



Hardy Headlines

Concepts of Ecology

This guide explores some concepts and vocabulary of ecology relevant to Phil Hardberger Park.

Google defines an ecosystem as “a biological community of interacting organisms and their physical environment.” In Phil Hardberger Park, the Live Oak–Ashe Juniper woodland is an example of an ecosystem.

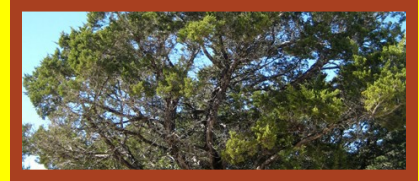
Three ecoregions join at Phil Hardberger Park : Blackland Prairie, South Texas Plains, and Edwards Plateau. A place in which two or more ecoregions join is an ecotone; an ecotone has increased biodiversity. Originally, Phil Hardberger Park was savanna. Savanna ecosystems cover 20% of the Earth’s surface. Savanna is grassland with sparse clumps of trees so that the tree canopy does not close.

The tree cover in the park was once only 15–30%; now it is 66–98% .



Relationships: There are several kinds of ecological relationships. Two species can have a neutral relationship. There may be competition for scarce resources. In *amensalism* one species is harmed while the other is not. In *commensalism* one species may benefit while the other does not. In *protocooperation* 2 species achieve common benefit. We will learn about obligate mutualism in which each member benefits.

Live Oak Ashe Juniper Ecosystem: Live Oaks generally grow in dry limestone soils and on hill tops and in valleys. They are a source of food both directly – acorns, and indirectly – insects . Originally the land around San Antonio had a balance of grasses, shrubs, small plants Live Oak and Ashe Juniper, maintained by roaming grazers and natural fire. Fenced livestock and fire suppression made it hard for grass, shrubs, small plants to compete. The original Live Oak -Ashe Juniper savanna became Live Oak -Ashe Juniper woodland. The water repellent leaf litter of the Ashe Juniper and absorption of light rains makes it hard for young plants and shrubs to flourish. The cedar sedge is the plant most likely to be found under the woodland tree canopy or cover. How do you think we can restore and maintain a Live Oak -Ashe Juniper savanna ecosystem?



Invasive and exotic plants: Exotic plants like Eurasian mustard are not native to the area. Invasive plants are able to out-compete other species and dominate an area. Not all exotic plants are invasive and not all invasive plants are exotic! Exotic plants can have an advantage. Since they are not native, they may not have any natural predators. Invasive plants thrive because conditions favor them. They may be exotic and have no natural predators.. They may have been bred to be free of naturally occurring diseases. In the case of the Ashe Juniper, changed conditions favored its dominance. Volunteers work in the park to eradicate Malta Star Thistle and an Eurasian mustard., two exotic and invasive plants.



Savanna Restoration: Savanna restoration is occurring in the park. The savanna – grass plugs and wildflower seed – was planted by hundreds of volunteers. The savanna provides natural services: reducing rain water runoff and increasing retention of water, decreasing erosion of soil, providing food for birds, butterflies and other insects, providing edge habitat for mammals and birds. It increases biodiversity in the ecosystem.

Yucca and the Yucca Moth: The *Yucca rupicola* and yucca moth (*Tegeticula yuccasella*) are an example of obligate mutualism. The yucca moth pollinates the yucca, and the yucca provides a place for mating and depositing and feeding eggs. They need each other and benefit from each other.

What do you think would happen to the yucca if there were no yucca moths, or to the yucca moth if there were no yuccas!



Tree-canopy, understory trees, and edge habitat: The tree-canopy is the upper layer of the forest formed by the leafy branches or crown of the taller trees like the Live Oak and Hackberry – it provides the cover when you look upward. Understory trees, like the Blue Condalia, are smaller trees under the canopy. A healthy forest will have different layers – tall canopy trees, smaller understory trees and a lower layer of shrubs, like Elbow bush, grass and plants. The edge habitat is the place where contrasting environments are side by side, producing more diversity. Fragmentation is the disruption of preferred environments for a species. Where do you see fragmentation in San Antonio?

Ecotones and Ecoregions: Ecotones are areas in which two or more ecoregions meet, creating more biodiversity. Ecoregions are areas of similar biological communities. They are defined by consistent climate, soil and landform conditions.

Describe some of the characteristics of the ecoregions which meet in the park:

Phil Hardberger Park
Conservancy

Alamo Area Master Naturalists

Educate, renew,
recreate



**Yucca moth picture image copied from
*desertusa.com/animals/coevolution-
mutualism.html***

**Savanna photo courtesy of Barbara
Schmidt.**

**Information on the Live Oak-Ashe Juniper
Ecosystem, Yucca and Yucca Moth Relation-
ship, and Savanna, is based on material in
the A Resource Guide to Phil Hardberger Park
and the Oak Loop Trail—**

<http://txmn.org/alamo/php-brochure/>

History

The value of biodiversity:

What is biodiversity? Biodiversity refers to the variation of life forms within an area, and is a measure of the ecological health of that area. The earth is very complex and each species plays its part in making that fragile complexity work.

The presence of biodiversity maintains the balance of ecosystems. It is a source of new medical treatment. It helps sustain a healthy food chain and promotes water and soil quality. It minimizes the chances of disease or insect pests wiping out a monoculture.

