



## 9-12<sup>th</sup> Grade - Keystone Species

### Teacher Guide

**Goal:** Students will be able to explain how specific keystone species are important to their ecosystems.

**GSE Connections:** SB5. Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment.

**NGSS Connection:** HS-LS2-5. Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new ecosystem.

#### Background Information:

Ecosystems are made from the connections between all of the living and non-living components of an environment. They are made up of complex food webs and individual habitats of animals, all working together. Each part of an ecosystem plays an important role; however, there are some species, called **keystone species**, that are so important that if they were to disappear, the entire ecosystem could break down.

Keystone species are organisms that directly impact multiple other species. They may be seed dispersers, meaning that without them, seeds would not become fertilized and grow new plants. Keystone species could also provide shelter not only for themselves, but also for various other organisms. Sometimes keystone species play a role in food webs and without them, many animals would not get enough food. These are just a couple of the ways in which keystone species could have an essential role in their ecosystems.

Vocabulary	
<b>Keystone species</b> – a species that plays a critical role within an ecosystem. If this species were to be removed, the ecosystem would drastically change.	<b>Habitat</b> - the place where a specific animal lives
<b>Ecosystem</b> - all the living and non-living components of an environment that work together	<b>Food Web</b> - a series of interconnected food chains

**Activity:** Review with students how keystone species impact their ecosystems. Then, as students explore Zoo Atlanta, they will learn about various keystone species and the important roles that they play in their ecosystems.



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### Student Explore Sheet

Keystone species are very important to the health of an ecosystem. If a keystone species were removed from the environment, many other organisms would suffer. As you visit Zoo Atlanta, check out the keystone species listed below and complete the chart.

<b>Keystone Species</b>	<b>Describe the habitat in which this animal lives.</b>	<b>How is this animal important to its ecosystem?</b>	<b>What would happen to the ecosystem if this animal were removed?</b>
<b>African elephant</b> <i>(Endangered in the wild)</i>			
<b>Western lowland gorilla</b> <i>(Critically Endangered in the wild)</i>			
<b>Gopher tortoise</b> <i>(Threatened in the wild)</i>			
<b>Sumatran orangutan</b> <i>(Critically Endangered in the wild)</i>			

Biodiversity is important to all ecosystems. However, when keystone species are removed, the entire ecosystem's health is threatened. All of the keystone species listed above are threatened, endangered or critically endangered in the wild, as classified by the International Union for Conservation of Nature (IUCN). Throughout the Zoo, information can be found on the threats to the species and their habitats.

After visiting the habitats above, pick one of the four animals and identify the threats to that species. Then, brainstorm what you and your classmates can do to help conserve their wild counterparts. Use the back of this sheet to brainstorm your ideas. Once you get back to class, present your ideas to your classmates!



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### Student Extension

Use this space to brainstorm threats to one of the keystone species on the front of this explore sheet. Then, design an action plan that you and your classmates can do to help save the animal's wild counterparts. Use the IUCN's website (<https://www.iucn.org/resources/conservation-tools>) and Zoo Atlanta's Animal Pages (<https://zoatlanta.org/animals/>) for more information.