The Variety and Amount of Mosses Growing at Different Elevations on Big Leaf Maples

(Near the Elwha River, on October 25th and 26th, in the autumn, from about 11 a.m. to 1 p.m.)

Hat made of big leaf maple wood

Hold on to your hats!

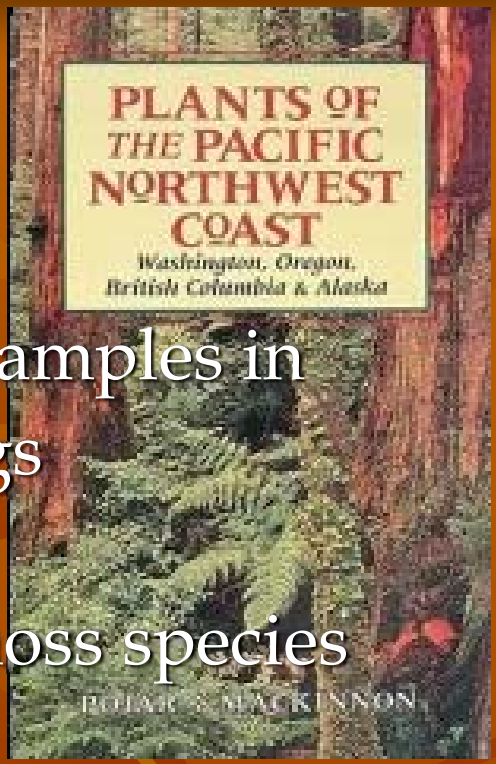
Research Question

What effect does elevation have on the amount and varieties of moss that will grow on big leaf maple trees in the Olympic National Park bordering the Elwha River?

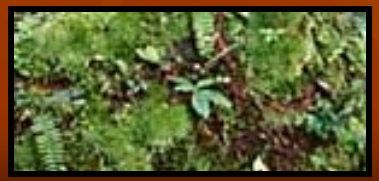
Hypothesis

Our hypothesis is that if a big leaf maple tree is at a lower elevation along the Elwha river, then it will have more variety and amount of moss than a tree at a higher elevation along the Elwha River because there is more moisture in the air at a lower elevation.

Materials



- 6 medium zip-loc bags to store moss samples in
- 1 large zip-loc bag to carry sample bags
- Marker to label bags
- Moss identification book to identify moss species
- Lab book and pencil to record data
- Transportation from one elevation to the next.
- Topographical map of the Elwha River and surrounding area to identify elevation
- Hand lens to inspect moss



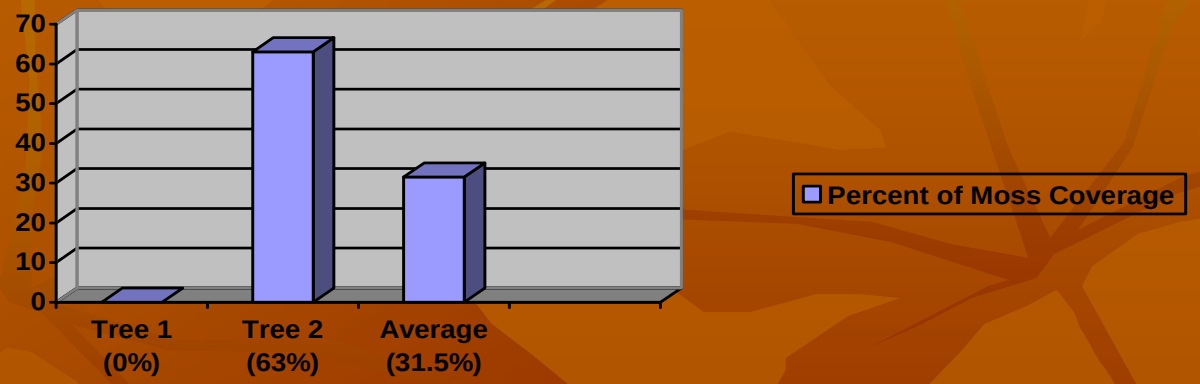
Procedure

1. Go to first site: The Happy Trail Trailhead with an elevation of 1700 feet above sea level. These will be trees 1 and 2.
2. Select one large and one small big leaf maple tree.
3. Take samples of all different mosses that are accessible on each tree.
4. Bag samples and label the bag with the tree number.
5. Use topographical map to determine elevation, record.
6. Estimate percentage of tree trunk covered in moss, record.
7. Go to the next site: The Ranger Station with an elevation of 300 feet above sea level.
8. Select next large and small big leaf maple tree.
9. Repeat steps 3-6. Record.
10. Go to next site: The Lower Elwha River with an elevation of 30 feet above sea level.
11. Pick last large and small big leaf maple tree.
12. Repeat steps 3-6. Record.
13. Go through each bag and classify each moss sample. Record.
14. Repeat if time constraints allow it.

