



Stability and Change in an Ecosystem



Introduction to Ecosystem Stability and Change

Ecosystem Stability

- Ecosystem stability refers to the ability of an ecosystem to maintain its structure, function, and processes over time, even in the face of disturbances. Stability can be achieved through biodiversity, ecological balance, and resilience.

Ecosystem Change

- Ecosystems are dynamic and may undergo changes due to natural or human-induced factors. These changes can be gradual (e.g., succession) or sudden (e.g., natural disasters or human activities).

Key Vocabulary

Match the following terms to their definitions:

- | | | |
|----------------|---------------|----------------|
| • Biodiversity | • Disturbance | • Human Impact |
| • Resilience | • Succession | |

Term	Definition
_____	The variety of life in an ecosystem.
_____	The ability of an ecosystem to recover after a disturbance.
_____	An event that disrupts ecosystem structure or processes.
_____	The natural progression of ecosystem development over time.
_____	Changes caused by human activities such as deforestation.

Stability vs. Change Scenarios

Instructions: Read the scenarios below. Indicate whether the scenario promotes stability or causes change, and explain your answer in one or two sentences.

- A forest ecosystem with a high level of biodiversity.
- Stability or Change? _____
- Explanation: _____
- A wildfire that destroys a large section of a grassland.
- Stability or Change? _____
- Explanation: _____
- The introduction of an invasive species into a freshwater lake.
- Stability or Change? _____
- Explanation: _____
- A coral reef system protected by marine conservation laws.
- Stability or Change? _____
- Explanation: _____

Case Study

- Case Study: Forest Succession After a Fire

A forest experiences a wildfire that destroys much of its vegetation. Over time, grasses and shrubs begin to grow, followed by young trees. Eventually, the forest returns to a mature state, similar to its original form.

Questions:

- What type of change is demonstrated in this case study? _____
- What role does biodiversity play in the recovery of the forest? _____
- How might human intervention (e.g., replanting trees) affect the process of succession? _____

Creative Activity

Design Your Stable Ecosystem : Draw and label a diagram of an ecosystem that demonstrates stability. Include the following:

Design Your Stable Ecosystem : Draw and label a diagram of an ecosystem that demonstrates stability. Include the following:

- Producers, consumers, and decomposers.
- At least three interactions (e.g., predator-prey, mutualism).
- An explanation of how biodiversity contributes to the stability of your ecosystem.

- Why is biodiversity important for ecosystem stability?

- Describe one way human activities can disrupt ecosystem stability and one way they can support it.

- How do small changes in an ecosystem sometimes lead to significant effects?

Research Challenge: Investigate an endangered ecosystem (e.g., Amazon rainforest, Great Barrier Reef) and write a short paragraph about the changes it faces and efforts being made to restore its stability.