3.0 How living and non-living elements interact in the forest

3.1 Various forms of plant species in the boreal forest

a. Vascular plants

- have a "plumbing system" in which fluids move throughout the plant
- this lets food and anything needed for the plant's survival and growth to get to the plant
- Most plants are vascular in nature, but plants like mosses and lichens aren't able to move material through the plant.

Vascular plants can be split into two groups:

1. **Spores** such as ferns
2. Those plants which produce seeds

a)-- these plants have naked seed
--have no "true flowers" and include fir, spruce, and pine trees
--include conifer trees
--have their seeds in a cone or some other casing
--700 species on the earth
--include conifer trees

b) these plants have enclosed seeds

--have true flowers which produce seeds and are covered up in various ways
--pin cherry or apples have seeds that are eaten and spread in many ways
--most common plants and there are over 250,000 on the earth

b. Life Span

- **Annual Plants**
  ---plants that germinate, grow, produce seeds and die all in one season
  ---plants don't get very large

- **Biennial Plants**
  ---produce seeds in the second year then dies
  ---examples are turnip, parsnip
  ---plants don't get very large in size

- **Perennial Plants**
  ---produce seeds and live indefinitely
  ---some can produce seeds each year
  ---these plants will only produce seeds if they are healthy, of the right age, and live on a rich growth site

- **Woody plants**
  ---are trees with wood as their stem such as the white spruce
  ---is a shrub less than 5 meters in height
  ---is usually multi-stemmed
  ---an example is a Jack Pine tree

- **Herbaceous Plants**
  ---is any plant whose stem withers away to the ground after each season's growth
  ---these plants do not get very large

3.2 Abiotic Factors Within a Forest Ecosystem

Abiotic means non-living and these factors are very important in a forest ecosystem.

A. Solar Radiation

- It allows photosynthesis to happen and to change light energy into chemical energy.
- In our hemisphere, slopes facing south will get more solar radiation then any other direction.
- Slopes facing east will get morning sun while here in the Northern Hemisphere, the north facing slopes have the least amount of solar radiation.

B. Temperature

- is important for life forms to occur
- Areas with very hot temperatures and very cold temperatures have limited life forms for plant and animal life.
- The average temperature for is 0 degrees C, but seasonal averages vary greatly.
- In Saskatchewan we have a short growing season (100 frost free days).
- The extreme temperatures from -40 degrees C to +37degrees C, limit plant growth not because of the higher summer temperatures but because of the cold winter temperatures here.
- **Hardiness** is the plant's ability to withstand certain cold temperatures. Most plants can survive in warmer temperatures but not in extreme cold temperatures.

C. Atmospheric Moisture

- If we had most of the moisture in the winter, or for three days in the summer, it would not be very beneficial for plant growth.

- In Saskatchewan, we normally get enough moisture for plant growth in our forest ecosystem, so it does not need irrigation.

- Moisture could be in the form of snow, sleet, mist, rain, or hail.

- If we get 3 days of solid rain for the whole summer, the first few hours of rain would be of the most use to plant growth. The rest of the moisture would be run off and would end up in streams and ponds.

D. Climate

- is solar radiation, temperature and moisture

- In southern Saskatchewan there is a lot of sunshine and little precipitation.

- In northern Saskatchewan the temperature is cooler with more moisture.

E. Soils

Most of the soils of Saskatchewan's forest ecosystem are made by deposits such as wind blowing, lake deposits, and mountain or glacial deposits.

- **Weathering** is the wearing away by water, wind, heat, and decomposition.

  ----Areas that have a lot of oxygen, moisture, high temperatures, and microorganisms will decompose plant parts rapidly.

----Plants in places such as bogs, marshes and tundra have carbon that is not fully decomposed and therefore is not a good spot for plant growth.

F. Fire has much influence on the forest ecosystem.

- Some plants depend upon fire for reproduction.
- Jack Pine trees need heat to open up their cones.
- For suckers and sprouting to happen on existing plants, or to just burn away competing vegetation, fire allows other plant species to grow on the burnt site.

G.

A plant lives in the environment and a change in any one factor may cause a change in what the plant needs to survive. These factors are interdependent and interrelated and make the ecosystem very complex.