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
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.
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.
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 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.
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 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.