Hardy's Nature Guide

for Young Naturalists

I'm Hardy—
your Phil
Hardberger
Park guide to
adventure
and learning

Write Your Own Guide!

- Here's how it works:
- Read the information on the page
- And add your own questions, observations and thoughts!

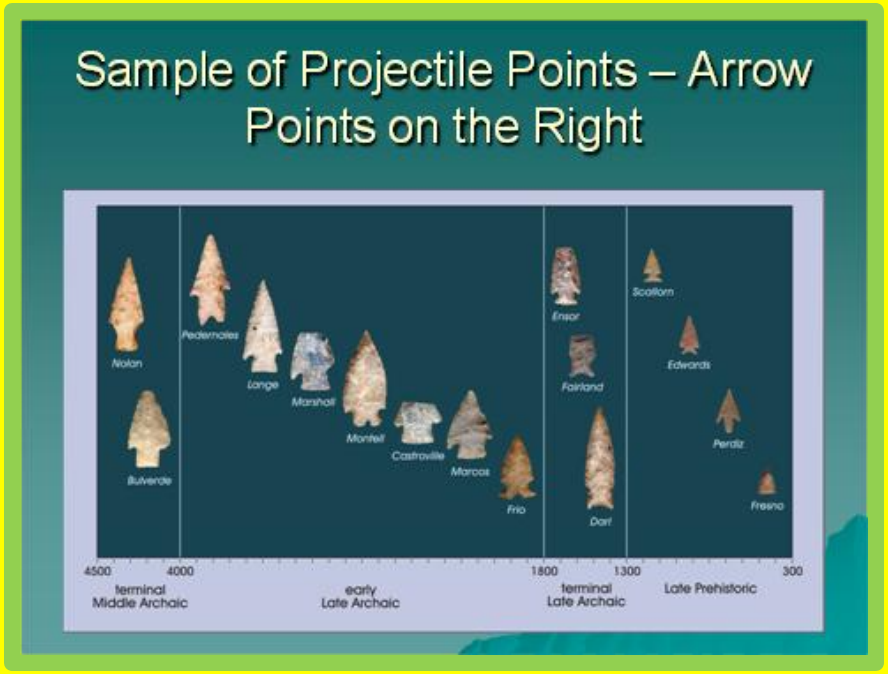
What Is Phil Hardberger Park All About?

- The park is about creating an urban wild in which wilderness coexists in the city.
- The goal is to restore and renew the original landscape, provide recreational opportunity for all ages and abilities, and educate about our San Antonio ecosystems and history and how they have interacted.

- Design a logo that represents what PHP is all about--

Early Humans in San Antonio

- **How might we learn about the earliest people in this part of Texas**



- *Dr. Steve Tomka, Director of the Archaeological Research Center at the University of Texas at San Antonio,*

