



# Managing the Forest

## Curriculum Connection

- *Grade 7 Science: Unit A: Interactions & Ecosystems* (STS & Knowledge Outcomes 1, 4)
- *Grade 7 Science: Unit B: Plants for Food & Fibre* (STS & Knowledge Outcomes 1, 4)
- *Grade 8 Science: Unit A: Fresh & Saltwater Systems* (STS & Knowledge Outcomes 4)
- *CTS Forestry* (FOR1010: Why Forestry?, FOR1100: Forest Use and Protection, FOR2030: Managing Alberta's Forests, FOR2070: Harvest Practices)

## Objectives

- *Students will examine the steps foresters go through when planning when and where a forest stand will be harvested*
- *Students will use map reading and drawing skills to develop a forest management plan for an area*

## Lesson/Activity Duration

- One class period

## Materials Needed

- *Managing the Forest* student worksheet - download and print off one copy per student
- Pencil crayons (6 colors) or pencils for shading in map

## Classroom Arrangement

- Individual

## Background Information

Large forest products companies in Alberta are given the right to harvest trees through what is called a *Forest Management Agreement* (FMA). Through these agreements, forest products companies become responsible for (often) very large tracts of forested land.

The FMAs come with several responsibilities – the forest company must submit plans to the Alberta government outlining:

- where they plan to harvest
- what trees they plan to harvest
- how they are plan on regenerating (re-growing) the trees they harvest

These plans also mean companies must keep record of the volume of wood they are harvesting in order to ensure they pay the correct *stumpage* (fee) to the government for the right to harvest those trees. Forest harvest plans are based at least in part on a calculation called the *Annual Allowable Cut* (AAC) – the volume of timber/wood that can be cut in a year. The official policy is something called *sustained yield*, meaning we never cut more timber in a year than the forest is capable of growing.

When planning, the company must take into account all of the different users in the FMA area, including the wildlife, other industry, recreational users, aboriginal groups and others. Further, each company will have some form of public input as part of the planning process where the general public will be invited to comment and to participate in the planning process.



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General plans are done for the next 20 years of harvesting, more specific plans are done for the next 5 years, and an annual operating plan is done for the next year of harvesting. This annual operating plan takes into consideration very specific details on cutblock locations, roads, operations (i.e. what machinery will be used), any trap lines that might be affected, and how each site is to be regenerated. The government must approve those plans before any harvesting occurs.

When planning out the harvest in the FMA area, there are many areas that cannot be harvested:

- some forests may be in wetlands that are too difficult to regenerate,
- some are left as *buffer zones* to protect bodies of water and provide a tree break between roads and cutblocks,
- some areas are too steep for harvesting machinery to operate in,
- some areas are already being used for other uses (campgrounds, etc.),
- and some are protected for special circumstances (threatened wildlife or heritage/traditional use sites).

These are called *deletions* and are not calculated into the AAC.

The process of forest management is a complex and detailed mix of ecology, economics, and technology and involves strong decision makers, mediators, computer planners, and scientists.

## Important Vocabulary (see Background Information for explanations)

- Forest Management Agreement
- Annual allowable cut
- Sustained yield
- Regeneration, reforestation
- Buffer zone
- Annual operating plan
- Deletion
- Merchantable timber

## Procedure

- Hand out one copy of *Managing the Forest* student worksheet to each student
- Review background information and vocabulary listed above before starting
- Have students follow instructions on worksheet and work through questions.
- Discuss answers

## Extension

- For more details on the rules and guidelines forest companies must follow, check out the Government of Alberta Sustainable Resource Development website at:  
[www3.gov.ab.ca/srd/forests/managing/](http://www3.gov.ab.ca/srd/forests/managing/)

*\*\*For more information on Alberta- Pacific's forest practices and harvest planning techniques, click here.*



