Cutting Styles

N°. 50

INTERMEDIATE/SENIOR

Social Studies

LESSON SUMMARY

To appreciate that because of ecological, economic, and social reasons, different forest types require different methods of harvesting and to familiarize students with the four harvesting techniques used in Canada.

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Activity Information

Grade Level: Intermediate/ Senior

Estimated Duration: 1 to 2 hours

Materials: Copies of the Assessment of Cutting Methods Activity Sheets (one set per student), one checker game

Setting: Indoors

Key Vocabulary: Even-aged forests, uneven-aged forests, clear cut, strip cut, shelterwood method, selection method, mature, rotation period

Background Information

There are a variety of different methods used to harvest trees. The harvesting technique used in particular area depends on a number of factors, including the type of site, location, accessibility and potential volume of wood, the kind of regeneration that will take place after cutting, and the impact of other uses and values of the forest. In some areas, it may be judged best to remove all the trees and leave the land for natural regeneration while in other areas only mature or damaged trees are removed on a selective basis.

In northern Ontario, there are mostly **even-aged forests**, in which all the trees are about the same age (within 10-20 years). These are forests that developed after fires cleared large areas of all the trees, and most of the species in these forests need full sunlight for their growth. In southern Ontario, most forests are **uneven-aged forests**. The young trees of common species here are able to grow in the shade of older trees, and trees of all sizes and stages of development may be found.

There are four main cutting methods used in Canada. The **clear cut** method involves removing all or most of the trees in an area in one operation. This method is widely used in the even-aged forests of northern Ontario. In very large cutovers, corridors of trees are left for soil and water conservation and for wildlife habitat. The advantage of this method is that it is easy to plan and carry out and it is economical. The disadvantage is that the moisture, wind, and light patterns in the cut area are severely altered, and artificial regeneration of the same species may be difficult. If the cut area is left for natural regeneration, then unwanted species that prefer the altered conditions may predominate.

Strip cutting involves removal of a tree crop in either strips or blocks. **Shelterwood cutting** involves leaving individual trees or groups of trees or alternating strips standing to provide seed and cover conditions for natural or artificial regeneration.

In uneven-aged stands, the **selection method** is used to harvest only the mature or defective trees on a regular basis. Younger trees are left with optimum spacing, which increases their growth rate. The selection method can also be used to promote the regeneration of superior trees, and the spread of desired species. Although this technique works well in small areas, it is costly on larger forests because trees must be selected and marked, and the volume of wood taken on each cut is relatively small. Again, there is also a risk of damage to remaining trees and to regeneration on each harvest. Selection cuts are done with a chain saw and skidders. In some areas, horse-drawn logging is still used in winter.

Once the method of harvesting is determined, the forest manager must calculate how much wood can be harvested on a regular basis. It is important that the area of forest depleted of trees is no greater than the area returned to forest through regeneration (see Reforestation, p. 179). The trees in a forest are continually growing, but at the age when they have reached the desired size for harvest, they are said to be **mature**. The length of time taken before newly planted seedlings will reach this age of maturity is the **rotation period**.

Advance Preparation

Make copies of the Assessment of Cutting Methods Activity Sheets (one set per student).

ACTIVITY #1

Introduce to the students the concepts in the background information, or try the following idea to convey the different kinds of harvesting techniques. Draw a checkerboard and fill each square with a quick sketch of a tree (e.g., silhouettes of evergreen and deciduous trees), or use a real checkerboard with each square filled with a playing piece to represent a tree (or use paper cut-outs of trees). The board now represents an aerial view of a forest. Demonstrate the four different harvesting methods by removing the appropriate pieces (e.g., use a pencil to outline the pattern or hand that removes the "trees"). Then discuss the resulting patterns, pointing out which could be called clear cuts, strip cuts, shelterwood cuts, or selection cuts.

Then have students imagine they are forest managers working with a logging company that is about to harvest a large forest area also used by cottagers and canoeists. Encourage them to predict what might happen if (a) all the trees on one side of the board were cut down; (b) if some of the trees were cut in strips or blocks; (c) if only certain trees were chosen to be cut. Explain that the company required at least 12 "checkers" of wood. Ask the students to consider how they would cut the trees so as to have minimal impact on the cottagers and wildlife and yet produce enough lumber to make the efforts profitable?

Have students use the library or other information sources to investigate the methods used for harvesting wood in Ontario and have them write a report on the advantages and disadvantages of each of the methods.

ACTIVITY #2

Distribute Assessment of Cutting Methods Activity Sheets (one set per student). When students complete the activity, have several present their answers and maps or have them compare their work with each other (answers follow). Continue the discussion about the suitability of different harvesting methods for different types of forests.

Answers to Assessment of Cutting Methods

Example 1: It maybe decided to clear- cut the area to make way for an intensive artificial regeneration program to restock the site with strong, fast growing trees in a desired species.

Example 2: Since black spruce regenerates well from seed provided by trees on the site, a strip or block cut might be used, allowing the area to regenerate on its own.

Example 3: Harvesting could be modified to preserve the tourism values of the area (e.g., leave a buffer zone around the lodge; use modified block cutting or strip cutting, taking into account natural topography and scenic vistas).

