**Use the information about biodiversity in longleaf pine ecosystems and your knowledge of science to answer the questions.**

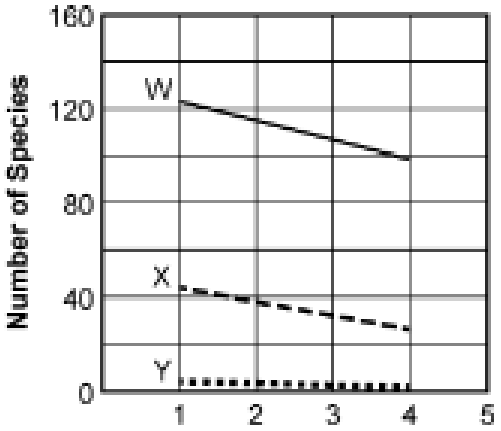
## Biodiversity in Longleaf Pine Ecosystems

Longleaf pine forests once covered large areas of the Southeast, including Louisiana. These ecosystems once contained a variety of wildlife and very diverse communities of plants. These ecosystems consisted of longleaf pines that were spaced far apart. This left open gaps in the forest that could support large populations of herbs and grasses. Many species of plants on the forest floor relied on fire to stimulate their flowering and seed production.

Human activities, such as farming and livestock grazing, have destroyed large areas of longleaf pine ecosystems. In the few remaining longleaf pine ecosystems, fire suppression (management strategies to prevent forest fires and/or fight fires to keep them from spreading) has allowed other large trees, such as oaks, to fill in the once-open spaces. Woody shrubs have also taken over the forest floor. This has caused a large decrease in plant biodiversity.

In recent decades, people have attempted to restore longleaf pine ecosystems across the Southeast. Data from these efforts show an increase in plant biodiversity, as measured by species richness. Scientists conducted a study to investigate the effects of fire suppression on biodiversity. The scientists selected plots (sections) of land in different areas. The plots were different scales (small to large) and were assigned to groups that would receive regular controlled burns every one to four years. Some plots were assigned to a group that would not receive any controlled burns. Each year of the study, the scientists counted the number of different plant species living in each plot. Graph 1 shows the relationship between the amount of time between controlled burns and the number of species in each plot.

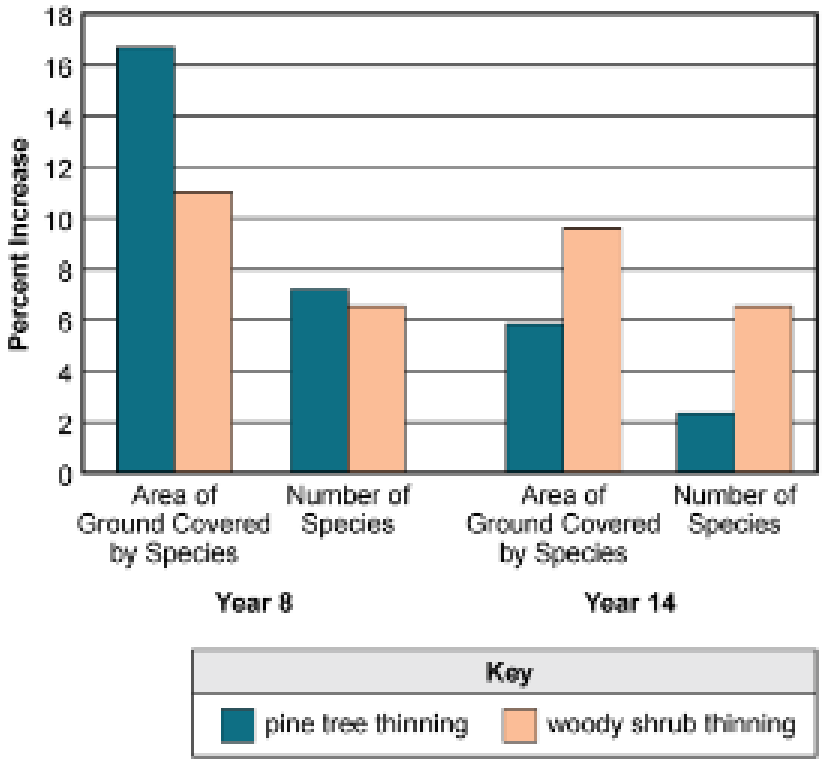
**Graph 1. Results of Plot Study**




| Key | |
|---|---|
| Line | Plot Size ($m^2$) |
| — W | 1000.00 |
| - - X | 10.00 |
| ·-·-· Y | 0.01 |

A second study showed further increases in biodiversity, with thinning (selective removal) of pine trees and woody shrubs in addition to controlled burns. Data from that study are shown in Graph 2.

**Graph 2. Pine Tree Thinning vs. Woody Shrub Thinning**



Images 1 and 2 show effects of different management practices in different areas.

**Image 1. Periodic Burning Only**

**Image 2. Periodic Burning and Thinning of Pine Trees and Woody Shrubs**