EDUCATE

RECREATE

RENEW

A Resource Guide to Phil Hardberger Park and the Oak Loop Trail

Entrance to the Oak Loop Trail as photographed by Barbara Schmidt in November 2011.

8400 NW Military Hwy

210-207-3284

Phil Hardberger Park Conservancy and Alamo Area Master Naturalists

FOREWARD

Entrance to Phil Hardberger Park (West) as photographed by Barbara Schmidt in November 2011.

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ACKNOWLEDGEMENTS

The production of this Resource Guide to the Oak Loop Trail is a joint project of the Alamo Area Master Naturalist Leadership Team for the Fourth Saturday Events in Phil Hardberger Park , the Phil Hardberger Park Conservancy, and the Alamo Group of the Sierra Club

Two key individuals with the Alamo Area Master Naturalists, Wendy Thornton, chair of the team, and Liz Robbins, president of the local chapter, were instrumental in leading, encouraging, supporting, and directing the effort.

A large group of Master Naturalists was involved in the writing and editing process. I want to be sure to thank those who wrote multiple talking points; these contributors are Wendy Leonard, Jessica Leslie, and Christine Westerman.

While many persons contributed to the editing, Jessica Leslie and Ron Tullius helped me in each picking up a third of the points to review editorial comments and finalize the pieces. But then, Ron Tullius did a superb job of re-editing the entire document. Ron improved tremendously the quality of the final product by catching so many spelling and grammar errors and suggesting many small improvements. The quality of the entire work was immeasurably enhanced by Ron's careful work. Thank you so much, Ron.

My wife, Wendy Drezek, was responsible for coming up with the layout and encouraging me to use Microsoft Publisher for developing the guide. She was a constant help and support throughout this project.

Finally, the inspiration for the guide came from my weekly association with two members of the City of San Antonio's *Natural Areas* staff, Wendy Leonard and Jayne Neal. A third, Gail Gallegos, actually came up with the need; she will be instrumental in helping implement the guide on various technological platforms.

NOTE TO THE USER

Ultimately, it is your experience reading, thinking about what you see along the way, and using this guide which matters. So feel free to direct questions, concerns, and suggestions for improvement to me.

Stan Drezek (stanwendre@gmail.com)

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Entrance to Phil Hardberger Park (West) as photographed by Barbara Schmidt in November 2011.

NOTE ON CONTENTS

Each section of the Resource Guide is arranged to include a set of Talking Points ideally suited to the seasons. This somewhat arbitrary arrangement is meant to facilitate walking the Oak Loop Trail. Because of the primacy of trees in the ecosystem, each "season" starts with a Talking Point about trees.

THE ASHE JUNIPER

LBJ Wildflower Center: NPIN Image 28552 by Claudia Leon

Much of the text and information for this point was taken by Alamo Area Master Naturalist Stan Drezek from the essay Mountain Cedar Friend or Foe? by COSA's Peggy Spring www.fofriedrichpark.org/Information/Essays/MountainCedar_Test.html and Jan Wrede's Texans Love Their Land , 1997.

OVERGRAZING & FIRE SUPPRESSION= ASHE JUNIPER DOMINANCE

DIOECIOUS*

The Ashe Juniper (*Juniperus ashei*) is the dominant native tree species of the Texas Hill Country. While Ashe Juniper has existed in the Hill Country for tens of thousands of years, its recent relative dominance can be explained by human control of grassland fires and overgrazing of native grasses, thereby reducing fuel for fires. The result is woody encroachment, especially by Ashe Juniper. **Can you see its dominance in the areas along the Oak Loop Trail?** Another particularly beautiful example of this dominance can be found in Friedrich Park's Juniper Barrens Trail.

The Ashe Juniper is an evergreen tree with tiny, scale-like leaves flattened into many little branches at the ends of twigs. There are separate male and female trees. From December to February the male trees turn golden brown with copious quantities of pollen, causing many locals to suffer from "cedar fever." In the fall, the female trees produce the familiar, blue juniper berries, which are actually miniature cones. **Can you find a female Ashe Juniper, whose "fruits" are eaten by many species of wildlife?**

The bark becomes shaggy with age and shreds into long, narrow, irregular strips. **Can you see some of this "old growth" Ashe Juniper along the trail?** The wood of the Ashe Juniper is resistant to decay and insects.

There is debate, subject to studies now being done, as to whether the environmental negative of the excess use of water by Ashe Juniper is outweighed by its positive contribution to soil stabilization and soil production, as well as providing shelter for wildlife. David Bamberger (see the April, 2010 *Bamberger Ranch Journal*) certainly makes the case for selective removal of Ashe Juniper.

* *having the male and female reproductive organs in separate flowers on separate plants*

THE ASHE JUNIPER (cont.)

REMOVAL?

vs.

LEAVE IT!

"OLD GROWTH" JUNIPERS & GOLDEN-CHEEKED WARBLERS

However, Bamberger found that it was not so much the trees' heavy use of water, but rather, as they form dense thickets, the trees actually prevent rain water from reaching the ground and, thus, percolating back into the groundwater supply. On the other hand, Bradford Wilcox's 2010 paper in *Geophysical Research Letters* found "overgrazing and resultant soil degradation, not encroachment by woody plants, were the main culprits behind reductions in stream flows and recharging of groundwater…." It is probably safe to say that the dense thickets of junipers and the removal of grasses and plants due to overgrazing and the resulting water runoff are both serious contributors to the lowering of the water table.

There is no debate, however, as to the importance of the Ashe Juniper to the endangered Golden-cheeked Warbler (*Dendroica chrysoparia)*. In March these birds return to Texas by flying over 1100 miles from wintering grounds in Guatemala and other Central American countries. It is the only bird species whose breeding grounds are confined to Texas, most notably the Texas Hill Country. All Golden-cheeked Warblers mate, reproduce and raise their babies in Texas. They weave their nests from the long, shaggy strips of "old growth" juniper and spider webs. They feed themselves and their young on the insects and arthropods living on Ashe Juniper, Red Oaks, Live Oaks, and Cedar Elms. Because of the impact of land development in reducing "old growth" juniper, governmental agencies are working on Habitat Conservation Plans to protect this precious resource. **Do you realize that if we had no "old growth" juniper, the Golden-cheeked Warbler would cease to exist?**

LBJ Wildflower Center: NPIN Images 28571 by Diana Kolshorn and 22932 by Sally and Andy Wasowski

SA AREA CULTURAL HISTORY

Dr. Steve Tomka, Director of the Archaeological Research Center at the University of Texas at San Antonio, wrote this point.

12,000 YEARS OF HUMAN OCCUPATION

Evidence of human occupation of Bexar County and the greater San Antonio region stretches back roughly 12,000 years.

NOMADIC HUNTER-GATHERERS

The earliest evidence of humans in South Texas consists of spear and dart points used by nomadic hunters and gatherers. The darts (large arrows or light spears) were thrown using an *atlatl* or throwing stick. These people hunted large game such as mastodons and mammoths. With the disappearance of the large animals, these hunters switched to smaller game such as deer and antelope, and they began to include roots, tubers, and seeds in their diet.

Small, widely-spread, nomadic groups returned regularly to territories they claimed as their own. With an increase in population, groups settled into small regions, with large cemeteries appearing around 3,000 years ago. Trade with neighboring groups was initiated, and inter-group violence occurred. Food sources remained constant, fluctuating only with changes in bison populations.

CERAMICS BOW & ARROW

Two major changes occurred about 1,200 years ago. Ceramic vessels came into use for cooking, and the bow and arrow became the primary hunting weapon.

Have we experienced technological changes in our lifetimes that have a major impact on how we live and behave?

SALADO CREEK CAMPS

Native groups in South Texas remained nomadic due to the lack of running streams south of the Nueces River. Lush resources along the San Antonio River basin permitted native groups to coalesce along the upper reaches of the river in what is known today as Brackenridge Park and to establish long-term settlements.

