

## **4.0 Effects of disturbances on the Forest**

Disturbances are normal to the life of the forest. Forests are able to bounce back and will quickly have some sort of vegetation growing naturally on the site within a year or two of the disturbance.

Disturbances common to the Boreal Forest include:

- fire and wind throw
- flooding
- clear cut / harvest types
- tornado damage
- insect and disease outbreaks
- hail, freezing rain
- hurricanes

If a flood occurs on the forest site and is only 3-4 days long, the trees are usually able to survive if there wasn't any mechanical damage to the trees.

## **4.2 Harvesting techniques in the forest**

The way that wood is harvested in the forest is important, but what is more important is the harvesting method.

### **Regeneration**

- Before most stands are harvested, there is a plan to visit the site to see if there is a future crop here or if the site needs to be planted.
- Most methods of harvesting try to encourage trees to grow back by natural means.
- However, sometimes trees come back too thick and need to be thinned out later in life.
- The advantage of natural regeneration is that the trees that are growing here came from seeds that are able to grow on this particular site.

## **Seed-tree method**

-----This method is not used much in Canada.

-----This method is used where most trees are harvested with a few tall trees left on the site to provide seeds for the forest to regenerate naturally.

*Advantages of seed-tree harvesting:*

- cheaper method of forest renewal
- trees are able to adapt to the site by the seed trees
- there is a chance to leave different species of trees on the harvested site

*Disadvantages of seed-tree harvesting:*

- hard to identify good seed trees or the trees are not in good spots for natural seeding
- trees have to be old enough and healthy enough to produce seeds
- seed trees are usually the most valuable trees and therefore there is pressure to cut them down
- the harvested site had to have good conditions for natural seeding to occur—good soil seed bed

## **Shelterwood method**

-----This method is not used much in Canada.

-----This gives shelter to the understory of the tree until it is ready and large enough to grow without any shelter.

-----As the crop gets older, more of the tree stand is removed and once tall enough, the shelterwood is removed.

*Advantages of the shelterwood method*

- allows species of shade tolerant trees to grow
- very little erosion happens because there is always something growing there
- trees die here when they are young and unhealthy

### *Disadvantages of the shelterwood method*

- needs knowledge of “leave” trees and open spaces for sheltered trees
- more expensive harvesting because each time you go back to this site to harvest, you need equipment, transportation, road maintenance, etc.

### **Selection Harvesting**

-----is the method used when only certain trees are selected to be harvested--the biggest and best trees on the site

-----is used in areas where one tree is worth thousand of dollars

-----this practice is used in B.C. and Ontario

### *Advantages of Selection Harvesting*

- there is always a crop on the site so there is little erosion
- harvest takes place every few years because trees are always growing into larger sizes
- many age groups and many species of trees
- many high-valued trees are here

### *Disadvantages of Selection Harvesting*

- trees here aren't the best genetics because the best genetic trees get harvested as soon as they can and therefore no seeds were produced
- many forestry circle do not look favorably on “harvesting the best and leaving the rest”
- the return visits each year are expensive
- the shade intolerant trees won't reproduce this way

## **Clear cutting**

- this is the choice of most of Canada's forests
- this is a system where all trees on an assigned area are cut
- most provinces limit the size of clear cuts and require some trees to be left on a site
- these residual trees are for the benefit of wildlife
- because each tree is not worth much money, it is cheaper to harvest as many trees as possible

### *Advantages of clear cutting*

- *it allows for aerial seeding*
- *it enables shade intolerant trees such as Trembling Aspen and Jack Pine to grow on harvested sites with little help*
- *it makes nature think that a disturbance such as tornado happened here*
- *it allows a plantation to be established easily*
- *easier to take care of when all species are of the same age and type*
- *is the cheapest way of harvesting available*
- *less money spent to keep the road in good condition*

### *Disadvantages of clear cutting*

- could be more erosion if retention trees aren't planted and there is no crop on the site
- people don't like this method of harvesting the forest
- the forest quickly changed, so the wildlife quickly changes too with some leaving and some coming
- this method is not completely understood by people

### 4.3 What happens to plants and trees after a Disturbance?

Plants that come in after a disturbance vary

- depending on the kind of disturbance
- how much damage was done
- how large an area was the damage in.

For example, if a tree blew down in a storm and fell to the ground and exposed the mineral soil, with a hole in the crown canopy, this would not allow light into the forest floor and therefore very few species would grow naturally.

- Species would be **shade tolerant** which means they would like mineral soil and would germinate on exposed soil. Examples would be Balsam Fir and White Spruce trees.
- This same situation would not be of benefit to areas that have been clear cut or burnt over which gives lots of light to the forest floor.
- The more damage there is to the forest floor, the **fewer species** are able to come back naturally. If a fire burnt off the vegetative and organic layer, then mosses would not be able to reproduce in the same way.
- **Plant succession** is the process of one plant community gradually or quickly replacing another.

---Change will occur in the forest, and it may be slow, depending on the time of the year and the amount of rainfall.

---The first thing that will be noticed will be plants germinating.

---Once vegetation starts growing then animal life will be found in the area. As well, this vegetation will give shelter so that more seeds will grow.

---Soon shrubs will grow whose seeds came by air or birds.

---Then fast-growing trees will begin to appear because the shrubs provided a good spot for the trees' seeds to collect and grow.

---After 60 to 70 years the fast-growing trees will be at the end of their life cycle, and the hardwood trees will start.

- **Pioneer species** are those species which first came in after a disturbance.
  - They are usually short-lived
  - shade intolerant
  - reproduce quickly
  - adapt to a variety of sites.
  
- **Climax species** are the last species on the site and usually regenerate themselves.
  - they are longer-lived
  - shade tolerant
  - produce seeds later in life.
  
- **Climax forest**
  - will regenerate (if it does not go through a disturbance) because it has its own shade tolerant seedlings in its understory
  - this forest makes it easier for future vegetation to grow there

#### **4.4 Seed viability and seeds in the forest floor**

- When seeds are able to germinate it is said that they are **Viable**.
- Trembling Aspen is viable for only 2-3 weeks after they have dropped in the spring. If these seeds don't germinate in this time then the seeds are not viable.
- Pin cherry trees can remain viable for over 100 years and because it is a pioneer species it can come in after a disturbance and if conditions are right, the seeds will germinate.
- There are up to 3000 seeds per square m on the forest floor. This means that there are a lot of seeds in the forest floor just waiting to germinate. As we know, different disturbances can cause different seeds to germinate and reproduce on a site.

#### **4.5 Reasons why a forest site may not be naturally regenerated**

- Not enough seed source—no seeds in the area
- Insufficient seedbed—the site is not able to grow or support a plant
- Insufficient space to grow—could be slash, blow down or something that doesn't allow the growth of a seedling.