**2.5.3 [AHL] Productivity and Factors of Succession**
**Multiple Choice Questions**

*Objectives*:

1. Outline influences on the type of community that develops in a succession
2. Summarise the changes in net productivity and gross productivity in a community undergoing succession
3. Outline r- and K-strategist species
4. Outline challenges to the concept of a climax community
5. Outline the term plagioclimax

*Questions:* **2.5 [AHL] Quiz**

1. Which of the following is a **climatic factor** that influences the type of community that develops in a succession?
    A. Local bedrock properties
    B. Soil pH
    C. Temperature
    D. Geomorphology

2. How do **fire and weather-related events** influence ecological succession?
    A. By determining soil development
    B. By influencing nutrient availability
    C. By creating diverse microhabitats
    D. By initiating a reset in succession

3. In the **early stages of succession**, gross productivity is often low due to:
    A. High density of producers
    B. Favourable starting conditions
    C. Poor starting conditions and a low density of producers
    D. High photosynthetic capability of pioneer plants

4. During the **early stages of succession**, net productivity is high because:
    A. Gross productivity is also high
    B. The fraction of energy lost by communal respiration is low
    C. Climax communities are being established
    D. There is a varied range of species

5. As **succession advances** and the community moves to later stages, gross output may be higher, particularly in climax communities, because:
    A. There are fewer species
    B. There are smaller plants with limited photosynthetic ability
    C. There is decreased biomass production rates
    D. There is a varied range of species, including bigger plants with greater photosynthetic ability

6. In a **climax community**, net productivity approaches zero because:
    A. Gross productivity is also zero
    B. There is low species variety
    C. The respiratory demands of a more sophisticated consumer society increase
    D. Energy input exceeds energy output

7. **r-strategist species** are better adapted to pioneer communities because:
    A. They produce a small number of offspring
    B. They have a slow reproduction rate
    C. They have a long lifespan
    D. They have the ability to produce a large number of offspring

8. Which of the following is a characteristic of **K-strategists**?
    A. High number of offspring
    B. Early maturity
    C. Longer lifespan
    D. Weak competitive ability

9. **K-strategists** are better adapted to climax communities because:
    A. They quickly colonize damaged environments
    B. They produce many offspring
    C. They have a stronger competitive ability
    D. They have limited photosynthetic capability

10. The concept of a **climax community** has been challenged because:
    A. Natural ecosystems are static and unchanging
    B. Natural ecosystems are dynamic and subject to a variety of natural and manmade disruptions
    C. Natural ecosystems always reach a stable endpoint
    D. Natural ecosystems are not affected by human impacts

11. **Alternative stable states** refer to:
    A. Ecosystems always returning to a predictable climax community
    B. A fixed peak community
    C. Different community compositions and structures that can exist under similar environmental conditions
    D. A guaranteed establishment of a predictable climax community

12. According to the **wood-pasture ('Vera') hypothesis**, substantial grazing pressure from large herbivores maintains:
    A. A stable peak state
    B. A predictable climax community
    C. A dynamic mosaic of open grassland patches and distributed trees
    D. A single fixed endpoint

13. The term **plagioclimax** refers to:
    A. A natural evolution of an ecosystem
    B. A community that has been halted or warped by human intervention
    C. The intended climax community forming
    D. An unaffected successional trajectory

14. Which of the following is an example of **human-induced plagioclimax**?
    A. Natural disasters
    B. The loss of top carnivores from an ecosystem
    C. A stable and diverse environment
    D. Propagules spreading by wind, water, or animals

15. How can **domesticated livestock grazing** lead to a plagioclimax?
    A. By promoting the growth of all plant species
    B. By resulting in the extinction of some plant species and the promotion of others
    C. By ensuring the transition to a climax community
    D. By resulting in a natural evolution of an ecosystem

16. Human activities can drastically affect the succession trajectory, deviating from the natural evolution and resulting in a situation known as:
    A. climax community
    B. plagioclimax
    C. natural selection
    D. interspecific competition

17. Which of the following factors does NOT influence the type of community that arises during succession?
    A. climatic factors
    B. the properties of the local bedrock and soil
    C. the presence of pioneer species only
    D. geomorphology

18. How can **disturbances** influence successional paths?
    A. disturbances have no impact on successional paths
    B. by ensuring a smooth transition to a climax community
    C. fire can initiate a reset in succession by eliminating vegetation
    D. disturbances only support the growth of climax species

19. What is the role of **top carnivores** in herbivore-population regulation?
    A. top carnivores have no effect on herbivore populations
    B. top carnivores play critical roles in herbivore-population regulation
    C. top carnivores promote plant development
    D. top carnivores help accelerate the transition to a climax community

20. Which of the following statements best describes how **top-down and bottom-up factors** interact to influence community structure during ecological succession1...?
    A. Top-down factors, such as nutrient availability, primarily determine the rate of primary production, while bottom-up factors, like predation, control the abundance of top predators.
    B. Bottom-up factors, such as resource availability, influence the abundance and diversity of lower trophic levels, which in turn affect higher trophic levels, while top-down factors, such as grazing pressure and keystone predators, can alter the structure and composition of lower trophic levels
    C. Top-down and bottom-up factors operate independently, with each having minimal influence on community structure during succession
    D. Bottom-up factors are only important in the early stages of succession, while top-down factors become more important in later stages as communities become more complex.