MISSIONS

The San Antonio River may have been an artery of transportation, with groups traveling long distances in canoes. The first Spanish visitors spent seven years in Texas between 1528 and 1535. Later, members of the Lipan Apache, Comanche, and Tonkawa tribes roamed the region. They often camped along Salado Creek, which runs through Phil Hardberger Park. Eventually, Spanish missions and forts were established across South Texas and in present-day Bexar County. Native groups lived and worked in the missions, leading to the assimilation of many groups after the secularization of the missions in the early 19th century.

SA AREA CULTURAL HISTORY (cont.)

DOCUMENTED SITES

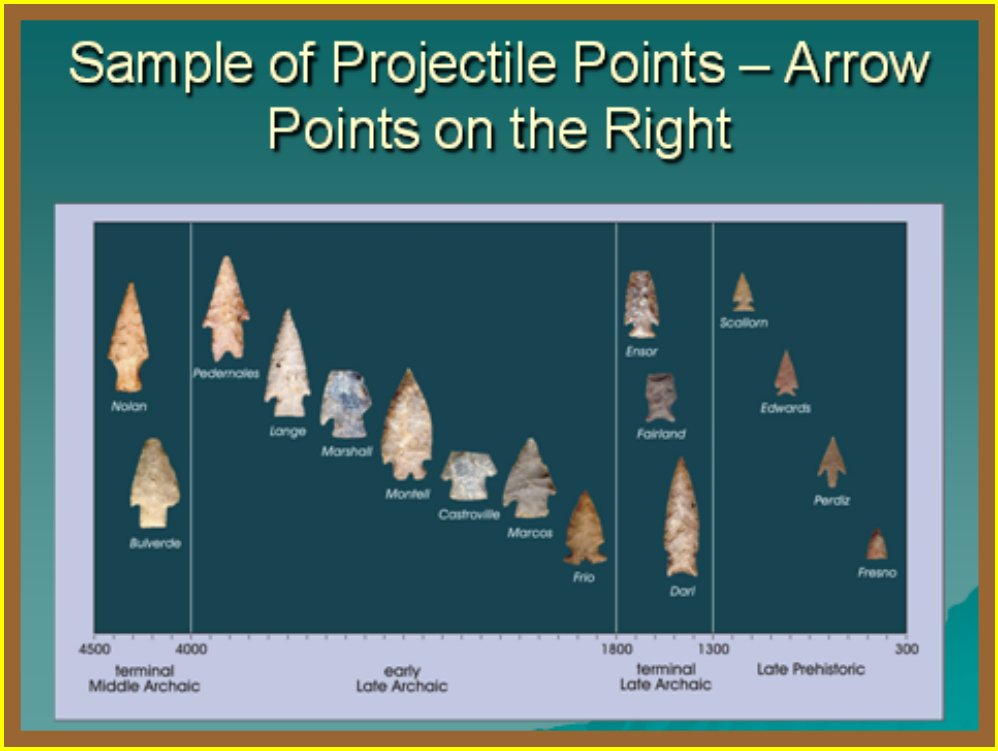
Archaeological surveys in Friedrich Park, Eisenhower Park, and Walker Ranch document these areas as camp sites, hunting spots, and quarry areas for good quality *chert*. The chert was used to make hide scrapers, arrow points, and various tools. Chert "blanks" from local quarries were traded across the state. Stone tool fragments, burned rocks, and animal bones indicate permanent encampments on the banks of creeks.

NO ARTIFACT COLLECTING

What is the true significance of archaeological sites and the artifacts found within them?

From artifacts found within the natural areas, archaeologists are able to reconstruct the site to identify who made the tools and the time of their fabrication. Surface artifacts reveal information about trade patterns, technology changes, and landscape uses. Loss of these artifacts means the permanent loss of information about the past. The collection of artifacts on city, county, and state lands is prohibited by law. Unlicensed artifact collection may lead to prosecution, which can result in fines or imprisonment.

Chart on Projectile Points produced by Dr. Steve Tomka.



IMPORTANCE OF SNAGS

SNAGS= STANDING DEAD TREES

COSA Parks and Recreation Department's Park Naturalist Wendy Leonard wrote this piece and took the picture above.

SNAGS= HOMES FOR BIRDS & MAMMALS

The saying "*home is where the heart is*" has never been more true than its meaning in nature. For many animals, home can be the heartwood of dead or decaying trees. Dead trees still standing in the forest are called snags. Snags provide home and refuge for many animals including birds, amphibians, reptiles, and mammals.

There are over 85 species of North American birds that use cavities in snags and decaying trees as their home[1]. A very few species including woodpeckers and nuthatches are *Primary* cavity nesters who have to excavate their own cavities; snags provide the perfect medium for this activity. These primary cavity nesters will rarely nest in cavities that they themselves did not excavate. If snags are not available for excavation, they may not be able to nest or to roost[2].

Many more species are *Secondary* cavity nesters such as the Eastern Bluebird and the Carolina Chickadee who cannot excavate cavities for themselves; thus, they rely on the primary cavity nesters to carve out a home in a dead or dying tree[2].

IMPORTANCE OF SNAGS (cont.)

ROTTEN WOOD IS A HOME, TOO !!!

THAT'S WHY WE LEAVE SNAGS

Do only birds make use of snags and tree cavities?
These cavities are home not only for numerous bird species, but also for many mammals such as squirrels and ringtails, both of which live in Phil Hardberger Park. Lizards such as the Texas Spiny Lizard, or Tree Lizard, take refuge in these cavities as well.

Cavity nesters are an important part of the forest ecosystem, because many of them are insectivorous and keep forest pests in check[2]. After a snag has rotted enough to fall to the ground, its role of providing a home does not end. Once on the forest floor, it encourages an entirely new ecosystem to begin. This rotten wood now becomes home for fungi, earthworms, fireflies, toads, and even salamanders—all the while recycling nutrients back into the earth[3].

What lessons do we learn from Mother Nature about recycling?

In the past, snags were removed from forest ecosystems. However, as we learn more and more about their importance, snag retention has become an increasingly important part of maintaining a healthy ecosystem. As you look around the forest floor, know that the dead wood you see can sustain as much life as a living tree[3].

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[1] Wildlife in Connecticut: Wildlife Habitat Series. 1999. *Snags for Wildlife*. Connecticut Department of Environmental Protection: Wildlife Division.
[2] Jones, E.J. et al. 1994. *Snags and the Downed Logs: Working With Wildlife.* North Carolina Cooperative Extension Service.
[3] Parker, M.O. 2011. *Skill Builder: Dead Wood Supports Life*. Texas Parks and Wildlife Magazine.

Carolina Chickadee. Photo by Susan Morgan from http://txmn.org/alamo/alamo-area-natural-history/birds-2/

EXOTIC INVASIVE PLANTS

NANDINA→

CHINESE TALLOW→→

Pictures of Nandina (L) and Chinese Tallow (R) from Non-Native Invasive Plants of the San Antonio Area http://www.texasinvasives.org/

Alamo Area Master Naturalist Jessica Leslie is the author of this piece.

Note: This notice is required by HB 338, passed by the 2011 legislature. Any plant termed below as an invasive "is only a recommended [characterization] and has no legal effect in the State of Texas. It is lawful to sell, distribute, import or possess a plant [we term invasive] unless the Texas Department of Agriculture labels the plant as noxious or invasive on the department's plant list."

INVASIVES DRIVE OUT NATIVES

Exotic invasive plants are those plants that are not native to an area, but reproduce so readily that they establish themselves very quickly. Their rapid spread often causes harm to the environment by outcompeting the native plants in an area. **Why is this a problem?**

The problem lies in the fact that other native species, such as insects, birds, etc., rely upon native plants as a source for food and shelter. If the invasive plants dominate an area, the native plants cannot survive. Without the natives, the insects and other species lose their food and shelter sources, and they, in turn, also cannot survive.

INVASIVES ESCAPE THE CONFINES OF LANDSCAPES

H**ow did these invasive plants get here?** Many of these plants were imported from other countries for their ornamental value and their resistance to insects and disease. Nurseries sell them as landscape plants, but, unfortunately, they do not remain in the confines of our yards. When they show up in a non-native area, they have no natural predators, thus they are able to reproduce without predation. The added fact that they are disease and insect-resistant only increases their sur-

EXOTIC INVASIVE PLANTS (cont.)