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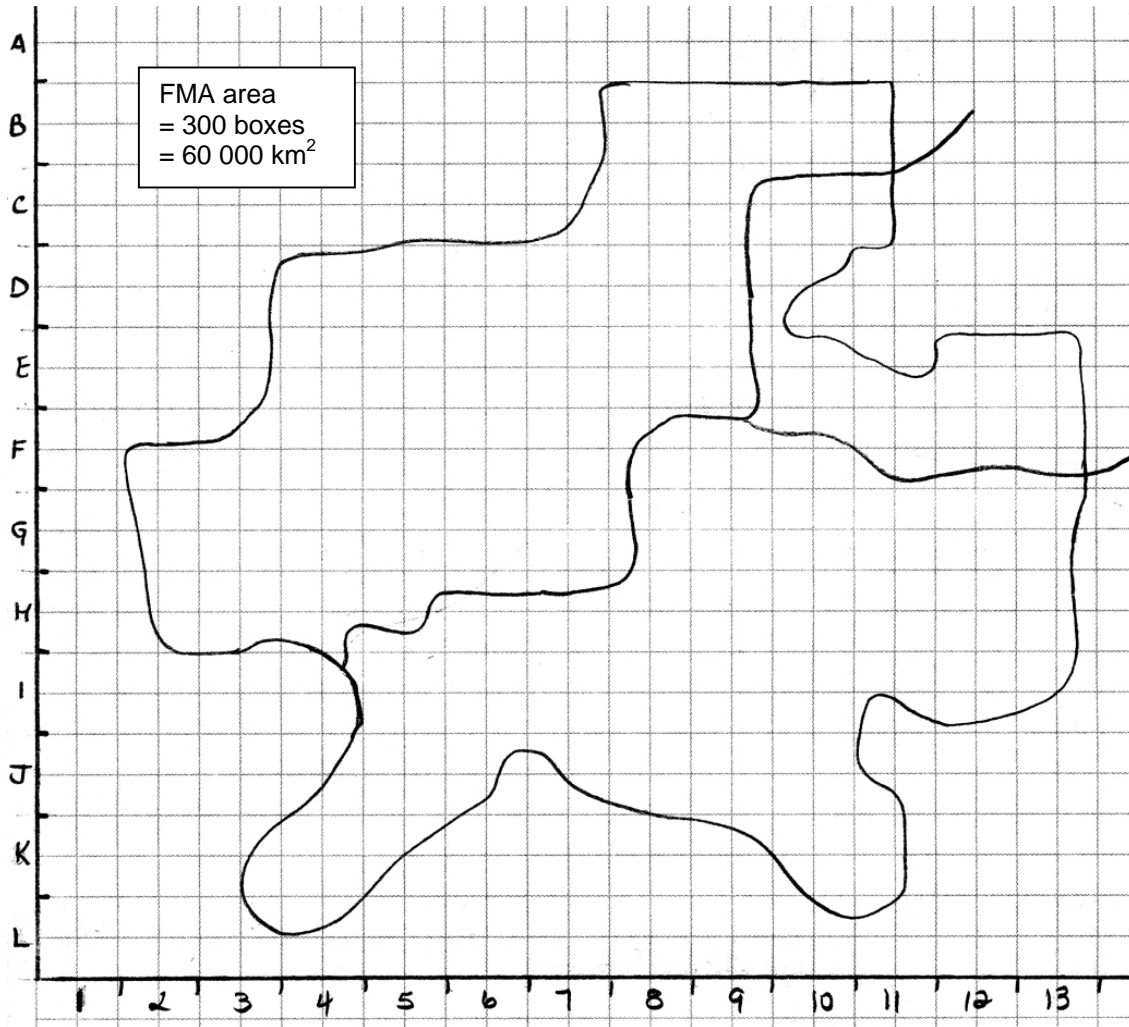
## Answer Key