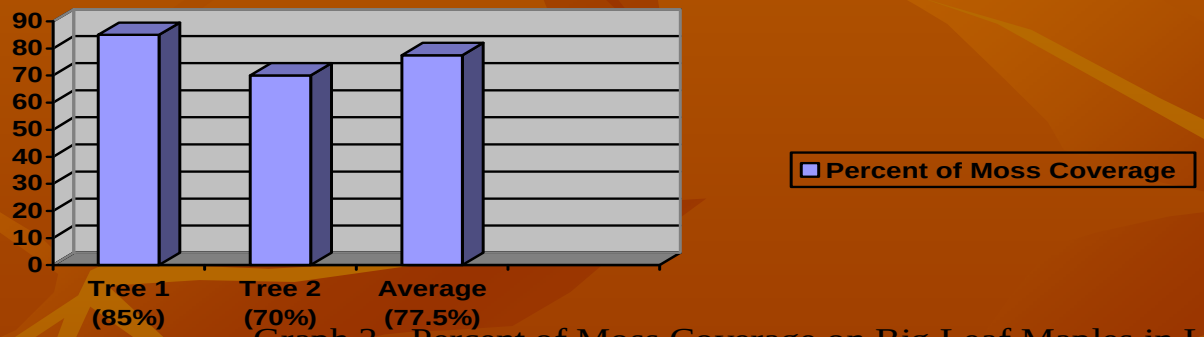
Results

Big Leaf Maple Tree Number	Location	Elevation	Number of Moss Species	Types of Moss Species
1	Happy Trail Trailhead	1700 feet above sea level	0	➢ None
2	Happy Trail Trailhead	1700 feet above sea level	4	➢ Douglas' Neckera ➢ Lanky Moss ➢ Spear Moss ➢ Magnificent Moss
3	Ranger Station	300 feet above sea level	5	➢Douglas' Neckera ➢Cattail Moss ➢Small Flat Moss ➢Goosenecked Moss ➢Magnificent Moss
4	Ranger Station	300 feet above sea level	5	➢Douglas' Neckera ➢Menzie's Neckera ➢Clear Moss ➢Tree Moss ➢Curly Hypnum
5	Lower Elwha	30 feet above sea level	3	➢Menzie's Neckera ➢False Polyrichum ➢Bottle Moss
6	Lower Elwha	30 feet above sea level	2	➢Clear Moss ➢Yellow Moss

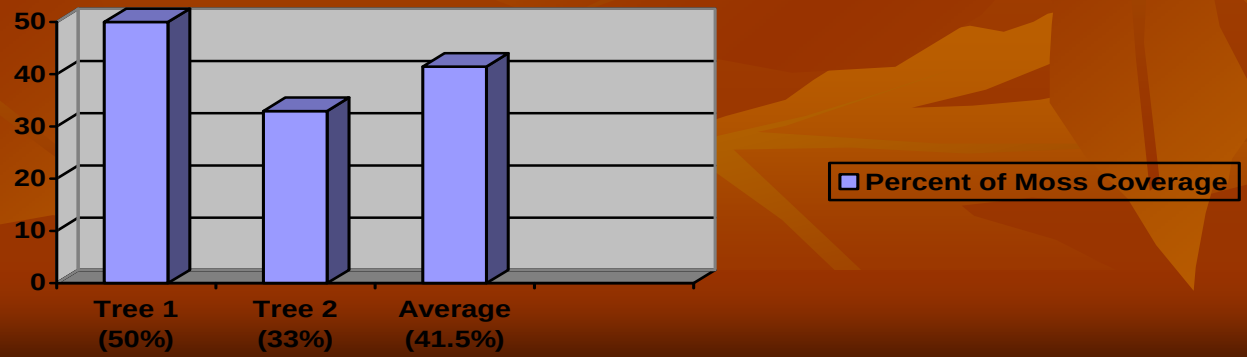
Graph 1 - Percent of Moss Coverage on Big Leaf Maples at Happy Trail Trailhead – 1700 feet above sea level



Graph 2 - Percent of Moss Coverage on Big Leaf Maples at Ranger Station – 300 feet above sea level



Graph 3 - Percent of Moss Coverage on Big Leaf Maples in Lower Elwha – 30 feet above sea level



Results, the Summarization

- The trees at the Ranger Station (300 feet) had, combined, 10 species of moss total, while the ones at the Lower Elwha (30 feet) had five, and the ones at the Happy Trail Trailhead (1700 feet) had only four.
- When the averages are compared, the trees at the Ranger Station (300 feet) have 36% more moss coverage than the trees at the Lower Elwha (30 feet), and 46% more moss than the trees at Happy Trail Trailhead (1700 feet).

Conclusion

- Hypothesis was not supported by our results
- Moss excels at an elevation that is between 30 and 1700 feet.
- Moss does not do especially well with extremes-such as more moisture in the air than rainfall.
- Medium levels of moisture need to be accompanied by medium amounts of rain in order for moss to proliferate best.

Discussion

- Problems:
  - Moss is hard to classify.
  - Couldn't repeat trials.
  - Look-and-guess method for determining moss coverage percentages.
  - A very small sample of all the trees in a location.
- Does the age of the tree have to do with anything?
- Possible supplementary experiments:
  - Explore what effects elevation has on a different plant relationship.
  - How does tree age affect total moss coverage and variety?
- Applies to how the interaction of organisms changes in varying conditions, such as elevation, as it relates to rainfall and water levels in the air.