REDUCE DIVERSITY

KING RANCH BLUESTEM

SO MANY OTHERS

LEARN MORE

texasinvasives.org

CHINABERRY→

PRIVET→→

vivability. When they take over an area and choke out natives, the other species such as the birds and insects no longer have a natural food source in the area, and so they move on. If an invasive plant becomes persistent over a large area, some animal species could become endangered or simply disappear. The end result is that native habitat becomes overrun with exotics and not only do our native plants disappear, but so do many of our native animals.

Volunteers working with city staff have removed many of the invasives from Phil Hardberger Park (West). The park is relatively free of invasives with the exception of King Ranch Bluestem, which is difficult to eradicate. King Ranch Bluestem (*Bothriochloa ischaemum var. songarica*) is a grass introduced from Europe and Asia as a livestock foliage and for erosion control, mainly along roadsides and highways. It established itself very quickly and is now present in many parts of the state, much to the demise of our native grasses such as Little Bluestem (*Schizachyrium scoparium*) and Sideoats Grama (*Bouteloua curtipendula*).

Other exotic invasives that have found their way from our backyards into our natural areas include:

Nandina (*Nandina domestica*)

Chinese Tallow (*Sapium sebiferum*)

Chinaberry (*Melia azedarach*)

Ligustrum or Privet (*Ligustrum japonicum*)

Lantana (*Lantana camara*), not to be confused with Texas Lantana (*Lantana horrida*)

How can the average citizen help control the spread of invasive plants?

Pictures of Chinaberry (L) from Non-Native Invasive Plants of the San Antonio Area http://www.texasinvasives.org/ and Ligustrum (R) from Wikipedia (Jose Luis Galvez 11-21-06)

LIVE OAK/ASHE JUNIPER ECOSYSTEM

Left: 1938 aerial photograph reproduced from Geological & Environmental Consultants Plate No. 1 in Phil Hardberger Park Master Plan . Right: author's photo

Christine Westerman, Office Lead, SWCA Environmental Consultants, San Antonio office, is the author of this piece.

PHP: ORIGINALLY A LIVE OAK SAVANNA

The Live Oak/Ashe Juniper ecosystem occurs in shallow limestone soils on hills and *escarpments* in the Edwards Plateau ecological region of Texas. Escarpments are steep areas or cliffs that separate one level of terrain from another.

Prior to European settlement the vegetation on the land which is now Phil Hardberger Park was primarily a mosaic of grassland and scattered trees (especially Live Oaks), a savanna--an expanse of grassland with scattered trees. Grasses were grazed by native animals such as the nomadic bison, which grazed an area very intensely, then moved on, giving the prairie grasses time to recover. In addition, natural fires and fires set by Native Americans killed woody plants, thereby promoting growth of native prairie grasses. The cycle of grazing, periodic fire, and recovery maintained prairie and savanna ecosystems for thousands of years.

The beautiful and majestic Live Oak in central Texas is the Plateau Live Oak (*Quercus fusiformis*). Live oaks sprout from the roots, forming groups of trees known as "mottes." Individual trees in these oak mottes are genetically identical and remain connected through their root systems. *Live Oak trees with trunk diameters up to 45 inches have been measured at Phil Hardberger Park!*

FEWER ASHE JUNIPERS

It is difficult for us to know the exact distribution and abundance of Ashe Juniper in central Texas at the time of European settlement. Early settlers recorded very dense, nearly closed-canopy "cedar brakes," especially on slopes and rocky canyon-lands, while also noting large expanses of savanna grasslands. When early settlers in Texas began to suppress wildfires and to fence livestock, Ashe Juniper became established in areas previously dominated by grasses. Thus, many areas that were originally Live Oak savanna became Live Oak/Ashe Juniper woodlands.

LIVE OAK/ASHE JUNIPER ECOSYSTEM (cont.)

LIVE OAK & ASHE JUNIPER WOODLAND

Look around the area where you are now standing. Can you see the extensive tree canopy of the dominant Live Oak/Ashe Juniper ecosystem?

Both Live Oaks and Ashe Junipers are important tree species for many reasons. Live Oaks provide cover and shelter for deer and other wildlife; oil-rich acorns are an important food source for numerous species, including white-tailed deer, squirrels, javelina, and bobwhite quail. Even the endangered Whooping Cranes eat acorns during their annual migration from Canada to the Aransas Wildlife Refuge. Songbirds feed on the spiders, insects, and caterpillars that live in Live Oak canopies.

Ashe Junipers provide nesting space and cover for many species of songbirds. The blue berries (actually "cones") produced in the fall are an important energy source for many native and migrant birds during the winter months. Strips of peeling bark on mature Ashe Junipers are the key nesting material for the endangered Golden-cheeked Warbler, which breeds only in a limited range in Central Texas.

IMPORTANT TREE SPECIES

Like any natural ecosystem, the Live Oak/Ashe Juniper community contains a diversity of trees, shrubs, grasses and wildflowers. Common species in this ecosystem include Texas Oak, Cedar Elm, and Escarpment Black Cherry (especially along creeks), as well as shrubs such as Texas Persimmon, Evergreen Sumac, Texas Mountain Laurel, Agarita, and Twist-leaf Yucca.

Cedar Sedge commonly occurs in the areas shaded by Live Oaks and Ashe Junipers and is often the only herbaceous species growing under them. *A thick layer of Ashe Juniper leaf litter inhibits germination and growth of seedlings—possibly because the hydrophobic (water-repelling) litter sheds water.* Sunnier areas can support a variety of grasses such as Little Bluestem, Texas Grama, Curly Mesquite, and Seep Muhly.

MANAGING WOODLANDS FOR DIVERSITY

The Live Oak/Ashe Juniper ecosystem can be managed to improve its value for wildlife. Land managers may create openings in woodland areas (*senderos*) to encourage the growth of grassland species and to provide "edge" habitats (where two habitat types such as grasslands and woodlands come together) for wildlife species such as white-tailed deer and wild turkeys. Natural resource managers at Phil Hardberger Park are re-creating savanna communities and "edge" habitats by selective clearing of Ashe Junipers and other woody species, along with re-planting of native grass and wildflower species.

References:
Fuhlendorf, S.D., Smeins, F.E., and W.E. Grant. 1996. *Simulation of a Fire-sensitive Ecological Threshold: a Case Study of Ashe Juniper on the Edwards Plateau of Texas,* USA. Ecological Modelling 90:245-255.

McMahan, C.A., R.G. Frye, and K.L. Brown. 1984. The Vegetation Types of Texas, Including Cropland. Texas Parks and Wildlife Department, Austin, Texas.

BIRDS OF PHIL HARDBERGER PARK

Left: **Black-crested Titmouse** in *http://en.wikipedia.org/wiki/File:Black-crested_Titmouse.jpg* from *www.naturespicsonline.com* which explicitly releases to public domain

Right: **Bewick's Wren** from public domain US Fish & Wildlife Service: *http://digitalmedia.fws.gov/cdm4/item_viewer.php?CISOROOT=/natdiglib&CISOPTR=7427&CISOBOX=1&REC=17*

LOOK FOR BIRDS

IN THE SKY:

VULTURES

CARACARAS

DOVES

HAWKS

Alamo Area Master Naturalist Patricia ("Patsy") Kuentz is the author of this piece.

Recent bird surveys of Phil Hardberger Park indicate that more than 100 species of birds are found in the park, many of them along the Oak Loop Trail. Although there is no guarantee that you will see any of these bird species on your visit (birds have wings, and they use them!), keep your eye out for some of the more common birds of the area.

Look skyward, and you might see soaring Turkey Vultures and Black Vultures. Occasionally, you may observe groups of three or four eating a dead animal on the ground. Although not as common, Northern Caracaras (called Mexican Eagles by some people) periodically patrol the park looking for carrion. (Because of its distinctive coloration, the Northern Caracara is sometimes mistaken for a Bald Eagle.) The vultures and caracaras are real public servants in helping keep our park clean.

What do you think would happen if there were no vultures to eat the carcasses of dead animals?