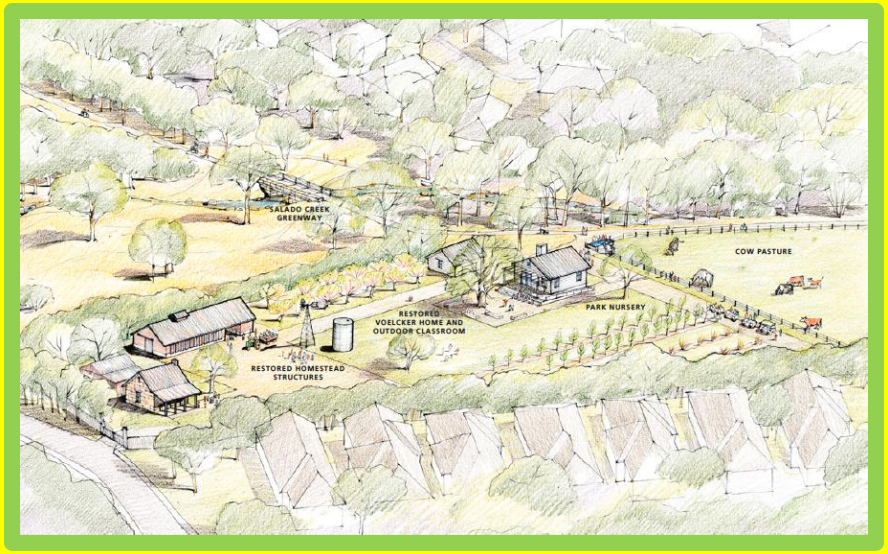
Early Humans in San Antonio

- What do we know about the early inhabitants of San Antonio?
- Archeologists have found evidence of early humans dating back 12,000 years ago—spear and dart points used by nomadic hunters.
- 300 0years ago cemeteries appeared and 1200 years ago ceramic vessels.
- Early people used the San Antonio River for travel.
- The Spaniards came in the 1500's and were followed by the Lipan Apaches, Comanche's and Tonkawa peoples, who settled near Salado Creek.

- Archeological finds in nearby parks suggest that there were chert quarries, good hunting and camping in the surrounding area.
- Draw a picture of some of the things that archeologists might find indicating the presence of early humans:

The Voelcker Farm

- **How was the land of Phil Hardberger Park used in the past?**



- Rendering courtesy of Phil Hardberger Park Master Plan as reproduced in
- http://blog.mysanantonio.com/jeffcoyle/2011/03/volunteers-to-restore-historic-dairy-barn-at-phil-hardberger-park/

The Voelcker Farm

- How was the land used before it was a park?
- Minnie and Max Voelcker lived on the land of Phil Hardberger Park. They had a dairy farm.
- When large dairies were formed, they sold their milk to the large dairies.
- When dairy farming became too competitive, they sold their cows and ran cattle and sold hunting leases.

- Minnie remained on the farm after Max died, and when she died in 2000 the land became available, and some was purchased to form the park.
- What do you think were some of the hardships of early farming life?

Ashe Juniper

- People sometimes call the Ashe Juniper “cedar”.
- What do you know about “cedar” trees?

Ashe Juniper

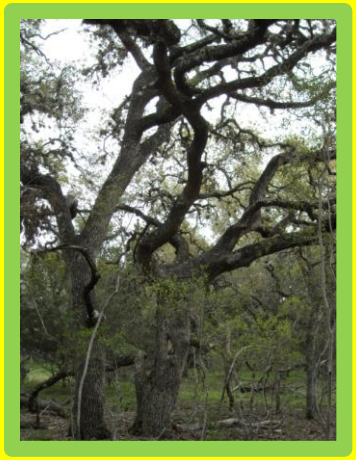
- The Ashe Juniper is the dominant tree in the park.
- In earlier times, natural fire kept the Ashe Juniper trees in balance. In recent times, man has suppressed fires and the Ashe Juniper outcompetes other vegetation.
- It takes up the first quarter inch of rain that falls.
- It's litter repels water so water runs off. The litter also covers other young plants.
- Its pollen causes allergies.
- The Golden Cheeked Warbler males its nest from strips of the bark of old Ashe Juniper.
- The Ashe Juniper litter helps with soil creation.

- Do you think the Ashe Juniper is good or bad? Why?

Ashe Juniper Live Oak Ecosystem

- What conditions favor the Ashe Juniper Live Oak ecosystem?

Ashe Juniper



Live Oak

Ashe Juniper Live Oak Ecosystem

- The land of Phil Hardberger Park was once a savanna grassland with sparse trees, mainly Live Oak.
- Live Oaks like to grow in shallow limestone soil on hills and escarpments, which are steep areas or cliffs.
- Ashe Juniper prefers to grow on slopes and in canyon lands.
- The savanna and Live Oaks were sustained by natural fire to reduce woody undergrowth, and by roaming native animals. After European settlement, fire was controlled, and fenced herds were able to strip native grasses to the ground.
- Live Oak savannas became Live Oak/Ashe Juniper woodlands.

