Name _____

The Vital Role of Non-Vascular Plants in Ecosystems

Open-Ended Response Answer Key

1. Non-vascular plants often form mutualistic relationships with animals and microorganisms. For example, certain species of mosses provide habitat for nitrogen-fixing bacteria, which enrich the soil with nitrogen compounds essential for plant growth. In return, these bacteria receive shelter and nutrients from the moss.
2. Declining populations of non-vascular plants can lead to increased soil erosion, loss of habitat for organisms, and reduced water retention capacity in ecosystems. This can result in destabilized ecosystems, loss of biodiversity, and decreased resilience to environmental disturbances.
3. Non-vascular plants play a crucial role in mitigating the impacts of climate change by sequestering carbon dioxide through photosynthesis and regulating local microclimates. By capturing and storing carbon in their tissues and soil, they help mitigate the greenhouse effect and reduce global warming. Additionally, their ability to retain moisture and provide shade contributes to temperature regulation in ecosystems.
4. Non-vascular plants exhibit various adaptations that enable them to thrive in different environments. For instance, mosses in Arctic regions have adaptations like dark pigments to absorb more sunlight and retain heat, allowing them to survive in cold climates. In contrast, desert-dwelling non-vascular plants have mechanisms such as water-storing tissues and reduced leaf surfaces to minimize water loss in arid conditions.