Red-shouldered Hawks frequent the skies of this area, too. White-winged Doves, whose call is sometimes thought to be similar to that of the Barred Owl, are also commonly seen flying in groups in the park. During migration periods, large aggregations of blackbirds such as Great-tailed Grackles can be visible from the Oak Loop Trail. Because this section of the park has no water source, ducks are not

BIRDS OF PHIL HARDBERGER PARK (cont.)

IN TREES:

WOODPECKERS
CARDINALS
BLUE JAYS
TITMICE
WRENS
MOCKINGBIRDS

ON THE GROUND:

SPARROWS
ROADRUNNERS

WINTER BIRDS:

PHOEBES
WARBLERS

common here; however, you might get an occasional look at a group of Black-bellied Whistling-Ducks flying overhead between ponds near the park.

The many tree-level birds in Phil Hardberger Park include woodpeckers such as the Golden-fronted Woodpecker and Ladder-backed Woodpecker, whose undulating flight patterns are good identification clues. They are joined in this area by Northern Cardinals, Blue Jays, Carolina Wrens, Bewick's Wrens, Lesser Goldfinches, Carolina Chickadees, and Black-crested Titmice. The Northern Mockingbird, our Texas state bird, is easily heard and usually seen on the Oak Loop Trail. Its various loud songs imitate those of other birds found locally.

As the plants in the park's restored savanna reach maturity, keep an eye out for various sparrows, since they will enjoy the many seeds and insects that will be available there. Be sure to watch for motion in the path ahead of you. If you are quiet and very lucky, you might spot a Greater Roadrunner. This long-tailed, large bird streaked with gray could be trotting across the path in search of a tasty lizard.

So what is the best place to look for birds?

The park also has many winter bird visitors. One of the most common, the Eastern Phoebe, often flicks its tail up and down as a clue to identity. Several warblers migrate through this area, but only a few, such as the Orange-crowned Warbler and the aptly named Yellow-rumped Warbler, routinely stay here for the winter.

Golden-fronted Woodpecker in *http://en.wikipedia.org/wiki/File:Melanerpes_aurifrons2.jpg* *from* *www.naturespicsonline.com* which explicitly releases to public domain

Greater Roadrunnner from *http://www.mrnussbaum.com/birds/roadrunner.htm* courtesy of fws.gov (public domain)

REPTILES OF PHIL HARDBERGER PARK

ROSEBELLY LIZARD→

Rosebelly Lizard (picture by author)

Fred Wills is the author of this piece.

Animals with backbones (vertebrates) fall into several classes. We all recognize feathered birds and hairy mammals. But what is a reptile? An easy definition of reptiles is that they are terrestrial, vertebrate animals with scales or plates covering the body. However, this definition simplifies their great diversity. In Texas alone, there are four major groups of reptiles: lizards, snakes, turtles, and crocodilians (alligators). Hardberger Park is home to lizards, snakes, and turtles.

Common lizards of the park include the Rosebelly Lizard, Texas Spiny Lizard, and Ground Skink. Common snakes of the park include the Texas Rat Snake, Rough Earth Snake, and Checkered Garter Snake. **Can you name any other lizards and snakes found in the area?** Hint: One lizard can change color, and one snake can produce sound.

Like many birds and mammals, reptiles are predators. Small ones like the Rosebelly Lizard and Rough Earth Snake eat invertebrate animals such as insects. Medium-sized snakes such as the Checkered Garter Snake often eat frogs. Larger snakes, including the Texas Rat Snake, typically eat small mammals and birds.

Where do reptiles live? The various species occupy almost all kinds of habitats, from dry prairie to moist woodland, and even wetlands and streams. Related species often divide up the habitat through differing behaviors. Two kinds of fence lizards, the Rosebelly Lizard and Texas Spiny Lizard, differ not just in size but also in their preference for living on the ground versus living in the trees. The Rosebelly Lizard is smaller and found on the ground. The larger Texas Spiny Lizard is frequently seen in trees, but will sometimes descend to the ground.

REPTILE= TERRESTRIAL VERTEBRATE WITH SCALES OR PLATES

PHP:

ROSEBELLY LIZARD
TEXAS SPINY LIZARD
GROUND SKINK
TEXAS RAT SNAKE
ROUGH EARTH SNAKE

REPTILES IN PHIL HARDBERGER PARK (cont.)

REPTILES CANNOT REGULATE BODY TEMPERATURE

CAMOUFLAGE

PHP: A HOME TO REPTILES

CHECKERED GARTER SNAKE→

Both of these lizards have rough scales. The Ground Skink is a small, shiny, snake-like lizard that lives among fallen leaves and grasses. Its smooth scales and tiny limbs allow it to slip easily away if pursued by a predator. Some reptiles even live in the ground. The Texas Blind Snake is worm-like, lives in the soil, and feeds on ant eggs, larvae and pupae. Using a noxious secretion, It can even repel an attack by ants.

Reptiles, unlike birds and mammals, cannot maintain a constant body temperature. They must move into or out of warm or cool areas in order to keep their bodies at the right temperature. **Why might this be an advantage compared to animals that maintain constant temperature using their physiology?**

Skin color in reptiles varies from dull browns and grays to striking bright green. Background-matching skin color or the ability to change skin color is an example of camouflage. The Texas Spiny Lizard's brownish, mottled skin blends well with tree bark, allowing it to remain concealed while in the open. The Green Anole has the ability to change from green to brown and back. This often makes the animal nearly invisible among leafy trees and vines.

The majority of snakes are non-poisonous, but even poisonous snakes are of little concern if proper precautions are taken. To avoid potential problems, do not handle unidentified or poisonous snakes, do not put your hands or feet in places you cannot see, be aware of your surroundings (like the trail surface and what might be on it), wear boots when off-trail, and use a light at night. While you may not see reptiles as you walk along the trail, know that Phil Hardberger Park provides a home for this interesting group of vertebrates.

Author's picture of Checkered Garter Snake eating an earthworm.

WILDFLOWERS OF PHIL HARDBERGER PARK

BLUEBONNET

INDIAN BLANKET

GAYFEATHER

TURK'S CAP

Alamo Area Master Naturalist and plant specialist Patty Leslie Pasztor is the author of this piece.

Phil Hardberger Park sits at the crossroads of three ecological areas: the Edwards Plateau, Blackland Prairie, and South Texas Plains. This convergence of regions supports a diversity of wildflower species. About 100 species have been observed in the park, and some, including Texas Bluebonnet and Twistleaf Yucca, occur only in Texas.

Wildflowers give us a sense of pride and place. Tourists often travel to Texas each spring just to see our beautiful wildflowers. Texas even has a wildflower hotline reporting the best spring displays in the state. As Lady Bird Johnson said, native plants "give us a sense of where we are in this great land of ours."

Everyone loves the sight of wildflowers in spring. **Can you think of other reasons why we want to encourage/ protect our wildflowers?** What role do they play in conservation? Do they help hold our soil in place and prevent erosion? **What animals depend on flowers for survival?** Did you know that some birds eat the seeds of our wildflowers? Native sunflowers and thistles are devoured by Goldfinches. Our wildflowers are also vital to butterflies and other insects such as native bees. Did you know that the Pipevine Swallowtail butterfly lays its eggs only on a certain wildflower called the Swanflower or Pipevine? **Can you think of a bird that seeks out the blooms of wildflowers?** Think nectar/hummingbirds! These winged jewels find sustenance on Purple Horsemint, Standing Cypress, and Gayfeather, to name just a few.

<u>The Benefits of Wildflowers:</u>

* aesthetics – a wildflower field is beautiful
* erosion control by stabilizing the soil
* decomposition: adding nutrients to soil
* water filtration through root systems
* a source of seed and forage
* nesting material & cover for wildlife
* nectar for butterflies, bees. and hummingbirds
* larval food for butterflies
* food source for humans
* source of medicine, fiber, dyes
* food for livestock
* landscape material

One of the first wildflowers to bloom each spring is our beloved state flower, the Texas Bluebonnet. It is an annual, meaning it grows from seed, blooms and then dies, all in one season. Many of the seeds then germinate the following summer or fall. **Did you know, that if you pick a bluebonnet you will prevent it from seeding and making a new plant?** Often wildflower seeds lie dormant in the soil waiting for the right conditions. Some germinate the following season; others might lie dormant for several years.