- Look at the two trees—what are some of the differences you see?

Savanna Restoration

- What is the purpose of savanna restoration projects?

Savanna Restoration

- Twenty per cent of the earth's surface is savanna. Originally Phil Hardberger Park was 15-30% tree cover—now it is 66-98%.
- Savanna is grassland with sparse tree cover.
- Savanna delivers natural services including water retention, reduced run-off, reduced flooding, and biodiversity.
- An ecotone is where two or more ecoregions come together; three ecoregions—Blackland Prairie, Edwards Plateu and South Texas Plains come together in the park.
- Biodiversity, more species, strengthens the ecosystem for all.
- Five hundred volunteers planted 50,000 "plugs" of grasses to restore the savanna.
- When fire was suppressed by settlers—woody plants grew unchecked and forced out the native grasses.
- When fenced cattle replaced nomadic, roaming bison, the cattle stripped the savanna of grasses.
- Gradually the savanna disappeared.

- Draw a picture of what a savanna looks like:

Snags

- What functions do snags serve?

Snags

- Do you wonder why the park service lets dead trees remain in the park?
- Standing dead trees are “snags” and they are essential to the ecosystem.
- Dead trees provide habitat to “primary cavity nesters” like woodpeckers and “secondary cavity nesters” like the Carolina Chickadee.
- Reptiles such as the Texas Spiny Lizard and mammals such as squirrels also live in snags.
- And when the trees fall, insects and fungi live on the dead trees and eventually the trees turn into rich soil.

- What are some of the benefits of snags?

Texas Persimmon

- What are some of the uses of the Texas Persimmon?

Texas Persimmon

- The Texas Persimmon is easy to spot with it's smooth gray bark and small oval leathery green leaves.
- It has many uses. Wildlife eat the fruit. The fruit makes delicious jelly. The wood is used to make piano keys and tool handles. You can make a dye from the fruit.

- **Draw a picture of one use of the Texas Persimmon:**

Kidneywood

- What insect is dependent on the Kidneywood tree?

Kidneywood

- Kidneywood is one of the many beautiful understory trees and shrubs in the park.
- Others are the Gum Bumelia, Blue Condalia, Wafer Ash and Elbowbush and Eve's Necklace.
- Kidneywood is the host tree for one stage of the Dogface Butterfly; other birds and butterflies love it's fragrant blossoms.
- The inside of the wood can be used to make an orange dye.
- Healthy forest ecosystems need three levels—"canopy" trees which are tall, "understory " trees and other plants which are middle sized and flowers and grasses and other ground level plants.

- Names tell you about plants.
- Why do you think Kidneywood, Elbowbush, Eve's Necklace, Gum Bumelia, and Wafer Ash or Hoptree, have those names?

Wildlife of the Park

- Which animals inhabit which ecosystems in the park?

- Ringtail (Bassaricus) from USDA FS

Wildlife of the Park

- The park has different ecosystems.
- Phil Hardberger Park East borders Salado Creek—a “riparian” corridor. Riparian refers to the plants that grow along rivers or creeks. Dark black Rock Squirrels like the vegetation, or plants, in a riparian area. Coyotes and raccoons use the corridor as a highway for travel.
- Some animals are nocturnal like the ringtail, a relative of the raccoon. Nocturnal animals are active at night, when the darkness provides cover.

- What are some of the advantages of being nocturnal?

Birds of the Park

What are some good places to look for birds?

Roadrunner

- Photos courtesy of Lora Render

Golden-crowned Kinglet

Sage Thrasher

Field Sparrow

Birds of the Park

- Above in the sky—that's where you may see Turkey Vultures, Black Vultures and Northern Caracaras.
- There are over 100 species of birds that have been seen in Phil Hardberger Park.
- In the trees you may see Northern Cardinals, Black-crested titmice, Bewick's Wrens and Golden-fronted Woodpeckers.
- And on the ground—Roadrunners!
- Migrating birds such as the Cedar Waxwings can be spotted as they visit.
- Draw a picture of one of the birds in the park:

- Photo courtesy of Barbara Schmidt

Reptiles of the Park

- How does camouflage help the reptiles?

