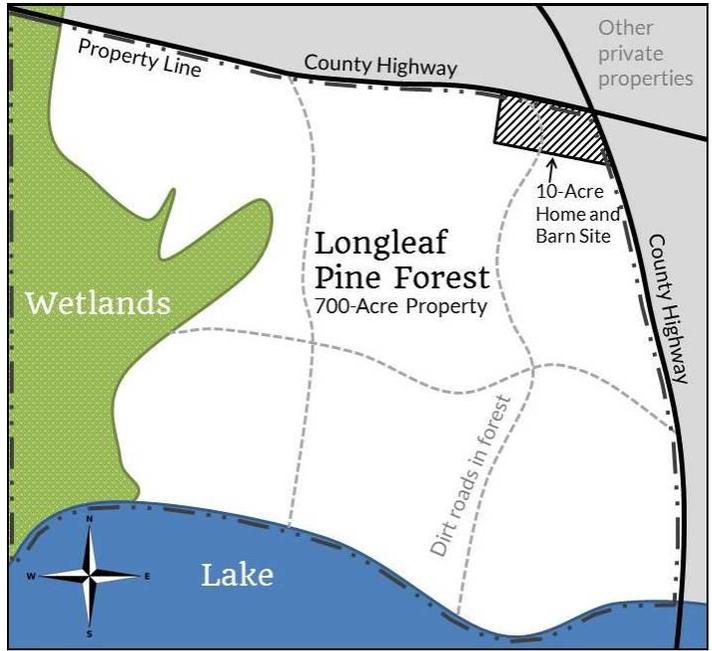


OPENING VIDEO | Watch the provided segment of “Roaming the Red Hills” by WFSU Public Media and think about the role of fire in the longleaf pine ecosystem.

ACTIVITY | You are helping a local conservation group make plans to take care of a new property they have acquired in the Red Hills region. Your team agrees they want to manage the property to benefit a wide variety of native wildlife species and that prescribed fire will need to have some role in the management plan. However, the team is struggling with the question of “how frequently should prescribed fire be applied to the site to promote biodiversity?”

- With your team, use data from the species cards, any background reading you have done, and the habitat data that follows to develop a claim that best answers the question.
- Once you have developed a claim, support your claim with evidence from the data. Don't be afraid to revise your claim as you work on the evidence.
- Lastly, develop reasoning to explain why each part of your evidence is important. Think about the different scientific ideas you have studied and how these ideas can be used to explain why your evidence supports your claim.

MAP OF THE NEW PROPERTY



A student activity sheet will be provided to help you organize your claim, evidence, and reasoning.

BACKGROUND | The Red Hills region is well known for its widely spaced pine trees. The spacing between the trees allows for sunlight to reach the ground and soil. Many species of ground cover plants are able to grow and thrive in these areas. The presence of this wide range of plant types supports the high biodiversity of other organisms by providing structure for their shelter and other basic needs, stable and diverse sources of food, as well as resilience and stability in the ecosystem over time. There are many interdependent relationships among plants and animals in an ecosystem.

Interestingly, fires are very important for the stability and structure of the longleaf pine ecosystem. Fires have long been caused by lightning strikes. There is also evidence of indigenous people purposely using fire to manage plant communities and improve hunting. Both of these instances of fire have shaped this unique ecosystem over a long period of time. As a result, the species in these areas have adaptations that are beneficial for surviving fire. Low-intensity fires trim back plants, but don't tend to hurt their roots. This benefits plant species that have adapted to fire by growing larger root systems or other adaptations. Now, if fire is absent from the longleaf pine forest, certain woody plants will outcompete most of the many leafy non-wood plants and grasses, and eventually non-fire-adapted plants will invade. This change results in less stability and a loss of biodiversity.

Excluding fires in fire adapted ecosystems is an example of a human impact on a natural system. Public and private land managers now use prescribed fire as a tool to sustain biodiversity. An additional benefit of prescribed fire is a reduced risk of wildfires that may impact human development.

Tall Timbers is a research station in the Red Hills region that focuses on the ecology and management of fire-dependent ecosystems. The following table provides generalized data from Tall Timbers on the effect of fire frequency (rows) on a variety of habitat characteristics (columns). Use the provided species information cards and the habitat characteristics below to explore relationships between the habitat needs of different species and fire frequency. The student activity sheet includes a table in the evidence section that you can use to help organize your data.

Generalized data on fire frequency and habitat characteristics

Fire Frequency (years)	20	5	5	90	Thick	0	100	High ↑
	10	5	5	90	Thick	0	100	
	5	10	10	80	Thickening	3	80	
	3	20	30	50	Moderate	5	50	
	2	33	33	33	Open	15	50	Low
	1	60	30	10	Open	15	50	
		% Grasses	% Leafy Non-Woody Plants	% Woody Plants	Ground Cover Structure	% Bare Ground	% Tree Canopy Cover	Fire Fuel Load
	Ground Cover Composition (plants below 5 feet in height)							

To aid in the long-term study of fire, Tall Timbers has established designated areas, or “fire plots,” that have been burned at set fire frequencies for decades. Maintaining the same fire frequency (years since fire) on the same plot of forest over many years allows researchers to evaluate the changes in habitat characteristics. Use the data in the table above to help you identify the fire frequency (1, 2, 3, or 5 years) represented in each photo (all taken in October of the same year). This visual information can also be used to help you develop your claim and support it in the Claim, Evidence, and Reasoning exercise.