WILDFLOWERS OF PHIL HARDBERGER PARK (cont.)

PRAIRIE VERBENA

WILD PETUNIA

LINDHEIMER'S SENNA

FROSTWEED

Most Texas wildflowers need full sun but some grow in shade, such as Turk's Cap and Frostweed (a favorite of monarchs migrating to Mexico in the fall). Other wildflowers you might see in the park include Engelmann Daisy, Fire-wheel or Indian Blanket, Prairie Verbena, Mealy Blue Sage, Yellow Flax, and Wild Petunia.

Wildflowers can be used for food, medicine, insecticides, dye, oil, fiber and more! Chile Pequín, Dewberries, Wild Garlic, Chickweed, and Spiderwort are all examples of wildflower food sources. Among many examples of possible medicinal uses is Lindheimer's Senna, whose velvety leaves have been used as a laxative. Horsemint is an example of an insecticide (its citronella-like smell repels mosquitos), as is Larkspur, which has been used to treat human parasites (Civil War Union troops killed body lice with it). Plants used for dyes include Navaho Tea or Greenthread, giving a yellow dye from the stems and a green dye from the flowers, Dewberry, producing shades of pink or gray from the fruit, and Goldenrod, whose shoots yield a brown or yellow dye.

There are fewer and fewer places where wildflowers can grow. This is due in part to habitat change, urban development, and displacement by non-native, invasive species.

As you walk the park, keep an eye out for wildflowers throughout the seasons. Enjoy these beauties and encourage their conservation. They not only bring pleasure and utility, but they also play a vital role in our ecosystem.

The images in the sidebars are all for unrestricted reproduction from the LBJ Wildflower Center, with their NPIN Image ID and photographer(s) listed:

BLUEBONNET	10623	Norman G. Flaigy
INDIAN BLANKET	4522	Mrs. W. D. Bransford
GAYFEATHER	10882	C. A. Reehentin
TURK'S CAP	23243	Sally & Andy Wasowski
PRAIRIE VERBENA	12721	Joseph A. Marcus
WILD PETUNIA	16643	Norman Flaigg
LINDHEIMER'S SENNA	26695	Bruce Leander
FROSTWEED (left)	13288	Joseph A. Marcus
FROSTWEED (right)	26843	Myra B. Allison

KIDNEY WOOD (*Eysenhardtia texana*)

SMALL, FRAGRANT, WHITE BLOSSOMS ON ELONGATED STALKS FOLLOWING RAIN

WHAT CREATURES WOULD BE ATTRACTED TO ITS BLOSSOMS?

LBJ Wildflower Center : NPIN Image ID 19734 by Melody Lyttle

Alamo Area Master Naturalist Ron Tullius is the author of this piece.

Kidney Wood is a perennial, non-spiny, Texas native, a member of the Pea Family; its multiple trunks show an open, airy habit.

It prefers to grow in the sun, but it will tolerate partial shade. The finely divided, deciduous leaves have the pungent smell of citrus.

Small, fragrant, white blossoms on elongated flower stalks appear in May, then intermittently through the summer and fall following rains. **What creatures would be attracted to an abundance of fragrant flowers?**

Kidney Wood is a magnet for butterflies and bees seeking nectar. It's a host plant for the Southern Dogface butterfly, whose larvae (caterpillars) eat the leaves of Kidney Wood.

The fruits are small brown pods attached to the ends of stems in September.

Why name a plant for an organ of the body? It's not unusual for a plant's common name to reflect its everyday use as a food, tool, or medicine. Wood from closely related species of Kidney Wood was used to treat kidney and bladder ailments.

Would you be surprised to know that the heartwood of this plant produces yellow and orange dyes?

The longer the wood is soaked in water, the more the color deepens. Even more

KIDNEY WOOD (cont.)

striking is the blue fluorescence visible when the dye is placed against a black background.

Kidney Wood is heat, cold, and drought tolerant, an excellent landscape plant for this area.

A number of other Texas native trees and shrubs can be seen along the trail.

Look for the spiny stems and cottony leaf undersides of Gum Bumelia (*Sideroxylon lanuginosum*). Its small, black fruits feed a number of bird species. People used to chew the sap issuing from the bark of the tree, an early form of chewing gum.

Also nearby is Eve's Necklace (*Sophora affinis*). Related to Texas Mountain Laurel, Eve's Necklace, a member of the pea family, produces springtime, drooping clusters of pinkish-white flowers, followed in the late summer and fall by bean pods that resemble strings of shiny, black beads . These "necklaces" will often hang on the gently drooping branches of the tree through the winter. The dense, hard wood of Eve's Necklace will produce a yellow dye.

As you continue your walk, you will encounter additional native species besides the frequent junipers, persimmons, oaks, and elms. These include Honey Mesquite, Bluewood Condalia, Net-leaf Hackberry, and Catclaw Acacia. Note the variety of leaf shapes, colors, and textures; feel the smooth, rough, and warty barks; and look for the presence or absence of spines.

LBJ Wildflower Center: NPIN Image 12057 by Joseph A. Marcus

EXCELLENT LANDSCAPE PLANT

CAN YOU SPOT?

Gum Bumelia

Eve's Necklace

Honey Mesquite

Brasil (Condalia)

Hackberry

Catclaw Acacia

PRICKLY PEAR CACTUS (*Opuntia "spp."*)

FLAT, ROUNDED PADS

SPINES & GLOCHIDS

NOPALITOS & TUNAS, TOO

LBJ Wildflower Center : NPIN Image ID 11879 by Joseph A Marcus

Alamo Area Master Naturalist Jessica Leslie is the author of this piece.

There are over 200 species of prickly pear cactus in the genus *Opuntia*. They are native only to the western hemisphere, but they have been introduced to other parts of the world.

Opuntia species typically grow with flat, rounded pads or platycades with two types of spines, the harder, fixed spines and the smaller, hair-like spines, termed glochids, that easily detach from the cactus pad when in contact with another surface. The cactus produces a fruit or tuna that can be red, wine-red, green or yellow/orange depending upon the species.

Have you ever eaten a Prickly Pear cactus? If so, hopefully you removed the spines first! Both the pad and the fruit are used as a food source. The spines are removed from the pads by "sanding" them in a grit medium or by burning off the spines. The young stems or pads are often used as a vegetable or in a salad. In Mexican cuisine, the sliced or chopped pads can be found in egg dishes and in tacos. The fruit or tunas are used to make jellies, candies and beverages.

Another important use of the cactus is the production of cochineal dye. The dye is actually made from an insect that feeds upon the Prickly Pear cactus. **Have**

PRICKLY PEAR CACTUS (cont.)

THE STORY OF COCHINEAL

you ever noticed small, white, cottony mounds on a cactus pad? They are *Dactylopius coccus*, a scale insect that feeds off the moisture and nutrients in the cactus sap. If you smash the insect between your fingers, it turns an intense maroon red. The insect produces carminic acid that helps to deter the bug's predators. The acid is removed from the body and eggs of the insect to make the deep red dye.

Just how valuable was cochineal? Early Mixtec Indians used cochineal to dye their clothing to show social status. They actually farmed the cactus, working to develop different colors of red dyes. When the Spaniards arrived in Mexico, they became enamored of the deep red dye. Clothing was dyed with cochineal and shipped back to Europe. They could not ship enough of the textiles to keep up with the demand, so they began shipping the actual cochineal to Europe. Cochineal became second only to gold in value. After 250 years of Spanish domination of the dye, other countries became involved, and soon cochineal could be found all over the world.

In fact, whenever a natural red dye is desired, cochineal is still the popular choice today. Although artificial colors have replaced the use of natural ones, you can still find cochineal in several products today. **Have you ever spread "bug juice" on your lips?** Chances are, if you have used red lipstick, you have put cochineal dye on your lips. The two main uses of the dye are for red food coloring and for cosmetics, such as rouges and lipsticks. Anytime you notice these ingredients—carmine, natural red 4, CI 75470 or E120 natural coloring—the source is cochineal dye. It is used to color many fruit juices, such as Ruby Red Grapefruit juice, some brands of strawberry yogurt, tropical punch drinks, and water-color paints. Look for these ingredients next time you purchase some of these items.