Rosebelly Lizard

Reptiles of the Park

- Reptiles are land animals with a backbone and scales covering the body. There are four kinds of reptiles in Texas, and three—snakes, lizards and turtles—live in the park.
- Reptiles are cold-blooded, depending on the outside temperature to regulate their own temperature. That is why you see them move in and out of the sun.
- Different reptiles like different habitats—rocky, moist, ground, trees.
- The Rosebelly Lizard is one of the most common reptiles seen in the park.

- **Draw a picture of one of the habitats of reptiles:**

Wildflowers of the Park

- Why are wildflowers important?

Horsemint

Greenthread

Prairie Verbena

Bladderpod

Gaillardia

2 Leaved Senna

Wildflowers of the Park

- Wildflowers do many things to sustain the ecosystem.
- They anchor soil and help retain water.
- They provide food, cover and nesting material for butterflies and other insects, birds and other species.
- Some wildflowers, such as Horsemint, Lindheimer's Senna and Larkspur, can be used like medicine.
- Some wildflowers provide beautiful dyes.
- And wildflowers make us happy with their beauty!

- **Draw a picture of a wildflower:**

Exotic Invasive Plants

- What conditions allow exotic invasive plants to take over the ecosystem?

KR Bluestem

Giant Mustard

Exotic Invasive Plants

- Exotic plants are not native to Texas.
- Invasive plants are able to out-compete native plants and dominate the ecosystem, forcing out native plants, which are necessary for the survival of native species of wildlife, birds, reptiles, amphibians and insects.
- Exotic invasives may be sold as landscaping plants, or seeds may enter the country on shipping from abroad.

- Since the plants are not native, they do not have native wildlife to keep them in check.
- Many of these plants have been bred to withstand extremes of weather and insects and so they can compete more favorably.
- Exotic invasives include: nandina, chinaberry, ligustrum, Chinese tallow tree and lantana.

Prickly Pear

- What is a tuna?

Prickly Pear

- Prickly Pear are Opuntia. They have flat pads or platycades. The pads have two kinds of spines—hard fixed spines and small hair-like spines called glochids. The small spines detach easily and stick to whatever touched them.
- The fruit of the cactus is called a tuna. Tuna is a Spanish word for fruit of a plant.
- The white on the cactus pad is cochineal—a red dye is made from it.

- What are some of the things spines do?

Tasajillo

- Tasajillo is also called the Christmas Cactus—why do you think people use that name?

Tasajillo

- Tasajillo is known by many names, most frequently Pencil Cactus. It is a narrow cactus with beautiful red fruit and yellow flowers.
- It is the nesting site for Cactus Wrens.
- It's fruits are eaten by many animals.

- Why do you think it's called Pencil Cactus.

Yucca Moth

- How are the yucca moth and yucca related?

Yucca Moth

- The Yucca Moth and the Yucca are an example of “obligate mutualism”. The yucca moth is attracted by the smell of the Twisted Leaf Yucca bloom. Yucca Moths mate in the bloom and pick up pollen. The moth flies to another bloom and lays her eggs in the bloom. At the same time she pollinates the yucca plant.
- “Obligate” means that the relationship is necessary for the survival, and “mutualism” means that both the moth and plant benefit.

- Draw a diagram of how the relationship between the Yucca Moth and Yucca works:

Butterflies and Bugs

Why do you think we see so many butterflies in the park?

Checkered Skipper

Sleepy Orange

Checkered white

tiger Swallowtail

Red Admiral

Butterflies and Bugs

- The savanna and wildflowers attract lots of butterflies. What similarities and differences can you see in how they look?