Extensions

1. Have students research the industries that manufacture tree harvesting equipment and report on the different machines and techniques used in different harvesting situations.
2. Have the class design their own tree harvesting machinery, taking into account its impact on the forest environment. Have students design it to carry out multiple functions, and develop drawings and specifications to illustrate how it would work.

Evaluation

1. Have students interview three people of their choice, asking if they can describe the four harvesting techniques used in Ontario, followed by an evaluation of the average person's knowledge of forest harvesting.
2. Ask students to imagine they were managing a forest that included part of a popular recreation area and write a short report outlining the cutting style used to harvest trees in this forest. Reasons should include consideration of the logging roads needed to haul the trees from the forest.

Assessment of Cutting Methods

Activity Sheet

You are in charge of harvesting a forest area and must decide what cutting method to use. Examine each of the following situations and decide which of the following four cutting methods should be used in each of the examples. Explain why you chose the method you did in each particular area.

Background Information

- Clear Cut Method - all or most of the trees are removed in one operation.
- Strip Cutting- involves the removal of a tree crop in either strips or blocks.
- Shelterwood Method - involves leaving individual trees or groups of trees or alternating strips standing to provide seed and cover conditions for natural or artificial regeneration.
- Selection Method - in uneven-aged stands, the mature and defective trees are removed on a regular basis. The best trees are left to mature.

Activity #1

1. The site is good - the soil is rich, the climate conditions ideal and the location is near a major lumber mill- but the trees growing on it are low-value or diseased. You want to clear the area to make way for an intensive artificial regeneration program that will restock the site with strong, fast-growing trees in a desired species. Which cutting method(s) would you use and why?

2. The physical characteristics of the site are mediocre, and it is located in a relatively remote area. It is populated mostly with black spruce, which regenerates well from seed provided by trees on the site. You want to let the area regenerate on its own. Which cutting method(s) would you use and why?

3. The site is near a hunting lodge or other tourist spot. Which cutting method(s) would you use and why?

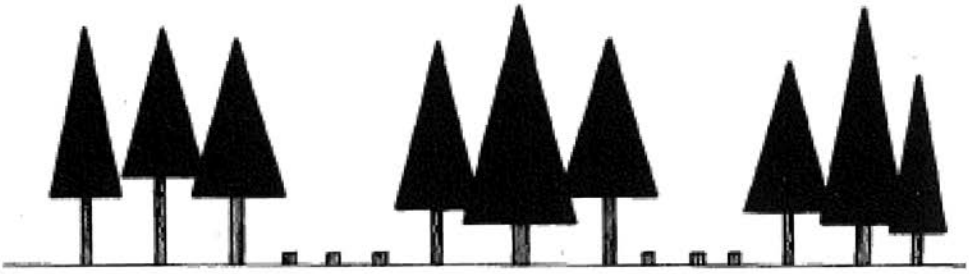
Activity #2

1. Using the stylized illustrations of cutting styles on the next page, sketch illustrations or rough mmaps of each of the three above situations.

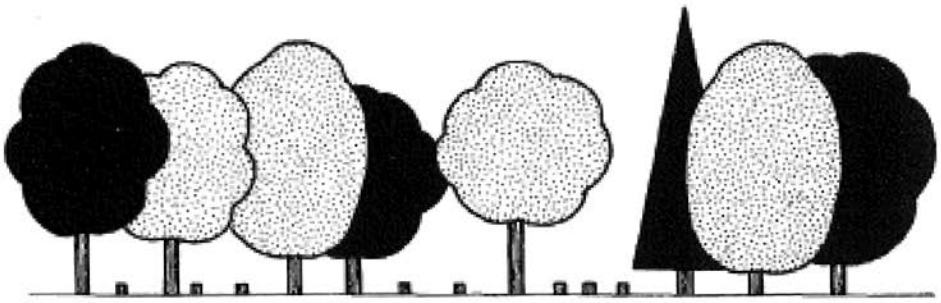
Assessment of Cutting Methods

Activity Sheet cont'd.

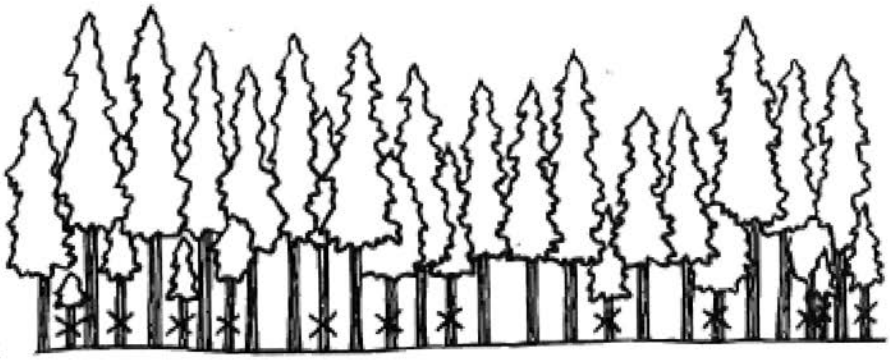
Clear Cut



Strip Cut



Selection Cut



Shelterwood Cut