LBJ Wildflower Center : NPIN Image IDs 13519 & 11885 by Joseph A Marcus

Cochineal on Prickly Pear photographed by Wendy Leonard, January 2012.

SAVANNA RESTORATION

SAVANNA= GRASSES WITH TREES FAR APART

PHP WAS A SAVANNA

SAVANNA DESTROYERS:

OVER-GRAZING

FIRE SUPPRESSION

Hardberger Park 3-ac savanna restoration photographed by Barbara Schmidt

Written by Alamo Area Master Naturalist Stan Drezek from materials supplied by Wendy Leonard and Fred Wills.

"A savanna is a grassland ecosystem characterized by the trees being sufficiently small or widely spaced so the canopy does not close," according to Wikipedia. Savannas tend to be found between tropical rainforest and desert biomes. The open canopy allows light, which supports an understory of grass and herbaceous plants. Surprisingly, approximately 20% of the earth's land area is savanna.

Prior to the onset of ranching in our area in the 1850s, the majority of Phil Hardberger Park was savanna. The Texas savanna, like most savannas, tends to get most of its rain during summer. In Bexar County we have a Live Oak-Ashe Juniper savanna whose perennial grasses include Little Bluestem, Curly Mesquite, and Buffalo Grass. Cacti are also common. Before the introduction of dairy farming in 1910, Phil Hardberger Park had only 15-30% tree canopy, according to estimates. Now it is roughly 66-98%. What a difference! **Looking at our restored savanna, what percentages of tree canopy and open land would you estimate?**

Two actions over the past century changed the ratio: over-grazing and fire suppression. Fenced cows kept grasses short, reducing root structure. The active suppression of fires allowed woody plants to proliferate. In addition, droughts proved even more damaging to short-rooted plants, which could not hold soil during periods of heavy rainfall. Erosion dramatically reduced the depth of nutrient-rich topsoil.

SAVANNA RESTORATION (cont.)

NATIVE PLANTS REDUCED

RESTORING SAVANNA

PHP & THE COMMUNITY

How did these actions change the landscape of Phil Hardberger Park? How does this area of savanna restoration differ from other areas of the park?

Another event affecting the original savanna was the introduction of non-native grass species such as King Ranch Bluestem and Bermuda Grass. These invasive plants have now become the dominant grasses in the non-restored grassland areas. In areas where fire suppression occurred, large stands of Texas Persimmon, Juniper, and Whitebrush now dominate the landscape. The result is decreased rain absorption, along with reduced native grass and herbaceous plant production. This is a dramatic change from the time when Native Americans set fires to keep woody plants in check and to allow tall grasses to flourish, sustaining bison, antelope, and other species.

The concept being evaluated in this three-acre trial restoration is that a reestablished savanna, with a large diversity of more than sixty native plant species*, will support a large insect population, along with numerous reptile, amphibian, bird, and mammal species. In a paper appearing in *Forest Ecology Management* in 2010, Catherine Mabry and co-authors found that restored savannas support the greatest diversity of bird species when the restoration site is in open country or at an *edge*, where forest canopy meets open range.

How will park naturalists measure the success of restoration efforts in Phil Hardberger Park?

*Thousands of plants were placed in the ground through the efforts of 500 local volunteers. **What does this say about the value of Phil Hardberger Park to the San Antonio community?**

Phil Hardberger Park 3-ac savanna restoration photographed by Barbara Schmidt.

TASAJILLO (*OPUNTIA LEPTOCAULIS*) & CACTI

LBJ Wildflower Center : NPIN Image ID 24641 by Harry Cliffe

Alamo Area Master Naturalist Stan Drezek is the author of this piece.

COMMON TO PHP

Pencil Cactus, Turkey Pear, Jumping Cactus, Christmas Cactus—**how can one plant have so many names**? Tasajillo is a relatively common cactus in our park. A close look at its parts may explain the multiple common names. It has thin, brittle stems, colorful winter fruit, and a brushy growth habit. Tasajillo provides nesting sites for Cactus Wrens, and its fruit is a good food source for birds and other small animals.

PRICKLY PEAR, TOO

The other cactus to look for on your walk is the Prickly Pear (*Opuntia engelmannii*). It is the state plant of Texas and so prevalent in Hardberger Park that we cover it in a separate talking point.

WHY CACTI?

Why are cacti present in our park at all? The answer is two-part. First, Bexar County lies at the juncture of three of Texas' Natural Regions: the Blackland Prairie, the Edward's Plateau, and the South Texas Brush Country. The South Texas Brush Country is home to the thorny shrubs and cacti we often see. Second, cacti are ideally suited to survive in our hot, dry environment. While far from being dominant species, cacti are definitely common in Phil Hardberger Park.

TASAJILLO (*OPUNTIA LEPTOCAULIS*) (cont.)

ADAPTATIONS

Look more closely at the Tasajillo here. **What is the main difference you see between it and the surrounding woody vegetation?** The most obvious difference is the lack of leaves and the presence of spines (actually, modified leaves). In addition to the absence of leaves, most succulents are also characterized by unique features that reduce water loss:

Photosynthesis in stems instead of leaves;

Cylindrical, spherical, compact shapes;

Thick, often waxy, outer surfaces;

Viscous, internal structures that retain water;

Quickly generating surface roots that pick up water from light rains or heavy dews.

Cacti also have other adaptations. **Did you know that the pads of prickly pear tend to be oriented east-west so that the smallest surface area possible is exposed to the sun**? Check out the next grouping of Prickly Pear you come across. Are the pads oriented east-west? Many cacti are ribbed, because a ribbed shape easily expands quickly to take in water and provides a design that minimizes the surface area exposed to the sun. **Can you visualize how spines can provide both shade and surfaces that guide and capture dew and light rain**? Some cacti have so many spines that they create a humid micro-climate near the cactus' surface, thereby reducing water loss.

NON-CACTI ADAPTORS:

High temperatures in excess of 120° that would kill many herbaceous plants can be tolerated by cacti. Besides cacti, you should look for two other plants common to Hardberger Park which exhibit adaptations to hot and dry climates: Twist-leaf Yucca (*Yucca rupicola*) and Thread-leaf Yucca (*Yucca constricta*). If you look carefully, you will spot both of these along the trail.