- One of the insects of the park is the dung beetle. Dung is animal droppings. These beetles roll dung into balls and roll the balls away. How do you think dung beetles help us?

Grasses

- Most people think all grass is the same—but each kind of grass is distinct!

Texas wintergrass

Bushy Bluestem

Australian Bluestem

Little Barley

Perennial Ryegrass

Eastern Gamagrass

Grasses

- The Savanna Restoration has many grasses. You can see both native and exotic invasive grasses in the park. Some of the native grasses are Texas wintergrass, Cupgrass, Eastern gamagrass, Perennial ryegrass and Texas grama. You will also see invasive King Ranch bluestem, Australian bluestem and Bermuda grass.

- Look at the grasses—what are some of the differences you see?

Your Phil Hardberger Park!

- Phil Hardberger Park is called a “learning landscape” and “urban wild”.

- What do those terms tell you about the park?

Key Words

- **Do you know the meaning of these words? Find them in the dictionary!**
- Ecosystem
- Biodiversity
- Savanna
- Snag
- Ecotone
- Obligate mutualism
- Archeology
- Chert
- Canopy tree
- Understory tree
- Riparian
- Habitat
- Nocturnal

Key Words Defined

- Ecosystem--the complex set of relationships among the resources, habitats, and residents of an area.
- Ecoregion—an area of similar communities, species, and habitats.
- Biodiversity–the variety of plants and animals in an area.
- Savanna—a grassland with occasional groupings of trees so that the tree canopy, or cover, does not close.
- Snag—a dead standing tree.
- Ecotone—the meeting of two or more ecoregions.
- Obligate mutualism—two species that depend upon each other to survive.
- Archeology–the study of past human life and activity based on objects from those times.
- Chert—a form of quartz that is tough and breaks into pieces with sharp edges.
- Canopy tree—a large tree the leaves and branches of which cover the ground when seen from above.
- Understory tree—a small tree that grows under a larger tree.
- Riparian—the plants that are found by rivers and creeks.
- Habitat—the natural place for a living thing to survive.
- Nocturnal—active at night.

Some Scientific Names

- Ashe Juniper-*Juniperus ashei*
- Live Oak—*Quercus virginiana*
- Texas Persimmon—*Diospyros texana*
- Kidneywood—*Eysenhardtia texana*
- Twist-leaf Yucca—*Yucca rupicola*
- Prickly Pear—*Opuntia engelmannii var. lindheimeri*
- Tasajillo—*Cylindropuntia leptocaulis*
- Yucca Moth—*Prodoxidae*
- Gaillardia—*Gaillardia pulchella*
- Prairie Verbena—*Glandularia bipinnatifida*
- Northern Cardinal— *Cardinalis cardinalis*
- Golden-cheeked Warbler— *Setophaga chrysoparia*
- Ringtail— *Bassariscus astutus*
- Rock Squirrel— *Otospermophilus variegatus*
- Rosebelly Lizard— *Sceloporus variabilis marmoratus*
- Texas Rat Snake--*Elaphe obsoleta lindheimerii*
- Tiger Swallowtail— *Papilio glaucus*
- Little Barley— *Hordeum pusillum*

Useful Websites

- http://www.flyingwild.org/
- http://www.gaultschool.org/Home.aspx
- http://www.wildflower.org/plants/
- http://www.texasbeyondhistory.net/
- http://www.edwardsaquifer.net/
- http://sfr.psu.edu/youth/sftrc/lesson-plans/forestry/k-5
- http://www.projectwild.org/growingupwild.htm
- http://www.thebutterflysite.com/texas-butterflies.shtml
- http://www.discoverlife.org/mp/20q?guide=Caterpillars
- http://www.sanaturalareas.org/butterflyid1.htm
- http://www.npot.org/
- http://essmextension.tamu.edu/plants/
- http://www.austinreptileservice.net/lizards.html
- http://birdingbyear.com/

- http://www.saws.org/education/h2o_university/index.cfm

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