NOWER WOOD FIELD STUDY

Aim

Our aim was to study two different areas of woodland that have been cut down at different times, and to study the diversity and the abundance in the ground plants in each of them. The two coppices are close to each other. The two coppices are 7(young) and 30(old) years old. Our main aim here is to check the diversity and abundance between the 2 coppices, plus comparing the species.

Hypothesis

I think that there will be more bio-diversity in the young coppice. I think this because the old coppice will have had more time to develop, and there will be a developed canopy, which will let through only enough light for the shade tolerant plants. The young coppice, however, will have a spotted canopy, and a much larger variation of plant life, as the light amounts from place to place will vary.

Factors affecting Abundance/Diversity

There are a many factors that that we want to monitor, as these are the factors that will affect how the plants have grown. These will all affect the plant's life in some way, whether it turns to be a large or small factor.

Light

Light is possibly the most important part of plant growth and survival; and light is measured in LUX. We use the environmental meter to measure light. Photosynthesis is what feeds the plant, and therefore keeps it alive. Basically, it is the source of energy that every plant needs to grow. This reaction happens in the leaf, and this happens because of the chlorophyll in the leaves, which give them their green colour.

Temperature

Temperature is also an important factor. This is because it can vary so much, and certain plants will not be used to certain temperatures, for example a tropical plant wouldn't survive long over here unless it was put in a greenhouse. Temperature is another factor that is measured with the environmental meter, and it is measured in Celsius. The reason temperature can make such a difference to plants is that it will affect the water supply to the plant because of evaporation levels, that is why in summer, plants need to be watered a lot.

Humidity

This is directly to temperature, because this can affect the amount of water that the plants will receive. This will therefore affect the rate of photosynthesis aswell, as water is one of the key ingredients to photosynthesis. The environmental meter also measures this.

Soil Type

To find the soil type, we did a series of tests to the soil. We got the soil from an auger, and the soil used was taken from the bottom of the auger, and to make sure it was a fair test we went the same depth each time. The soil was examined first, and then dampened with distilled H2O, and rolled into various positions; we did this to see whether the soil crumbled in any way, as that would give us an idea of the type. Soil type is a pretty important factor as a plant may not grow in a particular type of soil, and we have to know that information. The soil type could change quickly, in a few metres possibly, which would create a border between 2 types of plant.

Soil pH

Soil pH can vary between very acidic soil (5 maximum) to very alkaline soil (9 maximum). Soil pH can make a big difference; this is because particular plants can be very sensitive to the soil pH, whereas some won't care. Each plant will have a most favourable pH level, with plants being classified into 3 categories: acidic, alkaline, and neutral. To test the soil pH levels, we used the soil pH kit; this included a test tube, BaSO4, indicator, spatula, distilled water, and a key that you could use to view the results.

Soil Moisture

This is the measure of the amount of moisture in the soil. As water is a key ingredient to photosynthesis, and therefore needed badly, this was quite a key factor. Unfortunately, we didn't have the apparatus required to measure the moisture at our disposal. So, we were unable to take the soil moisture.

Method

We had a set list of apparatus to use; the apparatus are as follows:

- Quadrat
- Identification Book
- Auger
- Record Sheet
- Soil pH Kit
- Environmental Meter
- Tape Measure

Quadrat

We used the quadrat to get an area of ground to investigate. To make it fair, we had a random co-ordinates sheet and then we used them to get our information on the species. We used the species key to identify the species; this had a certain amount of plant species on it. When we took readings from the quadrat, we first identified a particular species, and then counted the number of squares it was in; this is what gave us our results

Auger

The auger is basically a large drill that we used to drill into the soil, in order to get the samples of soil we needed for the results. With the auger, we drilled into the ground. Then, once we'd removed the auger from the ground, we'd take the soil samples from the bottom of the auger, at the lowest point on the ground. The soil samples were needed for the results in soil moisture, pH, and soil type tests.