LBJ Wildflower Center : NPIN Image ID 11566 and 13552 both by Joseph A. Marcus

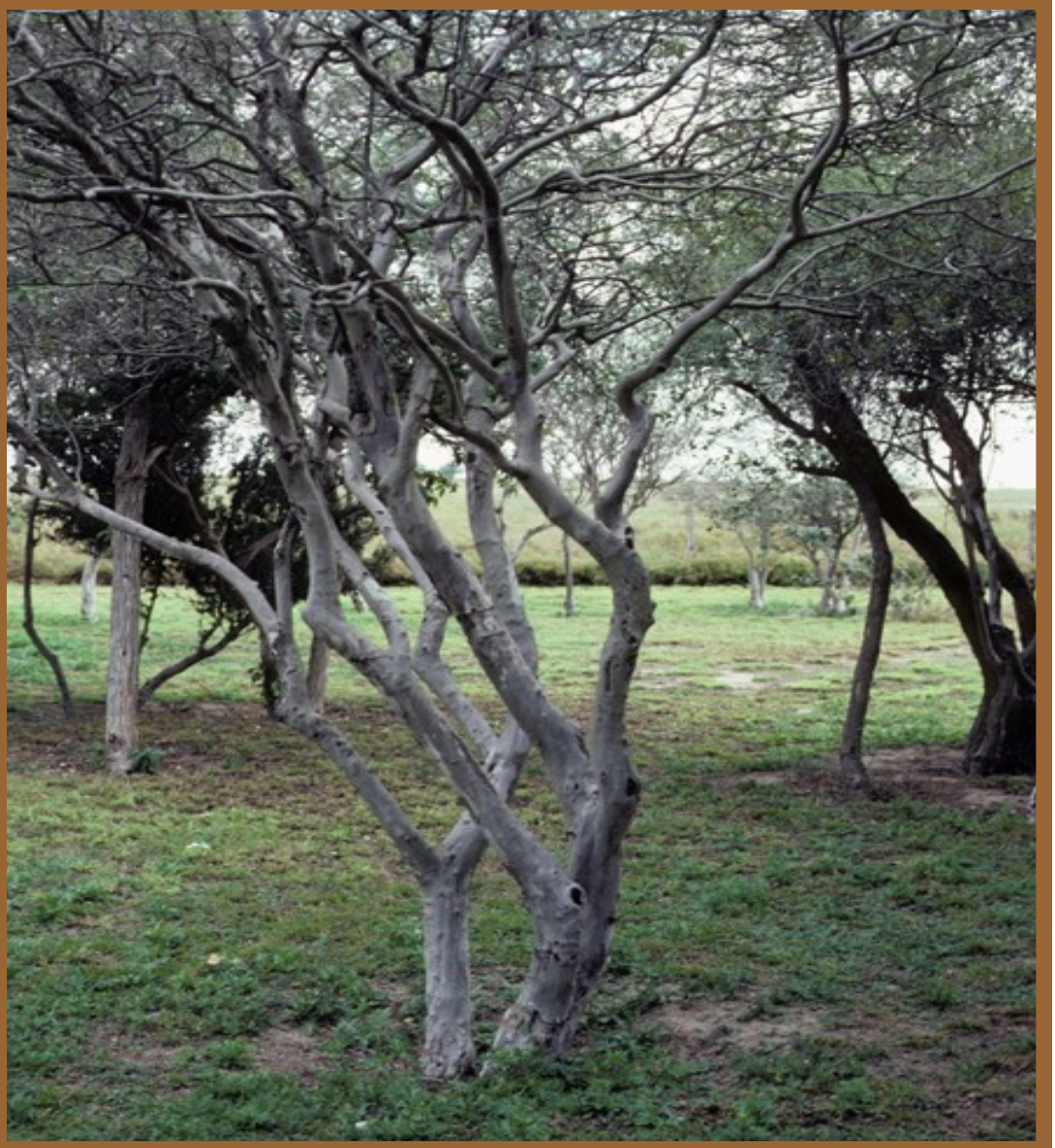
TWIST-LEAF YUCCA→

THREAD-LEAF YUCCA→ →

TEXAS PERSIMMON(*Diospyros texana*)

SEMI-EVERGREEN

DISTINCTIVE, SMOOTH, GRAY BARK



LBJ Wildflower Center : NPIN Image ID 22225 by Sally & Andy Wasowski

Alamo Area Master Naturalist Jessica Leslie is the author of this piece.

The Texas Persimmon is a semi-evergreen shrub or small tree growing to as much as fifteen feet. It is found in dry, rocky areas of central, west and south Texas. The most distinctive trait of the persimmon is the very smooth, gray bark of its trunk. **Can you identify literally dozens of Texas Persimmon from where you are standing?** It has simple, alternate, one to two-inch long, small, dark green, oval-shaped leaves with smooth edges that are slightly rolled under. The leaves are somewhat leathery on top and fuzzy underneath.

TEXAS PERSIMMON (cont.)

DIOECIOUS*

BEAUTIFUL LANDSCAPE TREE

GREEN FRUIT, RIPENING TO BLACK

* *having the male and female reproductive organs in separate flowers on separate plants*

The small, cream-colored, bell-shaped flowers occur in the spring and are very aromatic. The female tree produces a round, one-inch fruit that starts out green but ripens to black by late July to September. The skin is bitter and should be removed before use. This tasty fruit is used to make puddings, jellies and even wine. Some cook it with breads and muffins. **Is there a female Texas Persimmon nearby? If not, look for one as you complete the walk.**

But it is not only humans who enjoy the fruit. The Texas Persimmon is a valuable wildlife plant, providing food for many species of animals as well as cover. Birds nest and perch in the tree and eat its fruit. Numerous mammals also feast on the fruit, and deer and goats browse the leaves. Its flowers are also a source of nectar for bees.

Other uses have been found for this important tree. The hard, black heartwood is used for making furniture, piano keys and tool handles. Native Americans used concentrated juices from the fruit to dye animal hides. Because of its low water needs and tolerance for both sun and shade, people use the tree as an ornamental in landscapes. **Can you see the aesthetic quality in the smooth, gray bark of the trunk and branches of the Texas Persimmon tree, particularly in multi-tree mottes?** Perhaps next time you are looking for a shrub or small tree for your yard, you will see the benefits of planting the native Texas Persimmon.

LBJ Wildflower Center: NPIN Image 22227 by Sally & Andy Wasowski

WILDLIFE OF PHIL HARDBERGER PARK

Ringtail cat (*Bassariscus astutus*) from USDA Forest Service

Christine Westerman, Office Lead, SWCA Environmental Consultants, San Antonio office, is the author of this piece.

MULTIPLE ECO-REGIONS HAVE DIVERSE WILDLIFE

Ten eco-regions have been delineated in Texas. An eco-region is a major natural area defined by important ecological factors such as vegetation type, geology, soils, topography, and rainfall. Phil Hardberger Park is located in a unique area of Bexar County where three of these eco-regions converge: **Edwards Plateau** (or what we think of as "Texas Hill Country"), **Blackland Prairies** (or native grasslands), and **South Texas Plains** (what we often call "Brush Country").

What eco-region are you standing in now? What factors help identify it?

The science of ecology explores how plants and animals interact with their environment. Ecology tells us that different environments will support different types of plants and animals. Because of the amazing convergence of ecological areas in Phil Hardberger Park, there is a surprising variety of wildlife species that make their homes here. Initial wildlife studies conducted during park planning in 2007 identified 51 species of birds within the park! Biologists also observed nine species of mammals, five species of reptiles and amphibians, and ten species of butterflies.

PHP EAST incl RIPARIAN AREA

By exploring the different ecosystems of the park, you will have the opportunity to observe many different species of wildlife. On the northeast end of Phil Hardberger Park (East), along Salado Creek, you may find species that prefer the riparian corridor ("riparian" means the type of vegetation that occurs along a river or creek), because vegetation is denser and trees are taller in these areas. These riparian areas support species like rock squirrels. These dark-colored, large ground squirrels are excellent climbers, preferring to make their dens in rocky crevices, boulder piles and small caves. Salado Creek also provides a corridor – a sort of wildlife highway – where many types of animals can travel to and from the park in the relative safety of the wooded area along the creek. Examples of animals likely to use this highway include coyotes, raccoons, skunks, and white-tailed deer.

WILDLIFE OF PHIL HARDBERGER PARK (cont.)

NOCTURNAL MAMMALS

DIVERSE BIRDS

REPTILES & AMPHIBIANS, TOO

What are some of the major differences in the environment between where you are standing now in Phil Hardberger Park (West) and the riparian area we described along Salado Creek?

Many mammal species occurring in the park are nocturnal (active at night). One example of a nocturnal species that occurs here is the ringtail. The ringtail, a shy and elusive relative of the raccoon, is usually found in thick woods, especially with oaks, juniper (commonly known as mountain cedar), and mesquite. Favorite foods of the ringtail include insects, small animals, and fruit, especially persimmons. Ringtails are likely to occur in riparian areas, rocky sites, and in trees.

If animals are shy, what are ways that scientists can tell if they are here?

Birdwatchers can find a great variety of songbird species, doves, and raptors, e.g., the red-tailed hawk and the great horned owl. The savanna restoration at Phil Hardberger Park will benefit many bird species such as the American kestrel (the smallest falcon in North America) and a variety of native sparrows, which eat insects. These renewed savannas can create habitat for grassland species such as bobwhite quail, which have not yet been observed at Phil Hardberger Park.

