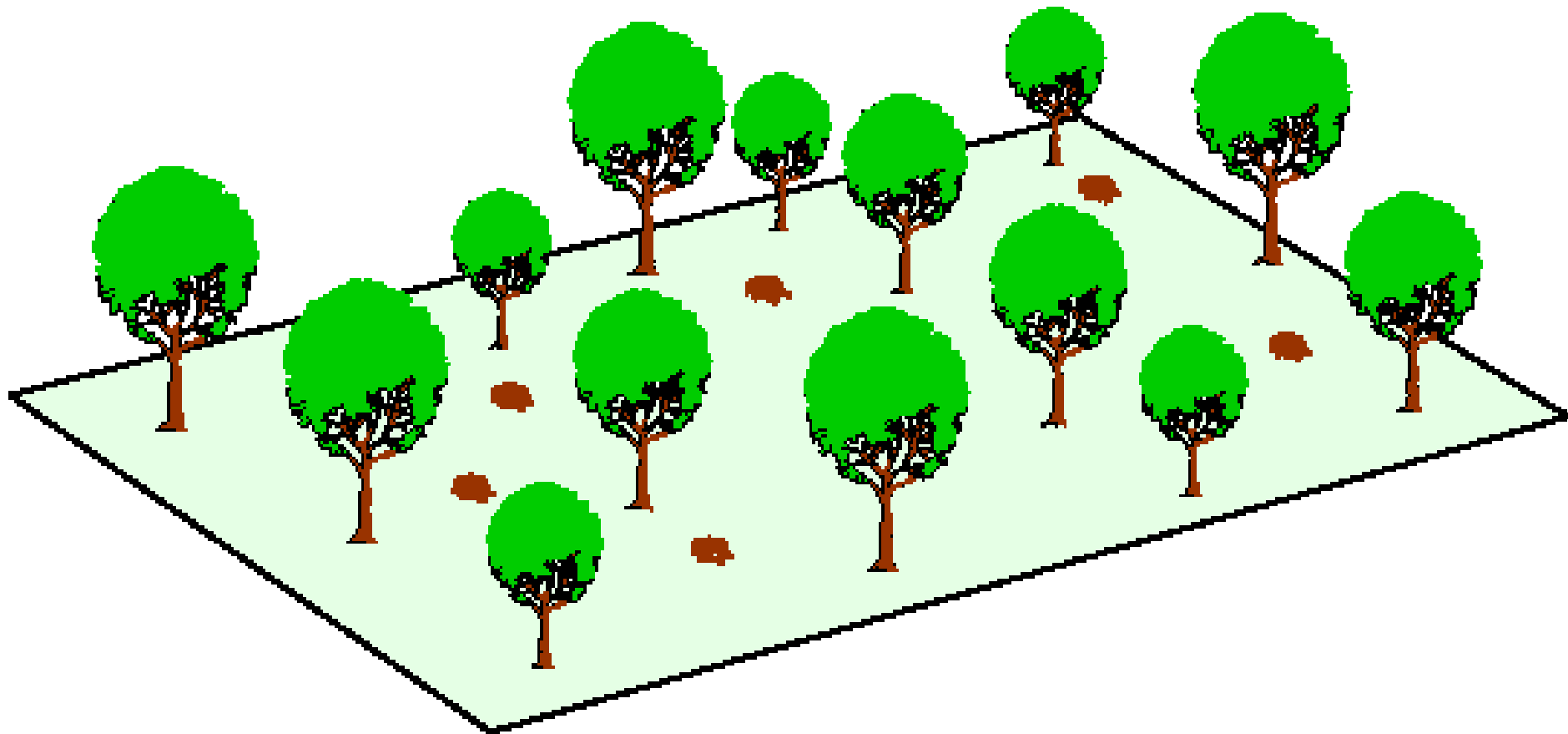
Selection cutting may be carried out in two ways.

- 1. In the single-tree selection method individual trees in the age class to be harvested are selected and removed.

Selection cutting may be carried out in two ways.

- 2. In the group selection method the stand is divided into small groups or units that are then managed for a single age class within the larger uneven-aged stand.

SELECTION CUTTING



(Courtesy, Interstate Publishers, Inc.)

Factors Affecting Tree-felling Outputs

- Felling is the act of cutting or severing a tree from its stump.
- It is more however, than just cutting it down.
 - It means cutting the tree in such a way that it safely falls in the desired direction and results in the least damage to the tree as well as surrounding trees.

Limbing

- Limbing is cutting branches off either felled or standing trees.
- Cutting to length or bucking, is cutting the felled trees into log or bolt lengths.

Factors Affecting Tree-felling Outputs

- The amount of work and time required to process a tree has been greatly reduced by the introduction of the power chainsaw.

Factors Affecting Tree-felling Outputs

- Also affecting the processing time is the kind and size of the tree being felled.
- Important factors affecting felling outputs are
 - 1. The volume per hectare and size of timber to be cut.
 - 2. The skill of logging crews.
 - 3. The condition of the terrain—the amount of brush growing there, the steepness of the land, and the wetness or dryness of the site.
 - 4. The amount of defect in the timber.
 - 5. The season of the year.

Factors Involved in Tree Skidding

- Skidding is the part of the logging operation in which the logs are dragged from where they were cut to length to a central location for loading onto trucks or railroad cars.
- In some cases this step is bypassed.

Factors Involved in Tree Skidding

- Short pulpwood bolts can be hand-carried and loaded directly onto the truck from the point where the tree was cut.

Factors Involved in Tree Skidding

- Factors involved in skidding are similar to those involved in felling, but the following must also be considered:
 - 1. The difference in weight of logs.
 - 2. The distance to skid.
 - 3. The amount of time required prior to skidding to bunch logs - collecting scattered logs into one place so they can be more efficiently skidded out to a central place.

Review / Summary.

1. Identify the major activities involved in harvesting forest trees.
2. Compare and contrast the various types of harvest cuttings.
3. Identify the important factors affecting tree-felling outputs.
4. Identify the factors involved in tree skidding.