

# Zoogeography

Lesson 15

# What precisely do we mean by **stability**?

Is a stable ecosystem one which is difficult to deflect from its current composition or function?

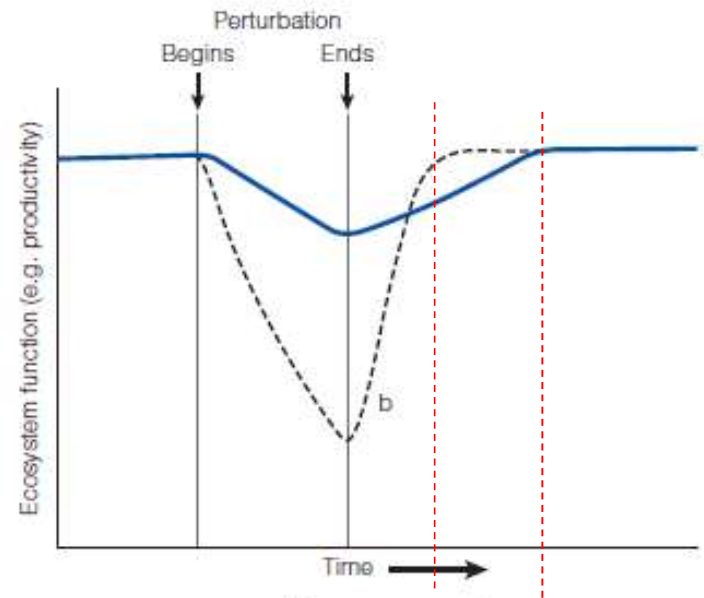
Stability can be explained in terms of **inertia**, or **resistance to change**



A stable ecosystem could be defined as one which **rapidly returns to its original state** following disturbance → this uses the concept of **resilience** as a basis for defining stability.

A stable ecosystem should **behave in a predictable manner** no matter what fate may cast in its path, and biodiversity does appear to render an ecosystem predictable by providing a kind of '**biological insurance**' against the failure of certain sensitive species when exposed to particular stresses.

# Responses of an ecosystem to disturbance



**Figure 3.6** Two possible responses of an ecosystem to disturbance. Line a (solid) represents an ecosystem that is resistant to perturbation. Its response to disturbance is slower and less severe, but its return to its original state is slow. Line b (dashed) shows a resilient ecosystem that is more severely affected by the disturbance, but rapidly returns to its original state. Either could be regarded as an illustration of ecosystem stability. Adapted from Leps [16].

# Modelling Biomes and Climate

- effort has been expended in improving the definitions of biological units, the biomes, and fitting them to specific climatic envelopes.
- We now have much more detailed information about the physiology of different plant and animals, including their tolerance of cold or heat and their ability to cope with drought or flooding.

<https://vimeo.com/143850932>

<https://vimeo.com/164607091>

# Biodiversity is Dynamic

- Genetic change resulting from mutation and recombination
- Evolution resulting from natural selection and genetic drift
- Interaction among biota
- Effects of a variable environment
- Effect of biota on the environment
- Relative rates of speciation and extinction