1. (answers will vary) protection of streambanks from machinery, reduces chance of soil entering streams (sedimentation)
2. (answers will vary) filter water before returning it to rivers/streams/lakes, absorb water, carbon sink, habitat for animals
3. (answers will vary) draining of wetlands for agriculture, building of roads through wetlands changes the underground flow of water (one side may be cut off)
4. (answers will vary) the public doesn't like to see the 'ugly' cutblocks / aesthetics
5. (answers will vary) areas for recreation, areas prevented from being developed for forestry/oil & gas, for animal conservation, to ensure habitat, areas to study to understand more about forest
6.  $1 \text{ box} = 60\,000 \text{ km}^2 / 300 = 200 \text{ km}^2$
7.  $100 \text{ boxes} / 300 \text{ boxes} = 33.3\%$
8. If it takes 100 years to reach maturity, then can only cut 1/100 or 1% of the forest each year.
9.  $1\% \text{ of } 240 \text{ million cubic metres} = 2.4 \text{ million cubic metres}$
10.  $2.4 \text{ million cubic metres} / 0.8067 \text{ cubic metres} = 2.975 \text{ million trees}$
11. (answers will vary) questions usually center around how the harvesting 'looks', interference with activities (i.e. loss of hiking/ATV trails through 'old' forest), pollution, effects on animal/plant life
12. to some extent, forest companies can adjust their plans, but some government rules have to be followed (i.e. cutting close to the AAC each year) or else area can be taken away

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Name: \_\_\_\_\_

You are the forest manager for a large forest products company in Alberta. The map below outlines the area that your Forest Management Agreement covers. Using the instructions listed below, you are going to plan where you are going to harvest the trees you need to supply your mill and how much you will be able to cut each year. You will also look at what else you might need to take into account when operating in your area.



Legend:

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Instructions:

- ❑ Forests located within a specific distance from a water body are contained within *buffer zones* – areas that are not harvested. Shade in all boxes that the river runs through. \*Note: buffer zones vary in width depending on the type of water body, but for simplicity, we will assume that the area shaded covers all buffer zones throughout the entire FMA area
- ❑ A significant amount of the boreal forest is covered in forested wetland areas—areas that cannot be harvested as it is too difficult to operate machinery and to re-grow trees. Shade in 45 randomly picked boxes in a second color or pattern to indicate wetland areas in the FMA area.
- ❑ Shade in 6 randomly picked boxes to indicate lakes in the FMA area in a third color or pattern.
- ❑ An FMA area generally has some land that is not growing trees or is not expected to grow trees in the future. Shade in 60 boxes in a fourth color or pattern to indicate this type of non-forested land.
- ❑ Some areas within an FMA area may be set aside as protected areas, either by the government or by the company itself. Shade in 10 boxes in a fifth color or pattern to indicate protected areas.
- ❑ Towns, cities, and other human developments are scattered throughout an FMA area – oil and gas leases, agricultural land, recreation sites. Randomly shade in 15 squares in a sixth color or pattern to indicate human development in the FMA area.

You have now completed the *deletions* portion of the planning process – ensure you have filled out your legend accurately. Using the information from your completed map, answer the following questions:

1. Why is it important to have buffers along water areas?
  
2. What role do wetlands play in the ecosystem?
  
3. If forest companies don't harvest trees in wetland areas, give one example of how humans have affected wetland ecosystems in Alberta.
  
4. Why would 'tree breaks' be left between cutblocks and roads or other areas that humans are active in? Do you agree with this?
  
5. Give two reasons why governments or companies might set aside areas to be protected as parks or protected areas.
  
6. Using the information given on the graph above, what area (in km<sup>2</sup>) does one box represent?

7. From your graph, you know what area of the FMA will not be harvested. The remaining area is what is called *merchantable* timber – the area that can be harvested by a forest company. What percent of the FMA area is considered to be merchantable?
  
8. *Sustained yield* means that a forest company can only cut in a year what the forest can grow back in the same year. If it takes approximately 100 years for trees to grow enough to be harvested again, what percent of the merchantable area can a company harvest each year?
  
9. If the total volume of timber in the merchantable area of the FMA area is 240 million cubic metres, what volume can be cut each year in order to follow the principal of sustained yield? The *annual allowable cut* - the amount the government lets a company cut each year - is based on this amount.
  
10. If we estimate an average aspen poplar tree has a volume of 0.8067 cubic metres (*Alberta Land and Forest Service data for central mixedwood aspen tree of 22m height, 34cm diameter*), how many average sized trees would the volume calculated in #9 be in a year?
  
11. As the manager of a forest company, you are responsible for enlisting public input during the planning process. What questions do you think would be asked at a public input meeting about proposed harvesting of the forest? Come up with at least two questions or concerns the public might have.
  
12. Do you think forest companies can adjust their plans based on concerns of the public? Why or why not?