Fire and Biodiversity

Slideshow Script

Slide 1 - *Please use the* Click *prompts that are embedded in the slideshow script to coordinate the narration with corresponding images.*

In this lesson we will learn about how fire can affect biodiversity. Click

Slide 2 - *Read the slide*.

The two trees shown are both oaks, but they are different species, Post Oak and Blackjack Oak. The white-tailed deer and elk are both members of the deer family, *Cervidae*, but are different species. Historically, these four species were all found in the Ozark Highlands. Which of these species is now only present in the Ozark Highlands in small, isolated groups? *Give students a chance to answer the question.* Elk numbers are currently low in the Ozark Highlands. As we continue our discussion, think about why Elk numbers are low while white-tailed deer populations are doing very well. Click

Slide 3 - Each species has a function and location within an ecosystem. *Give students time to list some of the characteristics of a niche*. *This could be a good opportunity to review trophic terminology*. Click

Slide 4 - *Read the definition of habitat.* The terms "habitat" and "niche" are often confused. Which term is "part" of the other? *Give students a moment….* Remember that a niche includes a species' location and trophic category, how it fits into a food web, whereas habitat only describes "where" a species is found. Click Would anyone like to describe the habitat of a Post Oak tree? *Give students an opportunity to respond*. Click Here is a typical "scientific" description of the habitat for Post Oaks. Click What about for white-taile deer? *Give students an opportunity*…. Click … and now for the detailed habitat description. Click

Slide 5 - The oak trees stand out in the image on the left, and the deer are the focus in the other image. Those are the populations you are supposed to notice. But be aware that there are other populations in each image. Click

Slide 6 - Population ecology investigates factors that cause a population's numbers to increase or decrease. There could be changes in abiotic factors, such as nutrients, sunlight, precipitation, temperature, or changes in biotic factors, such as predators, herbivores, and diseases. Click

Slide 7 - *Read the slide*. Click

Slide 8 - These two images are from a study that shows how a change in plant species and densities affects the range of animal species in an area. No species is isolated. All species interact with and depend upon other species. Thus, all populations interact with and depend upon populations of different species. Click

Slide 9 - Due to morphological characteristics fire tolerant species have a lower probability of being injured or being killed by fire. Such organisms are also referred to as fire resistant species. Click

Slide 10 - Fire intolerant species have a relatively high probability of being injured or killed by fire because they are very sensitive to fire or the heat produced by a fire. In the Ozark Highlands, Eastern Redcedar trees Click are an excellent example of a fire intolerant species because they are easily damaged Click or killed Click due to thin bark, shallow roots, Click inability to resprout, and highly combustible evergreen foliage. Eastern Redcedar can survive in fire prone landscapes Click if they grow in areas protected from fires. Click

Slide 11 - Click What would happen to a species/community if a fire passed through the area where it is found? Click Obviously, there could be dramatic short-term impacts, Click but how will the species/community respond in the following months or years? *Give students an opportunity to respond. Fire can have direct and indirect impacts on plants and animals*

found in the Ozark Highlands. Direct impacts include burns, heat stress, and predation as animals flee a fire. Indirect impacts include changes in food availability, loss of nesting sites, and increased predation pressure due to a loss of cover. On the community level, a disturbance usually "resets" succession which provides a variety of niche opportunities in a system. Such variety helps to promote biodiversity. Click Next, what would happen to a species/community if fire never occurred in the area where it is found? Click Once again, keep short-term and Click long-term impacts in mind. *Give students an opportunity…. The biggest long-term problem with a lack of fire in the Ozark Highlands would be the transition from one ecosystem to another (e.g., prairie to savanna to woodland to forest). This would cause the biodiversity in an area to decline.* Click The main question that you will address in this lesson is "Why is fire important for species and communities?" Click Any possible reasons why elk populations are struggling in the Ozark Highlands? *Give students an opportunity…. Plausible explanations include overhunting, disease outbreaks, loss of habitat (lack of fire or land use conversions), etc.* Click

Slide 12 – We have completed our review of basic concepts related to population ecology and community ecology. It is now time for you to investigate how fire impacts populations and communities and to develop a presentation with your findings.

Direct students to continue with Part B on their worksheets. Students may work on their own or in a group of two.

The End