Soil pH Kit

This consists of 5 items to help us get our results from the soil; these included the following

- Spatula
- Distilled H20
- Indicator
- BaSO4
- Test Tube

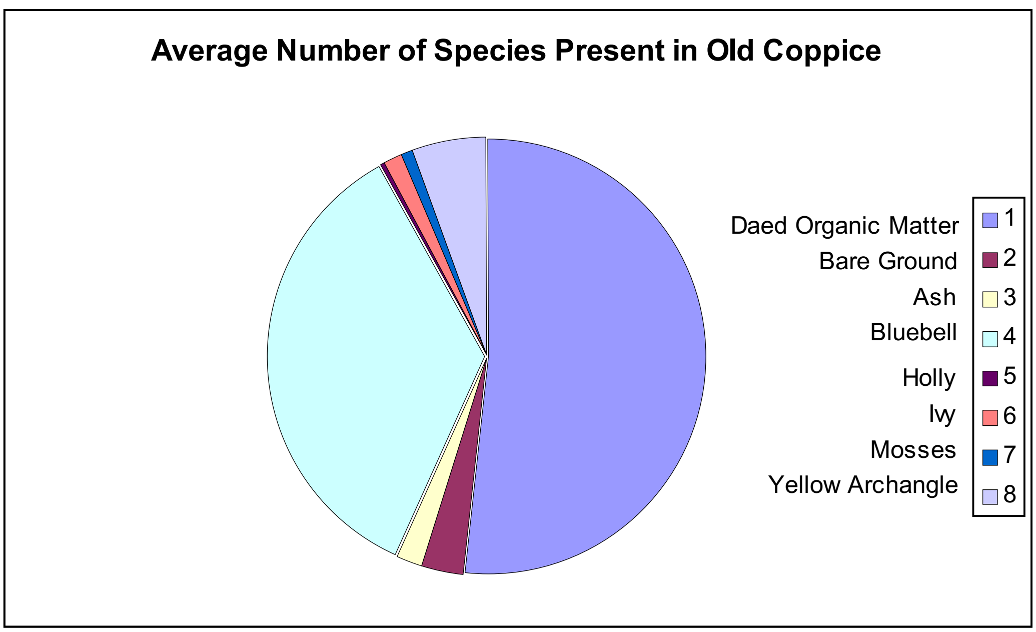
We rubbed the soil in our hands first, mixed with the water; this was to clean it to a certain extent. From that we could tell the type of soil, aswell as the moisture, however to get the acidity we had to do the following. We put it in the test tube, and added BaSO4 and indicator before mixing it with a spatula. We checked the colour for the acidity.

Environmental Meter

We used this device to get the results for the light, the temperature and the humidity. For these, we just had to change to the correct setting and leave the meter stable for 10sec to let the answer settle, once it clearly settles, we took the answer and recorded it.

Results

For our results, we counted how many different species were present in the quadrat; we did that 5 times. We also found out the Soil pH, temperature, light and humidity. Here are the results:

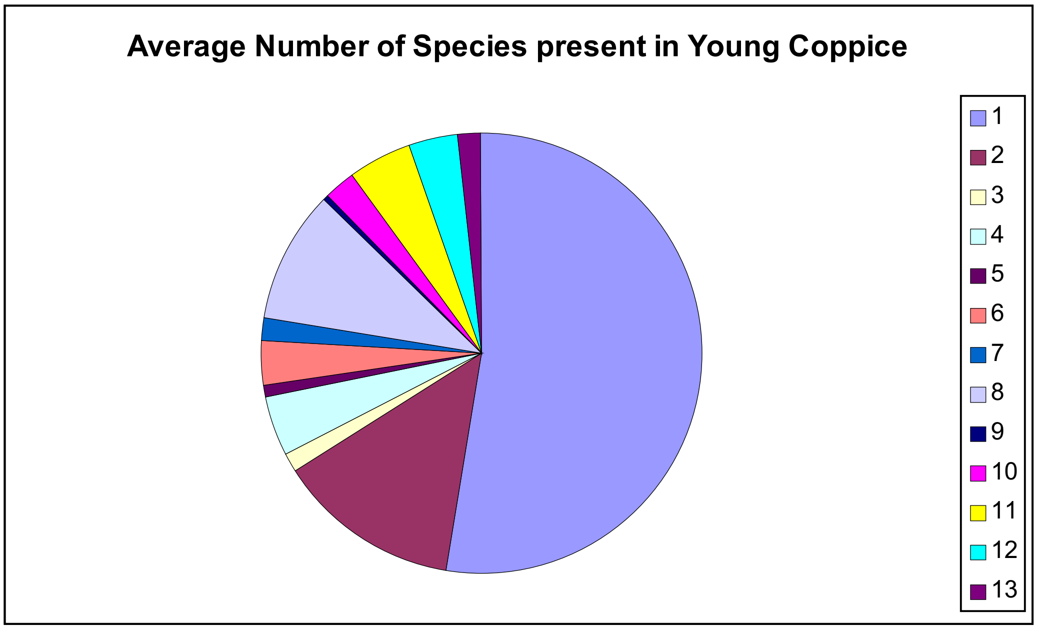


	1	2	3	4	5
Dead Organic matter	6	100	85	76	100
Bare Ground		22			
Ash		14			
Bluebell	100	12	33	100	6
Holly		2			
Ivy		6		3	2
Mosses			5		1
Yellow Archangle	30	9			

Old Coppice

Humidity	61.6	61.7
Soil pH		7
Light	57	52
Temperature	18	18

Old Coppice



	1	2	3	4	5
Dead Organic matter	85	100	53	75	82
Bare Ground					100
Birch	3		5	3	
Bluebell					
Bramble	3	11		20	
Chickweeds			5		
Fern			7	20	
Foxglove			12		
Grass	31			36	6
Ground ivy			3		
Hazel	18				
Honeysuckle		35			
Ivy		27			
Mosses			10		3

Young Coppice

Humidity	59.5	59.8	Young Coppice
Soil pH	6	6.5	
Light	67	154	
Temperature	20	20	

Conclusion

There are many reasons for the sets of results I have received, and I will now go through these comparing the young coppice with the old.

Firstly, it is quite obvious that more species were found in the young coppice, this is because of the light levels. In the old coppice, the trees are all at canopy level near enough, blocking out the light not giving new plats a chance to grow. Basically, the only plant species that is consistently present is the bluebell; the rest is mainly dead organic matter, as most plants have gradually faded away into ground making the dead organic matter. However, in the young coppice there's a bigger diversity of species, this because of the light, and also the space that the plants can grow into. Because of the cover in the old coppice, the plants in there won't get as much rain, as it will be cut off by the upper trees, therefore with the young coppice getting more water and light, their rate of photosynthesis will increase.

With all plants in the old coppice growing on top of each other, they end going into layers, meaning it is hard for any new species to flower or even get off the ground, add to that the lack of light then that jus makes it even harder. Whereas, in the young coppice, there is quite a bit of grass, and just bare ground, therefore it should be much easier for new species to flower, this is the reason there is a bigger range in the young coppice.

In the young coppice, the wind will be able to transport seeds to different areas of the coppice, and with enough bare ground, they should be able develop. Although this could still happen in the old coppice, it is harder for the seed to be planted, and the wind level may well be less in the old coppice.

In my hypothesis I stated that basically there would be a wider variety of species in the young coppice rather than the old coppice. This happened because of the reasons I stated in my results sections, so it hasn't come as a surprise.

However, although this was always likely to happen it doesn't mean that our results are perfect, or that we have done the experiment completely correct. There are reasons for this; we don't have the time to check every single area of each coppice so our results won't necessarily be perfect, however when we did our 5 samples, we used a random number table to generate our positioning, yet with trees and other groups in the way, and possibly not walking straight it was easy to get sidetracked slightly.

When searching through the coppice, human error may enter into the process, as it possible that certain species could have been missed, especially in the old coppice with separate layers of plants. Human error could actually be present at many parts of our experiment, and it is just something that we have to get on with, hopefully using machines like the environmental meter to give us more accurate results.

Results could always vary due to the weather, of course we do measure temperature and humidity, but as we are only there one day, we wouldn't be able to see how results varied on different, however it is unlikely there is a major difference, unless there has been a heat wave, or a giant thunderstorm.