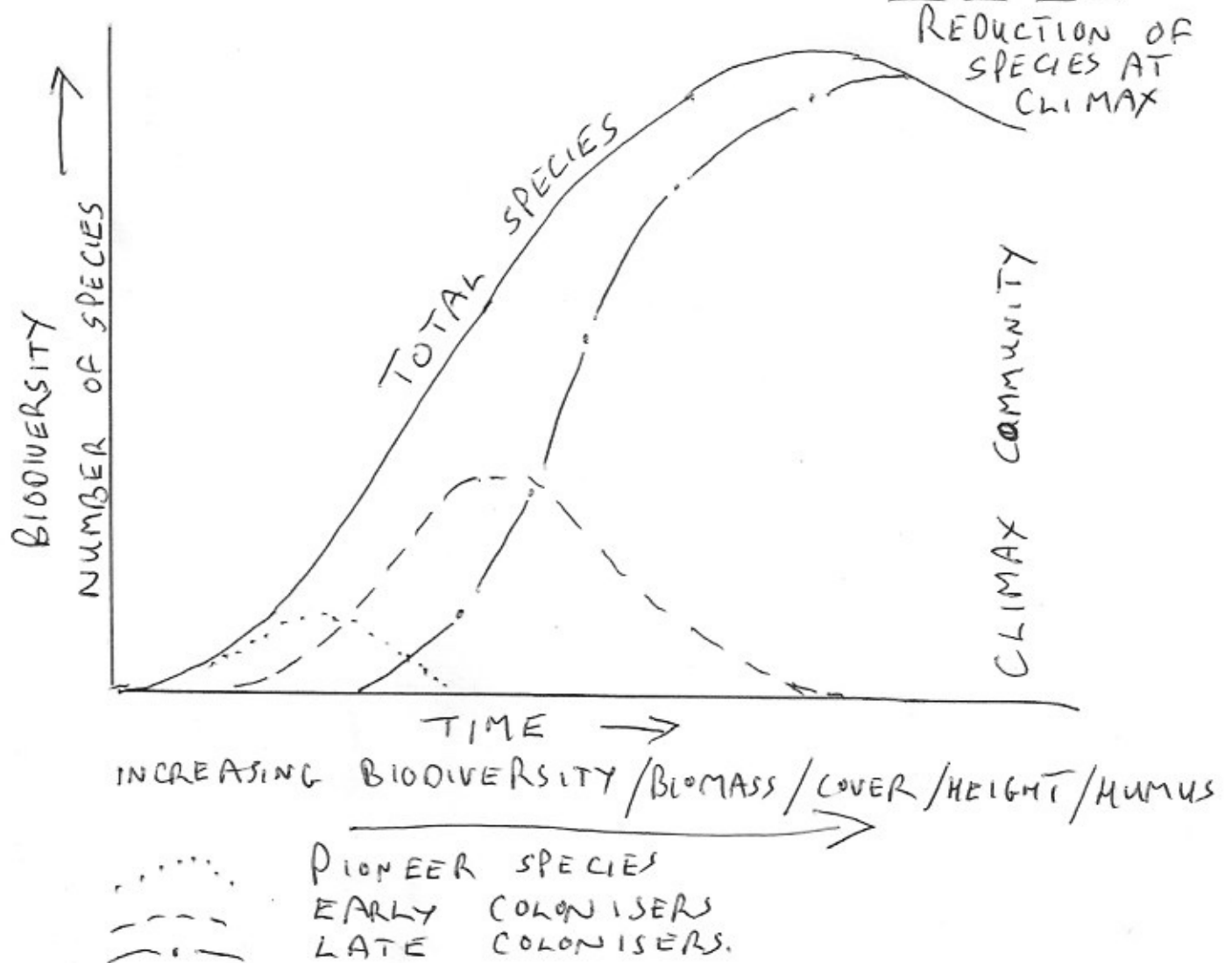


## VEGETATION CHANGES IN A PRIMARY SUCCESSION



The graph shows how the total number of plant species (biodiversity) changes over time in a primary succession. The general trend starting from a bare surface is for the number of species to increase over time. This increase continues until the Climax Community of plants develops when biodiversity may reduce to some extent as certain species become dominant.

The first species to take hold on the bare surface are the Pioneer Species, followed by Early then Late Colonisers, followed by the Climax Community. Each of these has certain characteristics that suit particular environments / niches. During the Succession not only does Biodiversity (number of plant species) increase, so does Biomass (the weight of living plant matter), ground cover, plant height and soil organic matter (humus) content.

Two important concepts underly this Succession, Facilitation and Competition.

### **Facilitation**

The first plants prepare the way in the initially very harsh environment for later plants to establish by adding organic matter to the developing soil to increase its fertility and water retaining capacity.

### **Competition**

Although the Pioneer plants are able to establish and even thrive in the initial harsh conditions, they are out competed by later colonising plants. This competition, in particular for space and light, allows stronger and taller shrubs and trees to dominate the later succession.

## **PIONEER SPECIES (r species)**

- hardy plants resist the harsh initial environmental of bare surfaces. For example XEROPHYTIC plants. Xerophytes are drought resistant plants that have deep roots to reach water and thin leaves with sunken stomata to reduce water loss by transpiration.
- large numbers of very few species.
- rapid growth, early and rapid reproduction.
- small size, low height.
- highly productive, very small seeds, often windblown to aid coverage and spread.
- high population growth rate.
- facilitation aids the colonisation of later species by adding organic matter to the soil increasing its fertility and water holding capacity.

## **LATER COLONISERS AND DOMINANT CLIMAX SPECIES (k species)**

- fewer plants, but mores species.
- fewer but larger seeds.
- they out compete the pioneers and early colonisers for light and space.
- lower growth rate than r species, reach reproductive stage later.
- population size close to the total possible.
- niche specialisation, pleats adapted to certain sites/conditions
- stratum specificity, layers of plants; field (ground) layer, shrub layer, under canopy, canopy.