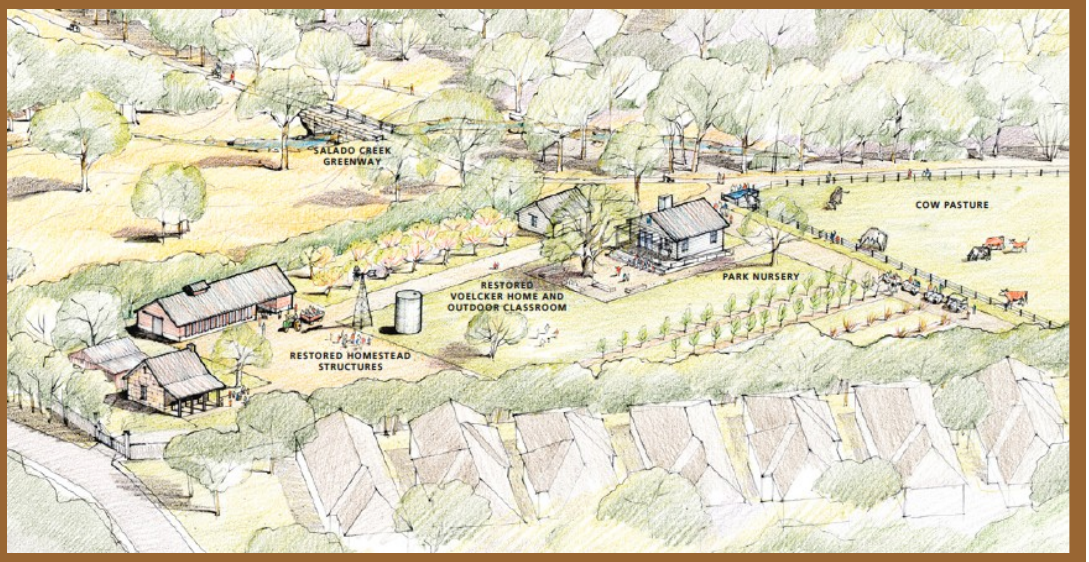
The varied ecosystems in the park also provide habitat for reptiles and amphibians, which are much more difficult to find. Species such as the Texas blind snake, a small, non-poisonous snake that resembles a shiny, black worm, may be found hiding under logs and rocks. Both the brushy areas in the southwest side of the park off NW Military Highway and the rocky areas in the northeast side off Blanco Road provide a home for the Texas spiny lizard and the ground skink, and Gulf Coast toads are likely to be found in riparian areas.

You probably learned in school that reptiles and amphibians are cold-blooded. What may these animals do to stay warm in winter or cool in summer?

Picture of Rock Squirrel from TPWD

HISTORY OF VOELCKER FARM

PHIL HARDBERGER PARK WAS ONCE THE SITE OF A DAIRY FARM



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/

Alamo Area Master Naturalist Wendy Thornton wrote this piece from information contained in the book Last Farm Standing on Buttermilk Hill: Voelcker Roots Run Deep in Hardberger Park by Gayle Brennan Spencer, © 2010.

MAX VOELCKER WORKED THE FARM & MINNIE DELIVERED THE MILK

The Voelcker farm, which is now Phil Hardberger Park, was the homestead of Max and Minnie Alma Tomerlin Voelcker. Max and Minnie came from a large farming and ranching community about twelve miles north of San Antonio.

In the early days of the settlement numerous hardships were endured, including attacks by marauding Indians. Women and children were particularly vulnerable during the Civil War, when men were away fighting in the Confederate Army. Accessing water was another hardship. When nearby creeks ran dry, the only available water was at San Pedro Springs in San Antonio, a half day's wagon ride distant.

If we didn't have water available at the turn of a tap, would we be better conservators of this valuable resource?

Max was the son of dairy farmers and ranchers. After their marriage, Max continued to work the farm, while Minnie delivered milk to San Antonio. During the Great Depression of the 1930s, they began to wholesale their milk products to

HISTORY OF VOELCKER FARM (cont.)

PHIL HARDBERGER PARK IS A CULTIVATED URBAN WILDERNESS.

WHAT DO YOU THINK "CULTIVATED URBAN WILDERNESS" MEANS?

large dairies in San Antonio. Eventually, fierce dairy price wars in Texas led to a decline in prices. In 1947 the Voelckers sold their dairy cows and managed a living by raising meat cattle and leasing their land to hunters.

In 1971 Max and Minnie sold a large parcel of land, which allowed them to live more comfortably. Minnie lived for twenty years after the death of her husband. She passed away in 2000 at the age of 96. Six years later, the city of San Antonio purchased a large acreage of the Voelcker property. The following year the city obtained a subsequent parcel for a total of 311 acres.

This property was destined to become a *green* area for urban dwellers. Groundbreaking for Voelcker Park took place in February 2009. In December of that year the park was renamed Phil Hardberger Park in recognition of the former mayor who worked so diligently to make the park a reality.

What kind of park can be made from previous dairy and cattle land?
Phil Hardberger Park is a cultivated urban wilderness. It will become a living laboratory for the preservation of trees and the restoration of native savannas—a thoughtful stewardship of ecosystems and the environment. The park plan reserves 75% of the land for preservation and restoration. Programmed areas such as walking paths and outdoor rooms are combined with wild areas that establish a wildlife corridor to Salado Creek. The park provides a model of the peaceful coexistence of urban living and wilderness.

Photo courtesy of Dudley Harris (http://blog.mysanantonio.com/jeffcoyle/2011/03/volunteers-to-restore-historic-dairy-barn-at-phil-hardberger-park/)

YUCCA & YUCCA MOTHS

LBJ Wildflower Center : NPIN Image ID 11566 by Joseph A. Marcus

IRRESISTIBLE ODOR OF YUCCA BLOOMS

YUCCA MOTHS MATE INSIDE THE YUCCA BLOOMS

LARVAL FEAST

OBLIGATE MUTUALISM

COSA Parks and Recreation Department's Wendy Leonard is the author of this piece.

Have you heard the story of the yucca moth and Twist-leaf Yucca (*Yucca rupicola)*? If not, you should become familiar with it, because it is a story that is playing out in our natural areas as we speak. From March to June almost every year, moths, lured by the irresistible smell of yucca flowers, emerge from the ground. Yucca moths are one of the oldest moth species (Yucca Moth: www.desertusa.com).

After being lured out of the ground, the yucca moths (*Tegeticula yuccasella)* in Central Texas spend their days resting on the yucca plants near the flowers. Then at nighttime, when blooms are fully open, the male and female yucca moths mate inside the yucca bloom. After mating and collecting flower pollen, the female yucca moth leaves the flower and sets out in search of a newly-opened yucca bloom. Once she finds a suitable flower, she lays her eggs inside the ovary of the flower and deposits the pollen she collected from the first blossom (Yucca Moth: www.desertusa.com).

The fertilized flower then starts forming fruit. Within a few days, the yucca moths hatch and start feeding on the developing seeds. The larvae progress downward through the fruit until they chew their way out and drop to the ground, burrowing into the soil and creating a cocoon. They later emerge as moths, lured once again by the irresistible smell of yucca blooms (Hebert, L. 2009, Yuccas and Yucca Moths).

In this example of obligate mutualism, the yucca needs the moth to pollinate the flowers, which only this moth can do; the moth needs the flower in which to de-

YUCCA & YUCCA MOTHS (cont.)

EXCESSIVE DEER EAT THE YUCCA BLOOMS

posit its eggs so the developing larvae can have a source of food (Hebert, L. 2009, Yuccas and Yucca Moths). Recently, biologists have found that each species of yucca has its own species of moth pollinator (www.yuccamuseum.org).

If the yuccas do not bloom, then moths do not breed. Likewise, if there are no yucca moths, the yuccas will never set seed. This is what is happening here in Central Texas, especially to the endemic Twist-leaf Yucca (*Yucca rupicola*). Tasting and looking much like asparagus sprouts when bloom stalks first start, the stalks are tasty morsels for deer, preventing yuccas from blooming. With the over-population of deer in the few wild lands left, browsing pressure is high, threatening the long-term success of the yucca moths and the yuccas. Those yuccas that are protected from deer and other herbivores have to be lucky enough to have a yucca moth by their side.

Image copied from *desertusa.com/animals/coevolution-mutualism.html*