Name _____

Keystone Species: Guardians of Ecosystems

Open-Ended Response Answer Key

1. Removal of keystone species can trigger a chain reaction of ecological changes. For example, the removal of wolves in Yellowstone National Park led to an increase in elk populations, which in turn resulted in overgrazing of vegetation and habitat degradation. Similarly, the loss of coral reef fish species can lead to coral bleaching due to algal overgrowth, ultimately impacting the entire reef ecosystem.
2. Introducing or reintroducing keystone species can have both positive and negative consequences. For instance, reintroducing wolves to certain areas can help control deer populations and restore ecosystem balance, but it may also lead to conflicts with livestock farmers. Similarly, introducing top predators to marine ecosystems can enhance biodiversity but may also disrupt local fishing industries.
3. Keystone species in terrestrial ecosystems, such as wolves and prairie dogs, often play roles in regulating herbivore populations and shaping vegetation structure. In contrast, keystone species in aquatic ecosystems, such as sea otters and coral reef fish, contribute to nutrient cycling and habitat formation. Despite these differences, both types of keystone species are essential for maintaining ecosystem health and resilience.
4. Managing keystone species populations requires careful consideration of ecological, social, and ethical factors. Conservation efforts aimed at protecting keystone species must balance the need to preserve biodiversity and ecosystem function with the interests of local communities and stakeholders. Additionally, managers must address potential conflicts between keystone species conservation and human activities such as agriculture, fishing, and urban development.